

Form 3160-3
(June 2015)FORM APPROVED
OMB No. 1004-0137
Expires: January 31, 2018

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: ☒ DRILL ☐ REENTER 1b. Type of Well: ☐ Oil Well ☒ Gas Well ☐ Other 1c. Type of Completion: ☐ Hydraulic Fracturing ☒ Single Zone ☐ Multiple Zone		5. Lease Serial No. NMSF078763 6. If Indian, Allottee or Tribe Name 7. If Unit or CA Agreement, Name and No. NMNM078407E/ROSA UNIT 8. Lease Name and Well No. ROSA UNIT 672H 9. API Well No. 30-039-31492
2. Name of Operator LOGOS OPERATING LLC 3a. Address 2010 AFTON PLACE, FARMINGTON, NM 87401 3b. Phone No. (include area code) (505) 278-8720		10. Field and Pool, or Exploratory BASIN MANCOS/BASIN MANCOS 11. Sec., T. R. M. or Blk. and Survey or Area SEC 8/T31N/R5W/NMP
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface NWNE / 713 FNL / 1931 FEL / LAT 36.919296 / LONG -107.383355 At proposed prod. zone NWSW / 2391 FSL / 1329 FWL / LAT 36.927979 / LONG -107.436674		12. County or Parish RIO ARRIBA 13. State NM
14. Distance in miles and direction from nearest town or post office* 38 miles		15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 713 feet 16. No of acres in lease 17. Spacing Unit dedicated to this well 1292.66
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 20 feet 19. Proposed Depth 6977 feet / 23156 feet 20. BLM/BIA Bond No. in file FED: NMB001821		21. Elevations (Show whether DF, KDB, RT, GL, etc.) 6347 feet 22. Approximate date work will start* 04/01/2025 23. Estimated duration 63 days
24. Attachments		

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, and the Hydraulic Fracturing rule per 43 CFR 3162.3-3 (as applicable)

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| 1. Well plat certified by a registered surveyor.
2. A Drilling Plan.
3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office). | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
5. Operator certification.
6. Such other site specific information and/or plans as may be requested by the BLM. |
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25. Signature (Electronic Submission) Title Regulatory Specialist	Name (Printed/Typed) ETTA TRUJILLO / Ph: (505) 324-4145	Date 01/29/2025
Approved by (Signature) (Electronic Submission) Title AFM-Minerals	Name (Printed/Typed) DAVE J MANKIEWICZ / Ph: (505) 564-7761 Office Farmington Field Office	Date 06/05/2025

Application approval 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.
Conditions of approval, if any, are attached.

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.



(Continued on page 2)

*(Instructions on page 2)

INSTRUCTIONS

GENERAL: This form is designed for submitting proposals to perform certain well operations, as indicated on Federal and Indian lands and leases for action by appropriate Federal agencies, pursuant to applicable Federal laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from local Federal offices.

ITEM I: If the proposal is to redrill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notations. Consult applicable Federal regulations concerning subsequent work proposals or reports on the well.

ITEM 4: Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local Federal offices for specific instructions.

ITEM 14: Needed only when location of well cannot readily be found by road from the land or lease description. A plat, or plats, separate or on the reverse side, showing the roads to, and the surveyed location of, the well, and any other required information, should be furnished when required by Federal agency offices.

ITEMS 15 AND 18: If well is to be, or has been directionally drilled, give distances for subsurface location of hole in any present or objective productive zone.

ITEM 22: Consult applicable Federal regulations, or appropriate officials, concerning approval of the proposal before operations are started.

ITEM 24: If the proposal will involve hydraulic fracturing operations, you must comply with 43 CFR 3162.3-3, including providing information about the protection of usable water. Operators should provide the best available information about all formations containing water and their depths. This information could include data and interpretation of resistivity logs run on nearby wells. Information may also be obtained from state or tribal regulatory agencies and from local BLM offices.

NOTICES

The Privacy Act of 1974 and regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this application.

AUTHORITY: 30 U.S.C. 181 et seq., 25 U.S.C. 396; 43 CFR 3160

PRINCIPAL PURPOSES: The information will be used to: (1) process and evaluate your application for a permit to drill a new oil, gas, or service well or to reenter a plugged and abandoned well; and (2) document, for administrative use, information for the management, disposal and use of National Resource Lands and resources including (a) analyzing your proposal to discover and extract the Federal or Indian resources encountered; (b) reviewing procedures and equipment and the projected impact on the land involved; and (c) evaluating the effects of the proposed operation on the surface and subsurface water and other environmental impacts.

ROUTINE USE: Information from the record and/or the record will be transferred to appropriate Federal, State, and local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecution, in connection with congressional inquiries and for regulatory responsibilities.

EFFECT OF NOT PROVIDING INFORMATION: Filing of this application and disclosure of the information is mandatory only if you elect to initiate a drilling or reentry operation on an oil and gas lease.

The Paperwork Reduction Act of 1995 requires us to inform you that:

The BLM connects this information to an evaluation of the technical, safety, and environmental factors involved with drilling for oil and/or gas on Federal and Indian oil and gas leases. This information will be used to analyze and approve applications. Response to this request is mandatory only if the operator elects to initiate drilling or reentry operations on an oil and gas lease. The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

BURDEN HOURS STATEMENT: Public reporting burden for this form is estimated to average 8 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to U.S. Department of the Interior, Bureau of Land Management (1004-0137), Bureau Information Connection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C. 20240.

Additional Operator Remarks

Location of Well

0. SHL: NWNE / 713 FNL / 1931 FEL / TWSP: 31N / RANGE: 5W / SECTION: 8 / LAT: 36.919296 / LONG: -107.383355 (TVD: 0 feet, MD: 0 feet)
PPP: NESE / 0 FSL / 0 FWL / TWSP: 31N / RANGE: 5W / SECTION: 2 / LAT: 36.927669 / LONG: -107.388982 (TVD: 0 feet, MD: 0 feet)
PPP: NESW / 2335 FSL / 1687 FWL / TWSP: 31N / RANGE: 5W / SECTION: 5 / LAT: 36.927669 / LONG: -107.388982 (TVD: 0 feet, MD: 0 feet)
PPP: NWSE / 1950 FSL / 2607 FEL / TWSP: 31N / RANGE: 5W / SECTION: 5 / LAT: 36.926613 / LONG: -107.385681 (TVD: 0 feet, MD: 0 feet)
PPP: LOT 4 / 0 FSL / 0 FWL / TWSP: 31N / RANGE: 5W / SECTION: 6 / LAT: 36.927669 / LONG: -107.388982 (TVD: 0 feet, MD: 0 feet)
PPP: NESE / 0 FSL / 0 FWL / TWSP: 31N / RANGE: 5W / SECTION: 6 / LAT: 36.927669 / LONG: -107.388982 (TVD: 0 feet, MD: 0 feet)
PPP: LOT 9 / 0 FSL / 0 FWL / TWSP: 31N / RANGE: 5W / SECTION: 1 / LAT: 36.927669 / LONG: -107.388982 (TVD: 0 feet, MD: 0 feet)
PPP: NWSE / 1613 FSL / 2246 FEL / TWSP: 31N / RANGE: 5W / SECTION: 5 / LAT: 36.925685 / LONG: -107.384442 (TVD: 6988 feet, MD: 7657 feet)
BHL: NWSW / 2391 FSL / 1329 FWL / TWSP: 31N / RANGE: 6W / SECTION: 2 / LAT: 36.927979 / LONG: -107.436674 (TVD: 6977 feet, MD: 23156 feet)

BLM Point of Contact

Name: CHRISTOPHER P WENMAN
Title: Natural Resource Specialist
Phone: (505) 564-7727
Email: cwenman@blm.gov

Review and Appeal Rights

A person contesting a decision shall request a State Director review. This request must be filed within 20 working days of receipt of the Notice with the appropriate State Director (see 43 CFR 3165.3). The State Director review decision may be appealed to the Interior Board of Land Appeals, 801 North Quincy Street, Suite 300, Arlington, VA 22203 (see 43 CFR 3165.4). Contact the above listed Bureau of Land Management office for further information.

CONFIDENTIAL

Conditions of Approval

Operator: LOGOS Resources, LLC (LOGOS)
Well Names: Rosa Unit Pad 34 Natural Gas Wells Project
Legal Location: Sec 8 T31N R5W, Rio Arriba County, NM
NEPA Log Number: DOI-BLM-NM-F010-2025-0013-EA
Onsite Date: July 18, 2023
Lease Number: NMSF078763

The following conditions of approval will apply to LOGOS Rosa Unit Pad 34 Natural Gas Wells Project, and other associated facilities, unless a particular Surface Managing Agency or private surface owner has supplied to Bureau of Land Management and the operator a contradictory environmental stipulation. The failure of the operator to comply with these requirements may result in an assessment or civil penalties pursuant to 43 CFR 3163.1 or 3163.2.

1. **Disclaimers:** BLM's approval of the APD does not relieve the lessee and operator from obtaining any other authorizations that may be required by the BIA, Navajo Tribe, State, or other jurisdictional entities.
2. **Copy of Plans:** A complete copy of the APD package, including Surface Use Plan of Operations, Bare Soil Reclamation Plan, Plan of Development (if required), Conditions of Approval, Cultural Resource Record of Review, Cultural Resources Compliance Form (if required), and Project Stipulations (if required) shall be at the project area at all times and available to all persons.
3. **Review of NEPA documents:** It is the responsibility of the operator to follow all the design features, best management practices, and mitigation measures as contained in the Environmental Assessment DOI-BLM-NM-F010-2025-0013-EA, which contains additional design features and best management practices that must be followed. Copies of the EA, Decision Record, and Finding of No Significant Impact may be obtained from the BLM FFO public room, or online at: [EplanningUi \(blm.gov\)](https://www.blm.gov/planning).
4. **Best Management Practices (BMPs):** Farmington Field Office established environmental Best Management Practices (BMP's) will be followed during construction and reclamation of well site pads, access roads, pipeline ties, facility placement or any other surface disturbing activity associated with this project. Bureau wide standard BMP's are found in the Gold Book, Fourth Edition-Revised 2007. Farmington Field Office BMP's are integrated into the Environmental Assessment, Surface Use Plan of Operations, Bare Soil Reclamation Plan, and COAs.

Construction, Production, Facilities, Reclamation & Maintenance

5. **Construction & Reclamation Notification:** The operator or their contractor will contact the Bureau of Land Management, Farmington Field Office Environmental Protection Staff at (505) 564-7600 or by email, at least 48 hours prior to any construction or reclamation on this project. The operator or their contractor will contact the grazing permittee to give notice at least 10 days prior to start of construction operations.

6. **Grazing Allotments, Permittee Notification, and Concerns:** The operator will notify the grazing lease operator of the Rosa Community allotment at least ten business days prior to beginning any construction activity to ensure there will be no conflicts between construction activities and livestock grazing operations. The operator is not obligated to cease or delay construction unless directed by the Authorized Officer (AO). Any range improvement (fences, pipelines, ponds, etc.) disturbed by construction activities will be repaired immediately following construction and will be repaired to the condition the improvement was in prior to disturbance. Cattle guards will be installed to replace any livestock fencing or gates removed for road construction. No cattle guards needed. If fencing has to be temporarily open to place layflat, ensure fencing secured.
7. **Livestock Grazing:** Cattle are in allotment between 5/1 and 10/31. Industry may need to coordinate with permittee if concerns of livestock in area during construction.
8. **Production Facilities:** As marked in the APD, design and layout of facilities will be deferred until an onsite with BLM-FFO surface protection staff is conducted to determine the best location. LOGOS or their contractor will contact the Bureau of Land Management, Farmington Field Office, Surface, and Environmental Protection Staff (505) 564-7600 to schedule a facility layout onsite.
9. **Open Trenches:** No more than ½ mile of trench or the amount of trench that can be worked in one day will be open at any given time.
10. **Staking:** The holder shall place slope stakes, culvert location and grade stakes, and other construction control stakes as deemed necessary by the authorized officer to ensure construction in accordance with the plan of development. If stakes are disturbed, they shall be replaced before proceeding with construction.
11. **Weather:** No construction or routine maintenance activities shall be performed during periods when the soil is too wet to adequately support construction equipment. If such equipment creates ruts more than 6 inches deep, the soil shall be deemed too wet.
12. **Stockpile of Soil:** The top 6 inches of soil material will be stripped and stockpiled in the construction zones around the pad [construction zones may be restricted or deleted to provide resource avoidance]. The stockpiled soil will be free of brush and tree limbs, trunks, and roots. The stockpiled soil material will be spread on the reclaimed portions of the pad [including the reserve pit, cut and fill slopes] prior to re-seeding. Spreading shall not be done when the ground or topsoil is frozen or wet.
13. **Painting of Equipment:** Within 90 days of installation, all above ground structures not subject to safety requirements shall be painted by the Holder to blend with the natural color of the landscape. A reflective material may be used to reduce hazards that may occur when such structures are near roads. Otherwise, the paint use shall be a non-glare, non-reflective, non-chalking color of: Federal 595a-34127 (Juniper Green)
14. **Storage Tanks:** All open top permanent production or storage tanks regardless of diameter made of fiberglass, steel, or other material used for the containment of oil,

condensate, produced water and or other production waste shall be screened, netted, or otherwise covered to protect migratory birds and other wildlife from access.

15. **Compressors:** Compressor units on this well location not equipped with a drip pan for containment of fluids shall be lined with an impervious material at least 8 mils thick and a 12-inch berm. The compressor will be painted to match the well facilities. Any variance to this will be approved by the Authorized Officer (AO). Noise mitigation may be required at the time of compressor installation.
16. **Acquisition of Water:** Water acquired to construct, produce, and maintain actions authorized by this permit to drill must be acquired from permitted water sources, or water authorized for use by the New Mexico Oil Conservation Division (OCD). Upon request the AO shall be provided with documentation of water sources.
17. **Culverts:** No culverts smaller than 18" will be installed. Silt Traps/Bell Holes will be built upstream of all culvert locations. Rip-rap will be placed at the downstream end of all culverts to prevent undercutting.
18. **Driving Surface Area:** All activities associated within the construction, operation, maintenance, and abandonment of the well location is limited to areas approved in the APD or ROW permit. During the production of the well, vehicular traffic is limited to the daily driving surface area established during interim reclamation construction operations. This area typically forms a keyhole or teardrop driving surface from which all production facilities may be serviced or inspected. A v-type ditch will be constructed on the outside of the driving surface to further define the driving surface and to deter vehicular traffic from entering onto the interim reclamation areas.
19. **Berms:** Berms or firewalls will be constructed around all storage facilities sufficient in size to contain the storage capacity of 110% of the largest tank, or 110% of the combined capacity of tanks if a rupture could drain more than one tank. Berm walls will be compacted with appropriate equipment to assure proper construction. Metal containment barriers, used for secondary containment, will be properly installed, per the manufacturer directions.
20. **Contouring of Cut and Fill Slopes:** The interim cut and fill slope grade shall be as close to the original contour as possible. To obtain this ratio, pits and slopes shall be back sloped into the pad during interim reclamation. Only subsurface soil and material shall be utilized in the contouring of the cut and fill slopes. Under no circumstances shall topsoil be utilized as substrate material for contouring of cut and fill slopes.
21. **Seed Mix:** The Pinyon/Juniper Seed Mix will be used for interim and final reclamation. The SUPO in the approved APD contains information on the specific seed mix and application rate. Seeding shall be accomplished within 120 days after final construction (time frame may be extended on a case-by-case basis with AO approval). Seeding shall be repeated if a satisfactory stand is not obtained as determined by the AO upon evaluation after the second growing season.
22. **Maintenance:** In order to perform subsequent well operations, right-of-way (ROW) operations, or install new/additional equipment, it may be necessary to drive, park, and

operate on restored, interim vegetation within the previously disturbed area. This is generally acceptable provided damage is promptly repaired and reclaimed following use. Where vehicular travel has occurred as a “convenience” and interim reclamation/vegetation has been compromised, immediate remediation of the affected areas is required. Additionally, where erosion has occurred and compromised the reclamation of the well location, the affected area must be promptly remediated so that future erosion is prevented, and the landform is stabilized.

23. **Non-Permitted Disturbance:** Construction maintenance or any other activity outside the areas permitted by the APO will require additional approval and may require a new cultural survey and clearance.
24. **Layflat Lines:** Layflat lines used for development of the wells may be on the ground for a maximum of 6 months and shall be retrieved within 30 days of ending completion operations. If the layflat lines are needed for longer than 6 months or cannot be retrieved within 30 days of ending completion operations, a Sundry NOI shall be submitted to the BLM FFO for review and decision that includes a rationale for the time extension.
25. **“Hotwork” and Construction Affecting Fire Safety:** The holder or its contractors will notify the BLM of any fires and comply with all rules and regulations administered by the BLM concerning the use, prevention and suppression of fires on federal lands, including any fire prevention orders that may be in effect at the time of the permitted activity. The holder or its contractors may be held liable for the cost of fire suppression, stabilization and rehabilitation. In the event of a fire, personal safety will be the first priority of the holder or its contractors.

The holder or its contractors shall:

- a. Operate all internal and external combustion engines (including off-highway vehicles, chainsaws, generators, heavy equipment, etc.) with a qualified spark arrester. Qualified spark arresters are maintained and not modified, and meet the Society of Automotive Engineers (SAE) Recommended Practices J335 or J350. Refer to 43 CFR §8343.1.
 - a. *Refueling of any combustible engine equipment must be minimum of 3 meters away from any ignition source (open flame, smoking, etc.).*
- b. Maintain and clean all equipment regularly to remove flammable debris buildup and prevent fluid leaks that can lead to ignitions.
- c. Carry at least one shovel or wildland fire hand tool (combi, Pulaski, McLeod) per person working, minimum 5 gallons of water, and a fire extinguisher rated at a minimum as ABC - 10 pound on each piece of equipment and each vehicle.
- d. When conducting “hotwork” such as, but not limited to welding, grinding, cutting, spark-producing work with metal, work that creates hot material or slag; choose an area large enough to contain all hot material that is naturally free of all flammable vegetation or remove the flammable vegetation in a manner compliant with the permitted activity. If adequate clearance cannot be made, wet an area large enough to contain all hot material prior to the activity and periodically throughout the activity to reduce the risk of wildfire ignition. Regardless of clearance, maintain readiness to respond to an ignition at all times. In addition, keep one hand tool per person and at least one fire extinguisher ready, minimum, as specified earlier (#3) during this activity.

- e. Keep apprised of current and forecasted weather at <https://www.weather.gov/abq/forecasts-fireweather-links> and fire conditions at www.wfas.net and take additional fire precautions when fire danger is rated High or greater. Red Flag Warnings are issued by the National Weather Service when fire conditions are most dangerous, and ignitions escape control quickly. Extra precautions are required during these warnings such as additional water, designate a fire watch/patrol and tools. If work is being conducted in an area that is not clear of vegetation within 50 feet of work area; then, when fire danger is rated High or greater and 1. There is a predicted Red Flag warning for your area or 2. If winds are predicted to be greater than 10 mph, stop all hotwork activities for the day at 10 am.
- f. In the event of an ignition, initiate fire suppression actions in the work area to prevent fire spread to or on federally administered lands. If a fire spreads beyond the capability of workers with the stipulated tools, all will cease fire suppression action and leave the area immediately via pre-identified escape routes.
- g. Call **911** or the **Taos Interagency Fire Dispatch Center (575-758-6208)** immediately of the location and status of any fire.

AND

Notify the respective BLM field office for which the permit or contract was issued immediately of the incident.

Farmington Field Office at 505-564-7600

Taos Field Office at 575-758-8851

26. **Noxious Weeds:** Inventory the proposed site for the presence of noxious and invasive weeds. Noxious weeds are those listed on the New Mexico Noxious Weed List and USDA's Federal Noxious Weed List. The New Mexico Noxious Weed List or USDA's Noxious Weed List can be updated at any time and should be regularly check for any changes. Invasive species may or may not be listed as a noxious weed but have been identified to likely cause economic or environmental harm or harm to human health. The following noxious weeds have been identified as occurring on lands within the boundaries of the Farmington Field Office (FFO). There are numerous invasive species on the FFO such as Russian thistle (*Salsola spp.*) and field bindweed (*Convolvulus arvensis*).

Russian Knapweed (<i>Centaurea repens</i>)	Musk Thistle (<i>Carduus nutans</i>)
Bull Thistle (<i>Cirsium vulgare</i>)	Canada Thistle (<i>Cirsium arvense</i>)
Scotch Thistle (<i>Onopordum acanthium</i>)	Hoary Cress (<i>Cardaria draba</i>)
Perennial Pepperweed (<i>Lepidium latifolium</i>)	Halogeton (<i>Halogeton glomeratus</i>)
Spotted Knapweed (<i>Centaurea maculosa</i>)	Dalmation Toadflax (<i>Linaria genistifolia</i>)
Yellow Toadflax (<i>Linaria vulgaris</i>)	Camelthorn (<i>Alhagi pseudalhagi</i>)
African Rue (<i>Peganum harmala</i>)	Salt Cedar (<i>Tamarix spp.</i>)
Diffuse Knapweed (<i>Centaurea diffusa</i>)	Leafy Spurge (<i>Euphorbia esula</i>)

- a. Identified weeds will be treated prior to new surface disturbance if determined by the FFO Noxious Weed Coordinator. A Pesticide Use Proposal (PUP) must be

- submitted to and approved by the FFO Noxious Weed Coordinator prior to application of pesticide. The FFO Noxious Weeds Coordinator (505-564-7600) can provide assistance in the development of the PUP.
- b. Vehicles and equipment should be inspected and cleaned prior to coming onto the work site. This is especially important on vehicles from out of state or if coming from a weed-infested site.
 - c. Construction equipment should be inspected and cleaned prior to coming onto the work site. This is especially important on vehicles from out of state or if coming from a weed-infested site.
 - d. Fill dirt or gravel may be needed for excavation, road construction/repair, or for spill remediation. If fill dirt or gravel will be required, the source shall be noxious weed free and approved by the FFO Noxious Weed Coordinator.
 - e. The site shall be monitored for the life of the project for the presence of noxious weeds (includes maintenance and construction activities). If weeds are found the FFO Coordinator shall be notified at (505) 564-7600 and provided with a Weed Management Plan and if necessary, a Pesticide Use Proposal (PUP) . The FFO Coordinator can provide assistance developing the Weed Management Plan and/or the Pesticide Use Proposal.
 - f. Only pesticides authorized for use on BLM lands would be used and applied by a licensed pesticide applicator. The use of pesticides would comply with federal and state laws and used only in accordance with their registered use and limitations. (Company Name)'s weed-control contractor would contact the BLM-FFO prior to using these chemicals.
 - g. Noxious/invasive weed treatments must be reported to the FFO Noxious Weed Coordinator. A Pesticide Application Record (PAR) is required to report any mechanical, chemical, biological or cultural treatments used to eradicate, and/or control noxious or invasive species. Reporting will be required quarterly and annually or per request from the FFO Noxious Weed Coordinator.
27. **Bare ground vegetation trim-out:** If bare ground vegetation treatment (trim-out) is desired around facility structures, the operator will submit a bare ground/trim-out design included in their Surface Use Plan of Operations (SUPO). The design will address vegetation safety concerns of the operator and BLM while minimizing impacts to interim reclamation efforts. The design must include what structures to be treated and buffer distances of trim-out. Pesticide use for vegetation control around anchor structures is not approved. If pesticides are used for bare ground trim-out, the trim-out will not exceed three feet from the edge of any eligible permanent structure (i.e., well heads, fences, tanks). Additional distance/areas may be requested and must be approved by the FFO authorized officer. The additional information below must also be provided to the FFO:
- a. Pesticide use for trim out will require a Pesticide Use Proposal (PUP). A PUP is required **prior** to any treatment and must be approved by the FFO Noxious Weed Coordinator. Only pesticides authorized for use on BLM lands would be used and applied by a licensed pesticide applicator. The use of pesticides would comply with federal and state laws and used only in accordance with their registered use and limitations. LOGOS' weed-control contractor would contact the BLM-FFO prior to using these chemicals and provide Pesticide Use Reports (PURs) post treatment.

- b. A Pesticide Use Report (PUR) or a Biological Use Report (BUR) is required to report any chemical, or biological treatments used to eradicate, or control vegetation on site. Reporting will be required quarterly and annually or per request from the FFO Noxious Weed Coordinator.
28. **Paleontology:** Any paleontological resource discovered by the Operator, or any person working on his behalf, on public or Federal land shall be immediately reported to the Authorized Officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant scientific values. The Holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the Authorized Officer after consulting with the Holder.
29. **Visual Resources:** Dark Sky COAs need to be applied to existing lighting, which is not dark sky friendly and to any additional lights added as part of pad expansion. All permanent lighting will use full cutoff luminaires, which are fully shielded (i.e., not emitting direct or indirect light above an imaginary horizontal plane passing through the lowest part of the light source). All permanent lighting will be pointed straight down at the ground in order to prevent light spill to the sides. All permanent lighting will be 4000° Kelvin or less with 3000° Kelvin preferred. Warmer light colors are less noticeable by humans and cause less impact to wildlife. All permanent lighting will be controlled by a switch and/or timer which allows the lights to be turned on when workers are on location during dark periods but will keep the lights off the majority of the time.
30. **Wildlife:** The proposed project is not anticipated to have significant impacts on small or big game species. However, the project is located within the BLM FFO-designated Rosa Mesa Wildlife Area, requiring a closure from December 1st through March 31st of each year. This stipulation applies only to construction, drilling, and completion activities. It does not apply to operation and maintenance of production facilities.
31. **Hazards:** Wildlife hazards associated with the proposed project would be fenced, covered, and/or contained in storage tanks, as necessary.
32. **Migratory Birds:** The BLM/FFO migratory bird policy requires a bird nest survey between May 15 - July 31 for any projects that would remove 4.0 or more acres or vegetation. The proposed project is estimated to disturb more than four acres of vegetation, a survey will be required if construction occurs within the specified timeframe. The operator would equip all open-top pits, tanks, ponds, and pipes containing hydrocarbons with nets, screens, or other avian exclusion devices to prevent injury or death to migratory birds (NTL-FFO/AUFO-2004-01, IM No. WO-2013-033, Onshore Order #7 III E-3). Exemptions to this stipulation would be made by the BLM/FFO Authorized Officer. Nest surveys will be conducted within 48 hours of scheduled construction by BLM/FFO personnel or approved biologist. Any active nests will require a disturbance buffer to eliminate impacts to nesting birds. Active nests will not be disturbed. Applicant will adhere to timing limitations and management measures if any new raptor nests are discovered within the project area. These timing limitations are species specific depending on the raptor that is discovered.

33. **Threatened, Endangered or Sensitive Species:** If, in operations the operator/holder discovers any Threatened, Endangered, or Sensitive species, work in the vicinity of the discovery will be suspended and the discovery promptly reported to the BLM-FFO T&E specialist at (505) 564-7600. The BLM-FFO will then specify what action is to be taken. Failure to notify the BLM-FFO about a discovery may result in civil or criminal penalties in accordance with The Endangered Species Act (as amended).

Cultural Resources

34. **Discovery of Cultural Resources in the Absence of Monitoring:** Discovery of Cultural Resources in the Absence of Monitoring: If, in its operations, operator/holder discovers any previously unidentified historic or prehistoric cultural resources, then work in the vicinity of the discovery will be suspended and the discovery promptly reported to BLM Field Manager. BLM will then specify what action is to be taken. If there is an approved "discovery plan" in place for the project, then the plan will be executed. In the absence of an approved plan, the BLM will evaluate the significance of the discovery in accordance with 36 CFR Section 800.13, in consultation with the appropriate State or Tribal Historic Preservation Officer(s) and Indian tribe(s) that might attach religious and cultural significance to the affected property, or in accordance with an approved program alternative. Minor recordation, stabilization, or data recovery may be performed by BLM or a third party acting on its behalf, such as a permitted cultural resources consultant. If warranted, more extensive archaeological or alternative mitigation, likely implemented by a permitted cultural resources consultant, may be required of the operator/holder prior to allowing the project to proceed. Further damage to significant cultural resources will not be allowed until any mitigations determined appropriate through the agency's Section 106 consultation are completed. Failure to notify the BLM about a discovery may result in civil or criminal penalties in accordance with the Archeological Resources Protection Act (ARPA) of 1979, as amended, the Native American Graves Protection and Repatriation Act (NAGRPA) of 1990, as amended, and other applicable laws.
35. **Discovery of Cultural Resources during Monitoring:** If monitoring confirms the presence of previously unidentified historic or prehistoric cultural resources, then work in the vicinity of the discovery will be suspended and the monitor will promptly report the discovery to the BLM Field Manager. BLM will then specify what action is to be taken. If there is an approved "discovery plan" in place for the project, then the plan will be executed. In the absence of an approved plan, the BLM will evaluate the significance of the discovery in accordance with 36 CFR Section 800.13, in consultation with the appropriate State or Tribal Historic Preservation Officer(s) and Indian tribe(s) that might attach religious and cultural significance to the affected property, or in accordance with an approved program alternative. Minor recordation, stabilization, or data recovery may be performed by BLM or a third party acting on its behalf, such as a permitted cultural resources consultant. If warranted, more extensive archaeological or alternative mitigation, likely implemented by a permitted cultural resources consultant, may be required of the operator/holder prior to allowing the project to proceed. Further damage to significant cultural resources will not be allowed until any mitigations determined appropriate through the agency's Section 106 consultation are completed.



United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Farmington District Office
6251 College Blvd, Suite A
Farmington, New Mexico 87402



In Reply Refer To:
3162.3-1(NMF0110)

* LOGOS OPERATING LLC
#672H ROSA UNIT
Lease: NMSF078763 Unit: NMNM78407E
SH: NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 8, T.31 N., R.5 W.
Rio Arriba County, New Mexico
BH: NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 2, T.31 N., R.6 W.
Rio Arriba County, New Mexico
***Above Data Required on Well Sign**

GENERAL REQUIREMENTS FOR OIL AND GAS OPERATIONS ON FEDERAL AND INDIAN LEASES

The following special requirements apply and are effective when **checked**:

- A. ☒ Note all surface/drilling conditions of approval attached.
- B. ☒ The required wait on cement (WOC) time will be a minimum of 500 psi compressive strength at 60 degrees. Blowout preventor (BOP) nipple-up operations may then be initiated
- C. ☒ Test all casing strings below the conductor casing to .22 psi/ft. of casing string length or 1500 psi, whichever is greater, but not to exceed 70% of the minimum internal yield (burst) for a minimum of 30 minutes. If pressure declines more than 10 percent in 30 minutes, corrective action shall be taken.
- D. ☐ Communitization Agreement covering the acreage dedicated to this well must be filed for approval with the Bureau of Land Management, New Mexico State Office, Reservoir Management Group, 301 Dinosaur Trail, Santa Fe, New Mexico 87508.
The effective date of the agreement must be **prior** to any sales.
- E. ☐ The use of co-flex hose is authorized contingent upon the following:
 1. From the BOP to the choke manifold: the co-flex hose must be hobbled on both ends and saddle to prevent whip.
 2. From the choke manifold to the discharge tank: the co-flex hoses must be as straight as practical, hobbled on both ends and anchored to prevent whip.
 3. The co-flex hose pressure rating must be at least commensurate with approved BOPE.

INTERIOR REGION 7 • UPPER COLORADO BASIN

COLORADO, NEW MEXICO, UTAH, WYOMING

I. GENERAL

- A. Full compliance with all applicable laws and regulations, with the approved Permit to drill, and with the approved Surface Use and Operations Plan is required. Lessees and/or operators are fully accountable for the actions of their contractors and subcontractors. Failure to comply with these requirements and the filing of required reports will result in strict enforcement pursuant to 43 CFR 3163.1 or 3163.2.
- B. Each well shall have a well sign in legible condition from spud date to final abandonment. The sign should show the operator's name, lease serial number, or unit name, well number, location of the well, and whether lease is Tribal or Allotted, (See 43 CFR 3162.6(b)).
- C. A complete copy of the approved Application for Permit to Drill, along with any conditions of approval, shall be available to authorized personnel at the drill site whenever active drilling operations are under way.
- D. For Wildcat wells only, a drilling operations progress report is to be submitted, to the BLM-Field Office, weekly from the spud date until the well is completed and the Well Completion Report is filed. The report should be on 8-1/2 x 11 inch paper, and each page should identify the well by; operator's name, well number, location and lease number.
- E. As soon as practical, notice is required of all blowouts, fires and accidents involving life-threatening injuries or loss of life. (See NTL-3A).
- F. BOP equipment (except the annular preventer) shall be tested utilizing a test plug to full working pressure for 10 minutes. No bleed-off of pressure is acceptable. (See 43 CFR 3172.6(b)(9)(ii)).
- G. The operator shall have sufficient weighting materials and lost circulation materials on location in the event of a pressure kick or in the event of lost circulation. (See 43 CFR 3172.8(a)).
- H. The flare line(s) discharge shall be located not less than 100 feet from the well head, having straight lines unless turns are targeted with running tees, and shall be positioned downwind of the prevailing wind direction and shall be anchored. The flare system shall have an effective method for ignition. Where noncombustible gas is likely or expected to be vented, the system shall be provided supplemental fuel for ignition and to maintain a continuous flare. (See 43 CFR 3172.8(b)(7)).
- I. Prior approval by the BLM-Authorized Office (Drilling and Production Section) is required for variance from the approved drilling program and before commencing plugging operations, plug back work, casing repair work, corrective cementing operations, or suspending drilling operations indefinitely. Emergency approval may be obtained orally, but such approval is contingent upon filing of a Notice of Intent sundry within three business days. **Any changes to the approved plan or any questions regarding drilling operations should be directed to BLM during regular business hours at 505-564-7600. Emergency program changes after hours should be directed to Virgil Lucero at 505-793-1836.**
- J. **The Inspection and Enforcement Section (I&E), phone number (505-564-7750) is to be notified at least 24 hours in advance of BOP test, spudding, cementing, or plugging operations so that a BLM representative may witness the operations.**
- K. Unless drilling operations are commenced within three years according to 43 CFR 3171.14, approval of the Application for Permit to Drill will expire. No extensions will be granted.

- L. From the time drilling operations are initiated and until drilling operations are completed, a member of the drilling crew or the tool pusher shall maintain rig surveillance at all times, unless the well is secured with blowout preventers or cement plugs.
- M. If for any reason, drilling operations are suspended for more than 90 days, a written notice must be provided to this office outlining your plans for this well.
- N. **Commingling:** No production (oil, gas, and water) from the subject well should start until Sundry Notices (if necessary) granting variances from applicable regulations as related to commingling and off-lease measurement are approved by this office. (See 43 CFR 3173.14)

II. REPORTING REQUIREMENTS

- A. For reporting purposes, all well Sundry notices, well completion and other well actions shall be referenced by the appropriate lease, communitization agreement and/or unit agreement numbers.
- B. The following reports shall be filed with the BLM-Authorized Officer online through AFMSS 2 within 30 days after the work is completed.
 - 1. Provide complete information concerning.
 - a. Setting of each string of casing. Show size and depth of hole, grade and weight of casing, depth set, depth of all cementing tools that are used, amount (in cubic feet) and types of cement used, whether cement circulated to surface and all cement tops in the casing annulus, casing test method and results, and the date work was done. Show spud date on first report submitted.
 - b. Intervals tested, perforated (include size, number and location of perforations), acidized, or fractured; and results obtained. Provide date work was done on well completion report and completion sundry notice.
 - c. Subsequent Report of Abandonment, show the way the well was plugged, including depths where casing was cut and pulled, intervals (by depths) where cement plugs were replaced, and dates of the operations.
 - 2. Well Completion Report will be submitted with 30 days after well has been completed.
 - a. Initial Bottom Hole Pressure (BHP) for the producing formations. Show the BHP on the completion report. The pressure may be: 1) measured with a bottom hole bomb, or; 2) calculated based on shut in surface pressures (minimum seven day buildup) and fluid level shot.
 - 3. Submit a cement evaluation log if cement is not circulated to surface.
- C. Production Startup Notification is required no later than the 5th business day after any well begins production on which royalty is due anywhere on a lease site or allocated to a lease site or resumes production in the case of a well which has been off production for more than 90 days. The operator shall notify the Authorized Officer by letter or Sundry Notice, Form 3160-5, or orally to be followed by a letter or Sundry Notice, of the date on which such production has begun or resumed. CFR 43 3162.4-1(c).

III. DRILLER'S LOG

The following shall be entered in the daily driller's log: 1) Blowout preventer pressures tests, including test pressures and results, 2) Blowout preventer tests for proper functioning, 3) Blowout prevention drills conducted, 4) Casing run, including size, grade, weight, and depth set, 5) How pipe was cemented, including amount of cement, type, whether cement circulated to surface, location of cementing tools, etc., 6) Waiting on cement time for each casing string, 7) Casing pressure tests after cementing, including test pressure and results, and 8) Estimated amounts of oil and gas recovered and/or produced during drill stem test.

IV. GAS FLARING

Gas produced from this well may not be vented or flared beyond an initial, authorized test period of * Days, 20 MMCF following its (completion)(recompletion), or flowback has been routed to the production separator, whichever first occurs, without the prior, written approval of the authorized officer in accordance with 43 CFR 3179.81. Should gas be vented or flared without approval beyond the test period authorized above, you may be directed to shut-in the well until the gas can be captured or approval to continue venting or flaring as uneconomic is granted. You shall be required to compensate the lessor for the portion of the gas vented or flared without approval which is determined to have been avoidably lost.

* 30 days, unless a longer test period is specifically approved by the authorized officer. The 30-day period will commence upon the beginning of flowback following completion or recompletion.

V. SAFETY

- A. All rig heating stoves are to be of the explosion-proof type.
- B. Rig safety lines are to be installed.
- C. Hard hats and other Personal Protective Equipment (PPE) must be utilized.

VI. CHANGE OF PLANS OR ABANDONMENT

- A. Any changes of plans required to mitigate unanticipated conditions encountered during drilling operations, will require approval as set forth in Section 1.I.
- B. If the well is dry, it is to be plugged in accordance with 43 CFR 3162.3-4, approval of the proposed plugging program is required as set forth in Section 1.I. The report should show the total depth reached, the reason for plugging, and the proposed intervals, by depths, where cement plugs are to be placed, type of plugging mud, etc. A Subsequent Report of Abandonment is required as set forth in Section II.B.1c.
- C. Unless a well has been properly cased and cemented, or properly plugged, the drilling rig must not be moved from the drill site without prior approval from the BLM-Authorized Officer.

VII. PHONE NUMBERS

- A. For BOPE tests, cementing, and plugging operations the phone number is 505-564-7750 and must be called 24 hours in advance in order that a BLM representative may witness the operations.

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

WELL LOCATION INFORMATION

API Number 30-039-31492	Pool Code 97232	Pool Name BASIN MANCOS
Property Code 320608	Property Name ROSA UNIT	Well Number 672H
OGRID No. 289408	Operator Name LOGOS OPERATING, LLC	Ground Level Elevation 6347'
Surface Owner: ☒ State ☐ Fee ☐ Tribal ☒ Federal		Mineral Owner: ☐ State ☐ Fee ☐ Tribal ☒ Federal

Surface Location

UL B	Section 8	Township 31N	Range 5W	Lot	Feet from N/S Line 713' NORTH	Feet from E/W Line 1931' EAST	Latitude 36.919296 °N	Longitude -107.383355 °W	County RIO ARRIBA
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Bottom Hole Location

UL L	Section 2	Township 31N	Range 6W	Lot	Feet from N/S Line 2391' SOUTH	Feet from E/W Line 1329' WEST	Latitude 36.927979 °N	Longitude -107.436674 °W	County RIO ARRIBA
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Dedicated Acres 1292.66	Penetrated Spacing Unit: Entire Sections 5 & 6, T31N, R5W Entire Sections 1 & 2, T31N, R6W	Infill or Defining Well INFILL	Defining Well API	Overlapping Spacing Unit ☐ Yes ☒ No	Consolidation Code UNITIZATION
Order Numbers R-13457			Well setbacks are under Common Ownership: ☐ Yes ☒ No		

Kick Off Point (KOP)

UL O	Section 5	Township 31N	Range 5W	Lot	Feet from N/S Line 1130' SOUTH	Feet from E/W Line 1831' EAST	Latitude 36.924358 °N	Longitude -107.383020 °W	County RIO ARRIBA
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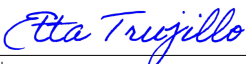
First Take Point (FTP)

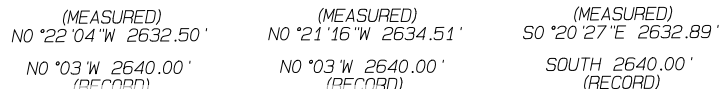
UL J	Section 5	Township 31N	Range 5W	Lot	Feet from N/S Line 1613' SOUTH	Feet from E/W Line 2246' EAST	Latitude 36.925685 °N	Longitude -107.384442 °W	County RIO ARRIBA
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Last Take Point (LTP)

UL L	Section 2	Township 31N	Range 6W	Lot	Feet from N/S Line 2391' SOUTH	Feet from E/W Line 1329' WEST	Latitude 36.927979 °N	Longitude -107.436674 °W	County RIO ARRIBA
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Unitized Area or Area of Uniform Interest ROSA UNIT	Spacing Unit Type ☒ Horizontal ☐ Vertical ☐ Directional	Ground Floor Elevation 6317'
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OPERATOR CERTIFICATION I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and, if the well is a vertical or directional well, that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of a working interest or unleased mineral interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. If this well is a horizontal well, I further certify that this organization has received the consent of at least one lessee or owner of a working interest or unleased mineral interest in each tract (in the target pool or formation) in which any part of the well's completed interval will be located or obtained a compulsory pooling order from the division.  Signature 12/12/2024 Date Etta Trujillo Printed Name etrujillo@logosresourcesllc.com E-mail Address	SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.  JASON C. EDWARDS Signature and Seal of Professional Surveyor Certificate Number 15269 Date of Survey DECEMBER 20, 2022
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State of New Mexico
Energy, Minerals and Natural Resources Department

Submit Electronically
Via E-permitting

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

NATURAL GAS MANAGEMENT PLAN

This Natural Gas Management Plan must be submitted with each Application for Permit to Drill (APD) for a new or recompleted well.

Section 1 – Plan Description Effective May 25, 2021

I. Operator: LOGOS Operating, LLC **OGRID:** 289408 **Date:** 1 / 29 / 2025

II. Type: ☒ Original ☐ Amendment due to ☐ 19.15.27.9.D(6)(a) NMAC ☐ 19.15.27.9.D(6)(b) NMAC ☐ Other.

If Other, please describe: _____

III. Well(s): Provide the following information for each new or recompleted well or set of wells proposed to be drilled or proposed to be recompleted from a single well pad or connected to a central delivery point.

Well Name	API	ULSTR	Footages	Anticipated Oil BBL/D	Anticipated Gas MCF/D	Anticipated Produced Water BBL/D
Rosa Unit 672H	30-039-pending	B-8-31N-5W	713'FNL, 1931'FWL	N/A	23,527	771
Rosa Unit 674H	30-039-pending	B-8-31N-5W	713'FNL, 1941'FEL	N/A	22,790	746
Rosa Unit 690H	30-039-pending	B-8-31N-5W	748'FNL, 1950'FEL	N/A	17,013	609
Rosa Unit 692H	30-039-pending	B-8-31N-5W	766'FNL, 1960'FEL	N/A	18,265	597
Rosa Unit 694H	30-039-pending	B-8-31N-5W	783'FNL, 1970'FEL	N/A	22,790	746
Rosa Unit 696H	30-039-pending	B-8-31N-5W	801'FNL, 1980'FEL	N/A	16,661	597

IV. Central Delivery Point Name: Harvest Gathering System [See 19.15.27.9(D)(1) NMAC]

V. Anticipated Schedule: Provide the following information for each new or recompleted well or set of wells proposed to be drilled or proposed to be recompleted from a single well pad or connected to a central delivery point.

Well Name	API	Spud Date	TD Reached Date	Completion Commencement Date	Initial Flow Back Date	First Production Date
Rosa Unit 672H	30-039-pending	Pending	Pending	Pending	Pending	Pending
Rosa Unit 674H	30-039-pending	Pending	Pending	Pending	Pending	Pending
Rosa Unit 690H	30-039-pending	Pending	Pending	Pending	Pending	Pending
Rosa Unit 692H	30-039-pending	Pending	Pending	Pending	Pending	Pending
Rosa Unit 694H	30-039-pending	Pending	Pending	Pending	Pending	Pending
Rosa Unit 696H	30-039-pending	Pending	Pending	Pending	Pending	Pending

VI. Separation Equipment: ☒ Attach a complete description of how Operator will size separation equipment to optimize gas capture.

VII. Operational Practices: ☒ Attach a complete description of the actions Operator will take to comply with the requirements of Subsection A through F of 19.15.27.8 NMAC.

VIII. Best Management Practices: ☒ Attach a complete description of Operator's best management practices to minimize venting during active and planned maintenance.

Section 2 – Enhanced Plan**EFFECTIVE APRIL 1, 2022**

Beginning April 1, 2022, an operator that is not in compliance with its statewide natural gas capture requirement for the applicable reporting area must complete this section.

☒ Operator certifies that it is not required to complete this section because Operator is in compliance with its statewide natural gas capture requirement for the applicable reporting area.

IX. Anticipated Natural Gas Production:

Well	API	Anticipated Average Natural Gas Rate MCF/D	Anticipated Volume of Natural Gas for the First Year MCF

X. Natural Gas Gathering System (NGGS):

Operator	System	ULSTR of Tie-in	Anticipated Gathering Start Date	Available Maximum Daily Capacity of System Segment Tie-in

XI. Map. ☐ Attach an accurate and legible map depicting the location of the well(s), the anticipated pipeline route(s) connecting the production operations to the existing or planned interconnect of the natural gas gathering system(s), and the maximum daily capacity of the segment or portion of the natural gas gathering system(s) to which the well(s) will be connected.

XII. Line Capacity. The natural gas gathering system ☐ will ☐ will not have capacity to gather 100% of the anticipated natural gas production volume from the well prior to the date of first production.

XIII. Line Pressure. Operator ☐ does ☐ does not anticipate that its existing well(s) connected to the same segment, or portion, of the natural gas gathering system(s) described above will continue to meet anticipated increases in line pressure caused by the new well(s).

☐ Attach Operator's plan to manage production in response to the increased line pressure.

XIV. Confidentiality: ☐ Operator asserts confidentiality pursuant to Section 71-2-8 NMSA 1978 for the information provided in Section 2 as provided in Paragraph (2) of Subsection D of 19.15.27.9 NMAC, and attaches a full description of the specific information for which confidentiality is asserted and the basis for such assertion.

Section 3 - Certifications

Effective May 25, 2021

Operator certifies that, after reasonable inquiry and based on the available information at the time of submittal:

☒ Operator will be able to connect the well(s) to a natural gas gathering system in the general area with sufficient capacity to transport one hundred percent of the anticipated volume of natural gas produced from the well(s) commencing on the date of first production, taking into account the current and anticipated volumes of produced natural gas from other wells connected to the pipeline gathering system; or

☐ Operator will not be able to connect to a natural gas gathering system in the general area with sufficient capacity to transport one hundred percent of the anticipated volume of natural gas produced from the well(s) commencing on the date of first production, taking into account the current and anticipated volumes of produced natural gas from other wells connected to the pipeline gathering system.

If Operator checks this box, Operator will select one of the following:

Well Shut-In. ☐ Operator will shut-in and not produce the well until it submits the certification required by Paragraph (4) of Subsection D of 19.15.27.9 NMAC; or

Venting and Flaring Plan. ☐ Operator has attached a venting and flaring plan that evaluates and selects one or more of the potential alternative beneficial uses for the natural gas until a natural gas gathering system is available, including:

- (a) power generation on lease;
- (b) power generation for grid;
- (c) compression on lease;
- (d) liquids removal on lease;
- (e) reinjection for underground storage;
- (f) reinjection for temporary storage;
- (g) reinjection for enhanced oil recovery;
- (h) fuel cell production; and
- (i) other alternative beneficial uses approved by the division.

Section 4 - Notices

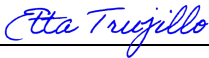
1. If, at any time after Operator submits this Natural Gas Management Plan and before the well is spud:

(a) Operator becomes aware that the natural gas gathering system it planned to connect the well(s) to has become unavailable or will not have capacity to transport one hundred percent of the production from the well(s), no later than 20 days after becoming aware of such information, Operator shall submit for OCD's approval a new or revised venting and flaring plan containing the information specified in Paragraph (5) of Subsection D of 19.15.27.9 NMAC; or

(b) Operator becomes aware that it has, cumulatively for the year, become out of compliance with its baseline natural gas capture rate or natural gas capture requirement, no later than 20 days after becoming aware of such information, Operator shall submit for OCD's approval a new or revised Natural Gas Management Plan for each well it plans to spud during the next 90 days containing the information specified in Paragraph (2) of Subsection D of 19.15.27.9 NMAC, and shall file an update for each Natural Gas Management Plan until Operator is back in compliance with its baseline natural gas capture rate or natural gas capture requirement.

2. OCD may deny or conditionally approve an APD if Operator does not make a certification, fails to submit an adequate venting and flaring plan which includes alternative beneficial uses for the anticipated volume of natural gas produced, or if OCD determines that Operator will not have adequate natural gas takeaway capacity at the time a well will be spud.

I certify that, after reasonable inquiry, the statements in and attached to this Natural Gas Management Plan are true and correct to the best of my knowledge and acknowledge that a false statement may be subject to civil and criminal penalties under the Oil and Gas Act.

Signature:	
Printed Name:	Etta Trujillo
Title:	Regulatory Specialist II
E-mail Address:	etrujillo@logosresourcesllc.com
Date:	1/28/2025
Phone:	(505) 324-4154
OIL CONSERVATION DIVISION (Only applicable when submitted as a standalone form)	
Approved By:	
Title:	
Approval Date:	
Conditions of Approval:	

VI. Separation Equipment

The operator will select separation equipment for the maximum anticipated throughput and pressure to optimize gas capture. Separation equipment is sized according to manufacturer's design specifications. Separation vessels are built following the A.S.M.E. section VII division 1 codes for pressure vessel design, fabrication, inspection, testing and certification. Anticipated well pressures and production rates are evaluated to select separation equipment according to the equipment's designed operating pressure and throughput.

After completion, the operator utilizes flowback equipment, including separators, to manage wellbore fluids and solids during the initial separation period. After the initial flowback period is complete the operator utilizes iterative facility separation equipment to ensure that optimal separation is achieved.

VII. Operational Practices 19.15.27.8 NMAC A through F

- A. The operator will maximize the recovery of natural gas and minimize the amount of gas vented or flared when technically and safely feasible as further described and detailed within the following subsections (B-F of 19.15.27.8). In all cases where natural gas venting and flaring requires regulatory reporting, reporting will be submitted accurately and within the required time frames.
- B. Venting and flaring during drilling operations:
 - a. New Drill HZ Oil Wells: The operator drills wells in the area by utilizing a balanced mud to safely drill the wellbore. This technique prevents gas from coming to surface during the drilling process. If there is an emergency or malfunction and natural gas does come to surface the natural gas will be captured or combusted, with an appropriately sized and located flare stack, if technically and safely feasible.
 - b. New Drill HZ Gas Wells: The operator drills wells in the area by balancing the mud weight to safely drill the wellbore with as minimal flaring as possible. When gas kicks enter the wellbore, sometimes it is necessary to circulate it out of the wellbore to an appropriately sized and located flare stack. The operator will estimate the volume flared and appropriately report.
- C. Venting and flaring during completion or recompletion operations:
 - a. New Drill HZ Oil Wells: The operator's facilities are designed to handle the maximum throughput and pressures from the newly drilled and completed wellbores. The amount of gas vented and flared will be minimized when technically and safely feasible. During initial flowback and initial separation flowback the operator will utilize contracted flowback equipment, including separators, to manage wellbore fluids and solids. The initial flowback period will be minimized and flow will be sent to separation equipment as soon as possible to reduce the amount of gas that is vented to atmosphere. During the separation flowback period natural gas will be routed to a properly sized and located flare until the natural gas is of pipeline quality (less than 60 days). The natural gas will also be utilized on site as needed for fuel gas or injection gas.
 - b. New Drill HZ Gas Wells: The operator's facilities are designed to handle the maximum throughput and pressures from the newly drilled and completed wellbores. The amount of gas vented and flared will be minimized when technically and safely feasible. During

initial flowback and initial separation flowback the operator will utilize contracted flowback equipment, including separators, to manage wellbore fluids and solids. The initial flowback period will be minimized and flow will be sent to separation equipment as soon as possible to reduce the amount of gas that is vented to atmosphere. The natural gas will be utilized on site as needed for fuel gas and natural gas will be sold.

D. Venting and flaring during production operations:

- a. New Drill HZ Oil Wells: The operator's facilities are designed to handle the maximum throughput and pressures from producing wellbores. The amount of gas vented and flared will be minimized when technically and safely feasible. This facility will operate under a notice of intent (NOI) from the New Mexico Environment Department (NMED).

Operations will effectively manage the following scenarios to minimize the quantity of natural gas that is vented or flared:

- (a) If there is an emergency or malfunction, vented or flared natural gas will be reported, if required, and the emergency or malfunction will be resolved as soon as technically and safely feasible.
- (b) If the wellbore requires liquids to be unloaded to atmosphere, the operator will not vent the well after the well has achieved a stabilized rate and pressure. The operator will remain on site during unloading. Plunger lift systems will be optimized to reduce the amount of natural gas venting. Downhole maintenance, such as workovers, swabbing, etc. will only be conducted as needed and best management practices will be utilized to reduce venting of natural gas.
- (c) The operator will minimize the amount of time that natural gas is vented to atmosphere from gauging and sampling a storage tank or low-pressure vessel, automatic tank gauges will be the primary means of gauging with minor exceptions.
- (d) The operator will reduce the amount of time needed for loading out liquids from a storage tanks or other low-pressure vessels whenever feasible. Operations will utilize a LACT system when available to minimize gas vented during oil tank loading.
- (e) Equipment will be repaired and maintained routinely to minimize the venting or flaring of natural gas. Repairs and maintenance will be conducted in a manner that minimizes the amount of natural gas vented to atmosphere through the isolation of the equipment that is being repaired or maintained.
- (f) Electric controllers and pumps will be installed to replace pneumatic controllers whenever feasible. Pneumatic controllers and pumps will be inspected frequently to ensure that no excess gas is vented to atmosphere.
- (g) Storage tanks and other low-pressure vessel normal operational venting will be minimized during the early life of the well with the installation of

a vapor recovery unit to limit the flash and working and breathing emissions to atmosphere.

- (h) No dehydration or amine units are anticipated to be set on location.
 - (i) Compressors, compressor engines, turbines, flanges, connectors, valves, and flanges will be routinely inspected to ensure that no excess venting occurs outside of normal operation.
 - (j) Regulatory required testing, such as bradenhead and packer testing will be performed in a manner that minimizes the amount of natural gas vented to atmosphere.
 - (k) When natural gas does not meet gathering pipeline specifications, for example high nitrogen content after a nearby frac, gas samples will be collected twice per week to determine when pipeline specification gas content has been achieved. During this time frame gas will be flared and not vented to atmosphere. Natural gas that meets pipeline specifications will be sold via pipeline and natural gas that can be utilized for fuel gas will be used during this time.
 - (l) If pipeline, equipment, or facilities need purged of impurities gas losses will be minimized as much as technically and safely feasible.
- b. New Drill HZ Gas Wells: The operator's facilities are designed to handle the maximum throughput and pressures from producing wellbores. The amount of gas vented and flared will be minimized when technically and safely feasible.

Operations will effectively manage the following scenarios to minimize the quantity of natural gas that is vented or flared:

- (a) If there is an emergency or malfunction vented or flared natural gas will be reported, if required, and the emergency or malfunction will be resolved as soon as technically and safely feasible.
- (b) If the wellbore needs to be unloaded to atmosphere the operator will not vent the well after the well has achieved a stabilized rate and pressure. The operator will remain on site during unloading. Plunger lift systems will be optimized to reduce the amount of natural gas venting. Downhole maintenance, such as workovers, swabbing, etc. will only be conducted as needed and best management practices will be utilized to reduce venting of natural gas.
- (c) The operator will minimize the amount of time that natural gas is vented to atmosphere from gauging and sampling a storage tank or low-pressure vessel, automatic tank gauges will be the primary means of gauging. The formation is only anticipated to produce water and therefore tank emissions are anticipated to be negligible.
- (d) The operator will reduce the amount of time needed for loading out liquids from a storage tanks or other low-pressure vessels whenever feasible. Operations will always utilize the water transfer systems when available. Water loading emissions are anticipated to be negligible.

- (e) Equipment will be repaired and maintained routinely to minimize the venting or flaring of natural gas. Repairs and maintenance will be conducted in a manner that minimizes the amount of natural gas vented to atmosphere through the isolation of the equipment that is being repaired or maintained.
- (f) Electric controllers and pumps, or instrument air, will be installed to replace pneumatic controllers whenever feasible. Pneumatic controllers and pumps will be inspected frequently to ensure that no excess gas is vented to atmosphere.
- (g) No dehydration or amine units are anticipated to be set on location.
- (h) Compressors, compressor engines, turbines, flanges, connectors, valves, storage tanks, and other low-pressure vessels and flanges will be routinely inspected to ensure that no excess venting occurs outside of normal operations.
- (i) Regulatory required testing, such as bradenhead and packer testing will be performed in a manner that minimizes the amount of natural gas vented to atmosphere.
- (j) If natural gas does not meet gathering pipeline specifications gas samples will be collected twice per week to determine when pipeline specification gas content has been achieved. During this time frame gas will be flared and not vented to atmosphere. Natural gas that meets pipeline specifications will be sold via pipeline and natural gas that can be utilized for fuel gas will be used during this time.
- (k) If pipeline, equipment, or facilities need purged of impurities gas losses will be minimized as much as technically and safely feasible.

E. Performance standards:

- a. The production facilities are designed to handle the maximum throughput and pressures from producing wellbores and will be designed to minimize waste. The amount of gas vented and flared will be minimized when technically and safely feasible.
- b. All tanks that are routed to a control device that is installed after 5/25/2021 will have an automatic gauging system to minimize the amount of vented natural gas.
- c. If a flare stack is installed or replaced after 5/25/2021 it will be equipped with an automatic ignitor or continuous pilot. The flare stack will be properly sized and designed to ensure proper combustion efficiency. The flare stack will be located 100 feet away from the nearest wellhead or storage tank.
- d. AVO inspections will be conducted weekly for the year after completion and for all wells producing greater than 60,000 cubic feet of natural gas daily. The AVO inspection will include all components, including flare stacks, thief hatches, closed vent systems, pumps, compressors, pressure relief devices, valves, lines, flanges, connectors, and associated pipeline to identify any leaks and releases by comprehensive auditory, visual, and olfactory inspection. The AVO inspection records will be maintained for 5 years which will be available at the department's request. Identified leaks will be repaired as soon as feasible to minimize the amount of vented natural gas.

F. Measurement or estimation of vented and flared natural gas.

- a. The volume of natural gas that is vented, flared or consumed for beneficial use will be measured when possible, or estimated, during drilling, completions, or production operations.
- b. Equipment will be installed to measure the volume of natural gas flared for all APD's issued after 5/25/2021 on facilities that will have an average daily gas rate greater than 60,000 cubic feet of natural gas. Measurement equipment will conform to API MPMS Chapter 14.10 regulations. The measurement equipment will not have a manifold that allows the diversion of natural gas around the metering element except for the sole purpose of inspecting and servicing the measurement equipment. If metering is not practical then the volume of gas will be estimated.



LOGOS Operating, LLC Operations Plan

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

Date:	December 11, 2024	Pool:	Basin Mancos
Well Name:	Rosa Unit 672H	GL Elevation:	6347
Surface Location:	Sec 8, T31N, R5W 713' FNL, 1931' FEL (36.919296° N, -107.383355° W – NAD83)	KB:	30'
Bottom Hole Location:	Sec 2, T31N, R6W 2391' FSL, 1329' FWL (36.927979° N, -107.436674° W – NAD83)	Measured Depth:	23,156' (KB)
Lease Serial CA Serial	# NMSF078763 # NMNM78407E	County:	Rio Arriba

I. GEOLOGY

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

NAME	MD	TVD	NAME	MD	TVD
OJO ALAMO	2,519'	2,439'	*POINT LOOKOUT	5,914'	5,635'
KIRTLAND	2,647'	2,559'	*MANCOS	6,536'	6,238'
*FRUITLAND	2,964'	2,858'	KICKOFF POINT	6,723'	6,422'
*PICTURED CLIFFS	3,506'	3,368'	LANDING POINT	7,657'	6,988'
LEWIS	3,615'	3,471'	TD	23,156'	6,977'
CHACRA	4,868'	4,649'			
*CLIFF HOUSE	5,693'	5,426'			
MENEFEE	5,730'	5,461'			

* 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 conductor 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) was used to drill the 26"/24" conductor hole. LSND (WBM) will be used to drill the 17-1/2" surface hole and 12-1/4" intermediate hole. A LSND (WBM) or (OBM) will be used to drill the 8-1/2" curve and lateral portion of the wellbore. Treat for lost circulation as necessary. Obtain 100% returns prior to cementing. Notify Engineering of any mud losses.

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



- B. BOP TESTING:** The BOPE will be tested to **250 psi (Low) for 5 minutes** and **3000 psi (High) for 10 minutes**. Pressure test surface casing to **600 psi for 30 minutes** and intermediate casing to **1500 psi for 30 minutes**. Utilize a BOPE Testing Unit with a recording chart and appropriate test plug for testing. The drum brakes will be inspected and tested each tour. BOP equipment will be tested every 30 days, after any repairs are made to the BOP equipment, and after the BOP equipment is subjected to pressure. Annular preventers will be functionally operated at least once per week. Pipe and blind rams shall be activated each trip or but not more than once a day. The New Mexico Oil & Gas Conservation Commission and the BLM will be notified 24 hours in advance of testing of BOPE. **All tests and inspections will be recorded and logged with time and results.** A full BOP test will be conducted when initially installed for the first well on the pad or if seals subject to test pressure are broken, following related repairs and at a minimum of 30 day intervals. A BOPE Shell Test only will be conducted for subsequent wells on the pad when seals subject to pressure have not been broken or repaired and fall within the 30 day interval of first full test.
- C. GeoHazards:** There are no Geohazards
- D. Maximum Anticipated Pressure:** $6988' \text{ TVD} \times 0.43 = 3,005 \text{ psi}$
- E. H2S Concerns:** There is no record of any naturally occurring H2S in any formation in the Rosa Unit. No H2S is anticipated in this formation or this well.

III. MATERIALS

A. CASING EQUIPMENT:

CASING TYPE	OH SIZE (IN)	DEPTH (MD)	CSG SIZE	WEIGHT	GRADE	CONN
CONDUCTOR (Pre-set)	26" or 24"	350' (GL) or Greater	20"	94 LBS	J-55 or equiv	LTC/BTC
SURFACE	17.5"	3,556'	13.375"	54.5 LBS	J-55 or equiv	LTC/BTC
INTERMEDIATE	12.25"	6,611'	9.625"	43.5 LBS	N-80 or equiv	LTC/BTC
PRODUCTION	8.5"	23,156'	5.5"	20 LBS	P-110 or equiv	LTC/BTC

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

B. FLOAT EQUIPMENT:

- 1. CONDUCTOR CASING:** 20" cement nose guide shoe. Place float shoe 1 joint above shoe. Run (1) standard centralizer on each of the bottom (3) joints of Surface Casing.
- 2. SURFACE CASING:** 13-3/8" cement nose guide shoe with 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
- 3. INTERMEDIATE CASING:** 9-5/8" cement float shoe. Place float collar one joint above the shoe. Install (1) centralizer on each of the bottom (3) joints and one standard centralizer every (3) joints to 2,500 ft. Run (1) centralizer at 2,500 ft., 2,300ft., 2,000ft., 1,500 ft., and 1,000 ft. Optional use of DV Tools (2) will be strategically placed above loss circulation zones anticipated in the Mesaverde and Fruitland Coal. Optional use of cancellation plugs for DV tools may be used if losses while cementing are not encountered. Optional use of an ICP may be used in conjunction with DV Tools.
- 4. PRODUCTION CASING:** Run 5-1/2" casing with cement nose guide Float Shoe, 5-1/2" full or pup joints as necessary, Landing Collar, 5-1/2" full or pup joints as necessary, at least (1) one Toe Sleeve (Sliding Sleeve) positioned inside the applicable production area. Centralizer



program will be determined by wellbore conditions. Production casing to be pressure tested during completion operations with frac stack installed.

C. CEMENTING:

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

1. CONDUCTOR: Casing shall be set at ~ 350' and cemented to surface. TOC at Surface.

Conductor - 20"	Top	Footage	Cement (ft3/ft) Annular Capacity	Excess (30%)	Total (ft3)	Total (bbl)	Slurry Yield (ft3/sk)	Sacks Cement	Density (PPG)
Type G	-	350	0.9599	1.3	487	87	1.10	442	15.8
Type III		350	0.9599	1.3	487	87	1.39	350	14.6
24" hole									
Set Depth	350								

2. SURFACE: Surface casing shall be kept fluid-filled while running into the hole to meet BLM minimum collapse requirements. The surface casing will be cemented in 1 stage. If cement does not circulate to the surface, a CBL will be run to determine TOC.

Surface - 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	2,956	600	0.6947	1.3	575	102	1.10	523	15.8
Stage 1 Lead - OH	350	2,606	0.6947	1.3	2,354	419	1.90	1239	12.4
Stage 2 Lead - Cased	-	350	1.019	1	357	64	1.90	188	12.4
					3,286	585		1950	
Set Depth	3556								

3. INTERMEDIATE : Intermediate casing shall be kept fluid filled while running in to the hole to meet BLM minimum collapse requirements. The intermediate casing will be cemented in 2 or 3 stages using DV/STAGE tools in order to reduce cement losses and maximize cement coverage. Operator proposes optional DV tools and optional ICP's above anticipated loss circulation zones in the Mesaverde and in the Fruitland coal. If losses are not observed during the second stage a cancelation plug will be pumped and the remaining cement will be pumped during stage 2. If cement does not circulate to the DV tool(s) or to surface, a CBL will be run to determine

Intermediate - 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	6,111	500	0.3132	1.3	220	39	1.10	200	15.8
Stage 1 Lead	4,943	1,168	0.3132	1.3	476	85	1.90	250	12.4
					696	124		450	
Stage 2 Tail	4,343	600	0.3132	1.3	244	44	1.58	155	13.2
Stage 2 Lead	3,456	887	0.3132	1.3	361	64	1.90	190	12.4
Stage 2 Lead - Cased	3,356	100	0.3627	1	36	6	1.90	19	12.4
Stage 2 Totals					642	114		364	
Int 2 Totals					1,337	238		814	
Contingency									
Stage 3 Tail	3,556	75	0.3132	1.3	31	5	1.58	19	13.2
Stage 3 Tail - Cased	3,056	500	0.3490	1	175	31	1.58	110	13.2
Stage 3 Lead - Cased	-	3,056	0.3490	1	1,067	190	1.90	561	12.4
Contingency Stage 3 Totals					1,272	226		691	
Set Depth	6611								

TOC. 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.

Production - 5-1/2"	Top	ft	Cement (ft3/ft) Annular Capacity	Excess (15%)	Total (ft3)	Total (bbl)	Slurry Yield (ft3/sk)	Sacks Cement	Density (PPG)
Cased Lead	6,511	100	0.2531	1	25	5	1.59	16	13.2
Open Hole Lead	6,611	16,545	0.2291	1.15	4,364	777	1.59	2,745	13.2
					4,390	782		2,761	

Set depth 23156

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 * 6988' TVD = 1537 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**

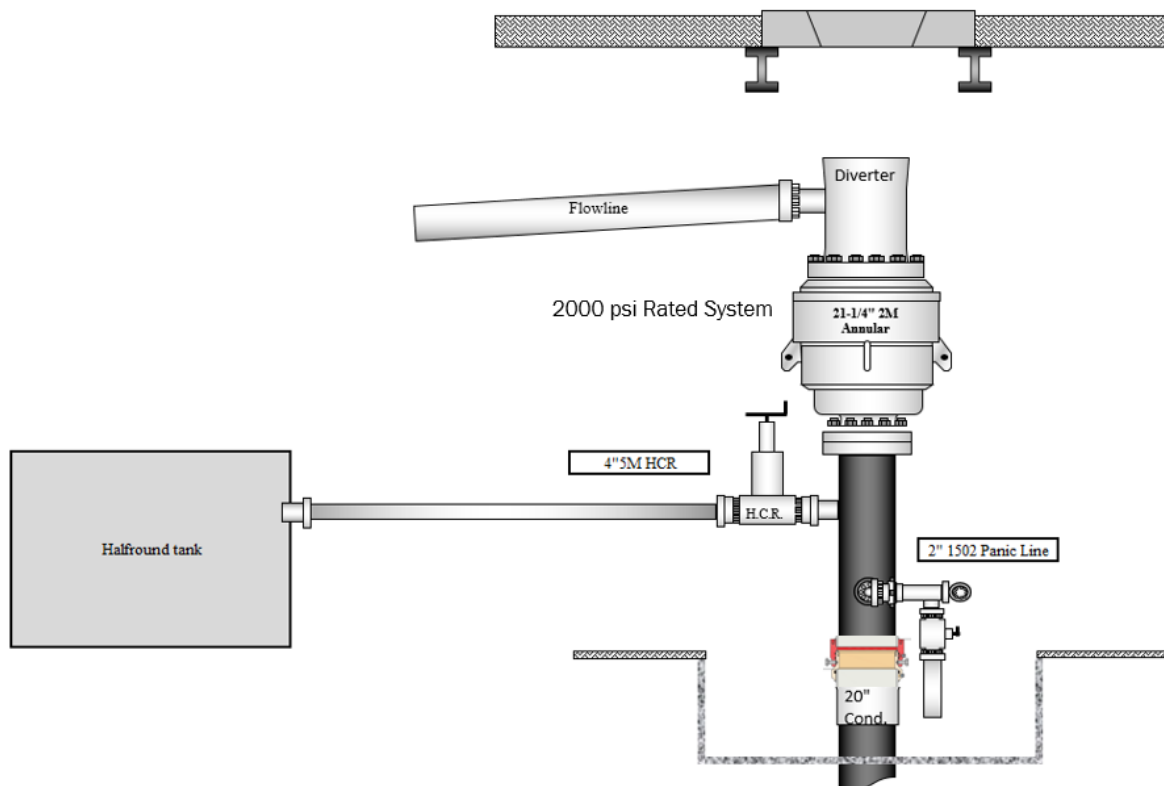
2-7/8", 6.5#, J-55 or L-80, EUE tubing will be run once volumes and pressures dictate. Due to the extremely high initial flow rates and pressures seen in offset wells, tubing will be installed once it is safe to do so, typically 12-36 months after completion.

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



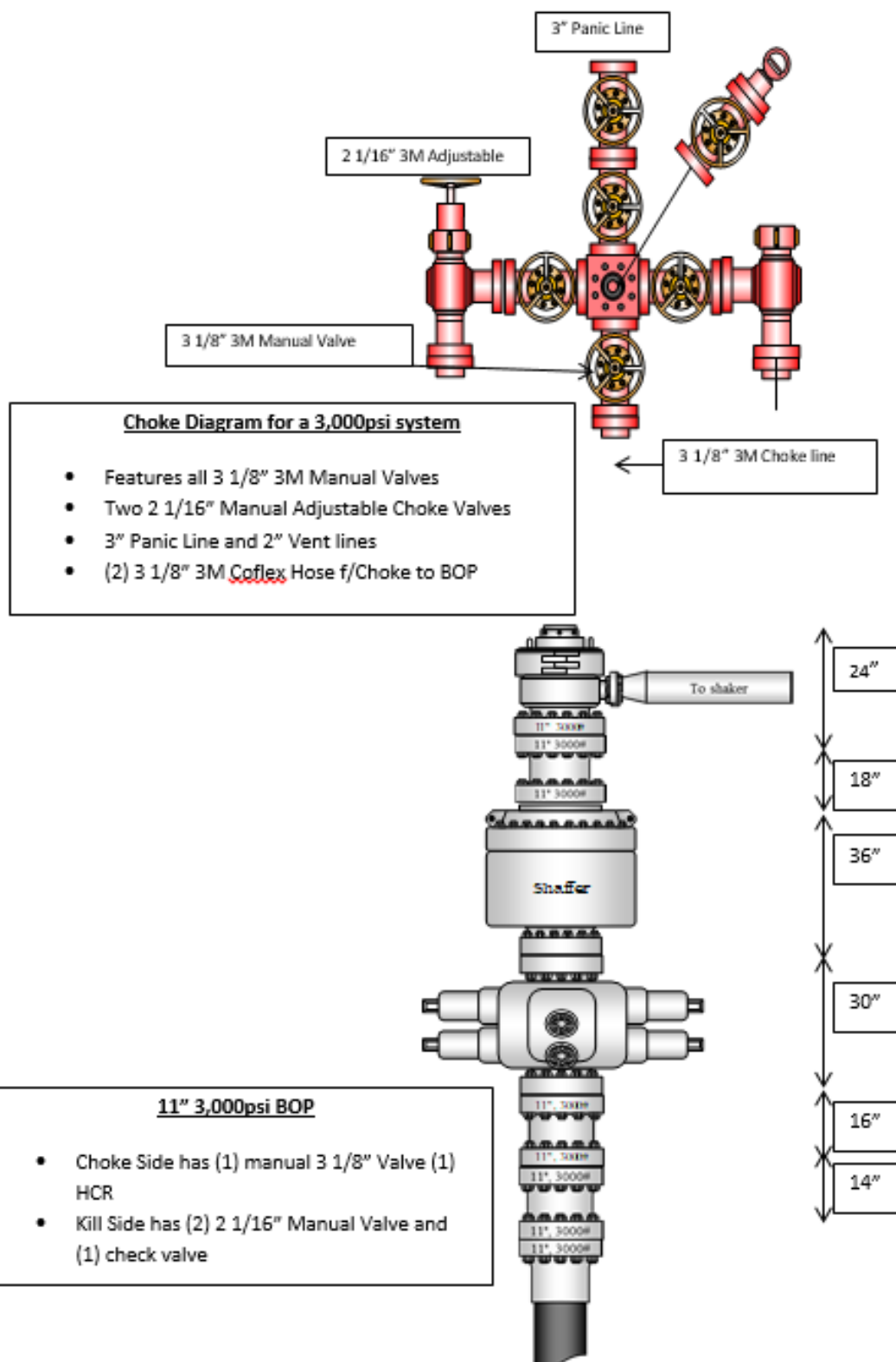
BOP Equipment

Surface Hole Diverter





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



Logos Operating LLC

Rio Arriba, NM (NAD83)

Rosa Unit 34

Rosa Unit #672H

OH

Prelim 5

Anticollision Report

22 November, 2024

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Reference	Prelim 5		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Max. Cent. Dist. of 99,999.00usft or Max. SF of 100	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	11/22/2024		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	23,155.63	Prelim 5 (OH)	MWD+HRGM+MS	MWD + HRGM + Multi-Station Correction	

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Rosa Unit 34						
(O) Carson #1 - OH - OH-INC	2,475.45	2,538.99	8,499.32	8,442.97	150.843	CC
(O) Carson #1 - OH - OH-INC	4,500.00	4,444.20	8,527.35	8,421.61	80.648	ES
(O) Carson #1 - OH - OH-INC	7,400.00	7,081.09	8,904.14	8,705.63	44.855	SF
(O) Rosa Unit #041B - OH - OH-SVY	10,600.00	7,382.06	1,979.21	1,873.95	18.804	SF
(O) Rosa Unit #041B - OH - OH-SVY	10,626.60	7,381.75	1,979.03	1,873.83	18.813	CC, ES
(O) Rosa Unit #041C - OH - OH-SVY	1,190.94	1,202.08	52.77	44.30	6.231	CC
(O) Rosa Unit #041C - OH - OH-SVY	1,200.00	1,210.70	52.86	44.22	6.118	ES, SF
(O) Rosa Unit #053 - OH - OH-INC	500.00	489.00	434.19	423.78	41.728	CC
(O) Rosa Unit #053 - OH - OH-INC	600.00	588.85	435.63	423.07	34.675	ES
(O) Rosa Unit #053 - OH - OH-INC	6,950.00	6,625.22	2,311.19	2,144.24	13.844	SF
(O) Rosa Unit #072C - OH - OH-SVY	13,600.00	7,097.58	1,487.07	1,367.89	12.477	SF
(O) Rosa Unit #072C - OH - OH-SVY	13,700.00	7,096.77	1,482.35	1,363.93	12.518	ES
(O) Rosa Unit #072C - OH - OH-SVY	13,720.04	7,096.60	1,482.22	1,364.00	12.538	CC
(O) Rosa Unit #080A - OH - OH-INC	281.75	187.74	2,019.01	2,014.26	425.417	CC
(O) Rosa Unit #080A - OH - OH-INC	600.00	506.00	2,020.29	2,008.30	168.478	ES
(O) Rosa Unit #080A - OH - OH-INC	5,100.00	4,774.36	2,993.64	2,868.26	23.877	SF
(O) Rosa Unit #107 - OH - OH-INC	6,779.95	6,293.66	3,836.96	3,677.75	24.101	CC
(O) Rosa Unit #107 - OH - OH-INC	6,800.00	6,313.13	3,837.13	3,677.44	24.028	ES
(O) Rosa Unit #107 - OH - OH-INC	7,300.00	6,707.35	3,954.83	3,783.52	23.086	SF
(O) Rosa Unit #108 - OH - OH-SVY	12,577.73	6,883.24	4,244.38	4,019.69	18.889	CC
(O) Rosa Unit #108 - OH - OH-SVY	12,600.00	6,883.22	4,244.44	4,019.59	18.877	ES
(O) Rosa Unit #108 - OH - OH-SVY	13,000.00	6,882.92	4,265.34	4,038.08	18.769	SF
(O) Rosa Unit #149 - OH - OH-INC	15,507.67	5,949.00	3,994.96	3,690.98	13.142	CC, ES
(O) Rosa Unit #149 - OH - OH-INC	15,800.00	5,949.00	4,005.64	3,700.07	13.108	SF
(O) Rosa Unit #149A - OH - OH-INC	16,883.87	6,000.00	4,346.97	4,082.44	16.433	CC
(O) Rosa Unit #149A - OH - OH-INC	16,900.00	6,000.00	4,347.00	4,082.36	16.426	ES
(O) Rosa Unit #149A - OH - OH-INC	17,200.00	6,000.00	4,358.45	4,091.98	16.356	SF
(O) Rosa Unit #149B - OH - OH-INC	18,824.00	7,025.76	3,792.21	3,435.25	10.624	CC, ES
(O) Rosa Unit #149B - OH - OH-INC	19,000.00	7,025.63	3,796.28	3,438.39	10.607	SF
(O) Rosa Unit #149C - OH - OH-SVY	16,206.97	7,094.39	3,560.99	2,984.22	6.174	CC, ES
(O) Rosa Unit #149C - OH - OH-SVY	16,300.00	7,095.62	3,562.21	2,984.78	6.169	SF
(O) Rosa Unit #164 - OH - OH-SVY	17,700.00	4,604.00	2,919.93	2,811.78	26.999	SF
(O) Rosa Unit #164 - OH - OH-SVY	17,824.00	4,604.00	2,917.29	2,809.31	27.018	CC, ES
(O) Rosa Unit #164A - OH - OH-INC	15,800.00	6,060.00	1,231.89	1,014.03	5.654	SF
(O) Rosa Unit #164A - OH - OH-INC	15,900.00	6,060.00	1,227.10	1,010.69	5.670	ES
(O) Rosa Unit #164A - OH - OH-INC	15,908.88	6,060.00	1,227.07	1,010.79	5.673	CC
(O) Rosa Unit #164B - OH - OH-SVY	18,006.22	7,616.14	1,941.58	1,711.26	8.430	CC, 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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

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 34						
(O) Rosa Unit #164C - OH - OH-SVY	15,600.00	7,301.23	2,120.96	1,971.97	14.235	SF
(O) Rosa Unit #164C - OH - OH-SVY	15,611.69	7,301.38	2,120.93	1,971.94	14.236	CC, ES
(O) Rosa Unit #171 - OH - OH-INC	12,353.31	6,028.00	4,302.81	4,106.64	21.935	CC
(O) Rosa Unit #171 - OH - OH-INC	12,400.00	6,028.00	4,303.06	4,106.58	21.901	ES
(O) Rosa Unit #171 - OH - OH-INC	12,800.00	6,028.00	4,325.93	4,127.07	21.754	SF
(O) Rosa Unit #171A - OH - OH-SVY	111.00	0.00	5,025.99	5,025.70	10,000.000	CC, ES
(O) Rosa Unit #171A - OH - OH-SVY	14,700.00	3,337.00	5,656.32	5,556.16	56.477	SF
(O) Rosa Unit #171B - OH - OH-SVY	13,113.17	6,388.00	2,790.18	2,670.18	23.251	CC, ES
(O) Rosa Unit #171B - OH - OH-SVY	13,200.00	6,388.00	2,791.53	2,671.47	23.250	SF
(O) Rosa Unit #171C - OH - OH-SVY	14,688.53	6,990.00	2,769.06	2,598.35	16.222	CC
(O) Rosa Unit #171C - OH - OH-SVY	14,700.00	6,990.00	2,769.08	2,598.28	16.213	ES
(O) Rosa Unit #171C - OH - OH-SVY	14,900.00	6,990.00	2,777.12	2,604.95	16.131	SF
(O) Rosa Unit #226 - OH - OH-INC	16,376.86	3,135.00	5,622.47	5,461.66	34.964	CC
(O) Rosa Unit #226 - OH - OH-INC	16,400.00	3,135.00	5,622.51	5,461.55	34.930	ES
(O) Rosa Unit #226 - OH - OH-INC	17,300.00	3,135.00	5,697.75	5,531.45	34.263	SF
(O) Rosa Unit #226A - OH - OH-SVY	15,938.38	5,392.00	4,672.88	4,544.07	36.277	CC
(O) Rosa Unit #226A - OH - OH-SVY	16,000.00	5,392.00	4,673.29	4,543.91	36.122	ES
(O) Rosa Unit #226A - OH - OH-SVY	16,800.00	5,392.00	4,751.65	4,616.67	35.201	SF
(O) Rosa Unit #228A - OH - OH-SVY	496.96	383.00	5,347.27	5,341.41	911.736	CC
(O) Rosa Unit #228A - OH - OH-SVY	13,508.34	3,253.00	5,415.29	5,330.82	64.113	ES
(O) Rosa Unit #228A - OH - OH-SVY	14,300.00	3,253.00	5,472.85	5,385.93	62.963	SF
(O) Rosa Unit #336 - OH - OH-INC	500.00	472.00	198.51	188.04	18.959	CC
(O) Rosa Unit #336 - OH - OH-INC	600.00	571.98	200.22	187.49	15.727	ES
(O) Rosa Unit #336 - OH - OH-INC	1,200.00	1,164.94	281.02	254.43	10.569	SF
(O) Rosa Unit #336A - OH - OH-INC	500.00	422.00	2,573.01	2,563.39	267.273	CC
(O) Rosa Unit #336A - OH - OH-INC	600.00	521.98	2,573.90	2,561.89	214.282	ES
(O) Rosa Unit #336A - OH - OH-INC	3,000.00	2,809.00	2,918.20	2,847.16	41.082	SF
(O) Rosa Unit #350A - OH - OH-SVY	0.00	284.33	7,240.05			
(O) Rosa Unit #350A - OH - OH-SVY	100.00	365.50	7,240.48	7,238.17	3,133.705	ES
(O) Rosa Unit #350A - OH - OH-SVY	6,750.00	3,645.00	8,689.63	8,640.89	178.289	SF
(O) Rosa Unit #46 - OH - OH-INC	197.64	161.64	181.84	178.34	52.009	CC
(O) Rosa Unit #46 - OH - OH-INC	600.00	563.74	183.02	170.39	14.492	ES
(O) Rosa Unit #46 - OH - OH-INC	1,200.00	1,157.19	258.80	231.88	9.611	SF
(O) Rosa Unit #80B - OH - OH-SVY	916.40	1,044.00	2,619.87	2,612.48	354.519	CC, ES
(O) Rosa Unit #80B - OH - OH-SVY	10,200.00	7,126.84	2,989.30	2,683.64	9.780	SF
(O) Rosa Unit #95 - OH - OH-INC	1,245.40	1,662.94	6,136.98	6,096.74	152.501	CC
(O) Rosa Unit #95 - OH - OH-INC	2,000.00	2,379.93	6,150.75	6,090.22	101.605	ES
(O) Rosa Unit #95 - OH - OH-INC	6,100.00	5,990.00	6,415.31	6,242.23	37.067	SF
(O) Rosa Unit 072B - OH - OH-SVY	13,200.00	7,463.05	212.09	78.76	1.591	CC, ES, SF
(O) Rosa Unit 148 COM - OH - OH-INC	21,636.25	6,926.41	1,941.58	1,525.57	4.667	CC, ES, SF
Rosa Unit #674H - OH - Prelim 5	500.00	500.00	19.96	16.59	5.924	CC, ES
Rosa Unit #674H - OH - Prelim 5	23,156.15	22,524.82	1,319.42	817.60	2.629	SF
Rosa Unit #690H - OH - Prelim 5	500.00	500.00	40.06	36.69	11.890	CC, ES
Rosa Unit #690H - OH - Prelim 5	7,300.00	7,457.60	136.73	77.62	2.313	SF
Rosa Unit #692H - OH - Prelim 5	500.00	500.00	60.03	56.66	17.814	CC, ES
Rosa Unit #692H - OH - Prelim 5	1,200.00	1,209.44	104.28	95.85	12.361	SF
Rosa Unit #694H - OH - Prelim 5	500.00	500.00	79.99	76.62	23.737	CC, ES
Rosa Unit #694H - OH - Prelim 5	23,155.65	22,269.73	2,573.16	2,072.10	5.135	SF
Rosa Unit #696H - OH - Prelim 5	500.00	500.00	100.09	96.72	29.703	CC, ES
Rosa Unit #696H - OH - Prelim 5	1,000.00	1,000.26	136.91	129.94	19.643	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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Carson #1 - OH - OH-INC													Offset Site Error: 0.00 usft
Survey Program: 434-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	141.00	141.00	0.00	2.50	89.37	93.05	8,524.22	8,524.72				
100.00	100.00	241.00	241.00	0.25	4.27	89.37	93.05	8,524.22	8,524.72	8,520.20	4.52	1,885.664	
200.00	200.00	341.00	341.00	0.61	6.04	89.37	93.05	8,524.22	8,524.72	8,518.07	6.65	1,281.734	
300.00	300.00	441.00	441.00	0.97	7.81	89.37	93.05	8,524.22	8,524.72	8,515.94	8.78	970.806	
400.00	400.00	541.00	541.00	1.33	9.58	89.37	93.05	8,524.22	8,524.72	8,513.81	10.91	781.279	
500.00	500.00	641.00	641.00	1.68	11.36	89.37	93.05	8,524.22	8,524.72	8,511.68	13.04	653.666	
600.00	599.98	741.06	741.06	2.04	13.13	79.39	93.25	8,524.22	8,524.40	8,509.23	15.17	561.856	
700.00	699.84	841.00	840.99	2.41	14.90	79.45	93.12	8,524.22	8,523.44	8,506.14	17.30	492.678	
800.00	799.45	940.46	940.45	2.77	16.66	79.53	93.05	8,524.22	8,521.84	8,502.42	19.42	438.757	
900.00	898.70	1,039.71	1,039.70	3.13	18.42	79.66	93.05	8,524.22	8,519.63	8,498.08	21.55	395.397	
1,000.00	997.47	1,138.50	1,138.49	3.50	20.17	79.81	93.26	8,524.22	8,516.81	8,493.14	23.67	359.780	
1,100.00	1,095.63	1,236.69	1,236.68	3.89	21.91	82.36	93.16	8,524.22	8,513.84	8,488.04	25.80	330.004	
1,200.00	1,193.09	1,334.10	1,334.09	4.29	23.65	84.26	93.05	8,524.22	8,511.19	8,483.26	27.94	304.637	
1,300.00	1,289.73	1,430.74	1,430.73	4.72	25.39	85.74	93.05	8,524.22	8,508.90	8,478.80	30.10	282.688	
1,400.00	1,385.42	1,526.41	1,526.40	5.16	27.11	86.95	93.25	8,524.22	8,506.98	8,474.71	32.27	263.653	
1,496.97	1,477.20	1,618.10	1,618.09	5.62	28.76	87.94	93.17	8,524.22	8,505.52	8,471.15	34.37	247.469	
1,500.00	1,480.05	1,620.95	1,620.94	5.63	28.81	87.95	93.16	8,524.22	8,505.48	8,471.05	34.44	246.996	
1,600.00	1,574.15	1,715.17	1,715.15	6.12	30.50	88.17	93.05	8,524.22	8,504.26	8,467.64	36.62	232.231	
1,700.00	1,668.25	1,809.27	1,809.25	6.62	32.20	88.38	93.05	8,524.22	8,503.18	8,464.37	38.81	219.078	
1,800.00	1,762.35	1,902.96	1,902.93	7.12	33.89	88.59	93.27	8,524.22	8,502.23	8,461.22	41.01	207.331	
1,900.00	1,856.45	1,997.48	1,997.45	7.64	35.60	88.81	93.05	8,524.22	8,501.42	8,458.18	43.23	196.639	
2,000.00	1,950.55	2,091.58	2,091.55	8.16	37.32	89.02	93.05	8,524.22	8,500.74	8,455.26	45.48	186.913	
2,100.00	2,044.65	2,185.62	2,185.60	8.68	39.05	89.24	93.26	8,524.22	8,500.18	8,452.46	47.73	178.093	
2,200.00	2,138.75	2,279.39	2,279.36	9.21	40.77	89.45	93.19	8,524.22	8,499.78	8,449.80	49.98	170.074	
2,300.00	2,232.85	2,373.89	2,373.85	9.74	42.51	89.67	93.05	8,524.22	8,499.51	8,447.26	52.25	162.674	
2,400.00	2,326.95	2,467.99	2,467.95	10.27	44.31	89.88	93.05	8,524.22	8,499.36	8,444.78	54.58	155.715	
2,475.45	2,397.95	2,538.99	2,538.95	10.68	45.67	90.04	93.62	8,524.22	8,499.32	8,442.97	56.35	150.843 CC	
2,500.00	2,421.05	2,561.74	2,561.69	10.81	46.11	90.09	93.61	8,524.22	8,499.33	8,442.42	56.91	149.341	
2,600.00	2,515.15	2,654.25	2,654.20	11.34	47.88	90.31	93.37	8,524.22	8,499.47	8,440.25	59.22	143.523	
2,700.00	2,609.25	2,750.32	2,750.25	11.88	49.74	90.53	93.05	8,524.22	8,499.75	8,438.13	61.62	137.941	
2,800.00	2,703.35	2,844.42	2,844.35	12.42	51.59	90.74	93.05	8,524.22	8,500.15	8,436.14	64.01	132.790	
2,900.00	2,797.45	2,936.19	2,936.11	12.96	53.40	90.95	93.30	8,524.22	8,500.66	8,434.30	66.36	128.099	
3,000.00	2,891.55	3,032.66	3,032.55	13.51	55.33	91.17	93.05	8,524.22	8,501.35	8,432.51	68.83	123.507	
3,100.00	2,985.65	3,126.76	3,126.65	14.05	57.24	91.38	93.05	8,524.22	8,502.15	8,430.86	71.29	119.264	
3,200.00	3,079.75	3,218.51	3,218.40	14.60	59.10	91.59	93.65	8,524.22	8,503.04	8,429.34	73.70	115.378	
3,300.00	3,173.85	3,309.23	3,309.11	15.14	60.95	91.80	93.10	8,524.22	8,504.15	8,428.07	76.09	111.770	
3,400.00	3,267.95	3,409.11	3,408.95	15.69	62.95	92.03	93.05	8,524.22	8,505.36	8,426.73	78.63	108.168	
3,500.00	3,362.05	3,503.21	3,503.05	16.23	64.83	92.24	93.05	8,524.22	8,506.70	8,425.64	81.06	104.944	
3,600.00	3,456.15	3,594.47	3,594.31	16.78	66.66	92.45	93.76	8,524.22	8,508.11	8,424.68	83.43	101.978	
3,700.00	3,550.25	3,685.16	3,684.99	17.33	68.47	92.66	93.25	8,524.22	8,509.77	8,423.98	85.79	99.191	
3,800.00	3,644.35	3,785.55	3,785.35	17.88	70.49	92.89	93.05	8,524.22	8,511.53	8,423.17	88.35	96.335	
3,900.00	3,738.45	3,879.65	3,879.45	18.42	72.38	93.10	93.05	8,524.22	8,513.40	8,422.61	90.79	93.768	
4,000.00	3,832.55	3,973.31	3,973.11	18.97	74.26	93.31	93.85	8,524.22	8,515.33	8,422.11	93.22	91.344	
4,100.00	3,926.65	4,065.06	4,064.85	19.52	76.10	93.52	93.69	8,524.22	8,517.49	8,421.87	95.61	89.082	
4,200.00	4,020.75	4,156.65	4,156.44	20.07	77.95	93.73	93.31	8,524.22	8,519.81	8,421.81	98.00	86.934	
4,300.00	4,114.85	4,256.11	4,255.85	20.62	80.02	93.95	93.05	8,524.22	8,522.25	8,421.63	100.62	84.698	
4,400.00	4,208.95	4,350.21	4,349.95	21.17	82.03	94.17	93.05	8,524.22	8,524.80	8,421.62	103.18	82.622	
4,500.00	4,303.05	4,444.20	4,443.93	21.72	84.04	94.38	94.10	8,524.22	8,527.35	8,421.61	105.73	80.648 ES	
4,600.00	4,397.15	4,534.61	4,534.34	22.27	85.97	94.58	93.94	8,524.22	8,530.18	8,421.96	108.21	78.827	
4,700.00	4,491.25	4,624.82	4,624.54	22.82	87.90	94.79	93.49	8,524.22	8,533.18	8,422.49	110.69	77.091	
4,800.00	4,585.35	4,726.70	4,726.35	23.37	90.20	95.02	93.05	8,524.22	8,536.32	8,422.78	113.54	75.186	
4,900.00	4,679.45	4,820.80	4,820.45	23.93	92.46	95.23	93.05	8,524.22	8,539.53	8,423.18	116.35	73.395	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Carson #1 - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program: 434-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)
5,000.00	4,773.55	4,908.61	4,908.25	24.48	94.58	95.43	93.72	8,524.22	8,542.78	8,423.77	119.01	71.780	
5,100.00	4,867.65	5,009.13	5,008.65	25.03	97.04	95.66	93.05	8,524.22	8,546.36	8,424.33	122.02	70.038	
5,200.00	4,961.75	5,103.23	5,102.75	25.58	99.56	95.87	93.05	8,524.22	8,549.97	8,424.88	125.08	68.354	
5,300.00	5,055.85	5,197.33	5,196.85	26.13	102.07	96.08	93.05	8,524.22	8,553.71	8,425.57	128.14	66.751	
5,400.00	5,149.95	5,285.60	5,285.08	26.68	104.43	96.27	94.99	8,524.22	8,557.27	8,426.23	131.05	65.300	
5,500.00	5,244.05	5,370.63	5,370.09	27.24	106.70	96.47	94.36	8,524.22	8,561.39	8,427.52	133.86	63.957	
5,600.00	5,338.15	5,479.92	5,479.15	27.79	109.64	96.72	93.05	8,524.22	8,565.73	8,428.38	137.35	62.365	
5,665.73	5,400.00	5,541.76	5,541.00	28.15	111.39	96.86	93.05	8,524.22	8,568.53	8,429.07	139.45	61.444	
5,700.00	5,432.28	5,574.05	5,573.28	28.34	112.30	96.95	93.05	8,524.22	8,569.99	8,429.44	140.55	60.975	
5,800.00	5,526.87	5,668.64	5,667.87	28.88	114.97	97.19	93.05	8,524.22	8,574.21	8,430.46	143.75	59.647	
5,900.00	5,622.01	5,755.89	5,755.08	29.41	117.43	97.40	94.85	8,524.22	8,578.00	8,431.27	146.73	58.461	
6,000.00	5,717.67	5,841.00	5,840.17	29.92	119.83	97.61	94.13	8,524.22	8,582.14	8,432.50	149.63	57.354	
6,100.00	5,813.83	5,955.90	5,954.83	30.41	123.23	97.86	93.05	8,524.22	8,586.17	8,432.65	153.52	55.927	
6,200.00	5,910.44	6,052.52	6,051.44	30.89	126.34	98.07	93.05	8,524.22	8,589.86	8,432.76	157.11	54.675	
6,300.00	6,007.50	6,140.44	6,139.32	31.36	129.17	98.23	94.63	8,524.22	8,593.08	8,432.69	160.40	53.574	
6,400.00	6,104.96	6,222.38	6,221.23	31.80	131.81	98.39	93.81	8,524.22	8,596.60	8,433.13	163.47	52.587	
6,500.00	6,202.80	6,345.24	6,343.80	32.24	136.05	98.60	93.05	8,524.22	8,599.85	8,431.70	168.14	51.147	
6,600.00	6,300.98	6,443.42	6,441.98	32.66	139.56	98.75	93.05	8,524.22	8,602.76	8,430.69	172.07	49.996	
6,700.00	6,399.48	6,533.68	6,532.14	33.06	142.79	98.86	95.90	8,524.22	8,604.87	8,429.17	175.69	48.976	
6,722.82	6,422.00	6,552.42	6,550.87	33.15	143.46	98.89	95.79	8,524.22	8,605.47	8,429.02	176.45	48.769	
6,750.00	6,448.76	6,574.66	6,573.10	33.26	144.26	108.63	95.61	8,524.22	8,606.70	8,429.34	177.36	48.528	
6,800.00	6,497.51	6,615.12	6,613.55	33.48	145.70	119.74	95.13	8,524.22	8,611.58	8,432.56	179.02	48.105	
6,850.00	6,545.40	6,654.75	6,653.15	33.72	147.12	125.94	94.48	8,524.22	8,619.85	8,439.19	180.66	47.713	
6,900.00	6,592.13	6,735.19	6,733.13	33.97	149.98	129.67	93.05	8,524.22	8,631.49	8,447.72	183.77	46.969	
6,950.00	6,637.40	6,780.46	6,778.40	34.25	151.55	131.84	93.05	8,524.22	8,646.14	8,460.55	185.60	46.586	
7,000.00	6,680.94	6,824.00	6,821.94	34.54	153.06	133.02	93.05	8,524.22	8,663.95	8,476.58	187.37	46.240	
7,050.00	6,722.48	6,864.48	6,862.36	34.85	154.46	133.46	94.91	8,524.22	8,684.42	8,495.37	189.05	45.938	
7,100.00	6,761.76	6,893.69	6,891.57	35.17	155.48	133.29	94.81	8,524.22	8,708.24	8,517.90	190.34	45.751	
7,150.00	6,798.55	6,920.86	6,918.72	35.51	156.42	132.60	94.58	8,524.22	8,734.90	8,543.33	191.57	45.597	
7,200.00	6,832.61	6,945.81	6,943.66	35.86	157.28	131.39	94.25	8,524.22	8,764.23	8,571.52	192.72	45.477	
7,250.00	6,863.74	7,007.14	7,004.74	36.22	159.41	129.87	93.05	8,524.22	8,796.16	8,601.03	195.13	45.078	
7,300.00	6,891.74	7,035.14	7,032.74	36.59	160.36	127.65	93.05	8,524.22	8,830.15	8,633.77	196.38	44.966	
7,350.00	6,916.44	7,059.84	7,057.44	36.98	161.20	124.82	93.05	8,524.22	8,866.21	8,668.71	197.50	44.892	
7,400.00	6,937.69	7,081.09	7,078.69	37.37	161.93	121.31	93.05	8,524.22	8,904.14	8,705.63	198.51	44.855 SF	
7,450.00	6,955.36	7,098.75	7,096.36	37.78	162.53	117.02	93.05	8,524.22	8,943.69	8,744.31	199.38	44.857	
7,500.00	6,969.34	7,112.73	7,110.34	38.19	163.01	111.87	93.05	8,524.22	8,984.63	8,784.50	200.13	44.894	
7,550.00	6,979.53	7,122.93	7,120.53	38.62	163.36	105.80	93.05	8,524.22	9,026.69	8,825.96	200.73	44.969	
7,600.00	6,985.89	7,129.29	7,126.89	39.05	163.58	98.84	93.05	8,524.22	9,069.64	8,868.44	201.20	45.078	
7,650.00	6,988.37	7,131.76	7,129.37	39.48	163.66	91.10	93.05	8,524.22	9,113.18	8,911.66	201.52	45.222	
7,657.25	6,988.40	7,131.80	7,129.40	39.54	163.66	89.93	93.05	8,524.22	9,119.53	8,917.98	201.56	45.245	
7,700.00	6,988.37	7,131.77	7,129.37	39.92	163.66	89.93	93.05	8,524.22	9,157.01	8,955.25	201.75	45.387	
7,800.00	6,988.30	7,131.70	7,129.30	40.82	163.66	89.93	93.05	8,524.22	9,244.85	9,042.64	202.21	45.719	
7,900.00	6,988.23	7,131.63	7,129.23	41.77	163.66	89.93	93.05	8,524.22	9,332.94	9,130.27	202.66	46.051	
8,000.00	6,988.16	7,131.56	7,129.16	42.75	163.65	89.92	93.05	8,524.22	9,421.26	9,218.15	203.12	46.384	
8,100.00	6,988.09	7,131.49	7,129.09	43.76	163.65	89.92	93.05	8,524.22	9,509.82	9,306.25	203.56	46.717	
8,152.35	6,988.06	7,131.45	7,129.06	44.30	163.65	89.92	93.05	8,524.22	9,556.27	9,352.47	203.80	46.891	
8,200.00	6,988.02	7,131.42	7,129.02	44.79	163.65	89.91	93.05	8,524.22	9,598.95	9,394.95	204.00	47.053	
8,300.00	6,987.95	7,131.35	7,128.95	45.83	163.65	89.89	93.05	8,524.22	9,690.82	9,486.43	204.39	47.414	
8,400.00	6,987.88	7,131.27	7,128.88	46.85	163.64	89.86	93.05	8,524.22	9,785.33	9,580.62	204.71	47.802	
8,500.00	6,987.80	7,131.20	7,128.80	47.85	163.64	89.81	93.05	8,524.22	9,881.97	9,677.01	204.96	48.214	
8,600.00	6,987.73	7,131.12	7,128.73	48.83	163.64	89.71	93.05	8,524.22	9,980.20	9,775.05	205.15	48.649	
8,700.00	6,987.65	7,131.05	7,128.65	49.79	163.64	89.45	93.05	8,524.22	10,079.51	9,874.24	205.26	49.105	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Carson #1 - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		434-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 Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
8,800.00	6,987.57	7,130.97	7,128.57	50.72	163.63	85.70	93.05	8,524.22	10,179.38	9,974.07	205.32	49.579		
8,900.00	6,987.50	7,130.89	7,128.50	51.62	163.63	-89.26	93.05	8,524.22	10,279.33	10,074.03	205.30	50.069		
9,000.00	6,987.42	7,130.82	7,128.42	52.48	163.63	-89.66	93.05	8,524.22	10,378.87	10,173.64	205.23	50.572		
9,100.00	6,987.34	7,130.74	7,128.34	53.30	163.63	-89.78	93.05	8,524.22	10,477.54	10,272.44	205.10	51.086		
9,200.00	6,987.27	7,130.66	7,128.27	54.08	163.62	-89.84	93.05	8,524.22	10,574.88	10,369.97	204.91	51.608		
9,215.33	6,987.26	7,130.65	7,128.26	54.20	163.62	-89.85	93.05	8,524.22	10,589.65	10,384.78	204.87	51.689		
9,300.00	6,987.20	7,130.59	7,128.20	54.85	163.62	-89.85	93.05	8,524.22	10,671.18	10,466.49	204.69	52.134		
9,400.00	6,987.12	7,130.52	7,128.12	55.65	163.62	-89.85	93.05	8,524.22	10,767.53	10,563.05	204.48	52.659		
9,500.00	6,987.05	7,130.44	7,128.05	56.48	163.61	-89.85	93.05	8,524.22	10,863.94	10,659.67	204.27	53.184		
9,600.00	6,986.98	7,130.37	7,127.98	57.35	163.61	-89.84	93.05	8,524.22	10,960.42	10,756.35	204.07	53.709		
9,700.00	6,986.90	7,130.30	7,127.90	58.24	163.61	-89.84	93.05	8,524.22	11,056.96	10,853.09	203.88	54.234		
9,800.00	6,986.83	7,130.22	7,127.83	59.17	163.61	-89.84	93.05	8,524.22	11,153.57	10,949.88	203.69	54.758		
9,900.00	6,986.75	7,130.15	7,127.75	60.12	163.60	-89.84	93.05	8,524.22	11,250.23	11,046.72	203.50	55.282		
10,000.00	6,986.68	7,130.08	7,127.68	61.10	163.60	-89.84	93.05	8,524.22	11,346.95	11,143.62	203.33	55.806		
10,100.00	6,986.61	7,130.00	7,127.61	62.11	163.60	-89.84	93.05	8,524.22	11,443.72	11,240.57	203.15	56.330		
10,200.00	6,986.53	7,129.93	7,127.53	63.14	163.60	-89.84	93.05	8,524.22	11,540.56	11,337.57	202.99	56.854		
10,300.00	6,986.46	7,129.86	7,127.46	64.20	163.59	-89.83	93.05	8,524.22	11,637.44	11,434.62	202.82	57.377		
10,400.00	6,986.39	7,129.78	7,127.39	65.28	163.59	-89.83	93.05	8,524.22	11,734.38	11,531.71	202.67	57.900		
10,500.00	6,986.31	7,129.71	7,127.31	66.38	163.59	-89.83	93.05	8,524.22	11,831.37	11,628.85	202.51	58.422		
10,600.00	6,986.24	7,129.63	7,127.24	67.50	163.59	-89.83	93.05	8,524.22	11,928.40	11,726.04	202.37	58.945		
10,700.00	6,986.17	7,129.56	7,127.17	68.64	163.58	-89.83	93.05	8,524.22	12,025.49	11,823.27	202.22	59.467		
10,800.00	6,986.09	7,129.49	7,127.09	69.80	163.58	-89.83	93.05	8,524.22	12,122.62	11,920.54	202.08	59.988		
10,900.00	6,986.02	7,129.41	7,127.02	70.98	163.58	-89.83	93.05	8,524.22	12,219.80	12,017.85	201.95	60.509		
11,000.00	6,985.95	7,129.34	7,126.95	72.17	163.58	-89.82	93.05	8,524.22	12,317.03	12,115.21	201.82	61.030		
11,100.00	6,985.87	7,129.27	7,126.87	73.38	163.57	-89.82	93.05	8,524.22	12,414.30	12,212.60	201.69	61.551		
11,200.00	6,985.80	7,129.19	7,126.80	74.61	163.57	-89.82	93.05	8,524.22	12,511.61	12,310.04	201.57	62.071		
11,300.00	6,985.72	7,129.12	7,126.72	75.85	163.57	-89.82	93.05	8,524.22	12,608.96	12,407.51	201.45	62.590		
11,400.00	6,985.65	7,129.05	7,126.65	77.10	163.57	-89.82	93.05	8,524.22	12,706.36	12,505.02	201.34	63.109		
11,500.00	6,985.58	7,128.97	7,126.58	78.37	163.56	-89.82	93.05	8,524.22	12,803.79	12,602.57	201.23	63.628		
11,600.00	6,985.50	7,128.90	7,126.50	79.65	163.56	-89.82	93.05	8,524.22	12,901.27	12,700.15	201.12	64.146		
11,700.00	6,985.43	7,128.83	7,126.43	80.94	163.56	-89.81	93.05	8,524.22	12,998.78	12,797.76	201.02	64.664		
11,800.00	6,985.36	7,128.75	7,126.36	82.24	163.56	-89.81	93.05	8,524.22	13,096.33	12,895.41	200.92	65.182		
11,900.00	6,985.28	7,128.68	7,126.28	83.56	163.55	-89.81	93.05	8,524.22	13,193.92	12,993.09	200.83	65.698		
12,000.00	6,985.21	7,128.60	7,126.21	84.88	163.55	-89.81	93.05	8,524.22	13,291.54	13,090.81	200.73	66.215		
12,100.00	6,985.14	7,128.53	7,126.14	86.21	163.55	-89.81	93.05	8,524.22	13,389.20	13,188.56	200.64	66.731		
12,200.00	6,985.06	7,128.46	7,126.06	87.56	163.55	-89.81	93.05	8,524.22	13,486.89	13,286.33	200.56	67.246		
12,300.00	6,984.99	7,128.38	7,125.99	88.91	163.54	-89.80	93.05	8,524.22	13,584.62	13,384.14	200.48	67.761		
12,400.00	6,984.92	7,128.31	7,125.92	90.27	163.54	-89.80	93.05	8,524.22	13,682.38	13,481.98	200.40	68.275		
12,500.00	6,984.84	7,128.24	7,125.84	91.64	163.54	-89.80	93.05	8,524.22	13,780.17	13,579.85	200.32	68.789		
12,600.00	6,984.77	7,128.16	7,125.77	93.01	163.54	-89.80	93.05	8,524.22	13,877.99	13,677.74	200.25	69.303		
12,700.00	6,984.69	7,128.09	7,125.69	94.40	163.53	-89.80	93.05	8,524.22	13,975.85	13,775.66	200.18	69.815		
12,800.00	6,984.62	7,128.02	7,125.62	95.79	163.53	-89.80	93.05	8,524.22	14,073.73	13,873.61	200.12	70.328		
12,900.00	6,984.55	7,127.94	7,125.55	97.18	163.53	-89.80	93.05	8,524.22	14,171.64	13,971.59	200.05	70.839		
13,000.00	6,984.47	7,127.87	7,125.47	98.59	163.53	-89.79	93.05	8,524.22	14,269.58	14,069.59	199.99	71.351		
13,100.00	6,984.40	7,127.79	7,125.40	100.00	163.52	-89.79	93.05	8,524.22	14,367.55	14,167.62	199.93	71.861		
13,200.00	6,984.33	7,127.72	7,125.33	101.41	163.52	-89.79	93.05	8,524.22	14,465.55	14,265.67	199.88	72.371		
13,300.00	6,984.25	7,127.65	7,125.25	102.83	163.52	-89.79	93.05	8,524.22	14,563.58	14,363.75	199.83	72.881		
13,400.00	6,984.18	7,127.57	7,125.18	104.26	163.52	-89.79	93.05	8,524.22	14,661.63	14,461.85	199.78	73.389		
13,500.00	6,984.11	7,127.50	7,125.11	105.69	163.51	-89.79	93.05	8,524.22	14,759.71	14,559.98	199.73	73.898		
13,600.00	6,984.03	7,127.43	7,125.03	107.13	163.51	-89.79	93.05	8,524.22	14,857.81	14,658.12	199.69	74.405		
13,700.00	6,983.96	7,127.35	7,124.96	108.57	163.51	-89.78	93.05	8,524.22	14,955.94	14,756.30	199.65	74.912		
13,800.00	6,983.88	7,127.28	7,124.88	110.02	163.51	-89.78	93.05	8,524.22	15,054.09	14,854.49	199.61	75.419		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Carson #1 - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program:		434-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)
13,900.00	6,983.81	7,127.21	7,124.81	111.47	163.50	-89.78	93.05	8,524.22	15,152.27	14,952.70	199.57	75.925	
14,000.00	6,983.74	7,127.13	7,124.74	112.92	163.50	-89.78	93.05	8,524.22	15,250.47	15,050.94	199.54	76.430	
14,100.00	6,983.66	7,127.06	7,124.66	114.38	163.50	-89.78	93.05	8,524.22	15,348.70	15,149.19	199.50	76.934	
14,200.00	6,983.59	7,126.99	7,124.59	115.85	163.50	-89.78	93.05	8,524.22	15,446.95	15,247.47	199.47	77.438	
14,300.00	6,983.52	7,126.91	7,124.52	117.31	163.49	-89.78	93.05	8,524.22	15,545.22	15,345.77	199.45	77.942	
14,400.00	6,983.44	7,126.84	7,124.44	118.78	163.49	-89.77	93.05	8,524.22	15,643.51	15,444.09	199.42	78.444	
14,500.00	6,983.37	7,126.76	7,124.37	120.26	163.49	-89.77	93.05	8,524.22	15,741.82	15,542.42	199.40	78.947	
14,600.00	6,983.30	7,126.69	7,124.30	121.74	163.49	-89.77	93.05	8,524.22	15,840.16	15,640.78	199.38	79.448	
14,700.00	6,983.22	7,126.62	7,124.22	123.22	163.48	-89.77	93.05	8,524.22	15,938.51	15,739.15	199.36	79.949	
14,800.00	6,983.15	7,126.54	7,124.15	124.70	163.48	-89.77	93.05	8,524.22	16,036.89	15,837.54	199.34	80.449	
14,900.00	6,983.08	7,126.47	7,124.08	126.19	163.48	-89.77	93.05	8,524.22	16,135.28	15,935.95	199.33	80.948	
15,000.00	6,983.00	7,126.40	7,124.00	127.68	163.48	-89.77	93.05	8,524.22	16,233.70	16,034.38	199.32	81.447	
15,100.00	6,982.93	7,126.32	7,123.93	129.17	163.47	-89.76	93.05	8,524.22	16,332.13	16,132.83	199.31	81.945	
15,200.00	6,982.85	7,126.25	7,123.85	130.67	163.47	-89.76	93.05	8,524.22	16,430.58	16,231.29	199.30	82.443	
15,300.00	6,982.78	7,126.18	7,123.78	132.16	163.47	-89.76	93.05	8,524.22	16,529.06	16,329.77	199.29	82.940	
15,400.00	6,982.71	7,126.10	7,123.71	133.66	163.47	-89.76	93.05	8,524.22	16,627.55	16,428.26	199.29	83.436	
15,500.00	6,982.63	7,126.03	7,123.63	135.17	163.46	-89.76	93.05	8,524.22	16,726.05	16,526.77	199.28	83.931	
15,600.00	6,982.56	7,125.96	7,123.56	136.67	163.46	-89.76	93.05	8,524.22	16,824.58	16,625.30	199.28	84.426	
15,700.00	6,982.49	7,125.88	7,123.49	138.18	163.46	-89.75	93.05	8,524.22	16,923.12	16,723.84	199.28	84.920	
15,800.00	6,982.41	7,125.81	7,123.41	139.69	163.46	-89.75	93.05	8,524.22	17,021.68	16,822.40	199.28	85.414	
15,900.00	6,982.34	7,125.73	7,123.34	141.20	163.45	-89.75	93.05	8,524.22	17,120.26	16,920.97	199.29	85.907	
16,000.00	6,982.27	7,125.66	7,123.27	142.71	163.45	-89.75	93.05	8,524.22	17,218.85	17,019.56	199.29	86.399	
16,100.00	6,982.19	7,125.59	7,123.19	144.23	163.45	-89.75	93.05	8,524.22	17,317.46	17,118.16	199.30	86.890	
16,200.00	6,982.12	7,125.51	7,123.12	145.75	163.45	-89.75	93.05	8,524.22	17,416.08	17,216.77	199.31	87.381	
16,300.00	6,982.05	7,125.44	7,123.05	147.27	163.44	-89.75	93.05	8,524.22	17,514.73	17,315.40	199.32	87.871	
16,400.00	6,981.97	7,125.37	7,122.97	148.79	163.44	-89.74	93.05	8,524.22	17,613.38	17,414.05	199.34	88.361	
16,500.00	6,981.90	7,125.29	7,122.90	150.31	163.44	-89.74	93.05	8,524.22	17,712.05	17,512.70	199.35	88.849	
16,600.00	6,981.82	7,125.22	7,122.82	151.84	163.44	-89.74	93.05	8,524.22	17,810.74	17,611.37	199.37	89.337	
16,700.00	6,981.75	7,125.15	7,122.75	153.36	163.43	-89.74	93.05	8,524.22	17,909.44	17,710.06	199.38	89.825	
16,800.00	6,981.68	7,125.07	7,122.68	154.89	163.43	-89.74	93.05	8,524.22	18,008.15	17,808.75	199.40	90.311	
16,900.00	6,981.60	7,125.00	7,122.60	156.42	163.43	-89.74	93.05	8,524.22	18,106.88	17,907.46	199.42	90.797	
17,000.00	6,981.53	7,124.92	7,122.53	157.95	163.43	-89.74	93.05	8,524.22	18,205.62	18,006.18	199.44	91.282	
17,100.00	6,981.46	7,124.85	7,122.46	159.49	163.42	-89.73	93.05	8,524.22	18,304.38	18,104.91	199.47	91.767	
17,200.00	6,981.38	7,124.78	7,122.38	161.02	163.42	-89.73	93.05	8,524.22	18,403.15	18,203.66	199.49	92.250	
17,300.00	6,981.31	7,124.70	7,122.31	162.56	163.42	-89.73	93.05	8,524.22	18,501.93	18,302.42	199.52	92.734	
17,400.00	6,981.24	7,124.63	7,122.24	164.09	163.42	-89.73	93.05	8,524.22	18,600.73	18,401.18	199.54	93.216	
17,500.00	6,981.16	7,124.56	7,122.16	165.63	163.41	-89.73	93.05	8,524.22	18,699.54	18,499.96	199.57	93.698	
17,600.00	6,981.09	7,124.48	7,122.09	167.17	163.41	-89.73	93.05	8,524.22	18,798.36	18,598.76	199.60	94.179	
17,700.00	6,981.01	7,124.41	7,122.01	168.71	163.41	-89.73	93.05	8,524.22	18,897.19	18,697.56	199.63	94.659	
17,800.00	6,980.94	7,124.34	7,121.94	170.25	163.41	-89.72	93.05	8,524.22	18,996.04	18,796.37	199.67	95.138	
17,900.00	6,980.87	7,124.26	7,121.87	171.80	163.40	-89.72	93.05	8,524.22	19,094.90	18,895.20	199.70	95.617	
18,000.00	6,980.79	7,124.19	7,121.79	173.34	163.40	-89.72	93.05	8,524.22	19,193.77	18,994.03	199.74	96.095	
18,100.00	6,980.72	7,124.12	7,121.72	174.89	163.40	-89.72	93.05	8,524.22	19,292.65	19,092.87	199.77	96.573	
18,200.00	6,980.65	7,124.04	7,121.65	176.43	163.40	-89.72	93.05	8,524.22	19,391.54	19,191.73	199.81	97.050	
18,300.00	6,980.57	7,123.97	7,121.57	177.98	163.39	-89.72	93.05	8,524.22	19,490.44	19,290.60	199.85	97.526	
18,400.00	6,980.50	7,123.89	7,121.50	179.53	163.39	-89.72	93.05	8,524.22	19,589.36	19,389.47	199.89	98.001	
18,500.00	6,980.43	7,123.82	7,121.43	181.08	163.39	-89.71	93.05	8,524.22	19,688.29	19,488.36	199.93	98.475	
18,600.00	6,980.35	7,123.75	7,121.35	182.63	163.39	-89.71	93.05	8,524.22	19,787.22	19,587.25	199.97	98.949	
18,700.00	6,980.28	7,123.67	7,121.28	184.18	163.38	-89.71	93.05	8,524.22	19,886.17	19,686.15	200.02	99.422	
18,800.00	6,980.21	7,123.60	7,121.21	185.73	163.38	-89.71	93.05	8,524.22	19,985.13	19,785.07	200.06	99.895	
18,900.00	6,980.13	7,123.53	7,121.13	187.28	163.38	-89.71	93.05	8,524.22	20,084.10	19,883.99	200.11	100.367	
19,000.00	6,980.06	7,123.45	7,121.06	188.84	163.38	-89.71	93.05	8,524.22	20,183.08	19,982.92	200.15	100.838	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Carson #1 - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program:		434-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)			
19,100.00	6,979.98	7,123.38	7,120.98	190.39	163.37	-89.71	93.05	8,524.22	20,282.07	20,081.86	200.20	101.308	
19,200.00	6,979.91	7,123.31	7,120.91	191.95	163.37	-89.70	93.05	8,524.22	20,381.06	20,180.81	200.25	101.778	
19,300.00	6,979.84	7,123.23	7,120.84	193.51	163.37	-89.70	93.05	8,524.22	20,480.07	20,279.77	200.30	102.246	
19,400.00	6,979.76	7,123.16	7,120.76	195.06	163.37	-89.70	93.05	8,524.22	20,579.09	20,378.74	200.35	102.715	
19,500.00	6,979.69	7,123.09	7,120.69	196.62	163.36	-89.70	93.05	8,524.22	20,678.12	20,477.71	200.40	103.182	
19,600.00	6,979.62	7,123.01	7,120.62	198.18	163.36	-89.70	93.05	8,524.22	20,777.15	20,576.70	200.46	103.649	
19,700.00	6,979.54	7,122.94	7,120.54	199.74	163.36	-89.70	93.05	8,524.22	20,876.20	20,675.69	200.51	104.115	
19,800.00	6,979.47	7,122.86	7,120.47	201.30	163.36	-89.69	93.05	8,524.22	20,975.26	20,774.69	200.57	104.580	
19,900.00	6,979.40	7,122.79	7,120.40	202.86	163.35	-89.69	93.05	8,524.22	21,074.32	20,873.70	200.62	105.045	
20,000.00	6,979.32	7,122.72	7,120.32	204.42	163.35	-89.69	93.05	8,524.22	21,173.39	20,972.71	200.68	105.509	
20,100.00	6,979.25	7,122.64	7,120.25	205.98	163.35	-89.69	93.05	8,524.22	21,272.47	21,071.74	200.74	105.972	
20,200.00	6,979.18	7,122.57	7,120.18	207.55	163.35	-89.69	93.05	8,524.22	21,371.56	21,170.77	200.80	106.434	
20,300.00	6,979.10	7,122.50	7,120.10	209.11	163.34	-89.69	93.05	8,524.22	21,470.66	21,269.81	200.86	106.896	
20,400.00	6,979.03	7,122.42	7,120.03	210.68	163.34	-89.69	93.05	8,524.22	21,569.77	21,368.85	200.92	107.357	
20,500.00	6,978.95	7,122.35	7,119.95	212.24	163.34	-89.68	93.05	8,524.22	21,668.88	21,467.90	200.98	107.817	
20,600.00	6,978.88	7,122.28	7,119.88	213.81	163.34	-89.68	93.05	8,524.22	21,768.01	21,566.97	201.04	108.277	
20,700.00	6,978.81	7,122.20	7,119.81	215.37	163.33	-89.68	93.05	8,524.22	21,867.14	21,666.03	201.10	108.736	
20,800.00	6,978.73	7,122.13	7,119.73	216.94	163.33	-89.68	93.05	8,524.22	21,966.28	21,765.11	201.17	109.194	
20,900.00	6,978.66	7,122.05	7,119.66	218.51	163.33	-89.68	93.05	8,524.22	22,065.42	21,864.19	201.23	109.651	
21,000.00	6,978.59	7,121.98	7,119.59	220.07	163.33	-89.68	93.05	8,524.22	22,164.58	21,963.28	201.30	110.108	
21,100.00	6,978.51	7,121.91	7,119.51	221.64	163.32	-89.68	93.05	8,524.22	22,263.74	22,062.37	201.36	110.564	
21,200.00	6,978.44	7,121.83	7,119.44	223.21	163.32	-89.67	93.05	8,524.22	22,362.91	22,161.48	201.43	111.020	
21,300.00	6,978.37	7,121.76	7,119.37	224.78	163.32	-89.67	93.05	8,524.22	22,462.08	22,260.58	201.50	111.474	
21,400.00	6,978.29	7,121.69	7,119.29	226.35	163.32	-89.67	93.05	8,524.22	22,561.27	22,359.70	201.57	111.928	
21,500.00	6,978.22	7,121.61	7,119.22	227.92	163.31	-89.67	93.05	8,524.22	22,660.46	22,458.82	201.64	112.381	
21,600.00	6,978.14	7,121.54	7,119.14	229.49	163.31	-89.67	93.05	8,524.22	22,759.66	22,557.95	201.71	112.834	
21,700.00	6,978.07	7,121.47	7,119.07	231.06	163.31	-89.67	93.05	8,524.22	22,858.86	22,657.08	201.78	113.286	
21,800.00	6,978.00	7,121.39	7,119.00	232.63	163.31	-89.67	93.05	8,524.22	22,958.07	22,756.22	201.85	113.737	
21,900.00	6,977.92	7,121.32	7,118.92	234.21	163.30	-89.66	93.05	8,524.22	23,057.29	22,855.37	201.93	114.187	
22,000.00	6,977.85	7,121.25	7,118.85	235.78	163.30	-89.66	93.05	8,524.22	23,156.52	22,954.52	202.00	114.637	
22,100.00	6,977.78	7,121.17	7,118.78	237.35	163.30	-89.66	93.05	8,524.22	23,255.75	23,053.68	202.07	115.086	
22,200.00	6,977.70	7,121.10	7,118.70	238.92	163.30	-89.66	93.05	8,524.22	23,354.99	23,152.84	202.15	115.534	
22,300.00	6,977.63	7,121.02	7,118.63	240.50	163.29	-89.66	93.05	8,524.22	23,454.23	23,252.01	202.22	115.982	
22,400.00	6,977.56	7,120.95	7,118.56	242.07	163.29	-89.66	93.05	8,524.22	23,553.49	23,351.19	202.30	116.429	
22,500.00	6,977.48	7,120.88	7,118.48	243.65	163.29	-89.66	93.05	8,524.22	23,652.74	23,450.37	202.38	116.875	
22,600.00	6,977.41	7,120.80	7,118.41	245.22	163.29	-89.65	93.05	8,524.22	23,752.01	23,549.55	202.45	117.320	
22,700.00	6,977.34	7,120.73	7,118.34	246.80	163.28	-89.65	93.05	8,524.22	23,851.28	23,648.75	202.53	117.765	
22,800.00	6,977.26	7,120.66	7,118.26	248.37	163.28	-89.65	93.05	8,524.22	23,950.56	23,747.94	202.61	118.209	
22,900.00	6,977.19	7,120.58	7,118.19	249.95	163.28	-89.65	93.05	8,524.22	24,049.84	23,847.15	202.69	118.653	
23,000.00	6,977.11	7,120.51	7,118.11	251.53	163.28	-89.65	93.05	8,524.22	24,149.13	23,946.35	202.77	119.096	
23,100.00	6,977.04	7,120.44	7,118.04	253.10	163.27	-89.65	93.05	8,524.22	24,248.42	24,045.57	202.85	119.538	
23,155.65	6,977.00	7,120.39	7,118.00	253.98	163.27	-89.65	93.05	8,524.22	24,303.68	24,100.79	202.90	119.783	
23,156.15	6,977.00	7,120.39	7,118.00	254.06	163.27	-89.65	93.05	8,524.22	24,304.18	24,096.39	207.79	116.966	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design:		Rosa Unit 34 - (O) Rosa Unit #041B - OH - OH-SVY											Offset Site Error:		0.00 usft		
Survey Program:		323-MWD OWSG Rev5						Rule Assigned:						Offset Well Error:		0.00 usft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)							
0.00	0.00	2,511.43	2,362.75	0.00	14.88	-71.74	1,277.18	-3,871.86	4,692.79								
100.00	100.00	2,562.57	2,407.20	0.25	15.35	-71.69	1,272.80	-3,846.96	4,643.69	4,627.51	16.18	287.017					
200.00	200.00	2,665.87	2,497.09	0.61	16.32	-71.60	1,263.09	-3,797.00	4,594.74	4,577.91	16.83	273.019					
300.00	300.00	2,805.61	2,618.06	0.97	17.62	-71.47	1,249.49	-3,728.38	4,544.90	4,527.18	17.72	256.449					
400.00	400.00	2,951.60	2,743.57	1.33	19.05	-71.36	1,233.11	-3,655.65	4,493.92	4,475.23	18.70	240.346					
500.00	500.00	3,161.60	2,922.00	1.68	21.18	-71.18	1,208.91	-3,547.63	4,441.38	4,421.32	20.06	221.403					
600.00	599.98	3,252.97	2,998.84	2.04	22.14	-82.38	1,199.25	-3,499.15	4,387.39	4,366.56	20.83	210.621					
700.00	699.84	3,330.38	3,063.99	2.41	22.95	-83.66	1,190.44	-3,458.27	4,333.04	4,311.49	21.54	201.145					
800.00	799.45	3,401.59	3,124.01	2.77	23.69	-85.00	1,182.26	-3,420.85	4,278.56	4,256.33	22.23	192.435					
900.00	898.70	3,468.12	3,180.25	3.13	24.38	-86.39	1,174.18	-3,386.22	4,224.14	4,201.22	22.91	184.343					
1,000.00	997.47	3,483.00	3,192.85	3.50	24.54	-87.70	1,172.29	-3,378.54	4,170.28	4,146.93	23.36	178.538					
1,100.00	1,095.63	3,541.84	3,243.03	3.89	25.13	-86.72	1,164.81	-3,348.73	4,116.58	4,092.53	24.05	171.159					
1,200.00	1,193.09	3,574.00	3,270.73	4.29	25.45	-86.36	1,160.81	-3,332.89	4,063.37	4,038.74	24.63	165.009					
1,300.00	1,289.73	3,604.77	3,297.42	4.72	25.73	-86.44	1,157.07	-3,318.06	4,010.57	3,985.34	25.23	158.931					
1,400.00	1,385.42	3,634.60	3,323.49	5.16	26.01	-86.80	1,153.53	-3,304.00	3,958.32	3,932.46	25.86	153.073					
1,496.97	1,477.20	3,667.00	3,352.02	5.62	26.31	-87.38	1,149.80	-3,289.10	3,908.28	3,881.78	26.51	147.445					
1,500.00	1,480.05	3,667.00	3,352.02	5.63	26.31	-87.38	1,149.80	-3,289.10	3,906.73	3,880.21	26.52	147.299					
1,600.00	1,574.15	3,667.00	3,352.02	6.12	26.31	-87.38	1,149.80	-3,289.10	3,856.41	3,829.40	27.01	142.769					
1,700.00	1,668.25	3,714.36	3,394.18	6.62	26.71	-87.67	1,144.73	-3,268.12	3,807.11	3,779.28	27.83	136.808					
1,800.00	1,762.35	3,760.00	3,435.35	7.12	27.09	-87.96	1,140.38	-3,248.92	3,759.65	3,731.01	28.65	131.240					
1,900.00	1,856.45	3,760.00	3,435.35	7.64	27.09	-87.96	1,140.38	-3,248.92	3,713.38	3,684.21	29.18	127.269					
2,000.00	1,950.55	3,809.95	3,480.84	8.16	27.47	-88.27	1,136.01	-3,228.75	3,668.56	3,638.55	30.01	122.243					
2,100.00	2,044.65	3,853.00	3,520.27	8.68	27.79	-88.54	1,132.42	-3,211.87	3,625.02	3,594.21	30.81	117.649					
2,200.00	2,138.75	3,853.00	3,520.27	9.21	27.79	-88.54	1,132.42	-3,211.87	3,583.22	3,551.85	31.37	114.240					
2,300.00	2,232.85	3,912.50	3,575.26	9.74	28.20	-88.92	1,127.44	-3,189.70	3,542.35	3,510.10	32.25	109.832					
2,400.00	2,326.95	3,944.00	3,604.64	10.27	28.42	-89.13	1,124.70	-3,178.67	3,503.46	3,470.47	32.99	106.197					
2,500.00	2,421.05	3,944.00	3,604.64	10.81	28.42	-89.13	1,124.70	-3,178.67	3,466.61	3,433.06	33.55	103.320					
2,600.00	2,515.15	3,994.19	3,651.89	11.34	28.71	-89.47	1,120.39	-3,162.30	3,431.05	3,396.58	34.47	99.537					
2,700.00	2,609.25	4,038.00	3,693.58	11.88	28.96	-89.77	1,116.80	-3,149.36	3,397.86	3,362.51	35.35	96.131					
2,800.00	2,703.35	4,038.00	3,693.58	12.42	28.96	-89.77	1,116.80	-3,149.36	3,366.36	3,330.45	35.90	93.762					
2,900.00	2,797.45	4,038.00	3,693.58	12.96	28.96	-89.77	1,116.80	-3,149.36	3,337.55	3,301.10	36.45	91.568					
3,000.00	2,891.55	4,093.37	3,746.90	13.51	29.22	-90.14	1,113.03	-3,134.89	3,309.82	3,272.34	37.48	88.319					
3,100.00	2,985.65	4,130.00	3,782.51	14.05	29.38	-90.38	1,111.28	-3,126.54	3,284.85	3,246.52	38.34	85.687					
3,200.00	3,079.75	4,130.00	3,782.51	14.60	29.38	-90.38	1,111.28	-3,126.54	3,262.01	3,223.16	38.86	83.952					
3,300.00	3,173.85	4,169.46	3,821.15	15.14	29.51	-90.64	1,109.87	-3,118.65	3,241.25	3,201.53	39.72	81.594					
3,400.00	3,267.95	4,222.00	3,872.94	15.69	29.69	-90.97	1,108.51	-3,109.94	3,223.19	3,182.48	40.71	79.174					
3,500.00	3,362.05	4,222.00	3,872.94	16.23	29.69	-90.97	1,108.51	-3,109.94	3,206.64	3,165.45	41.19	77.848					
3,600.00	3,456.15	4,256.07	3,906.68	16.78	29.76	-91.19	1,107.85	-3,105.26	3,192.63	3,150.75	41.88	76.227					
3,700.00	3,550.25	4,295.00	3,945.34	17.33	29.85	-91.43	1,107.15	-3,100.70	3,180.74	3,138.14	42.60	74.666					
3,800.00	3,644.35	4,295.00	3,945.34	17.88	29.85	-91.43	1,107.15	-3,100.70	3,171.29	3,128.27	43.02	73.717					
3,900.00	3,738.45	4,399.18	4,049.02	18.42	30.14	-92.10	1,105.17	-3,090.71	3,162.15	3,117.78	44.37	71.267					
4,000.00	3,832.55	4,455.61	4,105.26	18.97	30.30	-92.47	1,103.94	-3,086.24	3,155.08	3,109.80	45.28	69.676					
4,100.00	3,926.65	4,512.03	4,161.53	19.52	30.47	-92.84	1,102.60	-3,082.42	3,149.50	3,103.32	46.19	68.191					
4,200.00	4,020.75	4,568.42	4,217.81	20.07	30.64	-93.21	1,101.14	-3,079.27	3,145.42	3,098.34	47.08	66.808					
4,300.00	4,114.85	4,696.00	4,345.25	20.62	31.03	-94.06	1,097.43	-3,074.57	3,144.18	3,095.56	48.63	64.662					
4,400.00	4,208.95	4,696.00	4,345.25	21.17	31.03	-94.06	1,097.43	-3,074.57	3,141.85	3,092.86	48.99	64.138					
4,423.39	4,230.96	4,696.00	4,345.25	21.30	31.03	-94.06	1,097.43	-3,074.57	3,141.76	3,092.70	49.06	64.033					
4,500.00	4,303.05	4,758.52	4,407.72	21.72	31.42	-94.48	1,095.56	-3,073.15	3,142.02	3,092.11	49.91	62.959					
4,600.00	4,397.15	4,843.93	4,493.09	22.27	31.95	-95.04	1,093.33	-3,071.41	3,142.93	3,091.89	51.04	61.577					
4,700.00	4,491.25	4,929.63	4,578.75	22.82	32.48	-95.60	1,091.45	-3,069.88	3,144.48	3,092.31	52.18	60.266					
4,800.00	4,585.35	5,015.60	4,664.70	23.37	33.01	-96.16	1,089.93	-3,068.58	3,146.66	3,093.35	53.32	59.020					
4,900.00	4,679.45	5,101.85	4,750.93	23.93	33.54	-96.71	1,088.78	-3,067.51	3,149.46	3,095.01	54.45	57.836					

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #041B - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		323-MWD OWSG Rev5					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	
5,000.00	4,773.55	5,188.37	4,837.44	24.48	34.08	-97.25	1,087.99	-3,066.65	3,152.86	3,097.27	55.60	56.710		
5,100.00	4,867.65	5,275.16	4,924.23	25.03	34.62	-97.79	1,087.57	-3,066.03	3,156.85	3,100.11	56.74	55.638		
5,200.00	4,961.75	5,362.21	5,011.28	25.58	35.16	-98.32	1,087.53	-3,065.64	3,161.41	3,103.53	57.88	54.618		
5,300.00	5,055.85	5,449.53	5,098.60	26.13	35.70	-98.84	1,087.86	-3,065.48	3,166.53	3,107.50	59.03	53.645		
5,400.00	5,149.95	5,537.11	5,186.18	26.68	36.24	-99.36	1,088.57	-3,065.55	3,172.19	3,112.02	60.17	52.718		
5,500.00	5,244.05	5,624.94	5,274.00	27.24	36.78	-99.87	1,089.67	-3,065.86	3,178.38	3,117.07	61.32	51.834		
5,600.00	5,338.15	5,715.68	5,364.72	27.79	37.36	-100.39	1,091.07	-3,066.39	3,185.07	3,122.61	62.46	50.996		
5,665.73	5,400.00	5,776.41	5,425.45	28.15	37.75	-100.74	1,091.88	-3,066.76	3,189.68	3,126.48	63.20	50.469		
5,700.00	5,432.28	5,808.08	5,457.11	28.34	37.95	-100.95	1,092.25	-3,066.96	3,192.13	3,128.54	63.59	50.200		
5,800.00	5,526.87	5,900.69	5,549.72	28.88	38.55	-101.53	1,093.11	-3,067.54	3,199.30	3,134.59	64.71	49.443		
5,900.00	5,622.01	5,993.63	5,642.66	29.41	39.14	-102.09	1,093.67	-3,068.15	3,206.47	3,140.66	65.81	48.721		
6,000.00	5,717.67	6,086.88	5,735.91	29.92	39.74	-102.63	1,093.92	-3,068.77	3,213.61	3,146.70	66.90	48.033		
6,100.00	5,813.83	6,180.42	5,829.45	30.41	40.34	-103.14	1,093.85	-3,069.41	3,220.67	3,152.69	67.98	47.376		
6,200.00	5,910.44	6,274.25	5,923.27	30.89	40.94	-103.64	1,093.47	-3,070.07	3,227.63	3,158.59	69.04	46.747		
6,300.00	6,007.50	6,368.33	6,017.35	31.36	41.55	-104.10	1,092.76	-3,070.74	3,234.45	3,164.35	70.09	46.144		
6,400.00	6,104.96	6,462.67	6,111.67	31.80	42.15	-104.55	1,091.73	-3,071.44	3,241.09	3,169.96	71.13	45.566		
6,500.00	6,202.80	6,558.02	6,207.02	32.24	42.80	-104.97	1,090.36	-3,072.15	3,247.53	3,175.33	72.20	44.981		
6,600.00	6,300.98	6,660.99	6,309.97	32.66	43.86	-105.38	1,088.78	-3,072.84	3,253.60	3,179.92	73.68	44.159		
6,700.00	6,399.48	6,764.35	6,413.31	33.06	44.92	-105.76	1,087.24	-3,073.38	3,259.15	3,184.00	75.15	43.368		
6,722.82	6,422.00	6,787.99	6,436.95	33.15	45.17	-105.84	1,086.90	-3,073.48	3,260.35	3,184.86	75.49	43.192		
6,750.00	6,448.76	6,816.07	6,465.03	33.26	45.46	-96.08	1,086.49	-3,073.59	3,261.42	3,185.54	75.89	42.978		
6,800.00	6,497.51	6,867.22	6,516.18	33.48	45.98	-84.98	1,085.77	-3,073.77	3,261.70	3,185.06	76.64	42.560		
6,850.00	6,545.40	6,917.43	6,566.38	33.72	46.50	-78.86	1,085.06	-3,073.90	3,259.79	3,182.39	77.40	42.115		
6,900.00	6,592.13	6,966.39	6,615.33	33.97	47.01	-75.35	1,084.39	-3,073.99	3,255.77	3,177.59	78.18	41.647		
6,950.00	6,637.40	7,013.78	6,662.72	34.25	47.50	-73.36	1,083.76	-3,074.05	3,249.70	3,170.74	78.95	41.159		
7,000.00	6,680.94	7,059.31	6,708.25	34.54	47.97	-72.37	1,083.15	-3,074.07	3,241.68	3,161.95	79.73	40.657		
7,050.00	6,722.48	7,107.11	6,756.04	34.85	48.06	-72.13	1,082.58	-3,074.05	3,231.80	3,151.63	80.17	40.314		
7,100.00	6,761.76	7,152.50	6,801.43	35.17	48.13	-72.42	1,082.14	-3,073.96	3,220.17	3,139.57	80.60	39.953		
7,150.00	6,798.55	7,195.02	6,843.95	35.51	48.20	-73.14	1,081.82	-3,073.82	3,206.93	3,125.89	81.04	39.572		
7,200.00	6,832.61	7,234.40	6,883.33	35.86	48.26	-74.20	1,081.60	-3,073.63	3,192.26	3,110.77	81.49	39.172		
7,250.00	6,863.74	7,270.39	6,919.32	36.22	48.31	-75.53	1,081.47	-3,073.42	3,176.33	3,094.38	81.95	38.758		
7,300.00	6,891.74	7,302.77	6,951.70	36.59	48.36	-77.09	1,081.40	-3,073.20	3,159.33	3,076.91	82.42	38.332		
7,350.00	6,916.44	7,331.32	6,980.25	36.98	48.41	-78.82	1,081.39	-3,072.98	3,141.43	3,058.54	82.89	37.899		
7,400.00	6,937.69	7,355.87	7,004.79	37.37	48.45	-80.68	1,081.41	-3,072.76	3,122.84	3,039.47	83.37	37.459		
7,450.00	6,955.36	7,376.24	7,025.17	37.78	48.48	-82.62	1,081.45	-3,072.57	3,103.73	3,019.89	83.84	37.019		
7,500.00	6,969.34	7,392.31	7,041.24	38.19	48.50	-84.61	1,081.49	-3,072.41	3,084.29	2,999.97	84.32	36.579		
7,550.00	6,979.53	7,403.97	7,052.89	38.62	48.52	-86.60	1,081.53	-3,072.29	3,064.69	2,979.89	84.79	36.143		
7,600.00	6,985.89	7,411.13	7,060.05	39.05	48.53	-88.56	1,081.56	-3,072.22	3,045.09	2,959.82	85.26	35.714		
7,650.00	6,988.37	7,413.74	7,062.67	39.48	48.53	-90.47	1,081.57	-3,072.19	3,025.64	2,939.91	85.73	35.295		
7,657.25	6,988.40	7,413.74	7,062.66	39.54	48.53	-90.74	1,081.57	-3,072.19	3,022.84	2,937.05	85.79	35.235		
7,700.00	6,988.37	7,413.45	7,062.37	39.92	48.53	-90.74	1,081.57	-3,072.19	3,006.61	2,920.43	86.18	34.886		
7,800.00	6,988.30	7,412.77	7,061.70	40.82	48.53	-90.72	1,081.57	-3,072.20	2,970.71	2,883.59	87.12	34.099		
7,900.00	6,988.23	7,412.09	7,061.02	41.77	48.53	-90.71	1,081.57	-3,072.20	2,937.78	2,849.70	88.08	33.354		
8,000.00	6,988.16	7,411.41	7,060.34	42.75	48.53	-90.69	1,081.56	-3,072.21	2,907.91	2,818.86	89.05	32.653		
8,100.00	6,988.09	7,410.73	7,059.65	43.76	48.53	-90.68	1,081.56	-3,072.22	2,881.21	2,791.17	90.04	31.999		
8,152.35	6,988.06	7,410.37	7,059.30	44.30	48.53	-90.67	1,081.56	-3,072.22	2,868.52	2,777.96	90.56	31.676		
8,200.00	6,988.02	7,410.04	7,058.96	44.79	48.53	-90.67	1,081.56	-3,072.23	2,856.99	2,765.96	91.03	31.385		
8,300.00	6,987.95	7,409.27	7,058.19	45.83	48.53	-90.67	1,081.55	-3,072.24	2,830.21	2,738.20	92.01	30.760		
8,400.00	6,987.88	7,408.41	7,057.34	46.85	48.53	-90.67	1,081.55	-3,072.24	2,800.00	2,707.02	92.98	30.115		
8,500.00	6,987.80	7,407.48	7,056.41	47.85	48.53	-90.67	1,081.55	-3,072.25	2,766.37	2,672.45	93.92	29.453		
8,600.00	6,987.73	7,406.48	7,055.41	48.83	48.52	-90.67	1,081.54	-3,072.26	2,729.38	2,634.53	94.85	28.776		
8,700.00	6,987.65	7,405.41	7,054.34	49.79	48.52	-90.67	1,081.54	-3,072.28	2,689.06	2,593.31	95.75	28.084		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #041B - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		323-MWD OWSG Rev5						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	
8,800.00	6,987.57	7,404.29	7,053.21	50.72	48.52	-90.67	1,081.53	-3,072.29	2,645.48	2,548.85	96.62	27.379		
8,900.00	6,987.50	7,403.11	7,052.04	51.62	48.52	-90.67	1,081.53	-3,072.30	2,598.67	2,501.21	97.47	26.662		
9,000.00	6,987.42	7,401.89	7,050.82	52.48	48.52	-90.67	1,081.53	-3,072.31	2,548.70	2,450.43	98.27	25.935		
9,100.00	6,987.34	7,400.64	7,049.56	53.30	48.51	-90.66	1,081.52	-3,072.33	2,495.63	2,396.59	99.04	25.198		
9,200.00	6,987.27	7,399.36	7,048.28	54.08	48.51	-90.66	1,081.52	-3,072.34	2,439.53	2,339.76	99.77	24.451		
9,215.33	6,987.26	7,399.16	7,048.08	54.20	48.51	-90.66	1,081.52	-3,072.34	2,430.66	2,330.78	99.88	24.336		
9,300.00	6,987.20	7,398.06	7,046.99	54.85	48.51	-90.63	1,081.51	-3,072.35	2,382.51	2,282.04	100.47	23.714		
9,400.00	6,987.12	7,396.78	7,045.70	55.65	48.51	-90.59	1,081.51	-3,072.37	2,328.31	2,227.16	101.16	23.017		
9,500.00	6,987.05	7,395.50	7,044.43	56.48	48.51	-90.56	1,081.50	-3,072.38	2,277.22	2,175.40	101.83	22.364		
9,600.00	6,986.98	7,394.24	7,043.16	57.35	48.50	-90.52	1,081.50	-3,072.39	2,229.45	2,126.98	102.47	21.757		
9,700.00	6,986.90	7,392.98	7,041.91	58.24	48.50	-90.48	1,081.50	-3,072.41	2,185.21	2,082.13	103.08	21.199		
9,800.00	6,986.83	7,391.73	7,040.66	59.17	48.50	-90.45	1,081.49	-3,072.42	2,144.72	2,041.08	103.64	20.693		
9,900.00	6,986.75	7,390.49	7,039.42	60.12	48.50	-90.41	1,081.49	-3,072.43	2,108.20	2,004.05	104.15	20.242		
10,000.00	6,986.68	7,389.26	7,038.19	61.10	48.50	-90.38	1,081.48	-3,072.44	2,075.86	1,971.27	104.59	19.848		
10,100.00	6,986.61	7,388.04	7,036.97	62.11	48.50	-90.34	1,081.48	-3,072.46	2,047.90	1,942.95	104.95	19.513		
10,200.00	6,986.53	7,386.83	7,035.75	63.14	48.49	-90.30	1,081.48	-3,072.47	2,024.49	1,919.27	105.22	19.241		
10,300.00	6,986.46	7,385.62	7,034.55	64.20	48.49	-90.27	1,081.47	-3,072.48	2,005.80	1,900.41	105.39	19.032		
10,400.00	6,986.39	7,384.43	7,033.35	65.28	48.49	-90.24	1,081.47	-3,072.49	1,991.97	1,886.51	105.46	18.889		
10,500.00	6,986.31	7,383.24	7,032.16	66.38	48.49	-90.20	1,081.47	-3,072.50	1,983.08	1,877.67	105.41	18.812		
10,600.00	6,986.24	7,382.06	7,030.98	67.50	48.49	-90.17	1,081.46	-3,072.52	1,979.21	1,873.95	105.26	18.804 SF		
10,626.60	6,986.22	7,381.75	7,030.67	67.80	48.49	-90.16	1,081.46	-3,072.52	1,979.03	1,873.83	105.20	18.813 CC, ES		
10,700.00	6,986.17	7,380.89	7,029.81	68.64	48.48	-90.13	1,081.46	-3,072.53	1,980.39	1,875.40	104.99	18.863		
10,800.00	6,986.09	7,379.72	7,028.65	69.80	48.48	-90.10	1,081.46	-3,072.54	1,986.61	1,882.00	104.61	18.991		
10,900.00	6,986.02	7,378.57	7,027.49	70.98	48.48	-90.07	1,081.45	-3,072.55	1,997.82	1,893.69	104.12	19.187		
11,000.00	6,985.95	7,377.42	7,026.34	72.17	48.48	-90.03	1,081.45	-3,072.56	2,013.94	1,910.39	103.55	19.450		
11,100.00	6,985.87	7,376.28	7,025.20	73.38	48.48	-90.00	1,081.45	-3,072.57	2,034.85	1,931.96	102.88	19.778		
11,200.00	6,985.80	7,375.14	7,024.07	74.61	48.48	-89.97	1,081.45	-3,072.58	2,060.40	1,958.25	102.15	20.170		
11,300.00	6,985.72	7,374.02	7,022.94	75.85	48.47	-89.93	1,081.44	-3,072.59	2,090.43	1,989.08	101.36	20.624		
11,400.00	6,985.65	7,372.90	7,021.83	77.10	48.47	-89.90	1,081.44	-3,072.61	2,124.75	2,024.23	100.52	21.138		
11,500.00	6,985.58	7,371.79	7,020.72	78.37	48.47	-89.87	1,081.44	-3,072.62	2,163.15	2,063.50	99.65	21.708		
11,600.00	6,985.50	7,370.69	7,019.61	79.65	48.47	-89.84	1,081.44	-3,072.63	2,205.42	2,106.67	98.75	22.333		
11,700.00	6,985.43	7,369.59	7,018.52	80.94	48.47	-89.81	1,081.43	-3,072.64	2,251.34	2,153.49	97.85	23.009		
11,800.00	6,985.36	7,368.50	7,017.43	82.24	48.47	-89.77	1,081.43	-3,072.65	2,300.69	2,203.74	96.94	23.733		
11,900.00	6,985.28	7,367.42	7,016.35	83.56	48.46	-89.74	1,081.43	-3,072.66	2,353.25	2,257.21	96.04	24.502		
12,000.00	6,985.21	7,366.35	7,015.27	84.88	48.46	-89.71	1,081.43	-3,072.67	2,408.82	2,313.66	95.16	25.312		
12,100.00	6,985.14	7,365.28	7,014.21	86.21	48.46	-89.68	1,081.42	-3,072.68	2,467.20	2,372.90	94.30	26.162		
12,200.00	6,985.06	7,364.22	7,013.15	87.56	48.46	-89.65	1,081.42	-3,072.69	2,528.18	2,434.71	93.47	27.048		
12,300.00	6,984.99	7,363.17	7,012.09	88.91	48.46	-89.62	1,081.42	-3,072.70	2,591.59	2,498.92	92.67	27.967		
12,400.00	6,984.92	7,362.12	7,011.05	90.27	48.46	-89.59	1,081.42	-3,072.71	2,657.25	2,565.35	91.89	28.916		
12,500.00	6,984.84	7,361.08	7,010.01	91.64	48.45	-89.56	1,081.42	-3,072.72	2,725.00	2,633.84	91.16	29.893		
12,600.00	6,984.77	7,360.05	7,008.97	93.01	48.45	-89.53	1,081.42	-3,072.73	2,794.68	2,704.22	90.46	30.896		
12,700.00	6,984.69	7,359.02	7,007.95	94.40	48.45	-89.50	1,081.41	-3,072.74	2,866.16	2,776.37	89.79	31.921		
12,800.00	6,984.62	7,358.00	7,006.93	95.79	48.45	-89.47	1,081.41	-3,072.74	2,939.30	2,850.14	89.16	32.967		
12,900.00	6,984.55	7,356.99	7,005.91	97.18	48.45	-89.44	1,081.41	-3,072.75	3,013.98	2,925.42	88.56	34.032		
13,000.00	6,984.47	7,355.98	7,004.91	98.59	48.45	-89.41	1,081.41	-3,072.76	3,090.10	3,002.10	88.00	35.114		
13,100.00	6,984.40	7,354.98	7,003.91	100.00	48.44	-89.38	1,081.41	-3,072.77	3,167.54	3,080.07	87.47	36.211		
13,200.00	6,984.33	7,353.98	7,002.91	101.41	48.44	-89.35	1,081.41	-3,072.78	3,246.22	3,159.24	86.98	37.322		
13,300.00	6,984.25	7,353.00	7,001.92	102.83	48.44	-89.33	1,081.41	-3,072.79	3,326.04	3,239.53	86.52	38.444		
13,400.00	6,984.18	7,352.01	7,000.94	104.26	48.44	-89.30	1,081.40	-3,072.80	3,406.93	3,320.85	86.08	39.578		
13,500.00	6,984.11	7,351.04	6,999.97	105.69	48.44	-89.27	1,081.40	-3,072.81	3,488.81	3,403.13	85.67	40.721		
13,600.00	6,984.03	7,350.07	6,999.00	107.13	48.44	-89.24	1,081.40	-3,072.82	3,571.61	3,486.31	85.30	41.873		
13,700.00	6,983.96	7,349.11	6,998.03	108.57	48.44	-89.21	1,081.40	-3,072.82	3,655.27	3,570.33	84.94	43.033		

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #041B - OH - OH-SVY													Offset Site Error:	0.00 usft	
Survey Program:		323-MWD OWSG Rev5					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			
13,800.00	6,983.88	7,348.15	6,997.07	110.02	48.43	-89.19	1,081.40	-3,072.83	3,739.73	3,655.12	84.61	44.198			
13,900.00	6,983.81	7,347.20	6,996.12	111.47	48.43	-89.16	1,081.40	-3,072.84	3,824.94	3,740.64	84.31	45.370			
14,000.00	6,983.74	7,346.25	6,995.18	112.92	48.43	-89.13	1,081.40	-3,072.85	3,910.86	3,826.84	84.02	46.546			
14,100.00	6,983.66	7,345.31	6,994.24	114.38	48.43	-89.10	1,081.40	-3,072.86	3,997.42	3,913.67	83.76	47.727			
14,200.00	6,983.59	7,344.38	6,993.30	115.85	48.43	-89.08	1,081.40	-3,072.87	4,084.60	4,001.09	83.51	48.911			
14,300.00	6,983.52	7,343.45	6,992.37	117.31	48.43	-89.05	1,081.40	-3,072.87	4,172.36	4,089.08	83.28	50.099			
14,400.00	6,983.44	7,342.52	6,991.45	118.78	48.43	-89.02	1,081.40	-3,072.88	4,260.66	4,177.58	83.07	51.289			
14,500.00	6,983.37	7,341.61	6,990.53	120.26	48.42	-89.00	1,081.39	-3,072.89	4,349.46	4,266.58	82.88	52.481			
14,600.00	6,983.30	7,340.69	6,989.62	121.74	48.42	-88.97	1,081.39	-3,072.90	4,438.73	4,356.04	82.70	53.675			
14,700.00	6,983.22	7,339.79	6,988.71	123.22	48.42	-88.94	1,081.39	-3,072.91	4,528.46	4,445.93	82.53	54.870			
14,800.00	6,983.15	7,338.89	6,987.81	124.70	48.42	-88.92	1,081.39	-3,072.91	4,618.61	4,536.23	82.38	56.066			
14,900.00	6,983.08	7,337.99	6,986.92	126.19	48.42	-88.89	1,081.39	-3,072.92	4,709.15	4,626.91	82.24	57.262			
15,000.00	6,983.00	7,337.10	6,986.03	127.68	48.42	-88.87	1,081.39	-3,072.93	4,800.07	4,717.96	82.11	58.459			
15,100.00	6,982.93	7,336.22	6,985.14	129.17	48.42	-88.84	1,081.39	-3,072.94	4,891.35	4,809.36	81.99	59.656			
15,200.00	6,982.85	7,335.34	6,984.26	130.67	48.41	-88.81	1,081.39	-3,072.94	4,982.96	4,901.07	81.89	60.853			
15,300.00	6,982.78	7,334.46	6,983.39	132.16	48.41	-88.79	1,081.39	-3,072.95	5,074.88	4,993.10	81.79	62.049			
15,400.00	6,982.71	7,333.59	6,982.52	133.66	48.41	-88.76	1,081.39	-3,072.96	5,167.11	5,085.41	81.70	63.245			
15,500.00	6,982.63	7,332.73	6,981.66	135.17	48.41	-88.74	1,081.39	-3,072.97	5,259.62	5,178.00	81.62	64.440			
15,600.00	6,982.56	7,331.87	6,980.80	136.67	48.41	-88.71	1,081.39	-3,072.97	5,352.40	5,270.85	81.55	65.635			
15,700.00	6,982.49	7,331.02	6,979.94	138.18	48.41	-88.69	1,081.39	-3,072.98	5,445.43	5,363.95	81.48	66.828			
15,800.00	6,982.41	7,330.17	6,979.09	139.69	48.41	-88.66	1,081.39	-3,072.99	5,538.71	5,457.28	81.43	68.020			
15,900.00	6,982.34	7,329.32	6,978.25	141.20	48.40	-88.64	1,081.39	-3,072.99	5,632.22	5,550.84	81.38	69.210			
16,000.00	6,982.27	7,328.48	6,977.41	142.71	48.40	-88.62	1,081.39	-3,073.00	5,725.94	5,644.61	81.34	70.399			
16,100.00	6,982.19	7,327.65	6,976.57	144.23	48.40	-88.59	1,081.39	-3,073.01	5,819.88	5,738.58	81.30	71.587			
16,200.00	6,982.12	7,326.82	6,975.75	145.75	48.40	-88.57	1,081.39	-3,073.01	5,914.01	5,832.75	81.27	72.773			
16,300.00	6,982.05	7,325.99	6,974.92	147.27	48.40	-88.54	1,081.39	-3,073.02	6,008.34	5,927.10	81.24	73.957			
16,400.00	6,981.97	7,325.17	6,974.10	148.79	48.40	-88.52	1,081.39	-3,073.03	6,102.84	6,021.62	81.22	75.140			
16,500.00	6,981.90	7,324.36	6,973.28	150.31	48.40	-88.50	1,081.39	-3,073.03	6,197.52	6,116.32	81.20	76.320			
16,600.00	6,981.82	7,323.55	6,972.47	151.84	48.40	-88.47	1,081.39	-3,073.04	6,292.36	6,211.17	81.19	77.499			
16,700.00	6,981.75	7,322.74	6,971.67	153.36	48.39	-88.45	1,081.39	-3,073.05	6,387.36	6,306.17	81.19	78.676			
16,800.00	6,981.68	7,321.94	6,970.87	154.89	48.39	-88.43	1,081.39	-3,073.05	6,482.51	6,401.33	81.18	79.850			
16,900.00	6,981.60	7,321.14	6,970.07	156.42	48.39	-88.40	1,081.39	-3,073.06	6,577.80	6,496.62	81.18	81.023			
17,000.00	6,981.53	7,320.35	6,969.28	157.95	48.39	-88.38	1,081.39	-3,073.07	6,673.23	6,592.04	81.19	82.193			
17,100.00	6,981.46	7,319.56	6,968.49	159.49	48.39	-88.36	1,081.39	-3,073.07	6,768.79	6,687.60	81.20	83.361			
17,200.00	6,981.38	7,318.78	6,967.70	161.02	48.39	-88.34	1,081.39	-3,073.08	6,864.48	6,783.27	81.21	84.527			
17,300.00	6,981.31	7,318.00	6,966.92	162.56	48.39	-88.31	1,081.39	-3,073.08	6,960.29	6,879.07	81.23	85.691			
17,400.00	6,981.24	7,317.22	6,966.15	164.09	48.39	-88.29	1,081.39	-3,073.09	7,056.22	6,974.97	81.24	86.852			
17,500.00	6,981.16	7,316.45	6,965.38	165.63	48.39	-88.27	1,081.39	-3,073.10	7,152.26	7,070.99	81.27	88.011			
17,600.00	6,981.09	7,315.68	6,964.61	167.17	48.38	-88.25	1,081.39	-3,073.10	7,248.40	7,167.11	81.29	89.167			
17,700.00	6,981.01	7,314.92	6,963.85	168.71	48.38	-88.22	1,081.39	-3,073.11	7,344.65	7,263.33	81.32	90.321			
17,800.00	6,980.94	7,314.16	6,963.09	170.25	48.38	-88.20	1,081.39	-3,073.11	7,441.00	7,359.65	81.35	91.473			
17,900.00	6,980.87	7,313.41	6,962.34	171.80	48.38	-88.18	1,081.39	-3,073.12	7,537.44	7,456.06	81.38	92.622			
18,000.00	6,980.79	7,312.66	6,961.59	173.34	48.38	-88.16	1,081.39	-3,073.13	7,633.97	7,552.56	81.41	93.768			
18,100.00	6,980.72	7,311.92	6,960.84	174.89	48.38	-88.14	1,081.40	-3,073.13	7,730.59	7,649.14	81.45	94.912			
18,200.00	6,980.65	7,311.17	6,960.10	176.43	48.38	-88.12	1,081.40	-3,073.14	7,827.30	7,745.81	81.49	96.054			
18,300.00	6,980.57	7,310.44	6,959.36	177.98	48.38	-88.09	1,081.40	-3,073.14	7,924.08	7,842.55	81.53	97.193			
18,400.00	6,980.50	7,309.70	6,958.63	179.53	48.37	-88.07	1,081.40	-3,073.15	8,020.95	7,939.38	81.57	98.329			
18,500.00	6,980.43	7,308.97	6,957.90	181.08	48.37	-88.05	1,081.40	-3,073.15	8,117.89	8,036.27	81.62	99.463			
18,600.00	6,980.35	7,308.25	6,957.17	182.63	48.37	-88.03	1,081.40	-3,073.16	8,214.91	8,133.24	81.66	100.594			
18,700.00	6,980.28	7,307.53	6,956.45	184.18	48.37	-88.01	1,081.40	-3,073.17	8,311.99	8,230.28	81.71	101.722			
18,800.00	6,980.21	7,306.81	6,955.73	185.73	48.37	-87.99	1,081.40	-3,073.17	8,409.15	8,327.38	81.76	102.848			
18,900.00	6,980.13	7,306.09	6,955.02	187.28	48.37	-87.97	1,081.40	-3,073.18	8,506.37	8,424.55	81.82	103.971			

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #041B - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		323-MWD OWSG Rev5					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	
19,000.00	6,980.06	7,305.38	6,954.31	188.84	48.37	-87.95	1,081.40	-3,073.18	8,603.65	8,521.78	81.87	105.091		
19,100.00	6,979.98	7,304.68	6,953.60	190.39	48.37	-87.93	1,081.40	-3,073.19	8,701.00	8,619.07	81.92	106.209		
19,200.00	6,979.91	7,303.97	6,952.90	191.95	48.37	-87.91	1,081.40	-3,073.19	8,798.40	8,716.42	81.98	107.324		
19,300.00	6,979.84	7,303.27	6,952.20	193.51	48.36	-87.89	1,081.40	-3,073.20	8,895.86	8,813.83	82.04	108.436		
19,400.00	6,979.76	7,302.58	6,951.51	195.06	48.36	-87.87	1,081.40	-3,073.20	8,993.38	8,911.28	82.10	109.545		
19,500.00	6,979.69	7,301.89	6,950.82	196.62	48.36	-87.85	1,081.41	-3,073.21	9,090.95	9,008.80	82.16	110.652		
19,600.00	6,979.62	7,301.20	6,950.13	198.18	48.36	-87.83	1,081.41	-3,073.21	9,188.58	9,106.36	82.22	111.756		
19,700.00	6,979.54	7,300.51	6,949.44	199.74	48.36	-87.81	1,081.41	-3,073.22	9,286.25	9,203.97	82.28	112.857		
19,800.00	6,979.47	7,299.83	6,948.76	201.30	48.36	-87.79	1,081.41	-3,073.22	9,383.98	9,301.63	82.35	113.956		
19,900.00	6,979.40	7,299.16	6,948.08	202.86	48.36	-87.77	1,081.41	-3,073.23	9,481.75	9,399.33	82.41	115.051		
20,000.00	6,979.32	7,298.48	6,947.41	204.42	48.36	-87.75	1,081.41	-3,073.23	9,579.56	9,497.08	82.48	116.144		
20,100.00	6,979.25	7,297.81	6,946.74	205.98	48.36	-87.73	1,081.41	-3,073.24	9,677.42	9,594.88	82.55	117.234		
20,200.00	6,979.18	7,297.15	6,946.07	207.55	48.36	-87.71	1,081.41	-3,073.24	9,775.33	9,692.71	82.62	118.321		
20,300.00	6,979.10	7,296.48	6,945.41	209.11	48.35	-87.69	1,081.41	-3,073.25	9,873.28	9,790.59	82.69	119.406		
20,400.00	6,979.03	7,295.82	6,944.75	210.68	48.35	-87.67	1,081.41	-3,073.25	9,971.26	9,888.50	82.76	120.487		
20,500.00	6,978.95	7,295.17	6,944.09	212.24	48.35	-87.65	1,081.42	-3,073.26	10,069.29	9,986.46	82.83	121.566		
20,600.00	6,978.88	7,294.51	6,943.44	213.81	48.35	-87.63	1,081.42	-3,073.26	10,167.35	10,084.45	82.90	122.642		
20,700.00	6,978.81	7,293.86	6,942.79	215.37	48.35	-87.61	1,081.42	-3,073.27	10,265.46	10,182.48	82.98	123.715		
20,800.00	6,978.73	7,293.22	6,942.14	216.94	48.35	-87.60	1,081.42	-3,073.27	10,363.60	10,280.54	83.05	124.785		
20,900.00	6,978.66	7,292.57	6,941.50	218.51	48.35	-87.58	1,081.42	-3,073.28	10,461.77	10,378.64	83.13	125.853		
21,000.00	6,978.59	7,291.93	6,940.86	220.07	48.35	-87.56	1,081.42	-3,073.28	10,559.98	10,476.77	83.20	126.917		
21,100.00	6,978.51	7,291.29	6,940.22	221.64	48.35	-87.54	1,081.42	-3,073.28	10,658.22	10,574.94	83.28	127.979		
21,200.00	6,978.44	7,290.66	6,939.59	223.21	48.35	-87.52	1,081.42	-3,073.29	10,756.49	10,673.13	83.36	129.038		
21,300.00	6,978.37	7,290.03	6,938.96	224.78	48.34	-87.50	1,081.42	-3,073.29	10,854.80	10,771.36	83.44	130.094		
21,400.00	6,978.29	7,289.40	6,938.33	226.35	48.34	-87.49	1,081.43	-3,073.30	10,953.13	10,869.62	83.52	131.147		
21,500.00	6,978.22	7,288.78	6,937.71	227.92	48.34	-87.47	1,081.43	-3,073.30	11,051.50	10,967.90	83.60	132.197		
21,600.00	6,978.14	7,288.16	6,937.09	229.49	48.34	-87.45	1,081.43	-3,073.31	11,149.89	11,066.21	83.68	133.244		
21,700.00	6,978.07	7,287.54	6,936.47	231.06	48.34	-87.43	1,081.43	-3,073.31	11,248.32	11,164.56	83.76	134.289		
21,800.00	6,978.00	7,286.93	6,935.85	232.63	48.34	-87.41	1,081.43	-3,073.31	11,346.77	11,262.92	83.84	135.331		
21,900.00	6,977.92	7,286.31	6,935.24	234.21	48.34	-87.40	1,081.43	-3,073.32	11,445.25	11,361.32	83.93	136.369		
22,000.00	6,977.85	7,285.70	6,934.63	235.78	48.34	-87.38	1,081.43	-3,073.32	11,543.75	11,459.74	84.01	137.405		
22,100.00	6,977.78	7,285.10	6,934.03	237.35	48.34	-87.36	1,081.43	-3,073.33	11,642.28	11,558.18	84.10	138.438		
22,200.00	6,977.70	7,284.50	6,933.42	238.92	48.34	-87.34	1,081.43	-3,073.33	11,740.83	11,656.65	84.18	139.468		
22,300.00	6,977.63	7,283.90	6,932.82	240.50	48.33	-87.33	1,081.44	-3,073.34	11,839.41	11,755.14	84.27	140.496		
22,400.00	6,977.56	7,283.30	6,932.23	242.07	48.33	-87.31	1,081.44	-3,073.34	11,938.01	11,853.66	84.36	141.520		
22,500.00	6,977.48	7,282.70	6,931.63	243.65	48.33	-87.29	1,081.44	-3,073.34	12,036.64	11,952.19	84.44	142.542		
22,600.00	6,977.41	7,282.11	6,931.04	245.22	48.33	-87.28	1,081.44	-3,073.35	12,135.28	12,050.75	84.53	143.560		
22,700.00	6,977.34	7,281.52	6,930.45	246.80	48.33	-87.26	1,081.44	-3,073.35	12,233.95	12,149.33	84.62	144.576		
22,800.00	6,977.26	7,280.94	6,929.87	248.37	48.33	-87.24	1,081.44	-3,073.36	12,332.64	12,247.93	84.71	145.589		
22,900.00	6,977.19	1,747.80	1,701.40	249.95	11.04	-17.76	1,365.54	-4,242.39	12,425.31	12,350.34	74.98	165.725		
23,000.00	6,977.11	1,707.00	1,664.42	251.53	10.84	-17.61	1,369.64	-4,259.14	12,514.92	12,439.82	75.09	166.662		
23,100.00	6,977.04	1,707.00	1,664.42	253.10	10.84	-17.61	1,369.64	-4,259.14	12,604.33	12,529.19	75.14	167.741		
23,155.65	6,977.00	1,707.00	1,664.42	253.98	10.84	-17.61	1,369.64	-4,259.14	12,654.16	12,578.99	75.17	168.342		
23,156.15	6,977.00	1,707.00	1,664.42	254.06	10.84	-17.61	1,369.64	-4,259.14	12,654.61	12,578.09	76.53	165.364		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #041C - OH - OH-SVY													Offset Site Error: 0.00 usft
Survey Program: 388-APC_ISCWSA REV 2 MWD													Offset Well Error: 0.00 usft
Reference													
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)			
0.00	0.00	0.00	0.00	0.00	0.00	-160.66	-139.08	-48.82	150.22				
100.00	100.00	71.15	71.15	0.25	0.08	-160.66	-139.04	-48.80	147.36	147.03	0.33	445.054	
200.00	200.00	171.37	171.37	0.61	0.19	-160.68	-138.89	-48.69	147.18	146.38	0.80	183.471	
300.00	300.00	271.59	271.58	0.97	0.31	-160.72	-138.62	-48.49	146.86	145.58	1.27	115.335	
400.00	400.00	371.80	371.80	1.33	0.42	-160.78	-138.22	-48.20	146.38	144.64	1.74	83.916	
500.00	500.00	475.91	475.90	1.68	0.64	-160.85	-136.77	-47.50	144.87	142.55	2.32	62.477	
600.00	599.98	583.29	583.08	2.04	0.90	-171.36	-131.23	-44.59	140.84	137.92	2.92	48.221	
700.00	699.84	696.14	694.90	2.41	1.21	-172.74	-118.03	-37.79	133.04	129.51	3.53	37.676	
800.00	799.45	807.53	803.03	2.77	1.63	-175.75	-94.53	-25.43	118.11	113.98	4.14	28.537	
900.00	898.70	913.11	903.31	3.13	2.19	-179.25	-65.28	-10.21	99.78	95.01	4.77	20.920	
1,000.00	997.47	1,015.20	997.43	3.50	2.87	170.25	-30.20	7.90	78.59	73.06	5.54	14.197	
1,100.00	1,095.63	1,114.41	1,086.72	3.89	3.64	155.24	7.85	28.40	60.20	53.46	6.74	8.931	
1,190.94	1,184.30	1,202.08	1,163.34	4.26	4.41	129.95	44.78	49.60	52.77	44.30	8.47	6.231 CC	
1,200.00	1,193.09	1,210.70	1,170.76	4.29	4.49	127.09	48.57	51.79	52.86	44.22	8.64	6.118 ES, SF	
1,300.00	1,289.73	1,304.77	1,249.79	4.72	5.42	97.44	92.94	76.91	64.69	54.76	9.93	6.515	
1,400.00	1,385.42	1,394.69	1,320.31	5.16	6.45	77.02	142.21	102.97	92.99	82.64	10.35	8.983	
1,496.97	1,477.20	1,477.82	1,382.00	5.62	7.48	66.11	191.71	128.53	129.83	119.14	10.70	12.138	
1,500.00	1,480.05	1,480.47	1,383.93	5.63	7.51	65.87	193.31	129.37	131.08	120.36	10.71	12.237	
1,600.00	1,574.15	1,568.85	1,447.90	6.12	8.62	59.52	247.38	157.56	173.29	161.96	11.33	15.289	
1,700.00	1,668.25	1,658.46	1,512.33	6.62	9.72	55.34	302.87	185.86	216.88	204.81	12.07	17.965	
1,800.00	1,762.35	1,743.67	1,573.22	7.12	10.78	52.66	355.82	213.18	261.70	248.90	12.80	20.445	
1,900.00	1,856.45	1,831.58	1,635.67	7.64	11.89	50.77	410.45	242.26	307.75	294.10	13.65	22.550	
2,000.00	1,950.55	1,924.17	1,702.13	8.16	13.00	49.54	466.92	273.37	353.55	338.94	14.61	24.197	
2,100.00	2,044.65	2,013.91	1,767.65	8.68	14.09	48.87	520.17	303.77	398.38	382.80	15.57	25.581	
2,200.00	2,138.75	2,100.17	1,830.12	9.21	15.19	48.22	572.14	332.71	443.67	427.19	16.49	26.909	
2,300.00	2,232.85	2,190.83	1,895.14	9.74	16.35	47.47	627.96	362.28	489.29	471.83	17.47	28.012	
2,400.00	2,326.95	2,281.11	1,960.00	10.27	17.46	46.75	683.85	390.91	534.46	516.04	18.42	29.013	
2,500.00	2,421.05	2,375.24	2,028.22	10.81	18.62	46.22	741.33	420.94	579.14	559.69	19.45	29.769	
2,600.00	2,515.15	2,465.27	2,093.55	11.34	19.71	45.81	796.16	449.80	623.84	603.41	20.43	30.539	
2,700.00	2,609.25	2,560.58	2,163.62	11.88	20.84	45.53	853.08	480.33	667.56	646.08	21.48	31.073	
2,800.00	2,703.35	2,647.13	2,227.37	12.42	21.91	45.34	904.53	508.25	711.26	688.83	22.43	31.705	
2,900.00	2,797.45	2,761.56	2,312.05	12.96	23.31	45.24	971.48	546.17	755.23	731.45	23.79	31.750	
3,000.00	2,891.55	2,913.12	2,431.33	13.51	24.96	45.46	1,052.70	592.37	792.69	767.15	25.54	31.031	
3,100.00	2,985.65	3,045.53	2,539.66	14.05	26.31	45.66	1,119.91	628.11	825.31	798.33	26.98	30.589	
3,200.00	3,079.75	3,180.68	2,654.01	14.60	27.58	45.94	1,184.12	660.66	852.94	824.56	28.38	30.052	
3,300.00	3,173.85	3,313.01	2,768.73	15.14	28.75	46.23	1,243.75	688.78	876.46	846.76	29.70	29.510	
3,400.00	3,267.95	3,502.44	2,940.15	15.69	30.20	47.35	1,314.11	727.50	894.58	863.25	31.33	28.555	
3,500.00	3,362.05	3,697.44	3,125.84	16.23	31.27	49.04	1,366.19	755.48	899.48	866.79	32.70	27.511	
3,600.00	3,456.15	3,860.78	3,285.33	16.78	31.93	50.85	1,397.09	772.08	897.01	863.17	33.84	26.507	
3,700.00	3,550.25	4,053.24	3,476.45	17.33	32.38	53.61	1,416.07	782.74	885.74	850.96	34.78	25.469	
3,800.00	3,644.35	4,161.32	3,584.36	17.88	32.52	55.32	1,421.94	784.23	869.54	833.58	35.96	24.180	
3,900.00	3,738.45	4,257.08	3,679.99	18.42	32.65	56.88	1,426.98	785.02	853.46	816.22	37.25	22.912	
4,000.00	3,832.55	4,352.85	3,775.62	18.97	32.79	58.50	1,432.01	785.81	838.08	799.50	38.58	21.723	
4,100.00	3,926.65	4,448.61	3,871.25	19.52	32.93	60.18	1,437.04	786.61	823.41	783.47	39.94	20.618	
4,200.00	4,020.75	4,544.38	3,966.88	20.07	33.07	61.91	1,442.06	787.40	809.50	768.18	41.32	19.592	
4,300.00	4,114.85	4,640.14	4,062.51	20.62	33.22	63.69	1,447.09	788.20	796.39	753.67	42.72	18.643	
4,400.00	4,208.95	4,735.90	4,158.13	21.17	33.36	65.53	1,452.11	788.99	784.12	739.99	44.14	17.766	
4,500.00	4,303.05	4,831.66	4,253.76	21.72	33.50	67.42	1,457.14	789.78	772.74	727.17	45.57	16.958	
4,600.00	4,397.15	4,927.42	4,349.38	22.27	33.64	69.36	1,462.16	790.57	762.27	715.26	47.01	16.216	
4,700.00	4,491.25	5,023.18	4,445.01	22.82	33.78	71.35	1,467.17	791.37	752.76	704.31	48.45	15.537	
4,800.00	4,585.35	5,118.94	4,540.63	23.37	33.92	73.39	1,472.19	792.16	744.25	694.36	49.89	14.919	
4,900.00	4,679.45	5,214.70	4,636.25	23.93	34.06	75.46	1,477.21	792.95	736.77	685.45	51.31	14.358	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #041C - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		388-APC_ISCWSA REV 2 MWD							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)				
5,000.00	4,773.55	5,310.45	4,731.87	24.48	34.20	77.58	1,482.22	793.74	730.35	677.62	52.72	13.852		
5,100.00	4,867.65	5,406.20	4,827.49	25.03	34.34	79.72	1,487.23	794.53	725.02	670.91	54.11	13.399		
5,200.00	4,961.75	5,501.96	4,923.11	25.58	34.48	81.89	1,492.24	795.32	720.80	665.34	55.47	12.995		
5,300.00	5,055.85	5,597.71	5,018.73	26.13	34.62	84.08	1,497.25	796.11	717.72	660.94	56.78	12.640		
5,400.00	5,149.95	5,693.46	5,114.35	26.68	34.77	86.28	1,502.25	796.90	715.80	657.74	58.06	12.329		
5,500.00	5,244.05	5,789.21	5,209.96	27.24	34.91	88.50	1,507.26	797.69	715.03	655.74	59.28	12.061		
5,516.13	5,259.23	5,804.65	5,225.38	27.33	34.93	88.85	1,508.06	797.82	715.01	655.53	59.48	12.022		
5,600.00	5,338.15	5,884.96	5,305.58	27.79	35.05	90.71	1,512.26	798.48	715.42	654.97	60.46	11.834		
5,665.73	5,400.00	5,947.89	5,368.42	28.15	35.14	92.16	1,515.54	799.00	716.31	655.12	61.19	11.706		
5,700.00	5,432.28	5,980.74	5,401.22	28.34	35.19	92.92	1,517.26	799.27	716.97	655.40	61.57	11.645		
5,800.00	5,526.87	6,076.90	5,497.24	28.88	35.33	95.04	1,522.28	800.06	719.55	656.96	62.59	11.496		
5,900.00	5,622.01	6,173.52	5,593.73	29.41	35.48	97.04	1,527.32	800.86	722.94	659.41	63.53	11.380		
6,000.00	5,717.67	6,270.57	5,690.65	29.92	35.62	98.90	1,532.38	801.66	726.97	662.58	64.39	11.290		
6,100.00	5,813.83	6,368.04	5,787.98	30.41	35.76	100.63	1,537.47	802.46	731.44	666.26	65.18	11.221		
6,200.00	5,910.44	6,465.87	5,885.68	30.89	35.91	102.21	1,542.57	803.27	736.19	670.28	65.91	11.169		
6,300.00	6,007.50	6,564.05	5,983.72	31.36	36.06	103.66	1,547.68	804.07	741.08	674.49	66.59	11.128		
6,400.00	6,104.96	6,662.55	6,082.08	31.80	36.20	104.97	1,552.81	804.88	745.97	678.74	67.23	11.096		
6,500.00	6,202.80	6,761.33	6,180.73	32.24	36.35	106.13	1,557.96	805.70	750.74	682.91	67.83	11.068		
6,600.00	6,300.98	6,860.37	6,279.62	32.66	36.50	107.16	1,563.11	806.51	755.29	686.89	68.40	11.042		
6,700.00	6,399.48	6,959.63	6,378.75	33.06	36.64	108.06	1,568.28	807.33	759.52	690.58	68.94	11.017		
6,722.82	6,422.00	6,982.31	6,401.40	33.15	36.68	108.24	1,569.46	807.51	760.43	691.37	69.06	11.011		
6,750.00	6,448.76	7,009.28	6,428.33	33.26	36.72	118.18	1,570.86	807.73	762.05	692.84	69.21	11.011		
6,800.00	6,497.51	7,058.50	6,477.48	33.48	36.79	129.76	1,573.42	808.14	767.87	698.39	69.48	11.051		
6,850.00	6,545.40	7,106.96	6,525.88	33.72	36.86	136.55	1,575.94	808.53	777.37	707.61	69.76	11.143		
6,900.00	6,592.13	7,154.37	6,573.22	33.97	36.93	140.90	1,578.40	808.92	790.53	720.49	70.04	11.286		
6,950.00	6,637.40	7,200.42	6,619.21	34.25	37.00	143.86	1,580.80	809.30	807.30	736.98	70.32	11.481		
7,000.00	6,680.94	7,244.84	6,663.56	34.54	37.07	145.96	1,583.11	809.67	827.62	757.03	70.59	11.725		
7,050.00	6,722.48	7,287.35	6,706.01	34.85	37.13	147.44	1,585.32	810.01	851.37	780.53	70.84	12.017		
7,100.00	6,761.76	7,327.69	6,746.30	35.17	37.19	148.45	1,587.41	810.35	878.45	807.37	71.09	12.357		
7,150.00	6,798.55	7,365.61	6,784.17	35.51	37.25	149.05	1,589.38	810.66	908.70	837.39	71.31	12.743		
7,200.00	6,832.61	7,400.87	6,819.38	35.86	37.30	149.27	1,591.21	810.95	941.94	870.43	71.52	13.171		
7,250.00	6,863.74	7,433.27	6,851.73	36.22	37.35	149.08	1,592.90	811.21	977.98	906.27	71.70	13.639		
7,300.00	6,891.74	7,462.60	6,881.02	36.59	37.39	148.44	1,594.42	811.45	1,016.58	944.71	71.87	14.145		
7,350.00	6,916.44	7,488.67	6,907.06	36.98	37.43	147.24	1,595.77	811.67	1,057.51	985.50	72.01	14.686		
7,400.00	6,937.69	7,511.33	6,929.69	37.37	37.47	145.28	1,596.95	811.85	1,100.50	1,028.37	72.13	15.257		
7,450.00	6,955.36	7,530.44	6,948.77	37.78	37.49	142.27	1,597.94	812.01	1,145.28	1,073.06	72.23	15.857		
7,500.00	6,969.34	7,545.88	6,964.19	38.19	37.52	137.63	1,598.74	812.13	1,191.57	1,119.27	72.30	16.480		
7,550.00	6,979.53	7,557.56	6,975.85	38.62	37.53	130.35	1,599.35	812.23	1,239.05	1,166.70	72.36	17.124		
7,600.00	6,985.89	7,565.40	6,983.68	39.05	37.55	118.60	1,599.76	812.29	1,287.43	1,215.04	72.39	17.784		
7,650.00	6,988.37	7,569.35	6,987.63	39.48	37.55	99.92	1,599.96	812.33	1,336.40	1,263.99	72.41	18.457		
7,657.25	6,988.40	7,569.60	6,987.88	39.54	37.55	96.56	1,599.97	812.33	1,343.53	1,271.12	72.41	18.555		
7,700.00	6,988.37	7,570.83	6,989.10	39.92	37.55	96.85	1,600.04	812.34	1,385.60	1,313.19	72.41	19.136		
7,800.00	6,988.30	7,573.70	6,991.97	40.82	37.56	97.52	1,600.19	812.36	1,484.17	1,411.76	72.41	20.496		
7,900.00	6,988.23	7,576.57	6,994.84	41.77	37.56	98.19	1,600.34	812.39	1,582.92	1,510.51	72.41	21.860		
8,000.00	6,988.16	7,579.44	6,997.70	42.75	37.57	98.85	1,600.49	812.41	1,681.81	1,609.39	72.41	23.225		
8,100.00	6,988.09	7,582.31	7,000.57	43.76	37.57	99.51	1,600.63	812.43	1,780.82	1,708.40	72.42	24.591		
8,152.35	6,988.06	7,583.81	7,002.07	44.30	37.57	99.86	1,600.71	812.44	1,832.69	1,760.27	72.42	25.307		
8,200.00	6,988.02	7,585.15	7,003.40	44.79	37.58	103.53	1,600.78	812.46	1,880.02	1,807.59	72.42	25.959		
8,300.00	6,987.95	7,587.71	7,005.96	45.83	37.58	135.62	1,600.91	812.48	1,979.80	1,907.36	72.44	27.331		
8,400.00	6,987.88	7,589.95	7,008.20	46.85	37.58	-116.24	1,601.03	812.50	2,079.74	2,007.28	72.47	28.700		
8,500.00	6,987.80	7,591.85	7,010.10	47.85	37.59	-101.46	1,601.13	812.51	2,179.38	2,106.88	72.50	30.060		
8,600.00	6,987.73	7,593.41	7,011.65	48.83	37.59	-97.32	1,601.21	812.52	2,278.29	2,205.75	72.54	31.405		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #041C - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program:		388-APC_ISCWSA REV 2 MWD					Rule Assigned:					Offset Well Error:	0.00 usft
Reference	Offset	Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance				Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)		Separation Factor
8,700.00	6,987.65	7,594.62	7,012.86	49.79	37.59	-95.37	1,601.27	812.53	2,376.13	2,303.54	72.59	32.733	
8,800.00	6,987.57	7,595.46	7,013.70	50.72	37.59	-94.23	1,601.32	812.54	2,472.56	2,399.92	72.64	34.040	
8,900.00	6,987.50	7,595.95	7,014.18	51.62	37.59	-93.47	1,601.34	812.54	2,567.30	2,494.62	72.68	35.322	
9,000.00	6,987.42	7,596.06	7,014.30	52.48	37.59	-92.93	1,601.35	812.55	2,660.10	2,587.38	72.72	36.578	
9,100.00	6,987.34	7,595.82	7,014.06	53.30	37.59	-92.51	1,601.34	812.54	2,750.72	2,677.96	72.76	37.807	
9,200.00	6,987.27	7,595.21	7,013.44	54.08	37.59	-92.18	1,601.30	812.54	2,838.95	2,766.17	72.78	39.006	
9,215.33	6,987.26	7,595.08	7,013.32	54.20	37.59	-92.14	1,601.30	812.54	2,852.26	2,779.47	72.78	39.188	
9,300.00	6,987.20	7,594.36	7,012.60	54.85	37.59	-92.11	1,601.26	812.53	2,925.86	2,853.06	72.80	40.191	
9,400.00	6,987.12	7,593.51	7,011.75	55.65	37.59	-92.07	1,601.22	812.52	3,013.55	2,940.74	72.81	41.390	
9,500.00	6,987.05	7,592.66	7,010.91	56.48	37.59	-92.04	1,601.17	812.52	3,101.97	3,029.16	72.81	42.603	
9,600.00	6,986.98	7,591.81	7,010.06	57.35	37.59	-92.01	1,601.13	812.51	3,191.09	3,118.28	72.81	43.830	
9,700.00	6,986.90	7,590.96	7,009.21	58.24	37.58	-91.97	1,601.08	812.50	3,280.83	3,208.03	72.80	45.069	
9,800.00	6,986.83	7,590.12	7,008.36	59.17	37.58	-91.94	1,601.04	812.50	3,371.14	3,298.36	72.78	46.319	
9,900.00	6,986.75	7,589.27	7,007.51	60.12	37.58	-91.90	1,601.00	812.49	3,461.99	3,389.23	72.76	47.579	
10,000.00	6,986.68	7,588.42	7,006.67	61.10	37.58	-91.87	1,600.95	812.48	3,553.33	3,480.59	72.74	48.848	
10,100.00	6,986.61	7,587.57	7,005.82	62.11	37.58	-91.84	1,600.91	812.48	3,645.12	3,572.41	72.72	50.126	
10,200.00	6,986.53	7,586.72	7,004.97	63.14	37.58	-91.80	1,600.86	812.47	3,737.34	3,664.64	72.69	51.411	
10,300.00	6,986.46	7,585.87	7,004.12	64.20	37.58	-91.77	1,600.82	812.46	3,829.95	3,757.28	72.67	52.704	
10,400.00	6,986.39	7,585.02	7,003.27	65.28	37.58	-91.73	1,600.77	812.45	3,922.91	3,850.27	72.64	54.002	
10,500.00	6,986.31	7,584.17	7,002.43	66.38	37.57	-91.70	1,600.73	812.45	4,016.22	3,943.60	72.62	55.306	
10,600.00	6,986.24	7,583.32	7,001.58	67.50	37.57	-91.67	1,600.69	812.44	4,109.84	4,037.25	72.59	56.616	
10,700.00	6,986.17	7,582.47	7,000.73	68.64	37.57	-91.63	1,600.64	812.43	4,203.76	4,131.19	72.57	57.930	
10,800.00	6,986.09	7,581.63	6,999.88	69.80	37.57	-91.60	1,600.60	812.43	4,297.94	4,225.40	72.54	59.249	
10,900.00	6,986.02	7,580.78	6,999.04	70.98	37.57	-91.56	1,600.55	812.42	4,392.39	4,319.88	72.52	60.572	
11,000.00	6,985.95	7,579.93	6,998.19	72.17	37.57	-91.53	1,600.51	812.41	4,487.08	4,414.59	72.49	61.898	
11,100.00	6,985.87	7,579.08	6,997.34	73.38	37.57	-91.50	1,600.47	812.41	4,581.99	4,509.52	72.47	63.228	
11,200.00	6,985.80	7,578.23	6,996.49	74.61	37.57	-91.46	1,600.42	812.40	4,677.11	4,604.67	72.45	64.560	
11,300.00	6,985.72	7,577.38	6,995.64	75.85	37.56	-91.43	1,600.38	812.39	4,772.44	4,700.01	72.42	65.895	
11,400.00	6,985.65	7,576.53	6,994.80	77.10	37.56	-91.39	1,600.33	812.39	4,867.95	4,795.54	72.40	67.232	
11,500.00	6,985.58	7,575.68	6,993.95	78.37	37.56	-91.36	1,600.29	812.38	4,963.63	4,891.25	72.39	68.572	
11,600.00	6,985.50	7,574.83	6,993.10	79.65	37.56	-91.33	1,600.25	812.37	5,059.49	4,987.12	72.37	69.913	
11,700.00	6,985.43	7,573.98	6,992.25	80.94	37.56	-91.29	1,600.20	812.36	5,155.50	5,083.15	72.35	71.256	
11,800.00	6,985.36	7,573.13	6,991.40	82.24	37.56	-91.26	1,600.16	812.36	5,251.66	5,179.32	72.34	72.600	
11,900.00	6,985.28	7,572.29	6,990.56	83.56	37.56	-91.22	1,600.11	812.35	5,347.96	5,275.64	72.32	73.945	
12,000.00	6,985.21	7,571.44	6,989.71	84.88	37.55	-91.19	1,600.07	812.34	5,444.39	5,372.08	72.31	75.292	
12,100.00	6,985.14	7,570.59	6,988.86	86.21	37.55	-91.15	1,600.03	812.34	5,540.95	5,468.65	72.30	76.639	
12,200.00	6,985.06	7,569.74	6,988.01	87.56	37.55	-91.12	1,599.98	812.33	5,637.63	5,565.34	72.29	77.987	
12,300.00	6,984.99	7,568.89	6,987.16	88.91	37.55	-91.09	1,599.94	812.32	5,734.43	5,662.15	72.28	79.335	
12,400.00	6,984.92	7,568.04	6,986.32	90.27	37.55	-91.05	1,599.89	812.32	5,831.33	5,759.06	72.27	80.683	
12,500.00	6,984.84	7,567.19	6,985.47	91.64	37.55	-91.02	1,599.85	812.31	5,928.33	5,856.07	72.27	82.032	
12,600.00	6,984.77	7,566.34	6,984.62	93.01	37.55	-90.98	1,599.81	812.30	6,025.44	5,953.17	72.26	83.380	
12,700.00	6,984.69	7,565.49	6,983.77	94.40	37.55	-90.95	1,599.76	812.29	6,122.63	6,050.37	72.26	84.729	
12,800.00	6,984.62	7,564.64	6,982.92	95.79	37.54	-90.92	1,599.72	812.29	6,219.92	6,147.66	72.26	86.077	
12,900.00	6,984.55	7,563.79	6,982.08	97.18	37.54	-90.88	1,599.67	812.28	6,317.29	6,245.03	72.26	87.425	
13,000.00	6,984.47	7,562.94	6,981.23	98.59	37.54	-90.85	1,599.63	812.27	6,414.74	6,342.48	72.26	88.772	
13,100.00	6,984.40	7,562.10	6,980.38	100.00	37.54	-90.81	1,599.58	812.27	6,512.26	6,440.00	72.26	90.119	
13,200.00	6,984.33	7,561.25	6,979.53	101.41	37.54	-90.78	1,599.54	812.26	6,609.86	6,537.60	72.27	91.465	
13,300.00	6,984.25	7,560.40	6,978.68	102.83	37.54	-90.75	1,599.50	812.25	6,707.54	6,635.26	72.27	92.811	
13,400.00	6,984.18	7,559.55	6,977.84	104.26	37.54	-90.71	1,599.45	812.25	6,805.27	6,733.00	72.28	94.155	
13,500.00	6,984.11	7,558.70	6,976.99	105.69	37.54	-90.68	1,599.41	812.24	6,903.08	6,830.79	72.28	95.499	
13,600.00	6,984.03	7,557.85	6,976.14	107.13	37.53	-90.64	1,599.36	812.23	7,000.94	6,928.65	72.29	96.841	
13,700.00	6,983.96	7,557.00	6,975.29	108.57	37.53	-90.61	1,599.32	812.23	7,098.87	7,026.57	72.30	98.182	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #041C - OH - OH-SVY												Offset Site Error: 0.00 usft	
Survey Program:		388-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
13,800.00	6,983.88	7,556.15	6,974.44	110.02	37.53	-90.58	1,599.28	812.22	7,196.85	7,124.54	72.31	99.522	
13,900.00	6,983.81	7,555.30	6,973.60	111.47	37.53	-90.54	1,599.23	812.21	7,294.89	7,222.56	72.33	100.861	
14,000.00	6,983.74	7,554.45	6,972.75	112.92	37.53	-90.51	1,599.19	812.20	7,392.98	7,320.64	72.34	102.198	
14,100.00	6,983.66	7,553.60	6,971.90	114.38	37.53	-90.47	1,599.14	812.20	7,491.12	7,418.76	72.35	103.534	
14,200.00	6,983.59	7,552.75	6,971.05	115.85	37.53	-90.44	1,599.10	812.19	7,589.30	7,516.93	72.37	104.868	
14,300.00	6,983.52	7,551.91	6,970.20	117.31	37.53	-90.41	1,599.06	812.18	7,687.54	7,615.15	72.39	106.201	
14,400.00	6,983.44	7,551.06	6,969.36	118.78	37.52	-90.37	1,599.01	812.18	7,785.82	7,713.41	72.40	107.532	
14,500.00	6,983.37	7,550.21	6,968.51	120.26	37.52	-90.34	1,598.97	812.17	7,884.14	7,811.72	72.42	108.861	
14,600.00	6,983.30	7,549.36	6,967.66	121.74	37.52	-90.30	1,598.92	812.16	7,982.51	7,910.06	72.44	110.189	
14,700.00	6,983.22	7,548.51	6,966.81	123.22	37.52	-90.27	1,598.88	812.16	8,080.91	8,008.45	72.47	111.514	
14,800.00	6,983.15	7,547.66	6,965.96	124.70	37.52	-90.24	1,598.84	812.15	8,179.35	8,106.87	72.49	112.838	
14,900.00	6,983.08	7,546.81	6,965.12	126.19	37.52	-90.20	1,598.79	812.14	8,277.83	8,205.32	72.51	114.160	
15,000.00	6,983.00	7,545.96	6,964.27	127.68	37.52	-90.17	1,598.75	812.13	8,376.35	8,303.81	72.54	115.479	
15,100.00	6,982.93	7,545.11	6,963.42	129.17	37.52	-90.13	1,598.70	812.13	8,474.90	8,402.34	72.56	116.797	
15,200.00	6,982.85	7,544.26	6,962.57	130.67	37.51	-90.10	1,598.66	812.12	8,573.49	8,500.90	72.59	118.113	
15,300.00	6,982.78	7,543.41	6,961.72	132.16	37.51	-90.07	1,598.62	812.11	8,672.10	8,599.49	72.61	119.426	
15,400.00	6,982.71	7,542.56	6,960.88	133.66	37.51	-90.03	1,598.57	812.11	8,770.75	8,698.11	72.64	120.737	
15,500.00	6,982.63	7,541.71	6,960.03	135.17	37.51	-90.00	1,598.53	812.10	8,869.43	8,796.76	72.67	122.046	
15,600.00	6,982.56	7,540.86	6,959.18	136.67	37.51	-89.96	1,598.48	812.09	8,968.14	8,895.43	72.70	123.353	
15,700.00	6,982.49	7,540.02	6,958.33	138.18	37.51	-89.93	1,598.44	812.09	9,066.87	8,994.14	72.73	124.657	
15,800.00	6,982.41	7,539.17	6,957.48	139.69	37.51	-89.90	1,598.39	812.08	9,165.63	9,092.87	72.77	125.959	
15,900.00	6,982.34	7,538.32	6,956.63	141.20	37.51	-89.86	1,598.35	812.07	9,264.42	9,191.62	72.80	127.258	
16,000.00	6,982.27	7,537.47	6,955.79	142.71	37.50	-89.83	1,598.31	812.07	9,363.24	9,290.40	72.83	128.555	
16,100.00	6,982.19	7,536.62	6,954.94	144.23	37.50	-89.79	1,598.26	812.06	9,462.08	9,389.21	72.87	129.849	
16,200.00	6,982.12	7,535.77	6,954.09	145.75	37.50	-89.76	1,598.22	812.05	9,560.94	9,488.04	72.91	131.141	
16,300.00	6,982.05	7,534.92	6,953.24	147.27	37.50	-89.73	1,598.17	812.04	9,659.83	9,586.89	72.94	132.431	
16,400.00	6,981.97	7,534.07	6,952.39	148.79	37.50	-89.69	1,598.13	812.04	9,758.74	9,685.76	72.98	133.717	
16,500.00	6,981.90	7,533.22	6,951.55	150.31	37.50	-89.66	1,598.09	812.03	9,857.67	9,784.65	73.02	135.001	
16,600.00	6,981.82	7,532.37	6,950.70	151.84	37.50	-89.62	1,598.04	812.02	9,956.62	9,883.56	73.06	136.283	
16,700.00	6,981.75	7,531.52	6,949.85	153.36	37.50	-89.59	1,598.00	812.02	10,055.60	9,982.50	73.10	137.561	
16,800.00	6,981.68	7,530.67	6,949.00	154.89	37.49	-89.56	1,597.95	812.01	10,154.59	10,081.45	73.14	138.837	
16,900.00	6,981.60	7,529.82	6,948.15	156.42	37.49	-89.52	1,597.91	812.00	10,253.60	10,180.42	73.18	140.110	
17,000.00	6,981.53	7,528.97	6,947.31	157.95	37.49	-89.49	1,597.87	812.00	10,352.64	10,279.41	73.23	141.381	
17,100.00	6,981.46	7,528.13	6,946.46	159.49	37.49	-89.45	1,597.82	811.99	10,451.69	10,378.42	73.27	142.648	
17,200.00	6,981.38	7,527.28	6,945.61	161.02	37.49	-89.42	1,597.78	811.98	10,550.75	10,477.44	73.31	143.913	
17,300.00	6,981.31	7,526.43	6,944.76	162.56	37.49	-89.39	1,597.73	811.97	10,649.84	10,576.48	73.36	145.175	
17,400.00	6,981.24	7,525.58	6,943.91	164.09	37.49	-89.35	1,597.69	811.97	10,748.94	10,675.54	73.40	146.433	
17,500.00	6,981.16	7,524.73	6,943.06	165.63	37.49	-89.32	1,597.65	811.96	10,848.06	10,774.61	73.45	147.689	
17,600.00	6,981.09	7,523.88	6,942.22	167.17	37.48	-89.28	1,597.60	811.95	10,947.20	10,873.70	73.50	148.942	
17,700.00	6,981.01	7,523.03	6,941.37	168.71	37.48	-89.25	1,597.56	811.95	11,046.35	10,972.80	73.55	150.192	
17,800.00	6,980.94	7,522.18	6,940.52	170.25	37.48	-89.22	1,597.51	811.94	11,145.51	11,071.91	73.60	151.439	
17,900.00	6,980.87	7,521.33	6,939.67	171.80	37.48	-89.18	1,597.47	811.93	11,244.69	11,171.04	73.65	152.683	
18,000.00	6,980.79	7,520.48	6,938.82	173.34	37.48	-89.15	1,597.42	811.93	11,343.89	11,270.19	73.70	153.924	
18,100.00	6,980.72	7,519.63	6,937.97	174.89	37.48	-89.11	1,597.38	811.92	11,443.10	11,369.35	73.75	155.162	
18,200.00	6,980.65	7,518.78	6,937.13	176.43	37.48	-89.08	1,597.34	811.91	11,542.32	11,468.52	73.80	156.397	
18,300.00	6,980.57	7,517.93	6,936.28	177.98	37.48	-89.05	1,597.29	811.91	11,641.55	11,567.70	73.85	157.628	
18,400.00	6,980.50	7,517.08	6,935.43	179.53	37.47	-89.01	1,597.25	811.90	11,740.80	11,666.89	73.91	158.857	
18,500.00	6,980.43	7,516.23	6,934.58	181.08	37.47	-88.98	1,597.20	811.89	11,840.06	11,766.10	73.96	160.082	
18,600.00	6,980.35	7,515.38	6,933.73	182.63	37.47	-88.95	1,597.16	811.88	11,939.33	11,865.32	74.02	161.304	
18,700.00	6,980.28	7,514.53	6,932.89	184.18	37.47	-88.91	1,597.12	811.88	12,038.62	11,964.55	74.07	162.523	
18,800.00	6,980.21	7,513.69	6,932.04	185.73	37.47	-88.88	1,597.07	811.87	12,137.92	12,063.79	74.13	163.739	
18,900.00	6,980.13	7,512.84	6,931.19	187.28	37.47	-88.84	1,597.03	811.86	12,237.22	12,163.04	74.19	164.952	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #041C - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		388-APC_ISCWSA REV 2 MWD					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	
19,000.00	6,980.06	7,511.99	6,930.34	188.84	37.47	-88.81	1,596.98	811.86	12,336.54	12,262.30	74.24	166.161		
19,100.00	6,979.98	7,511.14	6,929.49	190.39	37.47	-88.78	1,596.94	811.85	12,435.87	12,361.57	74.30	167.367		
19,200.00	6,979.91	7,510.29	6,928.64	191.95	37.46	-88.74	1,596.90	811.84	12,535.21	12,460.85	74.36	168.570		
19,300.00	6,979.84	7,509.44	6,927.80	193.51	37.46	-88.71	1,596.85	811.84	12,634.57	12,560.14	74.42	169.769		
19,400.00	6,979.76	7,508.59	6,926.95	195.06	37.46	-88.67	1,596.81	811.83	12,733.93	12,659.44	74.48	170.966		
19,500.00	6,979.69	7,507.74	6,926.10	196.62	37.46	-88.64	1,596.76	811.82	12,833.30	12,758.75	74.54	172.159		
19,600.00	6,979.62	7,506.89	6,925.25	198.18	37.46	-88.61	1,596.72	811.81	12,932.68	12,858.07	74.61	173.349		
19,700.00	6,979.54	7,506.04	6,924.40	199.74	37.46	-88.57	1,596.67	811.81	13,032.07	12,957.40	74.67	174.535		
19,800.00	6,979.47	7,505.19	6,923.55	201.30	37.46	-88.54	1,596.63	811.80	13,131.47	13,056.74	74.73	175.718		
19,900.00	6,979.40	7,504.34	6,922.71	202.86	37.45	-88.50	1,596.59	811.79	13,230.88	13,156.08	74.79	176.898		
20,000.00	6,979.32	7,503.49	6,921.86	204.42	37.45	-88.47	1,596.54	811.79	13,330.29	13,255.44	74.86	178.074		
20,100.00	6,979.25	7,502.64	6,921.01	205.98	37.45	-88.44	1,596.50	811.78	13,429.72	13,354.80	74.92	179.247		
20,200.00	6,979.18	7,501.79	6,920.16	207.55	37.45	-88.40	1,596.45	811.77	13,529.15	13,454.16	74.99	180.417		
20,300.00	6,979.10	7,500.94	6,919.31	209.11	37.45	-88.37	1,596.41	811.77	13,628.60	13,553.54	75.05	181.583		
20,400.00	6,979.03	7,500.09	6,918.46	210.68	37.45	-88.34	1,596.37	811.76	13,728.05	13,652.92	75.12	182.746		
20,500.00	6,978.95	7,499.24	6,917.62	212.24	37.45	-88.30	1,596.32	811.75	13,827.50	13,752.32	75.19	183.905		
20,600.00	6,978.88	7,498.39	6,916.77	213.81	37.45	-88.27	1,596.28	811.75	13,926.97	13,851.71	75.26	185.061		
20,700.00	6,978.81	7,497.54	6,915.92	215.37	37.44	-88.23	1,596.23	811.74	14,026.44	13,951.12	75.32	186.214		
20,800.00	6,978.73	7,496.70	6,915.07	216.94	37.44	-88.20	1,596.19	811.73	14,125.92	14,050.53	75.39	187.363		
20,900.00	6,978.66	7,495.85	6,914.22	218.51	37.44	-88.17	1,596.15	811.72	14,225.41	14,149.95	75.46	188.509		
21,000.00	6,978.59	7,495.00	6,913.37	220.07	37.44	-88.13	1,596.10	811.72	14,324.91	14,249.38	75.53	189.652		
21,100.00	6,978.51	7,494.15	6,912.53	221.64	37.44	-88.10	1,596.06	811.71	14,424.41	14,348.81	75.60	190.791		
21,200.00	6,978.44	7,493.30	6,911.68	223.21	37.44	-88.06	1,596.01	811.70	14,523.92	14,448.24	75.67	191.926		
21,300.00	6,978.37	7,492.45	6,910.83	224.78	37.44	-88.03	1,595.97	811.70	14,623.43	14,547.69	75.75	193.058		
21,400.00	6,978.29	7,491.60	6,909.98	226.35	37.44	-88.00	1,595.93	811.69	14,722.96	14,647.14	75.82	194.187		
21,500.00	6,978.22	7,490.75	6,909.13	227.92	37.43	-87.96	1,595.88	811.68	14,822.49	14,746.59	75.89	195.312		
21,600.00	6,978.14	7,489.90	6,908.28	229.49	37.43	-87.93	1,595.84	811.68	14,922.02	14,846.06	75.96	196.434		
21,700.00	6,978.07	7,489.05	6,907.44	231.06	37.43	-87.89	1,595.79	811.67	15,021.56	14,945.52	76.04	197.552		
21,800.00	6,978.00	7,488.20	6,906.59	232.63	37.43	-87.86	1,595.75	811.66	15,121.11	15,044.99	76.11	198.667		
21,900.00	6,977.92	7,487.35	6,905.74	234.21	37.43	-87.83	1,595.70	811.65	15,220.66	15,144.47	76.19	199.778		
22,000.00	6,977.85	7,486.50	6,904.89	235.78	37.43	-87.79	1,595.66	811.65	15,320.22	15,243.96	76.26	200.886		
22,100.00	6,977.78	7,485.65	6,904.04	237.35	37.43	-87.76	1,595.62	811.64	15,419.78	15,343.44	76.34	201.991		
22,200.00	6,977.70	7,484.80	6,903.19	238.92	37.43	-87.73	1,595.57	811.63	15,519.35	15,442.94	76.42	203.092		
22,300.00	6,977.63	7,483.95	6,902.34	240.50	37.42	-87.69	1,595.53	811.63	15,618.93	15,542.44	76.49	204.189		
22,400.00	6,977.56	7,483.10	6,901.50	242.07	37.42	-87.66	1,595.48	811.62	15,718.51	15,641.94	76.57	205.283		
22,500.00	6,977.48	7,482.25	6,900.65	243.65	37.42	-87.62	1,595.44	811.61	15,818.09	15,741.45	76.65	206.374		
22,600.00	6,977.41	7,481.40	6,899.80	245.22	37.42	-87.59	1,595.40	811.61	15,917.69	15,840.96	76.73	207.461		
22,700.00	6,977.34	7,480.55	6,898.95	246.80	37.42	-87.56	1,595.35	811.60	16,017.28	15,940.48	76.81	208.545		
22,800.00	6,977.26	7,479.70	6,898.10	248.37	37.42	-87.52	1,595.31	811.59	16,116.88	16,040.00	76.88	209.625		
22,900.00	6,977.19	7,478.85	6,897.25	249.95	37.42	-87.49	1,595.26	811.58	16,216.49	16,139.52	76.96	210.701		
23,000.00	6,977.11	7,478.00	6,896.41	251.53	37.42	-87.46	1,595.22	811.58	16,316.10	16,239.05	77.04	211.775		
23,100.00	6,977.04	7,477.15	6,895.56	253.10	37.41	-87.42	1,595.18	811.57	16,415.71	16,338.59	77.13	212.844		
23,155.65	6,977.00	7,476.68	6,895.08	253.98	37.41	-87.40	1,595.15	811.57	16,471.15	16,393.98	77.17	213.438		
23,156.15	6,977.00	7,476.68	6,895.08	254.06	37.41	-87.40	1,595.15	811.57	16,471.65	16,389.73	81.92	201.070		

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

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COMPASS 5000.17 Build 06

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #053 - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program: 300-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)			
0.00	0.00	0.00	0.00	0.00	0.00	-154.90	-393.20	-184.17	434.33				
100.00	100.00	89.00	89.00	0.25	1.58	-154.90	-393.20	-184.17	434.19	432.36	1.83	237.537	
200.00	200.00	189.00	189.00	0.61	3.35	-154.90	-393.20	-184.17	434.19	430.23	3.96	109.700	
300.00	300.00	289.00	289.00	0.97	5.12	-154.90	-393.20	-184.17	434.19	428.10	6.09	71.318	
400.00	400.00	389.00	389.00	1.33	6.92	-154.90	-393.20	-184.17	434.19	425.94	8.25	52.661	
500.00	500.00	489.00	489.00	1.68	8.72	-154.90	-393.20	-184.17	434.19	423.78	10.41	41.728 CC	
600.00	599.98	588.85	588.85	2.04	10.52	-164.94	-392.93	-184.17	435.63	423.07	12.56	34.675 ES	
700.00	699.84	688.37	688.36	2.41	12.31	-165.09	-393.00	-184.17	440.76	426.04	14.72	29.947	
800.00	799.45	787.62	787.62	2.77	14.10	-165.34	-393.16	-184.17	449.33	432.46	16.87	26.637	
900.00	898.70	887.71	887.70	3.13	16.05	-165.67	-393.20	-184.17	461.16	441.98	19.19	24.037	
1,000.00	997.47	986.48	986.47	3.50	18.01	-166.06	-393.20	-184.17	476.34	454.84	21.50	22.151	
1,100.00	1,095.63	1,083.93	1,083.92	3.89	19.93	-164.08	-392.80	-184.17	494.39	470.59	23.80	20.772	
1,200.00	1,193.09	1,180.39	1,180.38	4.29	21.84	-162.91	-393.05	-184.17	516.11	490.03	26.08	19.790	
1,300.00	1,289.73	1,278.79	1,278.73	4.72	23.96	-162.26	-393.20	-184.17	540.83	512.26	28.57	18.931	
1,400.00	1,385.42	1,372.10	1,372.03	5.16	26.06	-161.89	-392.70	-184.17	568.08	537.04	31.04	18.300	
1,496.97	1,477.20	1,466.33	1,466.20	5.62	28.24	-161.84	-393.20	-184.17	598.42	564.83	33.60	17.812	
1,500.00	1,480.05	1,469.18	1,469.05	5.63	28.31	-161.87	-393.20	-184.17	599.40	565.72	33.68	17.796	
1,600.00	1,574.15	1,563.28	1,563.15	6.12	30.62	-162.82	-393.20	-184.17	631.82	595.45	36.38	17.369	
1,700.00	1,668.25	1,655.70	1,655.55	6.62	32.90	-163.63	-392.06	-184.17	663.31	624.27	39.03	16.993	
1,800.00	1,762.35	1,745.45	1,745.29	7.12	35.11	-164.40	-392.59	-184.17	696.52	654.89	41.62	16.734	
1,900.00	1,856.45	1,845.73	1,845.45	7.64	37.58	-165.17	-393.20	-184.17	729.86	685.37	44.48	16.407	
2,000.00	1,950.55	1,939.83	1,939.55	8.16	39.89	-165.82	-393.20	-184.17	762.74	715.55	47.19	16.165	
2,100.00	2,044.65	2,033.93	2,033.65	8.68	42.20	-166.41	-393.20	-184.17	795.70	745.81	49.89	15.950	
2,200.00	2,138.75	2,125.62	2,125.30	9.21	44.46	-166.91	-391.21	-184.17	826.81	774.28	52.53	15.740	
2,300.00	2,232.85	2,215.46	2,215.13	9.74	46.66	-167.41	-391.71	-184.17	860.41	805.29	55.12	15.609	
2,400.00	2,326.95	2,305.00	2,304.65	10.27	48.86	-167.87	-392.66	-184.17	894.53	836.82	57.71	15.501	
2,500.00	2,421.05	2,410.51	2,410.05	10.81	51.41	-168.37	-393.20	-184.17	928.18	867.50	60.68	15.297	
2,600.00	2,515.15	2,504.61	2,504.15	11.34	53.67	-168.78	-393.20	-184.17	961.42	898.10	63.33	15.182	
2,700.00	2,609.25	2,596.50	2,596.03	11.88	55.86	-169.13	-392.10	-184.17	993.65	927.73	65.92	15.074	
2,800.00	2,703.35	2,685.89	2,685.40	12.42	58.00	-169.48	-392.52	-184.17	1,027.39	958.94	68.45	15.010	
2,900.00	2,797.45	2,787.04	2,786.45	12.96	60.43	-169.84	-393.20	-184.17	1,061.38	990.10	71.28	14.890	
3,000.00	2,891.55	2,881.13	2,880.55	13.51	62.69	-170.15	-393.20	-184.17	1,094.77	1,020.82	73.94	14.805	
3,100.00	2,985.65	2,975.23	2,974.65	14.05	64.95	-170.45	-393.20	-184.17	1,128.18	1,051.58	76.60	14.727	
3,200.00	3,079.75	3,068.59	3,067.98	14.60	67.19	-170.70	-391.29	-184.17	1,159.75	1,080.50	79.25	14.635	
3,300.00	3,173.85	3,158.01	3,157.39	15.14	69.34	-170.95	-391.53	-184.17	1,193.45	1,111.67	81.78	14.593	
3,400.00	3,267.95	3,247.18	3,246.55	15.69	71.48	-171.19	-392.12	-184.17	1,227.55	1,143.23	84.31	14.559	
3,500.00	3,362.05	3,351.80	3,351.05	16.23	73.97	-171.47	-393.20	-184.17	1,262.06	1,174.82	87.24	14.467	
3,600.00	3,456.15	3,445.90	3,445.15	16.78	75.89	-171.69	-393.20	-184.17	1,295.57	1,206.02	89.55	14.467	
3,700.00	3,550.25	3,540.00	3,539.25	17.33	77.80	-171.90	-393.20	-184.17	1,329.11	1,237.24	91.87	14.467	
3,800.00	3,644.35	3,631.65	3,630.88	17.88	79.67	-172.08	-391.90	-184.17	1,361.38	1,267.25	94.13	14.463	
3,900.00	3,738.45	3,720.28	3,719.51	18.42	81.47	-172.27	-392.24	-184.17	1,395.30	1,298.98	96.32	14.486	
4,000.00	3,832.55	3,808.67	3,807.89	18.97	83.27	-172.44	-392.92	-184.17	1,429.59	1,331.09	98.50	14.513	
4,100.00	3,926.65	3,916.46	3,915.65	19.52	85.31	-172.64	-393.20	-184.17	1,463.38	1,362.38	101.00	14.489	
4,200.00	4,020.75	4,010.56	4,009.75	20.07	87.06	-172.81	-393.20	-184.17	1,496.98	1,393.83	103.15	14.513	
4,300.00	4,114.85	4,103.94	4,103.13	20.62	88.80	-172.96	-392.67	-184.17	1,530.08	1,424.79	105.29	14.533	
4,400.00	4,208.95	4,195.49	4,194.68	21.17	90.50	-173.11	-392.79	-184.17	1,563.82	1,456.43	107.38	14.563	
4,500.00	4,303.05	4,286.93	4,286.11	21.72	92.19	-173.26	-393.06	-184.17	1,597.72	1,488.24	109.48	14.594	
4,600.00	4,397.15	4,386.99	4,386.15	22.27	93.94	-173.40	-393.20	-184.17	1,631.48	1,519.83	111.65	14.612	
4,700.00	4,491.25	4,481.09	4,480.25	22.82	95.54	-173.54	-393.20	-184.17	1,665.13	1,551.47	113.65	14.651	
4,800.00	4,585.35	4,575.18	4,574.34	23.37	97.13	-173.66	-392.36	-184.17	1,697.95	1,582.30	115.65	14.682	
4,900.00	4,679.45	4,665.33	4,664.48	23.93	98.66	-173.78	-392.47	-184.17	1,731.72	1,614.15	117.57	14.729	
5,000.00	4,773.55	4,755.33	4,754.48	24.48	100.19	-173.90	-392.78	-184.17	1,765.72	1,646.22	119.49	14.777	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #053 - OH - OH-INC													Offset Site Error: 0.00 usft
Survey Program: 300-A027Ua_INC-ONLY													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
5,100.00	4,867.65	4,857.51	4,856.65	25.03	102.04	-174.02	-393.20	-184.17	1,799.78	1,678.01	121.78	14.780	
5,200.00	4,961.75	4,951.61	4,950.75	25.58	104.04	-174.13	-393.20	-184.17	1,833.47	1,709.28	124.18	14.764	
5,300.00	5,055.85	5,045.71	5,044.85	26.13	106.04	-174.24	-393.20	-184.17	1,867.15	1,740.56	126.59	14.749	
5,400.00	5,149.95	5,139.81	5,138.95	26.68	108.04	-174.34	-393.20	-184.17	1,900.84	1,771.84	129.00	14.735	
5,500.00	5,244.05	5,233.91	5,233.05	27.24	110.05	-174.44	-393.20	-184.17	1,934.54	1,803.13	131.41	14.721	
5,600.00	5,338.15	5,328.01	5,327.15	27.79	112.05	-174.54	-393.20	-184.17	1,968.24	1,834.42	133.82	14.708	
5,665.73	5,400.00	5,389.88	5,389.00	28.15	113.37	-174.60	-393.20	-184.17	1,990.40	1,854.99	135.41	14.699	
5,700.00	5,432.28	5,422.17	5,421.28	28.34	114.05	-174.64	-393.20	-184.17	2,001.85	1,865.62	136.24	14.694	
5,800.00	5,526.87	5,516.75	5,515.87	28.88	116.07	-174.76	-393.20	-184.17	2,034.18	1,895.53	138.65	14.671	
5,900.00	5,622.01	5,609.69	5,608.80	29.41	118.04	-174.86	-392.21	-184.17	2,063.89	1,922.87	141.03	14.635	
6,000.00	5,717.67	5,698.31	5,697.42	29.92	119.93	-174.95	-392.46	-184.17	2,093.18	1,949.90	143.29	14.608	
6,100.00	5,813.83	5,787.23	5,786.33	30.41	121.82	-175.04	-393.01	-184.17	2,121.13	1,975.58	145.55	14.573	
6,200.00	5,910.44	5,900.40	5,899.44	30.89	124.23	-175.13	-393.20	-184.17	2,146.94	1,998.54	148.40	14.467	
6,300.00	6,007.50	5,997.45	5,996.50	31.36	126.29	-175.21	-393.20	-184.17	2,170.95	2,020.10	150.85	14.391	
6,400.00	6,104.96	6,092.84	6,091.88	31.80	128.32	-175.27	-392.10	-184.17	2,192.17	2,038.92	153.26	14.304	
6,500.00	6,202.80	6,183.84	6,182.87	32.24	130.26	-175.33	-392.33	-184.17	2,213.03	2,057.48	155.55	14.227	
6,600.00	6,300.98	6,275.05	6,274.08	32.66	132.20	-175.38	-392.84	-184.17	2,232.50	2,074.66	157.84	14.144	
6,700.00	6,399.48	6,389.51	6,388.48	33.06	134.70	-175.44	-393.20	-184.17	2,250.00	2,089.24	160.75	13.997	
6,722.82	6,422.00	6,412.03	6,411.00	33.15	135.20	-175.45	-393.20	-184.17	2,253.68	2,092.35	161.33	13.969	
6,750.00	6,448.76	6,438.79	6,437.76	33.26	135.79	-165.35	-393.20	-184.17	2,258.35	2,096.32	162.03	13.938	
6,800.00	6,497.51	6,487.54	6,486.51	33.48	136.87	-153.39	-393.20	-184.17	2,268.64	2,105.35	163.30	13.893	
6,850.00	6,545.40	6,535.43	6,534.40	33.72	137.93	-146.08	-393.20	-184.17	2,281.11	2,116.55	164.55	13.862	
6,900.00	6,592.13	6,582.16	6,581.13	33.97	138.96	-141.06	-393.20	-184.17	2,295.70	2,129.91	165.79	13.847	
6,950.00	6,637.40	6,625.22	6,624.18	34.25	139.92	-137.23	-392.01	-184.17	2,311.19	2,144.24	166.94	13.844 SF	
7,000.00	6,680.94	6,665.77	6,664.73	34.54	140.81	-134.03	-392.08	-184.17	2,329.94	2,161.91	168.03	13.866	
7,050.00	6,722.48	6,704.40	6,703.35	34.85	141.67	-131.19	-392.19	-184.17	2,350.71	2,181.62	169.08	13.903	
7,100.00	6,761.76	6,740.87	6,739.82	35.17	142.48	-128.50	-392.33	-184.17	2,373.41	2,203.33	170.08	13.954	
7,150.00	6,798.55	6,774.96	6,773.91	35.51	143.23	-125.85	-392.51	-184.17	2,397.97	2,226.95	171.02	14.021	
7,200.00	6,832.61	6,806.45	6,805.40	35.86	143.93	-123.15	-392.71	-184.17	2,424.29	2,252.39	171.90	14.103	
7,250.00	6,863.74	6,835.16	6,834.11	36.22	144.56	-120.32	-392.91	-184.17	2,452.26	2,279.56	172.70	14.200	
7,300.00	6,891.74	6,881.88	6,880.74	36.59	145.61	-117.78	-393.20	-184.17	2,481.76	2,307.79	173.97	14.265	
7,350.00	6,916.44	6,906.58	6,905.44	36.98	146.18	-114.65	-393.20	-184.17	2,512.46	2,337.77	174.69	14.382	
7,400.00	6,937.69	6,927.83	6,926.69	37.37	146.67	-111.27	-393.20	-184.17	2,544.42	2,369.11	175.31	14.513	
7,450.00	6,955.36	6,945.50	6,944.36	37.78	147.07	-107.63	-393.20	-184.17	2,577.51	2,401.67	175.84	14.658	
7,500.00	6,969.34	6,959.47	6,958.34	38.19	147.39	-103.71	-393.20	-184.17	2,611.54	2,435.28	176.26	14.816	
7,550.00	6,979.53	6,969.67	6,968.53	38.62	147.63	-99.54	-393.20	-184.17	2,646.34	2,469.76	176.58	14.987	
7,600.00	6,985.89	6,976.03	6,974.89	39.05	147.78	-95.16	-393.20	-184.17	2,681.71	2,504.92	176.79	15.169	
7,650.00	6,988.37	6,978.50	6,977.37	39.48	147.83	-90.62	-393.20	-184.17	2,717.43	2,540.54	176.89	15.362	
7,657.25	6,988.40	6,978.54	6,977.40	39.54	147.83	-89.96	-393.20	-184.17	2,722.63	2,545.73	176.90	15.391	
7,700.00	6,988.37	6,978.51	6,977.37	39.92	147.83	-89.96	-393.20	-184.17	2,753.44	2,576.52	176.92	15.563	
7,800.00	6,988.30	6,978.44	6,977.30	40.82	147.83	-89.96	-393.20	-184.17	2,826.74	2,649.75	176.99	15.971	
7,900.00	6,988.23	6,978.37	6,977.23	41.77	147.83	-89.95	-393.20	-184.17	2,901.63	2,724.57	177.06	16.388	
8,000.00	6,988.16	6,978.30	6,977.16	42.75	147.83	-89.95	-393.20	-184.17	2,977.99	2,800.87	177.13	16.813	
8,100.00	6,988.09	6,978.23	6,977.09	43.76	147.83	-89.95	-393.20	-184.17	3,055.72	2,878.53	177.19	17.245	
8,152.35	6,988.06	6,978.19	6,977.06	44.30	147.83	-89.95	-393.20	-184.17	3,096.93	2,919.70	177.23	17.474	
8,200.00	6,988.02	6,978.16	6,977.02	44.79	147.82	-89.95	-393.20	-184.17	3,134.23	2,956.97	177.26	17.682	
8,300.00	6,987.95	6,978.09	6,976.95	45.83	147.82	-89.95	-393.20	-184.17	3,210.18	3,032.85	177.33	18.103	
8,400.00	6,987.88	6,978.01	6,976.88	46.85	147.82	-89.96	-393.20	-184.17	3,282.87	3,105.46	177.41	18.505	
8,500.00	6,987.80	6,977.94	6,976.80	47.85	147.82	-89.96	-393.20	-184.17	3,352.14	3,174.65	177.49	18.886	
8,600.00	6,987.73	6,977.86	6,976.73	48.83	147.82	-89.96	-393.20	-184.17	3,417.89	3,240.31	177.58	19.247	
8,700.00	6,987.65	6,977.79	6,976.65	49.79	147.82	-89.97	-393.20	-184.17	3,480.00	3,302.32	177.68	19.586	
8,800.00	6,987.57	6,977.71	6,976.57	50.72	147.81	-89.97	-393.20	-184.17	3,538.38	3,360.59	177.79	19.902	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #053 - OH - OH-INC												Offset Site Error:	0.00 usft								
Survey Program: 300-A027Ua_INC-ONLY				Reference		Offset		Semi Major Axis		Highside		Offset Wellbore Centre		Rule Assigned:		Distance		Warning		Offset Well Error:	0.00 usft
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)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor									
8,900.00	6,987.50	6,977.63	6,976.50	51.62	147.81	-89.97	-393.20	-184.17	3,592.91	3,415.01	177.91	20.196									
9,000.00	6,987.42	6,977.56	6,976.42	52.48	147.81	-89.98	-393.20	-184.17	3,643.52	3,465.50	178.03	20.466									
9,100.00	6,987.34	6,977.48	6,976.34	53.30	147.81	-89.98	-393.20	-184.17	3,690.13	3,511.98	178.16	20.713									
9,200.00	6,987.27	6,977.41	6,976.27	54.08	147.81	-89.98	-393.20	-184.17	3,732.66	3,554.37	178.29	20.936									
9,215.33	6,987.26	6,977.39	6,976.26	54.20	147.81	-89.98	-393.20	-184.17	3,738.82	3,560.51	178.31	20.968									
9,300.00	6,987.20	6,977.33	6,976.20	54.85	147.81	-89.98	-393.20	-184.17	3,773.34	3,594.92	178.43	21.148									
9,400.00	6,987.12	6,977.26	6,976.12	55.65	147.80	-89.98	-393.20	-184.17	3,816.14	3,637.57	178.57	21.370									
9,500.00	6,987.05	6,977.18	6,976.05	56.48	147.80	-89.98	-393.20	-184.17	3,861.05	3,682.33	178.72	21.604									
9,600.00	6,986.98	6,977.11	6,975.98	57.35	147.80	-89.98	-393.20	-184.17	3,908.01	3,729.14	178.86	21.849									
9,700.00	6,986.90	6,977.04	6,975.90	58.24	147.80	-89.98	-393.20	-184.17	3,956.93	3,777.92	179.01	22.104									
9,800.00	6,986.83	6,976.96	6,975.83	59.17	147.80	-89.97	-393.20	-184.17	4,007.76	3,828.59	179.16	22.370									
9,900.00	6,986.75	6,976.89	6,975.75	60.12	147.80	-89.97	-393.20	-184.17	4,060.41	3,881.10	179.31	22.645									
10,000.00	6,986.68	6,976.82	6,975.68	61.10	147.79	-89.97	-393.20	-184.17	4,114.81	3,935.36	179.46	22.929									
10,100.00	6,986.61	6,976.74	6,975.61	62.11	147.79	-89.97	-393.20	-184.17	4,170.91	3,991.31	179.60	23.223									
10,200.00	6,986.53	6,976.67	6,975.53	63.14	147.79	-89.97	-393.20	-184.17	4,228.63	4,048.88	179.75	23.525									
10,300.00	6,986.46	6,976.60	6,975.46	64.20	147.79	-89.97	-393.20	-184.17	4,287.90	4,108.01	179.89	23.836									
10,400.00	6,986.39	6,976.52	6,975.39	65.28	147.79	-89.97	-393.20	-184.17	4,348.66	4,168.63	180.03	24.155									
10,500.00	6,986.31	6,976.45	6,975.31	66.38	147.78	-89.97	-393.20	-184.17	4,410.86	4,230.69	180.17	24.481									
10,600.00	6,986.24	6,976.38	6,975.24	67.50	147.78	-89.96	-393.20	-184.17	4,474.42	4,294.11	180.31	24.815									
10,700.00	6,986.17	6,976.30	6,975.17	68.64	147.78	-89.96	-393.20	-184.17	4,539.30	4,358.86	180.44	25.156									
10,800.00	6,986.09	6,976.23	6,975.09	69.80	147.78	-89.96	-393.20	-184.17	4,605.44	4,424.86	180.58	25.504									
10,900.00	6,986.02	6,976.15	6,975.02	70.98	147.78	-89.96	-393.20	-184.17	4,672.78	4,492.07	180.71	25.859									
11,000.00	6,985.95	6,976.08	6,974.95	72.17	147.78	-89.96	-393.20	-184.17	4,741.27	4,560.44	180.83	26.219									
11,100.00	6,985.87	6,976.01	6,974.87	73.38	147.77	-89.96	-393.20	-184.17	4,810.87	4,629.91	180.96	26.586									
11,200.00	6,985.80	6,975.93	6,974.80	74.61	147.77	-89.96	-393.20	-184.17	4,881.52	4,700.44	181.08	26.958									
11,300.00	6,985.72	6,975.86	6,974.72	75.85	147.77	-89.96	-393.20	-184.17	4,953.18	4,771.98	181.20	27.336									
11,400.00	6,985.65	6,975.79	6,974.65	77.10	147.77	-89.95	-393.20	-184.17	5,025.81	4,844.50	181.32	27.719									
11,500.00	6,985.58	6,975.71	6,974.58	78.37	147.77	-89.95	-393.20	-184.17	5,099.37	4,917.94	181.43	28.107									
11,600.00	6,985.50	6,975.64	6,974.50	79.65	147.77	-89.95	-393.20	-184.17	5,173.82	4,992.28	181.54	28.499									
11,700.00	6,985.43	6,975.57	6,974.43	80.94	147.76	-89.95	-393.20	-184.17	5,249.11	5,067.46	181.65	28.896									
11,800.00	6,985.36	6,975.49	6,974.36	82.24	147.76	-89.95	-393.20	-184.17	5,325.22	5,143.46	181.76	29.298									
11,900.00	6,985.28	6,975.42	6,974.28	83.56	147.76	-89.95	-393.20	-184.17	5,402.11	5,220.24	181.87	29.704									
12,000.00	6,985.21	6,975.34	6,974.21	84.88	147.76	-89.95	-393.20	-184.17	5,479.74	5,297.77	181.97	30.114									
12,100.00	6,985.14	6,975.27	6,974.14	86.21	147.76	-89.95	-393.20	-184.17	5,558.09	5,376.02	182.07	30.527									
12,200.00	6,985.06	6,975.20	6,974.06	87.56	147.76	-89.94	-393.20	-184.17	5,637.12	5,454.95	182.17	30.944									
12,300.00	6,984.99	6,975.12	6,973.99	88.91	147.75	-89.94	-393.20	-184.17	5,716.81	5,534.55	182.27	31.365									
12,400.00	6,984.92	6,975.05	6,973.92	90.27	147.75	-89.94	-393.20	-184.17	5,797.13	5,614.77	182.36	31.789									
12,500.00	6,984.84	6,974.98	6,973.84	91.64	147.75	-89.94	-393.20	-184.17	5,878.06	5,695.60	182.46	32.216									
12,600.00	6,984.77	6,974.90	6,973.77	93.01	147.75	-89.94	-393.20	-184.17	5,959.56	5,777.01	182.55	32.646									
12,700.00	6,984.69	6,974.83	6,973.69	94.40	147.75	-89.94	-393.20	-184.17	6,041.62	5,858.98	182.64	33.079									
12,800.00	6,984.62	6,974.76	6,973.62	95.79	147.75	-89.94	-393.20	-184.17	6,124.21	5,941.48	182.73	33.515									
12,900.00	6,984.55	6,974.68	6,973.55	97.18	147.74	-89.94	-393.20	-184.17	6,207.31	6,024.49	182.82	33.953									
13,000.00	6,984.47	6,974.61	6,973.47	98.59	147.74	-89.94	-393.20	-184.17	6,290.91	6,108.00	182.91	34.394									
13,100.00	6,984.40	6,974.54	6,973.40	100.00	147.74	-89.93	-393.20	-184.17	6,374.98	6,191.99	182.99	34.838									
13,200.00	6,984.33	6,974.46	6,973.33	101.41	147.74	-89.93	-393.20	-184.17	6,459.50	6,276.42	183.08	35.283									
13,300.00	6,984.25	6,974.39	6,973.25	102.83	147.74	-89.93	-393.20	-184.17	6,544.46	6,361.30	183.16	35.731									
13,400.00	6,984.18	6,974.31	6,973.18	104.26	147.74	-89.93	-393.20	-184.17	6,629.83	6,446.59	183.24	36.181									
13,500.00	6,984.11	6,974.24	6,973.11	105.69	147.73	-89.93	-393.20	-184.17	6,715.62	6,532.29	183.32	36.633									
13,600.00	6,984.03	6,974.17	6,973.03	107.13	147.73	-89.93	-393.20	-184.17	6,801.79	6,618.38	183.40	37.087									
13,700.00	6,983.96	6,974.09	6,972.96	108.57	147.73	-89.93	-393.20	-184.17	6,888.33	6,704.85	183.48	37.542									
13,800.00	6,983.88	6,974.02	6,972.88	110.02	147.73	-89.93	-393.20	-184.17	6,975.23	6,791.67	183.56	38.000									
13,900.00	6,983.81	6,973.95	6,972.81	111.47	147.73	-89.92	-393.20	-184.17	7,062.48	6,878.85	183.64	38.459									

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #053 - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		300-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	
14,000.00	6,983.74	6,973.87	6,972.74	112.92	147.73	-89.92	-393.20	-184.17	7,150.07	6,966.35	183.71	38.919		
14,100.00	6,983.66	6,973.80	6,972.66	114.38	147.72	-89.92	-393.20	-184.17	7,237.97	7,054.18	183.79	39.381		
14,200.00	6,983.59	6,973.73	6,972.59	115.85	147.72	-89.92	-393.20	-184.17	7,326.19	7,142.32	183.87	39.845		
14,300.00	6,983.52	6,973.65	6,972.52	117.31	147.72	-89.92	-393.20	-184.17	7,414.71	7,230.76	183.94	40.310		
14,400.00	6,983.44	6,973.58	6,972.44	118.78	147.72	-89.92	-393.20	-184.17	7,503.51	7,319.49	184.02	40.776		
14,500.00	6,983.37	6,973.51	6,972.37	120.26	147.72	-89.92	-393.20	-184.17	7,592.59	7,408.50	184.09	41.244		
14,600.00	6,983.30	6,973.43	6,972.30	121.74	147.72	-89.92	-393.20	-184.17	7,681.94	7,497.78	184.17	41.712		
14,700.00	6,983.22	6,973.36	6,972.22	123.22	147.71	-89.91	-393.20	-184.17	7,771.55	7,587.31	184.24	42.182		
14,800.00	6,983.15	6,973.28	6,972.15	124.70	147.71	-89.91	-393.20	-184.17	7,861.41	7,677.10	184.31	42.653		
14,900.00	6,983.08	6,973.21	6,972.08	126.19	147.71	-89.91	-393.20	-184.17	7,951.52	7,767.13	184.38	43.125		
15,000.00	6,983.00	6,973.14	6,972.00	127.68	147.71	-89.91	-393.20	-184.17	8,041.85	7,857.40	184.46	43.597		
15,100.00	6,982.93	6,973.06	6,971.93	129.17	147.71	-89.91	-393.20	-184.17	8,132.42	7,947.89	184.53	44.071		
15,200.00	6,982.85	6,972.99	6,971.85	130.67	147.71	-89.91	-393.20	-184.17	8,223.20	8,038.60	184.60	44.546		
15,300.00	6,982.78	6,972.92	6,971.78	132.16	147.70	-89.91	-393.20	-184.17	8,314.19	8,129.52	184.67	45.021		
15,400.00	6,982.71	6,972.84	6,971.71	133.66	147.70	-89.91	-393.20	-184.17	8,405.39	8,220.65	184.74	45.498		
15,500.00	6,982.63	6,972.77	6,971.63	135.17	147.70	-89.90	-393.20	-184.17	8,496.79	8,311.97	184.82	45.974		
15,600.00	6,982.56	6,972.70	6,971.56	136.67	147.70	-89.90	-393.20	-184.17	8,588.37	8,403.49	184.89	46.452		
15,700.00	6,982.49	6,972.62	6,971.49	138.18	147.70	-89.90	-393.20	-184.17	8,680.15	8,495.19	184.96	46.931		
15,800.00	6,982.41	6,972.55	6,971.41	139.69	147.70	-89.90	-393.20	-184.17	8,772.10	8,587.07	185.03	47.409		
15,900.00	6,982.34	6,972.47	6,971.34	141.20	147.69	-89.90	-393.20	-184.17	8,864.23	8,679.13	185.10	47.889		
16,000.00	6,982.27	6,972.40	6,971.27	142.71	147.69	-89.90	-393.20	-184.17	8,956.53	8,771.36	185.17	48.369		
16,100.00	6,982.19	6,972.33	6,971.19	144.23	147.69	-89.90	-393.20	-184.17	9,048.99	8,863.75	185.24	48.850		
16,200.00	6,982.12	6,972.25	6,971.12	145.75	147.69	-89.90	-393.20	-184.17	9,141.60	8,956.29	185.31	49.331		
16,300.00	6,982.05	6,972.18	6,971.05	147.27	147.69	-89.89	-393.20	-184.17	9,234.38	9,049.00	185.38	49.813		
16,400.00	6,981.97	6,972.11	6,970.97	148.79	147.69	-89.89	-393.20	-184.17	9,327.30	9,141.85	185.45	50.295		
16,500.00	6,981.90	6,972.03	6,970.90	150.31	147.68	-89.89	-393.20	-184.17	9,420.37	9,234.84	185.52	50.777		
16,600.00	6,981.82	6,971.96	6,970.82	151.84	147.68	-89.89	-393.20	-184.17	9,513.58	9,327.98	185.60	51.260		
16,700.00	6,981.75	6,971.89	6,970.75	153.36	147.68	-89.89	-393.20	-184.17	9,606.92	9,421.25	185.67	51.743		
16,800.00	6,981.68	6,971.81	6,970.68	154.89	147.68	-89.89	-393.20	-184.17	9,700.40	9,514.66	185.74	52.226		
16,900.00	6,981.60	6,971.74	6,970.60	156.42	147.68	-89.89	-393.20	-184.17	9,794.00	9,608.19	185.81	52.710		
17,000.00	6,981.53	6,971.67	6,970.53	157.95	147.67	-89.89	-393.20	-184.17	9,887.73	9,701.85	185.88	53.194		
17,100.00	6,981.46	6,971.59	6,970.46	159.49	147.67	-89.88	-393.20	-184.17	9,981.59	9,795.64	185.95	53.679		
17,200.00	6,981.38	6,971.52	6,970.38	161.02	147.67	-89.88	-393.20	-184.17	10,075.56	9,889.54	186.02	54.163		
17,300.00	6,981.31	6,971.44	6,970.31	162.56	147.67	-89.88	-393.20	-184.17	10,169.64	9,983.55	186.09	54.648		
17,400.00	6,981.24	6,971.37	6,970.24	164.09	147.67	-89.88	-393.20	-184.17	10,263.84	10,077.68	186.17	55.133		
17,500.00	6,981.16	6,971.30	6,970.16	165.63	147.67	-89.88	-393.20	-184.17	10,358.15	10,171.91	186.24	55.618		
17,600.00	6,981.09	6,971.22	6,970.09	167.17	147.66	-89.88	-393.20	-184.17	10,452.56	10,266.25	186.31	56.103		
17,700.00	6,981.01	6,971.15	6,970.01	168.71	147.66	-89.88	-393.20	-184.17	10,547.08	10,360.70	186.38	56.588		
17,800.00	6,980.94	6,971.08	6,969.94	170.25	147.66	-89.88	-393.20	-184.17	10,641.69	10,455.24	186.46	57.074		
17,900.00	6,980.87	6,971.00	6,969.87	171.80	147.66	-89.87	-393.20	-184.17	10,736.41	10,549.88	186.53	57.559		
18,000.00	6,980.79	6,970.93	6,969.79	173.34	147.66	-89.87	-393.20	-184.17	10,831.22	10,644.61	186.60	58.045		
18,100.00	6,980.72	6,970.86	6,969.72	174.89	147.66	-89.87	-393.20	-184.17	10,926.12	10,739.44	186.67	58.530		
18,200.00	6,980.65	6,970.78	6,969.65	176.43	147.65	-89.87	-393.20	-184.17	11,021.11	10,834.36	186.75	59.016		
18,300.00	6,980.57	6,970.71	6,969.57	177.98	147.65	-89.87	-393.20	-184.17	11,116.19	10,929.37	186.82	59.502		
18,400.00	6,980.50	6,970.64	6,969.50	179.53	147.65	-89.87	-393.20	-184.17	11,211.35	11,024.46	186.89	59.987		
18,500.00	6,980.43	6,970.56	6,969.43	181.08	147.65	-89.87	-393.20	-184.17	11,306.60	11,119.63	186.97	60.473		
18,600.00	6,980.35	6,970.49	6,969.35	182.63	147.65	-89.87	-393.20	-184.17	11,401.93	11,214.89	187.04	60.959		
18,700.00	6,980.28	6,970.41	6,969.28	184.18	147.65	-89.87	-393.20	-184.17	11,497.34	11,310.22	187.12	61.444		
18,800.00	6,980.21	6,970.34	6,969.21	185.73	147.64	-89.86	-393.20	-184.17	11,592.82	11,405.63	187.19	61.930		
18,900.00	6,980.13	6,970.27	6,969.13	187.28	147.64	-89.86	-393.20	-184.17	11,688.39	11,501.12	187.27	62.415		
19,000.00	6,980.06	6,970.19	6,969.06	188.84	147.64	-89.86	-393.20	-184.17	11,784.02	11,596.68	187.34	62.901		
19,100.00	6,979.98	6,970.12	6,968.98	190.39	147.64	-89.86	-393.20	-184.17	11,879.73	11,692.31	187.42	63.386		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #053 - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		300-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		
19,200.00	6,979.91	6,970.05	6,968.91	191.95	147.64	-89.86	-393.20	-184.17	11,975.51	11,788.01	187.49	63.871		
19,300.00	6,979.84	6,969.97	6,968.84	193.51	147.64	-89.86	-393.20	-184.17	12,071.35	11,883.78	187.57	64.356		
19,400.00	6,979.76	6,969.90	6,968.76	195.06	147.63	-89.86	-393.20	-184.17	12,167.27	11,979.62	187.65	64.841		
19,500.00	6,979.69	6,969.83	6,968.69	196.62	147.63	-89.86	-393.20	-184.17	12,263.24	12,075.52	187.72	65.326		
19,600.00	6,979.62	6,969.75	6,968.62	198.18	147.63	-89.85	-393.20	-184.17	12,359.29	12,171.48	187.80	65.811		
19,700.00	6,979.54	6,969.68	6,968.54	199.74	147.63	-89.85	-393.20	-184.17	12,455.39	12,267.51	187.88	66.295		
19,800.00	6,979.47	6,969.60	6,968.47	201.30	147.63	-89.85	-393.20	-184.17	12,551.55	12,363.60	187.96	66.779		
19,900.00	6,979.40	6,969.53	6,968.40	202.86	147.63	-89.85	-393.20	-184.17	12,647.78	12,459.75	188.03	67.263		
20,000.00	6,979.32	6,969.46	6,968.32	204.42	147.62	-89.85	-393.20	-184.17	12,744.06	12,555.95	188.11	67.747		
20,100.00	6,979.25	6,969.38	6,968.25	205.98	147.62	-89.85	-393.20	-184.17	12,840.40	12,652.21	188.19	68.231		
20,200.00	6,979.18	6,969.31	6,968.18	207.55	147.62	-89.85	-393.20	-184.17	12,936.80	12,748.53	188.27	68.715		
20,300.00	6,979.10	6,969.24	6,968.10	209.11	147.62	-89.85	-393.20	-184.17	13,033.25	12,844.90	188.35	69.198		
20,400.00	6,979.03	6,969.16	6,968.03	210.68	147.62	-89.84	-393.20	-184.17	13,129.75	12,941.32	188.43	69.681		
20,500.00	6,978.95	6,969.09	6,967.95	212.24	147.62	-89.84	-393.20	-184.17	13,226.30	13,037.80	188.51	70.164		
20,600.00	6,978.88	6,969.02	6,967.88	213.81	147.61	-89.84	-393.20	-184.17	13,322.91	13,134.32	188.59	70.646		
20,700.00	6,978.81	6,968.94	6,967.81	215.37	147.61	-89.84	-393.20	-184.17	13,419.56	13,230.90	188.67	71.128		
20,800.00	6,978.73	6,968.87	6,967.73	216.94	147.61	-89.84	-393.20	-184.17	13,516.27	13,327.52	188.75	71.610		
20,900.00	6,978.66	6,968.80	6,967.66	218.51	147.61	-89.84	-393.20	-184.17	13,613.02	13,424.19	188.83	72.092		
21,000.00	6,978.59	6,968.72	6,967.59	220.07	147.61	-89.84	-393.20	-184.17	13,709.82	13,520.91	188.91	72.574		
21,100.00	6,978.51	6,968.65	6,967.51	221.64	147.61	-89.84	-393.20	-184.17	13,806.66	13,617.67	188.99	73.055		
21,200.00	6,978.44	6,968.57	6,967.44	223.21	147.60	-89.83	-393.20	-184.17	13,903.55	13,714.47	189.07	73.536		
21,300.00	6,978.37	6,968.50	6,967.37	224.78	147.60	-89.83	-393.20	-184.17	14,000.48	13,811.32	189.15	74.016		
21,400.00	6,978.29	6,968.43	6,967.29	226.35	147.60	-89.83	-393.20	-184.17	14,097.45	13,908.22	189.24	74.496		
21,500.00	6,978.22	6,968.35	6,967.22	227.92	147.60	-89.83	-393.20	-184.17	14,194.47	14,005.15	189.32	74.976		
21,600.00	6,978.14	6,968.28	6,967.14	229.49	147.60	-89.83	-393.20	-184.17	14,291.53	14,102.13	189.40	75.456		
21,700.00	6,978.07	6,968.21	6,967.07	231.06	147.60	-89.83	-393.20	-184.17	14,388.63	14,199.14	189.49	75.935		
21,800.00	6,978.00	6,968.13	6,967.00	232.63	147.59	-89.83	-393.20	-184.17	14,485.77	14,296.20	189.57	76.414		
21,900.00	6,977.92	6,968.06	6,966.92	234.21	147.59	-89.83	-393.20	-184.17	14,582.94	14,393.29	189.65	76.892		
22,000.00	6,977.85	6,967.99	6,966.85	235.78	147.59	-89.82	-393.20	-184.17	14,680.16	14,490.42	189.74	77.371		
22,100.00	6,977.78	6,967.91	6,966.78	237.35	147.59	-89.82	-393.20	-184.17	14,777.41	14,587.58	189.82	77.849		
22,200.00	6,977.70	6,967.84	6,966.70	238.92	147.59	-89.82	-393.20	-184.17	14,874.70	14,684.79	189.91	78.326		
22,300.00	6,977.63	6,967.77	6,966.63	240.50	147.59	-89.82	-393.20	-184.17	14,972.02	14,782.03	189.99	78.803		
22,400.00	6,977.56	6,967.69	6,966.56	242.07	147.58	-89.82	-393.20	-184.17	15,069.38	14,879.30	190.08	79.280		
22,500.00	6,977.48	6,967.62	6,966.48	243.65	147.58	-89.82	-393.20	-184.17	15,166.77	14,976.61	190.16	79.756		
22,600.00	6,977.41	6,967.54	6,966.41	245.22	147.58	-89.82	-393.20	-184.17	15,264.20	15,073.95	190.25	80.232		
22,700.00	6,977.34	6,967.47	6,966.34	246.80	147.58	-89.82	-393.20	-184.17	15,361.66	15,171.32	190.34	80.708		
22,800.00	6,977.26	6,967.40	6,966.26	248.37	147.58	-89.81	-393.20	-184.17	15,459.15	15,268.73	190.42	81.183		
22,900.00	6,977.19	6,967.32	6,966.19	249.95	147.57	-89.81	-393.20	-184.17	15,556.67	15,366.16	190.51	81.658		
23,000.00	6,977.11	6,967.25	6,966.11	251.53	147.57	-89.81	-393.20	-184.17	15,654.23	15,463.63	190.60	82.132		
23,100.00	6,977.04	6,967.18	6,966.04	253.10	147.57	-89.81	-393.20	-184.17	15,751.82	15,561.13	190.69	82.606		
23,155.65	6,977.00	6,967.14	6,966.00	253.98	147.57	-89.81	-393.20	-184.17	15,806.14	15,615.40	190.73	82.870		
23,156.15	6,977.00	6,967.14	6,966.00	254.06	147.57	-89.81	-393.20	-184.17	15,806.63	15,611.69	194.94	81.086		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #072C - OH - OH-SVY													Offset Site Error: 0.00 usft
Survey Program: 320-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	48.78	48.78	0.00	0.06	-69.45	2,398.83	-6,398.16	6,833.08				
100.00	100.00	1,244.67	1,228.14	0.25	3.52	-70.46	2,255.40	-6,356.64	6,828.33	6,824.69	3.64	1,875.888	
200.00	200.00	1,302.12	1,283.82	0.61	3.78	-70.56	2,241.96	-6,352.33	6,813.11	6,808.99	4.12	1,652.034	
300.00	300.00	1,419.64	1,397.62	0.97	4.35	-70.76	2,213.85	-6,343.86	6,798.09	6,793.14	4.95	1,374.090	
400.00	400.00	1,533.98	1,508.18	1.33	4.93	-70.96	2,185.92	-6,335.49	6,782.84	6,777.05	5.79	1,170.827	
500.00	500.00	1,594.00	1,566.21	1.68	5.21	-71.07	2,171.21	-6,331.15	6,767.72	6,761.33	6.39	1,059.480	
600.00	599.98	1,635.47	1,606.43	2.04	5.38	-81.44	2,161.51	-6,328.27	6,753.06	6,746.16	6.89	979.667	
700.00	699.84	1,687.86	1,657.44	2.41	5.60	-81.83	2,150.10	-6,324.81	6,738.73	6,731.29	7.44	905.413	
800.00	799.45	1,777.97	1,745.24	2.77	5.99	-82.33	2,130.70	-6,319.08	6,724.37	6,716.22	8.15	825.289	
900.00	898.70	1,922.56	1,885.98	3.13	6.66	-83.02	2,098.93	-6,309.60	6,709.37	6,700.26	9.11	736.836	
1,000.00	997.47	2,015.07	1,975.73	3.50	7.11	-83.62	2,077.29	-6,303.70	6,693.78	6,683.89	9.88	677.174	
1,100.00	1,095.63	2,197.69	2,152.51	3.89	8.00	-82.19	2,033.47	-6,290.32	6,676.33	6,665.26	11.06	603.540	
1,200.00	1,193.09	2,286.48	2,238.30	4.29	8.45	-81.18	2,011.57	-6,283.72	6,657.91	6,646.04	11.87	560.806	
1,300.00	1,289.73	2,362.71	2,312.04	4.72	8.82	-80.59	1,993.11	-6,277.94	6,638.65	6,626.03	12.63	525.829	
1,400.00	1,385.42	2,430.12	2,377.34	5.16	9.12	-80.27	1,977.19	-6,272.86	6,618.83	6,605.48	13.35	495.762	
1,496.97	1,477.20	2,503.37	2,448.30	5.62	9.47	-80.22	1,959.80	-6,267.57	6,599.15	6,585.02	14.13	467.058	
1,500.00	1,480.05	2,506.24	2,451.07	5.63	9.48	-80.23	1,959.11	-6,267.36	6,598.53	6,584.37	14.16	466.076	
1,600.00	1,574.15	2,567.14	2,510.07	6.12	9.78	-80.52	1,944.64	-6,263.00	6,578.22	6,563.30	14.92	440.867	
1,700.00	1,668.25	2,616.29	2,557.83	6.62	10.00	-80.74	1,933.54	-6,259.61	6,558.77	6,543.14	15.64	419.429	
1,800.00	1,762.35	2,701.08	2,640.30	7.12	10.37	-81.13	1,914.66	-6,253.94	6,539.98	6,523.49	16.50	396.465	
1,900.00	1,856.45	2,771.79	2,709.08	7.64	10.69	-81.46	1,898.98	-6,249.12	6,521.53	6,504.22	17.31	376.742	
2,000.00	1,950.55	2,883.30	2,817.53	8.16	11.19	-81.98	1,874.17	-6,241.55	6,503.44	6,485.14	18.30	355.331	
2,100.00	2,044.65	2,995.63	2,926.64	8.68	11.72	-82.50	1,848.66	-6,233.65	6,485.49	6,466.17	19.32	335.608	
2,200.00	2,138.75	3,085.19	3,013.49	9.21	12.15	-82.93	1,827.82	-6,227.12	6,467.59	6,447.33	20.26	319.180	
2,300.00	2,232.85	3,145.55	3,072.10	9.74	12.42	-83.22	1,814.01	-6,222.75	6,450.25	6,429.18	21.07	306.168	
2,400.00	2,326.95	3,190.03	3,115.33	10.27	12.62	-83.43	1,804.06	-6,219.69	6,433.73	6,411.92	21.81	295.000	
2,500.00	2,421.05	3,229.00	3,153.32	10.81	12.78	-83.61	1,795.73	-6,217.20	6,418.21	6,395.68	22.53	284.852	
2,600.00	2,515.15	3,262.59	3,186.17	11.34	12.91	-83.76	1,788.97	-6,215.23	6,403.73	6,380.50	23.23	275.711	
2,700.00	2,609.25	3,303.38	3,226.19	11.88	13.07	-83.94	1,781.41	-6,213.03	6,390.31	6,366.37	23.94	266.882	
2,800.00	2,703.35	3,368.16	3,289.92	12.42	13.30	-84.23	1,770.28	-6,209.63	6,377.66	6,352.92	24.73	257.874	
2,900.00	2,797.45	3,417.00	3,338.06	12.96	13.47	-84.44	1,762.41	-6,207.20	6,365.79	6,340.32	25.46	249.990	
3,000.00	2,891.55	3,445.25	3,365.95	13.51	13.56	-84.56	1,758.10	-6,205.98	6,354.94	6,328.82	26.13	243.216	
3,100.00	2,985.65	3,480.00	3,400.32	14.05	13.67	-84.70	1,753.15	-6,204.79	6,345.29	6,318.48	26.81	236.652	
3,200.00	3,079.75	3,551.02	3,470.64	14.60	13.89	-85.00	1,743.40	-6,202.70	6,336.52	6,308.92	27.60	229.584	
3,300.00	3,173.85	3,644.24	3,563.08	15.14	14.16	-85.38	1,731.79	-6,199.66	6,328.02	6,299.59	28.43	222.568	
3,400.00	3,267.95	3,699.67	3,618.16	15.69	14.31	-85.59	1,725.93	-6,197.78	6,320.00	6,290.85	29.15	216.834	
3,500.00	3,362.05	3,732.00	3,650.34	16.23	14.39	-85.72	1,722.92	-6,196.84	6,312.93	6,283.13	29.80	211.832	
3,600.00	3,456.15	3,794.00	3,712.15	16.78	14.52	-85.94	1,718.33	-6,195.44	6,306.85	6,276.34	30.51	206.739	
3,700.00	3,550.25	3,832.13	3,750.23	17.33	14.59	-86.08	1,716.31	-6,194.79	6,301.67	6,270.52	31.15	202.304	
3,800.00	3,644.35	3,905.77	3,823.79	17.88	14.72	-86.33	1,713.02	-6,193.80	6,297.24	6,265.39	31.85	197.712	
3,900.00	3,738.45	3,996.86	3,914.78	18.42	14.89	-86.64	1,709.04	-6,192.62	6,293.12	6,260.53	32.59	193.126	
4,000.00	3,832.55	4,087.96	4,005.78	18.97	15.05	-86.95	1,705.11	-6,191.45	6,289.24	6,255.92	33.32	188.750	
4,100.00	3,926.65	4,179.09	4,096.83	19.52	15.21	-87.27	1,701.23	-6,190.30	6,285.61	6,251.55	34.06	184.569	
4,200.00	4,020.75	4,270.27	4,187.92	20.07	15.37	-87.58	1,697.40	-6,189.16	6,282.22	6,247.43	34.79	180.573	
4,300.00	4,114.85	4,361.50	4,279.06	20.62	15.53	-87.89	1,693.62	-6,188.04	6,279.08	6,243.55	35.53	176.749	
4,400.00	4,208.95	4,452.76	4,370.24	21.17	15.69	-88.21	1,689.89	-6,186.93	6,276.18	6,239.92	36.26	173.087	
4,500.00	4,303.05	4,544.07	4,461.47	21.72	15.86	-88.52	1,686.22	-6,185.84	6,273.53	6,236.54	36.99	169.579	
4,600.00	4,397.15	4,635.42	4,552.74	22.27	16.02	-88.83	1,682.59	-6,184.76	6,271.13	6,233.40	37.73	166.215	
4,700.00	4,491.25	4,726.81	4,644.06	22.82	16.18	-89.14	1,679.01	-6,183.70	6,268.96	6,230.50	38.46	162.987	
4,800.00	4,585.35	4,818.24	4,735.42	23.37	16.34	-89.46	1,675.49	-6,182.65	6,267.04	6,227.84	39.20	159.887	
4,900.00	4,679.45	4,909.72	4,826.82	23.93	16.51	-89.77	1,672.02	-6,181.62	6,265.36	6,225.43	39.93	156.908	
5,000.00	4,773.55	5,001.24	4,918.27	24.48	16.67	-90.08	1,668.59	-6,180.60	6,263.92	6,223.26	40.66	154.045	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design:		Rosa Unit 34 - (O) Rosa Unit #072C - OH - OH-SVY											Offset Site Error:		0.00 usft	
Survey Program:		320-APC_ISCWSA REV 2 MWD											Offset Well Error:		0.00 usft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Rule Assigned:				Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor				
5,100.00	4,867.65	5,092.80	5,009.76	25.03	16.83	-90.39	1,665.22	-6,179.60	6,262.72	6,221.32	41.40	151.290				
5,200.00	4,961.75	5,184.40	5,101.30	25.58	16.99	-90.70	1,661.90	-6,178.61	6,261.76	6,219.63	42.13	148.638				
5,300.00	5,055.85	5,276.05	5,192.88	26.13	17.16	-91.01	1,658.63	-6,177.64	6,261.04	6,218.18	42.86	146.084				
5,400.00	5,149.95	5,367.73	5,284.51	26.68	17.32	-91.33	1,655.41	-6,176.69	6,260.55	6,216.96	43.59	143.624				
5,500.00	5,244.05	5,459.46	5,376.18	27.24	17.48	-91.64	1,652.25	-6,175.74	6,260.31	6,215.99	44.32	141.251				
5,554.81	5,295.63	5,509.76	5,426.44	27.54	17.57	-91.81	1,650.53	-6,175.24	6,260.27	6,215.55	44.72	139.987				
5,600.00	5,338.15	5,551.23	5,467.89	27.79	17.65	-91.95	1,649.13	-6,174.82	6,260.30	6,215.25	45.05	138.963				
5,665.73	5,400.00	5,611.57	5,528.19	28.15	17.75	-92.15	1,647.11	-6,174.22	6,260.42	6,214.89	45.53	137.503				
5,700.00	5,432.28	5,643.08	5,559.68	28.34	17.81	-92.26	1,646.07	-6,173.91	6,260.51	6,214.74	45.78	136.757				
5,800.00	5,526.87	5,735.46	5,652.01	28.88	17.98	-92.56	1,643.04	-6,173.01	6,260.91	6,214.41	46.49	134.658				
5,900.00	5,622.01	5,828.48	5,744.97	29.41	18.14	-92.86	1,640.04	-6,172.12	6,261.43	6,214.23	47.20	132.667				
6,000.00	5,717.67	5,922.10	5,838.54	29.92	18.31	-93.14	1,637.08	-6,171.24	6,262.05	6,214.17	47.88	130.777				
6,100.00	5,813.83	6,016.30	5,932.69	30.41	18.48	-93.41	1,634.16	-6,170.37	6,262.75	6,214.20	48.55	128.983				
6,200.00	5,910.44	6,111.04	6,027.39	30.89	18.65	-93.66	1,631.28	-6,169.51	6,263.51	6,214.30	49.21	127.278				
6,300.00	6,007.50	6,206.30	6,122.60	31.36	18.82	-93.90	1,628.43	-6,168.67	6,264.29	6,214.44	49.85	125.658				
6,400.00	6,104.96	6,302.03	6,218.29	31.80	18.99	-94.13	1,625.64	-6,167.84	6,265.08	6,214.60	50.48	124.116				
6,500.00	6,202.80	6,398.22	6,314.43	32.24	19.16	-94.35	1,622.88	-6,167.02	6,265.85	6,214.76	51.09	122.649				
6,600.00	6,300.98	6,494.82	6,410.99	32.66	19.33	-94.55	1,620.18	-6,166.22	6,266.58	6,214.90	51.68	121.252				
6,700.00	6,399.48	6,591.80	6,507.94	33.06	19.51	-94.73	1,617.52	-6,165.43	6,267.27	6,215.01	52.26	119.921				
6,722.82	6,422.00	6,613.99	6,530.11	33.15	19.55	-94.77	1,616.92	-6,165.25	6,267.41	6,215.02	52.39	119.627				
6,750.00	6,448.76	6,640.34	6,556.45	33.26	19.59	-85.05	1,616.21	-6,165.04	6,267.18	6,214.63	52.55	119.263				
6,800.00	6,497.51	6,688.28	6,604.37	33.48	19.68	-74.04	1,614.93	-6,164.66	6,264.61	6,211.75	52.86	118.520				
6,850.00	6,545.40	6,735.28	6,651.36	33.72	19.76	-67.99	1,613.69	-6,164.29	6,259.31	6,206.13	53.19	117.688				
6,900.00	6,592.13	6,781.06	6,697.12	33.97	19.84	-64.53	1,612.50	-6,163.93	6,251.33	6,197.80	53.53	116.775				
6,950.00	6,637.40	6,825.33	6,741.37	34.25	19.92	-62.60	1,611.36	-6,163.60	6,240.74	6,186.85	53.90	115.790				
7,000.00	6,680.94	6,867.81	6,783.84	34.54	20.00	-61.69	1,610.27	-6,163.27	6,227.63	6,173.35	54.28	114.739				
7,050.00	6,722.48	6,908.27	6,824.28	34.85	20.07	-61.50	1,609.25	-6,162.97	6,212.09	6,157.42	54.67	113.631				
7,100.00	6,761.76	6,946.43	6,862.43	35.17	20.14	-61.90	1,608.30	-6,162.69	6,194.25	6,139.18	55.07	112.474				
7,150.00	6,798.55	6,982.07	6,898.06	35.51	20.20	-62.78	1,607.41	-6,162.42	6,174.26	6,118.77	55.49	111.274				
7,200.00	6,832.61	7,014.97	6,930.95	35.86	20.26	-64.08	1,606.61	-6,162.18	6,152.24	6,096.33	55.91	110.039				
7,250.00	6,863.74	7,044.92	6,960.89	36.22	20.32	-65.78	1,605.88	-6,161.97	6,128.38	6,072.04	56.34	108.776				
7,300.00	6,891.74	7,071.75	6,987.71	36.59	20.36	-67.83	1,605.23	-6,161.78	6,102.83	6,046.05	56.77	107.492				
7,350.00	6,916.44	7,095.27	7,011.23	36.98	20.41	-70.21	1,604.66	-6,161.61	6,075.78	6,018.56	57.21	106.192				
7,400.00	6,937.69	7,115.35	7,031.30	37.37	20.44	-72.90	1,604.18	-6,161.47	6,047.42	5,989.76	57.66	104.884				
7,450.00	6,955.36	7,131.86	7,047.80	37.78	20.47	-75.88	1,603.79	-6,161.35	6,017.93	5,959.83	58.10	103.575				
7,500.00	6,969.34	7,144.70	7,060.63	38.19	20.49	-79.10	1,603.49	-6,161.26	5,987.52	5,928.97	58.55	102.269				
7,550.00	6,979.53	7,153.77	7,069.71	38.62	20.51	-82.52	1,603.27	-6,161.19	5,956.39	5,897.40	58.99	100.974				
7,600.00	6,985.89	7,159.03	7,074.96	39.05	20.52	-86.11	1,603.15	-6,161.16	5,924.73	5,865.30	59.43	99.696				
7,650.00	6,988.37	7,160.44	7,076.37	39.48	20.52	-89.80	1,603.12	-6,161.15	5,892.74	5,832.88	59.86	98.439				
7,657.25	6,988.40	7,160.32	7,076.25	39.54	20.52	-90.34	1,603.12	-6,161.15	5,888.08	5,828.16	59.92	98.259				
7,700.00	6,988.37	7,159.39	7,075.32	39.92	20.52	-90.32	1,603.14	-6,161.16	5,860.73	5,800.43	60.29	97.203				
7,800.00	6,988.30	7,157.22	7,073.15	40.82	20.52	-90.30	1,603.19	-6,161.17	5,797.46	5,736.28	61.18	94.758				
7,900.00	6,988.23	7,155.04	7,070.97	41.77	20.51	-90.27	1,603.24	-6,161.19	5,735.24	5,673.14	62.10	92.352				
8,000.00	6,988.16	7,152.86	7,068.80	42.75	20.51	-90.24	1,603.30	-6,161.20	5,674.10	5,611.05	63.05	89.989				
8,100.00	6,988.09	7,150.68	7,066.61	43.76	20.51	-90.21	1,603.35	-6,161.22	5,614.07	5,550.04	64.03	87.672				
8,152.35	6,988.06	7,149.53	7,065.47	44.30	20.50	-90.20	1,603.37	-6,161.22	5,583.10	5,518.54	64.56	86.479				
8,200.00	6,988.02	7,148.50	7,064.44	44.79	20.50	-90.19	1,603.40	-6,161.23	5,554.56	5,489.52	65.04	85.401				
8,300.00	6,987.95	7,146.40	7,062.34	45.83	20.50	-90.18	1,603.45	-6,161.25	5,491.42	5,425.38	66.03	83.161				
8,400.00	6,987.88	7,144.40	7,060.34	46.85	20.49	-90.17	1,603.50	-6,161.26	5,424.03	5,357.03	67.00	80.955				
8,500.00	6,987.80	7,142.51	7,058.45	47.85	20.49	-90.15	1,603.54	-6,161.27	5,352.58	5,284.65	67.93	78.790				
8,600.00	6,987.73	7,140.73	7,056.67	48.83	20.49	-90.14	1,603.58	-6,161.29	5,277.25	5,208.42	68.83	76.672				
8,700.00	6,987.65	7,139.08	7,055.02	49.79	20.48	-90.12	1,603.62	-6,161.30	5,198.25	5,128.57	69.68	74.603				

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #072C - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program:		320-APC_ISCWSA REV 2 MWD						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)
8,800.00	6,987.57	7,137.57	7,053.51	50.72	20.48	-90.11	1,603.66	-6,161.31	5,115.80	5,045.33	70.48	72.587	
8,900.00	6,987.50	7,136.20	7,052.14	51.62	20.48	-90.09	1,603.69	-6,161.32	5,030.15	4,958.93	71.22	70.629	
9,000.00	6,987.42	7,134.98	7,050.92	52.48	20.48	-90.08	1,603.72	-6,161.33	4,941.56	4,869.66	71.90	68.730	
9,100.00	6,987.34	7,133.91	7,049.85	53.30	20.48	-90.06	1,603.74	-6,161.33	4,850.30	4,777.80	72.51	66.895	
9,200.00	6,987.27	7,133.00	7,048.94	54.08	20.47	-90.04	1,603.77	-6,161.34	4,756.70	4,683.66	73.04	65.125	
9,215.33	6,987.26	7,132.88	7,048.82	54.20	20.47	-90.03	1,603.77	-6,161.34	4,742.16	4,669.04	73.11	64.859	
9,300.00	6,987.20	7,132.20	7,048.14	54.85	20.47	-90.01	1,603.78	-6,161.35	4,661.81	4,588.28	73.53	63.403	
9,400.00	6,987.12	7,131.40	7,047.34	55.65	20.47	-89.98	1,603.80	-6,161.35	4,567.11	4,493.08	74.03	61.692	
9,500.00	6,987.05	7,130.60	7,046.55	56.48	20.47	-89.95	1,603.82	-6,161.36	4,472.64	4,398.09	74.56	59.990	
9,600.00	6,986.98	7,129.80	7,045.75	57.35	20.47	-89.92	1,603.84	-6,161.36	4,378.42	4,303.32	75.11	58.297	
9,700.00	6,986.90	7,129.00	7,044.95	58.24	20.47	-89.88	1,603.86	-6,161.37	4,284.46	4,208.79	75.68	56.614	
9,800.00	6,986.83	7,128.20	7,044.15	59.17	20.47	-89.85	1,603.88	-6,161.37	4,190.78	4,114.51	76.28	54.942	
9,900.00	6,986.75	7,127.40	7,043.35	60.12	20.46	-89.82	1,603.90	-6,161.38	4,097.40	4,020.50	76.90	53.282	
10,000.00	6,986.68	7,126.60	7,042.55	61.10	20.46	-89.79	1,603.92	-6,161.39	4,004.34	3,926.79	77.55	51.634	
10,100.00	6,986.61	7,125.80	7,041.75	62.11	20.46	-89.76	1,603.94	-6,161.39	3,911.62	3,833.39	78.23	49.998	
10,200.00	6,986.53	7,125.00	7,040.95	63.14	20.46	-89.73	1,603.96	-6,161.40	3,819.27	3,740.32	78.95	48.377	
10,300.00	6,986.46	7,124.20	7,040.14	64.20	20.46	-89.70	1,603.97	-6,161.40	3,727.31	3,647.62	79.69	46.770	
10,400.00	6,986.39	7,123.40	7,039.34	65.28	20.46	-89.67	1,603.99	-6,161.41	3,635.78	3,555.31	80.48	45.178	
10,500.00	6,986.31	7,122.60	7,038.54	66.38	20.46	-89.64	1,604.01	-6,161.41	3,544.71	3,463.41	81.29	43.603	
10,600.00	6,986.24	7,121.79	7,037.74	67.50	20.45	-89.61	1,604.03	-6,161.42	3,454.13	3,371.97	82.15	42.046	
10,700.00	6,986.17	7,120.99	7,036.94	68.64	20.45	-89.57	1,604.05	-6,161.43	3,364.08	3,281.03	83.05	40.506	
10,800.00	6,986.09	7,120.19	7,036.13	69.80	20.45	-89.54	1,604.07	-6,161.43	3,274.61	3,190.61	83.99	38.987	
10,900.00	6,986.02	7,119.39	7,035.33	70.98	20.45	-89.51	1,604.09	-6,161.44	3,185.76	3,100.78	84.98	37.488	
11,000.00	6,985.95	7,118.58	7,034.53	72.17	20.45	-89.48	1,604.11	-6,161.44	3,097.60	3,011.58	86.02	36.012	
11,100.00	6,985.87	7,117.78	7,033.72	73.38	20.45	-89.45	1,604.13	-6,161.45	3,010.17	2,923.07	87.10	34.560	
11,200.00	6,985.80	7,116.97	7,032.92	74.61	20.45	-89.42	1,604.15	-6,161.45	2,923.55	2,835.31	88.24	33.132	
11,300.00	6,985.72	7,116.17	7,032.12	75.85	20.44	-89.39	1,604.17	-6,161.46	2,837.81	2,748.38	89.43	31.731	
11,400.00	6,985.65	7,115.36	7,031.31	77.10	20.44	-89.36	1,604.18	-6,161.46	2,753.03	2,662.35	90.68	30.359	
11,500.00	6,985.58	7,114.56	7,030.51	78.37	20.44	-89.33	1,604.20	-6,161.47	2,669.31	2,577.32	91.99	29.017	
11,600.00	6,985.50	7,113.75	7,029.70	79.65	20.44	-89.29	1,604.22	-6,161.48	2,586.74	2,493.38	93.36	27.707	
11,700.00	6,985.43	7,112.95	7,028.90	80.94	20.44	-89.26	1,604.24	-6,161.48	2,505.45	2,410.66	94.79	26.432	
11,800.00	6,985.36	7,112.14	7,028.09	82.24	20.44	-89.23	1,604.26	-6,161.49	2,425.55	2,329.27	96.28	25.193	
11,900.00	6,985.28	7,111.33	7,027.28	83.56	20.44	-89.20	1,604.28	-6,161.49	2,347.19	2,249.36	97.83	23.993	
12,000.00	6,985.21	7,110.53	7,026.48	84.88	20.43	-89.17	1,604.30	-6,161.50	2,270.53	2,171.09	99.44	22.834	
12,100.00	6,985.14	7,109.72	7,025.67	86.21	20.43	-89.14	1,604.32	-6,161.50	2,195.75	2,094.65	101.10	21.719	
12,200.00	6,985.06	7,108.91	7,024.86	87.56	20.43	-89.11	1,604.34	-6,161.51	2,123.05	2,020.24	102.80	20.651	
12,300.00	6,984.99	7,108.11	7,024.06	88.91	20.43	-89.08	1,604.36	-6,161.52	2,052.64	1,948.09	104.55	19.633	
12,400.00	6,984.92	7,107.30	7,023.25	90.27	20.43	-89.05	1,604.38	-6,161.52	1,984.78	1,878.46	106.32	18.668	
12,500.00	6,984.84	7,106.49	7,022.44	91.64	20.43	-89.01	1,604.40	-6,161.53	1,919.73	1,811.63	108.10	17.758	
12,600.00	6,984.77	7,105.68	7,021.63	93.01	20.43	-88.98	1,604.42	-6,161.53	1,857.79	1,747.91	109.88	16.908	
12,700.00	6,984.69	7,104.87	7,020.82	94.40	20.42	-88.95	1,604.43	-6,161.54	1,799.27	1,687.66	111.61	16.121	
12,800.00	6,984.62	7,104.06	7,020.01	95.79	20.42	-88.92	1,604.45	-6,161.55	1,744.53	1,631.25	113.28	15.400	
12,900.00	6,984.55	7,103.25	7,019.20	97.18	20.42	-88.89	1,604.47	-6,161.55	1,693.93	1,579.09	114.84	14.750	
13,000.00	6,984.47	7,102.44	7,018.39	98.59	20.42	-88.86	1,604.49	-6,161.56	1,647.84	1,531.59	116.26	14.174	
13,100.00	6,984.40	7,101.63	7,017.58	100.00	20.42	-88.83	1,604.51	-6,161.56	1,606.67	1,489.19	117.48	13.676	
13,200.00	6,984.33	7,100.82	7,016.77	101.41	20.42	-88.80	1,604.53	-6,161.57	1,570.79	1,452.33	118.47	13.259	
13,300.00	6,984.25	7,100.01	7,015.96	102.83	20.41	-88.76	1,604.55	-6,161.57	1,540.58	1,421.41	119.17	12.928	
13,400.00	6,984.18	7,099.20	7,015.15	104.26	20.41	-88.73	1,604.57	-6,161.58	1,516.37	1,396.83	119.54	12.685	
13,500.00	6,984.11	7,098.39	7,014.34	105.69	20.41	-88.70	1,604.59	-6,161.59	1,498.46	1,378.91	119.55	12.534	
13,600.00	6,984.03	7,097.58	7,013.53	107.13	20.41	-88.67	1,604.61	-6,161.59	1,487.07	1,367.89	119.18	12.477 SF	
13,700.00	6,983.96	7,096.77	7,012.72	108.57	20.41	-88.64	1,604.63	-6,161.60	1,482.35	1,363.93	118.42	12.518 ES	
13,720.04	6,983.94	7,096.60	7,012.56	108.86	20.41	-88.63	1,604.63	-6,161.60	1,482.22	1,364.00	118.22	12.538 CC	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #072C - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program:		320-APC_ISCWSA REV 2 MWD						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)
13,800.00	6,983.88	7,095.95	7,011.91	110.02	20.41	-88.61	1,604.65	-6,161.60	1,484.37	1,367.09	117.28	12.657	
13,900.00	6,983.81	7,095.14	7,011.09	111.47	20.41	-88.58	1,604.67	-6,161.61	1,493.10	1,377.32	115.78	12.896	
14,000.00	6,983.74	7,094.33	7,010.28	112.92	20.40	-88.54	1,604.69	-6,161.61	1,508.42	1,394.47	113.96	13.237	
14,100.00	6,983.66	7,093.51	7,009.47	114.38	20.40	-88.51	1,604.71	-6,161.62	1,530.14	1,418.27	111.86	13.679	
14,200.00	6,983.59	7,092.70	7,008.65	115.85	20.40	-88.48	1,604.73	-6,161.63	1,557.98	1,448.43	109.55	14.221	
14,300.00	6,983.52	7,091.89	7,007.84	117.31	20.40	-88.45	1,604.75	-6,161.63	1,591.63	1,484.55	107.08	14.864	
14,400.00	6,983.44	7,091.07	7,007.03	118.78	20.40	-88.42	1,604.76	-6,161.64	1,630.73	1,526.23	104.50	15.605	
14,500.00	6,983.37	7,090.26	7,006.21	120.26	20.40	-88.39	1,604.78	-6,161.64	1,674.89	1,573.03	101.86	16.443	
14,600.00	6,983.30	7,089.44	7,005.40	121.74	20.40	-88.36	1,604.80	-6,161.65	1,723.73	1,624.52	99.21	17.375	
14,700.00	6,983.22	7,088.63	7,004.58	123.22	20.39	-88.32	1,604.82	-6,161.65	1,776.86	1,680.28	96.58	18.398	
14,800.00	6,983.15	7,087.81	7,003.77	124.70	20.39	-88.29	1,604.84	-6,161.66	1,833.90	1,739.90	94.00	19.509	
14,900.00	6,983.08	7,087.00	7,002.95	126.19	20.39	-88.26	1,604.86	-6,161.67	1,894.51	1,803.01	91.50	20.705	
15,000.00	6,983.00	7,086.18	7,002.14	127.68	20.39	-88.23	1,604.88	-6,161.67	1,958.36	1,869.26	89.10	21.980	
15,100.00	6,982.93	7,085.36	7,001.32	129.17	20.39	-88.20	1,604.90	-6,161.68	2,025.13	1,938.33	86.79	23.332	
15,200.00	6,982.85	7,084.55	7,000.50	130.67	20.39	-88.17	1,604.92	-6,161.68	2,094.54	2,009.94	84.61	24.756	
15,300.00	6,982.78	7,083.73	6,999.69	132.16	20.39	-88.13	1,604.94	-6,161.69	2,166.35	2,083.82	82.54	26.248	
15,400.00	6,982.71	7,082.91	6,998.87	133.66	20.38	-88.10	1,604.96	-6,161.70	2,240.32	2,159.74	80.58	27.802	
15,500.00	6,982.63	7,082.09	6,998.05	135.17	20.38	-88.07	1,604.98	-6,161.70	2,316.25	2,237.50	78.75	29.414	
15,600.00	6,982.56	7,081.28	6,997.23	136.67	20.38	-88.04	1,605.00	-6,161.71	2,393.95	2,316.92	77.03	31.079	
15,700.00	6,982.49	7,080.46	6,996.41	138.18	20.38	-88.01	1,605.02	-6,161.71	2,473.25	2,397.83	75.42	32.793	
15,800.00	6,982.41	7,079.64	6,995.60	139.69	20.38	-87.98	1,605.04	-6,161.72	2,554.00	2,480.08	73.92	34.552	
15,900.00	6,982.34	7,078.82	6,994.78	141.20	20.38	-87.94	1,605.06	-6,161.72	2,636.07	2,563.55	72.52	36.350	
16,000.00	6,982.27	7,078.00	6,993.96	142.71	20.38	-87.91	1,605.08	-6,161.73	2,719.35	2,648.13	71.22	38.184	
16,100.00	6,982.19	7,077.18	6,993.14	144.23	20.37	-87.88	1,605.10	-6,161.74	2,803.71	2,733.71	70.01	40.049	
16,200.00	6,982.12	7,076.36	6,992.32	145.75	20.37	-87.85	1,605.12	-6,161.74	2,889.08	2,820.19	68.88	41.942	
16,300.00	6,982.05	7,075.54	6,991.50	147.27	20.37	-87.82	1,605.14	-6,161.75	2,975.35	2,907.51	67.84	43.858	
16,400.00	6,981.97	7,074.72	6,990.68	148.79	20.37	-87.79	1,605.16	-6,161.75	3,062.46	2,995.59	66.87	45.794	
16,500.00	6,981.90	7,073.90	6,989.86	150.31	20.37	-87.75	1,605.18	-6,161.76	3,150.34	3,084.36	65.98	47.747	
16,600.00	6,981.82	7,073.08	6,989.04	151.84	20.37	-87.72	1,605.20	-6,161.77	3,238.92	3,173.77	65.15	49.714	
16,700.00	6,981.75	7,072.26	6,988.22	153.36	20.37	-87.69	1,605.22	-6,161.77	3,328.14	3,263.76	64.39	51.691	
16,800.00	6,981.68	7,071.43	6,987.39	154.89	20.36	-87.66	1,605.24	-6,161.78	3,417.97	3,354.29	63.68	53.676	
16,900.00	6,981.60	7,070.61	6,986.57	156.42	20.36	-87.63	1,605.26	-6,161.78	3,508.34	3,445.32	63.02	55.667	
17,000.00	6,981.53	7,069.79	6,985.75	157.95	20.36	-87.60	1,605.28	-6,161.79	3,599.22	3,536.80	62.42	57.661	
17,100.00	6,981.46	7,068.97	6,984.93	159.49	20.36	-87.56	1,605.30	-6,161.80	3,690.58	3,628.71	61.86	59.657	
17,200.00	6,981.38	7,068.14	6,984.10	161.02	20.36	-87.53	1,605.32	-6,161.80	3,782.37	3,721.02	61.35	61.652	
17,300.00	6,981.31	7,067.32	6,983.28	162.56	20.36	-87.50	1,605.34	-6,161.81	3,874.56	3,813.68	60.88	63.644	
17,400.00	6,981.24	7,066.50	6,982.46	164.09	20.35	-87.47	1,605.36	-6,161.81	3,967.14	3,906.69	60.44	65.633	
17,500.00	6,981.16	7,065.67	6,981.63	165.63	20.35	-87.44	1,605.38	-6,161.82	4,060.06	4,000.02	60.04	67.617	
17,600.00	6,981.09	7,064.85	6,980.81	167.17	20.35	-87.40	1,605.40	-6,161.82	4,153.32	4,093.64	59.68	69.595	
17,700.00	6,981.01	7,064.02	6,979.98	168.71	20.35	-87.37	1,605.42	-6,161.83	4,246.88	4,187.54	59.34	71.565	
17,800.00	6,980.94	7,063.20	6,979.16	170.25	20.35	-87.34	1,605.44	-6,161.84	4,340.73	4,281.70	59.04	73.528	
17,900.00	6,980.87	7,062.37	6,978.33	171.80	20.35	-87.31	1,605.46	-6,161.84	4,434.85	4,376.09	58.75	75.481	
18,000.00	6,980.79	7,061.55	6,977.51	173.34	20.35	-87.28	1,605.48	-6,161.85	4,529.22	4,470.72	58.50	77.425	
18,100.00	6,980.72	7,060.72	6,976.68	174.89	20.34	-87.25	1,605.50	-6,161.85	4,623.82	4,565.56	58.26	79.359	
18,200.00	6,980.65	7,059.89	6,975.86	176.43	20.34	-87.21	1,605.52	-6,161.86	4,718.65	4,660.60	58.05	81.282	
18,300.00	6,980.57	7,059.07	6,975.03	177.98	20.34	-87.18	1,605.54	-6,161.87	4,813.69	4,755.83	57.86	83.194	
18,400.00	6,980.50	7,058.24	6,974.20	179.53	20.34	-87.15	1,605.56	-6,161.87	4,908.93	4,851.24	57.69	85.095	
18,500.00	6,980.43	7,057.41	6,973.38	181.08	20.34	-87.12	1,605.58	-6,161.88	5,004.35	4,946.82	57.53	86.985	
18,600.00	6,980.35	7,056.58	6,972.55	182.63	20.34	-87.09	1,605.60	-6,161.88	5,099.94	5,042.55	57.39	88.863	
18,700.00	6,980.28	7,055.76	6,971.72	184.18	20.34	-87.05	1,605.62	-6,161.89	5,195.70	5,138.44	57.27	90.729	
18,800.00	6,980.21	7,054.93	6,970.89	185.73	20.33	-87.02	1,605.64	-6,161.90	5,291.62	5,234.47	57.16	92.583	
18,900.00	6,980.13	7,054.10	6,970.06	187.28	20.33	-86.99	1,605.66	-6,161.90	5,387.69	5,330.63	57.06	94.426	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #072C - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		320-APC_ISCWSA REV 2 MWD					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	
19,000.00	6,980.06	7,053.27	6,969.24	188.84	20.33	-86.96	1,605.68	-6,161.91	5,483.90	5,426.92	56.97	96.256		
19,100.00	6,979.98	7,052.44	6,968.41	190.39	20.33	-86.93	1,605.70	-6,161.91	5,580.24	5,523.34	56.90	98.074		
19,200.00	6,979.91	7,051.61	6,967.58	191.95	20.33	-86.89	1,605.72	-6,161.92	5,676.70	5,619.87	56.83	99.881		
19,300.00	6,979.84	7,050.78	6,966.75	193.51	20.33	-86.86	1,605.74	-6,161.93	5,773.29	5,716.51	56.78	101.676		
19,400.00	6,979.76	7,049.95	6,965.92	195.06	20.33	-86.83	1,605.76	-6,161.93	5,869.99	5,813.25	56.74	103.458		
19,500.00	6,979.69	7,049.12	6,965.09	196.62	20.32	-86.80	1,605.78	-6,161.94	5,966.80	5,910.10	56.70	105.230		
19,600.00	6,979.62	7,048.29	6,964.26	198.18	20.32	-86.77	1,605.80	-6,161.94	6,063.71	6,007.04	56.68	106.989		
19,700.00	6,979.54	7,047.46	6,963.43	199.74	20.32	-86.73	1,605.82	-6,161.95	6,160.72	6,104.07	56.66	108.738		
19,800.00	6,979.47	7,046.63	6,962.59	201.30	20.32	-86.70	1,605.84	-6,161.96	6,257.83	6,201.19	56.65	110.474		
19,900.00	6,979.40	7,045.79	6,961.76	202.86	20.32	-86.67	1,605.86	-6,161.96	6,355.03	6,298.39	56.64	112.200		
20,000.00	6,979.32	7,044.96	6,960.93	204.42	20.32	-86.64	1,605.88	-6,161.97	6,452.31	6,395.67	56.64	113.915		
20,100.00	6,979.25	7,044.13	6,960.10	205.98	20.31	-86.60	1,605.90	-6,161.97	6,549.67	6,493.02	56.65	115.619		
20,200.00	6,979.18	7,043.30	6,959.26	207.55	20.31	-86.57	1,605.92	-6,161.98	6,647.11	6,590.45	56.66	117.312		
20,300.00	6,979.10	7,042.46	6,958.43	209.11	20.31	-86.54	1,605.94	-6,161.99	6,744.63	6,687.95	56.68	118.994		
20,400.00	6,979.03	7,041.63	6,957.60	210.68	20.31	-86.51	1,605.96	-6,161.99	6,842.21	6,785.51	56.70	120.666		
20,500.00	6,978.95	7,040.79	6,956.76	212.24	20.31	-86.48	1,605.98	-6,162.00	6,939.87	6,883.14	56.73	122.328		
20,600.00	6,978.88	7,039.96	6,955.93	213.81	20.31	-86.44	1,606.00	-6,162.00	7,037.59	6,980.83	56.76	123.980		
20,700.00	6,978.81	7,039.13	6,955.10	215.37	20.31	-86.41	1,606.02	-6,162.01	7,135.38	7,078.58	56.80	125.621		
20,800.00	6,978.73	7,038.29	6,954.26	216.94	20.30	-86.38	1,606.04	-6,162.02	7,233.22	7,176.38	56.84	127.253		
20,900.00	6,978.66	7,037.46	6,953.43	218.51	20.30	-86.35	1,606.06	-6,162.02	7,331.12	7,274.24	56.89	128.875		
21,000.00	6,978.59	7,036.62	6,952.59	220.07	20.30	-86.31	1,606.08	-6,162.03	7,429.08	7,372.15	56.93	130.488		
21,100.00	6,978.51	7,035.78	6,951.76	221.64	20.30	-86.28	1,606.10	-6,162.03	7,527.10	7,470.11	56.98	132.091		
21,200.00	6,978.44	7,034.95	6,950.92	223.21	20.30	-86.25	1,606.12	-6,162.04	7,625.16	7,568.12	57.04	133.684		
21,300.00	6,978.37	7,034.11	6,950.08	224.78	20.30	-86.22	1,606.14	-6,162.05	7,723.27	7,666.18	57.10	135.269		
21,400.00	6,978.29	7,033.27	6,949.25	226.35	20.30	-86.19	1,606.16	-6,162.05	7,821.44	7,764.28	57.16	136.845		
21,500.00	6,978.22	7,032.44	6,948.41	227.92	20.29	-86.15	1,606.18	-6,162.06	7,919.64	7,862.42	57.22	138.411		
21,600.00	6,978.14	7,031.60	6,947.57	229.49	20.29	-86.12	1,606.20	-6,162.06	8,017.89	7,960.61	57.28	139.969		
21,700.00	6,978.07	7,030.76	6,946.74	231.06	20.29	-86.09	1,606.22	-6,162.07	8,116.19	8,058.84	57.35	141.519		
21,800.00	6,978.00	7,029.92	6,945.90	232.63	20.29	-86.06	1,606.24	-6,162.08	8,214.52	8,157.10	57.42	143.059		
21,900.00	6,977.92	7,029.08	6,945.06	234.21	20.29	-86.02	1,606.26	-6,162.08	8,312.90	8,255.41	57.49	144.592		
22,000.00	6,977.85	7,028.25	6,944.22	235.78	20.29	-85.99	1,606.28	-6,162.09	8,411.31	8,353.75	57.57	146.116		
22,100.00	6,977.78	7,027.41	6,943.38	237.35	20.28	-85.96	1,606.30	-6,162.09	8,509.76	8,452.12	57.64	147.632		
22,200.00	6,977.70	7,026.57	6,942.54	238.92	20.28	-85.93	1,606.32	-6,162.10	8,608.25	8,550.53	57.72	149.140		
22,300.00	6,977.63	7,025.73	6,941.70	240.50	20.28	-85.89	1,606.34	-6,162.11	8,706.77	8,648.97	57.80	150.640		
22,400.00	6,977.56	7,024.89	6,940.86	242.07	20.28	-85.86	1,606.37	-6,162.11	8,805.32	8,747.44	57.88	152.132		
22,500.00	6,977.48	7,024.05	6,940.02	243.65	20.28	-85.83	1,606.39	-6,162.12	8,903.91	8,845.94	57.96	153.616		
22,600.00	6,977.41	7,023.21	6,939.18	245.22	20.28	-85.80	1,606.41	-6,162.12	9,002.52	8,944.48	58.05	155.092		
22,700.00	6,977.34	7,022.36	6,938.34	246.80	20.28	-85.76	1,606.43	-6,162.13	9,101.17	9,043.04	58.13	156.561		
22,800.00	6,977.26	7,021.52	6,937.50	248.37	20.27	-85.73	1,606.45	-6,162.14	9,199.85	9,141.63	58.22	158.023		
22,900.00	6,977.19	7,020.68	6,936.66	249.95	20.27	-85.70	1,606.47	-6,162.14	9,298.55	9,240.24	58.31	159.477		
23,000.00	6,977.11	7,019.84	6,935.82	251.53	20.27	-85.67	1,606.49	-6,162.15	9,397.28	9,338.89	58.40	160.923		
23,100.00	6,977.04	7,019.00	6,934.97	253.10	20.27	-85.63	1,606.51	-6,162.16	9,496.04	9,437.55	58.49	162.363		
23,155.65	6,977.00	7,018.53	6,934.51	253.98	20.27	-85.62	1,606.52	-6,162.16	9,551.01	9,492.48	58.54	163.161		
23,156.15	6,977.00	7,018.52	6,934.50	254.06	20.27	-85.62	1,606.52	-6,162.16	9,551.51	9,488.19	63.32	150.856		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #080A - OH - OH-INC													Offset Site Error: 0.00 usft
Survey Program: 95-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	-118.60	-966.48	-1,772.88	2,021.39				
100.00	100.00	6.00	6.00	0.25	0.13	-118.60	-966.48	-1,772.88	2,019.20	2,018.82	0.38	5,330.282	
200.00	200.00	106.00	106.00	0.61	2.24	-118.60	-966.48	-1,772.88	2,019.20	2,016.36	2.85	709.121	
281.75	281.75	187.74	187.73	0.90	3.84	-118.59	-966.07	-1,772.88	2,019.01	2,014.26	4.75	425.417	CC
300.00	300.00	204.46	204.45	0.97	4.17	-118.59	-966.09	-1,772.88	2,019.02	2,013.88	5.14	392.815	
400.00	400.00	306.02	306.00	1.33	6.15	-118.60	-966.48	-1,772.88	2,019.20	2,011.73	7.48	270.078	
500.00	500.00	406.02	406.00	1.68	8.05	-118.60	-966.48	-1,772.88	2,019.20	2,009.47	9.73	207.433	
600.00	599.98	506.00	505.98	2.04	9.95	-128.62	-966.48	-1,772.88	2,020.29	2,008.30	11.99	168.478	ES
700.00	699.84	604.72	604.70	2.41	11.82	-128.67	-965.96	-1,772.88	2,023.31	2,009.09	14.23	142.230	
800.00	799.45	702.69	702.67	2.77	13.68	-128.78	-966.16	-1,772.88	2,028.88	2,012.43	16.45	123.353	
900.00	898.70	804.75	804.70	3.13	15.65	-128.94	-966.48	-1,772.88	2,036.71	2,017.93	18.78	108.459	
1,000.00	997.47	903.52	903.47	3.50	17.74	-129.12	-966.48	-1,772.88	2,046.64	2,025.40	21.24	96.371	
1,100.00	1,095.63	1,001.68	1,001.63	3.89	19.81	-126.95	-966.48	-1,772.88	2,058.47	2,034.78	23.69	86.888	
1,200.00	1,193.09	1,098.20	1,098.14	4.29	21.85	-125.48	-965.61	-1,772.88	2,071.46	2,045.33	26.12	79.304	
1,300.00	1,289.73	1,192.36	1,192.29	4.72	23.84	-124.49	-965.81	-1,772.88	2,086.62	2,058.11	28.51	73.181	
1,400.00	1,385.42	1,285.47	1,285.40	5.16	25.81	-123.82	-966.21	-1,772.88	2,103.62	2,072.72	30.90	68.080	
1,496.97	1,477.20	1,383.34	1,383.20	5.62	27.97	-123.46	-966.48	-1,772.88	2,121.75	2,088.27	33.48	63.372	
1,500.00	1,480.05	1,386.19	1,386.05	5.63	28.04	-123.48	-966.48	-1,772.88	2,122.34	2,088.77	33.56	63.239	
1,600.00	1,574.15	1,480.29	1,480.15	6.12	30.19	-124.20	-966.48	-1,772.88	2,141.97	2,105.82	36.15	59.245	
1,700.00	1,668.25	1,574.39	1,574.25	6.62	32.34	-124.91	-966.48	-1,772.88	2,161.96	2,123.21	38.76	55.785	
1,800.00	1,762.35	1,663.87	1,663.71	7.12	34.38	-125.56	-965.28	-1,772.88	2,181.62	2,140.36	41.25	52.883	
1,900.00	1,856.45	1,752.91	1,752.74	7.64	36.41	-126.22	-965.79	-1,772.88	2,202.58	2,158.83	43.74	50.351	
2,000.00	1,950.55	1,856.81	1,856.55	8.16	38.79	-126.98	-966.48	-1,772.88	2,223.94	2,177.35	46.59	47.739	
2,100.00	2,044.65	1,950.91	1,950.65	8.68	40.96	-127.64	-966.48	-1,772.88	2,245.24	2,196.03	49.21	45.625	
2,200.00	2,138.75	2,045.01	2,044.75	9.21	43.12	-128.30	-966.48	-1,772.88	2,266.84	2,215.01	51.84	43.732	
2,300.00	2,232.85	2,134.90	2,134.63	9.74	45.19	-128.89	-965.26	-1,772.88	2,288.00	2,233.64	54.36	42.088	
2,400.00	2,326.95	2,223.19	2,222.91	10.27	47.21	-129.49	-965.70	-1,772.88	2,310.47	2,253.62	56.85	40.641	
2,500.00	2,421.05	2,327.42	2,327.05	10.81	49.63	-130.19	-966.48	-1,772.88	2,333.40	2,273.67	59.73	39.066	
2,600.00	2,515.15	2,421.52	2,421.15	11.34	51.88	-130.80	-966.48	-1,772.88	2,356.14	2,293.70	62.44	37.733	
2,700.00	2,609.25	2,515.62	2,515.25	11.88	54.14	-131.39	-966.48	-1,772.88	2,379.15	2,313.99	65.16	36.514	
2,800.00	2,703.35	2,606.49	2,606.10	12.42	56.31	-131.94	-965.17	-1,772.88	2,401.55	2,333.76	67.79	35.427	
2,900.00	2,797.45	2,694.37	2,693.97	12.96	58.42	-132.48	-965.52	-1,772.88	2,425.30	2,354.95	70.35	34.476	
3,000.00	2,891.55	2,782.01	2,781.60	13.51	60.52	-133.02	-966.20	-1,772.88	2,449.54	2,376.64	72.90	33.604	
3,100.00	2,985.65	2,892.17	2,891.65	14.05	63.24	-133.67	-966.48	-1,772.88	2,473.66	2,397.57	76.08	32.512	
3,200.00	3,079.75	2,986.27	2,985.75	14.60	65.59	-134.22	-966.48	-1,772.88	2,497.87	2,418.99	78.89	31.664	
3,300.00	3,173.85	3,080.37	3,079.85	15.14	67.94	-134.75	-966.48	-1,772.88	2,522.31	2,440.62	81.69	30.878	
3,400.00	3,267.95	3,168.26	3,167.72	15.69	70.14	-135.22	-964.76	-1,772.88	2,545.77	2,461.44	84.33	30.189	
3,500.00	3,362.05	3,255.03	3,254.47	16.23	72.31	-135.70	-965.23	-1,772.88	2,570.98	2,484.05	86.94	29.574	
3,600.00	3,456.15	3,341.55	3,340.98	16.78	74.47	-136.18	-966.06	-1,772.88	2,596.67	2,507.14	89.53	29.002	
3,700.00	3,550.25	3,456.96	3,456.25	17.33	76.98	-136.80	-966.48	-1,772.88	2,622.15	2,529.64	92.50	28.346	
3,800.00	3,644.35	3,551.06	3,550.35	17.88	78.89	-137.28	-966.48	-1,772.88	2,647.60	2,552.74	94.86	27.910	
3,900.00	3,738.45	3,645.16	3,644.45	18.42	80.80	-137.76	-966.48	-1,772.88	2,673.24	2,576.02	97.22	27.498	
4,000.00	3,832.55	3,739.26	3,738.55	18.97	82.72	-138.23	-966.48	-1,772.88	2,699.06	2,599.49	99.57	27.107	
4,100.00	3,926.65	3,833.36	3,832.65	19.52	84.63	-138.70	-966.48	-1,772.88	2,725.05	2,623.13	101.92	26.737	
4,200.00	4,020.75	3,927.46	3,926.75	20.07	86.54	-139.15	-966.48	-1,772.88	2,751.22	2,646.94	104.27	26.385	
4,300.00	4,114.85	4,021.56	4,020.85	20.62	88.46	-139.60	-966.48	-1,772.88	2,777.55	2,670.93	106.62	26.050	
4,400.00	4,208.95	4,115.66	4,114.95	21.17	90.37	-140.03	-966.48	-1,772.88	2,804.04	2,695.07	108.97	25.732	
4,500.00	4,303.05	4,209.76	4,209.05	21.72	92.28	-140.46	-966.48	-1,772.88	2,830.69	2,719.37	111.32	25.429	
4,600.00	4,397.15	4,303.86	4,303.15	22.27	94.20	-140.88	-966.48	-1,772.88	2,857.49	2,743.83	113.66	25.140	
4,700.00	4,491.25	4,397.96	4,397.25	22.82	96.11	-141.30	-966.48	-1,772.88	2,884.44	2,768.43	116.01	24.864	
4,800.00	4,585.35	4,492.06	4,491.35	23.37	98.02	-141.71	-966.48	-1,772.88	2,911.53	2,793.18	118.35	24.600	
4,900.00	4,679.45	4,586.16	4,585.45	23.93	99.94	-142.11	-966.48	-1,772.88	2,938.77	2,818.07	120.70	24.349	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #080A - OH - OH-INC													Offset Site Error: 0.00 usft
Survey Program: 95-A027Ua_INC-ONLY													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis			Offset Wellbore Centre		Distance		Rule Assigned:		Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
5,000.00	4,773.55	4,680.26	4,679.55	24.48	101.85	-142.50	-966.48	-1,772.88	2,966.14	2,843.10	123.04	24.108	
5,100.00	4,867.65	4,774.36	4,773.65	25.03	103.76	-142.89	-966.48	-1,772.88	2,993.64	2,868.26	125.38	23.877	SF
5,200.00	4,961.75	4,786.00	4,785.10	25.58	104.00	-142.93	-966.48	-1,772.88	3,022.40	2,896.51	125.89	24.009	
5,300.00	5,055.85	4,786.00	4,785.10	26.13	104.00	-142.93	-966.48	-1,772.88	3,054.14	2,928.11	126.03	24.234	
5,400.00	5,149.95	4,786.00	4,785.10	26.68	104.00	-142.93	-966.48	-1,772.88	3,088.80	2,962.74	126.06	24.503	
5,500.00	5,244.05	4,786.00	4,785.10	27.24	104.00	-142.93	-966.48	-1,772.88	3,126.27	3,000.29	125.98	24.815	
5,600.00	5,338.15	4,786.00	4,785.10	27.79	104.00	-142.93	-966.48	-1,772.88	3,166.46	3,040.65	125.81	25.168	
5,665.73	5,400.00	4,786.00	4,785.10	28.15	104.00	-142.93	-966.48	-1,772.88	3,194.31	3,068.65	125.65	25.422	
5,700.00	5,432.28	4,786.00	4,785.10	28.34	104.00	-143.03	-966.48	-1,772.88	3,209.19	3,083.64	125.55	25.561	
5,800.00	5,526.87	4,786.00	4,785.10	28.88	104.00	-143.33	-966.48	-1,772.88	3,253.46	3,128.26	125.20	25.985	
5,900.00	5,622.01	4,786.00	4,785.10	29.41	104.00	-143.63	-966.48	-1,772.88	3,298.93	3,174.16	124.77	26.440	
6,000.00	5,717.67	4,786.00	4,785.10	29.92	104.00	-143.94	-966.48	-1,772.88	3,345.55	3,221.29	124.25	26.925	
6,100.00	5,813.83	4,786.00	4,785.10	30.41	104.00	-144.26	-966.48	-1,772.88	3,393.24	3,269.58	123.66	27.439	
6,200.00	5,910.44	4,786.00	4,785.10	30.89	104.00	-144.58	-966.48	-1,772.88	3,441.96	3,318.95	123.01	27.982	
6,300.00	6,007.50	4,786.00	4,785.10	31.36	104.00	-144.92	-966.48	-1,772.88	3,491.64	3,369.35	122.28	28.554	
6,400.00	6,104.96	4,786.00	4,785.10	31.80	104.00	-145.25	-966.48	-1,772.88	3,542.22	3,420.72	121.50	29.154	
6,500.00	6,202.80	4,786.00	4,785.10	32.24	104.00	-145.59	-966.48	-1,772.88	3,593.67	3,473.00	120.66	29.782	
6,600.00	6,300.98	4,786.00	4,785.10	32.66	104.00	-145.94	-966.48	-1,772.88	3,645.91	3,526.13	119.78	30.439	
6,700.00	6,399.48	4,786.00	4,785.10	33.06	104.00	-146.28	-966.48	-1,772.88	3,698.91	3,580.07	118.84	31.124	
6,722.82	6,422.00	4,786.00	4,785.10	33.15	104.00	-146.36	-966.48	-1,772.88	3,711.11	3,592.48	118.62	31.285	
6,750.00	6,448.76	4,786.00	4,785.10	33.26	104.00	-135.03	-966.48	-1,772.88	3,725.77	3,607.41	118.37	31.477	
6,800.00	6,497.51	4,786.00	4,785.10	33.48	104.00	-120.78	-966.48	-1,772.88	3,753.31	3,635.41	117.90	31.834	
6,850.00	6,545.40	4,786.00	4,785.10	33.72	104.00	-111.20	-966.48	-1,772.88	3,781.40	3,663.94	117.46	32.194	
6,900.00	6,592.13	4,786.00	4,785.10	33.97	104.00	-103.96	-966.48	-1,772.88	3,809.87	3,692.84	117.04	32.553	
6,950.00	6,637.40	4,786.00	4,785.10	34.25	104.00	-98.02	-966.48	-1,772.88	3,838.54	3,721.90	116.64	32.909	
7,000.00	6,680.94	4,786.00	4,785.10	34.54	104.00	-92.91	-966.48	-1,772.88	3,867.22	3,750.95	116.28	33.259	
7,050.00	6,722.48	4,786.00	4,785.10	34.85	104.00	-88.36	-966.48	-1,772.88	3,895.75	3,779.80	115.94	33.600	
7,100.00	6,761.76	4,786.00	4,785.10	35.17	104.00	-84.26	-966.48	-1,772.88	3,923.94	3,808.30	115.65	33.930	
7,150.00	6,798.55	4,786.00	4,785.10	35.51	104.00	-80.52	-966.48	-1,772.88	3,951.64	3,836.26	115.39	34.247	
7,200.00	6,832.61	4,786.00	4,785.10	35.86	104.00	-77.11	-966.48	-1,772.88	3,978.69	3,863.52	115.17	34.547	
7,250.00	6,863.74	4,786.00	4,785.10	36.22	104.00	-74.01	-966.48	-1,772.88	4,004.93	3,889.94	114.99	34.827	
7,300.00	6,891.74	4,786.00	4,785.10	36.59	104.00	-71.18	-966.48	-1,772.88	4,030.22	3,915.36	114.87	35.086	
7,350.00	6,916.44	4,786.00	4,785.10	36.98	104.00	-68.63	-966.48	-1,772.88	4,054.43	3,939.64	114.78	35.322	
7,400.00	6,937.69	4,786.00	4,785.10	37.37	104.00	-66.33	-966.48	-1,772.88	4,077.42	3,962.66	114.75	35.532	
7,450.00	6,955.36	4,786.00	4,785.10	37.78	104.00	-64.28	-966.48	-1,772.88	4,099.07	3,984.30	114.77	35.714	
7,500.00	6,969.34	4,786.00	4,785.10	38.19	104.00	-62.46	-966.48	-1,772.88	4,119.28	4,004.44	114.85	35.868	
7,550.00	6,979.53	4,786.00	4,785.10	38.62	104.00	-60.87	-966.48	-1,772.88	4,137.94	4,022.97	114.97	35.991	
7,600.00	6,985.89	4,786.00	4,785.10	39.05	104.00	-59.50	-966.48	-1,772.88	4,154.96	4,039.81	115.15	36.084	
7,650.00	6,988.37	4,786.00	4,785.10	39.48	104.00	-58.33	-966.48	-1,772.88	4,170.25	4,054.87	115.37	36.146	
7,657.25	6,988.40	4,786.00	4,785.10	39.54	104.00	-58.18	-966.48	-1,772.88	4,172.32	4,056.91	115.41	36.152	
7,700.00	6,988.37	4,786.00	4,785.10	39.92	104.00	-58.18	-966.48	-1,772.88	4,184.61	4,068.97	115.64	36.188	
7,800.00	6,988.30	4,786.00	4,785.10	40.82	104.00	-58.18	-966.48	-1,772.88	4,214.91	4,098.72	116.19	36.276	
7,900.00	6,988.23	4,786.00	4,785.10	41.77	104.00	-58.18	-966.48	-1,772.88	4,247.35	4,130.58	116.77	36.374	
8,000.00	6,988.16	4,786.00	4,785.10	42.75	104.00	-58.18	-966.48	-1,772.88	4,281.88	4,164.51	117.37	36.482	
8,100.00	6,988.09	4,786.00	4,785.10	43.76	104.00	-58.18	-966.48	-1,772.88	4,318.45	4,200.46	117.99	36.600	
8,152.35	6,988.06	4,786.00	4,785.10	44.30	104.00	-58.18	-966.48	-1,772.88	4,338.39	4,220.07	118.32	36.667	
8,200.00	6,988.02	4,786.00	4,785.10	44.79	104.00	-58.59	-966.48	-1,772.88	4,356.39	4,237.77	118.62	36.727	
8,300.00	6,987.95	4,786.00	4,785.10	45.83	104.00	-59.36	-966.48	-1,772.88	4,391.52	4,272.29	119.23	36.834	
8,400.00	6,987.88	4,786.00	4,785.10	46.85	104.00	-60.04	-966.48	-1,772.88	4,423.01	4,303.19	119.82	36.915	
8,500.00	6,987.80	4,786.00	4,785.10	47.85	104.00	-60.61	-966.48	-1,772.88	4,450.79	4,330.40	120.39	36.971	
8,600.00	6,987.73	4,786.00	4,785.10	48.83	104.00	-61.10	-966.48	-1,772.88	4,474.78	4,353.85	120.94	37.001	
8,700.00	6,987.65	4,786.00	4,785.10	49.79	104.00	-61.50	-966.48	-1,772.88	4,494.95	4,373.48	121.47	37.005	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #080A - OH - OH-INC												Offset Site Error:	0.00 usft	
Survey Program:		95-A027Ua_INC-ONLY				Rule Assigned:							Offset Well Error:	0.00 usft
Reference		Offset		Semi Maior 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	
8,800.00	6,987.57	4,786.00	4,785.10	50.72	104.00	-61.81	-966.48	-1,772.88	4,511.23	4,389.25	121.98	36.984		
8,900.00	6,987.50	4,786.00	4,785.10	51.62	104.00	-62.05	-966.48	-1,772.88	4,523.60	4,401.13	122.47	36.938		
9,000.00	6,987.42	4,786.00	4,785.10	52.48	104.00	-62.21	-966.48	-1,772.88	4,532.02	4,409.09	122.93	36.867		
9,100.00	6,987.34	4,786.00	4,785.10	53.30	104.00	-62.30	-966.48	-1,772.88	4,536.47	4,413.11	123.36	36.774		
9,200.00	6,987.27	4,786.00	4,785.10	54.08	104.00	-62.31	-966.48	-1,772.88	4,536.95	4,413.19	123.77	36.657		
9,215.33	6,987.26	4,786.00	4,785.10	54.20	104.00	-62.30	-966.48	-1,772.88	4,536.67	4,412.85	123.83	36.638		
9,300.00	6,987.20	4,786.00	4,785.10	54.85	104.00	-62.30	-966.48	-1,772.88	4,535.67	4,411.51	124.16	36.531		
9,311.42	6,987.19	4,786.00	4,785.10	54.94	104.00	-62.30	-966.48	-1,772.88	4,535.66	4,411.45	124.21	36.517		
9,400.00	6,987.12	4,786.00	4,785.10	55.65	104.00	-62.30	-966.48	-1,772.88	4,536.52	4,411.95	124.57	36.416		
9,500.00	6,987.05	4,786.00	4,785.10	56.48	104.00	-62.30	-966.48	-1,772.88	4,539.58	4,414.56	125.01	36.313		
9,600.00	6,986.98	4,786.00	4,785.10	57.35	104.00	-62.30	-966.48	-1,772.88	4,544.83	4,419.36	125.47	36.223		
9,700.00	6,986.90	4,786.00	4,785.10	58.24	104.00	-62.30	-966.48	-1,772.88	4,552.27	4,426.33	125.94	36.145		
9,800.00	6,986.83	4,786.00	4,785.10	59.17	104.00	-62.30	-966.48	-1,772.88	4,561.90	4,435.46	126.44	36.081		
9,900.00	6,986.75	4,786.00	4,785.10	60.12	104.00	-62.30	-966.48	-1,772.88	4,573.69	4,446.74	126.94	36.030		
10,000.00	6,986.68	4,786.00	4,785.10	61.10	104.00	-62.30	-966.48	-1,772.88	4,587.63	4,460.17	127.46	35.992		
10,100.00	6,986.61	4,786.00	4,785.10	62.11	104.00	-62.30	-966.48	-1,772.88	4,603.70	4,475.71	127.99	35.969		
10,200.00	6,986.53	4,786.00	4,785.10	63.14	104.00	-62.30	-966.48	-1,772.88	4,621.88	4,493.35	128.53	35.959		
10,300.00	6,986.46	4,786.00	4,785.10	64.20	104.00	-62.30	-966.48	-1,772.88	4,642.14	4,513.06	129.08	35.964		
10,400.00	6,986.39	4,786.00	4,785.10	65.28	104.00	-62.30	-966.48	-1,772.88	4,664.46	4,534.83	129.63	35.983		
10,500.00	6,986.31	4,786.00	4,785.10	66.38	104.00	-62.30	-966.48	-1,772.88	4,688.81	4,558.62	130.19	36.016		
10,600.00	6,986.24	4,786.00	4,785.10	67.50	104.00	-62.30	-966.48	-1,772.88	4,715.15	4,584.40	130.75	36.064		
10,700.00	6,986.17	4,786.00	4,785.10	68.64	104.00	-62.30	-966.48	-1,772.88	4,743.45	4,612.15	131.31	36.125		
10,800.00	6,986.09	4,786.00	4,785.10	69.80	104.00	-62.30	-966.48	-1,772.88	4,773.68	4,641.82	131.87	36.201		
10,900.00	6,986.02	4,786.00	4,785.10	70.98	104.00	-62.30	-966.48	-1,772.88	4,805.80	4,673.38	132.42	36.291		
11,000.00	6,985.95	4,786.00	4,785.10	72.17	104.00	-62.30	-966.48	-1,772.88	4,839.78	4,706.80	132.98	36.395		
11,100.00	6,985.87	4,786.00	4,785.10	73.38	104.00	-62.30	-966.48	-1,772.88	4,875.57	4,742.04	133.53	36.513		
11,200.00	6,985.80	4,786.00	4,785.10	74.61	104.00	-62.30	-966.48	-1,772.88	4,913.14	4,779.06	134.07	36.645		
11,300.00	6,985.72	4,786.00	4,785.10	75.85	104.00	-62.30	-966.48	-1,772.88	4,952.44	4,817.82	134.61	36.790		
11,400.00	6,985.65	4,786.00	4,785.10	77.10	104.00	-62.30	-966.48	-1,772.88	4,993.43	4,858.28	135.14	36.949		
11,500.00	6,985.58	4,786.00	4,785.10	78.37	104.00	-62.30	-966.48	-1,772.88	5,036.07	4,900.41	135.67	37.120		
11,600.00	6,985.50	4,786.00	4,785.10	79.65	104.00	-62.30	-966.48	-1,772.88	5,080.33	4,944.15	136.18	37.305		
11,700.00	6,985.43	4,786.00	4,785.10	80.94	104.00	-62.30	-966.48	-1,772.88	5,126.16	4,989.47	136.69	37.502		
11,800.00	6,985.36	4,786.00	4,785.10	82.24	104.00	-62.30	-966.48	-1,772.88	5,173.51	5,036.32	137.19	37.711		
11,900.00	6,985.28	4,786.00	4,785.10	83.56	104.00	-62.30	-966.48	-1,772.88	5,222.35	5,084.67	137.67	37.932		
12,000.00	6,985.21	4,786.00	4,785.10	84.88	104.00	-62.30	-966.48	-1,772.88	5,272.63	5,134.48	138.15	38.165		
12,100.00	6,985.14	4,786.00	4,785.10	86.21	104.00	-62.30	-966.48	-1,772.88	5,324.32	5,185.70	138.62	38.410		
12,200.00	6,985.06	4,786.00	4,785.10	87.56	104.00	-62.30	-966.48	-1,772.88	5,377.36	5,238.29	139.07	38.666		
12,300.00	6,984.99	4,786.00	4,785.10	88.91	104.00	-62.30	-966.48	-1,772.88	5,431.74	5,292.22	139.52	38.932		
12,400.00	6,984.92	4,786.00	4,785.10	90.27	104.00	-62.30	-966.48	-1,772.88	5,487.39	5,347.44	139.95	39.209		
12,500.00	6,984.84	4,786.00	4,785.10	91.64	104.00	-62.30	-966.48	-1,772.88	5,544.29	5,403.92	140.37	39.497		
12,600.00	6,984.77	4,786.00	4,785.10	93.01	104.00	-62.30	-966.48	-1,772.88	5,602.40	5,461.62	140.78	39.794		
12,700.00	6,984.69	4,786.00	4,785.10	94.40	104.00	-62.30	-966.48	-1,772.88	5,661.68	5,520.50	141.18	40.101		
12,800.00	6,984.62	4,786.00	4,785.10	95.79	104.00	-62.30	-966.48	-1,772.88	5,722.09	5,580.52	141.57	40.418		
12,900.00	6,984.55	4,786.00	4,785.10	97.18	104.00	-62.30	-966.48	-1,772.88	5,783.60	5,641.65	141.95	40.743		
13,000.00	6,984.47	4,786.00	4,785.10	98.59	104.00	-62.30	-966.48	-1,772.88	5,846.18	5,703.86	142.32	41.078		
13,100.00	6,984.40	4,786.00	4,785.10	100.00	104.00	-62.30	-966.48	-1,772.88	5,909.78	5,767.10	142.68	41.421		
13,200.00	6,984.33	4,786.00	4,785.10	101.41	104.00	-62.30	-966.48	-1,772.88	5,974.38	5,831.36	143.02	41.772		
13,300.00	6,984.25	4,786.00	4,785.10	102.83	104.00	-62.30	-966.48	-1,772.88	6,039.94	5,896.58	143.36	42.132		
13,400.00	6,984.18	4,786.00	4,785.10	104.26	104.00	-62.30	-966.48	-1,772.88	6,106.44	5,962.76	143.69	42.499		
13,500.00	6,984.11	4,786.00	4,785.10	105.69	104.00	-62.30	-966.48	-1,772.88	6,173.84	6,029.84	144.00	42.873		
13,600.00	6,984.03	4,786.00	4,785.10	107.13	104.00	-62.30	-966.48	-1,772.88	6,242.12	6,097.81	144.31	43.255		
13,700.00	6,983.96	4,786.00	4,785.10	108.57	104.00	-62.30	-966.48	-1,772.88	6,311.24	6,166.63	144.61	43.644		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #080A - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		95-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		
13,800.00	6,983.88	4,786.00	4,785.10	110.02	104.00	-62.30	-966.48	-1,772.88	6,381.18	6,236.29	144.90	44.039		
13,900.00	6,983.81	4,786.00	4,785.10	111.47	104.00	-62.30	-966.48	-1,772.88	6,451.92	6,306.74	145.18	44.442		
14,000.00	6,983.74	4,786.00	4,785.10	112.92	104.00	-62.30	-966.48	-1,772.88	6,523.41	6,377.96	145.45	44.850		
14,100.00	6,983.66	4,786.00	4,785.10	114.38	104.00	-62.30	-966.48	-1,772.88	6,595.65	6,449.94	145.71	45.265		
14,200.00	6,983.59	4,786.00	4,785.10	115.85	104.00	-62.30	-966.48	-1,772.88	6,668.61	6,522.64	145.97	45.685		
14,300.00	6,983.52	4,786.00	4,785.10	117.31	104.00	-62.30	-966.48	-1,772.88	6,742.26	6,596.04	146.22	46.111		
14,400.00	6,983.44	4,786.00	4,785.10	118.78	104.00	-62.30	-966.48	-1,772.88	6,816.58	6,670.12	146.46	46.543		
14,500.00	6,983.37	4,786.00	4,785.10	120.26	104.00	-62.30	-966.48	-1,772.88	6,891.55	6,744.86	146.69	46.980		
14,600.00	6,983.30	4,786.00	4,785.10	121.74	104.00	-62.30	-966.48	-1,772.88	6,967.15	6,820.23	146.92	47.422		
14,700.00	6,983.22	4,786.00	4,785.10	123.22	104.00	-62.30	-966.48	-1,772.88	7,043.36	6,896.22	147.14	47.869		
14,800.00	6,983.15	4,786.00	4,785.10	124.70	104.00	-62.30	-966.48	-1,772.88	7,120.16	6,972.81	147.35	48.320		
14,900.00	6,983.08	4,786.00	4,785.10	126.19	104.00	-62.30	-966.48	-1,772.88	7,197.53	7,049.96	147.56	48.777		
15,000.00	6,983.00	4,786.00	4,785.10	127.68	104.00	-62.30	-966.48	-1,772.88	7,275.44	7,127.68	147.76	49.238		
15,100.00	6,982.93	4,786.00	4,785.10	129.17	104.00	-62.30	-966.48	-1,772.88	7,353.90	7,205.94	147.96	49.703		
15,200.00	6,982.85	4,786.00	4,785.10	130.67	104.00	-62.30	-966.48	-1,772.88	7,432.87	7,284.72	148.15	50.172		
15,300.00	6,982.78	4,786.00	4,785.10	132.16	104.00	-62.30	-966.48	-1,772.88	7,512.34	7,364.00	148.33	50.645		
15,400.00	6,982.71	4,786.00	4,785.10	133.66	104.00	-62.30	-966.48	-1,772.88	7,592.29	7,443.78	148.51	51.122		
15,500.00	6,982.63	4,786.00	4,785.10	135.17	104.00	-62.30	-966.48	-1,772.88	7,672.72	7,524.03	148.69	51.602		
15,600.00	6,982.56	4,786.00	4,785.10	136.67	104.00	-62.30	-966.48	-1,772.88	7,753.60	7,604.74	148.86	52.086		
15,700.00	6,982.49	4,786.00	4,785.10	138.18	104.00	-62.30	-966.48	-1,772.88	7,834.93	7,685.90	149.03	52.574		
15,800.00	6,982.41	4,786.00	4,785.10	139.69	104.00	-62.30	-966.48	-1,772.88	7,916.68	7,767.49	149.19	53.065		
15,900.00	6,982.34	4,786.00	4,785.10	141.20	104.00	-62.30	-966.48	-1,772.88	7,998.84	7,849.50	149.35	53.559		
16,000.00	6,982.27	4,786.00	4,785.10	142.71	104.00	-62.30	-966.48	-1,772.88	8,081.41	7,931.91	149.50	54.056		
16,100.00	6,982.19	4,786.00	4,785.10	144.23	104.00	-62.30	-966.48	-1,772.88	8,164.37	8,014.72	149.65	54.556		
16,200.00	6,982.12	4,786.00	4,785.10	145.75	104.00	-62.30	-966.48	-1,772.88	8,247.71	8,097.91	149.80	55.059		
16,300.00	6,982.05	4,786.00	4,785.10	147.27	104.00	-62.30	-966.48	-1,772.88	8,331.41	8,181.47	149.94	55.565		
16,400.00	6,981.97	4,786.00	4,785.10	148.79	104.00	-62.30	-966.48	-1,772.88	8,415.47	8,265.39	150.08	56.073		
16,500.00	6,981.90	4,786.00	4,785.10	150.31	104.00	-62.30	-966.48	-1,772.88	8,499.87	8,349.66	150.22	56.584		
16,600.00	6,981.82	4,786.00	4,785.10	151.84	104.00	-62.30	-966.48	-1,772.88	8,584.61	8,434.26	150.35	57.098		
16,700.00	6,981.75	4,786.00	4,785.10	153.36	104.00	-62.30	-966.48	-1,772.88	8,669.67	8,519.19	150.48	57.613		
16,800.00	6,981.68	4,786.00	4,785.10	154.89	104.00	-62.30	-966.48	-1,772.88	8,755.05	8,604.45	150.61	58.131		
16,900.00	6,981.60	4,786.00	4,785.10	156.42	104.00	-62.30	-966.48	-1,772.88	8,840.74	8,690.01	150.73	58.651		
17,000.00	6,981.53	4,786.00	4,785.10	157.95	104.00	-62.30	-966.48	-1,772.88	8,926.72	8,775.87	150.86	59.174		
17,100.00	6,981.46	4,786.00	4,785.10	159.49	104.00	-62.30	-966.48	-1,772.88	9,013.00	8,862.02	150.98	59.698		
17,200.00	6,981.38	4,786.00	4,785.10	161.02	104.00	-62.30	-966.48	-1,772.88	9,099.55	8,948.46	151.09	60.224		
17,300.00	6,981.31	4,786.00	4,785.10	162.56	104.00	-62.30	-966.48	-1,772.88	9,186.38	9,035.17	151.21	60.752		
17,400.00	6,981.24	4,786.00	4,785.10	164.09	104.00	-62.30	-966.48	-1,772.88	9,273.47	9,122.15	151.32	61.282		
17,500.00	6,981.16	4,786.00	4,785.10	165.63	104.00	-62.30	-966.48	-1,772.88	9,360.82	9,209.39	151.44	61.814		
17,600.00	6,981.09	4,786.00	4,785.10	167.17	104.00	-62.30	-966.48	-1,772.88	9,448.42	9,296.88	151.55	62.347		
17,700.00	6,981.01	4,786.00	4,785.10	168.71	104.00	-62.30	-966.48	-1,772.88	9,536.27	9,384.61	151.65	62.882		
17,800.00	6,980.94	4,786.00	4,785.10	170.25	104.00	-62.30	-966.48	-1,772.88	9,624.35	9,472.59	151.76	63.419		
17,900.00	6,980.87	4,786.00	4,785.10	171.80	104.00	-62.30	-966.48	-1,772.88	9,712.66	9,560.80	151.86	63.957		
18,000.00	6,980.79	4,786.00	4,785.10	173.34	104.00	-62.30	-966.48	-1,772.88	9,801.20	9,649.23	151.97	64.496		
18,100.00	6,980.72	4,786.00	4,785.10	174.89	104.00	-62.30	-966.48	-1,772.88	9,889.96	9,737.89	152.07	65.037		
18,200.00	6,980.65	4,786.00	4,785.10	176.43	104.00	-62.30	-966.48	-1,772.88	9,978.93	9,826.76	152.17	65.579		
18,300.00	6,980.57	4,786.00	4,785.10	177.98	104.00	-62.30	-966.48	-1,772.88	10,068.10	9,915.84	152.27	66.122		
18,400.00	6,980.50	4,786.00	4,785.10	179.53	104.00	-62.30	-966.48	-1,772.88	10,157.48	10,005.12	152.36	66.666		
18,500.00	6,980.43	4,786.00	4,785.10	181.08	104.00	-62.30	-966.48	-1,772.88	10,247.05	10,094.59	152.46	67.212		
18,600.00	6,980.35	4,786.00	4,785.10	182.63	104.00	-62.30	-966.48	-1,772.88	10,336.82	10,184.27	152.55	67.758		
18,700.00	6,980.28	4,786.00	4,785.10	184.18	104.00	-62.30	-966.48	-1,772.88	10,426.77	10,274.12	152.65	68.306		
18,800.00	6,980.21	4,786.00	4,785.10	185.73	104.00	-62.30	-966.48	-1,772.88	10,516.90	10,364.16	152.74	68.855		
18,900.00	6,980.13	4,786.00	4,785.10	187.28	104.00	-62.30	-966.48	-1,772.88	10,607.21	10,454.38	152.83	69.404		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #080A - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		95-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 Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
19,000.00	6,980.06	4,786.00	4,785.10	188.84	104.00	-62.30	-966.48	-1,772.88	10,697.70	10,544.77	152.92	69.955		
19,100.00	6,979.98	4,786.00	4,785.10	190.39	104.00	-62.30	-966.48	-1,772.88	10,788.35	10,635.33	153.01	70.506		
19,200.00	6,979.91	4,786.00	4,785.10	191.95	104.00	-62.30	-966.48	-1,772.88	10,879.16	10,726.06	153.10	71.059		
19,300.00	6,979.84	4,786.00	4,785.10	193.51	104.00	-62.30	-966.48	-1,772.88	10,970.13	10,816.94	153.19	71.612		
19,400.00	6,979.76	4,786.00	4,785.10	195.06	104.00	-62.30	-966.48	-1,772.88	11,061.26	10,907.99	153.28	72.165		
19,500.00	6,979.69	4,786.00	4,785.10	196.62	104.00	-62.30	-966.48	-1,772.88	11,152.55	10,999.18	153.36	72.720		
19,600.00	6,979.62	4,786.00	4,785.10	198.18	104.00	-62.30	-966.48	-1,772.88	11,243.98	11,090.53	153.45	73.275		
19,700.00	6,979.54	4,786.00	4,785.10	199.74	104.00	-62.30	-966.48	-1,772.88	11,335.55	11,182.02	153.53	73.831		
19,800.00	6,979.47	4,786.00	4,785.10	201.30	104.00	-62.30	-966.48	-1,772.88	11,427.27	11,273.65	153.62	74.387		
19,900.00	6,979.40	4,786.00	4,785.10	202.86	104.00	-62.30	-966.48	-1,772.88	11,519.12	11,365.42	153.70	74.944		
20,000.00	6,979.32	4,786.00	4,785.10	204.42	104.00	-62.30	-966.48	-1,772.88	11,611.11	11,457.32	153.79	75.502		
20,100.00	6,979.25	4,786.00	4,785.10	205.98	104.00	-62.30	-966.48	-1,772.88	11,703.23	11,549.36	153.87	76.060		
20,200.00	6,979.18	4,786.00	4,785.10	207.55	104.00	-62.30	-966.48	-1,772.88	11,795.48	11,641.53	153.95	76.618		
20,300.00	6,979.10	4,786.00	4,785.10	209.11	104.00	-62.30	-966.48	-1,772.88	11,887.85	11,733.82	154.03	77.177		
20,400.00	6,979.03	4,786.00	4,785.10	210.68	104.00	-62.30	-966.48	-1,772.88	11,980.35	11,826.23	154.11	77.737		
20,500.00	6,978.95	4,786.00	4,785.10	212.24	104.00	-62.30	-966.48	-1,772.88	12,072.96	11,918.77	154.20	78.296		
20,600.00	6,978.88	4,786.00	4,785.10	213.81	104.00	-62.30	-966.48	-1,772.88	12,165.70	12,011.42	154.28	78.856		
20,700.00	6,978.81	4,786.00	4,785.10	215.37	104.00	-62.30	-966.48	-1,772.88	12,258.54	12,104.19	154.36	79.417		
20,800.00	6,978.73	4,786.00	4,785.10	216.94	104.00	-62.30	-966.48	-1,772.88	12,351.50	12,197.06	154.44	79.978		
20,900.00	6,978.66	4,786.00	4,785.10	218.51	104.00	-62.30	-966.48	-1,772.88	12,444.57	12,290.05	154.52	80.539		
21,000.00	6,978.59	4,786.00	4,785.10	220.07	104.00	-62.30	-966.48	-1,772.88	12,537.74	12,383.15	154.60	81.100		
21,100.00	6,978.51	4,786.00	4,785.10	221.64	104.00	-62.30	-966.48	-1,772.88	12,631.02	12,476.35	154.68	81.661		
21,200.00	6,978.44	4,786.00	4,785.10	223.21	104.00	-62.30	-966.48	-1,772.88	12,724.40	12,569.65	154.75	82.223		
21,300.00	6,978.37	4,786.00	4,785.10	224.78	104.00	-62.30	-966.48	-1,772.88	12,817.88	12,663.05	154.83	82.785		
21,400.00	6,978.29	4,786.00	4,785.10	226.35	104.00	-62.30	-966.48	-1,772.88	12,911.46	12,756.55	154.91	83.347		
21,500.00	6,978.22	4,786.00	4,785.10	227.92	104.00	-62.30	-966.48	-1,772.88	13,005.14	12,850.15	154.99	83.909		
21,600.00	6,978.14	4,786.00	4,785.10	229.49	104.00	-62.30	-966.48	-1,772.88	13,098.90	12,943.84	155.07	84.471		
21,700.00	6,978.07	4,786.00	4,785.10	231.06	104.00	-62.30	-966.48	-1,772.88	13,192.76	13,037.62	155.15	85.034		
21,800.00	6,978.00	4,786.00	4,785.10	232.63	104.00	-62.30	-966.48	-1,772.88	13,286.71	13,131.49	155.23	85.596		
21,900.00	6,977.92	4,786.00	4,785.10	234.21	104.00	-62.30	-966.48	-1,772.88	13,380.75	13,225.45	155.30	86.159		
22,000.00	6,977.85	4,786.00	4,785.10	235.78	104.00	-62.30	-966.48	-1,772.88	13,474.87	13,319.49	155.38	86.721		
22,100.00	6,977.78	4,786.00	4,785.10	237.35	104.00	-62.30	-966.48	-1,772.88	13,569.08	13,413.62	155.46	87.284		
22,200.00	6,977.70	4,786.00	4,785.10	238.92	104.00	-62.30	-966.48	-1,772.88	13,663.37	13,507.83	155.54	87.846		
22,300.00	6,977.63	4,786.00	4,785.10	240.50	104.00	-62.30	-966.48	-1,772.88	13,757.74	13,602.12	155.61	88.409		
22,400.00	6,977.56	4,786.00	4,785.10	242.07	104.00	-62.30	-966.48	-1,772.88	13,852.18	13,696.49	155.69	88.971		
22,500.00	6,977.48	4,786.00	4,785.10	243.65	104.00	-62.30	-966.48	-1,772.88	13,946.71	13,790.94	155.77	89.534		
22,600.00	6,977.41	4,786.00	4,785.10	245.22	104.00	-62.30	-966.48	-1,772.88	14,041.31	13,885.46	155.85	90.096		
22,700.00	6,977.34	4,786.00	4,785.10	246.80	104.00	-62.30	-966.48	-1,772.88	14,135.99	13,980.06	155.93	90.659		
22,800.00	6,977.26	4,786.00	4,785.10	248.37	104.00	-62.30	-966.48	-1,772.88	14,230.74	14,074.73	156.00	91.221		
22,900.00	6,977.19	4,786.00	4,785.10	249.95	104.00	-62.30	-966.48	-1,772.88	14,325.56	14,169.48	156.08	91.783		
23,000.00	6,977.11	4,786.00	4,785.10	251.53	104.00	-62.30	-966.48	-1,772.88	14,420.45	14,264.29	156.16	92.345		
23,100.00	6,977.04	4,786.00	4,785.10	253.10	104.00	-62.30	-966.48	-1,772.88	14,515.41	14,359.17	156.24	92.907		
23,155.65	6,977.00	4,786.00	4,785.10	253.98	104.00	-62.30	-966.48	-1,772.88	14,568.28	14,412.00	156.28	93.219		
23,156.15	6,977.00	4,786.00	4,785.10	254.06	104.00	-62.30	-966.48	-1,772.88	14,568.76	14,409.79	158.97	91.645		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #107 - OH - OH-INC													Offset Site Error: 0.00 usft
Survey Program: 165-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	53.23	2,842.20	3,803.90	4,752.05				
100.00	100.00	0.00	0.00	0.25	0.00	53.23	2,842.20	3,803.90	4,749.21	4,748.95	0.25	N/A	
200.00	200.00	15.00	15.00	0.61	0.28	53.23	2,842.20	3,803.90	4,748.45	4,747.56	0.89	5,354.193	
300.00	300.00	115.00	115.00	0.97	2.13	53.23	2,842.20	3,803.90	4,748.45	4,745.35	3.09	1,534.849	
400.00	400.00	215.00	215.00	1.33	4.10	53.23	2,842.20	3,803.90	4,748.45	4,743.02	5.43	875.165	
500.00	500.00	318.39	318.39	1.68	6.27	53.23	2,842.45	3,803.90	4,748.59	4,740.64	7.95	597.012	
600.00	599.98	415.02	414.98	2.04	8.31	43.27	2,842.20	3,803.90	4,747.17	4,736.82	10.35	458.655	
700.00	699.84	514.88	514.84	2.41	10.51	43.36	2,842.20	3,803.90	4,743.36	4,730.45	12.92	367.222	
800.00	799.45	614.49	614.45	2.77	12.72	43.52	2,842.20	3,803.90	4,737.02	4,721.54	15.48	306.009	
900.00	898.70	713.74	713.70	3.13	14.91	43.74	2,842.20	3,803.90	4,728.17	4,710.13	18.04	262.118	
1,000.00	997.47	813.43	813.36	3.50	17.11	44.01	2,844.80	3,803.90	4,718.37	4,697.76	20.61	228.919	
1,100.00	1,095.63	921.54	921.45	3.89	19.50	46.79	2,844.57	3,803.90	4,704.79	4,681.41	23.38	201.252	
1,200.00	1,193.09	1,028.70	1,028.60	4.29	21.87	48.98	2,843.97	3,803.90	4,689.26	4,663.12	26.13	179.443	
1,300.00	1,289.73	1,134.76	1,134.64	4.72	24.21	50.83	2,843.00	3,803.90	4,671.84	4,642.97	28.88	161.795	
1,400.00	1,385.42	1,239.53	1,239.39	5.16	26.53	52.46	2,841.67	3,803.90	4,652.62	4,621.02	31.61	147.211	
1,496.97	1,477.20	1,292.40	1,292.20	5.62	27.47	53.75	2,842.20	3,803.90	4,633.31	4,600.35	32.96	140.553	
1,500.00	1,480.05	1,295.26	1,295.05	5.63	27.52	53.76	2,842.20	3,803.90	4,632.68	4,599.64	33.04	140.233	
1,600.00	1,574.15	1,389.36	1,389.15	6.12	29.37	54.09	2,842.20	3,803.90	4,611.96	4,576.64	35.32	130.564	
1,700.00	1,668.25	1,484.55	1,484.34	6.62	31.23	54.41	2,843.07	3,803.90	4,591.89	4,554.25	37.64	121.986	
1,800.00	1,762.35	1,584.98	1,584.77	7.12	33.19	54.76	2,842.90	3,803.90	4,571.40	4,531.32	40.07	114.076	
1,900.00	1,856.45	1,685.25	1,685.03	7.64	35.16	55.13	2,842.49	3,803.90	4,550.93	4,508.42	42.51	107.061	
2,000.00	1,950.55	1,765.80	1,765.55	8.16	36.79	55.42	2,842.20	3,803.90	4,530.67	4,486.05	44.62	101.540	
2,100.00	2,044.65	1,859.90	1,859.65	8.68	38.79	55.76	2,842.20	3,803.90	4,510.75	4,463.65	47.11	95.757	
2,200.00	2,138.75	1,954.00	1,953.75	9.21	40.79	56.10	2,842.20	3,803.90	4,491.00	4,441.40	49.60	90.549	
2,300.00	2,232.85	2,048.19	2,047.93	9.74	42.80	56.43	2,843.22	3,803.90	4,471.97	4,419.87	52.10	85.842	
2,400.00	2,326.95	2,147.21	2,146.95	10.27	44.90	56.80	2,843.12	3,803.90	4,452.50	4,397.80	54.70	81.400	
2,500.00	2,421.05	2,246.08	2,245.82	10.81	47.01	57.17	2,842.81	3,803.90	4,433.10	4,375.80	57.30	77.361	
2,600.00	2,515.15	2,344.81	2,344.55	11.34	49.11	57.55	2,842.29	3,803.90	4,413.78	4,353.87	59.91	73.675	
2,700.00	2,609.25	2,424.60	2,424.25	11.88	50.75	57.85	2,842.20	3,803.90	4,394.82	4,332.76	62.06	70.812	
2,800.00	2,703.35	2,518.70	2,518.35	12.42	52.67	58.21	2,842.20	3,803.90	4,376.12	4,311.62	64.50	67.849	
2,900.00	2,797.45	2,612.80	2,612.45	12.96	54.60	58.58	2,842.20	3,803.90	4,357.60	4,290.66	66.94	65.101	
3,000.00	2,891.55	2,710.66	2,710.29	13.51	56.60	58.94	2,843.82	3,803.90	4,340.07	4,270.62	69.45	62.491	
3,100.00	2,985.65	2,812.53	2,812.16	14.05	58.68	59.34	2,843.45	3,803.90	4,321.75	4,249.70	72.05	59.982	
3,200.00	3,079.75	2,914.15	2,913.77	14.60	60.76	59.75	2,842.72	3,803.90	4,303.45	4,228.80	74.65	57.650	
3,300.00	3,173.85	2,989.27	2,988.85	15.14	62.25	60.05	2,842.20	3,803.90	4,285.39	4,208.71	76.68	55.888	
3,400.00	3,267.95	3,083.37	3,082.95	15.69	64.03	60.43	2,842.20	3,803.90	4,267.81	4,188.83	78.98	54.036	
3,500.00	3,362.05	3,177.47	3,177.05	16.23	65.80	60.81	2,842.20	3,803.90	4,250.44	4,169.15	81.29	52.290	
3,600.00	3,456.15	3,271.57	3,271.15	16.78	67.58	61.19	2,842.20	3,803.90	4,233.26	4,149.67	83.59	50.642	
3,700.00	3,550.25	3,365.67	3,365.25	17.33	69.35	61.57	2,842.20	3,803.90	4,216.29	4,130.38	85.90	49.083	
3,800.00	3,644.35	3,459.77	3,459.35	17.88	71.13	61.96	2,842.20	3,803.90	4,199.51	4,111.30	88.21	47.607	
3,900.00	3,738.45	3,553.87	3,553.45	18.42	72.91	62.35	2,842.20	3,803.90	4,182.95	4,092.42	90.53	46.208	
4,000.00	3,832.55	3,647.97	3,647.55	18.97	74.68	62.74	2,842.20	3,803.90	4,166.59	4,073.75	92.84	44.879	
4,100.00	3,926.65	3,742.07	3,741.65	19.52	76.46	63.14	2,842.20	3,803.90	4,150.45	4,055.29	95.16	43.617	
4,200.00	4,020.75	3,836.54	3,836.12	20.07	78.24	63.52	2,844.01	3,803.90	4,135.29	4,037.81	97.48	42.421	
4,300.00	4,114.85	3,931.50	3,931.07	20.62	80.03	63.92	2,843.97	3,803.90	4,119.54	4,019.73	99.82	41.271	
4,400.00	4,208.95	4,026.42	4,025.99	21.17	81.82	64.33	2,843.88	3,803.90	4,104.00	4,001.84	102.16	40.174	
4,500.00	4,303.05	4,121.31	4,120.88	21.72	83.61	64.75	2,843.74	3,803.90	4,088.66	3,984.17	104.49	39.128	
4,600.00	4,397.15	4,216.17	4,215.74	22.27	85.40	65.16	2,843.55	3,803.90	4,073.53	3,966.69	106.83	38.129	
4,700.00	4,491.25	4,310.99	4,310.56	22.82	87.19	65.58	2,843.32	3,803.90	4,058.60	3,949.43	109.18	37.175	
4,800.00	4,585.35	4,405.78	4,405.35	23.37	88.98	66.00	2,843.04	3,803.90	4,043.89	3,932.38	111.52	36.262	
4,900.00	4,679.45	4,500.54	4,500.10	23.93	90.77	66.43	2,842.71	3,803.90	4,029.40	3,915.54	113.86	35.389	
5,000.00	4,773.55	4,595.26	4,594.83	24.48	92.55	66.85	2,842.34	3,803.90	4,015.13	3,898.93	116.20	34.552	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #107 - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program:		165-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)
5,100.00	4,867.65	4,683.17	4,682.65	25.03	94.26	67.25	2,842.20	3,803.90	4,001.18	3,882.71	118.47	33.774	
5,200.00	4,961.75	4,777.27	4,776.75	25.58	96.11	67.68	2,842.20	3,803.90	3,987.53	3,866.65	120.88	32.987	
5,300.00	5,055.85	4,871.37	4,870.85	26.13	97.96	68.11	2,842.20	3,803.90	3,974.12	3,850.82	123.30	32.232	
5,400.00	5,149.95	4,965.47	4,964.95	26.68	99.81	68.54	2,842.20	3,803.90	3,960.95	3,835.24	125.71	31.508	
5,500.00	5,244.05	5,059.57	5,059.05	27.24	101.67	68.97	2,842.20	3,803.90	3,948.02	3,819.90	128.13	30.813	
5,600.00	5,338.15	5,153.67	5,153.15	27.79	103.52	69.41	2,842.20	3,803.90	3,935.35	3,804.80	130.55	30.145	
5,665.73	5,400.00	5,216.22	5,215.69	28.15	104.75	69.67	2,843.97	3,803.90	3,927.72	3,795.58	132.15	29.722	
5,700.00	5,432.28	5,248.99	5,248.46	28.34	105.40	69.79	2,843.94	3,803.90	3,923.52	3,790.53	132.99	29.503	
5,800.00	5,526.87	5,344.97	5,344.44	28.88	107.29	70.11	2,843.80	3,803.90	3,911.78	3,776.35	135.43	28.884	
5,900.00	5,622.01	5,441.44	5,440.90	29.41	109.18	70.42	2,843.54	3,803.90	3,900.83	3,762.96	137.87	28.294	
6,000.00	5,717.67	5,538.37	5,537.83	29.92	111.09	70.72	2,843.17	3,803.90	3,890.63	3,750.33	140.30	27.730	
6,100.00	5,813.83	5,635.75	5,635.20	30.41	113.01	71.01	2,842.68	3,803.90	3,881.16	3,738.43	142.73	27.192	
6,200.00	5,910.44	5,726.06	5,725.44	30.89	114.80	71.26	2,842.20	3,803.90	3,872.42	3,727.41	145.02	26.703	
6,300.00	6,007.50	5,823.11	5,822.50	31.36	116.78	71.52	2,842.20	3,803.90	3,864.53	3,717.05	147.48	26.204	
6,400.00	6,104.96	5,920.57	5,919.96	31.80	118.77	71.76	2,842.20	3,803.90	3,857.31	3,707.37	149.94	25.727	
6,500.00	6,202.80	6,018.41	6,017.80	32.24	120.77	71.98	2,842.20	3,803.90	3,850.75	3,698.36	152.38	25.270	
6,600.00	6,300.98	6,116.59	6,115.98	32.66	122.78	72.19	2,842.20	3,803.90	3,844.81	3,689.99	154.82	24.834	
6,700.00	6,399.48	6,215.09	6,214.48	33.06	124.79	72.38	2,842.20	3,803.90	3,839.49	3,682.24	157.25	24.416	
6,722.82	6,422.00	6,237.61	6,237.00	33.15	125.25	72.42	2,842.20	3,803.90	3,838.36	3,680.55	157.80	24.324	
6,750.00	6,448.76	6,264.37	6,263.76	33.26	125.80	82.34	2,842.20	3,803.90	3,837.34	3,678.88	158.46	24.216	
6,779.95	6,478.05	6,293.66	6,293.05	33.39	126.40	90.00	2,842.20	3,803.90	3,836.96	3,677.75	159.20	24.101 CC	
6,800.00	6,497.51	6,313.13	6,312.51	33.48	126.80	93.80	2,842.20	3,803.90	3,837.13	3,677.44	159.69	24.028 ES	
6,850.00	6,545.40	6,361.01	6,360.40	33.72	127.78	100.38	2,842.20	3,803.90	3,839.09	3,678.15	160.93	23.855	
6,900.00	6,592.13	6,407.74	6,407.13	33.97	128.73	104.44	2,842.20	3,803.90	3,843.23	3,681.06	162.18	23.698	
6,950.00	6,637.40	6,453.01	6,452.40	34.25	129.66	107.03	2,842.20	3,803.90	3,849.59	3,686.17	163.41	23.558	
7,000.00	6,680.94	6,496.55	6,495.94	34.54	130.55	108.68	2,842.20	3,803.90	3,858.15	3,693.51	164.64	23.434	
7,050.00	6,722.48	6,538.09	6,537.48	34.85	131.40	109.66	2,842.20	3,803.90	3,868.92	3,703.08	165.84	23.329	
7,100.00	6,761.76	6,577.38	6,576.76	35.17	132.20	110.12	2,842.20	3,803.90	3,881.89	3,714.87	167.02	23.242	
7,150.00	6,798.55	6,614.16	6,613.55	35.51	132.95	110.14	2,842.20	3,803.90	3,897.01	3,728.85	168.16	23.174	
7,200.00	6,832.61	6,648.23	6,647.61	35.86	133.65	109.77	2,842.20	3,803.90	3,914.25	3,744.99	169.26	23.126	
7,250.00	6,863.74	6,679.35	6,678.74	36.22	134.28	109.04	2,842.20	3,803.90	3,933.55	3,763.24	170.31	23.096	
7,300.00	6,891.74	6,707.35	6,706.74	36.59	134.86	107.96	2,842.20	3,803.90	3,954.83	3,783.52	171.31	23.086 SF	
7,350.00	6,916.44	6,732.06	6,731.44	36.98	135.36	106.53	2,842.20	3,803.90	3,977.99	3,805.75	172.24	23.095	
7,400.00	6,937.69	6,753.31	6,752.69	37.37	135.80	104.75	2,842.20	3,803.90	4,002.93	3,829.82	173.11	23.123	
7,450.00	6,955.36	6,770.97	6,770.36	37.78	136.16	102.61	2,842.20	3,803.90	4,029.52	3,855.61	173.91	23.170	
7,500.00	6,969.34	6,784.95	6,784.34	38.19	136.44	100.11	2,842.20	3,803.90	4,057.60	3,882.97	174.63	23.235	
7,550.00	6,979.53	6,795.15	6,794.53	38.62	136.65	97.25	2,842.20	3,803.90	4,087.01	3,911.75	175.27	23.319	
7,600.00	6,985.89	6,801.50	6,800.89	39.05	136.78	94.04	2,842.20	3,803.90	4,117.58	3,941.76	175.82	23.419	
7,650.00	6,988.37	6,803.98	6,803.37	39.48	136.83	90.50	2,842.20	3,803.90	4,149.11	3,972.83	176.28	23.537	
7,657.25	6,988.40	6,804.02	6,803.40	39.54	136.83	89.97	2,842.20	3,803.90	4,153.75	3,977.41	176.34	23.555	
7,700.00	6,988.37	6,803.99	6,803.37	39.92	136.83	89.97	2,842.20	3,803.90	4,181.28	4,004.60	176.69	23.665	
7,800.00	6,988.30	6,803.92	6,803.30	40.82	136.83	89.96	2,842.20	3,803.90	4,246.66	4,069.18	177.48	23.927	
7,900.00	6,988.23	6,803.85	6,803.23	41.77	136.83	89.96	2,842.20	3,803.90	4,313.37	4,135.11	178.26	24.197	
8,000.00	6,988.16	6,803.78	6,803.16	42.75	136.83	89.96	2,842.20	3,803.90	4,381.35	4,202.33	179.02	24.474	
8,100.00	6,988.09	6,803.71	6,803.09	43.76	136.83	89.96	2,842.20	3,803.90	4,450.53	4,270.77	179.76	24.758	
8,152.35	6,988.06	6,803.67	6,803.06	44.30	136.83	89.96	2,842.20	3,803.90	4,487.21	4,307.07	180.14	24.909	
8,200.00	6,988.02	6,803.64	6,803.02	44.79	136.82	89.96	2,842.20	3,803.90	4,521.42	4,340.94	180.48	25.052	
8,300.00	6,987.95	6,803.56	6,802.95	45.83	136.82	89.95	2,842.20	3,803.90	4,597.40	4,416.26	181.14	25.381	
8,400.00	6,987.88	6,803.49	6,802.88	46.85	136.82	89.94	2,842.20	3,803.90	4,678.52	4,496.80	181.72	25.745	
8,500.00	6,987.80	6,803.42	6,802.80	47.85	136.82	89.92	2,842.20	3,803.90	4,764.13	4,581.90	182.23	26.143	
8,600.00	6,987.73	6,803.34	6,802.73	48.83	136.82	89.90	2,842.20	3,803.90	4,853.59	4,670.92	182.67	26.571	
8,700.00	6,987.65	6,803.26	6,802.65	49.79	136.82	89.88	2,842.20	3,803.90	4,946.27	4,763.24	183.03	27.025	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #107 - OH - OH-INC													Offset Site Error: 0.00 usft
Survey Program: 165-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)			
8,800.00	6,987.57	6,803.19	6,802.57	50.72	136.82	89.84	2,842.20	3,803.90	5,041.55	4,858.23	183.32	27.502	
8,900.00	6,987.50	6,803.11	6,802.50	51.62	136.81	89.78	2,842.20	3,803.90	5,138.83	4,955.30	183.53	28.000	
9,000.00	6,987.42	6,803.03	6,802.42	52.48	136.81	89.65	2,842.20	3,803.90	5,237.55	5,053.87	183.68	28.514	
9,100.00	6,987.34	6,802.96	6,802.34	53.30	136.81	89.16	2,842.20	3,803.90	5,337.15	5,153.39	183.76	29.044	
9,200.00	6,987.27	6,802.88	6,802.27	54.08	136.81	-87.76	2,842.20	3,803.90	5,437.12	5,253.33	183.79	29.584	
9,215.33	6,987.26	6,802.87	6,802.26	54.20	136.81	-88.57	2,842.20	3,803.90	5,452.44	5,268.66	183.78	29.668	
9,300.00	6,987.20	6,802.81	6,802.20	54.85	136.81	-88.55	2,842.20	3,803.90	5,537.08	5,353.31	183.77	30.130	
9,400.00	6,987.12	6,802.73	6,802.12	55.65	136.81	-88.52	2,842.20	3,803.90	5,637.03	5,453.28	183.76	30.677	
9,500.00	6,987.05	6,802.66	6,802.05	56.48	136.80	-88.50	2,842.20	3,803.90	5,736.99	5,553.25	183.74	31.223	
9,600.00	6,986.98	6,802.59	6,801.98	57.35	136.80	-88.47	2,842.20	3,803.90	5,836.96	5,653.23	183.73	31.769	
9,700.00	6,986.90	6,802.51	6,801.90	58.24	136.80	-88.44	2,842.20	3,803.90	5,936.92	5,753.20	183.72	32.315	
9,800.00	6,986.83	6,802.44	6,801.83	59.17	136.80	-88.42	2,842.20	3,803.90	6,036.88	5,853.17	183.71	32.861	
9,900.00	6,986.75	6,802.37	6,801.75	60.12	136.80	-88.39	2,842.20	3,803.90	6,136.85	5,953.15	183.70	33.407	
10,000.00	6,986.68	6,802.29	6,801.68	61.10	136.80	-88.36	2,842.20	3,803.90	6,236.81	6,053.12	183.69	33.952	
10,100.00	6,986.61	6,802.22	6,801.61	62.11	136.80	-88.34	2,842.20	3,803.90	6,336.78	6,153.09	183.69	34.498	
10,200.00	6,986.53	6,802.15	6,801.53	63.14	136.79	-88.31	2,842.20	3,803.90	6,436.75	6,253.07	183.68	35.043	
10,300.00	6,986.46	6,802.07	6,801.46	64.20	136.79	-88.29	2,842.20	3,803.90	6,536.72	6,353.04	183.68	35.588	
10,400.00	6,986.39	6,802.00	6,801.39	65.28	136.79	-88.26	2,842.20	3,803.90	6,636.69	6,453.02	183.67	36.133	
10,500.00	6,986.31	6,801.93	6,801.31	66.38	136.79	-88.23	2,842.20	3,803.90	6,736.66	6,552.99	183.67	36.678	
10,600.00	6,986.24	6,801.85	6,801.24	67.50	136.79	-88.21	2,842.20	3,803.90	6,836.63	6,652.96	183.67	37.222	
10,700.00	6,986.17	6,801.78	6,801.17	68.64	136.79	-88.18	2,842.20	3,803.90	6,936.61	6,752.93	183.67	37.766	
10,800.00	6,986.09	6,801.70	6,801.09	69.80	136.78	-88.15	2,842.20	3,803.90	7,036.58	6,852.91	183.67	38.311	
10,900.00	6,986.02	6,801.63	6,801.02	70.98	136.78	-88.13	2,842.20	3,803.90	7,136.55	6,952.88	183.67	38.855	
11,000.00	6,985.95	6,801.56	6,800.95	72.17	136.78	-88.10	2,842.20	3,803.90	7,236.53	7,052.85	183.68	39.398	
11,100.00	6,985.87	6,801.48	6,800.87	73.38	136.78	-88.08	2,842.20	3,803.90	7,336.50	7,152.82	183.68	39.942	
11,200.00	6,985.80	6,801.41	6,800.80	74.61	136.78	-88.05	2,842.20	3,803.90	7,436.48	7,252.80	183.68	40.485	
11,300.00	6,985.72	6,801.34	6,800.72	75.85	136.78	-88.02	2,842.20	3,803.90	7,536.46	7,352.77	183.69	41.028	
11,400.00	6,985.65	6,801.26	6,800.65	77.10	136.78	-88.00	2,842.20	3,803.90	7,636.43	7,452.74	183.70	41.571	
11,500.00	6,985.58	6,801.19	6,800.58	78.37	136.77	-87.97	2,842.20	3,803.90	7,736.41	7,552.71	183.70	42.114	
11,600.00	6,985.50	6,801.12	6,800.50	79.65	136.77	-87.94	2,842.20	3,803.90	7,836.39	7,652.68	183.71	42.656	
11,700.00	6,985.43	6,801.04	6,800.43	80.94	136.77	-87.92	2,842.20	3,803.90	7,936.37	7,752.65	183.72	43.199	
11,800.00	6,985.36	6,800.97	6,800.36	82.24	136.77	-87.89	2,842.20	3,803.90	8,036.35	7,852.62	183.73	43.741	
11,900.00	6,985.28	6,800.90	6,800.28	83.56	136.77	-87.87	2,842.20	3,803.90	8,136.33	7,952.59	183.74	44.282	
12,000.00	6,985.21	6,800.82	6,800.21	84.88	136.77	-87.84	2,842.20	3,803.90	8,236.31	8,052.56	183.75	44.824	
12,100.00	6,985.14	6,800.75	6,800.14	86.21	136.77	-87.81	2,842.20	3,803.90	8,336.29	8,152.53	183.76	45.365	
12,200.00	6,985.06	6,800.67	6,800.06	87.56	136.76	-87.79	2,842.20	3,803.90	8,436.27	8,252.50	183.77	45.906	
12,300.00	6,984.99	6,800.60	6,799.99	88.91	136.76	-87.76	2,842.20	3,803.90	8,536.26	8,352.47	183.79	46.447	
12,400.00	6,984.92	6,800.53	6,799.92	90.27	136.76	-87.73	2,842.20	3,803.90	8,636.24	8,452.44	183.80	46.987	
12,500.00	6,984.84	6,800.45	6,799.84	91.64	136.76	-87.71	2,842.20	3,803.90	8,736.22	8,552.41	183.81	47.528	
12,600.00	6,984.77	6,800.38	6,799.77	93.01	136.76	-87.68	2,842.20	3,803.90	8,836.21	8,652.38	183.83	48.068	
12,700.00	6,984.69	6,800.31	6,799.69	94.40	136.76	-87.66	2,842.20	3,803.90	8,936.19	8,752.34	183.84	48.607	
12,800.00	6,984.62	6,800.23	6,799.62	95.79	136.75	-87.63	2,842.20	3,803.90	9,036.17	8,852.31	183.86	49.147	
12,900.00	6,984.55	6,800.16	6,799.55	97.18	136.75	-87.60	2,842.20	3,803.90	9,136.16	8,952.28	183.88	49.686	
13,000.00	6,984.47	6,800.09	6,799.47	98.59	136.75	-87.58	2,842.20	3,803.90	9,236.14	9,052.25	183.90	50.225	
13,100.00	6,984.40	6,800.01	6,799.40	100.00	136.75	-87.55	2,842.20	3,803.90	9,336.13	9,152.21	183.92	50.763	
13,200.00	6,984.33	6,799.94	6,799.33	101.41	136.75	-87.53	2,842.20	3,803.90	9,436.11	9,252.18	183.93	51.301	
13,300.00	6,984.25	6,799.86	6,799.25	102.83	136.75	-87.50	2,842.20	3,803.90	9,536.10	9,352.14	183.95	51.839	
13,400.00	6,984.18	6,799.79	6,799.18	104.26	136.75	-87.47	2,842.20	3,803.90	9,636.08	9,452.11	183.98	52.377	
13,500.00	6,984.11	6,799.72	6,799.11	105.69	136.74	-87.45	2,842.20	3,803.90	9,736.07	9,552.07	184.00	52.914	
13,600.00	6,984.03	6,799.64	6,799.03	107.13	136.74	-87.42	2,842.20	3,803.90	9,836.06	9,652.04	184.02	53.451	
13,700.00	6,983.96	6,799.57	6,798.96	108.57	136.74	-87.39	2,842.20	3,803.90	9,936.04	9,752.00	184.04	53.988	
13,800.00	6,983.88	6,799.50	6,798.88	110.02	136.74	-87.37	2,842.20	3,803.90	10,036.03	9,851.97	184.06	54.525	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #107 - OH - OH-INC												Offset Site Error:	0.00 usft	
Survey Program:		165-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)	
13,900.00	6,983.81	6,799.42	6,798.81	111.47	136.74	-87.34	2,842.20	3,803.90	10,136.02	9,951.93	184.09	55.061		
14,000.00	6,983.74	6,799.35	6,798.74	112.92	136.74	-87.32	2,842.20	3,803.90	10,236.00	10,051.89	184.11	55.596		
14,100.00	6,983.66	6,799.28	6,798.66	114.38	136.74	-87.29	2,842.20	3,803.90	10,335.99	10,151.85	184.14	56.132		
14,200.00	6,983.59	6,799.20	6,798.59	115.85	136.73	-87.26	2,842.20	3,803.90	10,435.98	10,251.82	184.16	56.667		
14,300.00	6,983.52	6,799.13	6,798.52	117.31	136.73	-87.24	2,842.20	3,803.90	10,535.97	10,351.78	184.19	57.202		
14,400.00	6,983.44	6,799.06	6,798.44	118.78	136.73	-87.21	2,842.20	3,803.90	10,635.96	10,451.74	184.22	57.736		
14,500.00	6,983.37	6,798.98	6,798.37	120.26	136.73	-87.18	2,842.20	3,803.90	10,735.95	10,551.70	184.24	58.270		
14,600.00	6,983.30	6,798.91	6,798.30	121.74	136.73	-87.16	2,842.20	3,803.90	10,835.93	10,651.66	184.27	58.804		
14,700.00	6,983.22	6,798.83	6,798.22	123.22	136.73	-87.13	2,842.20	3,803.90	10,935.92	10,751.62	184.30	59.337		
14,800.00	6,983.15	6,798.76	6,798.15	124.70	136.72	-87.11	2,842.20	3,803.90	11,035.91	10,851.58	184.33	59.870		
14,900.00	6,983.08	6,798.69	6,798.08	126.19	136.72	-87.08	2,842.20	3,803.90	11,135.90	10,951.54	184.36	60.403		
15,000.00	6,983.00	6,798.61	6,798.00	127.68	136.72	-87.05	2,842.20	3,803.90	11,235.89	11,051.50	184.39	60.935		
15,100.00	6,982.93	6,798.54	6,797.93	129.17	136.72	-87.03	2,842.20	3,803.90	11,335.88	11,151.46	184.42	61.467		
15,200.00	6,982.85	6,798.47	6,797.85	130.67	136.72	-87.00	2,842.20	3,803.90	11,435.87	11,251.42	184.45	61.999		
15,300.00	6,982.78	6,798.39	6,797.78	132.16	136.72	-86.98	2,842.20	3,803.90	11,535.86	11,351.38	184.49	62.530		
15,400.00	6,982.71	6,798.32	6,797.71	133.66	136.72	-86.95	2,842.20	3,803.90	11,635.85	11,451.33	184.52	63.061		
15,500.00	6,982.63	6,798.25	6,797.63	135.17	136.71	-86.92	2,842.20	3,803.90	11,735.84	11,551.29	184.55	63.591		
15,600.00	6,982.56	6,798.17	6,797.56	136.67	136.71	-86.90	2,842.20	3,803.90	11,835.83	11,651.25	184.59	64.121		
15,700.00	6,982.49	6,798.10	6,797.49	138.18	136.71	-86.87	2,842.20	3,803.90	11,935.82	11,751.20	184.62	64.651		
15,800.00	6,982.41	6,798.03	6,797.41	139.69	136.71	-86.84	2,842.20	3,803.90	12,035.82	11,851.16	184.66	65.180		
15,900.00	6,982.34	6,797.95	6,797.34	141.20	136.71	-86.82	2,842.20	3,803.90	12,135.81	11,951.12	184.69	65.709		
16,000.00	6,982.27	6,797.88	6,797.27	142.71	136.71	-86.79	2,842.20	3,803.90	12,235.80	12,051.07	184.73	66.237		
16,100.00	6,982.19	6,797.80	6,797.19	144.23	136.71	-86.77	2,842.20	3,803.90	12,335.79	12,151.03	184.76	66.765		
16,200.00	6,982.12	6,797.73	6,797.12	145.75	136.70	-86.74	2,842.20	3,803.90	12,435.78	12,250.98	184.80	67.293		
16,300.00	6,982.05	6,797.66	6,797.05	147.27	136.70	-86.71	2,842.20	3,803.90	12,535.77	12,350.93	184.84	67.820		
16,400.00	6,981.97	6,797.58	6,796.97	148.79	136.70	-86.69	2,842.20	3,803.90	12,635.76	12,450.89	184.88	68.347		
16,500.00	6,981.90	6,797.51	6,796.90	150.31	136.70	-86.66	2,842.20	3,803.90	12,735.76	12,550.84	184.92	68.873		
16,600.00	6,981.82	6,797.44	6,796.82	151.84	136.70	-86.64	2,842.20	3,803.90	12,835.75	12,650.79	184.95	69.399		
16,700.00	6,981.75	6,797.36	6,796.75	153.36	136.70	-86.61	2,842.20	3,803.90	12,935.74	12,750.75	184.99	69.925		
16,800.00	6,981.68	6,797.29	6,796.68	154.89	136.69	-86.58	2,842.20	3,803.90	13,035.73	12,850.70	185.03	70.450		
16,900.00	6,981.60	6,797.22	6,796.60	156.42	136.69	-86.56	2,842.20	3,803.90	13,135.73	12,950.65	185.08	70.975		
17,000.00	6,981.53	6,797.14	6,796.53	157.95	136.69	-86.53	2,842.20	3,803.90	13,235.72	13,050.60	185.12	71.499		
17,100.00	6,981.46	6,797.07	6,796.46	159.49	136.69	-86.50	2,842.20	3,803.90	13,335.71	13,150.55	185.16	72.023		
17,200.00	6,981.38	6,796.99	6,796.38	161.02	136.69	-86.48	2,842.20	3,803.90	13,435.70	13,250.50	185.20	72.546		
17,300.00	6,981.31	6,796.92	6,796.31	162.56	136.69	-86.45	2,842.20	3,803.90	13,535.70	13,350.45	185.24	73.069		
17,400.00	6,981.24	6,796.85	6,796.24	164.09	136.69	-86.43	2,842.20	3,803.90	13,635.69	13,450.40	185.29	73.592		
17,500.00	6,981.16	6,796.77	6,796.16	165.63	136.68	-86.40	2,842.20	3,803.90	13,735.68	13,550.35	185.33	74.114		
17,600.00	6,981.09	6,796.70	6,796.09	167.17	136.68	-86.37	2,842.20	3,803.90	13,835.68	13,650.30	185.38	74.636		
17,700.00	6,981.01	6,796.63	6,796.01	168.71	136.68	-86.35	2,842.20	3,803.90	13,935.67	13,750.25	185.42	75.157		
17,800.00	6,980.94	6,796.55	6,795.94	170.25	136.68	-86.32	2,842.20	3,803.90	14,035.66	13,850.20	185.47	75.678		
17,900.00	6,980.87	6,796.48	6,795.87	171.80	136.68	-86.30	2,842.20	3,803.90	14,135.66	13,950.14	185.51	76.198		
18,000.00	6,980.79	6,796.41	6,795.79	173.34	136.68	-86.27	2,842.20	3,803.90	14,235.65	14,050.09	185.56	76.718		
18,100.00	6,980.72	6,796.33	6,795.72	174.89	136.68	-86.24	2,842.20	3,803.90	14,335.64	14,150.04	185.61	77.237		
18,200.00	6,980.65	6,796.26	6,795.65	176.43	136.67	-86.22	2,842.20	3,803.90	14,435.64	14,249.98	185.65	77.756		
18,300.00	6,980.57	6,796.19	6,795.57	177.98	136.67	-86.19	2,842.20	3,803.90	14,535.63	14,349.93	185.70	78.275		
18,400.00	6,980.50	6,796.11	6,795.50	179.53	136.67	-86.16	2,842.20	3,803.90	14,635.62	14,449.88	185.75	78.793		
18,500.00	6,980.43	6,796.04	6,795.43	181.08	136.67	-86.14	2,842.20	3,803.90	14,735.62	14,549.82	185.80	79.310		
18,600.00	6,980.35	6,795.96	6,795.35	182.63	136.67	-86.11	2,842.20	3,803.90	14,835.61	14,649.77	185.85	79.827		
18,700.00	6,980.28	6,795.89	6,795.28	184.18	136.67	-86.09	2,842.20	3,803.90	14,935.61	14,749.71	185.90	80.344		
18,800.00	6,980.21	6,795.82	6,795.21	185.73	136.66	-86.06	2,842.20	3,803.90	15,035.60	14,849.65	185.95	80.860		
18,900.00	6,980.13	6,795.74	6,795.13	187.28	136.66	-86.03	2,842.20	3,803.90	15,135.60	14,949.60	186.00	81.375		
19,000.00	6,980.06	6,795.67	6,795.06	188.84	136.66	-86.01	2,842.20	3,803.90	15,235.59	15,049.54	186.05	81.890		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #107 - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program:		165-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)
19,100.00	6,979.98	6,795.60	6,794.98	190.39	136.66	-85.98	2,842.20	3,803.90	15,335.58	15,149.48	186.10	82.405	
19,200.00	6,979.91	6,795.52	6,794.91	191.95	136.66	-85.96	2,842.20	3,803.90	15,435.58	15,249.43	186.15	82.919	
19,300.00	6,979.84	6,795.45	6,794.84	193.51	136.66	-85.93	2,842.20	3,803.90	15,535.57	15,349.37	186.20	83.433	
19,400.00	6,979.76	6,795.38	6,794.76	195.06	136.66	-85.90	2,842.20	3,803.90	15,635.57	15,449.31	186.26	83.946	
19,500.00	6,979.69	6,795.30	6,794.69	196.62	136.65	-85.88	2,842.20	3,803.90	15,735.56	15,549.25	186.31	84.459	
19,600.00	6,979.62	6,795.23	6,794.62	198.18	136.65	-85.85	2,842.20	3,803.90	15,835.56	15,649.19	186.36	84.971	
19,700.00	6,979.54	6,795.16	6,794.54	199.74	136.65	-85.83	2,842.20	3,803.90	15,935.55	15,749.13	186.42	85.482	
19,800.00	6,979.47	6,795.08	6,794.47	201.30	136.65	-85.80	2,842.20	3,803.90	16,035.55	15,849.07	186.47	85.994	
19,900.00	6,979.40	6,795.01	6,794.40	202.86	136.65	-85.77	2,842.20	3,803.90	16,135.54	15,949.01	186.53	86.504	
20,000.00	6,979.32	6,794.93	6,794.32	204.42	136.65	-85.75	2,842.20	3,803.90	16,235.54	16,048.95	186.58	87.014	
20,100.00	6,979.25	6,794.86	6,794.25	205.98	136.65	-85.72	2,842.20	3,803.90	16,335.53	16,148.89	186.64	87.524	
20,200.00	6,979.18	6,794.79	6,794.18	207.55	136.64	-85.69	2,842.20	3,803.90	16,435.53	16,248.83	186.70	88.033	
20,300.00	6,979.10	6,794.71	6,794.10	209.11	136.64	-85.67	2,842.20	3,803.90	16,535.52	16,348.77	186.75	88.542	
20,400.00	6,979.03	6,794.64	6,794.03	210.68	136.64	-85.64	2,842.20	3,803.90	16,635.52	16,448.71	186.81	89.050	
20,500.00	6,978.95	6,794.57	6,793.95	212.24	136.64	-85.62	2,842.20	3,803.90	16,735.51	16,548.64	186.87	89.557	
20,600.00	6,978.88	6,794.49	6,793.88	213.81	136.64	-85.59	2,842.20	3,803.90	16,835.51	16,648.58	186.93	90.064	
20,700.00	6,978.81	6,794.42	6,793.81	215.37	136.64	-85.56	2,842.20	3,803.90	16,935.50	16,748.52	186.99	90.571	
20,800.00	6,978.73	6,794.35	6,793.73	216.94	136.63	-85.54	2,842.20	3,803.90	17,035.50	16,848.45	187.05	91.077	
20,900.00	6,978.66	6,794.27	6,793.66	218.51	136.63	-85.51	2,842.20	3,803.90	17,135.50	16,948.39	187.11	91.582	
21,000.00	6,978.59	6,794.20	6,793.59	220.07	136.63	-85.49	2,842.20	3,803.90	17,235.49	17,048.33	187.17	92.087	
21,100.00	6,978.51	6,794.12	6,793.51	221.64	136.63	-85.46	2,842.20	3,803.90	17,335.49	17,148.26	187.23	92.591	
21,200.00	6,978.44	6,794.05	6,793.44	223.21	136.63	-85.43	2,842.20	3,803.90	17,435.48	17,248.20	187.29	93.095	
21,300.00	6,978.37	6,793.98	6,793.37	224.78	136.63	-85.41	2,842.20	3,803.90	17,535.48	17,348.13	187.35	93.599	
21,400.00	6,978.29	6,793.90	6,793.29	226.35	136.63	-85.38	2,842.20	3,803.90	17,635.47	17,448.06	187.41	94.101	
21,500.00	6,978.22	6,793.83	6,793.22	227.92	136.62	-85.36	2,842.20	3,803.90	17,735.47	17,548.00	187.47	94.604	
21,600.00	6,978.14	6,793.76	6,793.14	229.49	136.62	-85.33	2,842.20	3,803.90	17,835.47	17,647.93	187.53	95.105	
21,700.00	6,978.07	6,793.68	6,793.07	231.06	136.62	-85.30	2,842.20	3,803.90	17,935.46	17,747.87	187.60	95.607	
21,800.00	6,978.00	6,793.61	6,793.00	232.63	136.62	-85.28	2,842.20	3,803.90	18,035.46	17,847.80	187.66	96.107	
21,900.00	6,977.92	6,793.54	6,792.92	234.21	136.62	-85.25	2,842.20	3,803.90	18,135.45	17,947.73	187.72	96.607	
22,000.00	6,977.85	6,793.46	6,792.85	235.78	136.62	-85.23	2,842.20	3,803.90	18,235.45	18,047.66	187.79	97.107	
22,100.00	6,977.78	6,793.39	6,792.78	237.35	136.61	-85.20	2,842.20	3,803.90	18,335.45	18,147.59	187.85	97.606	
22,200.00	6,977.70	6,793.32	6,792.70	238.92	136.61	-85.17	2,842.20	3,803.90	18,435.44	18,247.53	187.92	98.104	
22,300.00	6,977.63	6,793.24	6,792.63	240.50	136.61	-85.15	2,842.20	3,803.90	18,535.44	18,347.46	187.98	98.602	
22,400.00	6,977.56	6,793.17	6,792.56	242.07	136.61	-85.12	2,842.20	3,803.90	18,635.43	18,447.39	188.05	99.099	
22,500.00	6,977.48	6,793.09	6,792.48	243.65	136.61	-85.09	2,842.20	3,803.90	18,735.43	18,547.32	188.11	99.596	
22,600.00	6,977.41	6,793.02	6,792.41	245.22	136.61	-85.07	2,842.20	3,803.90	18,835.43	18,647.25	188.18	100.092	
22,700.00	6,977.34	6,792.95	6,792.34	246.80	136.61	-85.04	2,842.20	3,803.90	18,935.42	18,747.18	188.25	100.588	
22,800.00	6,977.26	6,792.87	6,792.26	248.37	136.60	-85.02	2,842.20	3,803.90	19,035.42	18,847.11	188.31	101.083	
22,900.00	6,977.19	6,792.80	6,792.19	249.95	136.60	-84.99	2,842.20	3,803.90	19,135.42	18,947.03	188.38	101.578	
23,000.00	6,977.11	6,792.73	6,792.11	251.53	136.60	-84.96	2,842.20	3,803.90	19,235.41	19,046.96	188.45	102.072	
23,100.00	6,977.04	6,792.65	6,792.04	253.10	136.60	-84.94	2,842.20	3,803.90	19,335.41	19,146.89	188.52	102.565	
23,155.65	6,977.00	6,792.61	6,792.00	253.98	136.60	-84.92	2,842.20	3,803.90	19,391.06	19,202.50	188.56	102.839	
23,156.15	6,977.00	6,792.61	6,792.00	254.06	136.60	-84.92	2,842.20	3,803.90	19,391.56	19,198.96	192.60	100.681	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #108 - OH - OH-SVY													Offset Site Error: 0.00 usft
Survey Program: 107-MWD OWSG Rev5													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	-103.04	-1,167.44	-5,042.53	5,176.92				
100.00	100.00	0.00	0.00	0.25	0.00	-103.04	-1,167.44	-5,042.53	5,175.91	5,175.66	0.25	N/A	
134.01	134.01	32.01	32.01	0.37	0.20	-103.04	-1,167.44	-5,042.53	5,175.91	5,175.34	0.57	9,075.097	
200.00	200.00	98.00	98.00	0.61	0.61	-103.04	-1,167.44	-5,042.53	5,175.91	5,174.70	1.21	4,265.192	
268.00	268.00	166.00	166.99	0.85	1.17	-103.03	-1,167.25	-5,042.53	5,175.87	5,173.88	1.99	2,597.454	
300.00	300.00	194.33	194.33	0.97	1.40	-103.03	-1,167.30	-5,042.53	5,175.88	5,173.54	2.34	2,213.898	
400.00	400.00	298.01	298.00	1.33	2.23	-103.04	-1,167.44	-5,042.53	5,175.91	5,172.41	3.50	1,479.233	
417.57	417.57	315.57	315.56	1.39	2.37	-103.03	-1,167.35	-5,042.53	5,175.89	5,172.19	3.70	1,400.740	
500.00	500.00	395.75	395.74	1.68	3.00	-103.04	-1,167.42	-5,042.53	5,175.91	5,171.31	4.60	1,125.650	
600.00	599.98	498.00	497.98	2.04	4.74	-113.04	-1,167.44	-5,042.53	5,176.59	5,169.91	6.69	774.211	
700.00	699.84	597.85	597.84	2.41	6.55	-113.06	-1,167.44	-5,042.53	5,178.65	5,169.81	8.84	585.932	
800.00	799.45	696.29	696.27	2.77	8.33	-113.07	-1,166.64	-5,042.53	5,181.89	5,170.92	10.97	472.487	
900.00	898.70	792.55	792.53	3.13	10.07	-113.10	-1,166.85	-5,042.53	5,186.75	5,173.69	13.06	397.081	
1,000.00	997.47	888.27	888.24	3.50	11.80	-113.14	-1,167.31	-5,042.53	5,193.07	5,177.91	15.16	342.655	
1,100.00	1,095.63	993.69	993.63	3.89	13.23	-110.84	-1,167.44	-5,042.53	5,200.31	5,183.36	16.95	306.769	
1,200.00	1,193.09	1,091.15	1,091.09	4.29	14.44	-109.22	-1,167.44	-5,042.53	5,208.12	5,189.58	18.54	280.909	
1,300.00	1,289.73	1,184.91	1,184.85	4.72	15.60	-108.03	-1,166.85	-5,042.53	5,216.43	5,196.32	20.10	259.509	
1,400.00	1,385.42	1,276.72	1,276.65	5.16	16.74	-107.14	-1,167.20	-5,042.53	5,225.63	5,203.97	21.66	241.275	
1,496.97	1,477.20	1,375.29	1,375.20	5.62	17.56	-106.52	-1,167.44	-5,042.53	5,235.21	5,212.30	22.91	228.518	
1,500.00	1,480.05	1,378.14	1,378.05	5.63	17.58	-106.53	-1,167.44	-5,042.53	5,235.52	5,212.58	22.94	228.242	
1,600.00	1,574.15	1,472.24	1,472.15	6.12	18.09	-106.87	-1,167.44	-5,042.53	5,245.80	5,221.90	23.90	219.500	
1,700.00	1,668.25	1,562.88	1,562.80	6.62	18.57	-107.19	-1,167.21	-5,042.53	5,256.21	5,231.36	24.85	211.509	
1,800.00	1,762.35	1,660.44	1,660.35	7.12	19.15	-107.54	-1,167.44	-5,042.53	5,266.95	5,241.05	25.90	203.386	
1,900.00	1,856.45	1,754.54	1,754.45	7.64	19.82	-107.87	-1,167.44	-5,042.53	5,277.82	5,250.78	27.04	195.193	
2,000.00	1,950.55	1,848.64	1,848.55	8.16	20.48	-108.20	-1,167.44	-5,042.53	5,288.88	5,260.70	28.19	187.642	
2,100.00	2,044.65	1,941.35	1,941.26	8.68	21.14	-108.52	-1,167.25	-5,042.53	5,300.08	5,270.75	29.33	180.722	
2,200.00	2,138.75	2,033.97	2,033.88	9.21	21.80	-108.84	-1,167.37	-5,042.53	5,311.57	5,281.10	30.47	174.318	
2,300.00	2,232.85	2,130.96	2,130.85	9.74	22.27	-109.18	-1,167.44	-5,042.53	5,323.23	5,291.80	31.42	169.403	
2,400.00	2,326.95	2,222.73	2,222.62	10.27	22.60	-109.49	-1,167.05	-5,042.53	5,334.94	5,302.71	32.23	165.529	
2,500.00	2,421.05	2,309.23	2,309.11	10.81	22.91	-109.80	-1,167.37	-5,042.53	5,347.06	5,314.04	33.02	161.937	
2,600.00	2,515.15	2,413.29	2,413.15	11.34	23.30	-110.15	-1,167.44	-5,042.53	5,359.28	5,325.39	33.89	158.158	
2,700.00	2,609.25	2,506.31	2,506.16	11.88	23.66	-110.46	-1,166.69	-5,042.53	5,371.42	5,336.71	34.72	154.723	
2,800.00	2,703.35	2,592.66	2,592.51	12.42	23.99	-110.76	-1,166.93	-5,042.53	5,384.08	5,348.55	35.52	151.561	
2,900.00	2,797.45	2,695.64	2,695.45	12.96	24.63	-111.11	-1,167.44	-5,042.53	5,396.99	5,360.35	36.65	147.267	
3,000.00	2,891.55	2,789.74	2,789.55	13.51	25.81	-111.43	-1,167.44	-5,042.53	5,409.93	5,371.61	38.33	141.155	
3,100.00	2,985.65	2,883.84	2,883.65	14.05	26.99	-111.75	-1,167.44	-5,042.53	5,423.05	5,383.05	40.00	135.561	
3,200.00	3,079.75	2,977.94	2,977.75	14.60	28.16	-112.06	-1,167.44	-5,042.53	5,436.35	5,394.66	41.68	130.421	
3,300.00	3,173.85	3,068.38	3,068.17	15.14	29.29	-112.35	-1,166.07	-5,042.53	5,449.33	5,406.02	43.32	125.805	
3,400.00	3,267.95	3,157.75	3,157.54	15.69	30.41	-112.65	-1,166.35	-5,042.53	5,463.08	5,418.15	44.93	121.580	
3,500.00	3,362.05	3,246.98	3,246.76	16.23	31.53	-112.95	-1,166.83	-5,042.53	5,477.09	5,430.54	46.55	117.660	
3,600.00	3,456.15	3,354.40	3,354.15	16.78	33.42	-113.31	-1,167.44	-5,042.53	5,491.30	5,442.36	48.94	112.197	
3,700.00	3,550.25	3,448.50	3,448.25	17.33	36.45	-113.61	-1,167.44	-5,042.53	5,505.47	5,452.97	52.50	104.858	
3,800.00	3,644.35	3,542.60	3,542.35	17.88	39.49	-113.92	-1,167.44	-5,042.53	5,519.81	5,463.75	56.06	98.456	
3,900.00	3,738.45	3,636.70	3,636.45	18.42	42.52	-114.22	-1,167.44	-5,042.53	5,534.33	5,474.70	59.62	92.822	
4,000.00	3,832.55	3,730.80	3,730.55	18.97	45.56	-114.53	-1,167.44	-5,042.53	5,549.01	5,485.83	63.18	87.827	
4,100.00	3,926.65	3,824.90	3,824.65	19.52	48.60	-114.83	-1,167.44	-5,042.53	5,563.86	5,497.12	66.74	83.368	
4,200.00	4,020.75	3,918.26	3,918.01	20.07	51.61	-115.12	-1,166.25	-5,042.53	5,578.39	5,508.12	70.27	79.383	
4,300.00	4,114.85	4,010.68	4,010.43	20.62	54.59	-115.41	-1,166.32	-5,042.53	5,593.59	5,519.82	73.77	75.823	
4,400.00	4,208.95	4,103.05	4,102.79	21.17	57.57	-115.70	-1,166.45	-5,042.53	5,608.98	5,531.71	77.27	72.590	
4,500.00	4,303.05	4,195.37	4,195.11	21.72	60.55	-116.00	-1,166.65	-5,042.53	5,624.57	5,543.80	80.76	69.641	
4,600.00	4,397.15	4,287.65	4,287.39	22.27	63.53	-116.29	-1,166.91	-5,042.53	5,640.34	5,556.08	84.26	66.942	
4,700.00	4,491.25	4,379.87	4,379.61	22.82	66.50	-116.58	-1,167.25	-5,042.53	5,656.31	5,568.56	87.75	64.461	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #108 - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program: 107-MWD OWSG Rev5												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	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
4,800.00	4,585.35	4,483.70	4,483.35	23.37	68.39	-116.90	-1,167.44	-5,042.53	5,672.36	5,582.23	90.13	62.933	
4,900.00	4,679.45	4,577.80	4,577.45	23.93	69.00	-117.19	-1,167.44	-5,042.53	5,688.50	5,597.28	91.22	62.358	
5,000.00	4,773.55	4,667.09	4,666.73	24.48	69.57	-117.46	-1,166.63	-5,042.53	5,704.43	5,612.15	92.28	61.817	
5,100.00	4,867.65	4,751.58	4,751.22	25.03	70.11	-117.72	-1,166.95	-5,042.53	5,721.04	5,627.73	93.30	61.316	
5,200.00	4,961.75	4,860.13	4,859.75	25.58	71.21	-118.05	-1,167.44	-5,042.53	5,737.84	5,642.96	94.88	60.473	
5,300.00	5,055.85	4,954.23	4,953.85	26.13	72.75	-118.33	-1,167.44	-5,042.53	5,754.59	5,657.67	96.92	59.374	
5,400.00	5,149.95	5,048.33	5,047.95	26.68	74.30	-118.62	-1,167.44	-5,042.53	5,771.49	5,672.53	98.96	58.323	
5,500.00	5,244.05	5,142.43	5,142.05	27.24	75.85	-118.90	-1,167.44	-5,042.53	5,788.54	5,687.54	100.99	57.315	
5,600.00	5,338.15	5,236.53	5,236.15	27.79	77.40	-119.18	-1,167.44	-5,042.53	5,805.73	5,702.70	103.03	56.350	
5,665.73	5,400.00	5,298.38	5,298.00	28.15	78.42	-119.36	-1,167.44	-5,042.53	5,817.11	5,712.75	104.37	55.737	
5,700.00	5,432.28	5,330.67	5,330.28	28.34	78.95	-119.51	-1,167.44	-5,042.53	5,823.02	5,717.96	105.06	55.424	
5,800.00	5,526.87	5,424.58	5,424.19	28.88	80.49	-119.91	-1,166.20	-5,042.53	5,839.19	5,732.11	107.09	54.528	
5,900.00	5,622.01	5,517.71	5,517.32	29.41	82.03	-120.29	-1,166.26	-5,042.53	5,855.25	5,746.17	109.08	53.678	
6,000.00	5,717.67	5,611.31	5,610.92	29.92	83.57	-120.66	-1,166.38	-5,042.53	5,870.58	5,759.51	111.07	52.854	
6,100.00	5,813.83	5,705.36	5,704.97	30.41	85.12	-121.01	-1,166.57	-5,042.53	5,885.16	5,772.10	113.06	52.054	
6,200.00	5,910.44	5,799.84	5,799.44	30.89	86.67	-121.33	-1,166.83	-5,042.53	5,898.98	5,783.94	115.04	51.278	
6,300.00	6,007.50	5,894.70	5,894.31	31.36	88.23	-121.64	-1,167.16	-5,042.53	5,912.00	5,794.99	117.01	50.524	
6,400.00	6,104.96	6,003.41	6,002.96	31.80	91.49	-121.95	-1,167.44	-5,042.53	5,924.16	5,803.47	120.69	49.086	
6,500.00	6,202.80	6,101.25	6,100.80	32.24	96.84	-122.21	-1,167.44	-5,042.53	5,935.31	5,808.86	126.45	46.938	
6,600.00	6,300.98	6,199.43	6,198.98	32.66	102.21	-122.45	-1,167.44	-5,042.53	5,945.59	5,813.37	132.22	44.967	
6,700.00	6,399.48	6,297.93	6,297.48	33.06	107.60	-122.67	-1,167.44	-5,042.53	5,954.98	5,816.99	137.99	43.154	
6,722.82	6,422.00	6,320.45	6,320.00	33.15	108.83	-122.71	-1,167.44	-5,042.53	5,957.00	5,817.68	139.31	42.760	
6,750.00	6,448.76	6,347.21	6,346.76	33.26	110.29	-112.79	-1,167.44	-5,042.53	5,959.20	5,818.31	140.88	42.299	
6,800.00	6,497.51	6,395.97	6,395.51	33.48	112.96	-101.33	-1,167.44	-5,042.53	5,962.35	5,818.58	143.76	41.473	
6,850.00	6,545.40	6,443.85	6,443.40	33.72	115.58	-94.77	-1,167.44	-5,042.53	5,964.33	5,817.71	146.62	40.678	
6,900.00	6,592.13	6,490.58	6,490.13	33.97	118.14	-90.73	-1,167.44	-5,042.53	5,965.17	5,815.73	149.44	39.918	
6,950.00	6,637.40	6,535.85	6,535.40	34.25	120.61	-88.13	-1,167.44	-5,042.53	5,964.88	5,812.69	152.19	39.193	
7,000.00	6,680.94	6,579.39	6,578.94	34.54	122.99	-86.45	-1,167.44	-5,042.53	5,963.51	5,808.63	154.87	38.505	
7,050.00	6,722.48	6,620.93	6,620.48	34.85	125.27	-85.39	-1,167.44	-5,042.53	5,961.10	5,803.63	157.47	37.856	
7,100.00	6,761.76	6,660.22	6,659.76	35.17	127.42	-84.78	-1,167.44	-5,042.53	5,957.70	5,797.75	159.95	37.247	
7,150.00	6,798.55	6,697.00	6,696.55	35.51	129.43	-84.50	-1,167.44	-5,042.53	5,953.40	5,791.08	162.32	36.678	
7,200.00	6,832.61	6,731.06	6,730.61	35.86	131.29	-84.49	-1,167.44	-5,042.53	5,948.25	5,783.70	164.55	36.149	
7,250.00	6,863.74	6,762.19	6,761.74	36.22	132.99	-84.68	-1,167.44	-5,042.53	5,942.34	5,775.71	166.64	35.661	
7,300.00	6,891.74	6,790.19	6,789.74	36.59	134.53	-85.04	-1,167.44	-5,042.53	5,935.76	5,767.19	168.56	35.214	
7,350.00	6,916.44	6,814.89	6,814.44	36.98	135.88	-85.52	-1,167.44	-5,042.53	5,928.57	5,758.24	170.33	34.807	
7,400.00	6,937.69	6,836.14	6,835.69	37.37	137.04	-86.11	-1,167.44	-5,042.53	5,920.87	5,748.96	171.91	34.442	
7,450.00	6,955.36	6,853.81	6,853.36	37.78	138.00	-86.77	-1,167.44	-5,042.53	5,912.75	5,739.44	173.30	34.118	
7,500.00	6,969.34	6,867.79	6,867.34	38.19	138.77	-87.50	-1,167.44	-5,042.53	5,904.27	5,729.76	174.51	33.834	
7,550.00	6,979.53	6,877.98	6,877.53	38.62	139.33	-88.27	-1,167.44	-5,042.53	5,895.52	5,720.02	175.51	33.592	
7,600.00	6,985.89	6,884.34	6,883.89	39.05	139.67	-89.07	-1,167.44	-5,042.53	5,886.58	5,710.28	176.30	33.390	
7,650.00	6,988.37	6,886.82	6,886.37	39.48	139.81	-89.89	-1,167.44	-5,042.53	5,877.51	5,700.63	176.88	33.229	
7,657.25	6,988.40	6,886.85	6,886.40	39.54	139.81	-90.01	-1,167.44	-5,042.53	5,876.18	5,699.24	176.95	33.209	
7,700.00	6,988.37	6,886.82	6,886.37	39.92	139.81	-90.01	-1,167.44	-5,042.53	5,868.53	5,691.20	177.32	33.095	
7,800.00	6,988.30	6,886.75	6,886.30	40.82	139.81	-90.01	-1,167.44	-5,042.53	5,851.80	5,673.57	178.23	32.832	
7,900.00	6,988.23	6,886.68	6,886.23	41.77	139.80	-90.01	-1,167.44	-5,042.53	5,836.74	5,657.58	179.16	32.578	
8,000.00	6,988.16	6,886.62	6,886.16	42.75	139.80	-90.01	-1,167.44	-5,042.53	5,823.36	5,643.25	180.12	32.331	
8,100.00	6,988.09	6,886.55	6,886.09	43.76	139.80	-90.00	-1,167.44	-5,042.53	5,811.67	5,630.58	181.08	32.094	
8,152.35	6,988.06	6,886.51	6,886.06	44.30	139.79	-90.00	-1,167.44	-5,042.53	5,806.23	5,624.63	181.60	31.973	
8,200.00	6,988.02	6,886.48	6,886.02	44.79	139.79	-90.01	-1,167.44	-5,042.53	5,800.89	5,618.82	182.07	31.862	
8,300.00	6,987.95	6,886.40	6,885.95	45.83	139.79	-90.01	-1,167.44	-5,042.53	5,785.83	5,602.77	183.06	31.606	
8,400.00	6,987.88	6,886.33	6,885.88	46.85	139.78	-90.01	-1,167.44	-5,042.53	5,765.58	5,581.52	184.06	31.325	
8,500.00	6,987.80	6,886.25	6,885.80	47.85	139.78	-90.01	-1,167.44	-5,042.53	5,740.18	5,555.11	185.06	31.018	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #108 - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		107-MWD OWSG Rev5						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	
8,600.00	6,987.73	6,886.18	6,885.73	48.83	139.78	-90.02	-1,167.44	-5,042.53	5,709.68	5,523.61	186.06	30.687		
8,700.00	6,987.65	6,886.10	6,885.65	49.79	139.77	-90.02	-1,167.44	-5,042.53	5,674.15	5,487.09	187.06	30.334		
8,800.00	6,987.57	6,886.02	6,885.57	50.72	139.77	-90.02	-1,167.44	-5,042.53	5,633.67	5,445.63	188.04	29.960		
8,900.00	6,987.50	6,885.95	6,885.50	51.62	139.76	-90.02	-1,167.44	-5,042.53	5,588.34	5,399.32	189.01	29.566		
9,000.00	6,987.42	6,885.87	6,885.42	52.48	139.76	-90.03	-1,167.44	-5,042.53	5,538.25	5,348.29	189.96	29.155		
9,100.00	6,987.34	6,885.80	6,885.34	53.30	139.75	-90.03	-1,167.44	-5,042.53	5,483.53	5,292.64	190.89	28.726		
9,200.00	6,987.27	6,885.72	6,885.27	54.08	139.75	-90.03	-1,167.44	-5,042.53	5,424.31	5,232.52	191.79	28.283		
9,215.33	6,987.26	6,885.71	6,885.26	54.20	139.75	-90.03	-1,167.44	-5,042.53	5,414.84	5,222.92	191.92	28.214		
9,300.00	6,987.20	6,885.65	6,885.20	54.85	139.75	-90.03	-1,167.44	-5,042.53	5,362.67	5,170.00	192.67	27.834		
9,400.00	6,987.12	6,885.57	6,885.12	55.65	139.74	-90.03	-1,167.44	-5,042.53	5,302.14	5,108.57	193.57	27.391		
9,500.00	6,987.05	6,885.50	6,885.05	56.48	139.74	-90.03	-1,167.44	-5,042.53	5,242.82	5,048.33	194.49	26.957		
9,600.00	6,986.98	6,885.43	6,884.98	57.35	139.73	-90.03	-1,167.44	-5,042.53	5,184.75	4,989.32	195.43	26.530		
9,700.00	6,986.90	6,885.35	6,884.90	58.24	139.73	-90.03	-1,167.44	-5,042.53	5,127.97	4,931.58	196.39	26.112		
9,800.00	6,986.83	6,885.28	6,884.83	59.17	139.73	-90.03	-1,167.44	-5,042.53	5,072.53	4,875.17	197.36	25.702		
9,900.00	6,986.75	6,885.21	6,884.75	60.12	139.72	-90.03	-1,167.44	-5,042.53	5,018.46	4,820.11	198.35	25.301		
10,000.00	6,986.68	6,885.13	6,884.68	61.10	139.72	-90.03	-1,167.44	-5,042.53	4,965.83	4,766.47	199.36	24.909		
10,100.00	6,986.61	6,885.06	6,884.61	62.11	139.71	-90.02	-1,167.44	-5,042.53	4,914.66	4,714.28	200.38	24.527		
10,200.00	6,986.53	6,884.98	6,884.53	63.14	139.71	-90.02	-1,167.44	-5,042.53	4,865.01	4,663.60	201.42	24.154		
10,300.00	6,986.46	6,884.91	6,884.46	64.20	139.71	-90.02	-1,167.44	-5,042.53	4,816.93	4,614.47	202.46	23.792		
10,400.00	6,986.39	6,884.84	6,884.39	65.28	139.70	-90.02	-1,167.44	-5,042.53	4,770.46	4,566.94	203.52	23.440		
10,500.00	6,986.31	6,884.76	6,884.31	66.38	139.70	-90.02	-1,167.44	-5,042.53	4,725.64	4,521.06	204.58	23.099		
10,600.00	6,986.24	6,884.69	6,884.24	67.50	139.69	-90.02	-1,167.44	-5,042.53	4,682.54	4,476.89	205.65	22.769		
10,700.00	6,986.17	6,884.62	6,884.17	68.64	139.69	-90.02	-1,167.44	-5,042.53	4,641.19	4,434.46	206.72	22.451		
10,800.00	6,986.09	6,884.54	6,884.09	69.80	139.69	-90.02	-1,167.44	-5,042.53	4,601.64	4,393.84	207.80	22.144		
10,900.00	6,986.02	6,884.47	6,884.02	70.98	139.68	-90.02	-1,167.44	-5,042.53	4,563.94	4,355.06	208.88	21.850		
11,000.00	6,985.95	6,884.40	6,883.95	72.17	139.68	-90.02	-1,167.44	-5,042.53	4,528.13	4,318.18	209.95	21.567		
11,100.00	6,985.87	6,884.32	6,883.87	73.38	139.67	-90.01	-1,167.44	-5,042.53	4,494.27	4,283.24	211.02	21.297		
11,200.00	6,985.80	6,884.25	6,883.80	74.61	139.67	-90.01	-1,167.44	-5,042.53	4,462.39	4,250.30	212.09	21.040		
11,300.00	6,985.72	6,884.18	6,883.72	75.85	139.67	-90.01	-1,167.44	-5,042.53	4,432.53	4,219.39	213.14	20.796		
11,400.00	6,985.65	6,884.10	6,883.65	77.10	139.66	-90.01	-1,167.44	-5,042.53	4,404.75	4,190.56	214.19	20.565		
11,500.00	6,985.58	6,884.03	6,883.58	78.37	139.66	-90.01	-1,167.44	-5,042.53	4,379.07	4,163.86	215.22	20.347		
11,600.00	6,985.50	6,883.95	6,883.50	79.65	139.65	-90.01	-1,167.44	-5,042.53	4,355.54	4,139.31	216.23	20.143		
11,700.00	6,985.43	6,883.88	6,883.43	80.94	139.65	-90.01	-1,167.44	-5,042.53	4,334.19	4,116.97	217.22	19.953		
11,800.00	6,985.36	6,883.81	6,883.36	82.24	139.65	-90.01	-1,167.44	-5,042.53	4,315.05	4,096.86	218.19	19.777		
11,900.00	6,985.28	6,883.73	6,883.28	83.56	139.64	-90.01	-1,167.44	-5,042.53	4,298.15	4,079.02	219.13	19.615		
12,000.00	6,985.21	6,883.66	6,883.21	84.88	139.64	-90.01	-1,167.44	-5,042.53	4,283.52	4,063.47	220.05	19.466		
12,100.00	6,985.14	6,883.59	6,883.14	86.21	139.63	-90.00	-1,167.44	-5,042.53	4,271.18	4,050.25	220.93	19.332		
12,200.00	6,985.06	6,883.51	6,883.06	87.56	139.63	-90.00	-1,167.44	-5,042.53	4,261.16	4,039.37	221.79	19.213		
12,300.00	6,984.99	6,883.44	6,882.99	88.91	139.63	-90.00	-1,167.44	-5,042.53	4,253.46	4,030.85	222.61	19.107		
12,400.00	6,984.92	6,883.37	6,882.92	90.27	139.62	-90.00	-1,167.44	-5,042.53	4,248.10	4,024.71	223.40	19.016		
12,500.00	6,984.84	6,883.29	6,882.84	91.64	139.62	-90.00	-1,167.44	-5,042.53	4,245.09	4,020.95	224.14	18.939		
12,577.73	6,984.78	6,883.24	6,882.78	92.70	139.61	-90.00	-1,167.44	-5,042.53	4,244.38	4,019.69	224.70	18.889	CC	
12,600.00	6,984.77	6,883.22	6,882.77	93.01	139.61	-90.00	-1,167.44	-5,042.53	4,244.44	4,019.59	224.85	18.877	ES	
12,700.00	6,984.69	6,883.15	6,882.69	94.40	139.61	-90.00	-1,167.44	-5,042.53	4,246.14	4,020.63	225.52	18.829		
12,800.00	6,984.62	6,883.07	6,882.62	95.79	139.61	-90.00	-1,167.44	-5,042.53	4,250.20	4,024.06	226.14	18.795		
12,900.00	6,984.55	6,883.00	6,882.55	97.18	139.60	-90.00	-1,167.44	-5,042.53	4,256.60	4,029.88	226.72	18.775		
13,000.00	6,984.47	6,882.92	6,882.47	98.59	139.60	-90.00	-1,167.44	-5,042.53	4,265.34	4,038.08	227.26	18.769	SF	
13,100.00	6,984.40	6,882.85	6,882.40	100.00	139.59	-89.99	-1,167.44	-5,042.53	4,276.39	4,048.64	227.75	18.776		
13,200.00	6,984.33	6,882.78	6,882.33	101.41	139.59	-89.99	-1,167.44	-5,042.53	4,289.76	4,061.55	228.20	18.798		
13,300.00	6,984.25	6,882.70	6,882.25	102.83	139.59	-89.99	-1,167.44	-5,042.53	4,305.40	4,076.79	228.61	18.833		
13,400.00	6,984.18	6,882.63	6,882.18	104.26	139.58	-89.99	-1,167.44	-5,042.53	4,323.30	4,094.33	228.97	18.881		
13,500.00	6,984.11	6,882.56	6,882.11	105.69	139.58	-89.99	-1,167.44	-5,042.53	4,343.43	4,114.14	229.29	18.943		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #108 - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		107-MWD OWSG Rev5					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	
13,600.00	6,984.03	6,882.48	6,882.03	107.13	139.57	-89.99	-1,167.44	-5,042.53	4,365.76	4,136.19	229.56	19.018		
13,700.00	6,983.96	6,882.41	6,881.96	108.57	139.57	-89.99	-1,167.44	-5,042.53	4,390.25	4,160.45	229.80	19.105		
13,800.00	6,983.88	6,882.34	6,881.88	110.02	139.57	-89.99	-1,167.44	-5,042.53	4,416.87	4,186.88	229.99	19.205		
13,900.00	6,983.81	6,882.26	6,881.81	111.47	139.56	-89.99	-1,167.44	-5,042.53	4,445.58	4,215.44	230.14	19.317		
14,000.00	6,983.74	6,882.19	6,881.74	112.92	139.56	-89.99	-1,167.44	-5,042.53	4,476.34	4,246.08	230.26	19.441		
14,100.00	6,983.66	6,882.11	6,881.66	114.38	139.55	-89.98	-1,167.44	-5,042.53	4,509.11	4,278.78	230.33	19.576		
14,200.00	6,983.59	6,882.04	6,881.59	115.85	139.55	-89.98	-1,167.44	-5,042.53	4,543.85	4,313.47	230.38	19.724		
14,300.00	6,983.52	6,881.97	6,881.52	117.31	139.55	-89.98	-1,167.44	-5,042.53	4,580.50	4,350.12	230.38	19.882		
14,400.00	6,983.44	6,881.89	6,881.44	118.78	139.54	-89.98	-1,167.44	-5,042.53	4,619.03	4,388.67	230.36	20.051		
14,500.00	6,983.37	6,881.82	6,881.37	120.26	139.54	-89.98	-1,167.44	-5,042.53	4,659.39	4,429.09	230.30	20.231		
14,600.00	6,983.30	6,881.75	6,881.30	121.74	139.53	-89.98	-1,167.44	-5,042.53	4,701.53	4,471.31	230.22	20.422		
14,700.00	6,983.22	6,881.67	6,881.22	123.22	139.53	-89.98	-1,167.44	-5,042.53	4,745.40	4,515.29	230.11	20.622		
14,800.00	6,983.15	6,881.60	6,881.15	124.70	139.53	-89.98	-1,167.44	-5,042.53	4,790.96	4,560.98	229.97	20.833		
14,900.00	6,983.08	6,881.53	6,881.08	126.19	139.52	-89.98	-1,167.44	-5,042.53	4,838.15	4,608.34	229.81	21.053		
15,000.00	6,983.00	6,881.45	6,881.00	127.68	139.52	-89.98	-1,167.44	-5,042.53	4,886.94	4,657.31	229.63	21.282		
15,100.00	6,982.93	6,881.38	6,880.93	129.17	139.51	-89.97	-1,167.44	-5,042.53	4,937.27	4,707.84	229.43	21.520		
15,200.00	6,982.85	6,881.31	6,880.85	130.67	139.51	-89.97	-1,167.44	-5,042.53	4,989.10	4,759.89	229.21	21.767		
15,300.00	6,982.78	6,881.23	6,880.78	132.16	139.50	-89.97	-1,167.44	-5,042.53	5,042.38	4,813.41	228.97	22.022		
15,400.00	6,982.71	6,881.16	6,880.71	133.66	139.50	-89.97	-1,167.44	-5,042.53	5,097.06	4,868.34	228.71	22.286		
15,500.00	6,982.63	6,881.08	6,880.63	135.17	139.50	-89.97	-1,167.44	-5,042.53	5,153.10	4,924.66	228.45	22.557		
15,600.00	6,982.56	6,881.01	6,880.56	136.67	139.49	-89.97	-1,167.44	-5,042.53	5,210.46	4,982.30	228.16	22.836		
15,700.00	6,982.49	6,880.94	6,880.49	138.18	139.49	-89.97	-1,167.44	-5,042.53	5,269.10	5,041.22	227.87	23.123		
15,800.00	6,982.41	6,880.86	6,880.41	139.69	139.48	-89.97	-1,167.44	-5,042.53	5,328.96	5,101.39	227.57	23.417		
15,900.00	6,982.34	6,880.79	6,880.34	141.20	139.48	-89.97	-1,167.44	-5,042.53	5,390.02	5,162.76	227.26	23.718		
16,000.00	6,982.27	6,880.72	6,880.27	142.71	139.48	-89.97	-1,167.44	-5,042.53	5,452.22	5,225.28	226.94	24.025		
16,100.00	6,982.19	6,880.64	6,880.19	144.23	139.47	-89.97	-1,167.44	-5,042.53	5,515.54	5,288.93	226.61	24.339		
16,200.00	6,982.12	6,880.57	6,880.12	145.75	139.47	-89.96	-1,167.44	-5,042.53	5,579.93	5,353.65	226.28	24.660		
16,300.00	6,982.05	6,880.50	6,880.05	147.27	139.46	-89.96	-1,167.44	-5,042.53	5,645.36	5,419.42	225.94	24.986		
16,400.00	6,981.97	6,880.42	6,879.97	148.79	139.46	-89.96	-1,167.44	-5,042.53	5,711.79	5,486.19	225.60	25.318		
16,500.00	6,981.90	6,880.35	6,879.90	150.31	139.46	-89.96	-1,167.44	-5,042.53	5,779.19	5,553.93	225.26	25.656		
16,600.00	6,981.82	6,880.28	6,879.82	151.84	139.45	-89.96	-1,167.44	-5,042.53	5,847.52	5,622.61	224.91	25.999		
16,700.00	6,981.75	6,880.20	6,879.75	153.36	139.45	-89.96	-1,167.44	-5,042.53	5,916.75	5,692.19	224.56	26.348		
16,800.00	6,981.68	6,880.13	6,879.68	154.89	139.44	-89.96	-1,167.44	-5,042.53	5,986.85	5,762.64	224.21	26.702		
16,900.00	6,981.60	6,880.05	6,879.60	156.42	139.44	-89.96	-1,167.44	-5,042.53	6,057.79	5,833.93	223.86	27.060		
17,000.00	6,981.53	6,879.98	6,879.53	157.95	139.44	-89.96	-1,167.44	-5,042.53	6,129.54	5,906.03	223.51	27.424		
17,100.00	6,981.46	6,879.91	6,879.46	159.49	139.43	-89.96	-1,167.44	-5,042.53	6,202.07	5,978.91	223.16	27.792		
17,200.00	6,981.38	6,879.83	6,879.38	161.02	139.43	-89.95	-1,167.44	-5,042.53	6,275.36	6,052.55	222.81	28.164		
17,300.00	6,981.31	6,879.76	6,879.31	162.56	139.42	-89.95	-1,167.44	-5,042.53	6,349.38	6,126.91	222.47	28.541		
17,400.00	6,981.24	6,879.69	6,879.24	164.09	139.42	-89.95	-1,167.44	-5,042.53	6,424.10	6,201.98	222.12	28.921		
17,500.00	6,981.16	6,879.61	6,879.16	165.63	139.42	-89.95	-1,167.44	-5,042.53	6,499.50	6,277.72	221.78	29.306		
17,600.00	6,981.09	6,879.54	6,879.09	167.17	139.41	-89.95	-1,167.44	-5,042.53	6,575.56	6,354.12	221.44	29.695		
17,700.00	6,981.01	6,879.47	6,879.01	168.71	139.41	-89.95	-1,167.44	-5,042.53	6,652.25	6,431.15	221.10	30.087		
17,800.00	6,980.94	6,879.39	6,878.94	170.25	139.40	-89.95	-1,167.44	-5,042.53	6,729.56	6,508.79	220.77	30.483		
17,900.00	6,980.87	6,879.32	6,878.87	171.80	139.40	-89.95	-1,167.44	-5,042.53	6,807.45	6,587.01	220.44	30.882		
18,000.00	6,980.79	6,879.24	6,878.79	173.34	139.40	-89.95	-1,167.44	-5,042.53	6,885.91	6,665.81	220.11	31.284		
18,100.00	6,980.72	6,879.17	6,878.72	174.89	139.39	-89.95	-1,167.44	-5,042.53	6,964.93	6,745.15	219.78	31.690		
18,200.00	6,980.65	6,879.10	6,878.65	176.43	139.39	-89.94	-1,167.44	-5,042.53	7,044.48	6,825.02	219.46	32.099		
18,300.00	6,980.57	6,879.02	6,878.57	177.98	139.38	-89.94	-1,167.44	-5,042.53	7,124.55	6,905.40	219.15	32.510		
18,400.00	6,980.50	6,878.95	6,878.50	179.53	139.38	-89.94	-1,167.44	-5,042.53	7,205.11	6,986.28	218.84	32.925		
18,500.00	6,980.43	6,878.88	6,878.43	181.08	139.38	-89.94	-1,167.44	-5,042.53	7,286.16	7,067.63	218.53	33.342		
18,600.00	6,980.35	6,878.80	6,878.35	182.63	139.37	-89.94	-1,167.44	-5,042.53	7,367.67	7,149.44	218.22	33.762		
18,700.00	6,980.28	6,878.73	6,878.28	184.18	139.37	-89.94	-1,167.44	-5,042.53	7,449.63	7,231.71	217.93	34.184		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #108 - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		107-MWD OWSG Rev5					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		
18,800.00	6,980.21	6,878.66	6,878.21	185.73	139.36	-89.94	-1,167.44	-5,042.53	7,532.03	7,314.40	217.63	34.609		
18,900.00	6,980.13	6,878.58	6,878.13	187.28	139.36	-89.94	-1,167.44	-5,042.53	7,614.85	7,397.51	217.34	35.036		
19,000.00	6,980.06	6,878.51	6,878.06	188.84	139.36	-89.94	-1,167.44	-5,042.53	7,698.08	7,481.02	217.05	35.466		
19,100.00	6,979.98	6,878.44	6,877.98	190.39	139.35	-89.94	-1,167.44	-5,042.53	7,781.70	7,564.92	216.77	35.898		
19,200.00	6,979.91	6,878.36	6,877.91	191.95	139.35	-89.93	-1,167.44	-5,042.53	7,865.70	7,649.21	216.50	36.332		
19,300.00	6,979.84	6,878.29	6,877.84	193.51	139.34	-89.93	-1,167.44	-5,042.53	7,950.08	7,733.85	216.23	36.768		
19,400.00	6,979.76	6,878.21	6,877.76	195.06	139.34	-89.93	-1,167.44	-5,042.53	8,034.81	7,818.85	215.96	37.205		
19,500.00	6,979.69	6,878.14	6,877.69	196.62	139.34	-89.93	-1,167.44	-5,042.53	8,119.89	7,904.20	215.70	37.645		
19,600.00	6,979.62	6,878.07	6,877.62	198.18	139.33	-89.93	-1,167.44	-5,042.53	8,205.31	7,989.87	215.44	38.087		
19,700.00	6,979.54	6,877.99	6,877.54	199.74	139.33	-89.93	-1,167.44	-5,042.53	8,291.05	8,075.87	215.18	38.530		
19,800.00	6,979.47	6,877.92	6,877.47	201.30	139.32	-89.93	-1,167.44	-5,042.53	8,377.11	8,162.18	214.93	38.975		
19,900.00	6,979.40	6,877.85	6,877.40	202.86	139.32	-89.93	-1,167.44	-5,042.53	8,463.48	8,248.79	214.69	39.422		
20,000.00	6,979.32	6,877.77	6,877.32	204.42	139.32	-89.93	-1,167.44	-5,042.53	8,550.14	8,335.69	214.45	39.870		
20,100.00	6,979.25	6,877.70	6,877.25	205.98	139.31	-89.93	-1,167.44	-5,042.53	8,637.09	8,422.88	214.21	40.320		
20,200.00	6,979.18	6,877.63	6,877.18	207.55	139.31	-89.92	-1,167.44	-5,042.53	8,724.32	8,510.34	213.98	40.771		
20,300.00	6,979.10	6,877.55	6,877.10	209.11	139.30	-89.92	-1,167.44	-5,042.53	8,811.83	8,598.07	213.76	41.224		
20,400.00	6,979.03	6,877.48	6,877.03	210.68	139.30	-89.92	-1,167.44	-5,042.53	8,899.59	8,686.06	213.53	41.678		
20,500.00	6,978.95	6,877.41	6,876.95	212.24	139.30	-89.92	-1,167.44	-5,042.53	8,987.61	8,774.30	213.32	42.133		
20,600.00	6,978.88	6,877.33	6,876.88	213.81	139.29	-89.92	-1,167.44	-5,042.53	9,075.88	8,862.78	213.10	42.589		
20,700.00	6,978.81	6,877.26	6,876.81	215.37	139.29	-89.92	-1,167.44	-5,042.53	9,164.39	8,951.50	212.89	43.047		
20,800.00	6,978.73	6,877.18	6,876.73	216.94	139.28	-89.92	-1,167.44	-5,042.53	9,253.14	9,040.45	212.69	43.506		
20,900.00	6,978.66	6,877.11	6,876.66	218.51	139.28	-89.92	-1,167.44	-5,042.53	9,342.11	9,129.62	212.49	43.966		
21,000.00	6,978.59	6,877.04	6,876.59	220.07	139.28	-89.92	-1,167.44	-5,042.53	9,431.30	9,219.01	212.29	44.427		
21,100.00	6,978.51	6,876.96	6,876.51	221.64	139.27	-89.92	-1,167.44	-5,042.53	9,520.71	9,308.61	212.10	44.889		
21,200.00	6,978.44	6,876.89	6,876.44	223.21	139.27	-89.91	-1,167.44	-5,042.53	9,610.33	9,398.42	211.91	45.351		
21,300.00	6,978.37	6,876.82	6,876.37	224.78	139.26	-89.91	-1,167.44	-5,042.53	9,700.14	9,488.42	211.72	45.815		
21,400.00	6,978.29	6,876.74	6,876.29	226.35	139.26	-89.91	-1,167.44	-5,042.53	9,790.16	9,578.62	211.54	46.280		
21,500.00	6,978.22	6,876.67	6,876.22	227.92	139.26	-89.91	-1,167.44	-5,042.53	9,880.37	9,669.01	211.36	46.746		
21,600.00	6,978.14	6,876.60	6,876.14	229.49	139.25	-89.91	-1,167.44	-5,042.53	9,970.77	9,759.58	211.19	47.212		
21,700.00	6,978.07	6,876.52	6,876.07	231.06	139.25	-89.91	-1,167.44	-5,042.53	10,061.34	9,850.32	211.02	47.679		
21,800.00	6,978.00	6,876.45	6,876.00	232.63	139.24	-89.91	-1,167.44	-5,042.53	10,152.10	9,941.24	210.85	48.147		
21,900.00	6,977.92	6,876.37	6,875.92	234.21	139.24	-89.91	-1,167.44	-5,042.53	10,243.02	10,032.33	210.69	48.616		
22,000.00	6,977.85	6,876.30	6,875.85	235.78	139.24	-89.91	-1,167.44	-5,042.53	10,334.12	10,123.58	210.53	49.085		
22,100.00	6,977.78	6,876.23	6,875.78	237.35	139.23	-89.91	-1,167.44	-5,042.53	10,425.37	10,215.00	210.38	49.555		
22,200.00	6,977.70	6,876.15	6,875.70	238.92	139.23	-89.90	-1,167.44	-5,042.53	10,516.79	10,306.56	210.23	50.026		
22,300.00	6,977.63	6,876.08	6,875.63	240.50	139.22	-89.90	-1,167.44	-5,042.53	10,608.36	10,398.28	210.08	50.497		
22,400.00	6,977.56	6,876.01	6,875.56	242.07	139.22	-89.90	-1,167.44	-5,042.53	10,700.08	10,490.15	209.93	50.969		
22,500.00	6,977.48	6,875.93	6,875.48	243.65	139.22	-89.90	-1,167.44	-5,042.53	10,791.95	10,582.16	209.79	51.441		
22,600.00	6,977.41	6,875.86	6,875.41	245.22	139.21	-89.90	-1,167.44	-5,042.53	10,883.97	10,674.31	209.65	51.914		
22,700.00	6,977.34	6,875.79	6,875.34	246.80	139.21	-89.90	-1,167.44	-5,042.53	10,976.12	10,766.60	209.52	52.388		
22,800.00	6,977.26	6,875.71	6,875.26	248.37	139.20	-89.90	-1,167.44	-5,042.53	11,068.41	10,859.02	209.39	52.861		
22,900.00	6,977.19	6,875.64	6,875.19	249.95	139.20	-89.90	-1,167.44	-5,042.53	11,160.83	10,951.57	209.26	53.336		
23,000.00	6,977.11	6,875.57	6,875.11	251.53	139.19	-89.90	-1,167.44	-5,042.53	11,253.38	11,044.25	209.13	53.810		
23,100.00	6,977.04	6,875.49	6,875.04	253.10	139.19	-89.90	-1,167.44	-5,042.53	11,346.06	11,137.05	209.01	54.285		
23,155.65	6,977.00	6,875.45	6,875.00	253.98	139.19	-89.89	-1,167.44	-5,042.53	11,397.69	11,188.75	208.94	54.550		
23,156.15	6,977.00	6,875.45	6,875.00	254.06	139.19	-89.89	-1,167.44	-5,042.53	11,398.15	11,187.00	211.15	53.981		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149 - OH - OH-INC													Offset Site Error: 0.00 usft
Survey Program: 117-A027Ua_INC-ONLY													Offset Well Error: 0.00 usft
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance		Rule Assigned:		Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.00	0.00	0.00	0.00	0.00	0.00	-95.59	-779.28	-7,968.63	8,007.16				
100.00	100.00	9.00	9.00	0.25	0.18	-95.59	-779.28	-7,968.63	8,006.64	8,006.21	0.43	N/A	
200.00	200.00	109.00	109.00	0.61	2.15	-95.59	-779.28	-7,968.63	8,006.64	8,003.88	2.76	2,904.462	
300.00	300.00	209.00	209.00	0.97	4.61	-95.59	-779.28	-7,968.63	8,006.64	8,001.07	5.57	1,436.535	
400.00	400.00	309.00	309.00	1.33	7.11	-95.59	-779.28	-7,968.63	8,006.64	7,998.21	8.43	949.455	
435.84	435.84	343.94	343.93	1.45	7.98	-95.58	-778.67	-7,968.63	8,006.58	7,997.14	9.44	848.596	
500.00	500.00	406.46	406.45	1.68	9.54	-95.58	-778.81	-7,968.63	8,006.59	7,995.37	11.23	713.062	
600.00	599.98	509.13	508.98	2.04	12.15	-105.59	-779.28	-7,968.63	8,007.11	7,992.92	14.19	564.326	
700.00	699.84	608.98	608.84	2.41	15.21	-105.60	-779.28	-7,968.63	8,008.52	7,990.90	17.61	454.704	
800.00	799.45	698.88	698.69	2.77	17.97	-105.60	-778.56	-7,968.63	8,010.80	7,990.07	20.73	386.377	
900.00	898.70	808.01	807.70	3.13	21.05	-105.63	-779.28	-7,968.63	8,014.18	7,990.00	24.17	331.532	
1,000.00	997.47	902.90	902.56	3.50	23.55	-105.64	-778.27	-7,968.63	8,018.34	7,991.29	27.05	296.413	
1,100.00	1,095.63	1,005.05	1,004.63	3.89	26.21	-103.33	-779.28	-7,968.63	8,023.25	7,993.16	30.10	266.590	
1,200.00	1,193.09	1,102.51	1,102.09	4.29	28.45	-101.68	-779.28	-7,968.63	8,028.19	7,995.45	32.74	245.187	
1,300.00	1,289.73	1,199.14	1,198.73	4.72	30.68	-100.48	-779.28	-7,968.63	8,033.28	7,997.89	35.39	226.993	
1,400.00	1,385.42	1,292.79	1,292.36	5.16	32.84	-99.57	-777.98	-7,968.63	8,038.39	8,000.40	37.99	211.595	
1,496.97	1,477.20	1,380.85	1,380.41	5.62	34.87	-98.91	-778.35	-7,968.63	8,043.73	8,003.26	40.47	198.760	
1,500.00	1,480.05	1,383.58	1,383.14	5.63	34.93	-98.91	-778.37	-7,968.63	8,043.90	8,003.35	40.55	198.385	
1,600.00	1,574.15	1,473.61	1,473.16	6.12	37.01	-99.13	-779.11	-7,968.63	8,049.64	8,006.53	43.11	186.743	
1,700.00	1,668.25	1,577.79	1,577.25	6.62	39.32	-99.38	-779.28	-7,968.63	8,055.43	8,009.52	45.91	175.456	
1,800.00	1,762.35	1,671.89	1,671.35	7.12	41.39	-99.60	-779.28	-7,968.63	8,061.35	8,012.87	48.49	166.258	
1,900.00	1,856.45	1,764.76	1,764.21	7.64	43.44	-99.82	-777.94	-7,968.63	8,067.23	8,016.19	51.04	158.052	
2,000.00	1,950.55	1,854.45	1,853.89	8.16	45.41	-100.03	-778.21	-7,968.63	8,073.46	8,019.93	53.53	150.818	
2,100.00	2,044.65	1,943.89	1,943.33	8.68	47.38	-100.25	-778.84	-7,968.63	8,079.88	8,023.86	56.02	144.234	
2,200.00	2,138.75	2,048.38	2,047.75	9.21	49.56	-100.50	-779.28	-7,968.63	8,086.41	8,027.69	58.72	137.708	
2,300.00	2,232.85	2,142.48	2,141.85	9.74	51.45	-100.72	-779.28	-7,968.63	8,093.01	8,031.88	61.13	132.391	
2,400.00	2,326.95	2,235.81	2,235.17	10.27	53.32	-100.93	-778.27	-7,968.63	8,099.60	8,036.07	63.52	127.503	
2,500.00	2,421.05	2,325.55	2,324.90	10.81	55.11	-101.14	-778.48	-7,968.63	8,106.51	8,040.66	65.85	123.107	
2,600.00	2,515.15	2,415.07	2,414.42	11.34	56.91	-101.36	-778.99	-7,968.63	8,113.60	8,045.43	68.17	119.019	
2,700.00	2,609.25	2,518.94	2,518.25	11.88	59.00	-101.60	-779.28	-7,968.63	8,120.79	8,050.00	70.79	114.716	
2,800.00	2,703.35	2,613.04	2,612.35	12.42	60.89	-101.82	-779.28	-7,968.63	8,128.07	8,054.86	73.22	111.013	
2,900.00	2,797.45	2,707.06	2,706.37	12.96	62.79	-102.04	-778.45	-7,968.63	8,135.34	8,059.70	75.64	107.548	
3,000.00	2,891.55	2,797.76	2,797.07	13.51	64.61	-102.25	-778.56	-7,968.63	8,142.91	8,064.91	78.00	104.391	
3,100.00	2,985.65	2,888.31	2,887.61	14.05	66.44	-102.46	-778.88	-7,968.63	8,150.65	8,070.29	80.36	101.425	
3,200.00	3,079.75	2,989.50	2,988.75	14.60	68.45	-102.70	-779.28	-7,968.63	8,158.54	8,075.63	82.91	98.405	
3,300.00	3,173.85	3,083.60	3,082.85	15.14	70.27	-102.92	-779.28	-7,968.63	8,166.49	8,081.23	85.25	95.789	
3,400.00	3,267.95	3,177.70	3,176.95	15.69	72.08	-103.14	-779.28	-7,968.63	8,174.57	8,086.97	87.60	93.314	
3,500.00	3,362.05	3,270.24	3,269.49	16.23	73.86	-103.35	-778.07	-7,968.63	8,182.54	8,092.62	89.92	90.997	
3,600.00	3,456.15	3,359.70	3,358.94	16.78	75.59	-103.55	-778.28	-7,968.63	8,190.93	8,098.75	92.18	88.859	
3,700.00	3,550.25	3,448.99	3,448.23	17.33	77.31	-103.76	-778.74	-7,968.63	8,199.50	8,105.07	94.43	86.829	
3,800.00	3,644.35	3,554.15	3,553.35	17.88	79.40	-104.01	-779.28	-7,968.63	8,208.21	8,111.15	97.06	84.567	
3,900.00	3,738.45	3,647.62	3,646.82	18.42	81.39	-104.22	-779.02	-7,968.63	8,216.90	8,117.31	99.58	82.515	
4,000.00	3,832.55	3,735.85	3,735.05	18.97	83.26	-104.43	-779.20	-7,968.63	8,225.80	8,123.82	101.99	80.655	
4,100.00	3,926.65	3,836.48	3,835.65	19.52	86.51	-104.66	-779.28	-7,968.63	8,234.81	8,129.04	105.77	77.855	
4,200.00	4,020.75	3,930.58	3,929.75	20.07	89.81	-104.87	-779.28	-7,968.63	8,243.94	8,134.34	109.60	75.217	
4,300.00	4,114.85	4,022.92	4,022.07	20.62	93.05	-105.07	-777.66	-7,968.63	8,252.82	8,139.45	113.37	72.794	
4,400.00	4,208.95	4,108.36	4,107.50	21.17	96.04	-105.27	-777.93	-7,968.63	8,262.27	8,145.37	116.90	70.679	
4,500.00	4,303.05	4,193.54	4,192.66	21.72	99.03	-105.47	-778.58	-7,968.63	8,271.95	8,151.53	120.42	68.695	
4,600.00	4,397.15	4,307.60	4,306.15	22.27	103.73	-105.73	-779.28	-7,968.63	8,281.73	8,156.08	125.65	65.913	
4,700.00	4,491.25	4,402.05	4,400.25	22.82	108.30	-105.94	-779.28	-7,968.63	8,291.49	8,160.74	130.75	63.413	
4,800.00	4,585.35	4,496.41	4,494.35	23.37	112.89	-106.15	-779.28	-7,968.63	8,301.38	8,165.51	135.87	61.098	
4,900.00	4,679.45	4,590.74	4,588.45	23.93	117.40	-106.36	-779.28	-7,968.63	8,311.40	8,170.49	140.91	58.985	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149 - OH - OH-INC												Offset Site Error:	0.00 usft		
Survey Program:		117-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)		
5,000.00	4,773.55	4,660.10	4,657.76	24.48	120.86	-106.51	-778.24	-7,968.63	8,321.32	8,176.42	144.89	57.430			
5,100.00	4,867.65	4,762.02	4,759.32	25.03	125.97	-106.74	-778.39	-7,968.63	8,331.60	8,181.06	150.54	55.346			
5,200.00	4,961.75	4,873.67	4,870.75	25.58	131.53	-107.00	-779.28	-7,968.63	8,342.21	8,185.58	156.63	53.260			
5,300.00	5,055.85	4,968.15	4,964.85	26.13	136.24	-107.21	-779.28	-7,968.63	8,352.72	8,190.85	161.87	51.601			
5,400.00	5,149.95	5,032.27	5,028.91	26.68	139.52	-107.34	-778.29	-7,968.63	8,363.15	8,197.48	165.67	50.480			
5,500.00	5,244.05	5,156.69	5,153.05	27.24	145.73	-107.63	-779.28	-7,968.63	8,374.13	8,201.72	172.41	48.572			
5,600.00	5,338.15	5,250.79	5,247.15	27.79	150.36	-107.83	-779.28	-7,968.63	8,385.02	8,207.44	177.57	47.220			
5,665.73	5,400.00	5,306.34	5,302.54	28.15	153.10	-107.93	-775.25	-7,968.62	8,391.11	8,210.45	180.66	46.448			
5,700.00	5,432.28	5,329.40	5,325.58	28.34	154.24	-108.02	-775.36	-7,968.62	8,394.90	8,212.93	181.97	46.134			
5,800.00	5,526.87	5,396.67	5,392.79	28.88	157.55	-108.27	-776.19	-7,968.63	8,405.89	8,220.10	185.79	45.244			
5,900.00	5,622.01	5,535.72	5,531.01	29.41	164.35	-108.67	-779.28	-7,968.63	8,416.89	8,223.79	193.10	43.587			
6,000.00	5,717.67	5,631.38	5,626.67	29.92	168.88	-108.94	-779.28	-7,968.63	8,426.66	8,228.54	198.12	42.533			
6,100.00	5,813.83	5,727.53	5,722.83	30.41	173.44	-109.20	-779.28	-7,968.63	8,435.95	8,232.81	203.15	41.526			
6,200.00	5,910.44	5,824.15	5,819.44	30.89	178.01	-109.44	-779.28	-7,968.63	8,444.75	8,236.56	208.18	40.564			
6,300.00	6,007.50	5,921.21	5,916.50	31.36	182.61	-109.67	-779.28	-7,968.63	8,453.03	8,239.80	213.22	39.644			
6,400.00	6,104.96	5,949.00	5,943.35	31.80	183.92	-109.79	-779.28	-7,968.63	8,461.07	8,246.12	214.95	39.363			
6,500.00	6,202.80	5,949.00	5,943.35	32.24	183.92	-109.87	-779.28	-7,968.63	8,469.66	8,254.35	215.31	39.337			
6,600.00	6,300.98	5,949.00	5,943.35	32.66	183.92	-109.95	-779.28	-7,968.63	8,478.82	8,263.19	215.63	39.321			
6,700.00	6,399.48	5,949.00	5,943.35	33.06	183.92	-110.05	-779.28	-7,968.63	8,488.57	8,272.66	215.90	39.316			
6,722.82	6,422.00	5,949.00	5,943.35	33.15	183.92	-110.07	-779.28	-7,968.63	8,490.87	8,274.91	215.96	39.317			
6,750.00	6,448.76	5,949.00	5,943.35	33.26	183.92	-110.09	-779.28	-7,968.63	8,493.38	8,277.35	216.03	39.316			
6,800.00	6,497.51	5,949.00	5,943.35	33.48	183.92	-88.55	-779.28	-7,968.63	8,496.72	8,280.54	216.17	39.305			
6,850.00	6,545.40	5,949.00	5,943.35	33.72	183.92	-81.90	-779.28	-7,968.63	8,498.35	8,282.02	216.33	39.284			
6,900.00	6,592.13	5,949.00	5,943.35	33.97	183.92	-77.78	-779.28	-7,968.63	8,498.29	8,281.78	216.51	39.251			
6,950.00	6,637.40	5,949.00	5,943.35	34.25	183.92	-75.11	-779.28	-7,968.63	8,496.52	8,279.81	216.71	39.207			
7,000.00	6,680.94	5,949.00	5,943.35	34.54	183.92	-73.38	-779.28	-7,968.63	8,493.06	8,276.14	216.92	39.153			
7,050.00	6,722.48	5,949.00	5,943.35	34.85	183.92	-72.29	-779.28	-7,968.63	8,487.93	8,270.78	217.15	39.087			
7,100.00	6,761.76	5,949.00	5,943.35	35.17	183.92	-71.69	-779.28	-7,968.63	8,481.16	8,263.75	217.40	39.011			
7,150.00	6,798.55	5,949.00	5,943.35	35.51	183.92	-71.47	-779.28	-7,968.63	8,472.77	8,255.10	217.67	38.925			
7,200.00	6,832.61	5,949.00	5,943.35	35.86	183.92	-71.57	-779.28	-7,968.63	8,462.83	8,244.88	217.95	38.829			
7,250.00	6,863.74	5,949.00	5,943.35	36.22	183.92	-71.95	-779.28	-7,968.63	8,451.39	8,233.13	218.26	38.722			
7,300.00	6,891.74	5,949.00	5,943.35	36.59	183.92	-72.57	-779.28	-7,968.63	8,438.50	8,219.92	218.58	38.606			
7,350.00	6,916.44	5,949.00	5,943.35	36.98	183.92	-73.42	-779.28	-7,968.63	8,424.25	8,205.33	218.92	38.481			
7,400.00	6,937.69	5,949.00	5,943.35	37.37	183.92	-74.48	-779.28	-7,968.63	8,408.71	8,189.44	219.28	38.347			
7,450.00	6,955.36	5,949.00	5,943.35	37.78	183.92	-75.73	-779.28	-7,968.63	8,391.98	8,172.33	219.66	38.205			
7,500.00	6,969.34	5,949.00	5,943.35	38.19	183.92	-77.17	-779.28	-7,968.63	8,374.15	8,154.10	220.05	38.056			
7,550.00	6,979.53	5,949.00	5,943.35	38.62	183.92	-78.78	-779.28	-7,968.63	8,355.32	8,134.86	220.46	37.900			
7,600.00	6,985.89	5,949.00	5,943.35	39.05	183.92	-80.55	-779.28	-7,968.63	8,335.61	8,114.73	220.89	37.737			
7,650.00	6,988.37	5,949.00	5,943.35	39.48	183.92	-82.47	-779.28	-7,968.63	8,315.13	8,093.80	221.32	37.570			
7,657.25	6,988.40	5,949.00	5,943.35	39.54	183.92	-82.76	-779.28	-7,968.63	8,312.10	8,090.71	221.39	37.545			
7,700.00	6,988.37	5,949.00	5,943.35	39.92	183.92	-82.76	-779.28	-7,968.63	8,294.30	8,072.53	221.77	37.400			
7,800.00	6,988.30	5,949.00	5,943.35	40.82	183.92	-82.76	-779.28	-7,968.63	8,253.38	8,030.69	222.69	37.061			
7,900.00	6,988.23	5,949.00	5,943.35	41.77	183.92	-82.76	-779.28	-7,968.63	8,213.48	7,989.83	223.64	36.726			
8,000.00	6,988.16	5,949.00	5,943.35	42.75	183.92	-82.76	-779.28	-7,968.63	8,174.60	7,949.98	224.62	36.393			
8,100.00	6,988.09	5,949.00	5,943.35	43.76	183.92	-82.76	-779.28	-7,968.63	8,136.77	7,911.14	225.62	36.064			
8,152.35	6,988.06	5,949.00	5,943.35	44.30	183.92	-82.76	-779.28	-7,968.63	8,117.38	7,891.23	226.16	35.893			
8,200.00	6,988.02	5,949.00	5,943.35	44.79	183.92	-82.66	-779.28	-7,968.63	8,099.26	7,872.62	226.64	35.736			
8,300.00	6,987.95	5,949.00	5,943.35	45.83	183.92	-82.42	-779.28	-7,968.63	8,057.32	7,829.65	227.67	35.391			
8,400.00	6,987.88	5,949.00	5,943.35	46.85	183.92	-82.14	-779.28	-7,968.63	8,010.18	7,781.50	228.67	35.029			
8,500.00	6,987.80	5,949.00	5,943.35	47.85	183.92	-81.80	-779.28	-7,968.63	7,957.98	7,728.31	229.66	34.651			
8,600.00	6,987.73	5,949.00	5,943.35	48.83	183.92	-81.40	-779.28	-7,968.63	7,900.87	7,670.24	230.63	34.258			
8,700.00	6,987.65	5,949.00	5,943.35	49.79	183.92	-80.92	-779.28	-7,968.63	7,839.04	7,607.48	231.56	33.853			

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149 - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program:		117-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	
8,800.00	6,987.57	5,949.00	5,943.35	50.72	183.92	-80.34	-779.28	-7,968.63	7,772.67	7,540.21	232.46	33.437	
8,900.00	6,987.50	5,949.00	5,943.35	51.62	183.92	-79.65	-779.28	-7,968.63	7,701.97	7,468.66	233.31	33.011	
9,000.00	6,987.42	5,949.00	5,943.35	52.48	183.92	-78.81	-779.28	-7,968.63	7,627.18	7,393.06	234.12	32.579	
9,100.00	6,987.34	5,949.00	5,943.35	53.30	183.92	-77.78	-779.28	-7,968.63	7,548.54	7,313.67	234.87	32.140	
9,200.00	6,987.27	5,949.00	5,943.35	54.08	183.92	-76.49	-779.28	-7,968.63	7,466.31	7,230.76	235.55	31.697	
9,215.33	6,987.26	5,949.00	5,943.35	54.20	183.92	-76.27	-779.28	-7,968.63	7,453.41	7,217.75	235.65	31.629	
9,300.00	6,987.20	5,949.00	5,943.35	54.85	183.92	-76.27	-779.28	-7,968.63	7,382.07	7,145.86	236.20	31.253	
9,400.00	6,987.12	5,949.00	5,943.35	55.65	183.92	-76.27	-779.28	-7,968.63	7,298.18	7,061.31	236.87	30.811	
9,500.00	6,987.05	5,949.00	5,943.35	56.48	183.92	-76.27	-779.28	-7,968.63	7,214.70	6,977.15	237.55	30.371	
9,600.00	6,986.98	5,949.00	5,943.35	57.35	183.92	-76.27	-779.28	-7,968.63	7,131.64	6,893.39	238.25	29.934	
9,700.00	6,986.90	5,949.00	5,943.35	58.24	183.92	-76.27	-779.28	-7,968.63	7,049.03	6,810.06	238.97	29.498	
9,800.00	6,986.83	5,949.00	5,943.35	59.17	183.92	-76.27	-779.28	-7,968.63	6,966.87	6,727.16	239.71	29.064	
9,900.00	6,986.75	5,949.00	5,943.35	60.12	183.92	-76.27	-779.28	-7,968.63	6,885.18	6,644.72	240.46	28.633	
10,000.00	6,986.68	5,949.00	5,943.35	61.10	183.92	-76.27	-779.28	-7,968.63	6,803.98	6,562.74	241.24	28.204	
10,100.00	6,986.61	5,949.00	5,943.35	62.11	183.92	-76.27	-779.28	-7,968.63	6,723.29	6,481.25	242.04	27.778	
10,200.00	6,986.53	5,949.00	5,943.35	63.14	183.92	-76.27	-779.28	-7,968.63	6,643.12	6,400.27	242.85	27.354	
10,300.00	6,986.46	5,949.00	5,943.35	64.20	183.92	-76.27	-779.28	-7,968.63	6,563.50	6,319.81	243.69	26.934	
10,400.00	6,986.39	5,949.00	5,943.35	65.28	183.92	-76.27	-779.28	-7,968.63	6,484.45	6,239.90	244.55	26.516	
10,500.00	6,986.31	5,949.00	5,943.35	66.38	183.92	-76.27	-779.28	-7,968.63	6,405.97	6,160.54	245.43	26.101	
10,600.00	6,986.24	5,949.00	5,943.35	67.50	183.92	-76.27	-779.28	-7,968.63	6,328.11	6,081.78	246.33	25.689	
10,700.00	6,986.17	5,949.00	5,943.35	68.64	183.92	-76.27	-779.28	-7,968.63	6,250.87	6,003.62	247.25	25.281	
10,800.00	6,986.09	5,949.00	5,943.35	69.80	183.92	-76.27	-779.28	-7,968.63	6,174.29	5,926.09	248.20	24.876	
10,900.00	6,986.02	5,949.00	5,943.35	70.98	183.92	-76.27	-779.28	-7,968.63	6,098.39	5,849.23	249.17	24.475	
11,000.00	6,985.95	5,949.00	5,943.35	72.17	183.92	-76.27	-779.28	-7,968.63	6,023.19	5,773.04	250.15	24.078	
11,100.00	6,985.87	5,949.00	5,943.35	73.38	183.92	-76.27	-779.28	-7,968.63	5,948.72	5,697.56	251.17	23.684	
11,200.00	6,985.80	5,949.00	5,943.35	74.61	183.92	-76.27	-779.28	-7,968.63	5,875.01	5,622.81	252.20	23.295	
11,300.00	6,985.72	5,949.00	5,943.35	75.85	183.92	-76.27	-779.28	-7,968.63	5,802.09	5,548.83	253.26	22.910	
11,400.00	6,985.65	5,949.00	5,943.35	77.10	183.92	-76.27	-779.28	-7,968.63	5,729.98	5,475.65	254.33	22.529	
11,500.00	6,985.58	5,949.00	5,943.35	78.37	183.92	-76.27	-779.28	-7,968.63	5,658.72	5,403.29	255.44	22.153	
11,600.00	6,985.50	5,949.00	5,943.35	79.65	183.92	-76.27	-779.28	-7,968.63	5,588.35	5,331.79	256.56	21.782	
11,700.00	6,985.43	5,949.00	5,943.35	80.94	183.92	-76.27	-779.28	-7,968.63	5,518.88	5,261.18	257.71	21.415	
11,800.00	6,985.36	5,949.00	5,943.35	82.24	183.92	-76.27	-779.28	-7,968.63	5,450.37	5,191.50	258.87	21.054	
11,900.00	6,985.28	5,949.00	5,943.35	83.56	183.92	-76.27	-779.28	-7,968.63	5,382.84	5,122.78	260.06	20.698	
12,000.00	6,985.21	5,949.00	5,943.35	84.88	183.92	-76.27	-779.28	-7,968.63	5,316.34	5,055.07	261.27	20.348	
12,100.00	6,985.14	5,949.00	5,943.35	86.21	183.92	-76.27	-779.28	-7,968.63	5,250.90	4,988.40	262.50	20.003	
12,200.00	6,985.06	5,949.00	5,943.35	87.56	183.92	-76.27	-779.28	-7,968.63	5,186.56	4,922.81	263.76	19.664	
12,300.00	6,984.99	5,949.00	5,943.35	88.91	183.92	-76.27	-779.28	-7,968.63	5,123.37	4,858.34	265.03	19.331	
12,400.00	6,984.92	5,949.00	5,943.35	90.27	183.92	-76.27	-779.28	-7,968.63	5,061.36	4,795.04	266.32	19.005	
12,500.00	6,984.84	5,949.00	5,943.35	91.64	183.92	-76.27	-779.28	-7,968.63	5,000.58	4,732.96	267.62	18.685	
12,600.00	6,984.77	5,949.00	5,943.35	93.01	183.92	-76.27	-779.28	-7,968.63	4,941.08	4,672.14	268.95	18.372	
12,700.00	6,984.69	5,949.00	5,943.35	94.40	183.92	-76.27	-779.28	-7,968.63	4,882.90	4,612.62	270.28	18.066	
12,800.00	6,984.62	5,949.00	5,943.35	95.79	183.92	-76.27	-779.28	-7,968.63	4,826.10	4,554.46	271.64	17.767	
12,900.00	6,984.55	5,949.00	5,943.35	97.18	183.92	-76.27	-779.28	-7,968.63	4,770.71	4,497.71	273.00	17.475	
13,000.00	6,984.47	5,949.00	5,943.35	98.59	183.92	-76.27	-779.28	-7,968.63	4,716.79	4,442.42	274.37	17.191	
13,100.00	6,984.40	5,949.00	5,943.35	100.00	183.92	-76.27	-779.28	-7,968.63	4,664.40	4,388.64	275.76	16.915	
13,200.00	6,984.33	5,949.00	5,943.35	101.41	183.92	-76.27	-779.28	-7,968.63	4,613.57	4,336.43	277.15	16.647	
13,300.00	6,984.25	5,949.00	5,943.35	102.83	183.92	-76.27	-779.28	-7,968.63	4,564.38	4,285.84	278.54	16.387	
13,400.00	6,984.18	5,949.00	5,943.35	104.26	183.92	-76.27	-779.28	-7,968.63	4,516.86	4,236.92	279.93	16.135	
13,500.00	6,984.11	5,949.00	5,943.35	105.69	183.92	-76.27	-779.28	-7,968.63	4,471.07	4,189.74	281.33	15.893	
13,600.00	6,984.03	5,949.00	5,943.35	107.13	183.92	-76.27	-779.28	-7,968.63	4,427.07	4,144.35	282.72	15.659	
13,700.00	6,983.96	5,949.00	5,943.35	108.57	183.92	-76.27	-779.28	-7,968.63	4,384.91	4,100.81	284.10	15.434	
13,800.00	6,983.88	5,949.00	5,943.35	110.02	183.92	-76.27	-779.28	-7,968.63	4,344.64	4,059.16	285.47	15.219	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149 - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		117-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	
13,900.00	6,983.81	5,949.00	5,943.35	111.47	183.92	-76.27	-779.28	-7,968.63	4,306.31	4,019.48	286.83	15.013		
14,000.00	6,983.74	5,949.00	5,943.35	112.92	183.92	-76.27	-779.28	-7,968.63	4,269.99	3,981.81	288.18	14.817		
14,100.00	6,983.66	5,949.00	5,943.35	114.38	183.92	-76.27	-779.28	-7,968.63	4,235.71	3,946.21	289.50	14.631		
14,200.00	6,983.59	5,949.00	5,943.35	115.85	183.92	-76.27	-779.28	-7,968.63	4,203.54	3,912.74	290.80	14.455		
14,300.00	6,983.52	5,949.00	5,943.35	117.31	183.92	-76.27	-779.28	-7,968.63	4,173.51	3,881.44	292.07	14.289		
14,400.00	6,983.44	5,949.00	5,943.35	118.78	183.92	-76.27	-779.28	-7,968.63	4,145.68	3,852.37	293.31	14.134		
14,500.00	6,983.37	5,949.00	5,943.35	120.26	183.92	-76.27	-779.28	-7,968.63	4,120.09	3,825.57	294.52	13.989		
14,600.00	6,983.30	5,949.00	5,943.35	121.74	183.92	-76.27	-779.28	-7,968.63	4,096.78	3,801.09	295.69	13.855		
14,700.00	6,983.22	5,949.00	5,943.35	123.22	183.92	-76.27	-779.28	-7,968.63	4,075.79	3,778.97	296.82	13.732		
14,800.00	6,983.15	5,949.00	5,943.35	124.70	183.92	-76.27	-779.28	-7,968.63	4,057.16	3,759.26	297.90	13.619		
14,900.00	6,983.08	5,949.00	5,943.35	126.19	183.92	-76.27	-779.28	-7,968.63	4,040.91	3,741.99	298.93	13.518		
15,000.00	6,983.00	5,949.00	5,943.35	127.68	183.92	-76.27	-779.28	-7,968.63	4,027.09	3,727.18	299.91	13.428		
15,100.00	6,982.93	5,949.00	5,943.35	129.17	183.92	-76.27	-779.28	-7,968.63	4,015.71	3,714.88	300.83	13.349		
15,200.00	6,982.85	5,949.00	5,943.35	130.67	183.92	-76.27	-779.28	-7,968.63	4,006.79	3,705.09	301.70	13.281		
15,300.00	6,982.78	5,949.00	5,943.35	132.16	183.92	-76.27	-779.28	-7,968.63	4,000.36	3,697.85	302.51	13.224		
15,400.00	6,982.71	5,949.00	5,943.35	133.66	183.92	-76.27	-779.28	-7,968.63	3,996.41	3,693.16	303.25	13.178		
15,500.00	6,982.63	5,949.00	5,943.35	135.17	183.92	-76.27	-779.28	-7,968.63	3,994.97	3,691.04	303.93	13.144		
15,507.67	6,982.63	5,949.00	5,943.35	135.28	183.92	-76.27	-779.28	-7,968.63	3,994.96	3,690.98	303.98	13.142	CC, ES	
15,600.00	6,982.56	5,949.00	5,943.35	136.67	183.92	-76.27	-779.28	-7,968.63	3,996.03	3,691.48	304.55	13.121		
15,700.00	6,982.49	5,949.00	5,943.35	138.18	183.92	-76.27	-779.28	-7,968.63	3,999.59	3,694.49	305.10	13.109		
15,800.00	6,982.41	5,949.00	5,943.35	139.69	183.92	-76.27	-779.28	-7,968.63	4,005.64	3,700.07	305.58	13.108	SF	
15,900.00	6,982.34	5,949.00	5,943.35	141.20	183.92	-76.27	-779.28	-7,968.63	4,014.18	3,708.19	305.99	13.119		
16,000.00	6,982.27	5,949.00	5,943.35	142.71	183.92	-76.27	-779.28	-7,968.63	4,025.18	3,718.85	306.33	13.140		
16,100.00	6,982.19	5,949.00	5,943.35	144.23	183.92	-76.27	-779.28	-7,968.63	4,038.64	3,732.02	306.61	13.172		
16,200.00	6,982.12	5,949.00	5,943.35	145.75	183.92	-76.27	-779.28	-7,968.63	4,054.51	3,747.69	306.82	13.215		
16,300.00	6,982.05	5,949.00	5,943.35	147.27	183.92	-76.27	-779.28	-7,968.63	4,072.78	3,765.81	306.97	13.268		
16,400.00	6,981.97	5,949.00	5,943.35	148.79	183.92	-76.27	-779.28	-7,968.63	4,093.41	3,786.36	307.05	13.331		
16,500.00	6,981.90	5,949.00	5,943.35	150.31	183.92	-76.27	-779.28	-7,968.63	4,116.36	3,809.29	307.07	13.405		
16,600.00	6,981.82	5,949.00	5,943.35	151.84	183.92	-76.27	-779.28	-7,968.63	4,141.61	3,834.58	307.03	13.489		
16,700.00	6,981.75	5,949.00	5,943.35	153.36	183.92	-76.27	-779.28	-7,968.63	4,169.10	3,862.17	306.93	13.583		
16,800.00	6,981.68	5,949.00	5,943.35	154.89	183.92	-76.27	-779.28	-7,968.63	4,198.79	3,892.01	306.78	13.687		
16,900.00	6,981.60	5,949.00	5,943.35	156.42	183.92	-76.27	-779.28	-7,968.63	4,230.64	3,924.07	306.57	13.800		
17,000.00	6,981.53	5,949.00	5,943.35	157.95	183.92	-76.27	-779.28	-7,968.63	4,264.59	3,958.28	306.31	13.922		
17,100.00	6,981.46	5,949.00	5,943.35	159.49	183.92	-76.27	-779.28	-7,968.63	4,300.61	3,994.60	306.01	14.054		
17,200.00	6,981.38	5,949.00	5,943.35	161.02	183.92	-76.27	-779.28	-7,968.63	4,338.63	4,032.97	305.66	14.195		
17,300.00	6,981.31	5,949.00	5,943.35	162.56	183.92	-76.27	-779.28	-7,968.63	4,378.60	4,073.34	305.26	14.344		
17,400.00	6,981.24	5,949.00	5,943.35	164.09	183.92	-76.27	-779.28	-7,968.63	4,420.48	4,115.65	304.83	14.501		
17,500.00	6,981.16	5,949.00	5,943.35	165.63	183.92	-76.27	-779.28	-7,968.63	4,464.20	4,159.83	304.37	14.667		
17,600.00	6,981.09	5,949.00	5,943.35	167.17	183.92	-76.27	-779.28	-7,968.63	4,509.72	4,205.85	303.87	14.841		
17,700.00	6,981.01	5,949.00	5,943.35	168.71	183.92	-76.27	-779.28	-7,968.63	4,556.98	4,253.64	303.34	15.023		
17,800.00	6,980.94	5,949.00	5,943.35	170.25	183.92	-76.27	-779.28	-7,968.63	4,605.92	4,303.14	302.78	15.212		
17,900.00	6,980.87	5,949.00	5,943.35	171.80	183.92	-76.27	-779.28	-7,968.63	4,656.50	4,354.29	302.20	15.409		
18,000.00	6,980.79	5,949.00	5,943.35	173.34	183.92	-76.27	-779.28	-7,968.63	4,708.65	4,407.06	301.60	15.612		
18,100.00	6,980.72	5,949.00	5,943.35	174.89	183.92	-76.27	-779.28	-7,968.63	4,762.34	4,461.36	300.98	15.823		
18,200.00	6,980.65	5,949.00	5,943.35	176.43	183.92	-76.27	-779.28	-7,968.63	4,817.51	4,517.17	300.34	16.040		
18,300.00	6,980.57	5,949.00	5,943.35	177.98	183.92	-76.27	-779.28	-7,968.63	4,874.10	4,574.41	299.68	16.264		
18,400.00	6,980.50	5,949.00	5,943.35	179.53	183.92	-76.27	-779.28	-7,968.63	4,932.07	4,633.05	299.02	16.494		
18,500.00	6,980.43	5,949.00	5,943.35	181.08	183.92	-76.27	-779.28	-7,968.63	4,991.37	4,693.03	298.34	16.731		
18,600.00	6,980.35	5,949.00	5,943.35	182.63	183.92	-76.27	-779.28	-7,968.63	5,051.95	4,754.30	297.65	16.973		
18,700.00	6,980.28	5,949.00	5,943.35	184.18	183.92	-76.27	-779.28	-7,968.63	5,113.77	4,816.82	296.96	17.221		
18,800.00	6,980.21	5,949.00	5,943.35	185.73	183.92	-76.27	-779.28	-7,968.63	5,176.79	4,880.53	296.26	17.474		
18,900.00	6,980.13	5,949.00	5,943.35	187.28	183.92	-76.27	-779.28	-7,968.63	5,240.96	4,945.40	295.56	17.733		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149 - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		117-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)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
19,000.00	6,980.06	5,949.00	5,943.35	188.84	183.92	-76.27	-779.28	-7,968.63	5,306.23	5,011.38	294.85	17.996		
19,100.00	6,979.98	5,949.00	5,943.35	190.39	183.92	-76.27	-779.28	-7,968.63	5,372.57	5,078.43	294.14	18.265		
19,200.00	6,979.91	5,949.00	5,943.35	191.95	183.92	-76.27	-779.28	-7,968.63	5,439.95	5,146.51	293.44	18.539		
19,300.00	6,979.84	5,949.00	5,943.35	193.51	183.92	-76.27	-779.28	-7,968.63	5,508.31	5,215.58	292.73	18.817		
19,400.00	6,979.76	5,949.00	5,943.35	195.06	183.92	-76.27	-779.28	-7,968.63	5,577.63	5,285.60	292.03	19.099		
19,500.00	6,979.69	5,949.00	5,943.35	196.62	183.92	-76.27	-779.28	-7,968.63	5,647.87	5,356.54	291.33	19.386		
19,600.00	6,979.62	5,949.00	5,943.35	198.18	183.92	-76.27	-779.28	-7,968.63	5,718.99	5,428.36	290.64	19.677		
19,700.00	6,979.54	5,949.00	5,943.35	199.74	183.92	-76.27	-779.28	-7,968.63	5,790.97	5,501.02	289.95	19.973		
19,800.00	6,979.47	5,949.00	5,943.35	201.30	183.92	-76.27	-779.28	-7,968.63	5,863.77	5,574.51	289.26	20.271		
19,900.00	6,979.40	5,949.00	5,943.35	202.86	183.92	-76.27	-779.28	-7,968.63	5,937.36	5,648.78	288.58	20.574		
20,000.00	6,979.32	5,949.00	5,943.35	204.42	183.92	-76.27	-779.28	-7,968.63	6,011.72	5,723.81	287.91	20.880		
20,100.00	6,979.25	5,949.00	5,943.35	205.98	183.92	-76.27	-779.28	-7,968.63	6,086.81	5,799.56	287.25	21.190		
20,200.00	6,979.18	5,949.00	5,943.35	207.55	183.92	-76.27	-779.28	-7,968.63	6,162.60	5,876.01	286.59	21.503		
20,300.00	6,979.10	5,949.00	5,943.35	209.11	183.92	-76.27	-779.28	-7,968.63	6,239.08	5,953.14	285.94	21.820		
20,400.00	6,979.03	5,949.00	5,943.35	210.68	183.92	-76.27	-779.28	-7,968.63	6,316.22	6,030.92	285.30	22.139		
20,500.00	6,978.95	5,949.00	5,943.35	212.24	183.92	-76.27	-779.28	-7,968.63	6,393.99	6,109.32	284.66	22.461		
20,600.00	6,978.88	5,949.00	5,943.35	213.81	183.92	-76.27	-779.28	-7,968.63	6,472.37	6,188.33	284.04	22.787		
20,700.00	6,978.81	5,949.00	5,943.35	215.37	183.92	-76.27	-779.28	-7,968.63	6,551.34	6,267.91	283.43	23.115		
20,800.00	6,978.73	5,949.00	5,943.35	216.94	183.92	-76.27	-779.28	-7,968.63	6,630.87	6,348.05	282.82	23.446		
20,900.00	6,978.66	5,949.00	5,943.35	218.51	183.92	-76.27	-779.28	-7,968.63	6,710.96	6,428.73	282.22	23.779		
21,000.00	6,978.59	5,949.00	5,943.35	220.07	183.92	-76.27	-779.28	-7,968.63	6,791.57	6,509.93	281.64	24.115		
21,100.00	6,978.51	5,949.00	5,943.35	221.64	183.92	-76.27	-779.28	-7,968.63	6,872.69	6,591.63	281.06	24.453		
21,200.00	6,978.44	5,949.00	5,943.35	223.21	183.92	-76.27	-779.28	-7,968.63	6,954.30	6,673.81	280.49	24.794		
21,300.00	6,978.37	5,949.00	5,943.35	224.78	183.92	-76.27	-779.28	-7,968.63	7,036.39	6,756.46	279.93	25.136		
21,400.00	6,978.29	5,949.00	5,943.35	226.35	183.92	-76.27	-779.28	-7,968.63	7,118.94	6,839.56	279.38	25.481		
21,500.00	6,978.22	5,949.00	5,943.35	227.92	183.92	-76.27	-779.28	-7,968.63	7,201.93	6,923.09	278.84	25.828		
21,600.00	6,978.14	5,949.00	5,943.35	229.49	183.92	-76.27	-779.28	-7,968.63	7,285.34	7,007.03	278.31	26.177		
21,700.00	6,978.07	5,949.00	5,943.35	231.06	183.92	-76.27	-779.28	-7,968.63	7,369.17	7,091.38	277.79	26.528		
21,800.00	6,978.00	5,949.00	5,943.35	232.63	183.92	-76.27	-779.28	-7,968.63	7,453.40	7,176.12	277.28	26.881		
21,900.00	6,977.92	5,949.00	5,943.35	234.21	183.92	-76.27	-779.28	-7,968.63	7,538.01	7,261.24	276.77	27.235		
22,000.00	6,977.85	5,949.00	5,943.35	235.78	183.92	-76.27	-779.28	-7,968.63	7,623.00	7,346.71	276.28	27.591		
22,100.00	6,977.78	5,949.00	5,943.35	237.35	183.92	-76.27	-779.28	-7,968.63	7,708.34	7,432.54	275.80	27.949		
22,200.00	6,977.70	5,949.00	5,943.35	238.92	183.92	-76.27	-779.28	-7,968.63	7,794.04	7,518.71	275.32	28.309		
22,300.00	6,977.63	5,949.00	5,943.35	240.50	183.92	-76.27	-779.28	-7,968.63	7,880.07	7,605.21	274.86	28.670		
22,400.00	6,977.56	5,949.00	5,943.35	242.07	183.92	-76.27	-779.28	-7,968.63	7,966.42	7,692.02	274.40	29.032		
22,500.00	6,977.48	5,949.00	5,943.35	243.65	183.92	-76.27	-779.28	-7,968.63	8,053.10	7,779.15	273.95	29.396		
22,600.00	6,977.41	5,949.00	5,943.35	245.22	183.92	-76.27	-779.28	-7,968.63	8,140.08	7,866.56	273.51	29.761		
22,700.00	6,977.34	5,949.00	5,943.35	246.80	183.92	-76.27	-779.28	-7,968.63	8,227.35	7,954.27	273.08	30.128		
22,800.00	6,977.26	5,949.00	5,943.35	248.37	183.92	-76.27	-779.28	-7,968.63	8,314.91	8,042.25	272.66	30.495		
22,900.00	6,977.19	5,949.00	5,943.35	249.95	183.92	-76.27	-779.28	-7,968.63	8,402.75	8,130.51	272.25	30.864		
23,000.00	6,977.11	5,949.00	5,943.35	251.53	183.92	-76.27	-779.28	-7,968.63	8,490.86	8,219.02	271.84	31.235		
23,100.00	6,977.04	5,949.00	5,943.35	253.10	183.92	-76.27	-779.28	-7,968.63	8,579.23	8,307.79	271.44	31.606		
23,155.65	6,977.00	5,949.00	5,943.35	253.98	183.92	-76.27	-779.28	-7,968.63	8,628.52	8,357.29	271.23	31.813		
23,156.15	6,977.00	5,949.00	5,943.35	254.06	183.92	-76.27	-779.28	-7,968.63	8,628.96	8,356.42	272.54	31.661		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149A - OH - OH-INC													Offset Site Error: 0.00 usft
Survey Program: 245-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	-96.96	-1,141.97	-9,347.96	9,417.91				
100.00	100.00	7.00	7.00	0.25	0.12	-96.96	-1,141.97	-9,347.96	9,417.45	9,417.08	0.38	N/A	
200.00	200.00	107.00	107.00	0.61	1.90	-96.96	-1,141.97	-9,347.96	9,417.45	9,414.95	2.51	3,759.118	
300.00	300.00	207.00	207.00	0.97	3.67	-96.96	-1,141.97	-9,347.96	9,417.45	9,412.82	4.64	2,031.675	
400.00	400.00	307.00	307.00	1.33	5.44	-96.96	-1,141.97	-9,347.96	9,417.45	9,410.69	6.77	1,391.989	
456.82	456.82	363.81	363.81	1.53	6.45	-96.96	-1,141.84	-9,347.96	9,417.44	9,409.46	7.98	1,180.774	
500.00	500.00	406.10	406.10	1.68	7.19	-96.96	-1,141.86	-9,347.96	9,417.44	9,408.56	8.88	1,060.555	
600.00	599.98	506.98	506.98	2.04	9.00	-106.97	-1,141.97	-9,347.96	9,417.96	9,406.92	11.04	853.058	
700.00	699.84	606.84	606.84	2.41	10.83	-106.97	-1,141.97	-9,347.96	9,419.49	9,406.26	13.23	712.038	
800.00	799.45	705.04	705.04	2.77	12.63	-106.97	-1,141.87	-9,347.96	9,422.03	9,406.64	15.39	612.232	
900.00	898.70	805.72	805.70	3.13	14.49	-106.97	-1,141.97	-9,347.96	9,425.63	9,408.01	17.62	534.901	
1,000.00	997.47	904.48	904.47	3.50	16.36	-106.97	-1,141.97	-9,347.96	9,430.25	9,410.39	19.86	474.863	
1,100.00	1,095.63	1,002.65	1,002.63	3.89	18.21	-104.61	-1,141.97	-9,347.96	9,435.48	9,413.38	22.10	427.005	
1,200.00	1,193.09	1,097.47	1,097.45	4.29	20.00	-102.93	-1,141.25	-9,347.96	9,440.82	9,416.53	24.29	388.719	
1,300.00	1,289.73	1,190.97	1,190.95	4.72	21.76	-101.69	-1,141.57	-9,347.96	9,446.51	9,420.04	26.47	356.869	
1,400.00	1,385.42	1,292.47	1,292.42	5.16	23.68	-100.76	-1,141.97	-9,347.96	9,452.44	9,423.61	28.83	327.877	
1,496.97	1,477.20	1,384.25	1,384.20	5.62	25.42	-100.05	-1,141.97	-9,347.96	9,458.39	9,427.37	31.02	304.908	
1,500.00	1,480.05	1,387.10	1,387.05	5.63	25.48	-100.06	-1,141.97	-9,347.96	9,458.58	9,427.49	31.09	304.242	
1,600.00	1,574.15	1,481.20	1,481.15	6.12	27.26	-100.25	-1,141.97	-9,347.96	9,464.91	9,431.55	33.36	283.745	
1,700.00	1,668.25	1,573.80	1,573.75	6.62	29.02	-100.43	-1,141.47	-9,347.96	9,471.28	9,435.67	35.61	265.996	
1,800.00	1,762.35	1,665.58	1,665.53	7.12	30.76	-100.62	-1,141.64	-9,347.96	9,477.86	9,440.01	37.85	250.412	
1,900.00	1,856.45	1,763.53	1,763.45	7.64	32.62	-100.82	-1,141.97	-9,347.96	9,484.59	9,444.37	40.22	235.800	
2,000.00	1,950.55	1,857.63	1,857.55	8.16	34.63	-101.01	-1,141.97	-9,347.96	9,491.38	9,448.64	42.74	222.072	
2,100.00	2,044.65	1,951.73	1,951.65	8.68	36.63	-101.20	-1,141.97	-9,347.96	9,498.29	9,453.03	45.26	209.855	
2,200.00	2,138.75	2,044.43	2,044.35	9.21	38.61	-101.38	-1,141.17	-9,347.96	9,505.19	9,457.43	47.76	199.037	
2,300.00	2,232.85	2,134.76	2,134.68	9.74	40.53	-101.56	-1,141.36	-9,347.96	9,512.36	9,462.15	50.20	189.479	
2,400.00	2,326.95	2,224.94	2,224.85	10.27	42.45	-101.74	-1,141.76	-9,347.96	9,519.68	9,467.03	52.65	180.817	
2,500.00	2,421.05	2,328.23	2,328.05	10.81	44.67	-101.95	-1,141.97	-9,347.96	9,527.08	9,471.68	55.40	171.969	
2,600.00	2,515.15	2,422.33	2,422.15	11.34	46.71	-102.14	-1,141.97	-9,347.96	9,534.57	9,476.60	57.97	164.485	
2,700.00	2,609.25	2,515.51	2,515.31	11.88	48.73	-102.32	-1,140.37	-9,347.96	9,541.88	9,481.36	60.51	157.681	
2,800.00	2,703.35	2,601.58	2,601.37	12.42	50.59	-102.49	-1,140.61	-9,347.96	9,549.63	9,486.72	62.91	151.803	
2,900.00	2,797.45	2,687.37	2,687.15	12.96	52.45	-102.66	-1,141.25	-9,347.96	9,557.58	9,492.29	65.30	146.371	
3,000.00	2,891.55	2,798.83	2,798.55	13.51	54.81	-102.89	-1,141.97	-9,347.96	9,565.64	9,497.46	68.18	140.292	
3,100.00	2,985.65	2,892.93	2,892.65	14.05	56.72	-103.07	-1,141.97	-9,347.96	9,573.69	9,503.06	70.64	135.536	
3,200.00	3,079.75	2,987.03	2,986.75	14.60	58.64	-103.26	-1,141.97	-9,347.96	9,581.86	9,508.77	73.09	131.099	
3,300.00	3,173.85	3,077.10	3,076.82	15.14	60.48	-103.43	-1,141.25	-9,347.96	9,589.99	9,514.53	75.46	127.089	
3,400.00	3,267.95	3,166.50	3,166.22	15.69	62.30	-103.61	-1,141.54	-9,347.96	9,598.44	9,520.63	77.82	123.348	
3,500.00	3,362.05	3,269.38	3,269.05	16.23	64.39	-103.82	-1,141.97	-9,347.96	9,607.03	9,526.59	80.43	119.443	
3,600.00	3,456.15	3,363.48	3,363.15	16.78	66.24	-104.00	-1,141.97	-9,347.96	9,615.64	9,532.82	82.82	116.103	
3,700.00	3,550.25	3,457.58	3,457.25	17.33	68.09	-104.19	-1,141.97	-9,347.96	9,624.36	9,539.16	85.21	112.952	
3,800.00	3,644.35	3,550.79	3,550.45	17.88	69.93	-104.36	-1,140.71	-9,347.96	9,632.92	9,545.35	87.58	109.993	
3,900.00	3,738.45	3,639.26	3,638.91	18.42	71.67	-104.54	-1,140.86	-9,347.96	9,641.90	9,552.05	89.85	107.306	
4,000.00	3,832.55	3,727.56	3,727.21	18.97	73.41	-104.71	-1,141.25	-9,347.96	9,651.05	9,558.92	92.13	104.758	
4,100.00	3,926.65	3,834.03	3,833.65	19.52	75.51	-104.92	-1,141.97	-9,347.96	9,660.37	9,565.61	94.76	101.946	
4,200.00	4,020.75	3,928.13	3,927.75	20.07	77.36	-105.11	-1,141.97	-9,347.96	9,669.64	9,572.50	97.15	99.536	
4,300.00	4,114.85	4,022.23	4,021.85	20.62	79.22	-105.29	-1,141.97	-9,347.96	9,679.03	9,579.49	99.53	97.244	
4,400.00	4,208.95	4,114.18	4,113.79	21.17	81.03	-105.46	-1,141.48	-9,347.96	9,688.41	9,586.53	101.88	95.098	
4,500.00	4,303.05	4,204.36	4,203.97	21.72	82.80	-105.64	-1,141.64	-9,347.96	9,698.05	9,593.86	104.19	93.083	
4,600.00	4,397.15	4,304.58	4,304.15	22.27	84.78	-105.83	-1,141.97	-9,347.96	9,707.84	9,601.14	106.70	90.984	
4,700.00	4,491.25	4,398.68	4,398.25	22.82	86.70	-106.02	-1,141.97	-9,347.96	9,717.66	9,608.51	109.15	89.029	
4,800.00	4,585.35	4,492.78	4,492.35	23.37	88.62	-106.20	-1,141.97	-9,347.96	9,727.59	9,615.98	111.60	87.162	
4,900.00	4,679.45	4,583.70	4,583.26	23.93	90.48	-106.37	-1,140.92	-9,347.96	9,737.35	9,623.36	113.99	85.422	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149A - OH - OH-INC											Offset Site Error: 0.00 usft			
Survey Program: Reference		245-A027Ua_INC-ONLY Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Rule Assigned: Distance				Offset Well Error: 0.00 usft	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
5,000.00	4,773.55	4,670.17	4,669.73	24.48	92.24	-106.53	-1,141.16	-9,347.96	9,747.56	9,631.28	116.29	83.824		
5,100.00	4,867.65	4,756.46	4,756.01	25.03	94.01	-106.70	-1,141.66	-9,347.96	9,757.95	9,639.37	118.58	82.292		
5,200.00	4,961.75	4,869.23	4,868.75	25.58	96.20	-106.92	-1,141.97	-9,347.96	9,768.37	9,647.06	121.31	80.527		
5,300.00	5,055.85	4,963.33	4,962.85	26.13	97.99	-107.10	-1,141.97	-9,347.96	9,778.83	9,655.21	123.62	79.102		
5,400.00	5,149.95	5,056.56	5,056.07	26.68	99.76	-107.27	-1,141.16	-9,347.96	9,789.18	9,663.26	125.92	77.739		
5,500.00	5,244.05	5,144.50	5,144.01	27.24	101.43	-107.44	-1,141.29	-9,347.96	9,799.89	9,671.77	128.12	76.489		
5,600.00	5,338.15	5,232.29	5,231.79	27.79	103.10	-107.61	-1,141.63	-9,347.96	9,810.76	9,680.45	130.32	75.284		
5,665.73	5,400.00	5,307.51	5,307.00	28.15	104.55	-107.75	-1,141.97	-9,347.96	9,817.99	9,685.88	132.11	74.314		
5,700.00	5,432.28	5,339.80	5,339.28	28.34	105.20	-107.85	-1,141.97	-9,347.96	9,821.70	9,688.75	132.95	73.873		
5,800.00	5,526.87	5,434.38	5,433.87	28.88	107.13	-108.12	-1,141.97	-9,347.96	9,832.24	9,696.84	135.40	72.616		
5,900.00	5,622.01	5,529.52	5,529.01	29.41	109.08	-108.38	-1,141.97	-9,347.96	9,842.32	9,704.48	137.84	71.401		
6,000.00	5,717.67	5,621.13	5,620.62	29.92	110.95	-108.62	-1,141.49	-9,347.96	9,851.80	9,711.60	140.20	70.268		
6,100.00	5,813.83	5,712.64	5,712.12	30.41	112.81	-108.84	-1,141.70	-9,347.96	9,861.00	9,718.46	142.55	69.178		
6,200.00	5,910.44	5,818.02	5,817.44	30.89	115.08	-109.08	-1,141.97	-9,347.96	9,869.72	9,724.45	145.27	67.940		
6,300.00	6,007.50	5,915.07	5,914.50	31.36	117.41	-109.28	-1,141.97	-9,347.96	9,877.84	9,729.79	148.05	66.719		
6,400.00	6,104.96	6,000.00	5,999.35	31.80	119.45	-109.46	-1,141.97	-9,347.96	9,885.45	9,734.93	150.52	65.674		
6,500.00	6,202.80	6,000.00	5,999.35	32.24	119.45	-109.53	-1,141.97	-9,347.96	9,893.12	9,742.21	150.92	65.554		
6,600.00	6,300.98	6,000.00	5,999.35	32.66	119.45	-109.61	-1,141.97	-9,347.96	9,901.21	9,749.93	151.28	65.450		
6,700.00	6,399.48	6,000.00	5,999.35	33.06	119.45	-109.69	-1,141.97	-9,347.96	9,909.73	9,758.11	151.61	65.361		
6,722.82	6,422.00	6,000.00	5,999.35	33.15	119.45	-109.71	-1,141.97	-9,347.96	9,911.73	9,760.04	151.69	65.343		
6,750.00	6,448.76	6,000.00	5,999.35	33.26	119.45	-99.76	-1,141.97	-9,347.96	9,913.87	9,762.09	151.78	65.319		
6,800.00	6,497.51	6,000.00	5,999.35	33.48	119.45	-88.28	-1,141.97	-9,347.96	9,916.46	9,764.51	151.96	65.259		
6,850.00	6,545.40	6,000.00	5,999.35	33.72	119.45	-81.69	-1,141.97	-9,347.96	9,917.30	9,765.15	152.16	65.178		
6,900.00	6,592.13	6,000.00	5,999.35	33.97	119.45	-77.63	-1,141.97	-9,347.96	9,916.39	9,764.01	152.38	65.077		
6,950.00	6,637.40	6,000.00	5,999.35	34.25	119.45	-75.04	-1,141.97	-9,347.96	9,913.72	9,761.10	152.62	64.957		
7,000.00	6,680.94	6,000.00	5,999.35	34.54	119.45	-73.38	-1,141.97	-9,347.96	9,909.32	9,756.43	152.88	64.817		
7,050.00	6,722.48	6,000.00	5,999.35	34.85	119.45	-72.37	-1,141.97	-9,347.96	9,903.20	9,750.04	153.16	64.659		
7,100.00	6,761.76	6,000.00	5,999.35	35.17	119.45	-71.85	-1,141.97	-9,347.96	9,895.40	9,741.95	153.46	64.482		
7,150.00	6,798.55	6,000.00	5,999.35	35.51	119.45	-71.72	-1,141.97	-9,347.96	9,885.98	9,732.20	153.77	64.289		
7,200.00	6,832.61	6,000.00	5,999.35	35.86	119.45	-71.91	-1,141.97	-9,347.96	9,874.97	9,720.86	154.11	64.079		
7,250.00	6,863.74	6,000.00	5,999.35	36.22	119.45	-72.39	-1,141.97	-9,347.96	9,862.45	9,707.99	154.46	63.852		
7,300.00	6,891.74	6,000.00	5,999.35	36.59	119.45	-73.11	-1,141.97	-9,347.96	9,848.48	9,693.65	154.82	63.611		
7,350.00	6,916.44	6,000.00	5,999.35	36.98	119.45	-74.07	-1,141.97	-9,347.96	9,833.14	9,677.94	155.20	63.356		
7,400.00	6,937.69	6,000.00	5,999.35	37.37	119.45	-75.24	-1,141.97	-9,347.96	9,816.53	9,660.93	155.60	63.088		
7,450.00	6,955.36	6,000.00	5,999.35	37.78	119.45	-76.61	-1,141.97	-9,347.96	9,798.74	9,642.73	156.01	62.808		
7,500.00	6,969.34	6,000.00	5,999.35	38.19	119.45	-78.17	-1,141.97	-9,347.96	9,779.87	9,623.43	156.44	62.517		
7,550.00	6,979.53	6,000.00	5,999.35	38.62	119.45	-79.90	-1,141.97	-9,347.96	9,760.03	9,603.16	156.87	62.217		
7,600.00	6,985.89	6,000.00	5,999.35	39.05	119.45	-81.79	-1,141.97	-9,347.96	9,739.35	9,582.03	157.31	61.910		
7,650.00	6,988.37	6,000.00	5,999.35	39.48	119.45	-83.83	-1,141.97	-9,347.96	9,717.93	9,560.17	157.77	61.597		
7,657.25	6,988.40	6,000.00	5,999.35	39.54	119.45	-84.14	-1,141.97	-9,347.96	9,714.77	9,556.94	157.83	61.551		
7,700.00	6,988.37	6,000.00	5,999.35	39.92	119.45	-84.14	-1,141.97	-9,347.96	9,696.19	9,537.97	158.22	61.282		
7,800.00	6,988.30	6,000.00	5,999.35	40.82	119.45	-84.14	-1,141.97	-9,347.96	9,653.33	9,494.17	159.16	60.651		
7,900.00	6,988.23	6,000.00	5,999.35	41.77	119.45	-84.14	-1,141.97	-9,347.96	9,611.32	9,451.19	160.13	60.023		
8,000.00	6,988.16	6,000.00	5,999.35	42.75	119.45	-84.14	-1,141.97	-9,347.96	9,570.16	9,409.04	161.12	59.398		
8,100.00	6,988.09	6,000.00	5,999.35	43.76	119.45	-84.14	-1,141.97	-9,347.96	9,529.88	9,367.74	162.14	58.776		
8,152.35	6,988.06	6,000.00	5,999.35	44.30	119.45	-84.14	-1,141.97	-9,347.96	9,509.14	9,346.46	162.68	58.453		
8,200.00	6,988.02	6,000.00	5,999.35	44.79	119.45	-84.05	-1,141.97	-9,347.96	9,489.76	9,326.58	163.18	58.156		
8,300.00	6,987.95	6,000.00	5,999.35	45.83	119.45	-83.84	-1,141.97	-9,347.96	9,445.08	9,280.87	164.21	57.517		
8,400.00	6,987.88	6,000.00	5,999.35	46.85	119.45	-83.59	-1,141.97	-9,347.96	9,395.11	9,229.88	165.24	56.859		
8,500.00	6,987.80	6,000.00	5,999.35	47.85	119.45	-83.30	-1,141.97	-9,347.96	9,340.02	9,173.78	166.24	56.185		
8,600.00	6,987.73	6,000.00	5,999.35	48.83	119.45	-82.94	-1,141.97	-9,347.96	9,279.97	9,112.76	167.21	55.499		
8,700.00	6,987.65	6,000.00	5,999.35	49.79	119.45	-82.51	-1,141.97	-9,347.96	9,215.17	9,047.01	168.15	54.803		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149A - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		245-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)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
8,800.00	6,987.57	6,000.00	5,999.35	50.72	119.45	-81.99	-1,141.97	-9,347.96	9,145.83	8,976.78	169.05	54.101		
8,900.00	6,987.50	6,000.00	5,999.35	51.62	119.45	-81.37	-1,141.97	-9,347.96	9,072.20	8,902.30	169.90	53.396		
9,000.00	6,987.42	6,000.00	5,999.35	52.48	119.45	-80.60	-1,141.97	-9,347.96	8,994.53	8,823.83	170.70	52.691		
9,100.00	6,987.34	6,000.00	5,999.35	53.30	119.45	-79.63	-1,141.97	-9,347.96	8,913.10	8,741.66	171.45	51.988		
9,200.00	6,987.27	6,000.00	5,999.35	54.08	119.45	-78.41	-1,141.97	-9,347.96	8,828.21	8,656.09	172.12	51.290		
9,215.33	6,987.26	6,000.00	5,999.35	54.20	119.45	-78.20	-1,141.97	-9,347.96	8,814.91	8,642.69	172.22	51.184		
9,300.00	6,987.20	6,000.00	5,999.35	54.85	119.45	-78.20	-1,141.97	-9,347.96	8,741.35	8,568.59	172.76	50.599		
9,400.00	6,987.12	6,000.00	5,999.35	55.65	119.45	-78.20	-1,141.97	-9,347.96	8,654.74	8,481.33	173.41	49.910		
9,500.00	6,987.05	6,000.00	5,999.35	56.48	119.45	-78.20	-1,141.97	-9,347.96	8,568.41	8,394.34	174.07	49.223		
9,600.00	6,986.98	6,000.00	5,999.35	57.35	119.45	-78.20	-1,141.97	-9,347.96	8,482.39	8,307.64	174.75	48.539		
9,700.00	6,986.90	6,000.00	5,999.35	58.24	119.45	-78.20	-1,141.97	-9,347.96	8,396.68	8,221.22	175.45	47.857		
9,800.00	6,986.83	6,000.00	5,999.35	59.17	119.45	-78.20	-1,141.97	-9,347.96	8,311.28	8,135.11	176.17	47.178		
9,900.00	6,986.75	6,000.00	5,999.35	60.12	119.45	-78.20	-1,141.97	-9,347.96	8,226.21	8,049.32	176.90	46.502		
10,000.00	6,986.68	6,000.00	5,999.35	61.10	119.45	-78.20	-1,141.97	-9,347.96	8,141.49	7,963.84	177.65	45.829		
10,100.00	6,986.61	6,000.00	5,999.35	62.11	119.45	-78.20	-1,141.97	-9,347.96	8,057.11	7,878.70	178.42	45.159		
10,200.00	6,986.53	6,000.00	5,999.35	63.14	119.45	-78.20	-1,141.97	-9,347.96	7,973.10	7,793.90	179.20	44.492		
10,300.00	6,986.46	6,000.00	5,999.35	64.20	119.45	-78.20	-1,141.97	-9,347.96	7,889.46	7,709.45	180.01	43.829		
10,400.00	6,986.39	6,000.00	5,999.35	65.28	119.45	-78.20	-1,141.97	-9,347.96	7,806.20	7,625.37	180.83	43.169		
10,500.00	6,986.31	6,000.00	5,999.35	66.38	119.45	-78.20	-1,141.97	-9,347.96	7,723.34	7,541.67	181.67	42.513		
10,600.00	6,986.24	6,000.00	5,999.35	67.50	119.45	-78.20	-1,141.97	-9,347.96	7,640.89	7,458.36	182.53	41.860		
10,700.00	6,986.17	6,000.00	5,999.35	68.64	119.45	-78.20	-1,141.97	-9,347.96	7,558.86	7,375.45	183.42	41.212		
10,800.00	6,986.09	6,000.00	5,999.35	69.80	119.45	-78.20	-1,141.97	-9,347.96	7,477.27	7,292.96	184.32	40.567		
10,900.00	6,986.02	6,000.00	5,999.35	70.98	119.45	-78.20	-1,141.97	-9,347.96	7,396.14	7,210.90	185.24	39.927		
11,000.00	6,985.95	6,000.00	5,999.35	72.17	119.45	-78.20	-1,141.97	-9,347.96	7,315.47	7,129.29	186.18	39.292		
11,100.00	6,985.87	6,000.00	5,999.35	73.38	119.45	-78.20	-1,141.97	-9,347.96	7,235.28	7,048.14	187.15	38.661		
11,200.00	6,985.80	6,000.00	5,999.35	74.61	119.45	-78.20	-1,141.97	-9,347.96	7,155.60	6,967.46	188.13	38.035		
11,300.00	6,985.72	6,000.00	5,999.35	75.85	119.45	-78.20	-1,141.97	-9,347.96	7,076.42	6,887.28	189.14	37.414		
11,400.00	6,985.65	6,000.00	5,999.35	77.10	119.45	-78.20	-1,141.97	-9,347.96	6,997.79	6,807.62	190.17	36.798		
11,500.00	6,985.58	6,000.00	5,999.35	78.37	119.45	-78.20	-1,141.97	-9,347.96	6,919.70	6,728.48	191.22	36.187		
11,600.00	6,985.50	6,000.00	5,999.35	79.65	119.45	-78.20	-1,141.97	-9,347.96	6,842.18	6,649.89	192.29	35.582		
11,700.00	6,985.43	6,000.00	5,999.35	80.94	119.45	-78.20	-1,141.97	-9,347.96	6,765.25	6,571.86	193.39	34.982		
11,800.00	6,985.36	6,000.00	5,999.35	82.24	119.45	-78.20	-1,141.97	-9,347.96	6,688.94	6,494.43	194.51	34.389		
11,900.00	6,985.28	6,000.00	5,999.35	83.56	119.45	-78.20	-1,141.97	-9,347.96	6,613.25	6,417.60	195.65	33.801		
12,000.00	6,985.21	6,000.00	5,999.35	84.88	119.45	-78.20	-1,141.97	-9,347.96	6,538.22	6,341.40	196.82	33.219		
12,100.00	6,985.14	6,000.00	5,999.35	86.21	119.45	-78.20	-1,141.97	-9,347.96	6,463.87	6,265.86	198.01	32.644		
12,200.00	6,985.06	6,000.00	5,999.35	87.56	119.45	-78.20	-1,141.97	-9,347.96	6,390.21	6,190.99	199.22	32.076		
12,300.00	6,984.99	6,000.00	5,999.35	88.91	119.45	-78.20	-1,141.97	-9,347.96	6,317.28	6,116.82	200.46	31.514		
12,400.00	6,984.92	6,000.00	5,999.35	90.27	119.45	-78.20	-1,141.97	-9,347.96	6,245.10	6,043.38	201.72	30.960		
12,500.00	6,984.84	6,000.00	5,999.35	91.64	119.45	-78.20	-1,141.97	-9,347.96	6,173.69	5,970.69	203.00	30.412		
12,600.00	6,984.77	6,000.00	5,999.35	93.01	119.45	-78.20	-1,141.97	-9,347.96	6,103.09	5,898.78	204.31	29.872		
12,700.00	6,984.69	6,000.00	5,999.35	94.40	119.45	-78.20	-1,141.97	-9,347.96	6,033.32	5,827.68	205.64	29.340		
12,800.00	6,984.62	6,000.00	5,999.35	95.79	119.45	-78.20	-1,141.97	-9,347.96	5,964.41	5,757.42	206.99	28.815		
12,900.00	6,984.55	6,000.00	5,999.35	97.18	119.45	-78.20	-1,141.97	-9,347.96	5,896.39	5,688.02	208.37	28.298		
13,000.00	6,984.47	6,000.00	5,999.35	98.59	119.45	-78.20	-1,141.97	-9,347.96	5,829.29	5,619.52	209.76	27.790		
13,100.00	6,984.40	6,000.00	5,999.35	100.00	119.45	-78.20	-1,141.97	-9,347.96	5,763.14	5,551.96	211.18	27.290		
13,200.00	6,984.33	6,000.00	5,999.35	101.41	119.45	-78.20	-1,141.97	-9,347.96	5,697.99	5,485.36	212.63	26.798		
13,300.00	6,984.25	6,000.00	5,999.35	102.83	119.45	-78.20	-1,141.97	-9,347.96	5,633.85	5,419.76	214.09	26.316		
13,400.00	6,984.18	6,000.00	5,999.35	104.26	119.45	-78.20	-1,141.97	-9,347.96	5,570.77	5,355.20	215.57	25.842		
13,500.00	6,984.11	6,000.00	5,999.35	105.69	119.45	-78.20	-1,141.97	-9,347.96	5,508.79	5,291.72	217.07	25.378		
13,600.00	6,984.03	6,000.00	5,999.35	107.13	119.45	-78.20	-1,141.97	-9,347.96	5,447.93	5,229.34	218.59	24.923		
13,700.00	6,983.96	6,000.00	5,999.35	108.57	119.45	-78.20	-1,141.97	-9,347.96	5,388.25	5,168.12	220.13	24.478		
13,800.00	6,983.88	6,000.00	5,999.35	110.02	119.45	-78.20	-1,141.97	-9,347.96	5,329.77	5,108.09	221.68	24.043		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149A - OH - OH-INC											Offset Site Error: 0.00 usft			
Survey Program: Reference		245-A027Ua_INC-ONLY Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Rule Assigned: Distance				Offset Well Error: 0.00 usft	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
13,900.00	6,983.81	6,000.00	5,999.35	111.47	119.45	-78.20	-1,141.97	-9,347.96	5,272.54	5,049.29	223.25	23.617		
14,000.00	6,983.74	6,000.00	5,999.35	112.92	119.45	-78.20	-1,141.97	-9,347.96	5,216.60	4,991.77	224.83	23.203		
14,100.00	6,983.66	6,000.00	5,999.35	114.38	119.45	-78.20	-1,141.97	-9,347.96	5,161.99	4,935.57	226.42	22.798		
14,200.00	6,983.59	6,000.00	5,999.35	115.85	119.45	-78.20	-1,141.97	-9,347.96	5,108.75	4,880.73	228.02	22.405		
14,300.00	6,983.52	6,000.00	5,999.35	117.31	119.45	-78.20	-1,141.97	-9,347.96	5,056.93	4,827.30	229.63	22.022		
14,400.00	6,983.44	6,000.00	5,999.35	118.78	119.45	-78.20	-1,141.97	-9,347.96	5,006.57	4,775.33	231.24	21.651		
14,500.00	6,983.37	6,000.00	5,999.35	120.26	119.45	-78.20	-1,141.97	-9,347.96	4,957.72	4,724.86	232.86	21.290		
14,600.00	6,983.30	6,000.00	5,999.35	121.74	119.45	-78.20	-1,141.97	-9,347.96	4,910.42	4,675.94	234.48	20.942		
14,700.00	6,983.22	6,000.00	5,999.35	123.22	119.45	-78.20	-1,141.97	-9,347.96	4,864.72	4,628.62	236.10	20.605		
14,800.00	6,983.15	6,000.00	5,999.35	124.70	119.45	-78.20	-1,141.97	-9,347.96	4,820.65	4,582.94	237.71	20.279		
14,900.00	6,983.08	6,000.00	5,999.35	126.19	119.45	-78.20	-1,141.97	-9,347.96	4,778.27	4,538.96	239.32	19.966		
15,000.00	6,983.00	6,000.00	5,999.35	127.68	119.45	-78.20	-1,141.97	-9,347.96	4,737.63	4,496.72	240.91	19.666		
15,100.00	6,982.93	6,000.00	5,999.35	129.17	119.45	-78.20	-1,141.97	-9,347.96	4,698.76	4,456.27	242.49	19.377		
15,200.00	6,982.85	6,000.00	5,999.35	130.67	119.45	-78.20	-1,141.97	-9,347.96	4,661.71	4,417.66	244.05	19.101		
15,300.00	6,982.78	6,000.00	5,999.35	132.16	119.45	-78.20	-1,141.97	-9,347.96	4,626.53	4,380.94	245.60	18.838		
15,400.00	6,982.71	6,000.00	5,999.35	133.66	119.45	-78.20	-1,141.97	-9,347.96	4,593.26	4,346.14	247.12	18.587		
15,500.00	6,982.63	6,000.00	5,999.35	135.17	119.45	-78.20	-1,141.97	-9,347.96	4,561.94	4,313.33	248.61	18.350		
15,600.00	6,982.56	6,000.00	5,999.35	136.67	119.45	-78.20	-1,141.97	-9,347.96	4,532.60	4,282.53	250.07	18.125		
15,700.00	6,982.49	6,000.00	5,999.35	138.18	119.45	-78.20	-1,141.97	-9,347.96	4,505.30	4,253.80	251.49	17.914		
15,800.00	6,982.41	6,000.00	5,999.35	139.69	119.45	-78.20	-1,141.97	-9,347.96	4,480.06	4,227.18	252.88	17.716		
15,900.00	6,982.34	6,000.00	5,999.35	141.20	119.45	-78.20	-1,141.97	-9,347.96	4,456.92	4,202.70	254.23	17.531		
16,000.00	6,982.27	6,000.00	5,999.35	142.71	119.45	-78.20	-1,141.97	-9,347.96	4,435.92	4,180.39	255.53	17.360		
16,100.00	6,982.19	6,000.00	5,999.35	144.23	119.45	-78.20	-1,141.97	-9,347.96	4,417.08	4,160.31	256.78	17.202		
16,200.00	6,982.12	6,000.00	5,999.35	145.75	119.45	-78.20	-1,141.97	-9,347.96	4,400.44	4,142.46	257.97	17.058		
16,300.00	6,982.05	6,000.00	5,999.35	147.27	119.45	-78.20	-1,141.97	-9,347.96	4,386.01	4,126.89	259.11	16.927		
16,400.00	6,981.97	6,000.00	5,999.35	148.79	119.45	-78.20	-1,141.97	-9,347.96	4,373.82	4,113.62	260.20	16.810		
16,500.00	6,981.90	6,000.00	5,999.35	150.31	119.45	-78.20	-1,141.97	-9,347.96	4,363.89	4,102.67	261.22	16.706		
16,600.00	6,981.82	6,000.00	5,999.35	151.84	119.45	-78.20	-1,141.97	-9,347.96	4,356.23	4,094.05	262.18	16.616		
16,700.00	6,981.75	6,000.00	5,999.35	153.36	119.45	-78.20	-1,141.97	-9,347.96	4,350.86	4,087.79	263.07	16.539		
16,800.00	6,981.68	6,000.00	5,999.35	154.89	119.45	-78.20	-1,141.97	-9,347.96	4,347.78	4,083.89	263.89	16.476		
16,883.87	6,981.62	6,000.00	5,999.35	156.18	119.45	-78.20	-1,141.97	-9,347.96	4,346.97	4,082.44	264.53	16.433	CC	
16,900.00	6,981.60	6,000.00	5,999.35	156.42	119.45	-78.20	-1,141.97	-9,347.96	4,347.00	4,082.36	264.65	16.426	ES	
17,000.00	6,981.53	6,000.00	5,999.35	157.95	119.45	-78.20	-1,141.97	-9,347.96	4,348.52	4,083.19	265.33	16.389		
17,100.00	6,981.46	6,000.00	5,999.35	159.49	119.45	-78.20	-1,141.97	-9,347.96	4,352.34	4,086.40	265.94	16.366		
17,200.00	6,981.38	6,000.00	5,999.35	161.02	119.45	-78.20	-1,141.97	-9,347.96	4,358.45	4,091.98	266.48	16.356	SF	
17,300.00	6,981.31	6,000.00	5,999.35	162.56	119.45	-78.20	-1,141.97	-9,347.96	4,366.84	4,099.90	266.94	16.359		
17,400.00	6,981.24	6,000.00	5,999.35	164.09	119.45	-78.20	-1,141.97	-9,347.96	4,377.51	4,110.17	267.33	16.375		
17,500.00	6,981.16	6,000.00	5,999.35	165.63	119.45	-78.20	-1,141.97	-9,347.96	4,390.42	4,122.77	267.65	16.403		
17,600.00	6,981.09	6,000.00	5,999.35	167.17	119.45	-78.20	-1,141.97	-9,347.96	4,405.57	4,137.66	267.90	16.445		
17,700.00	6,981.01	6,000.00	5,999.35	168.71	119.45	-78.20	-1,141.97	-9,347.96	4,422.92	4,154.84	268.08	16.498		
17,800.00	6,980.94	6,000.00	5,999.35	170.25	119.45	-78.20	-1,141.97	-9,347.96	4,442.46	4,174.27	268.19	16.565		
17,900.00	6,980.87	6,000.00	5,999.35	171.80	119.45	-78.20	-1,141.97	-9,347.96	4,464.16	4,195.92	268.23	16.643		
18,000.00	6,980.79	6,000.00	5,999.35	173.34	119.45	-78.20	-1,141.97	-9,347.96	4,487.97	4,219.77	268.21	16.733		
18,100.00	6,980.72	6,000.00	5,999.35	174.89	119.45	-78.20	-1,141.97	-9,347.96	4,513.88	4,245.76	268.12	16.835		
18,200.00	6,980.65	6,000.00	5,999.35	176.43	119.45	-78.20	-1,141.97	-9,347.96	4,541.85	4,273.87	267.97	16.949		
18,300.00	6,980.57	6,000.00	5,999.35	177.98	119.45	-78.20	-1,141.97	-9,347.96	4,571.83	4,304.06	267.76	17.074		
18,400.00	6,980.50	6,000.00	5,999.35	179.53	119.45	-78.20	-1,141.97	-9,347.96	4,603.78	4,336.28	267.50	17.210		
18,500.00	6,980.43	6,000.00	5,999.35	181.08	119.45	-78.20	-1,141.97	-9,347.96	4,637.68	4,370.49	267.18	17.358		
18,600.00	6,980.35	6,000.00	5,999.35	182.63	119.45	-78.20	-1,141.97	-9,347.96	4,673.46	4,406.65	266.82	17.516		
18,700.00	6,980.28	6,000.00	5,999.35	184.18	119.45	-78.20	-1,141.97	-9,347.96	4,711.10	4,444.70	266.40	17.684		
18,800.00	6,980.21	6,000.00	5,999.35	185.73	119.45	-78.20	-1,141.97	-9,347.96	4,750.55	4,484.61	265.94	17.863		
18,900.00	6,980.13	6,000.00	5,999.35	187.28	119.45	-78.20	-1,141.97	-9,347.96	4,791.76	4,526.32	265.44	18.052		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149A - OH - OH-INC													Offset Site Error:	0.00 usft	
Survey Program: 245-A027Ua_INC-ONLY				Reference		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		
19,000.00	6,980.06	6,000.00	5,999.35	188.84	119.45	-78.20	-1,141.97	-9,347.96	4,834.68	4,569.78	264.90	18.251			
19,100.00	6,979.98	6,000.00	5,999.35	190.39	119.45	-78.20	-1,141.97	-9,347.96	4,879.28	4,614.96	264.33	18.459			
19,200.00	6,979.91	6,000.00	5,999.35	191.95	119.45	-78.20	-1,141.97	-9,347.96	4,925.51	4,661.79	263.72	18.677			
19,300.00	6,979.84	6,000.00	5,999.35	193.51	119.45	-78.20	-1,141.97	-9,347.96	4,973.31	4,710.24	263.08	18.904			
19,400.00	6,979.76	6,000.00	5,999.35	195.06	119.45	-78.20	-1,141.97	-9,347.96	5,022.66	4,760.25	262.41	19.140			
19,500.00	6,979.69	6,000.00	5,999.35	196.62	119.45	-78.20	-1,141.97	-9,347.96	5,073.49	4,811.77	261.72	19.385			
19,600.00	6,979.62	6,000.00	5,999.35	198.18	119.45	-78.20	-1,141.97	-9,347.96	5,125.77	4,864.77	261.00	19.639			
19,700.00	6,979.54	6,000.00	5,999.35	199.74	119.45	-78.20	-1,141.97	-9,347.96	5,179.46	4,919.18	260.27	19.900			
19,800.00	6,979.47	6,000.00	5,999.35	201.30	119.45	-78.20	-1,141.97	-9,347.96	5,234.50	4,974.98	259.52	20.170			
19,900.00	6,979.40	6,000.00	5,999.35	202.86	119.45	-78.20	-1,141.97	-9,347.96	5,290.86	5,032.11	258.75	20.448			
20,000.00	6,979.32	6,000.00	5,999.35	204.42	119.45	-78.20	-1,141.97	-9,347.96	5,348.50	5,090.53	257.97	20.733			
20,100.00	6,979.25	6,000.00	5,999.35	205.98	119.45	-78.20	-1,141.97	-9,347.96	5,407.37	5,150.19	257.18	21.026			
20,200.00	6,979.18	6,000.00	5,999.35	207.55	119.45	-78.20	-1,141.97	-9,347.96	5,467.44	5,211.06	256.38	21.326			
20,300.00	6,979.10	6,000.00	5,999.35	209.11	119.45	-78.20	-1,141.97	-9,347.96	5,528.66	5,273.10	255.57	21.633			
20,400.00	6,979.03	6,000.00	5,999.35	210.68	119.45	-78.20	-1,141.97	-9,347.96	5,591.01	5,336.25	254.75	21.947			
20,500.00	6,978.95	6,000.00	5,999.35	212.24	119.45	-78.20	-1,141.97	-9,347.96	5,654.43	5,400.50	253.93	22.267			
20,600.00	6,978.88	6,000.00	5,999.35	213.81	119.45	-78.20	-1,141.97	-9,347.96	5,718.90	5,465.79	253.11	22.595			
20,700.00	6,978.81	6,000.00	5,999.35	215.37	119.45	-78.20	-1,141.97	-9,347.96	5,784.38	5,532.09	252.29	22.928			
20,800.00	6,978.73	6,000.00	5,999.35	216.94	119.45	-78.20	-1,141.97	-9,347.96	5,850.83	5,599.37	251.46	23.267			
20,900.00	6,978.66	6,000.00	5,999.35	218.51	119.45	-78.20	-1,141.97	-9,347.96	5,918.23	5,667.60	250.64	23.613			
21,000.00	6,978.59	6,000.00	5,999.35	220.07	119.45	-78.20	-1,141.97	-9,347.96	5,986.54	5,736.73	249.81	23.964			
21,100.00	6,978.51	6,000.00	5,999.35	221.64	119.45	-78.20	-1,141.97	-9,347.96	6,055.73	5,806.74	248.99	24.321			
21,200.00	6,978.44	6,000.00	5,999.35	223.21	119.45	-78.20	-1,141.97	-9,347.96	6,125.78	5,877.60	248.18	24.683			
21,300.00	6,978.37	6,000.00	5,999.35	224.78	119.45	-78.20	-1,141.97	-9,347.96	6,196.64	5,949.28	247.37	25.051			
21,400.00	6,978.29	6,000.00	5,999.35	226.35	119.45	-78.20	-1,141.97	-9,347.96	6,268.30	6,021.74	246.56	25.423			
21,500.00	6,978.22	6,000.00	5,999.35	227.92	119.45	-78.20	-1,141.97	-9,347.96	6,340.73	6,094.97	245.76	25.801			
21,600.00	6,978.14	6,000.00	5,999.35	229.49	119.45	-78.20	-1,141.97	-9,347.96	6,413.90	6,168.93	244.96	26.183			
21,700.00	6,978.07	6,000.00	5,999.35	231.06	119.45	-78.20	-1,141.97	-9,347.96	6,487.78	6,243.60	244.18	26.570			
21,800.00	6,978.00	6,000.00	5,999.35	232.63	119.45	-78.20	-1,141.97	-9,347.96	6,562.36	6,318.96	243.40	26.962			
21,900.00	6,977.92	6,000.00	5,999.35	234.21	119.45	-78.20	-1,141.97	-9,347.96	6,637.60	6,394.98	242.62	27.358			
22,000.00	6,977.85	6,000.00	5,999.35	235.78	119.45	-78.20	-1,141.97	-9,347.96	6,713.49	6,471.63	241.86	27.758			
22,100.00	6,977.78	6,000.00	5,999.35	237.35	119.45	-78.20	-1,141.97	-9,347.96	6,790.01	6,548.90	241.11	28.162			
22,200.00	6,977.70	6,000.00	5,999.35	238.92	119.45	-78.20	-1,141.97	-9,347.96	6,867.13	6,626.77	240.36	28.570			
22,300.00	6,977.63	6,000.00	5,999.35	240.50	119.45	-78.20	-1,141.97	-9,347.96	6,944.83	6,705.21	239.62	28.983			
22,400.00	6,977.56	6,000.00	5,999.35	242.07	119.45	-78.20	-1,141.97	-9,347.96	7,023.09	6,784.20	238.89	29.398			
22,500.00	6,977.48	6,000.00	5,999.35	243.65	119.45	-78.20	-1,141.97	-9,347.96	7,101.91	6,863.73	238.18	29.818			
22,600.00	6,977.41	6,000.00	5,999.35	245.22	119.45	-78.20	-1,141.97	-9,347.96	7,181.25	6,943.78	237.47	30.241			
22,700.00	6,977.34	6,000.00	5,999.35	246.80	119.45	-78.20	-1,141.97	-9,347.96	7,261.10	7,024.33	236.77	30.668			
22,800.00	6,977.26	6,000.00	5,999.35	248.37	119.45	-78.20	-1,141.97	-9,347.96	7,341.44	7,105.36	236.08	31.097			
22,900.00	6,977.19	6,000.00	5,999.35	249.95	119.45	-78.20	-1,141.97	-9,347.96	7,422.26	7,186.86	235.40	31.530			
23,000.00	6,977.11	6,000.00	5,999.35	251.53	119.45	-78.20	-1,141.97	-9,347.96	7,503.55	7,268.82	234.73	31.967			
23,100.00	6,977.04	6,000.00	5,999.35	253.10	119.45	-78.20	-1,141.97	-9,347.96	7,585.28	7,351.21	234.07	32.406			
23,155.65	6,977.00	6,000.00	5,999.35	253.98	119.45	-78.20	-1,141.97	-9,347.96	7,630.95	7,397.24	233.71	32.651			
23,156.15	6,977.00	6,000.00	5,999.35	254.06	119.45	-78.20	-1,141.97	-9,347.96	7,631.36	7,396.89	234.47	32.547			

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149B - OH - OH-INC											Offset Site Error: 0.00 usft
Survey Program: 520-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)	
0.00	0.00	44.00	44.00	0.00	0.94	-93.36	-662.87	-11,285.03	11,304.48		
100.00	100.00	144.00	144.00	0.25	3.06	-93.36	-662.87	-11,285.03	11,304.48	11,301.16	3.32 3,409.213
200.00	200.00	244.00	244.00	0.61	5.19	-93.36	-662.87	-11,285.03	11,304.48	11,298.68	5.80 1,948.168
300.00	300.00	344.00	344.00	0.97	7.32	-93.36	-662.87	-11,285.03	11,304.48	11,296.19	8.29 1,363.731
400.00	400.00	444.00	444.00	1.33	9.45	-93.36	-662.87	-11,285.03	11,304.48	11,293.70	10.78 1,049.029
500.00	500.00	544.03	544.00	1.68	11.58	-93.36	-662.87	-11,285.03	11,304.48	11,291.22	13.26 852.302
600.00	599.98	644.01	643.98	2.04	13.71	-103.36	-662.87	-11,285.03	11,304.88	11,289.13	15.75 717.809
700.00	699.84	743.86	743.84	2.41	15.83	-103.36	-662.87	-11,285.03	11,306.10	11,287.86	18.23 620.115
800.00	799.45	841.42	841.38	2.77	17.91	-103.36	-661.95	-11,285.03	11,308.06	11,287.39	20.67 547.104
900.00	898.70	938.20	938.15	3.13	19.97	-103.37	-662.42	-11,285.03	11,310.93	11,287.83	23.09 489.765
1,000.00	997.47	1,041.56	1,041.47	3.50	22.25	-103.38	-662.87	-11,285.03	11,314.62	11,288.87	25.75 439.420
1,100.00	1,095.63	1,139.73	1,139.63	3.89	24.51	-101.03	-662.87	-11,285.03	11,318.68	11,290.28	28.40 398.535
1,200.00	1,193.09	1,237.19	1,237.09	4.29	26.76	-99.36	-662.87	-11,285.03	11,322.71	11,291.66	31.05 364.641
1,300.00	1,289.73	1,331.53	1,331.42	4.72	28.94	-98.12	-661.91	-11,285.03	11,326.66	11,293.01	33.65 336.608
1,400.00	1,385.42	1,424.54	1,424.42	5.16	31.08	-97.19	-662.33	-11,285.03	11,330.72	11,294.48	36.24 312.673
1,496.97	1,477.20	1,521.42	1,521.20	5.62	33.37	-96.51	-662.87	-11,285.03	11,334.69	11,295.71	38.98 290.813
1,500.00	1,480.05	1,524.27	1,524.05	5.63	33.44	-96.51	-662.87	-11,285.03	11,334.81	11,295.75	39.06 290.177
1,600.00	1,574.15	1,618.37	1,618.15	6.12	35.80	-96.67	-662.87	-11,285.03	11,338.93	11,297.03	41.90 270.600
1,700.00	1,668.25	1,712.47	1,712.25	6.62	38.15	-96.83	-662.87	-11,285.03	11,343.16	11,298.41	44.75 253.452
1,800.00	1,762.35	1,803.75	1,803.51	7.12	40.44	-96.98	-661.32	-11,285.03	11,347.36	11,299.81	47.54 238.672
1,900.00	1,856.45	1,893.24	1,892.98	7.64	42.68	-97.13	-661.80	-11,285.03	11,351.82	11,301.52	50.29 225.707
2,000.00	1,950.55	1,982.43	1,982.16	8.16	44.91	-97.29	-662.70	-11,285.03	11,356.42	11,303.38	53.04 214.098
2,100.00	2,044.65	2,089.04	2,088.65	8.68	47.68	-97.47	-662.87	-11,285.03	11,361.05	11,304.72	56.34 201.668
2,200.00	2,138.75	2,183.14	2,182.75	9.21	50.14	-97.63	-662.87	-11,285.03	11,365.77	11,306.45	59.32 191.605
2,300.00	2,232.85	2,275.19	2,274.78	9.74	52.55	-97.78	-661.30	-11,285.03	11,370.44	11,308.19	62.25 182.653
2,400.00	2,326.95	2,363.85	2,363.43	10.27	54.86	-97.93	-661.68	-11,285.03	11,375.39	11,310.29	65.10 174.743
2,500.00	2,421.05	2,452.22	2,451.78	10.81	57.17	-98.08	-662.47	-11,285.03	11,380.49	11,312.55	67.94 167.511
2,600.00	2,515.15	2,559.74	2,559.15	11.34	59.84	-98.27	-662.87	-11,285.03	11,385.64	11,314.51	71.14 160.056
2,700.00	2,609.25	2,653.84	2,653.25	11.88	62.11	-98.43	-662.87	-11,285.03	11,390.85	11,316.91	73.94 154.047
2,800.00	2,703.35	2,747.55	2,746.94	12.42	64.38	-98.57	-660.90	-11,285.03	11,395.94	11,319.20	76.75 148.491
2,900.00	2,797.45	2,834.90	2,834.27	12.96	66.49	-98.72	-661.15	-11,285.03	11,401.38	11,321.99	79.39 143.607
3,000.00	2,891.55	2,921.95	2,921.30	13.51	68.59	-98.87	-661.86	-11,285.03	11,406.97	11,324.94	82.03 139.052
3,100.00	2,985.65	3,030.39	3,029.65	14.05	71.12	-99.06	-662.87	-11,285.03	11,412.69	11,327.58	85.10 134.106
3,200.00	3,079.75	3,124.49	3,123.75	14.60	73.11	-99.22	-662.87	-11,285.03	11,418.39	11,330.76	87.63 130.301
3,300.00	3,173.85	3,218.59	3,217.85	15.14	75.10	-99.38	-662.87	-11,285.03	11,424.19	11,334.03	90.16 126.710
3,400.00	3,267.95	3,312.69	3,311.95	15.69	77.09	-99.53	-662.87	-11,285.03	11,430.08	11,337.39	92.69 123.316
3,500.00	3,362.05	3,405.39	3,404.64	16.23	79.05	-99.68	-661.29	-11,285.03	11,435.87	11,340.68	95.19 120.137
3,600.00	3,456.15	3,496.14	3,495.38	16.78	80.97	-99.83	-661.47	-11,285.03	11,441.98	11,344.33	97.65 117.175
3,700.00	3,550.25	3,586.74	3,585.98	17.33	82.89	-99.99	-661.85	-11,285.03	11,448.22	11,348.11	100.11 114.362
3,800.00	3,644.35	3,677.21	3,676.44	17.88	84.80	-100.14	-662.42	-11,285.03	11,454.58	11,352.03	102.56 111.688
3,900.00	3,738.45	3,783.30	3,782.45	18.42	87.25	-100.32	-662.87	-11,285.03	11,461.02	11,355.47	105.55 108.587
4,000.00	3,832.55	3,877.40	3,876.55	18.97	89.62	-100.48	-662.87	-11,285.03	11,467.50	11,359.04	108.46 105.732
4,100.00	3,926.65	3,971.50	3,970.65	19.52	91.99	-100.63	-662.87	-11,285.03	11,474.07	11,362.70	111.37 103.028
4,200.00	4,020.75	4,065.60	4,064.75	20.07	94.36	-100.79	-662.87	-11,285.03	11,480.74	11,366.46	114.28 100.462
4,300.00	4,114.85	4,159.70	4,158.85	20.62	96.73	-100.95	-662.87	-11,285.03	11,487.51	11,370.32	117.19 98.024
4,400.00	4,208.95	4,253.80	4,252.95	21.17	99.10	-101.10	-662.87	-11,285.03	11,494.37	11,374.26	120.10 95.705
4,500.00	4,303.05	4,347.90	4,347.05	21.72	101.47	-101.26	-662.87	-11,285.03	11,501.32	11,378.31	123.01 93.497
4,600.00	4,397.15	4,442.00	4,441.15	22.27	103.84	-101.41	-662.87	-11,285.03	11,508.37	11,382.45	125.92 91.392
4,700.00	4,491.25	4,536.10	4,535.25	22.82	106.21	-101.57	-662.87	-11,285.03	11,515.52	11,386.69	128.83 89.382
4,800.00	4,585.35	4,630.20	4,629.35	23.37	108.58	-101.73	-662.87	-11,285.03	11,522.76	11,391.02	131.74 87.463
4,900.00	4,679.45	4,724.30	4,723.45	23.93	110.95	-101.88	-662.87	-11,285.03	11,530.10	11,395.44	134.65 85.627
5,000.00	4,773.55	4,817.15	4,816.26	24.48	113.29	-102.01	-658.48	-11,285.03	11,536.76	11,399.23	137.53 83.883

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149B - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		520-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	
5,100.00	4,867.65	4,909.61	4,908.71	25.03	115.62	-102.17	-658.57	-11,285.03	11,544.29	11,403.89	140.40	82.223		
5,200.00	4,961.75	5,002.01	5,001.11	25.58	117.95	-102.32	-658.74	-11,285.03	11,551.93	11,408.66	143.27	80.631		
5,300.00	5,055.85	5,094.37	5,093.46	26.13	120.27	-102.47	-658.98	-11,285.03	11,559.68	11,413.54	146.13	79.103		
5,400.00	5,149.95	5,186.67	5,185.76	26.68	122.60	-102.63	-659.30	-11,285.03	11,567.53	11,418.54	149.00	77.635		
5,500.00	5,244.05	5,278.92	5,278.01	27.24	124.92	-102.78	-659.68	-11,285.03	11,575.50	11,423.64	151.86	76.225		
5,600.00	5,338.15	5,371.12	5,370.20	27.79	127.25	-102.93	-660.15	-11,285.03	11,583.58	11,428.85	154.72	74.867		
5,665.73	5,400.00	5,431.70	5,430.77	28.15	128.77	-103.03	-660.49	-11,285.03	11,588.94	11,432.34	156.60	74.003		
5,700.00	5,432.28	5,463.31	5,462.38	28.34	129.57	-103.11	-660.68	-11,285.03	11,591.74	11,434.16	157.58	73.561		
5,800.00	5,526.87	5,555.89	5,554.96	28.88	131.90	-103.34	-661.29	-11,285.03	11,599.70	11,439.26	160.44	72.300		
5,900.00	5,622.01	5,648.98	5,648.04	29.41	134.24	-103.55	-661.98	-11,285.03	11,607.36	11,444.06	163.29	71.083		
6,000.00	5,717.67	5,763.24	5,761.67	29.92	137.15	-103.79	-662.87	-11,285.03	11,614.71	11,448.01	166.70	69.675		
6,100.00	5,813.83	5,859.40	5,857.83	30.41	139.99	-103.98	-662.87	-11,285.03	11,621.54	11,451.52	170.02	68.353		
6,200.00	5,910.44	5,956.02	5,954.44	30.89	142.84	-104.16	-662.87	-11,285.03	11,628.02	11,454.67	173.35	67.080		
6,300.00	6,007.50	6,053.07	6,051.50	31.36	145.71	-104.33	-662.87	-11,285.03	11,634.11	11,457.45	176.67	65.854		
6,400.00	6,104.96	6,150.53	6,148.96	31.80	148.59	-104.49	-662.87	-11,285.03	11,639.82	11,459.84	179.98	64.671		
6,500.00	6,202.80	6,248.37	6,246.80	32.24	151.48	-104.64	-662.87	-11,285.03	11,645.13	11,461.83	183.30	63.531		
6,600.00	6,300.98	6,346.55	6,344.98	32.66	154.38	-104.78	-662.87	-11,285.03	11,650.03	11,463.42	186.61	62.430		
6,700.00	6,399.48	6,445.05	6,443.48	33.06	157.29	-104.90	-662.87	-11,285.03	11,654.52	11,464.60	189.91	61.367		
6,722.82	6,422.00	6,467.57	6,466.00	33.15	157.96	-104.93	-662.87	-11,285.03	11,655.48	11,464.81	190.67	61.130		
6,750.00	6,448.76	6,494.33	6,492.76	33.26	158.75	-95.11	-662.87	-11,285.03	11,656.28	11,464.71	191.57	60.847		
6,800.00	6,497.51	6,543.08	6,541.51	33.48	160.19	-83.90	-662.87	-11,285.03	11,656.02	11,462.79	193.23	60.323		
6,850.00	6,545.40	6,590.97	6,589.40	33.72	161.60	-77.63	-662.87	-11,285.03	11,653.51	11,458.63	194.88	59.797		
6,900.00	6,592.13	6,637.70	6,636.13	33.97	162.98	-73.93	-662.87	-11,285.03	11,648.79	11,452.26	196.53	59.273		
6,950.00	6,637.40	6,682.97	6,681.40	34.25	164.32	-71.74	-662.87	-11,285.03	11,641.89	11,443.74	198.15	58.752		
7,000.00	6,680.94	6,726.51	6,724.94	34.54	165.61	-70.53	-662.87	-11,285.03	11,632.88	11,433.13	199.75	58.238		
7,050.00	6,722.48	6,768.05	6,766.48	34.85	166.83	-70.01	-662.87	-11,285.03	11,621.82	11,420.52	201.30	57.734		
7,100.00	6,761.76	6,807.34	6,805.76	35.17	167.99	-70.02	-662.87	-11,285.03	11,608.81	11,406.01	202.80	57.242		
7,150.00	6,798.55	6,844.12	6,842.55	35.51	169.08	-70.46	-662.87	-11,285.03	11,593.93	11,389.68	204.25	56.764		
7,200.00	6,832.61	6,878.18	6,876.61	35.86	170.09	-71.27	-662.87	-11,285.03	11,577.30	11,371.67	205.63	56.301		
7,250.00	6,863.74	6,909.31	6,907.74	36.22	171.01	-72.40	-662.87	-11,285.03	11,559.04	11,352.10	206.94	55.857		
7,300.00	6,891.74	6,937.31	6,935.74	36.59	171.83	-73.82	-662.87	-11,285.03	11,539.28	11,331.11	208.17	55.432		
7,350.00	6,916.44	6,962.01	6,960.44	36.98	172.56	-75.50	-662.87	-11,285.03	11,518.15	11,308.83	209.32	55.027		
7,400.00	6,937.69	6,983.26	6,981.69	37.37	173.19	-77.41	-662.87	-11,285.03	11,495.80	11,285.43	210.37	54.646		
7,450.00	6,955.36	7,000.93	6,999.36	37.78	173.71	-79.53	-662.87	-11,285.03	11,472.39	11,261.06	211.33	54.287		
7,500.00	6,969.34	7,014.91	7,013.34	38.19	174.12	-81.84	-662.87	-11,285.03	11,448.06	11,235.88	212.18	53.954		
7,550.00	6,979.53	7,025.10	7,023.53	38.62	174.43	-84.31	-662.87	-11,285.03	11,422.98	11,210.04	212.93	53.646		
7,600.00	6,985.89	7,031.46	7,029.89	39.05	174.61	-86.91	-662.87	-11,285.03	11,397.30	11,183.72	213.57	53.365		
7,650.00	6,988.37	7,033.94	7,032.37	39.48	174.69	-89.62	-662.87	-11,285.03	11,371.18	11,157.08	214.10	53.112		
7,657.25	6,988.40	7,033.97	7,032.40	39.54	174.69	-90.02	-662.87	-11,285.03	11,367.37	11,153.20	214.17	53.077		
7,700.00	6,988.37	7,033.94	7,032.37	39.92	174.69	-90.02	-662.87	-11,285.03	11,344.93	11,130.37	214.56	52.876		
7,800.00	6,988.30	7,033.87	7,032.30	40.82	174.68	-90.02	-662.87	-11,285.03	11,292.89	11,077.41	215.49	52.407		
7,900.00	6,988.23	7,033.80	7,032.23	41.77	174.68	-90.02	-662.87	-11,285.03	11,241.51	11,025.06	216.44	51.937		
8,000.00	6,988.16	7,033.73	7,032.16	42.75	174.68	-90.02	-662.87	-11,285.03	11,190.78	10,973.35	217.43	51.469		
8,100.00	6,988.09	7,033.67	7,032.09	43.76	174.68	-90.02	-662.87	-11,285.03	11,140.72	10,922.28	218.44	51.002		
8,152.35	6,988.06	7,033.63	7,032.06	44.30	174.68	-90.02	-662.87	-11,285.03	11,114.78	10,895.81	218.97	50.758		
8,200.00	6,988.02	7,033.60	7,032.02	44.79	174.68	-90.02	-662.87	-11,285.03	11,090.65	10,871.18	219.46	50.535		
8,300.00	6,987.95	7,033.52	7,031.95	45.83	174.67	-90.03	-662.87	-11,285.03	11,036.10	10,815.62	220.48	50.054		
8,400.00	6,987.88	7,033.45	7,031.88	46.85	174.67	-90.03	-662.87	-11,285.03	10,976.44	10,754.96	221.48	49.560		
8,500.00	6,987.80	7,033.37	7,031.80	47.85	174.67	-90.04	-662.87	-11,285.03	10,911.87	10,689.43	222.44	49.055		
8,600.00	6,987.73	7,033.30	7,031.73	48.83	174.67	-90.04	-662.87	-11,285.03	10,842.63	10,619.26	223.37	48.541		
8,700.00	6,987.65	7,033.22	7,031.65	49.79	174.67	-90.05	-662.87	-11,285.03	10,768.95	10,544.70	224.25	48.021		
8,800.00	6,987.57	7,033.14	7,031.57	50.72	174.66	-90.06	-662.87	-11,285.03	10,691.12	10,466.03	225.09	47.498		

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

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Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149B - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program:		520-A027Ua_INC-ONLY					Rule Assigned:		Offset Well Error:		0.00 usft		
Measured Depth (usft)	Reference Vertical Depth (usft)	Measured Depth (usft)	Offset Vertical Depth (usft)	Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Separation Factor	Warning	
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)		
8,900.00	6,987.50	7,033.07	7,031.50	51.62	174.66	-90.07	-662.87	-11,285.03	10,609.42	10,383.56	225.86	46.973	
9,000.00	6,987.42	7,032.99	7,031.42	52.48	174.66	-90.08	-662.87	-11,285.03	10,524.17	10,297.60	226.57	46.450	
9,100.00	6,987.34	7,032.92	7,031.34	53.30	174.66	-90.09	-662.87	-11,285.03	10,435.71	10,208.49	227.21	45.929	
9,200.00	6,987.27	7,032.84	7,031.27	54.08	174.65	-90.10	-662.87	-11,285.03	10,344.38	10,116.60	227.78	45.414	
9,215.33	6,987.26	7,032.83	7,031.26	54.20	174.65	-90.11	-662.87	-11,285.03	10,330.14	10,102.28	227.86	45.335	
9,300.00	6,987.20	7,032.77	7,031.20	54.85	174.65	-90.11	-662.87	-11,285.03	10,251.43	10,023.14	228.30	44.904	
9,400.00	6,987.12	7,032.69	7,031.12	55.65	174.65	-90.10	-662.87	-11,285.03	10,158.59	9,929.77	228.82	44.395	
9,500.00	6,987.05	7,032.62	7,031.05	56.48	174.65	-90.10	-662.87	-11,285.03	10,065.89	9,836.53	229.36	43.886	
9,600.00	6,986.98	7,032.55	7,030.98	57.35	174.65	-90.10	-662.87	-11,285.03	9,973.33	9,743.42	229.91	43.378	
9,700.00	6,986.90	7,032.47	7,030.90	58.24	174.64	-90.10	-662.87	-11,285.03	9,880.92	9,650.44	230.48	42.871	
9,800.00	6,986.83	7,032.40	7,030.83	59.17	174.64	-90.10	-662.87	-11,285.03	9,788.65	9,557.59	231.05	42.365	
9,900.00	6,986.75	7,032.33	7,030.75	60.12	174.64	-90.10	-662.87	-11,285.03	9,696.54	9,464.89	231.64	41.860	
10,000.00	6,986.68	7,032.25	7,030.68	61.10	174.64	-90.10	-662.87	-11,285.03	9,604.58	9,372.33	232.25	41.355	
10,100.00	6,986.61	7,032.18	7,030.61	62.11	174.63	-90.10	-662.87	-11,285.03	9,512.79	9,279.92	232.86	40.851	
10,200.00	6,986.53	7,032.10	7,030.53	63.14	174.63	-90.10	-662.87	-11,285.03	9,421.16	9,187.67	233.49	40.349	
10,300.00	6,986.46	7,032.03	7,030.46	64.20	174.63	-90.09	-662.87	-11,285.03	9,329.71	9,095.57	234.14	39.847	
10,400.00	6,986.39	7,031.96	7,030.39	65.28	174.63	-90.09	-662.87	-11,285.03	9,238.43	9,003.63	234.80	39.346	
10,500.00	6,986.31	7,031.88	7,030.31	66.38	174.63	-90.09	-662.87	-11,285.03	9,147.33	8,911.86	235.47	38.847	
10,600.00	6,986.24	7,031.81	7,030.24	67.50	174.62	-90.09	-662.87	-11,285.03	9,056.43	8,820.27	236.16	38.349	
10,700.00	6,986.17	7,031.74	7,030.17	68.64	174.62	-90.09	-662.87	-11,285.03	8,965.71	8,728.85	236.87	37.851	
10,800.00	6,986.09	7,031.66	7,030.09	69.80	174.62	-90.09	-662.87	-11,285.03	8,875.20	8,637.61	237.59	37.356	
10,900.00	6,986.02	7,031.59	7,030.02	70.98	174.62	-90.09	-662.87	-11,285.03	8,784.89	8,546.57	238.32	36.861	
11,000.00	6,985.95	7,031.52	7,029.95	72.17	174.62	-90.09	-662.87	-11,285.03	8,694.80	8,455.72	239.08	36.368	
11,100.00	6,985.87	7,031.44	7,029.87	73.38	174.61	-90.09	-662.87	-11,285.03	8,604.92	8,365.07	239.85	35.876	
11,200.00	6,985.80	7,031.37	7,029.80	74.61	174.61	-90.08	-662.87	-11,285.03	8,515.27	8,274.63	240.64	35.386	
11,300.00	6,985.72	7,031.30	7,029.72	75.85	174.61	-90.08	-662.87	-11,285.03	8,425.85	8,184.41	241.44	34.898	
11,400.00	6,985.65	7,031.22	7,029.65	77.10	174.61	-90.08	-662.87	-11,285.03	8,336.67	8,094.40	242.27	34.411	
11,500.00	6,985.58	7,031.15	7,029.58	78.37	174.60	-90.08	-662.87	-11,285.03	8,247.74	8,004.63	243.11	33.926	
11,600.00	6,985.50	7,031.07	7,029.50	79.65	174.60	-90.08	-662.87	-11,285.03	8,159.07	7,915.09	243.98	33.442	
11,700.00	6,985.43	7,031.00	7,029.43	80.94	174.60	-90.08	-662.87	-11,285.03	8,070.66	7,825.80	244.86	32.961	
11,800.00	6,985.36	7,030.93	7,029.36	82.24	174.60	-90.08	-662.87	-11,285.03	7,982.53	7,736.77	245.76	32.481	
11,900.00	6,985.28	7,030.85	7,029.28	83.56	174.60	-90.08	-662.87	-11,285.03	7,894.67	7,647.99	246.68	32.003	
12,000.00	6,985.21	7,030.78	7,029.21	84.88	174.59	-90.08	-662.87	-11,285.03	7,807.11	7,559.49	247.63	31.528	
12,100.00	6,985.14	7,030.71	7,029.14	86.21	174.59	-90.07	-662.87	-11,285.03	7,719.86	7,471.26	248.59	31.054	
12,200.00	6,985.06	7,030.63	7,029.06	87.56	174.59	-90.07	-662.87	-11,285.03	7,632.91	7,383.33	249.58	30.583	
12,300.00	6,984.99	7,030.56	7,028.99	88.91	174.59	-90.07	-662.87	-11,285.03	7,546.29	7,295.70	250.59	30.114	
12,400.00	6,984.92	7,030.49	7,028.92	90.27	174.58	-90.07	-662.87	-11,285.03	7,460.00	7,208.38	251.63	29.647	
12,500.00	6,984.84	7,030.41	7,028.84	91.64	174.58	-90.07	-662.87	-11,285.03	7,374.06	7,121.38	252.68	29.183	
12,600.00	6,984.77	7,030.34	7,028.77	93.01	174.58	-90.07	-662.87	-11,285.03	7,288.48	7,034.71	253.77	28.721	
12,700.00	6,984.69	7,030.27	7,028.69	94.40	174.58	-90.07	-662.87	-11,285.03	7,203.27	6,948.40	254.87	28.262	
12,800.00	6,984.62	7,030.19	7,028.62	95.79	174.58	-90.07	-662.87	-11,285.03	7,118.44	6,862.44	256.00	27.806	
12,900.00	6,984.55	7,030.12	7,028.55	97.18	174.57	-90.07	-662.87	-11,285.03	7,034.02	6,776.86	257.16	27.353	
13,000.00	6,984.47	7,030.04	7,028.47	98.59	174.57	-90.06	-662.87	-11,285.03	6,950.00	6,691.66	258.35	26.902	
13,100.00	6,984.40	7,029.97	7,028.40	100.00	174.57	-90.06	-662.87	-11,285.03	6,866.42	6,606.86	259.56	26.455	
13,200.00	6,984.33	7,029.90	7,028.33	101.41	174.57	-90.06	-662.87	-11,285.03	6,783.28	6,522.48	260.79	26.010	
13,300.00	6,984.25	7,029.82	7,028.25	102.83	174.57	-90.06	-662.87	-11,285.03	6,700.60	6,438.54	262.06	25.569	
13,400.00	6,984.18	7,029.75	7,028.18	104.26	174.56	-90.06	-662.87	-11,285.03	6,618.40	6,355.04	263.35	25.131	
13,500.00	6,984.11	7,029.68	7,028.11	105.69	174.56	-90.06	-662.87	-11,285.03	6,536.69	6,272.01	264.68	24.697	
13,600.00	6,984.03	7,029.60	7,028.03	107.13	174.56	-90.06	-662.87	-11,285.03	6,455.50	6,189.47	266.03	24.266	
13,700.00	6,983.96	7,029.53	7,027.96	108.57	174.56	-90.06	-662.87	-11,285.03	6,374.84	6,107.43	267.41	23.839	
13,800.00	6,983.88	7,029.46	7,027.88	110.02	174.55	-90.06	-662.87	-11,285.03	6,294.74	6,025.92	268.83	23.416	
13,900.00	6,983.81	7,029.38	7,027.81	111.47	174.55	-90.05	-662.87	-11,285.03	6,215.22	5,944.95	270.27	22.996	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149B - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		520-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	
14,000.00	6,983.74	7,029.31	7,027.74	112.92	174.55	-90.05	-662.87	-11,285.03	6,136.29	5,864.55	271.75	22.581		
14,100.00	6,983.66	7,029.23	7,027.66	114.38	174.55	-90.05	-662.87	-11,285.03	6,057.99	5,784.74	273.25	22.170		
14,200.00	6,983.59	7,029.16	7,027.59	115.85	174.55	-90.05	-662.87	-11,285.03	5,980.33	5,705.54	274.79	21.763		
14,300.00	6,983.52	7,029.09	7,027.52	117.31	174.54	-90.05	-662.87	-11,285.03	5,903.35	5,626.99	276.36	21.361		
14,400.00	6,983.44	7,029.01	7,027.44	118.78	174.54	-90.05	-662.87	-11,285.03	5,827.07	5,549.10	277.97	20.963		
14,500.00	6,983.37	7,028.94	7,027.37	120.26	174.54	-90.05	-662.87	-11,285.03	5,751.51	5,471.90	279.60	20.570		
14,600.00	6,983.30	7,028.87	7,027.30	121.74	174.54	-90.05	-662.87	-11,285.03	5,676.71	5,395.43	281.27	20.182		
14,700.00	6,983.22	7,028.79	7,027.22	123.22	174.53	-90.05	-662.87	-11,285.03	5,602.69	5,319.72	282.98	19.799		
14,800.00	6,983.15	7,028.72	7,027.15	124.70	174.53	-90.04	-662.87	-11,285.03	5,529.49	5,244.78	284.71	19.421		
14,900.00	6,983.08	7,028.65	7,027.08	126.19	174.53	-90.04	-662.87	-11,285.03	5,457.15	5,170.67	286.48	19.049		
15,000.00	6,983.00	7,028.57	7,027.00	127.68	174.53	-90.04	-662.87	-11,285.03	5,385.69	5,097.40	288.28	18.682		
15,100.00	6,982.93	7,028.50	7,026.93	129.17	174.53	-90.04	-662.87	-11,285.03	5,315.15	5,025.03	290.11	18.321		
15,200.00	6,982.85	7,028.43	7,026.85	130.67	174.52	-90.04	-662.87	-11,285.03	5,245.56	4,953.58	291.98	17.966		
15,300.00	6,982.78	7,028.35	7,026.78	132.16	174.52	-90.04	-662.87	-11,285.03	5,176.98	4,883.10	293.87	17.616		
15,400.00	6,982.71	7,028.28	7,026.71	133.66	174.52	-90.04	-662.87	-11,285.03	5,109.43	4,813.63	295.80	17.273		
15,500.00	6,982.63	7,028.20	7,026.63	135.17	174.52	-90.04	-662.87	-11,285.03	5,042.95	4,745.20	297.75	16.937		
15,600.00	6,982.56	7,028.13	7,026.56	136.67	174.52	-90.04	-662.87	-11,285.03	4,977.60	4,677.87	299.74	16.607		
15,700.00	6,982.49	7,028.06	7,026.49	138.18	174.51	-90.03	-662.87	-11,285.03	4,913.42	4,611.67	301.75	16.283		
15,800.00	6,982.41	7,027.98	7,026.41	139.69	174.51	-90.03	-662.87	-11,285.03	4,850.45	4,546.67	303.78	15.967		
15,900.00	6,982.34	7,027.91	7,026.34	141.20	174.51	-90.03	-662.87	-11,285.03	4,788.74	4,482.90	305.84	15.658		
16,000.00	6,982.27	7,027.84	7,026.27	142.71	174.51	-90.03	-662.87	-11,285.03	4,728.33	4,420.42	307.91	15.356		
16,100.00	6,982.19	7,027.76	7,026.19	144.23	174.50	-90.03	-662.87	-11,285.03	4,669.29	4,359.28	310.01	15.062		
16,200.00	6,982.12	7,027.69	7,026.12	145.75	174.50	-90.03	-662.87	-11,285.03	4,611.66	4,299.54	312.12	14.775		
16,300.00	6,982.05	7,027.62	7,026.05	147.27	174.50	-90.03	-662.87	-11,285.03	4,555.50	4,241.26	314.24	14.497		
16,400.00	6,981.97	7,027.54	7,025.97	148.79	174.50	-90.03	-662.87	-11,285.03	4,500.86	4,184.48	316.38	14.226		
16,500.00	6,981.90	7,027.47	7,025.90	150.31	174.50	-90.03	-662.87	-11,285.03	4,447.80	4,129.28	318.52	13.964		
16,600.00	6,981.82	7,027.40	7,025.82	151.84	174.49	-90.02	-662.87	-11,285.03	4,396.37	4,075.71	320.66	13.711		
16,700.00	6,981.75	7,027.32	7,025.75	153.36	174.49	-90.02	-662.87	-11,285.03	4,346.63	4,023.84	322.79	13.466		
16,800.00	6,981.68	7,027.25	7,025.68	154.89	174.49	-90.02	-662.87	-11,285.03	4,298.65	3,973.72	324.92	13.230		
16,900.00	6,981.60	7,027.17	7,025.60	156.42	174.49	-90.02	-662.87	-11,285.03	4,252.47	3,925.43	327.04	13.003		
17,000.00	6,981.53	7,027.10	7,025.53	157.95	174.48	-90.02	-662.87	-11,285.03	4,208.17	3,879.03	329.14	12.785		
17,100.00	6,981.46	7,027.03	7,025.46	159.49	174.48	-90.02	-662.87	-11,285.03	4,165.79	3,834.58	331.22	12.577		
17,200.00	6,981.38	7,026.95	7,025.38	161.02	174.48	-90.02	-662.87	-11,285.03	4,125.41	3,792.14	333.26	12.379		
17,300.00	6,981.31	7,026.88	7,025.31	162.56	174.48	-90.02	-662.87	-11,285.03	4,087.07	3,751.79	335.27	12.190		
17,400.00	6,981.24	7,026.81	7,025.24	164.09	174.48	-90.02	-662.87	-11,285.03	4,050.84	3,713.59	337.24	12.012		
17,500.00	6,981.16	7,026.73	7,025.16	165.63	174.47	-90.01	-662.87	-11,285.03	4,016.77	3,677.61	339.16	11.843		
17,600.00	6,981.09	7,026.66	7,025.09	167.17	174.47	-90.01	-662.87	-11,285.03	3,984.92	3,643.89	341.03	11.685		
17,700.00	6,981.01	7,026.59	7,025.01	168.71	174.47	-90.01	-662.87	-11,285.03	3,955.34	3,612.51	342.83	11.537		
17,800.00	6,980.94	7,026.51	7,024.94	170.25	174.47	-90.01	-662.87	-11,285.03	3,928.09	3,583.52	344.57	11.400		
17,900.00	6,980.87	7,026.44	7,024.87	171.80	174.47	-90.01	-662.87	-11,285.03	3,903.21	3,556.98	346.23	11.274		
18,000.00	6,980.79	7,026.36	7,024.79	173.34	174.46	-90.01	-662.87	-11,285.03	3,880.75	3,532.94	347.80	11.158		
18,100.00	6,980.72	7,026.29	7,024.72	174.89	174.46	-90.01	-662.87	-11,285.03	3,860.74	3,511.45	349.29	11.053		
18,200.00	6,980.65	7,026.22	7,024.65	176.43	174.46	-90.01	-662.87	-11,285.03	3,843.24	3,492.55	350.69	10.959		
18,300.00	6,980.57	7,026.14	7,024.57	177.98	174.46	-90.01	-662.87	-11,285.03	3,828.27	3,476.29	351.98	10.876		
18,400.00	6,980.50	7,026.07	7,024.50	179.53	174.45	-90.00	-662.87	-11,285.03	3,815.86	3,462.69	353.17	10.805		
18,500.00	6,980.43	7,026.00	7,024.43	181.08	174.45	-90.00	-662.87	-11,285.03	3,806.04	3,451.79	354.25	10.744		
18,600.00	6,980.35	7,025.92	7,024.35	182.63	174.45	-90.00	-662.87	-11,285.03	3,798.83	3,443.61	355.22	10.694		
18,700.00	6,980.28	7,025.85	7,024.28	184.18	174.45	-90.00	-662.87	-11,285.03	3,794.24	3,438.17	356.07	10.656		
18,800.00	6,980.21	7,025.78	7,024.21	185.73	174.45	-90.00	-662.87	-11,285.03	3,792.28	3,435.49	356.80	10.629		
18,824.00	6,980.19	7,025.76	7,024.19	186.10	174.45	-90.00	-662.87	-11,285.03	3,792.21	3,435.25	356.95	10.624 CC, ES		
18,900.00	6,980.13	7,025.70	7,024.13	187.28	174.44	-90.00	-662.87	-11,285.03	3,792.96	3,435.56	357.40	10.613		
19,000.00	6,980.06	7,025.63	7,024.06	188.84	174.44	-90.00	-662.87	-11,285.03	3,796.28	3,438.39	357.89	10.607 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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149B - OH - OH-INC												Offset Site Error: 0.00 usft	
Survey Program: 520-A027Ua_INC-ONLY				Reference 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
19,100.00	6,979.98	7,025.56	7,023.98	190.39	174.44	-90.00	-662.87	-11,285.03	3,802.22	3,443.97	358.25	10.613	
19,200.00	6,979.91	7,025.48	7,023.91	191.95	174.44	-90.00	-662.87	-11,285.03	3,810.78	3,452.29	358.49	10.630	
19,300.00	6,979.84	7,025.41	7,023.84	193.51	174.43	-89.99	-662.87	-11,285.03	3,821.93	3,463.33	358.61	10.658	
19,400.00	6,979.76	7,025.33	7,023.76	195.06	174.43	-89.99	-662.87	-11,285.03	3,835.67	3,477.06	358.61	10.696	
19,500.00	6,979.69	7,025.26	7,023.69	196.62	174.43	-89.99	-662.87	-11,285.03	3,851.95	3,493.46	358.49	10.745	
19,600.00	6,979.62	7,025.19	7,023.62	198.18	174.43	-89.99	-662.87	-11,285.03	3,870.74	3,512.48	358.26	10.804	
19,700.00	6,979.54	7,025.11	7,023.54	199.74	174.43	-89.99	-662.87	-11,285.03	3,892.02	3,534.10	357.92	10.874	
19,800.00	6,979.47	7,025.04	7,023.47	201.30	174.42	-89.99	-662.87	-11,285.03	3,915.73	3,558.26	357.47	10.954	
19,900.00	6,979.40	7,024.97	7,023.40	202.86	174.42	-89.99	-662.87	-11,285.03	3,941.84	3,584.92	356.92	11.044	
20,000.00	6,979.32	7,024.89	7,023.32	204.42	174.42	-89.99	-662.87	-11,285.03	3,970.30	3,614.02	356.28	11.144	
20,100.00	6,979.25	7,024.82	7,023.25	205.98	174.42	-89.99	-662.87	-11,285.03	4,001.05	3,645.51	355.54	11.253	
20,200.00	6,979.18	7,024.75	7,023.18	207.55	174.42	-89.98	-662.87	-11,285.03	4,034.05	3,679.32	354.73	11.372	
20,300.00	6,979.10	7,024.67	7,023.10	209.11	174.41	-89.98	-662.87	-11,285.03	4,069.24	3,715.41	353.83	11.501	
20,400.00	6,979.03	7,024.60	7,023.03	210.68	174.41	-89.98	-662.87	-11,285.03	4,106.56	3,753.70	352.86	11.638	
20,500.00	6,978.95	7,024.53	7,022.95	212.24	174.41	-89.98	-662.87	-11,285.03	4,145.96	3,794.14	351.82	11.784	
20,600.00	6,978.88	7,024.45	7,022.88	213.81	174.41	-89.98	-662.87	-11,285.03	4,187.38	3,836.65	350.73	11.939	
20,700.00	6,978.81	7,024.38	7,022.81	215.37	174.40	-89.98	-662.87	-11,285.03	4,230.76	3,881.18	349.57	12.103	
20,800.00	6,978.73	7,024.30	7,022.73	216.94	174.40	-89.98	-662.87	-11,285.03	4,276.03	3,927.66	348.37	12.274	
20,900.00	6,978.66	7,024.23	7,022.66	218.51	174.40	-89.98	-662.87	-11,285.03	4,323.15	3,976.02	347.13	12.454	
21,000.00	6,978.59	7,024.16	7,022.59	220.07	174.40	-89.98	-662.87	-11,285.03	4,372.04	4,026.20	345.84	12.642	
21,100.00	6,978.51	7,024.08	7,022.51	221.64	174.40	-89.97	-662.87	-11,285.03	4,422.66	4,078.13	344.53	12.837	
21,200.00	6,978.44	7,024.01	7,022.44	223.21	174.39	-89.97	-662.87	-11,285.03	4,474.94	4,131.76	343.18	13.040	
21,300.00	6,978.37	7,023.94	7,022.37	224.78	174.39	-89.97	-662.87	-11,285.03	4,528.82	4,187.01	341.81	13.249	
21,400.00	6,978.29	7,023.86	7,022.29	226.35	174.39	-89.97	-662.87	-11,285.03	4,584.25	4,243.83	340.42	13.466	
21,500.00	6,978.22	7,023.79	7,022.22	227.92	174.39	-89.97	-662.87	-11,285.03	4,641.18	4,302.16	339.02	13.690	
21,600.00	6,978.14	7,023.72	7,022.14	229.49	174.38	-89.97	-662.87	-11,285.03	4,699.54	4,361.94	337.60	13.920	
21,700.00	6,978.07	7,023.64	7,022.07	231.06	174.38	-89.97	-662.87	-11,285.03	4,759.29	4,423.11	336.18	14.157	
21,800.00	6,978.00	7,023.57	7,022.00	232.63	174.38	-89.97	-662.87	-11,285.03	4,820.37	4,485.62	334.75	14.400	
21,900.00	6,977.92	7,023.49	7,021.92	234.21	174.38	-89.97	-662.87	-11,285.03	4,882.74	4,549.42	333.32	14.649	
22,000.00	6,977.85	7,023.42	7,021.85	235.78	174.38	-89.96	-662.87	-11,285.03	4,946.34	4,614.45	331.89	14.904	
22,100.00	6,977.78	7,023.35	7,021.78	237.35	174.37	-89.96	-662.87	-11,285.03	5,011.13	4,680.67	330.46	15.164	
22,200.00	6,977.70	7,023.27	7,021.70	238.92	174.37	-89.96	-662.87	-11,285.03	5,077.07	4,748.02	329.04	15.430	
22,300.00	6,977.63	7,023.20	7,021.63	240.50	174.37	-89.96	-662.87	-11,285.03	5,144.10	4,816.47	327.63	15.701	
22,400.00	6,977.56	7,023.13	7,021.56	242.07	174.37	-89.96	-662.87	-11,285.03	5,212.19	4,885.96	326.22	15.977	
22,500.00	6,977.48	7,023.05	7,021.48	243.65	174.37	-89.96	-662.87	-11,285.03	5,281.29	4,956.46	324.83	16.259	
22,600.00	6,977.41	7,022.98	7,021.41	245.22	174.36	-89.96	-662.87	-11,285.03	5,351.37	5,027.92	323.45	16.545	
22,700.00	6,977.34	7,022.91	7,021.34	246.80	174.36	-89.96	-662.87	-11,285.03	5,422.39	5,100.31	322.09	16.835	
22,800.00	6,977.26	7,022.83	7,021.26	248.37	174.36	-89.96	-662.87	-11,285.03	5,494.32	5,173.58	320.74	17.130	
22,900.00	6,977.19	7,022.76	7,021.19	249.95	174.36	-89.95	-662.87	-11,285.03	5,567.10	5,247.70	319.40	17.430	
23,000.00	6,977.11	7,022.69	7,021.11	251.53	174.35	-89.95	-662.87	-11,285.03	5,640.73	5,322.64	318.08	17.734	
23,100.00	6,977.04	7,022.61	7,021.04	253.10	174.35	-89.95	-662.87	-11,285.03	5,715.15	5,398.37	316.78	18.041	
23,155.65	6,977.00	7,022.57	7,021.00	253.98	174.35	-89.95	-662.87	-11,285.03	5,756.91	5,440.84	316.07	18.214	
23,156.15	6,977.00	7,022.57	7,021.00	254.06	174.35	-89.95	-662.87	-11,285.03	5,757.28	5,440.66	316.63	18.183	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149C - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		327-MWD OWSG Rev5					Rule Assigned:				Offset Well Error:	0.00 usft		
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance				Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
0.00	0.00	2,722.26	2,550.55	0.00	15.54	-93.84	-590.00	-8,784.02	9,187.27					
100.00	100.00	2,738.00	2,565.17	0.25	15.64	-93.82	-585.72	-8,780.03	9,159.12	9,143.42	15.70	583.347		
200.00	200.00	2,738.00	2,565.17	0.61	15.64	-93.82	-585.72	-8,780.03	9,131.88	9,116.01	15.87	575.338		
300.00	300.00	2,738.00	2,565.17	0.97	15.64	-93.82	-585.72	-8,780.03	9,105.66	9,089.53	16.13	564.514		
400.00	400.00	2,800.00	2,623.28	1.33	16.00	-93.72	-569.53	-8,765.73	9,080.14	9,063.34	16.80	540.467		
500.00	500.00	2,800.00	2,623.28	1.68	16.00	-93.72	-569.53	-8,765.73	9,055.34	9,038.22	17.12	529.014		
600.00	599.98	2,800.00	2,623.28	2.04	16.00	-104.18	-569.53	-8,765.73	9,031.98	9,014.54	17.44	517.825		
700.00	699.84	2,839.62	2,660.83	2.41	16.22	-104.57	-560.03	-8,757.42	9,010.23	8,992.23	18.01	500.360		
800.00	799.45	2,988.00	2,802.59	2.77	16.95	-104.88	-529.83	-8,725.66	8,989.15	8,970.05	19.10	470.570		
900.00	898.70	2,988.00	2,802.59	3.13	16.95	-105.27	-529.83	-8,725.66	8,969.51	8,950.06	19.45	461.168		
1,000.00	997.47	3,019.00	2,832.38	3.50	17.09	-105.61	-524.03	-8,719.34	8,951.63	8,931.68	19.96	448.538		
1,100.00	1,095.63	3,039.26	2,851.93	3.89	17.18	-103.59	-520.47	-8,715.43	8,935.15	8,914.72	20.42	437.470		
1,200.00	1,193.09	3,106.18	2,916.65	4.29	17.46	-102.24	-509.22	-8,702.67	8,919.28	8,898.16	21.12	422.263		
1,300.00	1,289.73	3,145.00	2,954.24	4.72	17.63	-101.31	-502.70	-8,695.49	8,904.08	8,882.37	21.71	410.124		
1,400.00	1,385.42	3,175.00	2,983.33	5.16	17.75	-100.64	-497.75	-8,690.09	8,889.67	8,867.40	22.27	399.101		
1,496.97	1,477.20	3,206.00	3,013.49	5.62	17.86	-100.17	-492.97	-8,684.72	8,876.60	8,853.75	22.85	388.477		
1,500.00	1,480.05	3,206.00	3,013.49	5.63	17.86	-100.17	-492.97	-8,684.72	8,876.21	8,853.34	22.86	388.224		
1,600.00	1,574.15	3,237.00	3,043.73	6.12	17.98	-100.21	-488.53	-8,679.54	8,863.57	8,840.10	23.47	377.675		
1,700.00	1,668.25	3,269.00	3,075.01	6.62	18.09	-100.26	-484.18	-8,674.41	8,851.72	8,827.63	24.09	367.513		
1,800.00	1,762.35	3,301.00	3,106.36	7.12	18.19	-100.31	-480.01	-8,669.51	8,840.65	8,815.94	24.71	357.815		
1,900.00	1,856.45	3,333.00	3,137.76	7.64	18.30	-100.35	-475.92	-8,664.90	8,830.40	8,805.06	25.33	348.577		
2,000.00	1,950.55	3,362.00	3,166.25	8.16	18.38	-100.40	-472.19	-8,660.98	8,820.98	8,795.03	25.95	339.946		
2,100.00	2,044.65	3,394.00	3,197.72	8.68	18.48	-100.45	-468.15	-8,656.77	8,812.24	8,785.67	26.58	331.559		
2,200.00	2,138.75	3,426.00	3,229.25	9.21	18.57	-100.49	-464.41	-8,652.80	8,804.31	8,777.10	27.21	323.585		
2,300.00	2,232.85	3,458.00	3,260.86	9.74	18.65	-100.55	-461.12	-8,649.09	8,797.24	8,769.41	27.84	316.014		
2,400.00	2,326.95	3,458.00	3,260.86	10.27	18.65	-100.55	-461.12	-8,649.09	8,791.04	8,762.70	28.35	310.142		
2,500.00	2,421.05	3,488.00	3,290.58	10.81	18.72	-100.60	-458.46	-8,645.98	8,785.75	8,756.79	28.96	303.329		
2,600.00	2,515.15	3,502.04	3,304.52	11.34	18.75	-100.62	-457.32	-8,644.68	8,781.43	8,751.91	29.52	297.459		
2,700.00	2,609.25	3,519.00	3,321.36	11.88	18.78	-100.65	-456.01	-8,643.22	8,778.05	8,747.96	30.09	291.742		
2,800.00	2,703.35	3,550.00	3,352.18	12.42	18.84	-100.71	-453.67	-8,640.86	8,775.60	8,744.90	30.70	285.859		
2,900.00	2,797.45	3,550.00	3,352.18	12.96	18.84	-100.71	-453.67	-8,640.86	8,774.07	8,742.87	31.20	281.197		
3,000.00	2,891.55	3,582.00	3,384.03	13.51	18.90	-100.76	-451.34	-8,638.87	8,773.41	8,741.61	31.81	275.823		
3,014.00	2,904.73	3,582.00	3,384.03	13.58	18.90	-100.76	-451.34	-8,638.87	8,773.40	8,741.52	31.88	275.215		
3,100.00	2,985.65	3,613.00	3,414.93	14.05	18.94	-100.82	-449.31	-8,637.31	8,773.73	8,741.33	32.40	270.771		
3,200.00	3,079.75	3,613.00	3,414.93	14.60	18.94	-100.82	-449.31	-8,637.31	8,774.93	8,742.03	32.90	266.710		
3,300.00	3,173.85	3,644.00	3,445.86	15.14	18.98	-100.88	-447.81	-8,636.11	8,777.05	8,743.56	33.49	262.107		
3,400.00	3,267.95	3,644.00	3,445.86	15.69	18.98	-100.88	-447.81	-8,636.11	8,780.19	8,746.21	33.98	258.400		
3,500.00	3,362.05	3,676.00	3,477.84	16.23	19.01	-100.94	-447.09	-8,635.30	8,784.20	8,749.63	34.56	254.161		
3,600.00	3,456.15	3,691.00	3,492.84	16.78	19.01	-100.98	-447.03	-8,635.06	8,789.20	8,754.11	35.09	250.503		
3,700.00	3,550.25	3,726.43	3,528.27	17.33	19.00	-101.06	-447.20	-8,634.71	8,795.06	8,759.43	35.64	246.798		
3,800.00	3,644.35	3,769.00	3,570.84	17.88	18.99	-101.15	-447.55	-8,634.55	8,801.67	8,765.52	36.16	243.436		
3,900.00	3,738.45	3,816.04	3,617.88	18.42	19.00	-101.25	-447.63	-8,634.75	8,808.99	8,772.38	36.61	240.619		
4,000.00	3,832.55	3,908.38	3,710.22	18.97	27.67	-101.45	-447.72	-8,635.22	8,816.60	8,770.67	45.92	191.987		
4,100.00	3,926.65	4,000.12	3,801.96	19.52	39.36	-101.65	-447.81	-8,635.70	8,824.35	8,766.11	58.24	151.511		
4,200.00	4,020.75	4,091.87	3,893.70	20.07	51.08	-101.85	-447.91	-8,636.21	8,832.25	8,761.70	70.55	125.197		
4,300.00	4,114.85	4,183.60	3,985.43	20.62	62.82	-102.05	-448.01	-8,636.74	8,840.30	8,757.45	82.85	106.709		
4,400.00	4,208.95	4,275.33	4,077.16	21.17	74.56	-102.24	-448.12	-8,637.30	8,848.49	8,753.35	95.14	93.006		
4,500.00	4,303.05	4,367.06	4,168.89	21.72	86.30	-102.44	-448.23	-8,637.88	8,856.84	8,749.41	107.43	82.442		
4,600.00	4,397.15	4,458.78	4,260.61	22.27	98.04	-102.64	-448.35	-8,638.48	8,865.33	8,745.61	119.72	74.050		
4,700.00	4,491.25	4,550.50	4,352.33	22.82	109.79	-102.83	-448.47	-8,639.11	8,873.97	8,741.96	132.01	67.222		
4,800.00	4,585.35	4,642.22	4,444.04	23.37	121.53	-103.03	-448.59	-8,639.76	8,882.75	8,738.45	144.30	61.559		
4,900.00	4,679.45	4,733.93	4,535.75	23.93	133.28	-103.22	-448.72	-8,640.44	8,891.68	8,735.10	156.58	56.785		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149C - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program:		327-MWD OWSG Rev5						Rule Assigned:				Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			Minimum Separation (usft)
5,000.00	4,773.55	4,825.63	4,627.45	24.48	145.02	-103.42	-448.86	-8,641.13	8,900.76	8,731.89	168.87	52.708	
5,100.00	4,867.65	4,917.33	4,719.15	25.03	156.77	-103.61	-449.00	-8,641.85	8,909.98	8,728.82	181.15	49.185	
5,200.00	4,961.75	5,009.03	4,810.84	25.58	168.51	-103.81	-449.14	-8,642.60	8,919.34	8,725.91	193.44	46.110	
5,300.00	5,055.85	5,100.72	4,902.53	26.13	180.26	-104.00	-449.29	-8,643.37	8,928.85	8,723.13	205.72	43.403	
5,400.00	5,149.95	5,192.41	4,994.21	26.68	192.00	-104.20	-449.44	-8,644.16	8,938.51	8,720.51	218.00	41.002	
5,500.00	5,244.05	5,284.09	5,085.89	27.24	203.75	-104.39	-449.59	-8,644.97	8,948.31	8,718.02	230.28	38.858	
5,600.00	5,338.15	5,375.77	5,177.57	27.79	215.49	-104.58	-449.75	-8,645.81	8,958.25	8,715.69	242.56	36.932	
5,665.73	5,400.00	5,436.03	5,237.82	28.15	223.21	-104.71	-449.86	-8,646.38	8,964.86	8,714.23	250.63	35.769	
5,700.00	5,432.28	5,467.48	5,269.27	28.34	227.24	-104.81	-449.92	-8,646.68	8,968.31	8,713.46	254.84	35.192	
5,800.00	5,526.87	5,559.62	5,361.41	28.88	239.04	-105.09	-450.09	-8,647.57	8,978.15	8,710.98	267.17	33.605	
5,900.00	5,622.01	5,652.31	5,454.09	29.41	250.91	-105.36	-450.27	-8,648.49	8,987.68	8,708.13	279.55	32.150	
6,000.00	5,717.67	5,745.50	5,547.28	29.92	262.85	-105.61	-450.45	-8,649.44	8,996.86	8,704.87	291.98	30.813	
6,100.00	5,813.83	5,839.18	5,640.95	30.41	274.85	-105.86	-450.64	-8,650.41	9,005.68	8,701.21	304.47	29.579	
6,200.00	5,910.44	5,933.31	5,735.07	30.89	286.91	-106.09	-450.83	-8,651.42	9,014.12	8,697.13	316.99	28.437	
6,300.00	6,007.50	6,027.86	5,829.62	31.36	299.02	-106.30	-451.03	-8,652.46	9,022.17	8,692.61	329.55	27.377	
6,400.00	6,104.96	6,122.81	5,924.57	31.80	311.18	-106.51	-451.23	-8,653.53	9,029.81	8,687.65	342.16	26.391	
6,500.00	6,202.80	6,218.13	6,019.88	32.24	323.39	-106.70	-451.45	-8,654.62	9,037.03	8,682.24	354.79	25.472	
6,600.00	6,300.98	6,313.79	6,115.53	32.66	335.64	-106.87	-451.66	-8,655.75	9,043.81	8,676.36	367.45	24.612	
6,700.00	6,399.48	6,409.75	6,211.49	33.06	347.94	-107.03	-451.88	-8,656.91	9,050.16	8,670.01	380.14	23.807	
6,722.82	6,422.00	6,431.70	6,233.43	33.15	350.75	-107.07	-451.93	-8,657.17	9,051.54	8,668.50	383.04	23.631	
6,750.00	6,448.76	6,457.77	6,259.50	33.26	354.09	-97.22	-452.00	-8,657.50	9,052.86	8,666.37	386.49	23.423	
6,800.00	6,497.51	6,505.30	6,307.03	33.48	360.18	-85.94	-452.11	-8,658.08	9,053.65	8,660.85	392.80	23.049	
6,850.00	6,545.40	6,552.02	6,353.74	33.72	366.16	-79.60	-452.22	-8,658.67	9,052.32	8,653.29	399.02	22.686	
6,900.00	6,592.13	6,597.63	6,399.35	33.97	372.00	-75.83	-452.33	-8,659.24	9,048.90	8,643.76	405.13	22.336	
6,950.00	6,637.40	6,641.86	6,443.57	34.25	377.67	-73.57	-452.44	-8,659.81	9,043.42	8,632.33	411.08	21.999	
7,000.00	6,680.94	6,684.43	6,486.14	34.54	383.12	-72.27	-452.55	-8,660.36	9,035.94	8,619.09	416.84	21.677	
7,050.00	6,722.48	6,725.08	6,526.78	34.85	388.33	-71.66	-452.65	-8,660.89	9,026.52	8,604.14	422.38	21.371	
7,100.00	6,761.76	6,763.56	6,565.26	35.17	393.26	-71.57	-452.74	-8,661.39	9,015.24	8,587.59	427.65	21.081	
7,150.00	6,798.55	6,799.63	6,601.33	35.51	397.88	-71.90	-452.84	-8,661.87	9,002.20	8,569.57	432.63	20.808	
7,200.00	6,832.61	6,833.08	6,634.78	35.86	402.17	-72.58	-452.92	-8,662.31	8,987.51	8,550.21	437.29	20.553	
7,250.00	6,863.74	6,863.69	6,665.39	36.22	406.09	-73.56	-453.00	-8,662.72	8,971.27	8,529.66	441.61	20.315	
7,300.00	6,891.74	6,891.29	6,692.98	36.59	409.62	-74.81	-453.07	-8,663.10	8,953.60	8,508.06	445.55	20.096	
7,350.00	6,916.44	6,915.68	6,717.37	36.98	412.75	-76.29	-453.13	-8,663.43	8,934.65	8,485.56	449.09	19.895	
7,400.00	6,937.69	6,936.74	6,738.43	37.37	415.44	-77.98	-453.19	-8,663.71	8,914.53	8,462.32	452.22	19.713	
7,450.00	6,955.36	6,954.32	6,756.00	37.78	417.70	-79.86	-453.24	-8,663.96	8,893.41	8,438.50	454.91	19.550	
7,500.00	6,969.34	6,968.31	6,770.00	38.19	419.49	-81.90	-453.27	-8,664.15	8,871.41	8,414.27	457.15	19.406	
7,550.00	6,979.53	6,978.64	6,780.33	38.62	420.81	-84.08	-453.30	-8,664.29	8,848.69	8,389.77	458.92	19.281	
7,600.00	6,985.89	6,985.23	6,786.92	39.05	421.66	-86.38	-453.32	-8,664.38	8,825.40	8,365.18	460.22	19.176	
7,650.00	6,988.37	6,988.05	6,789.73	39.48	422.02	-88.76	-453.32	-8,664.42	8,801.69	8,340.64	461.04	19.091	
7,657.25	6,988.40	6,988.14	6,789.83	39.54	422.03	-89.11	-453.32	-8,664.42	8,798.22	8,337.10	461.12	19.080	
7,700.00	6,988.37	6,988.46	6,790.14	39.92	422.07	-89.12	-453.33	-8,664.43	8,777.85	8,316.30	461.56	19.018	
7,800.00	6,988.30	6,989.20	6,790.89	40.82	422.16	-89.12	-453.33	-8,664.44	8,730.83	8,268.24	462.59	18.874	
7,900.00	6,988.23	6,989.94	6,791.63	41.77	422.26	-89.13	-453.33	-8,664.45	8,684.71	8,221.05	463.66	18.731	
8,000.00	6,988.16	6,990.68	6,792.37	42.75	422.35	-89.13	-453.33	-8,664.46	8,639.50	8,174.74	464.76	18.589	
8,100.00	6,988.09	6,991.43	6,793.11	43.76	422.45	-89.14	-453.33	-8,664.47	8,595.22	8,129.33	465.88	18.449	
8,152.35	6,988.06	6,991.81	6,793.50	44.30	422.50	-89.14	-453.33	-8,664.47	8,572.41	8,105.93	466.48	18.377	
8,200.00	6,988.02	6,992.18	6,793.86	44.79	422.55	-89.13	-453.34	-8,664.48	8,551.16	8,084.13	467.02	18.310	
8,300.00	6,987.95	6,992.99	6,794.67	45.83	422.65	-89.11	-453.34	-8,664.49	8,502.69	8,034.52	468.17	18.161	
8,400.00	6,987.88	6,993.87	6,795.56	46.85	422.76	-89.08	-453.34	-8,664.50	8,449.09	7,979.77	469.31	18.003	
8,500.00	6,987.80	6,994.82	6,796.50	47.85	422.88	-89.04	-453.34	-8,664.51	8,390.52	7,920.08	470.44	17.835	
8,600.00	6,987.73	6,995.83	6,797.51	48.83	423.01	-89.00	-453.35	-8,664.53	8,327.17	7,855.62	471.55	17.659	
8,700.00	6,987.65	6,996.90	6,798.58	49.79	423.15	-88.94	-453.35	-8,664.54	8,259.24	7,786.61	472.63	17.475	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149C - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		327-MWD OWSG Rev5					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	
8,800.00	6,987.57	6,998.02	6,799.70	50.72	423.29	-88.88	-453.35	-8,664.56	8,186.96	7,713.28	473.68	17.284		
8,900.00	6,987.50	6,999.18	6,800.86	51.62	423.44	-88.80	-453.35	-8,664.57	8,110.55	7,635.87	474.68	17.086		
9,000.00	6,987.42	7,000.38	6,802.06	52.48	423.60	-88.70	-453.36	-8,664.59	8,030.29	7,554.65	475.64	16.883		
9,100.00	6,987.34	7,001.62	6,803.30	53.30	423.75	-88.57	-453.36	-8,664.61	7,946.45	7,469.91	476.54	16.675		
9,200.00	6,987.27	7,002.88	6,804.57	54.08	423.92	-88.40	-453.36	-8,664.62	7,859.33	7,381.96	477.37	16.464		
9,215.33	6,987.26	7,003.08	6,804.76	54.20	423.94	-88.37	-453.36	-8,664.63	7,845.71	7,368.21	477.50	16.431		
9,300.00	6,987.20	7,004.16	6,805.85	54.85	424.08	-88.39	-453.37	-8,664.64	7,770.36	7,292.19	478.17	16.250		
9,400.00	6,987.12	7,005.45	6,807.13	55.65	424.25	-88.41	-453.37	-8,664.66	7,681.63	7,202.64	478.99	16.037		
9,500.00	6,987.05	7,006.73	6,808.41	56.48	424.41	-88.43	-453.37	-8,664.68	7,593.17	7,113.35	479.82	15.825		
9,600.00	6,986.98	7,008.01	6,809.69	57.35	424.57	-88.45	-453.38	-8,664.70	7,505.00	7,024.33	480.67	15.614		
9,700.00	6,986.90	7,009.30	6,810.98	58.24	424.74	-88.47	-453.38	-8,664.71	7,417.14	6,935.60	481.54	15.403		
9,800.00	6,986.83	7,010.58	6,812.26	59.17	424.90	-88.49	-453.38	-8,664.73	7,329.58	6,847.15	482.43	15.193		
9,900.00	6,986.75	7,011.87	6,813.55	60.12	425.07	-88.51	-453.39	-8,664.75	7,242.34	6,759.01	483.33	14.984		
10,000.00	6,986.68	7,013.15	6,814.83	61.10	425.23	-88.53	-453.39	-8,664.77	7,155.44	6,671.18	484.26	14.776		
10,100.00	6,986.61	7,014.44	6,816.12	62.11	425.40	-88.55	-453.39	-8,664.78	7,068.89	6,583.68	485.21	14.569		
10,200.00	6,986.53	7,015.73	6,817.41	63.14	425.56	-88.57	-453.40	-8,664.80	6,982.69	6,496.52	486.18	14.362		
10,300.00	6,986.46	7,017.01	6,818.70	64.20	425.73	-88.59	-453.40	-8,664.82	6,896.87	6,409.70	487.17	14.157		
10,400.00	6,986.39	7,018.30	6,819.98	65.28	425.89	-88.61	-453.40	-8,664.84	6,811.43	6,323.26	488.18	13.953		
10,500.00	6,986.31	7,019.59	6,821.27	66.38	426.06	-88.64	-453.41	-8,664.86	6,726.40	6,237.19	489.21	13.749		
10,600.00	6,986.24	7,020.88	6,822.56	67.50	426.22	-88.66	-453.41	-8,664.87	6,641.78	6,151.51	490.27	13.547		
10,700.00	6,986.17	7,022.17	6,823.85	68.64	426.39	-88.68	-453.42	-8,664.89	6,557.59	6,066.24	491.35	13.346		
10,800.00	6,986.09	7,023.47	6,825.15	69.80	426.55	-88.70	-453.42	-8,664.91	6,473.86	5,981.40	492.46	13.146		
10,900.00	6,986.02	7,024.76	6,826.44	70.98	426.72	-88.72	-453.42	-8,664.93	6,390.59	5,897.00	493.59	12.947		
11,000.00	6,985.95	7,026.05	6,827.73	72.17	426.88	-88.74	-453.43	-8,664.95	6,307.81	5,813.07	494.74	12.750		
11,100.00	6,985.87	7,027.35	6,829.03	73.38	427.05	-88.76	-453.43	-8,664.96	6,225.53	5,729.61	495.92	12.553		
11,200.00	6,985.80	7,028.64	6,830.32	74.61	427.22	-88.78	-453.43	-8,664.98	6,143.78	5,646.65	497.13	12.359		
11,300.00	6,985.72	7,029.94	6,831.61	75.85	427.38	-88.80	-453.44	-8,665.00	6,062.57	5,564.21	498.36	12.165		
11,400.00	6,985.65	7,031.23	6,832.91	77.10	427.55	-88.82	-453.44	-8,665.02	5,981.93	5,482.31	499.62	11.973		
11,500.00	6,985.58	7,032.53	6,834.21	78.37	427.71	-88.84	-453.44	-8,665.04	5,901.89	5,400.98	500.91	11.782		
11,600.00	6,985.50	7,033.83	6,835.50	79.65	427.88	-88.86	-453.45	-8,665.05	5,822.46	5,320.24	502.23	11.593		
11,700.00	6,985.43	7,035.12	6,836.80	80.94	428.05	-88.88	-453.45	-8,665.07	5,743.68	5,240.11	503.57	11.406		
11,800.00	6,985.36	7,036.42	6,838.10	82.24	428.21	-88.91	-453.45	-8,665.09	5,665.56	5,160.62	504.95	11.220		
11,900.00	6,985.28	7,037.72	6,839.40	83.56	428.38	-88.93	-453.46	-8,665.11	5,588.15	5,081.80	506.35	11.036		
12,000.00	6,985.21	7,039.02	6,840.70	84.88	428.55	-88.95	-453.46	-8,665.13	5,511.45	5,003.67	507.78	10.854		
12,100.00	6,985.14	7,040.32	6,842.00	86.21	428.71	-88.97	-453.46	-8,665.14	5,435.52	4,926.27	509.25	10.674		
12,200.00	6,985.06	7,041.63	6,843.30	87.56	428.88	-88.99	-453.47	-8,665.16	5,360.38	4,849.64	510.74	10.495		
12,300.00	6,984.99	7,042.93	6,844.61	88.91	429.05	-89.01	-453.47	-8,665.18	5,286.05	4,773.79	512.26	10.319		
12,400.00	6,984.92	7,044.23	6,845.91	90.27	429.21	-89.03	-453.47	-8,665.20	5,212.59	4,698.78	513.81	10.145		
12,500.00	6,984.84	7,045.54	6,847.21	91.64	429.38	-89.05	-453.48	-8,665.22	5,140.02	4,624.63	515.40	9.973		
12,600.00	6,984.77	7,046.84	6,848.52	93.01	429.55	-89.07	-453.48	-8,665.24	5,068.39	4,551.38	517.01	9.803		
12,700.00	6,984.69	7,048.15	6,849.82	94.40	429.71	-89.09	-453.48	-8,665.25	4,997.73	4,479.08	518.65	9.636		
12,800.00	6,984.62	7,049.45	6,851.13	95.79	429.88	-89.12	-453.49	-8,665.27	4,928.09	4,407.76	520.32	9.471		
12,900.00	6,984.55	7,050.76	6,852.44	97.18	430.05	-89.14	-453.49	-8,665.29	4,859.50	4,337.48	522.03	9.309		
13,000.00	6,984.47	7,052.07	6,853.74	98.59	430.22	-89.16	-453.50	-8,665.31	4,792.02	4,268.27	523.75	9.149		
13,100.00	6,984.40	7,053.37	6,855.05	100.00	430.38	-89.18	-453.50	-8,665.33	4,725.70	4,200.19	525.51	8.993		
13,200.00	6,984.33	7,054.68	6,856.36	101.41	430.55	-89.20	-453.50	-8,665.35	4,660.57	4,133.28	527.29	8.839		
13,300.00	6,984.25	7,055.99	6,857.67	102.83	430.72	-89.22	-453.51	-8,665.36	4,596.70	4,067.60	529.10	8.688		
13,400.00	6,984.18	7,057.30	6,858.98	104.26	430.89	-89.24	-453.51	-8,665.38	4,534.13	4,003.20	530.93	8.540		
13,500.00	6,984.11	7,058.61	6,860.29	105.69	431.06	-89.26	-453.51	-8,665.40	4,472.92	3,940.14	532.78	8.395		
13,600.00	6,984.03	7,059.93	6,861.60	107.13	431.22	-89.28	-453.52	-8,665.42	4,413.13	3,878.48	534.65	8.254		
13,700.00	6,983.96	7,061.24	6,862.91	108.57	431.39	-89.30	-453.52	-8,665.44	4,354.82	3,818.28	536.54	8.116		
13,800.00	6,983.88	7,062.55	6,864.23	110.02	431.56	-89.33	-453.52	-8,665.46	4,298.04	3,759.59	538.44	7.982		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149C - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program:		327-MWD OWSG Rev5						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)
13,900.00	6,983.81	7,063.87	6,865.54	111.47	431.73	-89.35	-453.53	-8,665.47	4,242.85	3,702.50	540.36	7.852	
14,000.00	6,983.74	7,065.18	6,866.86	112.92	431.90	-89.37	-453.53	-8,665.49	4,189.33	3,647.05	542.28	7.725	
14,100.00	6,983.66	7,066.50	6,868.17	114.38	432.07	-89.39	-453.53	-8,665.51	4,137.53	3,593.33	544.21	7.603	
14,200.00	6,983.59	7,067.81	6,869.49	115.85	432.23	-89.41	-453.54	-8,665.53	4,087.53	3,541.39	546.14	7.484	
14,300.00	6,983.52	7,069.13	6,870.81	117.31	432.40	-89.43	-453.54	-8,665.55	4,039.37	3,491.31	548.06	7.370	
14,400.00	6,983.44	7,070.45	6,872.12	118.78	432.57	-89.45	-453.54	-8,665.57	3,993.15	3,443.17	549.98	7.261	
14,500.00	6,983.37	7,071.77	6,873.44	120.26	432.74	-89.47	-453.55	-8,665.58	3,948.91	3,397.02	551.89	7.155	
14,600.00	6,983.30	7,073.09	6,874.76	121.74	432.91	-89.50	-453.55	-8,665.60	3,906.73	3,352.96	553.77	7.055	
14,700.00	6,983.22	7,074.41	6,876.08	123.22	433.08	-89.52	-453.56	-8,665.62	3,866.68	3,311.04	555.64	6.959	
14,800.00	6,983.15	7,075.73	6,877.40	124.70	433.25	-89.54	-453.56	-8,665.64	3,828.82	3,271.35	557.47	6.868	
14,900.00	6,983.08	7,077.05	6,878.72	126.19	433.42	-89.56	-453.56	-8,665.66	3,793.22	3,233.95	559.27	6.782	
15,000.00	6,983.00	7,078.37	6,880.04	127.68	433.59	-89.58	-453.57	-8,665.68	3,759.94	3,198.92	561.03	6.702	
15,100.00	6,982.93	7,079.69	6,881.37	129.17	433.76	-89.60	-453.57	-8,665.70	3,729.05	3,166.31	562.74	6.627	
15,200.00	6,982.85	7,081.02	6,882.69	130.67	433.93	-89.62	-453.57	-8,665.71	3,700.60	3,136.21	564.39	6.557	
15,300.00	6,982.78	7,082.34	6,884.01	132.16	434.10	-89.64	-453.58	-8,665.73	3,674.66	3,108.67	565.99	6.492	
15,400.00	6,982.71	7,083.67	6,885.34	133.66	434.27	-89.67	-453.58	-8,665.75	3,651.27	3,083.75	567.52	6.434	
15,500.00	6,982.63	7,084.99	6,886.67	135.17	434.43	-89.69	-453.58	-8,665.77	3,630.48	3,061.50	568.98	6.381	
15,600.00	6,982.56	7,086.32	6,887.99	136.67	434.60	-89.71	-453.59	-8,665.79	3,612.34	3,041.99	570.35	6.334	
15,700.00	6,982.49	7,087.65	6,889.32	138.18	434.77	-89.73	-453.59	-8,665.81	3,596.89	3,025.24	571.65	6.292	
15,800.00	6,982.41	7,088.97	6,890.65	139.69	434.95	-89.75	-453.59	-8,665.83	3,584.17	3,011.31	572.86	6.257	
15,900.00	6,982.34	7,090.30	6,891.98	141.20	435.12	-89.77	-453.60	-8,665.85	3,574.20	3,000.23	573.97	6.227	
16,000.00	6,982.27	7,091.63	6,893.30	142.71	435.29	-89.79	-453.60	-8,665.86	3,567.00	2,992.01	574.99	6.204	
16,100.00	6,982.19	7,092.96	6,894.63	144.23	435.46	-89.82	-453.61	-8,665.88	3,562.60	2,986.70	575.90	6.186	
16,200.00	6,982.12	7,094.29	6,895.97	145.75	435.63	-89.84	-453.61	-8,665.90	3,561.00	2,984.28	576.72	6.175	
16,206.97	6,982.11	7,094.39	6,896.06	145.85	435.64	-89.84	-453.61	-8,665.90	3,560.99	2,984.22	576.77	6.174 CC, ES	
16,300.00	6,982.05	7,095.62	6,897.30	147.27	435.80	-89.86	-453.61	-8,665.92	3,562.21	2,984.78	577.42	6.169 SF	
16,400.00	6,981.97	7,096.96	6,898.63	148.79	435.97	-89.88	-453.62	-8,665.94	3,566.22	2,988.19	578.03	6.170	
16,500.00	6,981.90	7,098.29	6,899.96	150.31	436.14	-89.90	-453.62	-8,665.96	3,573.03	2,994.50	578.52	6.176	
16,600.00	6,981.82	7,099.62	6,901.30	151.84	436.31	-89.92	-453.62	-8,665.98	3,582.61	3,003.70	578.91	6.188	
16,700.00	6,981.75	7,100.96	6,902.63	153.36	436.48	-89.94	-453.63	-8,666.00	3,594.95	3,015.75	579.20	6.207	
16,800.00	6,981.68	7,102.29	6,903.97	154.89	436.65	-89.97	-453.63	-8,666.01	3,610.03	3,030.64	579.39	6.231	
16,900.00	6,981.60	7,103.63	6,905.30	156.42	436.82	-89.99	-453.63	-8,666.03	3,627.79	3,048.32	579.47	6.261	
17,000.00	6,981.53	7,104.97	6,906.64	157.95	436.99	-90.01	-453.64	-8,666.05	3,648.21	3,068.75	579.46	6.296	
17,100.00	6,981.46	7,106.31	6,907.98	159.49	437.17	-90.03	-453.64	-8,666.07	3,671.24	3,091.89	579.35	6.337	
17,200.00	6,981.38	7,107.64	6,909.32	161.02	437.34	-90.05	-453.65	-8,666.09	3,696.84	3,117.68	579.16	6.383	
17,300.00	6,981.31	7,108.98	6,910.65	162.56	437.51	-90.07	-453.65	-8,666.11	3,724.94	3,146.06	578.88	6.435	
17,400.00	6,981.24	7,110.32	6,911.99	164.09	437.68	-90.09	-453.65	-8,666.13	3,755.49	3,176.97	578.52	6.492	
17,500.00	6,981.16	7,111.66	6,913.34	165.63	437.85	-90.12	-453.66	-8,666.15	3,788.44	3,210.35	578.09	6.553	
17,600.00	6,981.09	7,113.01	6,914.68	167.17	438.02	-90.14	-453.66	-8,666.17	3,823.72	3,246.13	577.59	6.620	
17,700.00	6,981.01	7,114.35	6,916.02	168.71	438.20	-90.16	-453.66	-8,666.19	3,861.27	3,284.24	577.03	6.692	
17,800.00	6,980.94	7,115.69	6,917.36	170.25	438.37	-90.18	-453.67	-8,666.20	3,901.02	3,324.62	576.41	6.768	
17,900.00	6,980.87	7,117.04	6,918.71	171.80	438.54	-90.20	-453.67	-8,666.22	3,942.91	3,367.18	575.73	6.849	
18,000.00	6,980.79	7,118.38	6,920.05	173.34	438.71	-90.22	-453.67	-8,666.24	3,986.86	3,411.85	575.01	6.934	
18,100.00	6,980.72	7,119.72	6,921.39	174.89	438.88	-90.25	-453.68	-8,666.26	4,032.82	3,458.57	574.24	7.023	
18,200.00	6,980.65	7,121.07	6,922.74	176.43	439.06	-90.27	-453.68	-8,666.28	4,080.70	3,507.26	573.44	7.116	
18,300.00	6,980.57	7,122.42	6,924.09	177.98	439.23	-90.29	-453.69	-8,666.30	4,130.46	3,557.85	572.61	7.213	
18,400.00	6,980.50	7,123.77	6,925.43	179.53	439.40	-90.31	-453.69	-8,666.32	4,182.01	3,610.26	571.75	7.314	
18,500.00	6,980.43	7,125.11	6,926.78	181.08	439.57	-90.33	-453.69	-8,666.34	4,235.30	3,664.43	570.87	7.419	
18,600.00	6,980.35	7,126.46	6,928.13	182.63	439.75	-90.35	-453.70	-8,666.36	4,290.25	3,720.29	569.96	7.527	
18,700.00	6,980.28	7,127.81	6,929.48	184.18	439.92	-90.38	-453.70	-8,666.38	4,346.81	3,777.77	569.05	7.639	
18,800.00	6,980.21	7,129.16	6,930.83	185.73	440.09	-90.40	-453.70	-8,666.40	4,404.92	3,836.80	568.12	7.754	
18,900.00	6,980.13	7,130.51	6,932.18	187.28	440.27	-90.42	-453.71	-8,666.41	4,464.50	3,897.33	567.18	7.871	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149C - OH - OH-SVY													Offset Site Error:	0.00 usft			
Survey Program:		327-MWD OWSG Rev5					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				
19,000.00	6,980.06	7,131.87	6,933.54	188.84	440.44	-90.44	-453.71	-8,666.43	4,525.52	3,959.28	566.23	7.992					
19,100.00	6,979.98	7,133.22	6,934.89	190.39	440.61	-90.46	-453.71	-8,666.45	4,587.90	4,022.61	565.29	8.116					
19,200.00	6,979.91	7,134.57	6,936.24	191.95	440.79	-90.48	-453.72	-8,666.47	4,651.59	4,087.25	564.34	8.242					
19,300.00	6,979.84	7,135.93	6,937.60	193.51	440.96	-90.51	-453.72	-8,666.49	4,716.55	4,153.14	563.40	8.372					
19,400.00	6,979.76	7,137.28	6,938.95	195.06	441.13	-90.53	-453.73	-8,666.51	4,782.71	4,220.25	562.46	8.503					
19,500.00	6,979.69	7,138.64	6,940.31	196.62	441.31	-90.55	-453.73	-8,666.53	4,850.03	4,288.50	561.53	8.637					
19,600.00	6,979.62	7,140.00	6,941.66	198.18	441.48	-90.57	-453.73	-8,666.55	4,918.46	4,357.86	560.61	8.773					
19,700.00	6,979.54	7,141.35	6,943.02	199.74	441.65	-90.59	-453.74	-8,666.57	4,987.96	4,428.27	559.69	8.912					
19,800.00	6,979.47	7,142.71	6,944.38	201.30	441.83	-90.62	-453.74	-8,666.59	5,058.48	4,499.69	558.79	9.053					
19,900.00	6,979.40	7,144.07	6,945.74	202.86	442.00	-90.64	-453.74	-8,666.61	5,129.98	4,572.08	557.90	9.195					
20,000.00	6,979.32	7,145.43	6,947.10	204.42	442.18	-90.66	-453.75	-8,666.63	5,202.42	4,645.40	557.02	9.340					
20,100.00	6,979.25	7,146.79	6,948.46	205.98	442.35	-90.68	-453.75	-8,666.65	5,275.76	4,719.60	556.16	9.486					
20,200.00	6,979.18	7,148.15	6,949.82	207.55	442.53	-90.70	-453.76	-8,666.67	5,349.96	4,794.66	555.31	9.634					
20,300.00	6,979.10	7,149.51	6,951.18	209.11	442.70	-90.73	-453.76	-8,666.68	5,425.00	4,870.52	554.47	9.784					
20,400.00	6,979.03	7,150.88	6,952.54	210.68	442.87	-90.75	-453.76	-8,666.70	5,500.82	4,947.16	553.66	9.935					
20,500.00	6,978.95	7,152.24	6,953.91	212.24	443.05	-90.77	-453.77	-8,666.72	5,577.41	5,024.55	552.85	10.088					
20,600.00	6,978.88	7,153.60	6,955.27	213.81	443.22	-90.79	-453.77	-8,666.74	5,654.73	5,102.66	552.07	10.243					
20,700.00	6,978.81	7,154.97	6,956.64	215.37	443.40	-90.81	-453.77	-8,666.76	5,732.75	5,181.44	551.30	10.399					
20,800.00	6,978.73	7,156.34	6,958.00	216.94	443.57	-90.83	-453.78	-8,666.78	5,811.44	5,260.89	550.55	10.556					
20,900.00	6,978.66	7,157.70	6,959.37	218.51	443.75	-90.86	-453.78	-8,666.80	5,890.78	5,340.96	549.82	10.714					
21,000.00	6,978.59	7,159.07	6,960.74	220.07	443.92	-90.88	-453.79	-8,666.82	5,970.74	5,421.63	549.10	10.874					
21,100.00	6,978.51	7,160.44	6,962.10	221.64	444.10	-90.90	-453.79	-8,666.84	6,051.29	5,502.89	548.40	11.034					
21,200.00	6,978.44	7,161.81	6,963.47	223.21	444.28	-90.92	-453.79	-8,666.86	6,132.42	5,584.70	547.72	11.196					
21,300.00	6,978.37	7,163.18	6,964.84	224.78	444.45	-90.94	-453.80	-8,666.88	6,214.10	5,667.04	547.06	11.359					
21,400.00	6,978.29	7,164.55	6,966.21	226.35	444.63	-90.97	-453.80	-8,666.90	6,296.30	5,749.89	546.41	11.523					
21,500.00	6,978.22	7,165.92	6,967.58	227.92	444.80	-90.99	-453.80	-8,666.92	6,379.01	5,833.23	545.78	11.688					
21,600.00	6,978.14	7,167.29	6,968.96	229.49	444.98	-91.01	-453.81	-8,666.94	6,462.22	5,917.05	545.17	11.854					
21,700.00	6,978.07	7,168.66	6,970.33	231.06	445.15	-91.03	-453.81	-8,666.96	6,545.89	6,001.32	544.57	12.020					
21,800.00	6,978.00	7,170.04	6,971.70	232.63	445.33	-91.06	-453.82	-8,666.98	6,630.01	6,086.02	543.99	12.188					
21,900.00	6,977.92	7,171.41	6,973.08	234.21	445.51	-91.08	-453.82	-8,667.00	6,714.57	6,171.14	543.43	12.356					
22,000.00	6,977.85	7,172.79	6,974.45	235.78	445.68	-91.10	-453.82	-8,667.02	6,799.55	6,256.67	542.88	12.525					
22,100.00	6,977.78	7,174.16	6,975.83	237.35	445.86	-91.12	-453.83	-8,667.04	6,884.93	6,342.58	542.35	12.695					
22,200.00	6,977.70	7,175.54	6,977.20	238.92	446.03	-91.14	-453.83	-8,667.06	6,970.70	6,428.86	541.83	12.865					
22,300.00	6,977.63	7,176.92	6,978.58	240.50	446.21	-91.17	-453.83	-8,667.08	7,056.84	6,515.51	541.33	13.036					
22,400.00	6,977.56	7,178.30	6,979.96	242.07	446.39	-91.19	-453.84	-8,667.10	7,143.35	6,602.50	540.85	13.208					
22,500.00	6,977.48	7,179.67	6,981.34	243.65	446.56	-91.21	-453.84	-8,667.12	7,230.20	6,689.82	540.38	13.380					
22,600.00	6,977.41	7,181.05	6,982.72	245.22	446.74	-91.23	-453.85	-8,667.14	7,317.39	6,777.46	539.92	13.553					
22,700.00	6,977.34	7,182.44	6,984.10	246.80	446.92	-91.25	-453.85	-8,667.16	7,404.90	6,865.42	539.48	13.726					
22,800.00	6,977.26	7,183.82	6,985.48	248.37	447.09	-91.28	-453.85	-8,667.18	7,492.72	6,953.67	539.05	13.900					
22,900.00	6,977.19	7,185.20	6,986.86	249.95	447.27	-91.30	-453.86	-8,667.20	7,580.85	7,042.21	538.64	14.074					
23,000.00	6,977.11	7,186.58	6,988.25	251.53	447.45	-91.32	-453.86	-8,667.21	7,669.26	7,131.02	538.24	14.249					
23,100.00	6,977.04	7,187.97	6,989.63	253.10	447.63	-91.34	-453.86	-8,667.23	7,757.96	7,220.11	537.85	14.424					
23,155.65	6,977.00	7,188.74	6,990.40	253.98	447.72	-91.36	-453.87	-8,667.25	7,807.44	7,269.80	537.64	14.522					
23,156.15	6,977.00	7,188.74	6,990.41	254.06	447.73	-91.36	-453.87	-8,667.25	7,807.89	7,268.70	539.18	14.481					

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164 - OH - OH-SVY													Offset Site Error: 0.00 usft
Survey Program: 497-MWD OWSG Rev5													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	-75.17	2,235.98	-8,445.00	8,736.22				
100.00	100.00	38.00	38.00	0.25	1.20	-75.17	2,235.98	-8,445.00	8,736.00	8,734.54	1.45	6,005.539	
200.00	200.00	138.00	138.00	0.61	4.37	-75.17	2,235.98	-8,445.00	8,736.00	8,731.02	4.98	1,754.110	
300.00	300.00	238.00	238.00	0.97	7.54	-75.17	2,235.98	-8,445.00	8,736.00	8,727.49	8.51	1,027.046	
400.00	400.00	338.00	338.00	1.33	10.71	-75.17	2,235.98	-8,445.00	8,736.00	8,723.96	12.03	726.088	
500.00	500.00	438.00	438.00	1.68	13.87	-75.17	2,235.98	-8,445.00	8,736.00	8,720.44	15.56	561.539	
579.36	579.35	497.00	497.00	1.97	15.74	-85.18	2,235.98	-8,445.00	8,735.93	8,718.22	17.71	493.283	
600.00	599.98	497.00	497.00	2.04	15.74	-85.18	2,235.98	-8,445.00	8,735.95	8,718.16	17.78	491.240	
700.00	699.84	546.42	546.42	2.41	15.79	-85.18	2,236.50	-8,445.20	8,736.22	8,718.05	18.17	480.691	
800.00	799.45	578.58	578.57	2.77	15.80	-85.18	2,237.19	-8,445.55	8,736.97	8,718.43	18.54	471.178	
900.00	898.70	622.98	622.95	3.13	15.82	-85.19	2,238.16	-8,446.28	8,738.09	8,719.18	18.92	461.887	
1,000.00	997.47	639.03	638.99	3.50	15.82	-85.17	2,238.53	-8,446.60	8,739.66	8,720.37	19.29	453.035	
1,100.00	1,095.63	670.04	669.98	3.89	15.83	-82.81	2,239.27	-8,447.65	8,741.47	8,721.79	19.68	444.155	
1,200.00	1,193.09	700.74	700.64	4.29	15.84	-81.13	2,239.96	-8,448.98	8,742.97	8,722.88	20.09	435.266	
1,300.00	1,289.73	700.74	700.64	4.72	15.84	-79.84	2,239.96	-8,448.98	8,744.22	8,723.72	20.50	426.612	
1,400.00	1,385.42	731.10	730.94	5.16	15.85	-78.89	2,240.77	-8,450.68	8,745.20	8,724.25	20.94	417.582	
1,496.97	1,477.20	777.19	776.92	5.62	15.87	-78.20	2,241.50	-8,453.73	8,745.72	8,724.31	21.41	408.470	
1,500.00	1,480.05	777.53	777.26	5.63	15.87	-78.20	2,241.51	-8,453.75	8,745.74	8,724.31	21.43	408.200	
1,600.00	1,574.15	793.71	793.39	6.12	15.87	-78.24	2,241.69	-8,455.04	8,746.69	8,724.79	21.90	399.314	
1,700.00	1,668.25	793.71	793.39	6.62	15.87	-78.24	2,241.69	-8,455.04	8,748.67	8,726.29	22.38	390.901	
1,800.00	1,762.35	825.11	824.64	7.12	15.89	-78.31	2,241.98	-8,458.01	8,751.54	8,728.66	22.89	382.398	
1,900.00	1,856.45	875.74	875.00	7.64	15.90	-78.43	2,242.31	-8,463.23	8,755.17	8,731.77	23.40	374.075	
2,000.00	1,950.55	887.61	886.80	8.16	15.91	-78.45	2,242.43	-8,464.50	8,759.59	8,735.68	23.90	366.467	
2,100.00	2,044.65	918.16	917.14	8.68	15.92	-78.52	2,242.95	-8,468.10	8,764.98	8,740.56	24.42	358.944	
2,200.00	2,138.75	938.99	937.79	9.21	15.93	-78.57	2,243.28	-8,470.80	8,771.30	8,746.37	24.93	351.855	
2,300.00	2,232.85	963.37	961.95	9.74	15.95	-78.63	2,243.57	-8,474.06	8,778.42	8,752.97	25.44	344.998	
2,400.00	2,326.95	1,011.83	1,009.93	10.27	15.97	-78.74	2,244.27	-8,480.80	8,786.24	8,760.25	25.99	338.121	
2,500.00	2,421.05	1,027.51	1,025.45	10.81	15.99	-78.77	2,244.44	-8,483.05	8,794.82	8,768.32	26.50	331.906	
2,600.00	2,515.15	1,043.02	1,040.75	11.34	16.00	-78.81	2,244.57	-8,485.56	8,804.52	8,777.51	27.01	325.982	
2,700.00	2,609.25	1,043.02	1,040.75	11.88	16.00	-78.81	2,244.57	-8,485.56	8,815.18	8,787.68	27.50	320.568	
2,800.00	2,703.35	1,043.02	1,040.75	12.42	16.00	-78.81	2,244.57	-8,485.56	8,826.97	8,798.98	27.99	315.416	
2,900.00	2,797.45	1,074.75	1,071.93	12.96	16.03	-78.88	2,244.97	-8,491.44	8,839.69	8,811.17	28.52	309.921	
3,000.00	2,891.55	1,074.75	1,071.93	13.51	16.03	-78.88	2,244.97	-8,491.44	8,853.37	8,824.36	29.00	305.250	
3,100.00	2,985.65	1,093.31	1,090.10	14.05	16.05	-78.93	2,245.31	-8,495.20	8,868.06	8,838.55	29.51	300.514	
3,200.00	3,079.75	1,105.75	1,102.26	14.60	16.06	-78.96	2,245.54	-8,497.81	8,883.67	8,853.66	30.00	296.087	
3,300.00	3,173.85	1,121.49	1,117.62	15.14	16.08	-78.99	2,245.90	-8,501.23	8,900.22	8,869.72	30.50	291.811	
3,400.00	3,267.95	1,136.35	1,132.08	15.69	16.09	-79.03	2,246.36	-8,504.61	8,917.75	8,886.76	30.99	287.745	
3,500.00	3,362.05	1,168.18	1,163.01	16.23	16.12	-79.10	2,247.32	-8,512.06	8,936.11	8,904.60	31.51	283.605	
3,600.00	3,456.15	1,183.42	1,177.80	16.78	16.13	-79.13	2,247.72	-8,515.73	8,955.28	8,923.28	32.00	279.885	
3,700.00	3,550.25	1,199.00	1,192.87	17.33	16.15	-79.17	2,248.19	-8,519.65	8,975.41	8,942.93	32.48	276.330	
3,800.00	3,644.35	1,230.05	1,222.84	17.88	16.18	-79.24	2,248.91	-8,527.75	8,996.43	8,963.44	32.99	272.677	
3,900.00	3,738.45	1,261.54	1,253.19	18.42	16.21	-79.32	2,249.39	-8,536.13	9,018.11	8,984.61	33.50	269.175	
4,000.00	3,832.55	1,261.54	1,253.19	18.97	16.21	-79.32	2,249.39	-8,536.13	9,040.69	9,006.75	33.95	266.312	
4,100.00	3,926.65	1,292.54	1,282.93	19.52	16.24	-79.39	2,249.74	-8,544.87	9,064.14	9,029.69	34.46	263.065	
4,200.00	4,020.75	1,292.54	1,282.93	20.07	16.24	-79.39	2,249.74	-8,544.87	9,088.50	9,053.61	34.89	260.476	
4,300.00	4,114.85	1,307.87	1,297.55	20.62	16.26	-79.43	2,249.85	-8,549.48	9,113.83	9,078.47	35.36	257.741	
4,400.00	4,208.95	1,323.84	1,312.75	21.17	16.28	-79.47	2,249.97	-8,554.38	9,140.01	9,104.18	35.83	255.118	
4,500.00	4,303.05	1,354.82	1,342.15	21.72	16.32	-79.55	2,250.10	-8,564.14	9,166.98	9,130.65	36.32	252.369	
4,600.00	4,397.15	1,385.50	1,371.20	22.27	16.36	-79.62	2,250.20	-8,574.00	9,194.67	9,157.86	36.82	249.735	
4,700.00	4,491.25	1,385.50	1,371.20	22.82	16.36	-79.62	2,250.20	-8,574.00	9,223.21	9,185.98	37.23	247.727	
4,800.00	4,585.35	1,414.27	1,398.31	23.37	16.39	-79.69	2,250.47	-8,583.62	9,252.57	9,214.86	37.72	245.316	
4,900.00	4,679.45	1,425.76	1,409.10	23.93	16.41	-79.72	2,250.60	-8,587.59	9,282.80	9,244.65	38.15	243.304	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164 - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program: 497-MWD OWSG Rev5												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)			
5,000.00	4,773.55	1,443.67	1,425.89	24.48	16.43	-79.77	2,250.74	-8,593.81	9,313.77	9,275.17	38.60	241.269	
5,100.00	4,867.65	1,443.67	1,425.89	25.03	16.43	-79.77	2,250.74	-8,593.81	9,345.68	9,306.68	39.00	239.649	
5,200.00	4,961.75	1,475.04	1,455.07	25.58	16.48	-79.84	2,251.12	-8,605.30	9,378.44	9,338.96	39.48	237.520	
5,300.00	5,055.85	1,475.04	1,455.07	26.13	16.48	-79.84	2,251.12	-8,605.30	9,411.97	9,372.10	39.87	236.070	
5,400.00	5,149.95	1,475.04	1,455.07	26.68	16.48	-79.84	2,251.12	-8,605.30	9,446.43	9,406.18	40.25	234.704	
5,500.00	5,244.05	1,488.23	1,467.23	27.24	16.51	-79.88	2,251.39	-8,610.42	9,481.75	9,441.08	40.67	233.147	
5,600.00	5,338.15	1,505.65	1,483.22	27.79	16.54	-79.92	2,251.86	-8,617.31	9,517.90	9,476.80	41.10	231.579	
5,665.73	5,400.00	1,505.65	1,483.22	28.15	16.54	-79.92	2,251.86	-8,617.31	9,542.07	9,500.73	41.34	230.822	
5,700.00	5,432.28	1,505.65	1,483.22	28.34	16.54	-80.05	2,251.86	-8,617.31	9,554.85	9,513.39	41.46	230.444	
5,800.00	5,526.87	1,537.35	1,512.16	28.88	16.59	-80.53	2,252.43	-8,630.24	9,592.74	9,550.81	41.92	228.827	
5,900.00	5,622.01	1,554.33	1,527.59	29.41	16.61	-80.99	2,252.42	-8,637.32	9,631.62	9,589.31	42.31	227.640	
6,000.00	5,717.67	1,567.98	1,539.96	29.92	16.64	-81.45	2,252.27	-8,643.08	9,671.46	9,628.79	42.67	226.656	
6,100.00	5,813.83	1,598.26	1,567.29	30.41	16.69	-81.96	2,251.93	-8,656.11	9,712.25	9,669.18	43.07	225.477	
6,200.00	5,910.44	1,598.26	1,567.29	30.89	16.69	-82.41	2,251.93	-8,656.11	9,753.97	9,710.62	43.35	225.016	
6,300.00	6,007.50	1,629.61	1,595.41	31.36	16.74	-82.94	2,251.86	-8,669.98	9,796.59	9,752.87	43.72	224.051	
6,400.00	6,104.96	1,643.75	1,608.04	31.80	16.77	-83.44	2,251.88	-8,676.33	9,840.07	9,796.05	44.02	223.544	
6,500.00	6,202.80	1,660.93	1,623.35	32.24	16.80	-83.96	2,251.82	-8,684.12	9,884.35	9,840.05	44.31	223.086	
6,600.00	6,300.98	1,694.67	1,653.33	32.66	16.87	-84.52	2,251.66	-8,699.61	9,929.37	9,884.72	44.65	222.359	
6,700.00	6,399.48	1,722.18	1,677.68	33.06	16.92	-85.07	2,251.63	-8,712.40	9,975.12	9,930.16	44.96	221.863	
6,722.82	6,422.00	1,722.18	1,677.68	33.15	16.92	-85.19	2,251.63	-8,712.40	9,985.66	9,940.66	45.00	221.898	
6,750.00	6,448.76	1,722.18	1,677.68	33.26	16.92	-74.71	2,251.63	-8,712.40	9,997.85	9,952.80	45.05	221.927	
6,800.00	6,497.51	1,752.80	1,704.68	33.48	16.99	-62.36	2,251.63	-8,726.85	10,018.09	9,972.80	45.29	221.212	
6,850.00	6,545.40	1,752.80	1,704.68	33.72	16.99	-54.93	2,251.63	-8,726.85	10,035.44	9,990.03	45.41	220.996	
6,900.00	6,592.13	1,752.80	1,704.68	33.97	16.99	-50.08	2,251.63	-8,726.85	10,049.88	10,004.33	45.55	220.632	
6,950.00	6,637.40	1,752.80	1,704.68	34.25	16.99	-46.73	2,251.63	-8,726.85	10,061.32	10,015.62	45.71	220.126	
7,000.00	6,680.94	1,769.09	1,718.96	34.54	17.03	-44.37	2,251.75	-8,734.68	10,069.60	10,023.65	45.95	219.125	
7,050.00	6,722.48	1,784.13	1,732.06	34.85	17.06	-42.68	2,252.06	-8,742.08	10,074.86	10,028.65	46.21	218.024	
7,100.00	6,761.76	1,784.13	1,732.06	35.17	17.06	-41.44	2,252.06	-8,742.08	10,076.89	10,030.48	46.41	217.128	
7,150.00	6,798.55	1,799.08	1,745.04	35.51	17.10	-40.65	2,252.38	-8,749.48	10,075.78	10,029.09	46.69	215.791	
7,200.00	6,832.61	1,815.08	1,758.94	35.86	17.14	-40.19	2,252.73	-8,757.39	10,071.44	10,024.45	46.99	214.324	
7,250.00	6,863.74	1,831.91	1,773.55	36.22	17.19	-40.04	2,252.97	-8,765.75	10,063.92	10,016.61	47.31	212.740	
7,300.00	6,891.74	1,846.38	1,786.06	36.59	17.23	-40.15	2,253.10	-8,773.02	10,053.33	10,005.71	47.62	211.117	
7,350.00	6,916.44	1,846.38	1,786.06	36.98	17.23	-40.47	2,253.10	-8,773.02	10,039.69	9,991.82	47.87	209.716	
7,400.00	6,937.69	1,846.38	1,786.06	37.37	17.23	-41.04	2,253.10	-8,773.02	10,023.13	9,975.00	48.13	208.237	
7,450.00	6,955.36	1,846.38	1,786.06	37.78	17.23	-41.88	2,253.10	-8,773.02	10,003.72	9,955.32	48.40	206.689	
7,500.00	6,969.34	1,846.38	1,786.06	38.19	17.23	-42.99	2,253.10	-8,773.02	9,981.58	9,932.91	48.67	205.079	
7,550.00	6,979.53	1,863.11	1,800.45	38.62	17.29	-44.49	2,253.34	-8,781.53	9,956.71	9,907.68	49.03	203.060	
7,600.00	6,985.89	1,877.09	1,812.41	39.05	17.33	-46.31	2,253.71	-8,788.77	9,929.46	9,880.08	49.38	201.063	
7,650.00	6,988.37	1,877.09	1,812.41	39.48	17.33	-48.43	2,253.71	-8,788.77	9,899.81	9,850.15	49.67	199.326	
7,657.25	6,988.40	1,877.09	1,812.41	39.54	17.33	-48.77	2,253.71	-8,788.77	9,895.33	9,845.62	49.71	199.064	
7,700.00	6,988.37	1,877.09	1,812.41	39.92	17.33	-48.77	2,253.71	-8,788.77	9,868.82	9,818.87	49.95	197.577	
7,800.00	6,988.30	1,898.36	1,830.58	40.82	17.41	-48.90	2,254.05	-8,799.83	9,807.23	9,756.60	50.64	193.674	
7,900.00	6,988.23	1,909.21	1,839.85	41.77	17.45	-48.97	2,254.23	-8,805.47	9,746.18	9,694.89	51.29	190.004	
8,000.00	6,988.16	1,909.21	1,839.85	42.75	17.45	-48.97	2,254.23	-8,805.47	9,685.77	9,633.86	51.91	186.571	
8,100.00	6,988.09	1,922.72	1,851.36	43.76	17.51	-49.06	2,254.32	-8,812.53	9,625.94	9,573.31	52.63	182.898	
8,152.35	6,988.06	1,925.03	1,853.32	44.30	17.52	-49.08	2,254.35	-8,813.75	9,594.90	9,541.91	52.99	181.082	
8,200.00	6,988.02	1,938.67	1,864.84	44.79	17.58	-48.22	2,254.64	-8,821.05	9,566.38	9,513.00	53.37	179.230	
8,300.00	6,987.95	1,938.67	1,864.84	45.83	17.58	-46.04	2,254.64	-8,821.05	9,503.82	9,449.81	54.00	175.986	
8,400.00	6,987.88	1,938.67	1,864.84	46.85	17.58	-43.57	2,254.64	-8,821.05	9,438.02	9,383.43	54.59	172.890	
8,500.00	6,987.80	1,938.67	1,864.84	47.85	17.58	-40.76	2,254.64	-8,821.05	9,369.25	9,314.12	55.13	169.954	
8,600.00	6,987.73	1,938.67	1,864.84	48.83	17.58	-37.59	2,254.64	-8,821.05	9,297.77	9,242.16	55.61	167.184	
8,700.00	6,987.65	1,970.00	1,891.02	49.79	17.72	-34.22	2,255.40	-8,838.24	9,223.82	9,167.58	56.24	164.018	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164 - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program:		497-MWD OWSG Rev5						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)
8,800.00	6,987.57	1,970.00	1,891.02	50.72	17.72	-30.25	2,255.40	-8,838.24	9,147.64	9,091.03	56.60	161.605	
8,900.00	6,987.50	1,970.00	1,891.02	51.62	17.72	-25.85	2,255.40	-8,838.24	9,069.66	9,012.75	56.91	159.375	
9,000.00	6,987.42	1,990.13	1,907.70	52.48	17.81	-21.14	2,255.78	-8,849.50	8,990.16	8,932.89	57.27	156.986	
9,100.00	6,987.34	2,001.36	1,916.99	53.30	17.86	-16.00	2,255.96	-8,855.82	8,909.45	8,851.95	57.50	154.943	
9,200.00	6,987.27	2,015.43	1,928.58	54.08	17.93	-10.56	2,256.18	-8,863.78	8,827.91	8,770.23	57.68	153.046	
9,215.33	6,987.26	2,017.00	1,929.87	54.20	17.94	-9.70	2,256.20	-8,864.68	8,815.37	8,757.67	57.70	152.782	
9,300.00	6,987.20	2,031.12	1,941.44	54.85	18.01	-9.72	2,256.44	-8,872.77	8,746.17	8,688.35	57.83	151.248	
9,400.00	6,987.12	2,031.12	1,941.44	55.65	18.01	-9.72	2,256.44	-8,872.77	8,664.73	8,606.85	57.88	149.711	
9,500.00	6,987.05	2,537.29	2,361.07	56.48	21.27	-10.52	2,264.76	-9,155.42	8,582.82	8,521.48	61.34	139.932	
9,600.00	6,986.98	2,555.27	2,376.21	57.35	21.39	-10.55	2,265.18	-9,165.10	8,498.81	8,437.27	61.54	138.112	
9,700.00	6,986.90	2,555.27	2,376.21	58.24	21.39	-10.55	2,265.18	-9,165.10	8,415.06	8,353.44	61.62	136.571	
9,800.00	6,986.83	2,646.62	2,452.82	59.17	22.07	-10.71	2,267.11	-9,214.82	8,331.56	8,269.21	62.35	133.617	
9,900.00	6,986.75	2,677.99	2,479.18	60.12	22.31	-10.77	2,267.73	-9,231.81	8,247.83	8,185.16	62.67	131.606	
10,000.00	6,986.68	2,677.99	2,479.18	61.10	22.31	-10.77	2,267.73	-9,231.81	8,164.37	8,101.59	62.77	130.062	
10,100.00	6,986.61	3,458.77	3,144.54	62.11	28.67	-11.79	2,327.99	-9,633.70	8,080.33	8,011.92	68.40	118.132	
10,200.00	6,986.53	3,458.77	3,144.54	63.14	28.67	-11.79	2,327.99	-9,633.70	7,992.59	7,924.06	68.53	116.636	
10,300.00	6,986.46	3,458.77	3,144.54	64.20	28.67	-11.79	2,327.99	-9,633.70	7,905.15	7,836.49	68.66	115.140	
10,400.00	6,986.39	3,458.77	3,144.54	65.28	28.67	-11.79	2,327.99	-9,633.70	7,818.00	7,749.21	68.79	113.644	
10,500.00	6,986.31	3,458.77	3,144.54	66.38	28.67	-11.79	2,327.99	-9,633.70	7,731.17	7,662.23	68.94	112.149	
10,600.00	6,986.24	3,458.77	3,144.54	67.50	28.67	-11.79	2,327.99	-9,633.70	7,644.66	7,575.57	69.09	110.654	
10,700.00	6,986.17	3,489.30	3,170.81	68.64	28.94	-11.83	2,330.64	-9,649.03	7,558.35	7,488.89	69.46	108.815	
10,800.00	6,986.09	3,489.30	3,170.81	69.80	28.94	-11.83	2,330.64	-9,649.03	7,472.31	7,402.69	69.62	107.325	
10,900.00	6,986.02	3,498.58	3,178.73	70.98	29.02	-11.84	2,331.41	-9,653.81	7,386.61	7,316.75	69.86	105.734	
11,000.00	6,985.95	3,532.66	3,207.80	72.17	29.32	-11.89	2,334.18	-9,671.39	7,301.10	7,230.82	70.28	103.885	
11,100.00	6,985.87	3,609.88	3,273.90	73.38	29.99	-12.05	2,338.34	-9,711.07	7,215.57	7,144.55	71.02	101.599	
11,200.00	6,985.80	3,626.32	3,288.00	74.61	30.13	-12.08	2,338.86	-9,719.49	7,130.06	7,058.73	71.33	99.956	
11,300.00	6,985.72	3,645.58	3,304.47	75.85	30.30	-12.13	2,339.49	-9,729.48	7,044.85	6,973.17	71.67	98.291	
11,400.00	6,985.65	3,645.58	3,304.47	77.10	30.30	-12.13	2,339.49	-9,729.48	6,959.92	6,888.04	71.88	96.823	
11,500.00	6,985.58	3,675.71	3,330.06	78.37	30.57	-12.20	2,340.39	-9,745.35	6,875.30	6,802.97	72.32	95.066	
11,600.00	6,985.50	3,675.71	3,330.06	79.65	30.57	-12.20	2,340.39	-9,745.35	6,790.96	6,718.42	72.55	93.607	
11,700.00	6,985.43	3,692.06	3,343.86	80.94	30.72	-12.24	2,340.78	-9,754.10	6,706.98	6,634.07	72.90	91.998	
11,800.00	6,985.36	3,706.80	3,356.25	82.24	30.85	-12.28	2,341.04	-9,762.09	6,623.34	6,550.08	73.26	90.412	
11,900.00	6,985.28	3,737.76	3,382.25	83.56	31.14	-12.37	2,341.31	-9,778.90	6,539.93	6,466.18	73.74	88.687	
12,000.00	6,985.21	3,769.67	3,408.96	84.88	31.44	-12.46	2,341.38	-9,796.35	6,456.77	6,382.52	74.24	86.967	
12,100.00	6,985.14	3,769.67	3,408.96	86.21	31.44	-12.46	2,341.38	-9,796.35	6,373.94	6,299.43	74.52	85.536	
12,200.00	6,985.06	3,976.02	3,581.94	87.56	33.42	-13.15	2,338.30	-9,908.78	6,291.08	6,214.71	76.37	82.375	
12,300.00	6,984.99	4,013.00	3,613.18	88.91	33.78	-13.28	2,337.77	-9,928.55	6,207.32	6,130.37	76.94	80.673	
12,400.00	6,984.92	4,013.00	3,613.18	90.27	33.78	-13.28	2,337.77	-9,928.55	6,123.86	6,046.61	77.25	79.271	
12,500.00	6,984.84	4,059.18	3,652.02	91.64	34.23	-13.44	2,337.36	-9,953.53	6,040.53	5,962.61	77.92	77.519	
12,600.00	6,984.77	4,107.00	3,692.02	93.01	34.71	-13.62	2,336.70	-9,979.74	5,957.66	5,879.04	78.62	75.779	
12,700.00	6,984.69	4,226.97	3,792.91	94.40	35.88	-14.07	2,335.27	-10,044.64	5,874.40	5,794.53	79.87	73.547	
12,800.00	6,984.62	4,267.00	3,826.67	95.79	36.27	-14.22	2,335.53	-10,066.14	5,790.79	5,710.27	80.53	71.913	
12,900.00	6,984.55	4,267.00	3,826.67	97.18	36.27	-14.22	2,335.53	-10,066.14	5,707.60	5,626.71	80.89	70.556	
13,000.00	6,984.47	4,310.81	3,863.41	98.59	36.76	-14.37	2,336.38	-10,089.99	5,624.45	5,542.81	81.64	68.893	
13,100.00	6,984.40	4,329.68	3,879.10	100.00	36.97	-14.44	2,336.94	-10,100.45	5,541.85	5,459.66	82.19	67.428	
13,200.00	6,984.33	4,348.96	3,895.05	101.41	37.19	-14.50	2,337.63	-10,111.26	5,459.64	5,376.88	82.75	65.975	
13,300.00	6,984.25	4,395.00	3,932.79	102.83	37.70	-14.64	2,339.77	-10,137.55	5,378.00	5,294.46	83.54	64.378	
13,400.00	6,984.18	4,395.00	3,932.79	104.26	37.70	-14.64	2,339.77	-10,137.55	5,296.42	5,212.45	83.97	63.073	
13,500.00	6,984.11	4,455.25	3,981.83	105.69	38.35	-14.82	2,343.25	-10,172.35	5,215.31	5,130.47	84.83	61.478	
13,600.00	6,984.03	4,590.30	4,091.59	107.13	39.83	-15.10	2,357.75	-10,249.66	5,133.57	5,047.44	86.13	59.606	
13,700.00	6,983.96	4,604.00	4,102.74	108.57	39.97	-15.13	2,359.45	-10,257.44	5,051.62	4,964.94	86.68	58.278	
13,800.00	6,983.88	4,604.00	4,102.74	110.02	39.97	-15.13	2,359.45	-10,257.44	4,970.32	4,883.15	87.17	57.016	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164 - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		497-MWD OWSG Rev5					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	
13,900.00	6,983.81	4,604.00	4,102.74	111.47	39.97	-15.13	2,359.45	-10,257.44	4,889.71	4,802.03	87.68	55.767		
14,000.00	6,983.74	4,604.00	4,102.74	112.92	39.97	-15.13	2,359.45	-10,257.44	4,809.83	4,721.62	88.20	54.531		
14,100.00	6,983.66	4,604.00	4,102.74	114.38	39.97	-15.13	2,359.45	-10,257.44	4,730.71	4,641.97	88.74	53.308		
14,200.00	6,983.59	4,604.00	4,102.74	115.85	39.97	-15.13	2,359.45	-10,257.44	4,652.39	4,563.10	89.30	52.100		
14,300.00	6,983.52	4,604.00	4,102.74	117.31	39.97	-15.13	2,359.45	-10,257.44	4,574.93	4,485.06	89.87	50.908		
14,400.00	6,983.44	4,604.00	4,102.74	118.78	39.97	-15.13	2,359.45	-10,257.44	4,498.35	4,407.89	90.45	49.731		
14,500.00	6,983.37	4,604.00	4,102.74	120.26	39.97	-15.13	2,359.45	-10,257.44	4,422.70	4,331.65	91.06	48.571		
14,600.00	6,983.30	4,604.00	4,102.74	121.74	39.97	-15.13	2,359.45	-10,257.44	4,348.04	4,256.37	91.67	47.429		
14,700.00	6,983.22	4,604.00	4,102.74	123.22	39.97	-15.13	2,359.45	-10,257.44	4,274.42	4,182.11	92.31	46.306		
14,800.00	6,983.15	4,604.00	4,102.74	124.70	39.97	-15.13	2,359.45	-10,257.44	4,201.89	4,108.93	92.96	45.203		
14,900.00	6,983.08	4,604.00	4,102.74	126.19	39.97	-15.13	2,359.45	-10,257.44	4,130.50	4,036.88	93.62	44.121		
15,000.00	6,983.00	4,604.00	4,102.74	127.68	39.97	-15.13	2,359.45	-10,257.44	4,060.32	3,966.03	94.29	43.060		
15,100.00	6,982.93	4,604.00	4,102.74	129.17	39.97	-15.13	2,359.45	-10,257.44	3,991.41	3,896.43	94.98	42.023		
15,200.00	6,982.85	4,604.00	4,102.74	130.67	39.97	-15.13	2,359.45	-10,257.44	3,923.84	3,828.16	95.68	41.009		
15,300.00	6,982.78	4,604.00	4,102.74	132.16	39.97	-15.13	2,359.45	-10,257.44	3,857.68	3,761.29	96.39	40.021		
15,400.00	6,982.71	4,604.00	4,102.74	133.66	39.97	-15.13	2,359.45	-10,257.44	3,793.01	3,695.90	97.11	39.059		
15,500.00	6,982.63	4,604.00	4,102.74	135.17	39.97	-15.13	2,359.45	-10,257.44	3,729.89	3,632.06	97.83	38.125		
15,600.00	6,982.56	4,604.00	4,102.74	136.67	39.97	-15.13	2,359.45	-10,257.44	3,668.41	3,569.85	98.56	37.220		
15,700.00	6,982.49	4,604.00	4,102.74	138.18	39.97	-15.13	2,359.45	-10,257.44	3,608.66	3,509.37	99.29	36.345		
15,800.00	6,982.41	4,604.00	4,102.74	139.69	39.97	-15.13	2,359.45	-10,257.44	3,550.72	3,450.70	100.02	35.501		
15,900.00	6,982.34	4,604.00	4,102.74	141.20	39.97	-15.13	2,359.45	-10,257.44	3,494.68	3,393.94	100.74	34.690		
16,000.00	6,982.27	4,604.00	4,102.74	142.71	39.97	-15.13	2,359.45	-10,257.44	3,440.63	3,339.18	101.46	33.912		
16,100.00	6,982.19	4,604.00	4,102.74	144.23	39.97	-15.13	2,359.45	-10,257.44	3,388.68	3,286.52	102.16	33.170		
16,200.00	6,982.12	4,604.00	4,102.74	145.75	39.97	-15.13	2,359.45	-10,257.44	3,338.91	3,236.06	102.85	32.464		
16,300.00	6,982.05	4,604.00	4,102.74	147.27	39.97	-15.13	2,359.45	-10,257.44	3,291.43	3,187.91	103.52	31.796		
16,400.00	6,981.97	4,604.00	4,102.74	148.79	39.97	-15.13	2,359.45	-10,257.44	3,246.33	3,142.17	104.16	31.167		
16,500.00	6,981.90	4,604.00	4,102.74	150.31	39.97	-15.13	2,359.45	-10,257.44	3,203.72	3,098.95	104.77	30.578		
16,600.00	6,981.82	4,604.00	4,102.74	151.84	39.97	-15.13	2,359.45	-10,257.44	3,163.70	3,058.35	105.35	30.030		
16,700.00	6,981.75	4,604.00	4,102.74	153.36	39.97	-15.13	2,359.45	-10,257.44	3,126.37	3,020.48	105.89	29.525		
16,800.00	6,981.68	4,604.00	4,102.74	154.89	39.97	-15.13	2,359.45	-10,257.44	3,091.83	2,985.44	106.38	29.064		
16,900.00	6,981.60	4,604.00	4,102.74	156.42	39.97	-15.13	2,359.45	-10,257.44	3,060.16	2,953.33	106.82	28.647		
17,000.00	6,981.53	4,604.00	4,102.74	157.95	39.97	-15.13	2,359.45	-10,257.44	3,031.46	2,924.24	107.21	28.275		
17,100.00	6,981.46	4,604.00	4,102.74	159.49	39.97	-15.13	2,359.45	-10,257.44	3,005.81	2,898.27	107.54	27.950		
17,200.00	6,981.38	4,604.00	4,102.74	161.02	39.97	-15.13	2,359.45	-10,257.44	2,983.30	2,875.49	107.81	27.671		
17,300.00	6,981.31	4,604.00	4,102.74	162.56	39.97	-15.13	2,359.45	-10,257.44	2,964.00	2,855.98	108.02	27.440		
17,400.00	6,981.24	4,604.00	4,102.74	164.09	39.97	-15.13	2,359.45	-10,257.44	2,947.96	2,839.80	108.15	27.258		
17,500.00	6,981.16	4,604.00	4,102.74	165.63	39.97	-15.13	2,359.45	-10,257.44	2,935.24	2,827.02	108.22	27.123		
17,600.00	6,981.09	4,604.00	4,102.74	167.17	39.97	-15.13	2,359.45	-10,257.44	2,925.88	2,817.67	108.22	27.037		
17,700.00	6,981.01	4,604.00	4,102.74	168.71	39.97	-15.13	2,359.45	-10,257.44	2,919.93	2,811.78	108.15	26.999 SF		
17,800.00	6,980.94	4,604.00	4,102.74	170.25	39.97	-15.13	2,359.45	-10,257.44	2,917.39	2,809.37	108.02	27.009		
17,824.00	6,980.92	4,604.00	4,102.74	170.62	39.97	-15.13	2,359.45	-10,257.44	2,917.29	2,809.31	107.97	27.018 CC, ES		
17,900.00	6,980.87	4,604.00	4,102.74	171.80	39.97	-15.13	2,359.45	-10,257.44	2,918.28	2,810.46	107.82	27.066		
18,000.00	6,980.79	4,604.00	4,102.74	173.34	39.97	-15.13	2,359.45	-10,257.44	2,922.59	2,815.02	107.57	27.170		
18,100.00	6,980.72	4,604.00	4,102.74	174.89	39.97	-15.13	2,359.45	-10,257.44	2,930.30	2,823.05	107.26	27.320		
18,200.00	6,980.65	4,604.00	4,102.74	176.43	39.97	-15.13	2,359.45	-10,257.44	2,941.40	2,834.50	106.90	27.515		
18,300.00	6,980.57	4,604.00	4,102.74	177.98	39.97	-15.13	2,359.45	-10,257.44	2,955.85	2,849.34	106.51	27.752		
18,400.00	6,980.50	4,604.00	4,102.74	179.53	39.97	-15.13	2,359.45	-10,257.44	2,973.59	2,867.51	106.08	28.032		
18,500.00	6,980.43	4,604.00	4,102.74	181.08	39.97	-15.13	2,359.45	-10,257.44	2,994.56	2,888.94	105.62	28.352		
18,600.00	6,980.35	4,604.00	4,102.74	182.63	39.97	-15.13	2,359.45	-10,257.44	3,018.70	2,913.56	105.15	28.710		
18,700.00	6,980.28	4,604.00	4,102.74	184.18	39.97	-15.13	2,359.45	-10,257.44	3,045.94	2,941.29	104.65	29.105		
18,800.00	6,980.21	4,604.00	4,102.74	185.73	39.97	-15.13	2,359.45	-10,257.44	3,076.19	2,972.03	104.15	29.535		
18,900.00	6,980.13	4,604.00	4,102.74	187.28	39.97	-15.13	2,359.45	-10,257.44	3,109.36	3,005.71	103.65	29.999		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164 - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		497-MWD OWSG Rev5					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	
19,000.00	6,980.06	4,604.00	4,102.74	188.84	39.97	-15.13	2,359.45	-10,257.44	3,145.36	3,042.22	103.14	30.495		
19,100.00	6,979.98	4,604.00	4,102.74	190.39	39.97	-15.13	2,359.45	-10,257.44	3,184.09	3,081.46	102.64	31.022		
19,200.00	6,979.91	4,604.00	4,102.74	191.95	39.97	-15.13	2,359.45	-10,257.44	3,225.47	3,123.33	102.14	31.579		
19,300.00	6,979.84	4,604.00	4,102.74	193.51	39.97	-15.13	2,359.45	-10,257.44	3,269.37	3,167.73	101.65	32.165		
19,400.00	6,979.76	4,604.00	4,102.74	195.06	39.97	-15.13	2,359.45	-10,257.44	3,315.72	3,214.56	101.16	32.778		
19,500.00	6,979.69	4,604.00	4,102.74	196.62	39.97	-15.13	2,359.45	-10,257.44	3,364.40	3,263.72	100.68	33.418		
19,600.00	6,979.62	4,604.00	4,102.74	198.18	39.97	-15.13	2,359.45	-10,257.44	3,415.31	3,315.11	100.20	34.084		
19,700.00	6,979.54	4,604.00	4,102.74	199.74	39.97	-15.13	2,359.45	-10,257.44	3,468.36	3,368.62	99.74	34.775		
19,800.00	6,979.47	4,604.00	4,102.74	201.30	39.97	-15.13	2,359.45	-10,257.44	3,523.45	3,424.17	99.28	35.491		
19,900.00	6,979.40	4,604.00	4,102.74	202.86	39.97	-15.13	2,359.45	-10,257.44	3,580.48	3,481.66	98.83	36.230		
20,000.00	6,979.32	4,604.00	4,102.74	204.42	39.97	-15.13	2,359.45	-10,257.44	3,639.37	3,540.99	98.38	36.992		
20,100.00	6,979.25	4,604.00	4,102.74	205.98	39.97	-15.13	2,359.45	-10,257.44	3,700.03	3,602.09	97.94	37.777		
20,200.00	6,979.18	4,604.00	4,102.74	207.55	39.97	-15.13	2,359.45	-10,257.44	3,762.37	3,664.85	97.52	38.582		
20,300.00	6,979.10	4,604.00	4,102.74	209.11	39.97	-15.13	2,359.45	-10,257.44	3,826.30	3,729.21	97.09	39.408		
20,400.00	6,979.03	4,604.00	4,102.74	210.68	39.97	-15.13	2,359.45	-10,257.44	3,891.76	3,795.07	96.68	40.254		
20,500.00	6,978.95	4,604.00	4,102.74	212.24	39.97	-15.13	2,359.45	-10,257.44	3,958.65	3,862.38	96.27	41.118		
20,600.00	6,978.88	4,604.00	4,102.74	213.81	39.97	-15.13	2,359.45	-10,257.44	4,026.92	3,931.05	95.88	42.001		
20,700.00	6,978.81	4,604.00	4,102.74	215.37	39.97	-15.13	2,359.45	-10,257.44	4,096.50	4,001.01	95.49	42.900		
20,800.00	6,978.73	4,604.00	4,102.74	216.94	39.97	-15.13	2,359.45	-10,257.44	4,167.31	4,072.20	95.11	43.816		
20,900.00	6,978.66	4,604.00	4,102.74	218.51	39.97	-15.13	2,359.45	-10,257.44	4,239.30	4,144.56	94.74	44.748		
21,000.00	6,978.59	4,604.00	4,102.74	220.07	39.97	-15.13	2,359.45	-10,257.44	4,312.40	4,218.03	94.38	45.694		
21,100.00	6,978.51	4,604.00	4,102.74	221.64	39.97	-15.13	2,359.45	-10,257.44	4,386.57	4,292.55	94.02	46.654		
21,200.00	6,978.44	4,604.00	4,102.74	223.21	39.97	-15.13	2,359.45	-10,257.44	4,461.75	4,368.07	93.68	47.628		
21,300.00	6,978.37	4,604.00	4,102.74	224.78	39.97	-15.13	2,359.45	-10,257.44	4,537.88	4,444.53	93.35	48.614		
21,400.00	6,978.29	4,604.00	4,102.74	226.35	39.97	-15.13	2,359.45	-10,257.44	4,614.92	4,521.90	93.02	49.612		
21,500.00	6,978.22	4,604.00	4,102.74	227.92	39.97	-15.13	2,359.45	-10,257.44	4,692.84	4,600.13	92.71	50.621		
21,600.00	6,978.14	4,604.00	4,102.74	229.49	39.97	-15.13	2,359.45	-10,257.44	4,771.57	4,679.17	92.40	51.641		
21,700.00	6,978.07	4,604.00	4,102.74	231.06	39.97	-15.13	2,359.45	-10,257.44	4,851.09	4,758.99	92.10	52.670		
21,800.00	6,978.00	4,604.00	4,102.74	232.63	39.97	-15.13	2,359.45	-10,257.44	4,931.35	4,839.54	91.82	53.709		
21,900.00	6,977.92	4,604.00	4,102.74	234.21	39.97	-15.13	2,359.45	-10,257.44	5,012.33	4,920.79	91.54	54.757		
22,000.00	6,977.85	4,604.00	4,102.74	235.78	39.97	-15.13	2,359.45	-10,257.44	5,093.98	5,002.71	91.27	55.813		
22,100.00	6,977.78	4,604.00	4,102.74	237.35	39.97	-15.13	2,359.45	-10,257.44	5,176.27	5,085.26	91.01	56.876		
22,200.00	6,977.70	4,604.00	4,102.74	238.92	39.97	-15.13	2,359.45	-10,257.44	5,259.18	5,168.42	90.76	57.947		
22,300.00	6,977.63	4,604.00	4,102.74	240.50	39.97	-15.13	2,359.45	-10,257.44	5,342.67	5,252.15	90.52	59.025		
22,400.00	6,977.56	4,604.00	4,102.74	242.07	39.97	-15.13	2,359.45	-10,257.44	5,426.72	5,336.44	90.28	60.108		
22,500.00	6,977.48	4,604.00	4,102.74	243.65	39.97	-15.13	2,359.45	-10,257.44	5,511.30	5,421.25	90.06	61.197		
22,600.00	6,977.41	4,604.00	4,102.74	245.22	39.97	-15.13	2,359.45	-10,257.44	5,596.40	5,506.56	89.84	62.292		
22,700.00	6,977.34	4,604.00	4,102.74	246.80	39.97	-15.13	2,359.45	-10,257.44	5,681.97	5,592.34	89.63	63.392		
22,800.00	6,977.26	4,604.00	4,102.74	248.37	39.97	-15.13	2,359.45	-10,257.44	5,768.02	5,678.58	89.43	64.496		
22,900.00	6,977.19	4,604.00	4,102.74	249.95	39.97	-15.13	2,359.45	-10,257.44	5,854.50	5,765.26	89.24	65.605		
23,000.00	6,977.11	4,604.00	4,102.74	251.53	39.97	-15.13	2,359.45	-10,257.44	5,941.41	5,852.36	89.05	66.717		
23,100.00	6,977.04	4,604.00	4,102.74	253.10	39.97	-15.13	2,359.45	-10,257.44	6,028.73	5,939.85	88.88	67.833		
23,155.65	6,977.00	4,604.00	4,102.74	253.98	39.97	-15.13	2,359.45	-10,257.44	6,077.49	5,988.71	88.78	68.455		
23,156.15	6,977.00	4,604.00	4,102.74	254.06	39.97	-15.13	2,359.45	-10,257.44	6,077.93	5,988.04	89.89	67.618		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164A - OH - OH-INC													Offset Site Error: 0.00 usft
Survey Program: 535-A027Ua_INC-ONLY													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis			Offset Wellbore Centre		Distance		Rule Assigned:		Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.00	0.00	0.00	0.00	0.00	0.00	-75.04	2,230.42	-8,344.65	8,637.83				
100.00	100.00	36.00	36.00	0.25	0.83	-75.04	2,230.42	-8,344.65	8,637.59	8,636.51	1.08	7,961.650	
200.00	200.00	136.00	136.00	0.61	3.15	-75.04	2,230.42	-8,344.65	8,637.59	8,633.83	3.76	2,297.600	
300.00	300.00	236.00	236.00	0.97	5.47	-75.04	2,230.42	-8,344.65	8,637.59	8,631.16	6.43	1,342.514	
400.00	400.00	336.00	336.00	1.33	7.78	-75.04	2,230.42	-8,344.65	8,637.59	8,628.49	9.11	948.311	
500.00	500.00	436.00	436.00	1.68	10.10	-75.04	2,230.42	-8,344.65	8,637.59	8,625.81	11.78	733.062	
600.00	599.98	536.02	535.98	2.04	12.41	-85.05	2,230.42	-8,344.65	8,637.44	8,622.99	14.46	597.449	
700.00	699.84	635.88	635.84	2.41	14.73	-85.09	2,230.42	-8,344.65	8,636.99	8,619.86	17.13	504.270	
800.00	799.45	735.49	735.45	2.77	17.03	-85.17	2,230.42	-8,344.65	8,636.25	8,616.45	19.80	436.281	
900.00	898.70	834.74	834.70	3.13	19.33	-85.27	2,230.42	-8,344.65	8,635.23	8,612.77	22.46	384.472	
1,000.00	997.47	933.51	933.47	3.50	21.62	-85.39	2,230.42	-8,344.65	8,633.94	8,608.81	25.12	343.670	
1,100.00	1,095.63	1,032.36	1,032.29	3.89	23.91	-83.18	2,233.05	-8,344.65	8,632.63	8,604.83	27.80	310.523	
1,200.00	1,193.09	1,134.80	1,134.72	4.29	26.28	-81.69	2,232.90	-8,344.65	8,629.55	8,598.97	30.58	282.227	
1,300.00	1,289.73	1,236.25	1,236.17	4.72	28.63	-80.67	2,232.52	-8,344.65	8,625.36	8,592.01	33.35	258.642	
1,400.00	1,385.42	1,336.57	1,336.48	5.16	30.96	-79.98	2,231.91	-8,344.65	8,620.10	8,583.98	36.12	238.681	
1,496.97	1,477.20	1,432.64	1,432.53	5.62	33.18	-79.54	2,231.12	-8,344.65	8,614.02	8,575.23	38.79	222.051	
1,500.00	1,480.05	1,435.62	1,435.51	5.63	33.25	-79.55	2,231.09	-8,344.65	8,613.82	8,574.94	38.88	221.567	
1,600.00	1,574.15	1,510.43	1,510.15	6.12	35.00	-79.72	2,230.42	-8,344.65	8,607.16	8,566.05	41.11	209.362	
1,700.00	1,668.25	1,604.53	1,604.25	6.62	37.37	-79.93	2,230.42	-8,344.65	8,600.82	8,556.84	43.98	195.574	
1,800.00	1,762.35	1,698.63	1,698.35	7.12	39.74	-80.13	2,230.42	-8,344.65	8,594.60	8,547.75	46.85	183.443	
1,900.00	1,856.45	1,796.42	1,796.13	7.64	42.20	-80.34	2,231.74	-8,344.65	8,588.82	8,538.99	49.83	172.377	
2,000.00	1,950.55	1,898.92	1,898.63	8.16	44.79	-80.58	2,231.32	-8,344.65	8,582.77	8,529.84	52.92	162.172	
2,100.00	2,044.65	2,001.11	2,000.80	8.68	47.36	-80.81	2,230.44	-8,344.65	8,576.76	8,520.74	56.02	153.105	
2,200.00	2,138.75	2,075.20	2,074.75	9.21	49.08	-80.97	2,230.42	-8,344.65	8,571.04	8,512.77	58.26	147.108	
2,300.00	2,232.85	2,169.30	2,168.85	9.74	51.26	-81.19	2,230.42	-8,344.65	8,565.47	8,504.50	60.97	140.485	
2,400.00	2,326.95	2,264.85	2,264.37	10.27	53.47	-81.39	2,232.31	-8,344.65	8,560.02	8,496.71	63.71	134.356	
2,500.00	2,421.05	2,370.11	2,369.62	10.81	55.91	-81.63	2,231.88	-8,344.65	8,555.03	8,488.34	66.68	128.290	
2,600.00	2,515.15	2,474.91	2,474.39	11.34	58.33	-81.87	2,230.78	-8,344.65	8,549.65	8,480.01	69.65	122.757	
2,700.00	2,609.25	2,545.82	2,545.25	11.88	59.80	-82.03	2,230.42	-8,344.65	8,544.50	8,472.86	71.65	119.257	
2,800.00	2,703.35	2,639.92	2,639.35	12.42	61.61	-82.24	2,230.42	-8,344.65	8,539.59	8,465.59	74.00	115.404	
2,900.00	2,797.45	2,734.02	2,733.45	12.96	63.42	-82.45	2,230.42	-8,344.65	8,534.81	8,458.46	76.35	111.788	
3,000.00	2,891.55	2,828.12	2,827.55	13.51	65.23	-82.67	2,230.42	-8,344.65	8,530.16	8,451.46	78.70	108.388	
3,100.00	2,985.65	2,922.22	2,921.65	14.05	67.04	-82.88	2,230.42	-8,344.65	8,525.64	8,444.58	81.05	105.186	
3,200.00	3,079.75	3,016.32	3,015.75	14.60	68.85	-83.09	2,230.42	-8,344.65	8,521.25	8,437.84	83.41	102.164	
3,300.00	3,173.85	3,111.43	3,110.85	15.14	70.68	-83.30	2,232.21	-8,344.65	8,517.30	8,431.52	85.78	99.290	
3,400.00	3,267.95	3,207.12	3,206.53	15.69	72.52	-83.51	2,232.09	-8,344.65	8,513.15	8,424.98	88.17	96.555	
3,500.00	3,362.05	3,302.73	3,302.15	16.23	74.35	-83.73	2,231.86	-8,344.65	8,509.11	8,418.56	90.55	93.966	
3,600.00	3,456.15	3,398.27	3,397.68	16.78	76.19	-83.95	2,231.52	-8,344.65	8,505.20	8,412.26	92.94	91.513	
3,700.00	3,550.25	3,493.73	3,493.14	17.33	78.03	-84.17	2,231.08	-8,344.65	8,501.40	8,406.08	95.32	89.184	
3,800.00	3,644.35	3,589.12	3,588.52	17.88	79.86	-84.39	2,230.53	-8,344.65	8,497.73	8,400.02	97.71	86.970	
3,900.00	3,738.45	3,675.12	3,674.45	18.42	81.72	-84.59	2,230.42	-8,344.65	8,494.25	8,394.13	100.12	84.844	
4,000.00	3,832.55	3,769.22	3,768.55	18.97	83.81	-84.80	2,230.42	-8,344.65	8,490.92	8,388.17	102.75	82.633	
4,100.00	3,926.65	3,863.47	3,862.80	19.52	85.90	-85.01	2,231.24	-8,344.65	8,487.85	8,382.45	105.40	80.533	
4,200.00	4,020.75	3,960.45	3,959.78	20.07	88.05	-85.23	2,231.11	-8,344.65	8,484.77	8,376.67	108.10	78.491	
4,300.00	4,114.85	4,057.27	4,056.59	20.62	90.20	-85.45	2,230.73	-8,344.65	8,481.79	8,371.00	110.80	76.551	
4,400.00	4,208.95	4,145.72	4,144.95	21.17	92.40	-85.66	2,230.42	-8,344.65	8,478.96	8,365.42	113.55	74.673	
4,500.00	4,303.05	4,239.82	4,239.05	21.72	95.12	-85.87	2,230.42	-8,344.65	8,476.31	8,359.48	116.82	72.557	
4,600.00	4,397.15	4,333.92	4,333.15	22.27	97.85	-86.09	2,230.42	-8,344.65	8,473.79	8,353.69	120.10	70.557	
4,700.00	4,491.25	4,432.32	4,431.52	22.82	100.69	-86.30	2,231.82	-8,344.65	8,471.56	8,348.06	123.50	68.596	
4,800.00	4,585.35	4,531.40	4,530.59	23.37	103.56	-86.53	2,231.12	-8,344.65	8,469.23	8,342.31	126.92	66.729	
4,900.00	4,679.45	4,616.52	4,615.45	23.93	106.16	-86.73	2,230.42	-8,344.65	8,467.03	8,336.96	130.07	65.094	
5,000.00	4,773.55	4,710.62	4,709.55	24.48	109.44	-86.95	2,230.42	-8,344.65	8,465.05	8,331.15	133.90	63.218	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164A - OH - OH-INC											Offset Site Error: 0.00 usft						
Survey Program: 535-A027Ua_INC-ONLY				Reference		Offset		Semi Major Axis		Highside Toolface		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				
5,100.00	4,867.65	4,804.72	4,803.65	25.03	112.71	-87.16	2,230.42	-8,344.65	8,463.20	8,325.47	137.73	61.447					
5,200.00	4,961.75	4,898.82	4,897.75	25.58	115.99	-87.38	2,230.42	-8,344.65	8,461.49	8,319.93	141.56	59.773					
5,300.00	5,055.85	4,992.92	4,991.85	26.13	119.27	-87.59	2,230.42	-8,344.65	8,459.91	8,314.52	145.39	58.188					
5,400.00	5,149.95	5,087.02	5,085.95	26.68	122.54	-87.81	2,230.42	-8,344.65	8,458.47	8,309.25	149.22	56.685					
5,500.00	5,244.05	5,181.12	5,180.05	27.24	125.82	-88.02	2,230.42	-8,344.65	8,457.16	8,304.11	153.05	55.258					
5,600.00	5,338.15	5,275.22	5,274.15	27.79	129.09	-88.24	2,230.42	-8,344.65	8,455.99	8,299.11	156.88	53.902					
5,665.73	5,400.00	5,337.07	5,336.00	28.15	131.25	-88.38	2,230.42	-8,344.65	8,455.29	8,295.90	159.39	53.046					
5,700.00	5,432.28	5,369.35	5,368.28	28.34	132.37	-88.45	2,230.42	-8,344.65	8,454.96	8,294.25	160.71	52.611					
5,800.00	5,526.87	5,463.94	5,462.87	28.88	135.66	-88.65	2,230.42	-8,344.65	8,454.09	8,289.55	164.54	51.380					
5,900.00	5,622.01	5,559.07	5,558.01	29.41	138.98	-88.84	2,230.42	-8,344.65	8,453.38	8,285.00	168.38	50.204					
6,000.00	5,717.67	5,654.74	5,653.67	29.92	142.31	-89.03	2,230.42	-8,344.65	8,452.81	8,280.59	172.22	49.081					
6,100.00	5,813.83	5,750.89	5,749.83	30.41	145.65	-89.20	2,230.42	-8,344.65	8,452.37	8,276.31	176.06	48.008					
6,200.00	5,910.44	5,847.51	5,846.44	30.89	149.02	-89.37	2,230.42	-8,344.65	8,452.04	8,272.13	179.91	46.980					
6,300.00	6,007.50	5,944.57	5,943.50	31.36	152.40	-89.52	2,230.42	-8,344.65	8,451.80	8,268.05	183.75	45.996					
6,400.00	6,104.96	6,042.03	6,040.96	31.80	155.79	-89.67	2,230.42	-8,344.65	8,451.63	8,264.04	187.59	45.053					
6,426.64	6,130.99	6,060.00	6,057.39	31.92	156.41	-89.69	2,230.42	-8,344.65	8,451.61	8,263.27	188.33	44.876					
6,500.00	6,202.80	6,060.00	6,057.39	32.24	156.41	-89.69	2,230.42	-8,344.65	8,451.93	8,263.29	188.64	44.804					
6,600.00	6,300.98	6,060.00	6,057.39	32.66	156.41	-89.71	2,230.42	-8,344.65	8,453.40	8,264.37	189.03	44.720					
6,700.00	6,399.48	6,060.00	6,057.39	33.06	156.41	-89.74	2,230.42	-8,344.65	8,456.06	8,266.69	189.37	44.653					
6,722.82	6,422.00	6,060.00	6,057.39	33.15	156.41	-89.74	2,230.42	-8,344.65	8,456.84	8,267.39	189.44	44.640					
6,750.00	6,448.76	6,060.00	6,057.39	33.26	156.41	-79.94	2,230.42	-8,344.65	8,457.39	8,267.86	189.53	44.622					
6,800.00	6,497.51	6,060.00	6,057.39	33.48	156.41	-68.71	2,230.42	-8,344.65	8,456.31	8,266.60	189.71	44.576					
6,850.00	6,545.40	6,060.00	6,057.39	33.72	156.41	-62.41	2,230.42	-8,344.65	8,452.51	8,262.61	189.90	44.511					
6,900.00	6,592.13	6,060.00	6,057.39	33.97	156.41	-58.66	2,230.42	-8,344.65	8,446.00	8,255.90	190.10	44.429					
6,950.00	6,637.40	6,060.00	6,057.39	34.25	156.41	-56.41	2,230.42	-8,344.65	8,436.83	8,246.52	190.32	44.330					
7,000.00	6,680.94	6,060.00	6,057.39	34.54	156.41	-55.12	2,230.42	-8,344.65	8,425.04	8,234.50	190.55	44.215					
7,050.00	6,722.48	6,060.00	6,057.39	34.85	156.41	-54.53	2,230.42	-8,344.65	8,410.69	8,219.90	190.79	44.084					
7,100.00	6,761.76	6,060.00	6,057.39	35.17	156.41	-54.49	2,230.42	-8,344.65	8,393.86	8,202.82	191.04	43.937					
7,150.00	6,798.55	6,060.00	6,057.39	35.51	156.41	-54.91	2,230.42	-8,344.65	8,374.64	8,183.33	191.31	43.775					
7,200.00	6,832.61	6,060.00	6,057.39	35.86	156.41	-55.74	2,230.42	-8,344.65	8,353.13	8,161.54	191.59	43.600					
7,250.00	6,863.74	6,060.00	6,057.39	36.22	156.41	-56.96	2,230.42	-8,344.65	8,329.44	8,137.56	191.88	43.411					
7,300.00	6,891.74	6,060.00	6,057.39	36.59	156.41	-58.55	2,230.42	-8,344.65	8,303.70	8,111.53	192.18	43.209					
7,350.00	6,916.44	6,060.00	6,057.39	36.98	156.41	-60.53	2,230.42	-8,344.65	8,276.06	8,083.57	192.49	42.996					
7,400.00	6,937.69	6,060.00	6,057.39	37.37	156.41	-62.88	2,230.42	-8,344.65	8,246.66	8,053.86	192.81	42.772					
7,450.00	6,955.36	6,060.00	6,057.39	37.78	156.41	-65.63	2,230.42	-8,344.65	8,215.67	8,022.54	193.14	42.538					
7,500.00	6,969.34	6,060.00	6,057.39	38.19	156.41	-68.77	2,230.42	-8,344.65	8,183.27	7,989.79	193.48	42.295					
7,550.00	6,979.53	6,060.00	6,057.39	38.62	156.41	-72.31	2,230.42	-8,344.65	8,149.63	7,955.80	193.83	42.045					
7,600.00	6,985.89	6,060.00	6,057.39	39.05	156.41	-76.23	2,230.42	-8,344.65	8,114.96	7,920.77	194.19	41.789					
7,650.00	6,988.37	6,060.00	6,057.39	39.48	156.41	-80.51	2,230.42	-8,344.65	8,079.44	7,884.89	194.55	41.528					
7,657.25	6,988.40	6,060.00	6,057.39	39.54	156.41	-81.15	2,230.42	-8,344.65	8,074.23	7,879.62	194.61	41.489					
7,700.00	6,988.37	6,060.00	6,057.39	39.92	156.41	-81.15	2,230.42	-8,344.65	8,043.55	7,848.62	194.93	41.264					
7,800.00	6,988.30	6,060.00	6,057.39	40.82	156.41	-81.15	2,230.42	-8,344.65	7,972.21	7,776.51	195.69	40.738					
7,900.00	6,988.23	6,060.00	6,057.39	41.77	156.41	-81.15	2,230.42	-8,344.65	7,901.48	7,705.00	196.48	40.214					
8,000.00	6,988.16	6,060.00	6,057.39	42.75	156.41	-81.15	2,230.42	-8,344.65	7,831.40	7,634.10	197.30	39.692					
8,100.00	6,988.09	6,060.00	6,057.39	43.76	156.41	-81.15	2,230.42	-8,344.65	7,761.97	7,563.82	198.15	39.172					
8,152.35	6,988.06	6,060.00	6,057.39	44.30	156.41	-81.15	2,230.42	-8,344.65	7,725.89	7,527.29	198.60	38.901					
8,200.00	6,988.02	6,060.00	6,057.39	44.79	156.41	-80.87	2,230.42	-8,344.65	7,692.65	7,493.64	199.01	38.654					
8,300.00	6,987.95	6,060.00	6,057.39	45.83	156.41	-80.17	2,230.42	-8,344.65	7,619.80	7,419.95	199.85	38.127					
8,400.00	6,987.88	6,060.00	6,057.39	46.85	156.41	-79.32	2,230.42	-8,344.65	7,542.97	7,342.32	200.65	37.592					
8,500.00	6,987.80	6,060.00	6,057.39	47.85	156.41	-78.26	2,230.42	-8,344.65	7,462.42	7,261.02	201.40	37.052					
8,600.00	6,987.73	6,060.00	6,057.39	48.83	156.41	-76.94	2,230.42	-8,344.65	7,378.42	7,176.32	202.09	36.510					
8,700.00	6,987.65	6,060.00	6,057.39	49.79	156.41	-75.23	2,230.42	-8,344.65	7,291.27	7,088.55	202.72	35.967					

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164A - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		535-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 Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
8,800.00	6,987.57	6,060.00	6,057.39	50.72	156.41	-72.97	2,230.42	-8,344.65	7,201.29	6,998.01	203.28	35.425		
8,900.00	6,987.50	6,060.00	6,057.39	51.62	156.41	-69.87	2,230.42	-8,344.65	7,108.81	6,905.05	203.76	34.887		
9,000.00	6,987.42	6,060.00	6,057.39	52.48	156.41	-65.43	2,230.42	-8,344.65	7,014.21	6,810.05	204.16	34.356		
9,100.00	6,987.34	6,060.00	6,057.39	53.30	156.41	-58.67	2,230.42	-8,344.65	6,917.86	6,713.38	204.47	33.832		
9,200.00	6,987.27	6,060.00	6,057.39	54.08	156.41	-47.70	2,230.42	-8,344.65	6,820.16	6,615.47	204.69	33.319		
9,215.33	6,987.26	6,060.00	6,057.39	54.20	156.41	-45.44	2,230.42	-8,344.65	6,805.09	6,600.38	204.71	33.242		
9,300.00	6,987.20	6,060.00	6,057.39	54.85	156.41	-45.44	2,230.42	-8,344.65	6,721.83	6,516.98	204.84	32.814		
9,400.00	6,987.12	6,060.00	6,057.39	55.65	156.41	-45.44	2,230.42	-8,344.65	6,623.53	6,418.53	205.00	32.310		
9,500.00	6,987.05	6,060.00	6,057.39	56.48	156.41	-45.44	2,230.42	-8,344.65	6,525.29	6,320.13	205.16	31.806		
9,600.00	6,986.98	6,060.00	6,057.39	57.35	156.41	-45.44	2,230.42	-8,344.65	6,427.10	6,221.78	205.33	31.302		
9,700.00	6,986.90	6,060.00	6,057.39	58.24	156.41	-45.44	2,230.42	-8,344.65	6,328.97	6,123.47	205.50	30.798		
9,800.00	6,986.83	6,060.00	6,057.39	59.17	156.41	-45.44	2,230.42	-8,344.65	6,230.90	6,025.22	205.67	30.295		
9,900.00	6,986.75	6,060.00	6,057.39	60.12	156.41	-45.44	2,230.42	-8,344.65	6,132.89	5,927.03	205.86	29.792		
10,000.00	6,986.68	6,060.00	6,057.39	61.10	156.41	-45.44	2,230.42	-8,344.65	6,034.94	5,828.90	206.04	29.290		
10,100.00	6,986.61	6,060.00	6,057.39	62.11	156.41	-45.44	2,230.42	-8,344.65	5,937.07	5,730.83	206.24	28.788		
10,200.00	6,986.53	6,060.00	6,057.39	63.14	156.41	-45.44	2,230.42	-8,344.65	5,839.26	5,632.83	206.44	28.286		
10,300.00	6,986.46	6,060.00	6,057.39	64.20	156.41	-45.44	2,230.42	-8,344.65	5,741.54	5,534.89	206.64	27.785		
10,400.00	6,986.39	6,060.00	6,057.39	65.28	156.41	-45.44	2,230.42	-8,344.65	5,643.89	5,437.03	206.85	27.284		
10,500.00	6,986.31	6,060.00	6,057.39	66.38	156.41	-45.44	2,230.42	-8,344.65	5,546.32	5,339.25	207.07	26.784		
10,600.00	6,986.24	6,060.00	6,057.39	67.50	156.41	-45.44	2,230.42	-8,344.65	5,448.84	5,241.55	207.30	26.285		
10,700.00	6,986.17	6,060.00	6,057.39	68.64	156.41	-45.44	2,230.42	-8,344.65	5,351.46	5,143.93	207.53	25.786		
10,800.00	6,986.09	6,060.00	6,057.39	69.80	156.41	-45.44	2,230.42	-8,344.65	5,254.17	5,046.40	207.77	25.288		
10,900.00	6,986.02	6,060.00	6,057.39	70.98	156.41	-45.44	2,230.42	-8,344.65	5,156.99	4,948.97	208.02	24.791		
11,000.00	6,985.95	6,060.00	6,057.39	72.17	156.41	-45.44	2,230.42	-8,344.65	5,059.92	4,851.64	208.28	24.294		
11,100.00	6,985.87	6,060.00	6,057.39	73.38	156.41	-45.44	2,230.42	-8,344.65	4,962.96	4,754.42	208.55	23.798		
11,200.00	6,985.80	6,060.00	6,057.39	74.61	156.41	-45.44	2,230.42	-8,344.65	4,866.13	4,657.31	208.82	23.303		
11,300.00	6,985.72	6,060.00	6,057.39	75.85	156.41	-45.44	2,230.42	-8,344.65	4,769.43	4,560.33	209.11	22.809		
11,400.00	6,985.65	6,060.00	6,057.39	77.10	156.41	-45.44	2,230.42	-8,344.65	4,672.87	4,463.47	209.40	22.316		
11,500.00	6,985.58	6,060.00	6,057.39	78.37	156.41	-45.44	2,230.42	-8,344.65	4,576.45	4,366.75	209.71	21.823		
11,600.00	6,985.50	6,060.00	6,057.39	79.65	156.41	-45.44	2,230.42	-8,344.65	4,480.19	4,270.17	210.02	21.332		
11,700.00	6,985.43	6,060.00	6,057.39	80.94	156.41	-45.44	2,230.42	-8,344.65	4,384.10	4,173.76	210.35	20.842		
11,800.00	6,985.36	6,060.00	6,057.39	82.24	156.41	-45.44	2,230.42	-8,344.65	4,288.19	4,077.51	210.69	20.353		
11,900.00	6,985.28	6,060.00	6,057.39	83.56	156.41	-45.44	2,230.42	-8,344.65	4,192.47	3,981.43	211.04	19.866		
12,000.00	6,985.21	6,060.00	6,057.39	84.88	156.41	-45.44	2,230.42	-8,344.65	4,096.95	3,885.55	211.40	19.380		
12,100.00	6,985.14	6,060.00	6,057.39	86.21	156.41	-45.44	2,230.42	-8,344.65	4,001.66	3,789.88	211.78	18.895		
12,200.00	6,985.06	6,060.00	6,057.39	87.56	156.41	-45.44	2,230.42	-8,344.65	3,906.60	3,694.43	212.17	18.413		
12,300.00	6,984.99	6,060.00	6,057.39	88.91	156.41	-45.44	2,230.42	-8,344.65	3,811.79	3,599.21	212.57	17.931		
12,400.00	6,984.92	6,060.00	6,057.39	90.27	156.41	-45.44	2,230.42	-8,344.65	3,717.25	3,504.25	213.00	17.452		
12,500.00	6,984.84	6,060.00	6,057.39	91.64	156.41	-45.44	2,230.42	-8,344.65	3,623.00	3,409.57	213.43	16.975		
12,600.00	6,984.77	6,060.00	6,057.39	93.01	156.41	-45.44	2,230.42	-8,344.65	3,529.08	3,315.19	213.88	16.500		
12,700.00	6,984.69	6,060.00	6,057.39	94.40	156.41	-45.44	2,230.42	-8,344.65	3,435.49	3,221.14	214.35	16.027		
12,800.00	6,984.62	6,060.00	6,057.39	95.79	156.41	-45.44	2,230.42	-8,344.65	3,342.28	3,127.44	214.84	15.557		
12,900.00	6,984.55	6,060.00	6,057.39	97.18	156.41	-45.44	2,230.42	-8,344.65	3,249.47	3,034.13	215.34	15.090		
13,000.00	6,984.47	6,060.00	6,057.39	98.59	156.41	-45.44	2,230.42	-8,344.65	3,157.10	2,941.24	215.86	14.626		
13,100.00	6,984.40	6,060.00	6,057.39	100.00	156.41	-45.44	2,230.42	-8,344.65	3,065.21	2,848.81	216.40	14.165		
13,200.00	6,984.33	6,060.00	6,057.39	101.41	156.41	-45.44	2,230.42	-8,344.65	2,973.84	2,756.88	216.96	13.707		
13,300.00	6,984.25	6,060.00	6,057.39	102.83	156.41	-45.44	2,230.42	-8,344.65	2,883.05	2,665.51	217.53	13.253		
13,400.00	6,984.18	6,060.00	6,057.39	104.26	156.41	-45.44	2,230.42	-8,344.65	2,792.88	2,574.76	218.12	12.804		
13,500.00	6,984.11	6,060.00	6,057.39	105.69	156.41	-45.44	2,230.42	-8,344.65	2,703.41	2,484.67	218.73	12.360		
13,600.00	6,984.03	6,060.00	6,057.39	107.13	156.41	-45.44	2,230.42	-8,344.65	2,614.69	2,395.34	219.35	11.920		
13,700.00	6,983.96	6,060.00	6,057.39	108.57	156.41	-45.44	2,230.42	-8,344.65	2,526.83	2,306.84	219.99	11.486		
13,800.00	6,983.88	6,060.00	6,057.39	110.02	156.41	-45.44	2,230.42	-8,344.65	2,439.89	2,219.26	220.64	11.058		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164A - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		535-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	
13,900.00	6,983.81	6,060.00	6,057.39	111.47	156.41	-45.44	2,230.42	-8,344.65	2,354.00	2,132.71	221.29	10.638		
14,000.00	6,983.74	6,060.00	6,057.39	112.92	156.41	-45.44	2,230.42	-8,344.65	2,269.26	2,047.31	221.94	10.225		
14,100.00	6,983.66	6,060.00	6,057.39	114.38	156.41	-45.44	2,230.42	-8,344.65	2,185.81	1,963.22	222.59	9.820		
14,200.00	6,983.59	6,060.00	6,057.39	115.85	156.41	-45.44	2,230.42	-8,344.65	2,103.80	1,880.57	223.23	9.425		
14,300.00	6,983.52	6,060.00	6,057.39	117.31	156.41	-45.44	2,230.42	-8,344.65	2,023.41	1,799.57	223.84	9.040		
14,400.00	6,983.44	6,060.00	6,057.39	118.78	156.41	-45.44	2,230.42	-8,344.65	1,944.84	1,720.43	224.41	8.666		
14,500.00	6,983.37	6,060.00	6,057.39	120.26	156.41	-45.44	2,230.42	-8,344.65	1,868.33	1,643.39	224.94	8.306		
14,600.00	6,983.30	6,060.00	6,057.39	121.74	156.41	-45.44	2,230.42	-8,344.65	1,794.12	1,568.73	225.39	7.960		
14,700.00	6,983.22	6,060.00	6,057.39	123.22	156.41	-45.44	2,230.42	-8,344.65	1,722.52	1,496.78	225.75	7.630		
14,800.00	6,983.15	6,060.00	6,057.39	124.70	156.41	-45.44	2,230.42	-8,344.65	1,653.88	1,427.90	225.98	7.319		
14,900.00	6,983.08	6,060.00	6,057.39	126.19	156.41	-45.44	2,230.42	-8,344.65	1,588.57	1,362.49	226.07	7.027		
15,000.00	6,983.00	6,060.00	6,057.39	127.68	156.41	-45.44	2,230.42	-8,344.65	1,527.01	1,301.03	225.99	6.757		
15,100.00	6,982.93	6,060.00	6,057.39	129.17	156.41	-45.44	2,230.42	-8,344.65	1,469.69	1,244.00	225.69	6.512		
15,200.00	6,982.85	6,060.00	6,057.39	130.67	156.41	-45.44	2,230.42	-8,344.65	1,417.11	1,191.94	225.17	6.293		
15,300.00	6,982.78	6,060.00	6,057.39	132.16	156.41	-45.44	2,230.42	-8,344.65	1,369.83	1,145.42	224.41	6.104		
15,400.00	6,982.71	6,060.00	6,057.39	133.66	156.41	-45.44	2,230.42	-8,344.65	1,328.41	1,104.99	223.41	5.946		
15,500.00	6,982.63	6,060.00	6,057.39	135.17	156.41	-45.44	2,230.42	-8,344.65	1,293.40	1,071.20	222.20	5.821		
15,600.00	6,982.56	6,060.00	6,057.39	136.67	156.41	-45.44	2,230.42	-8,344.65	1,265.35	1,044.52	220.83	5.730		
15,700.00	6,982.49	6,060.00	6,057.39	138.18	156.41	-45.44	2,230.42	-8,344.65	1,244.72	1,025.36	219.36	5.674		
15,800.00	6,982.41	6,060.00	6,057.39	139.69	156.41	-45.44	2,230.42	-8,344.65	1,231.89	1,014.03	217.86	5.654 SF		
15,900.00	6,982.34	6,060.00	6,057.39	141.20	156.41	-45.44	2,230.42	-8,344.65	1,227.10	1,010.69	216.41	5.670 ES		
15,908.88	6,982.33	6,060.00	6,057.39	141.34	156.41	-45.44	2,230.42	-8,344.65	1,227.07	1,010.79	216.28	5.673 CC		
16,000.00	6,982.27	6,060.00	6,057.39	142.71	156.41	-45.44	2,230.42	-8,344.65	1,230.45	1,015.40	215.05	5.722		
16,100.00	6,982.19	6,060.00	6,057.39	144.23	156.41	-45.44	2,230.42	-8,344.65	1,241.87	1,028.06	213.80	5.808		
16,200.00	6,982.12	6,060.00	6,057.39	145.75	156.41	-45.44	2,230.42	-8,344.65	1,261.13	1,048.47	212.66	5.930		
16,300.00	6,982.05	6,060.00	6,057.39	147.27	156.41	-45.44	2,230.42	-8,344.65	1,287.90	1,076.30	211.60	6.087		
16,400.00	6,981.97	6,060.00	6,057.39	148.79	156.41	-45.44	2,230.42	-8,344.65	1,321.70	1,111.13	210.57	6.277		
16,500.00	6,981.90	6,060.00	6,057.39	150.31	156.41	-45.44	2,230.42	-8,344.65	1,362.03	1,152.47	209.57	6.499		
16,600.00	6,981.82	6,060.00	6,057.39	151.84	156.41	-45.44	2,230.42	-8,344.65	1,408.32	1,199.76	208.55	6.753		
16,700.00	6,981.75	6,060.00	6,057.39	153.36	156.41	-45.44	2,230.42	-8,344.65	1,459.99	1,252.46	207.53	7.035		
16,800.00	6,981.68	6,060.00	6,057.39	154.89	156.41	-45.44	2,230.42	-8,344.65	1,516.51	1,310.02	206.49	7.344		
16,900.00	6,981.60	6,060.00	6,057.39	156.42	156.41	-45.44	2,230.42	-8,344.65	1,577.35	1,371.89	205.46	7.677		
17,000.00	6,981.53	6,060.00	6,057.39	157.95	156.41	-45.44	2,230.42	-8,344.65	1,642.03	1,437.59	204.43	8.032		
17,100.00	6,981.46	6,060.00	6,057.39	159.49	156.41	-45.44	2,230.42	-8,344.65	1,710.11	1,506.68	203.43	8.406		
17,200.00	6,981.38	6,060.00	6,057.39	161.02	156.41	-45.44	2,230.42	-8,344.65	1,781.21	1,578.75	202.46	8.798		
17,300.00	6,981.31	6,060.00	6,057.39	162.56	156.41	-45.44	2,230.42	-8,344.65	1,854.97	1,653.45	201.53	9.205		
17,400.00	6,981.24	6,060.00	6,057.39	164.09	156.41	-45.44	2,230.42	-8,344.65	1,931.10	1,730.45	200.65	9.624		
17,500.00	6,981.16	6,060.00	6,057.39	165.63	156.41	-45.44	2,230.42	-8,344.65	2,009.32	1,809.50	199.82	10.055		
17,600.00	6,981.09	6,060.00	6,057.39	167.17	156.41	-45.44	2,230.42	-8,344.65	2,089.40	1,890.34	199.06	10.496		
17,700.00	6,981.01	6,060.00	6,057.39	168.71	156.41	-45.44	2,230.42	-8,344.65	2,171.13	1,972.78	198.35	10.946		
17,800.00	6,980.94	6,060.00	6,057.39	170.25	156.41	-45.44	2,230.42	-8,344.65	2,254.34	2,056.63	197.70	11.403		
17,900.00	6,980.87	6,060.00	6,057.39	171.80	156.41	-45.44	2,230.42	-8,344.65	2,338.86	2,141.74	197.12	11.865		
18,000.00	6,980.79	6,060.00	6,057.39	173.34	156.41	-45.44	2,230.42	-8,344.65	2,424.56	2,227.98	196.59	12.333		
18,100.00	6,980.72	6,060.00	6,057.39	174.89	156.41	-45.44	2,230.42	-8,344.65	2,511.32	2,315.21	196.11	12.806		
18,200.00	6,980.65	6,060.00	6,057.39	176.43	156.41	-45.44	2,230.42	-8,344.65	2,599.03	2,403.34	195.68	13.282		
18,300.00	6,980.57	6,060.00	6,057.39	177.98	156.41	-45.44	2,230.42	-8,344.65	2,687.59	2,492.29	195.31	13.761		
18,400.00	6,980.50	6,060.00	6,057.39	179.53	156.41	-45.44	2,230.42	-8,344.65	2,776.94	2,581.96	194.98	14.242		
18,500.00	6,980.43	6,060.00	6,057.39	181.08	156.41	-45.44	2,230.42	-8,344.65	2,866.99	2,672.30	194.69	14.726		
18,600.00	6,980.35	6,060.00	6,057.39	182.63	156.41	-45.44	2,230.42	-8,344.65	2,957.67	2,763.23	194.44	15.211		
18,700.00	6,980.28	6,060.00	6,057.39	184.18	156.41	-45.44	2,230.42	-8,344.65	3,048.94	2,854.72	194.23	15.698		
18,800.00	6,980.21	6,060.00	6,057.39	185.73	156.41	-45.44	2,230.42	-8,344.65	3,140.75	2,946.70	194.05	16.185		
18,900.00	6,980.13	6,060.00	6,057.39	187.28	156.41	-45.44	2,230.42	-8,344.65	3,233.03	3,039.14	193.90	16.674		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164A - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program:		535-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)
19,000.00	6,980.06	6,060.00	6,057.39	188.84	156.41	-45.44	2,230.42	-8,344.65	3,325.77	3,131.99	193.78	17.163	
19,100.00	6,979.98	6,060.00	6,057.39	190.39	156.41	-45.44	2,230.42	-8,344.65	3,418.91	3,225.23	193.68	17.652	
19,200.00	6,979.91	6,060.00	6,057.39	191.95	156.41	-45.44	2,230.42	-8,344.65	3,512.43	3,318.83	193.61	18.142	
19,300.00	6,979.84	6,060.00	6,057.39	193.51	156.41	-45.44	2,230.42	-8,344.65	3,606.30	3,412.75	193.56	18.632	
19,400.00	6,979.76	6,060.00	6,057.39	195.06	156.41	-45.44	2,230.42	-8,344.65	3,700.49	3,506.97	193.52	19.122	
19,500.00	6,979.69	6,060.00	6,057.39	196.62	156.41	-45.44	2,230.42	-8,344.65	3,794.98	3,601.47	193.50	19.612	
19,600.00	6,979.62	6,060.00	6,057.39	198.18	156.41	-45.44	2,230.42	-8,344.65	3,889.74	3,696.24	193.50	20.102	
19,700.00	6,979.54	6,060.00	6,057.39	199.74	156.41	-45.44	2,230.42	-8,344.65	3,984.76	3,791.24	193.52	20.591	
19,800.00	6,979.47	6,060.00	6,057.39	201.30	156.41	-45.44	2,230.42	-8,344.65	4,080.02	3,886.47	193.54	21.081	
19,900.00	6,979.40	6,060.00	6,057.39	202.86	156.41	-45.44	2,230.42	-8,344.65	4,175.49	3,981.92	193.58	21.570	
20,000.00	6,979.32	6,060.00	6,057.39	204.42	156.41	-45.44	2,230.42	-8,344.65	4,271.18	4,077.56	193.62	22.059	
20,100.00	6,979.25	6,060.00	6,057.39	205.98	156.41	-45.44	2,230.42	-8,344.65	4,367.06	4,173.38	193.68	22.548	
20,200.00	6,979.18	6,060.00	6,057.39	207.55	156.41	-45.44	2,230.42	-8,344.65	4,463.12	4,269.37	193.74	23.036	
20,300.00	6,979.10	6,060.00	6,057.39	209.11	156.41	-45.44	2,230.42	-8,344.65	4,559.35	4,365.53	193.82	23.524	
20,400.00	6,979.03	6,060.00	6,057.39	210.68	156.41	-45.44	2,230.42	-8,344.65	4,655.74	4,461.84	193.89	24.012	
20,500.00	6,978.95	6,060.00	6,057.39	212.24	156.41	-45.44	2,230.42	-8,344.65	4,752.27	4,558.30	193.98	24.499	
20,600.00	6,978.88	6,060.00	6,057.39	213.81	156.41	-45.44	2,230.42	-8,344.65	4,848.95	4,654.88	194.07	24.986	
20,700.00	6,978.81	6,060.00	6,057.39	215.37	156.41	-45.44	2,230.42	-8,344.65	4,945.76	4,751.60	194.16	25.472	
20,800.00	6,978.73	6,060.00	6,057.39	216.94	156.41	-45.44	2,230.42	-8,344.65	5,042.69	4,848.44	194.26	25.959	
20,900.00	6,978.66	6,060.00	6,057.39	218.51	156.41	-45.44	2,230.42	-8,344.65	5,139.75	4,945.38	194.36	26.444	
21,000.00	6,978.59	6,060.00	6,057.39	220.07	156.41	-45.44	2,230.42	-8,344.65	5,236.91	5,042.44	194.47	26.929	
21,100.00	6,978.51	6,060.00	6,057.39	221.64	156.41	-45.44	2,230.42	-8,344.65	5,334.18	5,139.60	194.58	27.414	
21,200.00	6,978.44	6,060.00	6,057.39	223.21	156.41	-45.44	2,230.42	-8,344.65	5,431.54	5,236.86	194.69	27.899	
21,300.00	6,978.37	6,060.00	6,057.39	224.78	156.41	-45.44	2,230.42	-8,344.65	5,529.00	5,334.20	194.80	28.383	
21,400.00	6,978.29	6,060.00	6,057.39	226.35	156.41	-45.44	2,230.42	-8,344.65	5,626.55	5,431.64	194.92	28.866	
21,500.00	6,978.22	6,060.00	6,057.39	227.92	156.41	-45.44	2,230.42	-8,344.65	5,724.19	5,529.15	195.04	29.349	
21,600.00	6,978.14	6,060.00	6,057.39	229.49	156.41	-45.44	2,230.42	-8,344.65	5,821.90	5,626.75	195.16	29.832	
21,700.00	6,978.07	6,060.00	6,057.39	231.06	156.41	-45.44	2,230.42	-8,344.65	5,919.70	5,724.42	195.28	30.314	
21,800.00	6,978.00	6,060.00	6,057.39	232.63	156.41	-45.44	2,230.42	-8,344.65	6,017.56	5,822.16	195.40	30.796	
21,900.00	6,977.92	6,060.00	6,057.39	234.21	156.41	-45.44	2,230.42	-8,344.65	6,115.49	5,919.97	195.52	31.278	
22,000.00	6,977.85	6,060.00	6,057.39	235.78	156.41	-45.44	2,230.42	-8,344.65	6,213.49	6,017.84	195.65	31.759	
22,100.00	6,977.78	6,060.00	6,057.39	237.35	156.41	-45.44	2,230.42	-8,344.65	6,311.55	6,115.78	195.77	32.239	
22,200.00	6,977.70	6,060.00	6,057.39	238.92	156.41	-45.44	2,230.42	-8,344.65	6,409.67	6,213.77	195.90	32.719	
22,300.00	6,977.63	6,060.00	6,057.39	240.50	156.41	-45.44	2,230.42	-8,344.65	6,507.85	6,311.83	196.03	33.199	
22,400.00	6,977.56	6,060.00	6,057.39	242.07	156.41	-45.44	2,230.42	-8,344.65	6,606.09	6,409.93	196.15	33.678	
22,500.00	6,977.48	6,060.00	6,057.39	243.65	156.41	-45.44	2,230.42	-8,344.65	6,704.37	6,508.09	196.28	34.157	
22,600.00	6,977.41	6,060.00	6,057.39	245.22	156.41	-45.44	2,230.42	-8,344.65	6,802.71	6,606.29	196.41	34.635	
22,700.00	6,977.34	6,060.00	6,057.39	246.80	156.41	-45.44	2,230.42	-8,344.65	6,901.09	6,704.55	196.54	35.113	
22,800.00	6,977.26	6,060.00	6,057.39	248.37	156.41	-45.44	2,230.42	-8,344.65	6,999.52	6,802.85	196.67	35.590	
22,900.00	6,977.19	6,060.00	6,057.39	249.95	156.41	-45.44	2,230.42	-8,344.65	7,097.99	6,901.19	196.80	36.067	
23,000.00	6,977.11	6,060.00	6,057.39	251.53	156.41	-45.44	2,230.42	-8,344.65	7,196.51	6,999.58	196.93	36.544	
23,100.00	6,977.04	6,060.00	6,057.39	253.10	156.41	-45.44	2,230.42	-8,344.65	7,295.06	7,098.00	197.06	37.020	
23,155.65	6,977.00	6,060.00	6,057.39	253.98	156.41	-45.44	2,230.42	-8,344.65	7,349.93	7,152.80	197.13	37.285	
23,156.15	6,977.00	6,060.00	6,057.39	254.06	156.41	-45.44	2,230.42	-8,344.65	7,350.42	7,149.19	201.23	36.528	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164B - OH - OH-SVY													Offset Site Error: 0.00 usft
Survey Program: 563-MWD OWSG Rev5													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	-75.08	2,232.28	-8,378.74	8,671.21				
100.00	100.00	37.98	37.98	0.25	0.67	-75.08	2,232.26	-8,378.75	8,671.01	8,670.08	0.92	9,381.654	
200.00	200.00	132.94	132.94	0.61	2.36	-75.08	2,232.04	-8,378.86	8,671.06	8,668.10	2.97	2,923.961	
300.00	300.00	227.89	227.89	0.97	4.05	-75.09	2,231.56	-8,379.09	8,671.17	8,666.17	5.01	1,731.897	
400.00	400.00	322.84	322.83	1.33	5.73	-75.09	2,230.84	-8,379.45	8,671.34	8,664.29	7.05	1,230.342	
500.00	500.00	417.78	417.77	1.68	7.42	-75.10	2,229.86	-8,379.94	8,671.57	8,662.48	9.09	954.075	
600.00	599.98	512.67	512.65	2.04	9.11	-85.12	2,228.63	-8,380.54	8,671.70	8,660.58	11.13	779.240	
665.52	665.42	563.00	562.97	2.28	10.00	-85.14	2,227.88	-8,380.91	8,671.67	8,659.42	12.25	707.620	
700.00	699.84	563.00	562.97	2.41	10.00	-85.14	2,227.88	-8,380.91	8,671.73	8,659.35	12.38	700.582	
800.00	799.45	611.33	611.28	2.77	10.18	-85.16	2,226.93	-8,381.62	8,672.04	8,659.16	12.88	673.260	
900.00	898.70	654.00	653.92	3.13	10.34	-85.19	2,225.78	-8,382.80	8,672.90	8,659.53	13.37	648.779	
1,000.00	997.47	654.00	653.92	3.50	10.34	-85.16	2,225.78	-8,382.80	8,674.31	8,660.57	13.74	631.304	
1,100.00	1,095.63	654.00	653.92	3.89	10.34	-82.76	2,225.78	-8,382.80	8,676.14	8,662.01	14.12	614.310	
1,200.00	1,193.09	705.23	705.05	4.29	10.55	-81.13	2,223.78	-8,385.27	8,677.20	8,662.55	14.64	592.598	
1,300.00	1,289.73	744.00	743.66	4.72	10.73	-79.92	2,221.68	-8,388.14	8,678.48	8,663.34	15.14	573.177	
1,400.00	1,385.42	744.00	743.66	5.16	10.73	-78.92	2,221.68	-8,388.14	8,679.33	8,663.75	15.58	557.185	
1,496.97	1,477.20	779.53	778.98	5.62	10.87	-78.23	2,219.45	-8,391.27	8,679.99	8,663.89	16.10	539.147	
1,500.00	1,480.05	780.78	780.22	5.63	10.87	-78.24	2,219.37	-8,391.39	8,680.01	8,663.89	16.12	538.584	
1,600.00	1,574.15	835.00	834.06	6.12	11.08	-78.39	2,215.66	-8,396.60	8,680.90	8,664.19	16.71	519.518	
1,700.00	1,668.25	835.00	834.06	6.62	11.08	-78.39	2,215.66	-8,396.60	8,682.56	8,665.36	17.20	504.924	
1,800.00	1,762.35	893.78	892.30	7.12	11.24	-78.55	2,210.88	-8,402.97	8,684.86	8,667.07	17.79	488.237	
1,900.00	1,856.45	928.00	926.11	7.64	11.33	-78.65	2,207.57	-8,407.09	8,688.03	8,669.68	18.35	473.586	
2,000.00	1,950.55	928.00	926.11	8.16	11.33	-78.65	2,207.57	-8,407.09	8,692.18	8,673.33	18.85	461.179	
2,100.00	2,044.65	989.10	986.30	8.68	11.55	-78.84	2,200.90	-8,415.23	8,696.85	8,677.36	19.49	446.217	
2,200.00	2,138.75	1,023.00	1,019.59	9.21	11.68	-78.94	2,196.85	-8,420.17	8,702.52	8,682.44	20.07	433.506	
2,300.00	2,232.85	1,023.00	1,019.59	9.74	11.68	-78.94	2,196.85	-8,420.17	8,709.14	8,688.56	20.58	423.102	
2,400.00	2,326.95	1,061.70	1,057.49	10.27	11.81	-79.06	2,192.03	-8,426.28	8,716.54	8,695.34	21.19	411.278	
2,500.00	2,421.05	1,118.00	1,112.44	10.81	12.01	-79.24	2,184.81	-8,436.21	8,725.26	8,703.41	21.85	399.296	
2,600.00	2,515.15	1,118.00	1,112.44	11.34	12.01	-79.24	2,184.81	-8,436.21	8,734.35	8,711.99	22.36	390.590	
2,700.00	2,609.25	1,118.00	1,112.44	11.88	12.01	-79.24	2,184.81	-8,436.21	8,744.57	8,721.70	22.87	382.354	
2,800.00	2,703.35	1,155.85	1,149.24	12.42	12.13	-79.37	2,179.72	-8,443.48	8,755.69	8,732.21	23.48	372.829	
2,900.00	2,797.45	1,210.00	1,201.68	12.96	12.31	-79.54	2,171.95	-8,454.47	8,767.75	8,743.60	24.15	363.113	
3,000.00	2,891.55	1,210.00	1,201.68	13.51	12.31	-79.54	2,171.95	-8,454.47	8,780.44	8,755.79	24.65	356.191	
3,100.00	2,985.65	1,210.00	1,201.68	14.05	12.31	-79.54	2,171.95	-8,454.47	8,794.26	8,769.11	25.15	349.635	
3,200.00	3,079.75	1,267.90	1,257.44	14.60	12.53	-79.74	2,162.79	-8,467.10	8,808.57	8,782.73	25.85	340.809	
3,300.00	3,173.85	1,305.00	1,292.95	15.14	12.68	-79.87	2,156.36	-8,475.70	8,823.95	8,797.48	26.47	333.349	
3,400.00	3,267.95	1,305.00	1,292.95	15.69	12.68	-79.87	2,156.36	-8,475.70	8,840.19	8,813.22	26.97	327.819	
3,500.00	3,362.05	1,305.00	1,292.95	16.23	12.68	-79.87	2,156.36	-8,475.70	8,857.52	8,830.06	27.46	322.576	
3,600.00	3,456.15	1,353.08	1,338.70	16.78	12.89	-80.04	2,147.53	-8,487.57	8,875.37	8,847.23	28.14	315.375	
3,700.00	3,550.25	1,395.00	1,378.32	17.33	13.07	-80.19	2,139.50	-8,498.66	8,894.49	8,865.69	28.80	308.819	
3,800.00	3,644.35	1,395.00	1,378.32	17.88	13.07	-80.19	2,139.50	-8,498.66	8,914.25	8,884.96	29.29	304.386	
3,900.00	3,738.45	1,395.00	1,378.32	18.42	13.07	-80.19	2,139.50	-8,498.66	8,935.08	8,905.32	29.77	300.179	
4,000.00	3,832.55	1,429.78	1,410.96	18.97	13.25	-80.32	2,132.43	-8,508.36	8,956.71	8,926.30	30.42	294.445	
4,100.00	3,926.65	1,449.53	1,429.38	19.52	13.35	-80.39	2,128.16	-8,514.07	8,979.28	8,948.28	30.99	289.709	
4,200.00	4,020.75	1,487.00	1,464.08	20.07	13.55	-80.54	2,119.55	-8,525.26	9,002.80	8,971.14	31.66	284.353	
4,300.00	4,114.85	1,487.00	1,464.08	20.62	13.55	-80.54	2,119.55	-8,525.26	9,027.04	8,994.92	32.13	280.979	
4,400.00	4,208.95	1,487.00	1,464.08	21.17	13.55	-80.54	2,119.55	-8,525.26	9,052.33	9,019.74	32.59	277.779	
4,500.00	4,303.05	1,487.00	1,464.08	21.72	13.55	-80.54	2,119.55	-8,525.26	9,078.65	9,045.61	33.04	274.742	
4,600.00	4,397.15	1,539.29	1,512.02	22.27	13.83	-80.74	2,106.72	-8,541.75	9,105.31	9,071.50	33.80	269.351	
4,700.00	4,491.25	1,578.00	1,547.14	22.82	14.04	-80.89	2,096.76	-8,554.61	9,133.27	9,098.79	34.49	264.839	
4,800.00	4,585.35	1,578.00	1,547.14	23.37	14.04	-80.89	2,096.76	-8,554.61	9,161.87	9,126.94	34.93	262.275	
4,900.00	4,679.45	1,578.00	1,547.14	23.93	14.04	-80.89	2,096.76	-8,554.61	9,191.47	9,156.10	35.37	259.844	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164B - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		563-MWD OWSG Rev5					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	
5,000.00	4,773.55	1,578.00	1,547.14	24.48	14.04	-80.89	2,096.76	-8,554.61	9,222.06	9,186.25	35.81	257.540		
5,100.00	4,867.65	1,578.00	1,547.14	25.03	14.04	-80.89	2,096.76	-8,554.61	9,253.62	9,217.38	36.24	255.358		
5,200.00	4,961.75	1,623.22	1,587.72	25.58	14.28	-81.08	2,084.67	-8,570.48	9,285.48	9,248.52	36.96	251.212		
5,300.00	5,055.85	1,670.00	1,629.11	26.13	14.53	-81.27	2,071.66	-8,587.99	9,318.97	9,281.27	37.70	247.191		
5,400.00	5,149.95	1,670.00	1,629.11	26.68	14.53	-81.27	2,071.66	-8,587.99	9,352.69	9,314.57	38.12	245.358		
5,500.00	5,244.05	1,670.00	1,629.11	27.24	14.53	-81.27	2,071.66	-8,587.99	9,387.35	9,348.82	38.53	243.626		
5,600.00	5,338.15	1,670.00	1,629.11	27.79	14.53	-81.27	2,071.66	-8,587.99	9,422.95	9,384.01	38.94	241.989		
5,665.73	5,400.00	1,670.00	1,629.11	28.15	14.53	-81.27	2,071.66	-8,587.99	9,446.85	9,407.64	39.20	240.964		
5,700.00	5,432.28	1,670.00	1,629.11	28.34	14.53	-81.40	2,071.66	-8,587.99	9,459.48	9,420.14	39.34	240.451		
5,800.00	5,526.87	1,670.00	1,629.11	28.88	14.53	-81.80	2,071.66	-8,587.99	9,497.11	9,457.39	39.72	239.072		
5,900.00	5,622.01	1,710.98	1,664.93	29.41	14.72	-82.38	2,060.09	-8,604.16	9,535.40	9,495.02	40.38	236.159		
6,000.00	5,717.67	1,724.61	1,676.79	29.92	14.78	-82.86	2,056.25	-8,609.70	9,574.89	9,534.07	40.82	234.563		
6,100.00	5,813.83	1,763.00	1,709.97	30.41	14.96	-83.44	2,045.50	-8,625.72	9,615.53	9,574.11	41.42	232.138		
6,200.00	5,910.44	1,763.00	1,709.97	30.89	14.96	-83.89	2,045.50	-8,625.72	9,656.80	9,615.07	41.73	231.404		
6,300.00	6,007.50	1,763.00	1,709.97	31.36	14.96	-84.35	2,045.50	-8,625.72	9,699.09	9,657.07	42.02	230.814		
6,400.00	6,104.96	1,763.00	1,709.97	31.80	14.96	-84.83	2,045.50	-8,625.72	9,742.38	9,700.09	42.29	230.361		
6,500.00	6,202.80	1,804.25	1,745.31	32.24	15.11	-85.46	2,033.82	-8,643.50	9,786.28	9,743.45	42.82	228.523		
6,600.00	6,300.98	1,859.00	1,791.69	32.66	15.32	-86.13	2,017.82	-8,667.81	9,831.36	9,787.93	43.43	226.358		
6,700.00	6,399.48	1,859.00	1,791.69	33.06	15.32	-86.64	2,017.82	-8,667.81	9,876.72	9,833.07	43.65	226.265		
6,722.82	6,422.00	1,859.00	1,791.69	33.15	15.32	-86.76	2,017.82	-8,667.81	9,887.20	9,843.50	43.70	226.260		
6,750.00	6,448.76	1,859.00	1,791.69	33.26	15.32	-76.26	2,017.82	-8,667.81	9,899.32	9,855.56	43.76	226.238		
6,800.00	6,497.51	1,859.00	1,791.69	33.48	15.32	-63.82	2,017.82	-8,667.81	9,919.55	9,875.67	43.88	226.074		
6,850.00	6,545.40	1,859.00	1,791.69	33.72	15.32	-56.35	2,017.82	-8,667.81	9,937.01	9,892.99	44.02	225.750		
6,900.00	6,592.13	1,859.00	1,791.69	33.97	15.32	-51.46	2,017.82	-8,667.81	9,951.61	9,907.43	44.18	225.268		
6,950.00	6,637.40	1,859.00	1,791.69	34.25	15.32	-48.08	2,017.82	-8,667.81	9,963.27	9,918.92	44.35	224.634		
7,000.00	6,680.94	1,859.00	1,791.69	34.54	15.32	-45.65	2,017.82	-8,667.81	9,971.93	9,927.38	44.55	223.855		
7,050.00	6,722.48	1,859.00	1,791.69	34.85	15.32	-43.89	2,017.82	-8,667.81	9,977.55	9,932.79	44.75	222.941		
7,100.00	6,761.76	1,859.00	1,791.69	35.17	15.32	-42.63	2,017.82	-8,667.81	9,980.09	9,935.11	44.98	221.897		
7,150.00	6,798.55	1,859.00	1,791.69	35.51	15.32	-41.77	2,017.82	-8,667.81	9,979.54	9,934.33	45.21	220.732		
7,200.00	6,832.61	1,900.16	1,825.97	35.86	15.54	-41.43	2,005.18	-8,686.76	9,975.31	9,929.48	45.83	217.654		
7,250.00	6,863.74	1,904.20	1,829.29	36.22	15.56	-41.21	2,003.90	-8,688.66	9,968.49	9,922.36	46.13	216.110		
7,300.00	6,891.74	1,907.92	1,832.35	36.59	15.58	-41.27	2,002.71	-8,690.42	9,958.63	9,912.20	46.43	214.487		
7,350.00	6,916.44	1,911.32	1,835.14	36.98	15.60	-41.58	2,001.62	-8,692.03	9,945.80	9,899.06	46.74	212.794		
7,400.00	6,937.69	1,952.00	1,868.09	37.37	15.81	-42.36	1,988.13	-8,711.71	9,930.56	9,883.16	47.40	209.500		
7,450.00	6,955.36	1,952.00	1,868.09	37.78	15.81	-43.18	1,988.13	-8,711.71	9,911.93	9,864.23	47.70	207.818		
7,500.00	6,969.34	1,952.00	1,868.09	38.19	15.81	-44.27	1,988.13	-8,711.71	9,890.59	9,842.59	47.99	206.077		
7,550.00	6,979.53	1,952.00	1,868.09	38.62	15.81	-45.65	1,988.13	-8,711.71	9,866.65	9,818.35	48.30	204.287		
7,600.00	6,985.89	1,952.00	1,868.09	39.05	15.81	-47.36	1,988.13	-8,711.71	9,840.25	9,791.65	48.60	202.456		
7,650.00	6,988.37	1,952.00	1,868.09	39.48	15.81	-49.42	1,988.13	-8,711.71	9,811.53	9,762.62	48.91	200.595		
7,657.25	6,988.40	1,952.00	1,868.09	39.54	15.81	-49.75	1,988.13	-8,711.71	9,807.18	9,758.23	48.96	200.316		
7,700.00	6,988.37	1,952.00	1,868.09	39.92	15.81	-49.75	1,988.13	-8,711.71	9,781.47	9,732.25	49.22	198.727		
7,800.00	6,988.30	1,952.00	1,868.09	40.82	15.81	-49.75	1,988.13	-8,711.71	9,721.80	9,671.95	49.85	195.021		
7,900.00	6,988.23	1,952.00	1,868.09	41.77	15.81	-49.75	1,988.13	-8,711.71	9,662.79	9,612.29	50.50	191.339		
8,000.00	6,988.16	1,952.00	1,868.09	42.75	15.81	-49.75	1,988.13	-8,711.71	9,604.46	9,553.29	51.17	187.685		
8,100.00	6,988.09	1,952.00	1,868.09	43.76	15.81	-49.75	1,988.13	-8,711.71	9,546.82	9,494.96	51.87	184.065		
8,152.35	6,988.06	1,952.00	1,868.09	44.30	15.81	-49.75	1,988.13	-8,711.71	9,516.93	9,464.69	52.24	182.186		
8,200.00	6,988.02	1,952.00	1,868.09	44.79	15.81	-48.87	1,988.13	-8,711.71	9,489.39	9,436.82	52.57	180.495		
8,300.00	6,987.95	1,952.00	1,868.09	45.83	15.81	-46.84	1,988.13	-8,711.71	9,429.00	9,375.75	53.26	177.053		
8,400.00	6,987.88	1,952.00	1,868.09	46.85	15.81	-44.53	1,988.13	-8,711.71	9,365.27	9,311.38	53.90	173.766		
8,500.00	6,987.80	1,952.00	1,868.09	47.85	15.81	-41.91	1,988.13	-8,711.71	9,298.45	9,243.96	54.49	170.646		
8,600.00	6,987.73	1,952.00	1,868.09	48.83	15.81	-38.96	1,988.13	-8,711.71	9,228.79	9,173.76	55.03	167.700		
8,700.00	6,987.65	1,952.00	1,868.09	49.79	15.81	-35.64	1,988.13	-8,711.71	9,156.58	9,101.06	55.52	164.934		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164B - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program:		563-MWD OWSG Rev5						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
8,800.00	6,987.57	1,952.00	1,868.09	50.72	15.81	-31.94	1,988.13	-8,711.71	9,082.11	9,026.17	55.94	162.352	
8,900.00	6,987.50	1,952.00	1,868.09	51.62	15.81	-27.83	1,988.13	-8,711.71	9,005.69	8,949.40	56.30	159.959	
9,000.00	6,987.42	1,952.00	1,868.09	52.48	15.81	-23.34	1,988.13	-8,711.71	8,927.66	8,871.07	56.59	157.760	
9,100.00	6,987.34	1,952.00	1,868.09	53.30	15.81	-18.47	1,988.13	-8,711.71	8,848.35	8,791.54	56.81	155.756	
9,200.00	6,987.27	1,990.84	1,898.96	54.08	16.02	-13.53	1,974.74	-8,731.10	8,767.67	8,710.26	57.41	152.723	
9,215.33	6,987.26	1,992.32	1,900.13	54.20	16.03	-12.72	1,974.22	-8,731.85	8,755.27	8,697.83	57.44	152.417	
9,300.00	6,987.20	2,000.60	1,906.65	54.85	16.07	-12.77	1,971.32	-8,736.05	8,686.91	8,629.29	57.63	150.745	
9,400.00	6,987.12	2,046.00	1,942.00	55.65	16.33	-13.04	1,955.18	-8,759.51	8,606.87	8,548.59	58.28	147.692	
9,500.00	6,987.05	2,046.00	1,942.00	56.48	16.33	-13.04	1,955.18	-8,759.51	8,526.62	8,468.23	58.39	146.017	
9,600.00	6,986.98	2,046.00	1,942.00	57.35	16.33	-13.04	1,955.18	-8,759.51	8,446.80	8,388.28	58.52	144.338	
9,700.00	6,986.90	2,046.00	1,942.00	58.24	16.33	-13.04	1,955.18	-8,759.51	8,367.41	8,308.75	58.65	142.655	
9,800.00	6,986.83	2,046.00	1,942.00	59.17	16.33	-13.04	1,955.18	-8,759.51	8,288.46	8,229.66	58.80	140.969	
9,900.00	6,986.75	2,046.00	1,942.00	60.12	16.33	-13.04	1,955.18	-8,759.51	8,209.98	8,151.03	58.95	139.281	
10,000.00	6,986.68	2,083.38	1,970.68	61.10	16.47	-13.26	1,941.53	-8,779.22	8,131.66	8,072.18	59.48	136.716	
10,100.00	6,986.61	6,165.81	5,551.86	62.11	53.61	-55.54	1,125.52	-10,220.82	8,048.38	7,948.65	99.73	80.700	
10,200.00	6,986.53	6,186.93	5,572.59	63.14	53.74	-55.93	1,126.42	-10,224.75	7,953.04	7,852.75	100.29	79.297	
10,300.00	6,986.46	6,208.01	5,593.29	64.20	53.88	-56.33	1,127.32	-10,228.66	7,857.77	7,756.90	100.87	77.902	
10,400.00	6,986.39	6,229.06	5,613.96	65.28	54.01	-56.73	1,128.24	-10,232.57	7,762.56	7,661.11	101.45	76.516	
10,500.00	6,986.31	6,250.08	5,634.58	66.38	54.14	-57.14	1,129.17	-10,236.47	7,667.42	7,565.38	102.05	75.138	
10,600.00	6,986.24	6,271.06	5,655.18	67.50	54.27	-57.55	1,130.12	-10,240.35	7,572.36	7,469.71	102.65	73.768	
10,700.00	6,986.17	6,292.00	5,675.74	68.64	54.41	-57.96	1,131.07	-10,244.23	7,477.38	7,374.11	103.27	72.406	
10,800.00	6,986.09	6,312.91	5,696.26	69.80	54.54	-58.37	1,132.04	-10,248.10	7,382.47	7,278.57	103.90	71.053	
10,900.00	6,986.02	6,333.79	5,716.76	70.98	54.67	-58.79	1,133.03	-10,251.95	7,287.65	7,183.10	104.54	69.709	
11,000.00	6,985.95	6,354.62	5,737.21	72.17	54.80	-59.21	1,134.02	-10,255.80	7,192.91	7,087.71	105.20	68.373	
11,100.00	6,985.87	6,375.43	5,757.63	73.38	54.93	-59.64	1,135.03	-10,259.64	7,098.27	6,992.40	105.87	67.046	
11,200.00	6,985.80	6,396.20	5,778.02	74.61	55.06	-60.07	1,136.05	-10,263.46	7,003.72	6,897.16	106.56	65.728	
11,300.00	6,985.72	6,416.93	5,798.37	75.85	55.19	-60.50	1,137.08	-10,267.28	6,909.27	6,802.01	107.26	64.419	
11,400.00	6,985.65	6,437.63	5,818.69	77.10	55.33	-60.93	1,138.12	-10,271.09	6,814.92	6,706.95	107.97	63.118	
11,500.00	6,985.58	6,458.29	5,838.98	78.37	55.46	-61.37	1,139.18	-10,274.89	6,720.67	6,611.97	108.70	61.827	
11,600.00	6,985.50	6,479.33	5,859.63	79.65	55.59	-61.82	1,140.27	-10,278.75	6,626.54	6,517.09	109.45	60.544	
11,700.00	6,985.43	6,502.66	5,882.53	80.94	55.72	-62.32	1,141.47	-10,283.02	6,532.52	6,422.30	110.22	59.266	
11,800.00	6,985.36	6,525.72	5,905.18	82.24	55.86	-62.82	1,142.63	-10,287.21	6,438.62	6,327.61	111.01	57.998	
11,900.00	6,985.28	6,548.52	5,927.58	83.56	55.99	-63.33	1,143.77	-10,291.34	6,344.83	6,233.01	111.82	56.741	
12,000.00	6,985.21	6,571.07	5,949.73	84.88	56.12	-63.83	1,144.87	-10,295.39	6,251.18	6,138.53	112.65	55.494	
12,100.00	6,985.14	6,593.36	5,971.63	86.21	56.25	-64.33	1,145.94	-10,299.38	6,157.66	6,044.17	113.49	54.257	
12,200.00	6,985.06	6,615.40	5,993.30	87.56	56.38	-64.83	1,146.98	-10,303.30	6,064.28	5,949.92	114.35	53.031	
12,300.00	6,984.99	6,637.19	6,014.72	88.91	56.51	-65.33	1,147.99	-10,307.15	5,971.04	5,855.80	115.24	51.814	
12,400.00	6,984.92	6,658.75	6,035.92	90.27	56.63	-65.83	1,148.98	-10,310.94	5,877.97	5,761.82	116.15	50.608	
12,500.00	6,984.84	6,680.06	6,056.88	91.64	56.76	-66.33	1,149.93	-10,314.67	5,785.06	5,667.99	117.08	49.413	
12,600.00	6,984.77	6,701.14	6,077.62	93.01	56.88	-66.83	1,150.86	-10,318.34	5,692.33	5,574.30	118.03	48.228	
12,700.00	6,984.69	6,722.00	6,098.14	94.40	57.00	-67.33	1,151.76	-10,321.94	5,599.78	5,480.77	119.01	47.053	
12,800.00	6,984.62	6,742.62	6,118.44	95.79	57.12	-67.82	1,152.64	-10,325.49	5,507.43	5,387.42	120.02	45.889	
12,900.00	6,984.55	6,763.02	6,138.52	97.18	57.24	-68.32	1,153.49	-10,328.98	5,415.29	5,294.24	121.05	44.736	
13,000.00	6,984.47	6,783.21	6,158.40	98.59	57.36	-68.81	1,154.32	-10,332.42	5,323.37	5,201.25	122.11	43.594	
13,100.00	6,984.40	6,803.18	6,178.06	100.00	57.48	-69.30	1,155.12	-10,335.80	5,231.67	5,108.46	123.21	42.462	
13,200.00	6,984.33	6,822.93	6,197.52	101.41	57.59	-69.80	1,155.90	-10,339.13	5,140.22	5,015.89	124.33	41.342	
13,300.00	6,984.25	6,842.48	6,216.77	102.83	57.71	-70.28	1,156.66	-10,342.41	5,049.03	4,923.54	125.49	40.233	
13,400.00	6,984.18	6,861.82	6,235.83	104.26	57.82	-70.77	1,157.39	-10,345.63	4,958.12	4,831.43	126.69	39.136	
13,500.00	6,984.11	6,880.96	6,254.69	105.69	57.93	-71.26	1,158.11	-10,348.80	4,867.49	4,739.57	127.92	38.050	
13,600.00	6,984.03	6,899.90	6,273.36	107.13	58.04	-71.74	1,158.80	-10,351.93	4,777.17	4,647.98	129.20	36.976	
13,700.00	6,983.96	6,918.64	6,291.83	108.57	58.15	-72.22	1,159.48	-10,355.00	4,687.18	4,556.67	130.51	35.914	
13,800.00	6,983.88	6,937.19	6,310.12	110.02	58.26	-72.71	1,160.13	-10,358.03	4,597.54	4,465.68	131.87	34.865	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164B - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program: 563-MWD OWSG Rev5												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)			
13,900.00	6,983.81	6,955.55	6,328.23	111.47	58.37	-73.18	1,160.76	-10,361.01	4,508.27	4,375.00	133.27	33.828	
14,000.00	6,983.74	6,975.80	6,348.20	112.92	58.48	-73.72	1,161.45	-10,364.28	4,419.39	4,284.66	134.73	32.802	
14,100.00	6,983.66	6,998.44	6,370.54	114.38	58.61	-74.31	1,162.21	-10,367.90	4,330.91	4,194.65	136.25	31.785	
14,200.00	6,983.59	7,020.59	6,392.39	115.85	58.73	-74.90	1,162.95	-10,371.41	4,242.86	4,105.03	137.83	30.783	
14,300.00	6,983.52	7,042.26	6,413.78	117.31	58.85	-75.48	1,163.67	-10,374.80	4,155.27	4,015.81	139.46	29.796	
14,400.00	6,983.44	7,063.46	6,434.72	118.78	58.97	-76.05	1,164.38	-10,378.08	4,068.16	3,927.02	141.14	28.824	
14,500.00	6,983.37	7,084.22	6,455.22	120.26	59.08	-76.62	1,165.06	-10,381.26	3,981.59	3,838.71	142.88	27.866	
14,600.00	6,983.30	7,104.55	6,475.30	121.74	59.19	-77.17	1,165.73	-10,384.34	3,895.57	3,750.89	144.69	26.924	
14,700.00	6,983.22	7,124.46	6,494.98	123.22	59.30	-77.71	1,166.38	-10,387.33	3,810.16	3,663.61	146.55	25.998	
14,800.00	6,983.15	7,143.96	6,514.25	124.70	59.41	-78.25	1,167.02	-10,390.22	3,725.40	3,576.91	148.49	25.089	
14,900.00	6,983.08	7,163.06	6,533.14	126.19	59.52	-78.78	1,167.64	-10,393.03	3,641.33	3,490.84	150.50	24.195	
15,000.00	6,983.00	7,181.79	6,551.65	127.68	59.62	-79.30	1,168.24	-10,395.75	3,558.01	3,405.43	152.58	23.319	
15,100.00	6,982.93	7,200.14	6,569.80	129.17	59.72	-79.81	1,168.83	-10,398.39	3,475.49	3,320.76	154.73	22.461	
15,200.00	6,982.85	7,218.13	6,587.60	130.67	59.82	-80.32	1,169.41	-10,400.96	3,393.84	3,236.87	156.97	21.621	
15,300.00	6,982.78	7,235.77	6,605.05	132.16	59.92	-80.81	1,169.97	-10,403.45	3,313.12	3,153.82	159.29	20.799	
15,400.00	6,982.71	7,253.07	6,622.17	133.66	60.01	-81.30	1,170.52	-10,405.87	3,233.39	3,071.70	161.70	19.997	
15,500.00	6,982.63	7,270.03	6,638.97	135.17	60.11	-81.78	1,171.06	-10,408.22	3,154.75	2,990.56	164.19	19.214	
15,600.00	6,982.56	7,286.68	6,655.45	136.67	60.20	-82.25	1,171.58	-10,410.51	3,077.27	2,910.50	166.77	18.452	
15,700.00	6,982.49	7,303.02	6,671.62	138.18	60.29	-82.72	1,172.09	-10,412.73	3,001.05	2,831.61	169.44	17.711	
15,800.00	6,982.41	7,319.05	6,687.50	139.69	60.38	-83.18	1,172.60	-10,414.88	2,926.19	2,753.98	172.21	16.992	
15,900.00	6,982.34	7,334.78	6,703.09	141.20	60.46	-83.63	1,173.09	-10,416.98	2,852.80	2,677.74	175.06	16.296	
16,000.00	6,982.27	7,350.23	6,718.40	142.71	60.55	-84.07	1,173.57	-10,419.03	2,780.99	2,602.98	178.00	15.623	
16,100.00	6,982.19	7,365.40	6,733.43	144.23	60.63	-84.51	1,174.04	-10,421.01	2,710.89	2,529.86	181.03	14.975	
16,200.00	6,982.12	7,380.30	6,748.19	145.75	60.72	-84.94	1,174.49	-10,422.95	2,642.64	2,458.51	184.14	14.351	
16,300.00	6,982.05	7,394.93	6,762.70	147.27	60.80	-85.36	1,174.94	-10,424.83	2,576.40	2,389.08	187.32	13.754	
16,400.00	6,981.97	7,409.31	6,776.95	148.79	60.88	-85.77	1,175.38	-10,426.66	2,512.32	2,321.75	190.57	13.183	
16,500.00	6,981.90	7,423.43	6,790.95	150.31	60.95	-86.18	1,175.81	-10,428.45	2,450.56	2,256.70	193.86	12.641	
16,600.00	6,981.82	7,437.31	6,804.71	151.84	61.03	-86.59	1,176.24	-10,430.19	2,391.33	2,194.13	197.20	12.127	
16,700.00	6,981.75	7,450.95	6,818.24	153.36	61.11	-86.98	1,176.65	-10,431.88	2,334.80	2,134.25	200.55	11.642	
16,800.00	6,981.68	7,464.36	6,831.54	154.89	61.18	-87.37	1,177.06	-10,433.54	2,281.18	2,077.29	203.89	11.188	
16,900.00	6,981.60	7,477.72	6,844.80	156.42	61.24	-87.76	1,177.46	-10,435.17	2,230.69	2,023.50	207.19	10.766	
17,000.00	6,981.53	7,490.95	6,857.93	157.95	61.31	-88.15	1,177.86	-10,436.78	2,183.54	1,973.12	210.42	10.377	
17,100.00	6,981.46	7,504.04	6,870.91	159.49	61.37	-88.53	1,178.26	-10,438.36	2,139.95	1,926.40	213.55	10.021	
17,200.00	6,981.38	7,516.97	6,883.74	161.02	61.43	-88.91	1,178.66	-10,439.92	2,100.14	1,883.60	216.54	9.699	
17,300.00	6,981.31	7,529.76	6,896.43	162.56	61.49	-89.28	1,179.06	-10,441.44	2,064.35	1,845.00	219.35	9.411	
17,400.00	6,981.24	7,542.40	6,908.98	164.09	61.55	-89.65	1,179.45	-10,442.95	2,032.77	1,810.84	221.92	9.160	
17,500.00	6,981.16	7,554.91	6,921.39	165.63	61.61	-90.02	1,179.84	-10,444.42	2,005.61	1,781.38	224.23	8.944	
17,600.00	6,981.09	7,567.28	6,933.67	167.17	61.67	-90.38	1,180.23	-10,445.88	1,983.05	1,756.83	226.22	8.766	
17,700.00	6,981.01	7,579.51	6,945.81	168.71	61.72	-90.74	1,180.62	-10,447.31	1,965.26	1,737.40	227.85	8.625	
17,800.00	6,980.94	7,591.60	6,957.82	170.25	61.78	-91.09	1,181.01	-10,448.71	1,952.36	1,723.26	229.10	8.522	
17,900.00	6,980.87	7,603.57	6,969.69	171.80	61.84	-91.44	1,181.39	-10,450.10	1,944.45	1,714.53	229.92	8.457	
18,000.00	6,980.79	7,615.41	6,981.45	173.34	61.89	-91.79	1,181.77	-10,451.46	1,941.59	1,711.28	230.31	8.430	
18,006.22	6,980.79	7,616.14	6,982.17	173.44	61.90	-91.81	1,181.80	-10,451.54	1,941.58	1,711.26	230.32	8.430 CC, ES, SF	
18,100.00	6,980.72	7,627.11	6,993.07	174.89	61.95	-92.13	1,182.15	-10,452.80	1,943.82	1,713.56	230.25	8.442	
18,200.00	6,980.65	7,638.70	7,004.57	176.43	62.00	-92.47	1,182.53	-10,454.12	1,951.10	1,721.35	229.76	8.492	
18,300.00	6,980.57	7,650.16	7,015.95	177.98	62.06	-92.81	1,182.91	-10,455.41	1,963.39	1,734.56	228.83	8.580	
18,400.00	6,980.50	7,661.50	7,027.21	179.53	62.11	-93.14	1,183.28	-10,456.69	1,980.60	1,753.10	227.50	8.706	
18,500.00	6,980.43	7,672.72	7,038.36	181.08	62.16	-93.47	1,183.65	-10,457.95	2,002.59	1,776.80	225.79	8.869	
18,600.00	6,980.35	7,683.82	7,049.38	182.63	62.21	-93.80	1,184.02	-10,459.18	2,029.22	1,805.48	223.74	9.069	
18,700.00	6,980.28	7,694.80	7,060.30	184.18	62.27	-94.12	1,184.39	-10,460.40	2,060.30	1,838.90	221.40	9.306	
18,800.00	6,980.21	7,705.68	7,071.10	185.73	62.32	-94.44	1,184.76	-10,461.60	2,095.64	1,876.83	218.81	9.577	
18,900.00	6,980.13	7,716.44	7,081.78	187.28	62.37	-94.75	1,185.12	-10,462.78	2,135.03	1,919.02	216.01	9.884	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164B - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program:		563-MWD OWSG Rev5						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)
19,000.00	6,980.06	7,727.09	7,092.36	188.84	62.42	-95.06	1,185.48	-10,463.94	2,178.25	1,965.20	213.05	10.224	
19,100.00	6,979.98	7,737.63	7,102.84	190.39	62.47	-95.37	1,185.84	-10,465.08	2,225.07	2,015.11	209.96	10.598	
19,200.00	6,979.91	7,748.06	7,113.20	191.95	62.52	-95.68	1,186.20	-10,466.21	2,275.28	2,068.49	206.79	11.003	
19,300.00	6,979.84	7,758.39	7,123.46	193.51	62.57	-95.98	1,186.55	-10,467.32	2,328.65	2,125.08	203.57	11.439	
19,400.00	6,979.76	7,768.61	7,133.62	195.06	62.61	-96.28	1,186.91	-10,468.41	2,384.98	2,184.64	200.33	11.905	
19,500.00	6,979.69	7,778.73	7,143.68	196.62	62.66	-96.57	1,187.26	-10,469.49	2,444.05	2,246.96	197.10	12.400	
19,600.00	6,979.62	7,788.75	7,153.64	198.18	62.71	-96.86	1,187.61	-10,470.55	2,505.69	2,311.80	193.89	12.923	
19,700.00	6,979.54	7,798.67	7,163.50	199.74	62.76	-97.15	1,187.95	-10,471.60	2,569.70	2,378.97	190.73	13.473	
19,800.00	6,979.47	7,808.50	7,173.26	201.30	62.80	-97.44	1,188.30	-10,472.62	2,635.91	2,448.27	187.63	14.048	
19,900.00	6,979.40	7,818.23	7,182.93	202.86	62.85	-97.72	1,188.64	-10,473.64	2,704.16	2,519.55	184.60	14.648	
20,000.00	6,979.32	7,827.86	7,192.50	204.42	62.89	-98.00	1,188.98	-10,474.64	2,774.30	2,592.64	181.66	15.272	
20,100.00	6,979.25	7,837.40	7,201.99	205.98	62.94	-98.28	1,189.32	-10,475.62	2,846.19	2,667.39	178.80	15.918	
20,200.00	6,979.18	7,846.84	7,211.38	207.55	62.98	-98.55	1,189.66	-10,476.59	2,919.70	2,743.67	176.03	16.586	
20,300.00	6,979.10	7,856.20	7,220.68	209.11	63.03	-98.82	1,190.00	-10,477.55	2,994.71	2,821.36	173.36	17.275	
20,400.00	6,979.03	7,865.46	7,229.89	210.68	63.07	-99.09	1,190.33	-10,478.49	3,071.12	2,900.34	170.78	17.983	
20,500.00	6,978.95	7,874.64	7,239.01	212.24	63.11	-99.35	1,190.66	-10,479.42	3,148.82	2,980.53	168.30	18.710	
20,600.00	6,978.88	7,883.73	7,248.05	213.81	63.16	-99.62	1,190.99	-10,480.34	3,227.72	3,061.81	165.91	19.454	
20,700.00	6,978.81	7,892.73	7,257.00	215.37	63.20	-99.88	1,191.32	-10,481.24	3,307.74	3,144.12	163.62	20.216	
20,800.00	6,978.73	7,901.65	7,265.87	216.94	63.24	-100.13	1,191.64	-10,482.13	3,388.79	3,227.36	161.43	20.993	
20,900.00	6,978.66	7,910.49	7,274.65	218.51	63.28	-100.39	1,191.97	-10,483.01	3,470.80	3,311.48	159.32	21.785	
21,000.00	6,978.59	7,938.00	7,302.02	220.07	63.41	-101.18	1,192.99	-10,485.72	3,553.77	3,396.24	157.53	22.560	
21,100.00	6,978.51	7,938.00	7,302.02	221.64	63.41	-101.18	1,192.99	-10,485.72	3,637.47	3,481.98	155.49	23.394	
21,200.00	6,978.44	7,938.00	7,302.02	223.21	63.41	-101.18	1,192.99	-10,485.72	3,721.98	3,568.45	153.54	24.241	
21,300.00	6,978.37	7,938.00	7,302.02	224.78	63.41	-101.18	1,192.99	-10,485.72	3,807.25	3,655.58	151.67	25.103	
21,400.00	6,978.29	7,938.00	7,302.02	226.35	63.41	-101.18	1,192.99	-10,485.72	3,893.21	3,743.34	149.87	25.977	
21,500.00	6,978.22	7,938.00	7,302.02	227.92	63.41	-101.18	1,192.99	-10,485.72	3,979.83	3,831.67	148.15	26.863	
21,600.00	6,978.14	7,938.00	7,302.02	229.49	63.41	-101.18	1,192.99	-10,485.72	4,067.06	3,920.56	146.50	27.761	
21,700.00	6,978.07	7,938.00	7,302.02	231.06	63.41	-101.18	1,192.99	-10,485.72	4,154.87	4,009.94	144.92	28.669	
21,800.00	6,978.00	7,938.00	7,302.02	232.63	63.41	-101.18	1,192.99	-10,485.72	4,243.21	4,099.80	143.41	29.588	
21,900.00	6,977.92	7,938.00	7,302.02	234.21	63.41	-101.18	1,192.99	-10,485.72	4,332.07	4,190.11	141.96	30.516	
22,000.00	6,977.85	7,938.00	7,302.02	235.78	63.41	-101.18	1,192.99	-10,485.72	4,421.40	4,280.83	140.57	31.453	
22,100.00	6,977.78	8,006.65	7,370.30	237.35	63.89	-103.13	1,195.57	-10,492.27	4,510.52	4,370.30	140.22	32.167	
22,200.00	6,977.70	8,014.01	7,377.63	238.92	63.94	-103.34	1,195.85	-10,492.95	4,600.59	4,461.54	139.05	33.086	
22,300.00	6,977.63	8,021.30	7,384.88	240.50	64.00	-103.54	1,196.12	-10,493.62	4,691.04	4,553.11	137.93	34.010	
22,400.00	6,977.56	8,028.52	7,392.06	242.07	64.05	-103.75	1,196.40	-10,494.29	4,781.86	4,645.00	136.86	34.940	
22,500.00	6,977.48	8,035.65	7,399.16	243.65	64.10	-103.95	1,196.67	-10,494.94	4,873.02	4,737.18	135.84	35.874	
22,600.00	6,977.41	8,042.71	7,406.19	245.22	64.14	-104.15	1,196.95	-10,495.58	4,964.51	4,829.65	134.86	36.813	
22,700.00	6,977.34	8,049.70	7,413.14	246.80	64.19	-104.34	1,197.21	-10,496.21	5,056.31	4,922.39	133.92	37.755	
22,800.00	6,977.26	8,056.61	7,420.02	248.37	64.24	-104.54	1,197.48	-10,496.83	5,148.41	5,015.38	133.03	38.701	
22,900.00	6,977.19	8,063.46	7,426.83	249.95	64.29	-104.73	1,197.75	-10,497.44	5,240.78	5,108.61	132.17	39.651	
23,000.00	6,977.11	8,070.23	7,433.57	251.53	64.34	-104.92	1,198.01	-10,498.05	5,333.42	5,202.06	131.36	40.603	
23,100.00	6,977.04	8,076.93	7,440.24	253.10	64.38	-105.11	1,198.27	-10,498.64	5,426.30	5,295.73	130.58	41.557	
23,155.65	6,977.00	8,080.63	7,443.93	253.98	64.41	-105.21	1,198.41	-10,498.97	5,478.10	5,347.95	130.16	42.089	
23,156.15	6,977.00	8,080.66	7,443.96	254.06	64.41	-105.21	1,198.42	-10,498.97	5,478.57	5,345.84	132.73	41.275	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164C - OH - OH-SVY													Offset Site Error: 0.00 usft
Survey Program: 386-APC_ISCWSA REV 2 MWD													Offset Well Error: 0.00 usft
Reference													
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)			
0.00	0.00	0.00	0.00	0.00	0.00	-72.06	2,592.97	-8,008.29	8,417.63				
100.00	100.00	1,677.55	1,560.83	0.25	9.38	-75.25	2,107.94	-8,007.21	8,411.23	8,401.71	9.51	884.219	
200.00	200.00	1,709.79	1,587.47	0.61	9.67	-75.37	2,089.80	-8,007.17	8,394.05	8,384.01	10.05	835.366	
300.00	300.00	1,796.07	1,659.13	0.97	10.44	-75.70	2,041.75	-8,007.27	8,377.61	8,366.50	11.11	753.806	
400.00	400.00	1,863.52	1,715.16	1.33	11.10	-75.95	2,004.19	-8,007.17	8,361.31	8,349.21	12.11	690.659	
500.00	500.00	1,881.00	1,729.73	1.68	11.27	-76.01	1,994.52	-8,007.22	8,345.83	8,333.21	12.62	661.134	
600.00	599.98	1,928.56	1,769.67	2.04	11.68	-86.49	1,968.70	-8,007.48	8,331.07	8,317.68	13.39	622.399	
700.00	699.84	1,990.49	1,821.60	2.41	12.28	-87.03	1,934.98	-8,008.09	8,316.73	8,302.39	14.34	580.093	
800.00	799.45	2,028.86	1,853.74	2.77	12.65	-87.47	1,914.02	-8,008.70	8,302.98	8,287.91	15.07	550.916	
900.00	898.70	2,181.00	1,980.75	3.13	14.12	-88.42	1,830.30	-8,010.50	8,289.04	8,272.15	16.89	490.812	
1,000.00	997.47	2,198.00	1,994.84	3.50	14.29	-88.77	1,820.79	-8,010.77	8,275.73	8,258.28	17.45	474.281	
1,100.00	1,095.63	2,340.18	2,112.56	3.89	15.66	-87.36	1,741.11	-8,012.99	8,262.50	8,243.30	19.20	430.332	
1,200.00	1,193.09	2,474.51	2,225.63	4.29	16.90	-86.61	1,668.58	-8,013.16	8,248.44	8,227.60	20.84	395.809	
1,300.00	1,289.73	2,500.99	2,247.95	4.72	17.16	-85.76	1,654.34	-8,013.10	8,233.91	8,212.37	21.54	382.292	
1,400.00	1,385.42	2,628.32	2,355.34	5.16	18.36	-85.74	1,585.93	-8,012.52	8,219.01	8,195.83	23.19	354.488	
1,496.97	1,477.20	2,654.88	2,377.76	5.62	18.62	-85.40	1,571.70	-8,012.39	8,204.58	8,180.66	23.91	343.084	
1,500.00	1,480.05	2,655.77	2,378.51	5.63	18.63	-85.41	1,571.22	-8,012.39	8,204.13	8,180.19	23.94	342.717	
1,600.00	1,574.15	2,916.00	2,596.67	6.12	21.16	-86.86	1,429.43	-8,009.11	8,189.19	8,162.26	26.92	304.151	
1,700.00	1,668.25	2,931.00	2,609.07	6.62	21.31	-86.95	1,421.00	-8,008.82	8,174.26	8,146.66	27.60	296.139	
1,800.00	1,762.35	3,044.60	2,705.10	7.12	22.33	-87.58	1,360.45	-8,006.19	8,160.35	8,131.23	29.13	280.176	
1,900.00	1,856.45	3,090.00	2,744.56	7.64	22.71	-87.82	1,338.04	-8,004.56	8,146.75	8,116.70	30.04	271.174	
2,000.00	1,950.55	3,122.00	2,772.57	8.16	22.97	-87.99	1,322.61	-8,003.44	8,134.02	8,103.17	30.85	263.648	
2,100.00	2,044.65	3,138.41	2,787.05	8.68	23.10	-88.07	1,314.90	-8,002.93	8,122.33	8,090.80	31.54	257.561	
2,200.00	2,138.75	3,153.00	2,799.98	9.21	23.21	-88.15	1,308.16	-8,002.53	8,111.70	8,079.49	32.21	251.857	
2,300.00	2,232.85	3,191.07	2,833.91	9.74	23.51	-88.35	1,290.92	-8,001.63	8,102.06	8,069.00	33.05	245.114	
2,400.00	2,326.95	3,216.00	2,856.26	10.27	23.70	-88.47	1,279.90	-8,001.08	8,093.33	8,059.53	33.80	239.437	
2,500.00	2,421.05	3,247.00	2,884.26	10.81	23.92	-88.63	1,266.59	-8,000.51	8,085.59	8,051.00	34.59	233.770	
2,600.00	2,515.15	3,247.00	2,884.26	11.34	23.92	-88.63	1,266.59	-8,000.51	8,079.01	8,043.86	35.15	229.846	
2,700.00	2,609.25	3,279.00	2,913.47	11.88	24.15	-88.79	1,253.55	-8,000.30	8,073.47	8,037.54	35.93	224.688	
2,800.00	2,703.35	3,468.00	3,090.72	12.42	25.30	-89.65	1,188.23	-7,998.12	8,068.93	8,031.30	37.63	214.451	
2,900.00	2,797.45	3,468.00	3,090.72	12.96	25.30	-89.65	1,188.23	-7,998.12	8,063.98	8,025.79	38.19	211.158	
3,000.00	2,891.55	3,500.00	3,121.31	13.51	25.47	-89.78	1,178.86	-7,997.72	8,060.17	8,021.25	38.92	207.122	
3,100.00	2,985.65	3,500.00	3,121.31	14.05	25.47	-89.78	1,178.86	-7,997.72	8,057.37	8,017.90	39.47	204.125	
3,200.00	3,079.75	3,531.00	3,151.15	14.60	25.62	-89.91	1,170.47	-7,997.81	8,055.73	8,015.56	40.18	200.500	
3,300.00	3,173.85	3,657.00	3,273.43	15.14	26.19	-90.41	1,140.07	-7,997.67	8,054.42	8,013.12	41.30	195.039	
3,400.00	3,267.95	3,688.00	3,303.67	15.69	26.31	-90.53	1,133.27	-7,997.57	8,053.51	8,011.53	41.98	191.864	
3,500.00	3,362.05	3,767.90	3,382.14	16.23	26.60	-90.82	1,118.28	-7,997.74	8,053.39	8,010.58	42.81	188.112	
3,600.00	3,456.15	3,891.81	3,504.54	16.78	26.98	-91.24	1,099.06	-7,997.23	8,053.04	8,009.30	43.74	184.108	
3,611.54	3,467.01	3,894.72	3,507.43	16.84	26.98	-91.25	1,098.69	-7,997.22	8,053.04	8,009.22	43.81	183.808	
3,700.00	3,550.25	3,907.00	3,519.62	17.33	27.02	-91.29	1,097.18	-7,997.19	8,053.43	8,009.10	44.33	181.669	
3,800.00	3,644.35	3,938.00	3,550.44	17.88	27.09	-91.39	1,093.83	-7,997.35	8,054.76	8,009.82	44.95	179.204	
3,900.00	3,738.45	3,969.00	3,581.32	18.42	27.15	-91.48	1,091.19	-7,997.85	8,057.12	8,011.57	45.55	176.883	
4,000.00	3,832.55	4,023.69	3,635.90	18.97	27.23	-91.63	1,088.00	-7,999.08	8,060.30	8,014.13	46.18	174.558	
4,100.00	3,926.65	4,117.21	3,729.32	19.52	27.34	-91.88	1,084.27	-8,001.17	8,063.75	8,016.91	46.84	172.152	
4,200.00	4,020.75	4,211.88	3,823.89	20.07	27.46	-92.13	1,080.53	-8,003.27	8,067.36	8,019.85	47.51	169.799	
4,300.00	4,114.85	4,306.59	3,918.51	20.62	27.59	-92.38	1,076.83	-8,005.34	8,071.11	8,022.93	48.18	167.516	
4,400.00	4,208.95	4,401.33	4,013.16	21.17	27.71	-92.64	1,073.18	-8,007.39	8,075.02	8,026.17	48.85	165.301	
4,500.00	4,303.05	4,496.11	4,107.85	21.72	27.83	-92.89	1,069.57	-8,009.41	8,079.07	8,029.55	49.52	163.150	
4,600.00	4,397.15	4,590.93	4,202.58	22.27	27.95	-93.14	1,066.00	-8,011.42	8,083.27	8,033.09	50.19	161.062	
4,700.00	4,491.25	4,685.78	4,297.34	22.82	28.08	-93.39	1,062.47	-8,013.40	8,087.62	8,036.77	50.85	159.033	
4,800.00	4,585.35	4,780.67	4,392.15	23.37	28.20	-93.64	1,058.98	-8,015.36	8,092.12	8,040.59	51.52	157.062	
4,900.00	4,679.45	4,875.60	4,486.99	23.93	28.32	-93.89	1,055.54	-8,017.29	8,096.76	8,044.57	52.19	155.145	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164C - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		386-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	Warning	
5,000.00	4,773.55	4,970.56	4,581.87	24.48	28.44	-94.14	1,052.13	-8,019.20	8,101.54	8,048.69	52.85	153.282		
5,100.00	4,867.65	5,065.55	4,676.79	25.03	28.57	-94.39	1,048.77	-8,021.09	8,106.47	8,052.95	53.52	151.468		
5,200.00	4,961.75	5,160.59	4,771.75	25.58	28.69	-94.64	1,045.45	-8,022.95	8,111.54	8,057.36	54.18	149.704		
5,300.00	5,055.85	5,255.66	4,866.74	26.13	28.81	-94.88	1,042.17	-8,024.79	8,116.76	8,061.91	54.85	147.987		
5,400.00	5,149.95	5,350.76	4,961.78	26.68	28.94	-95.13	1,038.93	-8,026.61	8,122.11	8,066.60	55.51	146.316		
5,500.00	5,244.05	5,445.91	5,056.85	27.24	29.06	-95.38	1,035.74	-8,028.40	8,127.61	8,071.43	56.17	144.688		
5,600.00	5,338.15	5,541.09	5,151.96	27.79	29.18	-95.62	1,032.58	-8,030.17	8,133.24	8,076.40	56.83	143.103		
5,665.73	5,400.00	5,603.66	5,214.49	28.15	29.26	-95.79	1,030.53	-8,031.32	8,137.02	8,079.75	57.27	142.084		
5,700.00	5,432.28	5,636.34	5,247.14	28.34	29.30	-95.89	1,029.47	-8,031.91	8,139.00	8,081.51	57.49	141.562		
5,800.00	5,526.87	5,732.13	5,342.87	28.88	29.43	-96.18	1,026.38	-8,033.65	8,144.75	8,086.61	58.14	140.081		
5,900.00	5,622.01	5,828.58	5,439.26	29.41	29.55	-96.47	1,023.32	-8,035.37	8,150.43	8,091.66	58.78	138.665		
6,000.00	5,717.67	5,925.66	5,536.27	29.92	29.68	-96.74	1,020.28	-8,037.07	8,156.02	8,096.62	59.40	137.311		
6,100.00	5,813.83	6,023.33	5,633.88	30.41	29.80	-97.00	1,017.27	-8,038.76	8,161.49	8,101.49	60.00	136.015		
6,200.00	5,910.44	6,121.55	5,732.05	30.89	29.93	-97.25	1,014.28	-8,040.44	8,166.83	8,106.23	60.60	134.776		
6,300.00	6,007.50	6,220.31	5,830.74	31.36	30.06	-97.49	1,011.33	-8,042.09	8,172.01	8,110.83	61.17	133.589		
6,400.00	6,104.96	6,319.56	5,929.94	31.80	30.19	-97.71	1,008.41	-8,043.73	8,177.01	8,115.27	61.74	132.452		
6,500.00	6,202.80	6,419.27	6,029.60	32.24	30.32	-97.92	1,005.52	-8,045.35	8,181.82	8,119.53	62.28	131.363		
6,600.00	6,300.98	6,519.42	6,129.69	32.66	30.45	-98.11	1,002.67	-8,046.95	8,186.42	8,123.60	62.82	130.321		
6,700.00	6,399.48	6,619.96	6,230.17	33.06	30.58	-98.30	999.85	-8,048.53	8,190.79	8,127.46	63.34	129.321		
6,722.82	6,422.00	6,642.96	6,253.16	33.15	30.61	-98.34	999.21	-8,048.89	8,191.76	8,128.30	63.45	129.099		
6,750.00	6,448.76	6,670.28	6,280.47	33.26	30.64	-98.55	998.46	-8,049.31	8,192.51	8,128.92	63.59	128.823		
6,800.00	6,497.51	6,720.05	6,330.22	33.48	30.70	-77.39	997.10	-8,050.08	8,191.89	8,128.02	63.87	128.254		
6,850.00	6,545.40	6,768.90	6,379.05	33.72	30.77	-71.18	995.77	-8,050.82	8,188.69	8,124.52	64.17	127.608		
6,900.00	6,592.13	6,816.55	6,426.67	33.97	30.83	-67.57	994.48	-8,051.54	8,182.92	8,118.44	64.49	126.892		
6,950.00	6,637.40	6,862.68	6,472.78	34.25	30.89	-65.48	993.25	-8,052.24	8,174.66	8,109.84	64.82	126.111		
7,000.00	6,680.94	6,907.03	6,517.11	34.54	30.95	-64.38	992.08	-8,052.90	8,163.97	8,098.80	65.17	125.272		
7,050.00	6,722.48	6,949.31	6,559.37	34.85	31.00	-64.00	990.96	-8,053.52	8,150.93	8,085.40	65.53	124.380		
7,100.00	6,761.76	6,989.27	6,599.32	35.17	31.05	-64.18	989.92	-8,054.10	8,135.65	8,069.75	65.91	123.441		
7,150.00	6,798.55	7,026.66	6,636.69	35.51	31.10	-64.82	988.95	-8,054.65	8,118.25	8,051.96	66.29	122.461		
7,200.00	6,832.61	7,061.25	6,671.26	35.86	31.15	-65.86	988.06	-8,055.15	8,098.86	8,032.17	66.69	121.445		
7,250.00	6,863.74	7,092.82	6,702.81	36.22	31.19	-67.26	987.25	-8,055.60	8,077.62	8,010.53	67.09	120.400		
7,300.00	6,891.74	7,121.17	6,731.16	36.59	31.22	-68.99	986.53	-8,056.01	8,054.67	7,987.18	67.50	119.330		
7,350.00	6,916.44	7,146.14	6,756.12	36.98	31.26	-71.03	985.90	-8,056.36	8,030.19	7,962.28	67.91	118.241		
7,400.00	6,937.69	7,167.57	6,777.54	37.37	31.28	-73.35	985.36	-8,056.66	8,004.35	7,936.01	68.33	117.138		
7,450.00	6,955.36	7,185.33	6,795.29	37.78	31.31	-75.93	984.91	-8,056.91	7,977.30	7,908.55	68.75	116.028		
7,500.00	6,969.34	7,199.30	6,809.25	38.19	31.33	-78.74	984.56	-8,057.11	7,949.25	7,880.07	69.18	114.915		
7,550.00	6,979.53	7,209.40	6,819.35	38.62	31.34	-81.75	984.31	-8,057.25	7,920.36	7,850.77	69.60	113.804		
7,600.00	6,985.89	7,215.56	6,825.51	39.05	31.35	-84.94	984.16	-8,057.34	7,890.83	7,820.82	70.02	112.702		
7,650.00	6,988.37	7,217.75	6,827.70	39.48	31.35	-88.25	984.10	-8,057.37	7,860.84	7,790.41	70.43	111.613		
7,657.25	6,988.40	7,217.74	6,827.68	39.54	31.35	-88.73	984.10	-8,057.37	7,856.46	7,785.97	70.49	111.456		
7,700.00	6,988.37	7,217.41	6,827.35	39.92	31.35	-88.73	984.11	-8,057.36	7,830.72	7,759.88	70.84	110.538		
7,800.00	6,988.30	7,216.64	6,826.59	40.82	31.35	-88.72	984.13	-8,057.35	7,771.08	7,699.39	71.69	108.401		
7,900.00	6,988.23	7,215.87	6,825.82	41.77	31.35	-88.72	984.15	-8,057.34	7,712.27	7,639.71	72.56	106.287		
8,000.00	6,988.16	7,215.10	6,825.05	42.75	31.35	-88.71	984.17	-8,057.33	7,654.32	7,580.86	73.46	104.199		
8,100.00	6,988.09	7,214.34	6,824.28	43.76	31.34	-88.70	984.19	-8,057.32	7,597.24	7,522.86	74.38	102.138		
8,152.35	6,988.06	7,213.93	6,823.88	44.30	31.34	-88.70	984.20	-8,057.32	7,567.72	7,492.84	74.87	101.071		
8,200.00	6,988.02	7,213.59	6,823.54	44.79	31.34	-88.67	984.21	-8,057.31	7,540.41	7,465.08	75.32	100.105		
8,300.00	6,987.95	7,213.02	6,822.96	45.83	31.34	-88.59	984.22	-8,057.30	7,479.58	7,403.32	76.25	98.087		
8,400.00	6,987.88	7,212.64	6,822.59	46.85	31.34	-88.50	984.23	-8,057.30	7,414.14	7,336.99	77.16	96.089		
8,500.00	6,987.80	7,212.47	6,822.42	47.85	31.34	-88.40	984.23	-8,057.30	7,344.30	7,266.27	78.03	94.120		
8,600.00	6,987.73	7,212.51	6,822.46	48.83	31.34	-88.28	984.23	-8,057.30	7,270.28	7,191.41	78.87	92.186		
8,700.00	6,987.65	7,212.75	6,822.69	49.79	31.34	-88.13	984.23	-8,057.30	7,192.30	7,112.64	79.65	90.293		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164C - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		386-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	Warning	
8,800.00	6,987.57	7,213.19	6,823.14	50.72	31.34	-87.94	984.22	-8,057.31	7,110.63	7,030.23	80.39	88.447		
8,900.00	6,987.50	7,213.83	6,823.78	51.62	31.34	-87.71	984.20	-8,057.31	7,025.54	6,944.46	81.08	86.651		
9,000.00	6,987.42	7,214.67	6,824.62	52.48	31.35	-87.40	984.18	-8,057.33	6,937.33	6,855.63	81.70	84.912		
9,100.00	6,987.34	7,215.70	6,825.65	53.30	31.35	-87.00	984.15	-8,057.34	6,846.32	6,764.06	82.25	83.233		
9,200.00	6,987.27	7,216.92	6,826.87	54.08	31.35	-86.42	984.12	-8,057.36	6,752.84	6,670.10	82.74	81.618		
9,215.33	6,987.26	7,217.13	6,827.07	54.20	31.35	-86.31	984.12	-8,057.36	6,738.31	6,655.51	82.80	81.376		
9,300.00	6,987.20	7,218.26	6,828.21	54.85	31.35	-86.34	984.09	-8,057.38	6,658.01	6,574.84	83.17	80.050		
9,400.00	6,987.12	7,219.60	6,829.55	55.65	31.35	-86.38	984.06	-8,057.39	6,563.30	6,479.68	83.62	78.489		
9,500.00	6,987.05	7,220.94	6,830.88	56.48	31.35	-86.42	984.02	-8,057.41	6,468.76	6,384.68	84.08	76.934		
9,600.00	6,986.98	7,222.28	6,832.22	57.35	31.36	-86.45	983.99	-8,057.43	6,374.38	6,289.82	84.56	75.385		
9,700.00	6,986.90	7,223.61	6,833.56	58.24	31.36	-86.49	983.96	-8,057.45	6,280.17	6,195.12	85.05	73.842		
9,800.00	6,986.83	7,224.95	6,834.89	59.17	31.36	-86.52	983.92	-8,057.47	6,186.15	6,100.59	85.56	72.306		
9,900.00	6,986.75	7,226.29	6,836.23	60.12	31.36	-86.56	983.89	-8,057.49	6,092.31	6,006.23	86.08	70.777		
10,000.00	6,986.68	7,227.62	6,837.56	61.10	31.36	-86.60	983.86	-8,057.51	5,998.68	5,912.06	86.62	69.255		
10,100.00	6,986.61	7,228.95	6,838.89	62.11	31.36	-86.63	983.82	-8,057.53	5,905.25	5,818.08	87.17	67.740		
10,200.00	6,986.53	7,230.29	6,840.23	63.14	31.37	-86.67	983.79	-8,057.54	5,812.04	5,724.29	87.75	66.234		
10,300.00	6,986.46	7,231.62	6,841.56	64.20	31.37	-86.70	983.76	-8,057.56	5,719.06	5,630.72	88.34	64.736		
10,400.00	6,986.39	7,232.95	6,842.89	65.28	31.37	-86.74	983.72	-8,057.58	5,626.32	5,537.37	88.96	63.247		
10,500.00	6,986.31	7,234.28	6,844.22	66.38	31.37	-86.78	983.69	-8,057.60	5,533.84	5,444.24	89.59	61.767		
10,600.00	6,986.24	7,235.61	6,845.55	67.50	31.37	-86.81	983.66	-8,057.62	5,441.62	5,351.37	90.25	60.297		
10,700.00	6,986.17	7,236.94	6,846.88	68.64	31.37	-86.85	983.63	-8,057.64	5,349.67	5,258.75	90.92	58.836		
10,800.00	6,986.09	7,238.27	6,848.21	69.80	31.38	-86.88	983.59	-8,057.66	5,258.03	5,166.40	91.62	57.386		
10,900.00	6,986.02	7,239.60	6,849.54	70.98	31.38	-86.92	983.56	-8,057.67	5,166.69	5,074.34	92.35	55.947		
11,000.00	6,985.95	7,240.93	6,850.86	72.17	31.38	-86.96	983.53	-8,057.69	5,075.68	4,982.58	93.10	54.520		
11,100.00	6,985.87	7,242.25	6,852.19	73.38	31.38	-86.99	983.49	-8,057.71	4,985.01	4,891.13	93.87	53.104		
11,200.00	6,985.80	7,243.58	6,853.52	74.61	31.38	-87.03	983.46	-8,057.73	4,894.70	4,800.03	94.67	51.701		
11,300.00	6,985.72	7,244.91	6,854.84	75.85	31.38	-87.06	983.43	-8,057.75	4,804.78	4,709.28	95.50	50.311		
11,400.00	6,985.65	7,246.23	6,856.16	77.10	31.39	-87.10	983.40	-8,057.77	4,715.26	4,618.90	96.36	48.934		
11,500.00	6,985.58	7,247.56	6,857.49	78.37	31.39	-87.13	983.36	-8,057.78	4,626.18	4,528.93	97.25	47.571		
11,600.00	6,985.50	7,248.88	6,858.81	79.65	31.39	-87.17	983.33	-8,057.80	4,537.55	4,439.38	98.17	46.223		
11,700.00	6,985.43	7,250.20	6,860.13	80.94	31.39	-87.21	983.30	-8,057.82	4,449.40	4,350.28	99.12	44.890		
11,800.00	6,985.36	7,251.52	6,861.45	82.24	31.39	-87.24	983.26	-8,057.84	4,361.76	4,261.65	100.10	43.574		
11,900.00	6,985.28	7,252.84	6,862.78	83.56	31.39	-87.28	983.23	-8,057.86	4,274.66	4,173.54	101.12	42.274		
12,000.00	6,985.21	7,254.16	6,864.09	84.88	31.40	-87.31	983.20	-8,057.88	4,188.14	4,085.96	102.17	40.991		
12,100.00	6,985.14	7,255.48	6,865.41	86.21	31.40	-87.35	983.17	-8,057.89	4,102.23	3,998.96	103.26	39.726		
12,200.00	6,985.06	7,256.80	6,866.73	87.56	31.40	-87.38	983.13	-8,057.91	4,016.97	3,912.58	104.39	38.480		
12,300.00	6,984.99	7,258.12	6,868.05	88.91	31.40	-87.42	983.10	-8,057.93	3,932.41	3,826.85	105.56	37.254		
12,400.00	6,984.92	7,259.44	6,869.37	90.27	31.40	-87.46	983.07	-8,057.95	3,848.58	3,741.82	106.76	36.048		
12,500.00	6,984.84	7,260.76	6,870.68	91.64	31.41	-87.49	983.04	-8,057.97	3,765.55	3,657.54	108.01	34.863		
12,600.00	6,984.77	7,262.07	6,872.00	93.01	31.41	-87.53	983.00	-8,057.99	3,683.36	3,574.06	109.30	33.700		
12,700.00	6,984.69	7,263.39	6,873.31	94.40	31.41	-87.56	982.97	-8,058.00	3,602.07	3,491.44	110.63	32.560		
12,800.00	6,984.62	7,264.70	6,874.63	95.79	31.41	-87.60	982.94	-8,058.02	3,521.74	3,409.74	112.00	31.444		
12,900.00	6,984.55	7,266.02	6,875.94	97.18	31.41	-87.63	982.91	-8,058.04	3,442.44	3,329.03	113.41	30.353		
13,000.00	6,984.47	7,267.33	6,877.26	98.59	31.41	-87.67	982.87	-8,058.06	3,364.24	3,249.38	114.87	29.288		
13,100.00	6,984.40	7,268.64	6,878.57	100.00	31.42	-87.70	982.84	-8,058.08	3,287.23	3,170.87	116.37	28.249		
13,200.00	6,984.33	7,269.95	6,879.88	101.41	31.42	-87.74	982.81	-8,058.10	3,211.48	3,093.58	117.90	27.238		
13,300.00	6,984.25	7,271.27	6,881.19	102.83	31.42	-87.77	982.78	-8,058.11	3,137.10	3,017.62	119.48	26.256		
13,400.00	6,984.18	7,272.58	6,882.50	104.26	31.42	-87.81	982.74	-8,058.13	3,064.17	2,943.07	121.09	25.305		
13,500.00	6,984.11	7,273.89	6,883.81	105.69	31.42	-87.85	982.71	-8,058.15	2,992.80	2,870.06	122.74	24.384		
13,600.00	6,984.03	7,275.20	6,885.12	107.13	31.42	-87.88	982.68	-8,058.17	2,923.11	2,798.70	124.41	23.495		
13,700.00	6,983.96	7,276.50	6,886.43	108.57	31.43	-87.92	982.65	-8,058.19	2,855.22	2,729.11	126.11	22.640		
13,800.00	6,983.88	7,277.81	6,887.73	110.02	31.43	-87.95	982.62	-8,058.20	2,789.27	2,661.44	127.83	21.820		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164C - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program: 386-APC_ISCWSA REV 2 MWD												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)			
13,900.00	6,983.81	7,279.12	6,889.04	111.47	31.43	-87.99	982.58	-8,058.22	2,725.39	2,595.83	129.56	21.035	
14,000.00	6,983.74	7,280.43	6,890.35	112.92	31.43	-88.02	982.55	-8,058.24	2,663.73	2,532.43	131.30	20.288	
14,100.00	6,983.66	7,281.73	6,891.65	114.38	31.43	-88.06	982.52	-8,058.26	2,604.45	2,471.43	133.03	19.579	
14,200.00	6,983.59	7,283.04	6,892.95	115.85	31.43	-88.09	982.49	-8,058.28	2,547.72	2,412.99	134.74	18.909	
14,300.00	6,983.52	7,284.34	6,894.26	117.31	31.44	-88.13	982.45	-8,058.29	2,493.71	2,357.29	136.42	18.280	
14,400.00	6,983.44	7,285.64	6,895.56	118.78	31.44	-88.16	982.42	-8,058.31	2,442.60	2,304.54	138.06	17.692	
14,500.00	6,983.37	7,286.95	6,896.86	120.26	31.44	-88.20	982.39	-8,058.33	2,394.58	2,254.94	139.64	17.148	
14,600.00	6,983.30	7,288.25	6,898.17	121.74	31.44	-88.23	982.36	-8,058.35	2,349.83	2,208.68	141.15	16.648	
14,700.00	6,983.22	7,289.55	6,899.47	123.22	31.44	-88.27	982.33	-8,058.37	2,308.55	2,165.98	142.57	16.193	
14,800.00	6,983.15	7,290.85	6,900.77	124.70	31.44	-88.30	982.29	-8,058.38	2,270.92	2,127.04	143.88	15.783	
14,900.00	6,983.08	7,292.15	6,902.07	126.19	31.45	-88.34	982.26	-8,058.40	2,237.13	2,092.06	145.07	15.421	
15,000.00	6,983.00	7,293.45	6,903.37	127.68	31.45	-88.37	982.23	-8,058.42	2,207.36	2,061.24	146.13	15.106	
15,100.00	6,982.93	7,294.75	6,904.66	129.17	31.45	-88.41	982.20	-8,058.44	2,181.77	2,034.74	147.03	14.839	
15,200.00	6,982.85	7,296.05	6,905.96	130.67	31.45	-88.44	982.17	-8,058.46	2,160.51	2,012.73	147.78	14.620	
15,300.00	6,982.78	7,297.34	6,907.26	132.16	31.45	-88.48	982.13	-8,058.47	2,143.71	1,995.35	148.35	14.450	
15,400.00	6,982.71	7,298.64	6,908.55	133.66	31.45	-88.51	982.10	-8,058.49	2,131.47	1,982.72	148.75	14.329	
15,500.00	6,982.63	7,299.94	6,909.85	135.17	31.46	-88.55	982.07	-8,058.51	2,123.87	1,974.90	148.97	14.257	
15,600.00	6,982.56	7,301.23	6,911.14	136.67	31.46	-88.58	982.04	-8,058.53	2,120.96	1,971.97	149.00	14.235 SF	
15,611.69	6,982.55	7,301.38	6,911.30	136.85	31.46	-88.59	982.04	-8,058.53	2,120.93	1,971.94	148.99	14.236 CC, ES	
15,700.00	6,982.49	7,302.53	6,912.44	138.18	31.46	-88.62	982.01	-8,058.54	2,122.77	1,973.93	148.84	14.262	
15,800.00	6,982.41	7,303.82	6,913.73	139.69	31.46	-88.65	981.98	-8,058.56	2,129.27	1,980.77	148.50	14.338	
15,900.00	6,982.34	7,305.11	6,915.02	141.20	31.46	-88.69	981.94	-8,058.58	2,140.43	1,992.45	147.98	14.464	
16,000.00	6,982.27	7,306.41	6,916.32	142.71	31.46	-88.72	981.91	-8,058.60	2,156.18	2,008.89	147.29	14.639	
16,100.00	6,982.19	7,307.70	6,917.61	144.23	31.47	-88.76	981.88	-8,058.62	2,176.41	2,029.98	146.42	14.864	
16,200.00	6,982.12	7,308.99	6,918.90	145.75	31.47	-88.79	981.85	-8,058.63	2,201.00	2,055.60	145.40	15.137	
16,300.00	6,982.05	7,310.28	6,920.19	147.27	31.47	-88.83	981.82	-8,058.65	2,229.81	2,085.57	144.24	15.459	
16,400.00	6,981.97	7,311.57	6,921.48	148.79	31.47	-88.86	981.79	-8,058.67	2,262.67	2,119.73	142.94	15.830	
16,500.00	6,981.90	7,312.86	6,922.77	150.31	31.47	-88.90	981.75	-8,058.69	2,299.41	2,157.89	141.52	16.248	
16,600.00	6,981.82	7,314.15	6,924.05	151.84	31.47	-88.93	981.72	-8,058.70	2,339.86	2,199.85	140.00	16.713	
16,700.00	6,981.75	7,315.44	6,925.34	153.36	31.48	-88.97	981.69	-8,058.72	2,383.81	2,245.41	138.40	17.224	
16,800.00	6,981.68	7,316.72	6,926.63	154.89	31.48	-89.00	981.66	-8,058.74	2,431.09	2,294.35	136.74	17.779	
16,900.00	6,981.60	7,318.01	6,927.91	156.42	31.48	-89.04	981.63	-8,058.76	2,481.49	2,346.48	135.02	18.379	
17,000.00	6,981.53	7,319.29	6,929.20	157.95	31.48	-89.07	981.60	-8,058.78	2,534.84	2,401.58	133.26	19.022	
17,100.00	6,981.46	7,320.58	6,930.48	159.49	31.48	-89.11	981.57	-8,058.79	2,590.95	2,459.47	131.48	19.705	
17,200.00	6,981.38	7,321.86	6,931.77	161.02	31.48	-89.14	981.53	-8,058.81	2,649.65	2,519.95	129.70	20.429	
17,300.00	6,981.31	7,323.15	6,933.05	162.56	31.49	-89.18	981.50	-8,058.83	2,710.77	2,582.86	127.91	21.192	
17,400.00	6,981.24	7,324.43	6,934.33	164.09	31.49	-89.21	981.47	-8,058.85	2,774.14	2,648.00	126.14	21.993	
17,500.00	6,981.16	7,325.71	6,935.61	165.63	31.49	-89.25	981.44	-8,058.86	2,839.62	2,715.24	124.38	22.830	
17,600.00	6,981.09	7,326.99	6,936.90	167.17	31.49	-89.28	981.41	-8,058.88	2,907.07	2,784.42	122.65	23.702	
17,700.00	6,981.01	7,328.28	6,938.18	168.71	31.49	-89.31	981.38	-8,058.90	2,976.35	2,855.39	120.96	24.607	
17,800.00	6,980.94	7,329.56	6,939.46	170.25	31.49	-89.35	981.35	-8,058.92	3,047.33	2,928.04	119.30	25.544	
17,900.00	6,980.87	7,330.84	6,940.74	171.80	31.50	-89.38	981.32	-8,058.93	3,119.91	3,002.23	117.68	26.513	
18,000.00	6,980.79	7,332.11	6,942.01	173.34	31.50	-89.42	981.28	-8,058.95	3,193.97	3,077.87	116.10	27.511	
18,100.00	6,980.72	7,333.39	6,943.29	174.89	31.50	-89.45	981.25	-8,058.97	3,269.40	3,154.84	114.57	28.537	
18,200.00	6,980.65	7,334.67	6,944.57	176.43	31.50	-89.49	981.22	-8,058.99	3,346.13	3,233.05	113.08	29.590	
18,300.00	6,980.57	7,335.95	6,945.84	177.98	31.50	-89.52	981.19	-8,059.00	3,424.06	3,312.41	111.64	30.669	
18,400.00	6,980.50	7,337.22	6,947.12	179.53	31.50	-89.56	981.16	-8,059.02	3,503.10	3,392.85	110.25	31.773	
18,500.00	6,980.43	7,338.50	6,948.40	181.08	31.51	-89.59	981.13	-8,059.04	3,583.20	3,474.28	108.91	32.900	
18,600.00	6,980.35	7,339.77	6,949.67	182.63	31.51	-89.63	981.10	-8,059.06	3,664.27	3,556.65	107.62	34.049	
18,700.00	6,980.28	7,341.05	6,950.94	184.18	31.51	-89.66	981.07	-8,059.07	3,746.25	3,639.88	106.37	35.219	
18,800.00	6,980.21	7,342.32	6,952.22	185.73	31.51	-89.69	981.04	-8,059.09	3,829.10	3,723.93	105.17	36.408	
18,900.00	6,980.13	7,343.59	6,953.49	187.28	31.51	-89.73	981.00	-8,059.11	3,912.74	3,808.73	104.01	37.617	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164C - OH - OH-SVY													Offset Site Error: 0.00 usft
Survey Program: 386-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)			
19,000.00	6,980.06	7,344.87	6,954.76	188.84	31.51	-89.76	980.97	-8,059.12	3,997.13	3,894.23	102.90	38.843	
19,100.00	6,979.98	7,346.14	6,956.03	190.39	31.52	-89.80	980.94	-8,059.14	4,082.23	3,980.40	101.84	40.087	
19,200.00	6,979.91	7,347.41	6,957.30	191.95	31.52	-89.83	980.91	-8,059.16	4,168.00	4,067.19	100.81	41.346	
19,300.00	6,979.84	7,348.68	6,958.57	193.51	31.52	-89.87	980.88	-8,059.18	4,254.38	4,154.55	99.82	42.619	
19,400.00	6,979.76	7,349.95	6,959.84	195.06	31.52	-89.90	980.85	-8,059.19	4,341.34	4,242.47	98.88	43.907	
19,500.00	6,979.69	7,351.22	6,961.11	196.62	31.52	-89.93	980.82	-8,059.21	4,428.86	4,330.89	97.97	45.207	
19,600.00	6,979.62	7,352.48	6,962.38	198.18	31.52	-89.97	980.79	-8,059.23	4,516.89	4,419.80	97.10	46.520	
19,700.00	6,979.54	7,353.75	6,963.64	199.74	31.53	-90.00	980.76	-8,059.25	4,605.42	4,509.16	96.26	47.844	
19,800.00	6,979.47	7,355.02	6,964.91	201.30	31.53	-90.04	980.73	-8,059.26	4,694.40	4,598.94	95.46	49.178	
19,900.00	6,979.40	7,356.29	6,966.18	202.86	31.53	-90.07	980.70	-8,059.28	4,783.82	4,689.13	94.69	50.522	
20,000.00	6,979.32	7,357.55	6,967.44	204.42	31.53	-90.11	980.67	-8,059.30	4,873.65	4,779.70	93.95	51.875	
20,100.00	6,979.25	7,358.82	6,968.70	205.98	31.53	-90.14	980.64	-8,059.31	4,963.86	4,870.62	93.24	53.236	
20,200.00	6,979.18	7,360.08	6,969.97	207.55	31.53	-90.17	980.60	-8,059.33	5,054.45	4,961.89	92.56	54.605	
20,300.00	6,979.10	7,361.34	6,971.23	209.11	31.54	-90.21	980.57	-8,059.35	5,145.38	5,053.47	91.91	55.980	
20,400.00	6,979.03	7,362.61	6,972.49	210.68	31.54	-90.24	980.54	-8,059.37	5,236.65	5,145.36	91.29	57.362	
20,500.00	6,978.95	7,363.87	6,973.76	212.24	31.54	-90.28	980.51	-8,059.38	5,328.23	5,237.53	90.69	58.749	
20,600.00	6,978.88	7,365.13	6,975.02	213.81	31.54	-90.31	980.48	-8,059.40	5,420.10	5,329.98	90.12	60.141	
20,700.00	6,978.81	7,366.39	6,976.28	215.37	31.54	-90.34	980.45	-8,059.42	5,512.26	5,422.68	89.57	61.538	
20,800.00	6,978.73	7,367.65	6,977.54	216.94	31.54	-90.38	980.42	-8,059.43	5,604.68	5,515.63	89.05	62.939	
20,900.00	6,978.66	7,368.91	6,978.80	218.51	31.55	-90.41	980.39	-8,059.45	5,697.37	5,608.82	88.55	64.343	
21,000.00	6,978.59	7,370.17	6,980.05	220.07	31.55	-90.45	980.36	-8,059.47	5,790.29	5,702.22	88.07	65.750	
21,100.00	6,978.51	7,371.43	6,981.31	221.64	31.55	-90.48	980.33	-8,059.49	5,883.45	5,795.84	87.60	67.160	
21,200.00	6,978.44	7,372.68	6,982.57	223.21	31.55	-90.51	980.30	-8,059.50	5,976.82	5,889.66	87.16	68.571	
21,300.00	6,978.37	7,373.94	6,983.82	224.78	31.55	-90.55	980.27	-8,059.52	6,070.41	5,983.67	86.74	69.984	
21,400.00	6,978.29	7,375.20	6,985.08	226.35	31.55	-90.58	980.24	-8,059.54	6,164.20	6,077.87	86.33	71.399	
21,500.00	6,978.22	7,376.45	6,986.34	227.92	31.56	-90.62	980.21	-8,059.55	6,258.18	6,172.23	85.95	72.814	
21,600.00	6,978.14	7,377.71	6,987.59	229.49	31.56	-90.65	980.18	-8,059.57	6,352.35	6,266.77	85.58	74.229	
21,700.00	6,978.07	7,378.96	6,988.84	231.06	31.56	-90.68	980.15	-8,059.59	6,446.69	6,361.47	85.22	75.645	
21,800.00	6,978.00	7,380.22	6,990.10	232.63	31.56	-90.72	980.12	-8,059.61	6,541.20	6,456.31	84.88	77.060	
21,900.00	6,977.92	7,381.47	6,991.35	234.21	31.56	-90.75	980.09	-8,059.62	6,635.87	6,551.31	84.56	78.475	
22,000.00	6,977.85	7,382.72	6,992.60	235.78	31.56	-90.78	980.06	-8,059.64	6,730.69	6,646.44	84.25	79.889	
22,100.00	6,977.78	7,383.97	6,993.85	237.35	31.56	-90.82	980.03	-8,059.66	6,825.66	6,741.70	83.95	81.302	
22,200.00	6,977.70	7,385.22	6,995.10	238.92	31.57	-90.85	980.00	-8,059.67	6,920.77	6,837.10	83.67	82.713	
22,300.00	6,977.63	7,386.47	6,996.35	240.50	31.57	-90.89	979.97	-8,059.69	7,016.02	6,932.62	83.40	84.123	
22,400.00	6,977.56	7,387.72	6,997.60	242.07	31.57	-90.92	979.94	-8,059.71	7,111.40	7,028.25	83.14	85.531	
22,500.00	6,977.48	7,388.97	6,998.85	243.65	31.57	-90.95	979.91	-8,059.72	7,206.90	7,124.00	82.90	86.937	
22,600.00	6,977.41	7,390.22	7,000.10	245.22	31.57	-90.99	979.88	-8,059.74	7,302.52	7,219.86	82.66	88.340	
22,700.00	6,977.34	7,391.47	7,001.35	246.80	31.57	-91.02	979.85	-8,059.76	7,398.26	7,315.82	82.44	89.741	
22,800.00	6,977.26	7,392.72	7,002.59	248.37	31.58	-91.05	979.82	-8,059.77	7,494.11	7,411.88	82.23	91.139	
22,900.00	6,977.19	7,393.96	7,003.84	249.95	31.58	-91.09	979.79	-8,059.79	7,590.07	7,508.04	82.02	92.534	
23,000.00	6,977.11	7,395.21	7,005.08	251.53	31.58	-91.12	979.76	-8,059.81	7,686.13	7,604.30	81.83	93.927	
23,100.00	6,977.04	7,396.45	7,006.33	253.10	31.58	-91.15	979.73	-8,059.83	7,782.29	7,700.64	81.65	95.315	
23,155.65	6,977.00	7,397.15	7,007.02	253.98	31.58	-91.17	979.71	-8,059.83	7,835.84	7,754.29	81.55	96.087	
23,156.15	6,977.00	7,397.15	7,007.03	254.06	31.58	-91.17	979.71	-8,059.83	7,836.32	7,751.32	85.00	92.187	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171 - OH - OH-INC													Offset Site Error: 0.00 usft
Survey Program: 95-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	-103.36	-1,143.86	-4,817.29	4,952.49				
100.00	100.00	0.00	0.00	0.25	0.00	-103.36	-1,143.86	-4,817.29	4,951.24	4,950.99	0.25	N/A	
137.88	137.88	25.88	25.88	0.39	0.48	-103.36	-1,143.86	-4,817.29	4,951.23	4,950.36	0.87	5,722.371	
200.00	200.00	88.00	88.00	0.61	1.63	-103.36	-1,143.86	-4,817.29	4,951.23	4,948.99	2.24	2,214.192	
286.69	286.69	174.43	174.43	0.92	3.22	-103.36	-1,143.69	-4,817.29	4,951.19	4,947.04	4.14	1,194.611	
300.00	300.00	186.92	186.91	0.97	3.46	-103.36	-1,143.70	-4,817.29	4,951.19	4,946.77	4.42	1,119.397	
400.00	400.00	288.01	288.00	1.33	5.32	-103.36	-1,143.86	-4,817.29	4,951.23	4,944.58	6.65	744.515	
480.54	480.54	368.53	368.52	1.62	6.81	-103.35	-1,143.59	-4,817.29	4,951.16	4,942.74	8.43	587.501	
500.00	500.00	387.22	387.21	1.68	7.16	-103.35	-1,143.60	-4,817.29	4,951.17	4,942.32	8.84	559.913	
600.00	599.98	483.27	483.26	2.04	8.93	-113.36	-1,143.83	-4,817.29	4,951.91	4,940.94	10.98	451.153	
700.00	699.84	587.85	587.84	2.41	10.87	-113.38	-1,143.86	-4,817.29	4,954.00	4,940.73	13.27	373.390	
800.00	799.45	687.47	687.45	2.77	12.71	-113.41	-1,143.86	-4,817.29	4,957.47	4,942.00	15.47	320.465	
900.00	898.70	785.23	785.21	3.13	14.52	-113.44	-1,143.40	-4,817.29	4,962.24	4,944.60	17.64	281.269	
1,000.00	997.47	881.79	881.77	3.50	16.30	-113.49	-1,143.61	-4,817.29	4,968.59	4,948.78	19.80	250.928	
1,100.00	1,095.63	983.67	983.63	3.89	18.22	-111.19	-1,143.86	-4,817.29	4,975.96	4,953.85	22.11	225.076	
1,200.00	1,193.09	1,081.13	1,081.09	4.29	20.13	-109.57	-1,143.86	-4,817.29	4,983.90	4,959.49	24.41	204.150	
1,300.00	1,289.73	1,177.76	1,177.73	4.72	22.02	-108.40	-1,143.86	-4,817.29	4,992.50	4,965.79	26.72	186.851	
1,400.00	1,385.42	1,271.56	1,271.53	5.16	23.85	-107.52	-1,143.39	-4,817.29	5,001.68	4,972.69	28.99	172.530	
1,496.97	1,477.20	1,361.18	1,361.15	5.62	25.61	-106.88	-1,143.59	-4,817.29	5,011.46	4,980.27	31.19	160.688	
1,500.00	1,480.05	1,363.97	1,363.93	5.63	25.66	-106.89	-1,143.60	-4,817.29	5,011.78	4,980.52	31.26	160.344	
1,600.00	1,574.15	1,462.23	1,462.15	6.12	27.59	-107.26	-1,143.86	-4,817.29	5,022.35	4,988.69	33.66	149.225	
1,700.00	1,668.25	1,556.33	1,556.25	6.62	29.43	-107.61	-1,143.86	-4,817.29	5,033.06	4,997.07	35.99	139.852	
1,800.00	1,762.35	1,650.43	1,650.35	7.12	31.28	-107.96	-1,143.86	-4,817.29	5,043.98	5,005.65	38.33	131.601	
1,900.00	1,856.45	1,742.40	1,742.31	7.64	33.09	-108.28	-1,142.73	-4,817.29	5,054.78	5,014.15	40.63	124.407	
2,000.00	1,950.55	1,832.09	1,832.00	8.16	34.85	-108.61	-1,143.00	-4,817.29	5,066.18	5,023.28	42.89	118.110	
2,100.00	2,044.65	1,921.60	1,921.50	8.68	36.61	-108.94	-1,143.52	-4,817.29	5,077.86	5,032.70	45.16	112.452	
2,200.00	2,138.75	2,026.88	2,026.75	9.21	38.68	-109.33	-1,143.86	-4,817.29	5,089.67	5,041.93	47.73	106.628	
2,300.00	2,232.85	2,120.98	2,120.85	9.74	40.53	-109.67	-1,143.86	-4,817.29	5,101.59	5,051.49	50.09	101.843	
2,400.00	2,326.95	2,214.08	2,213.95	10.27	42.36	-110.00	-1,143.39	-4,817.29	5,113.55	5,061.12	52.43	97.523	
2,500.00	2,421.05	2,305.18	2,305.05	10.81	44.15	-110.33	-1,143.52	-4,817.29	5,125.91	5,071.17	54.74	93.646	
2,600.00	2,515.15	2,403.32	2,403.15	11.34	46.08	-110.68	-1,143.86	-4,817.29	5,138.51	5,081.33	57.18	89.866	
2,700.00	2,609.25	2,497.42	2,497.25	11.88	47.87	-111.02	-1,143.86	-4,817.29	5,151.21	5,091.73	59.49	86.597	
2,800.00	2,703.35	2,591.52	2,591.35	12.42	49.66	-111.35	-1,143.86	-4,817.29	5,164.10	5,102.31	61.79	83.575	
2,900.00	2,797.45	2,679.90	2,679.72	12.96	51.34	-111.65	-1,143.09	-4,817.29	5,176.91	5,112.92	63.99	80.907	
3,000.00	2,891.55	2,767.07	2,766.89	13.51	53.00	-111.96	-1,143.53	-4,817.29	5,190.34	5,124.18	66.16	78.454	
3,100.00	2,985.65	2,873.84	2,873.65	14.05	54.96	-112.34	-1,143.86	-4,817.29	5,203.88	5,135.26	68.63	75.829	
3,200.00	3,079.75	2,967.94	2,967.75	14.60	56.63	-112.66	-1,143.86	-4,817.29	5,217.52	5,146.70	70.82	73.677	
3,300.00	3,173.85	3,061.92	3,061.73	15.14	58.31	-112.99	-1,143.59	-4,817.29	5,231.24	5,158.23	73.00	71.657	
3,400.00	3,267.95	3,154.41	3,154.22	15.69	59.96	-113.30	-1,143.63	-4,817.29	5,245.25	5,170.09	75.16	69.784	
3,500.00	3,362.05	3,246.85	3,246.66	16.23	61.60	-113.62	-1,143.75	-4,817.29	5,259.47	5,182.15	77.32	68.020	
3,600.00	3,456.15	3,344.35	3,344.15	16.78	63.45	-113.95	-1,143.86	-4,817.29	5,273.87	5,194.19	79.68	66.189	
3,700.00	3,550.25	3,438.45	3,438.25	17.33	65.36	-114.27	-1,143.86	-4,817.29	5,288.41	5,206.31	82.10	64.415	
3,800.00	3,644.35	3,532.55	3,532.35	17.88	67.27	-114.59	-1,143.86	-4,817.29	5,303.12	5,218.60	84.52	62.745	
3,900.00	3,738.45	3,626.65	3,626.45	18.42	69.18	-114.91	-1,143.86	-4,817.29	5,318.01	5,231.07	86.94	61.171	
4,000.00	3,832.55	3,720.75	3,720.55	18.97	71.09	-115.22	-1,143.86	-4,817.29	5,333.07	5,243.71	89.35	59.684	
4,100.00	3,926.65	3,814.85	3,814.65	19.52	73.00	-115.53	-1,143.86	-4,817.29	5,348.30	5,256.53	91.77	58.278	
4,200.00	4,020.75	3,908.95	3,908.75	20.07	74.91	-115.84	-1,143.86	-4,817.29	5,363.70	5,269.51	94.19	56.947	
4,300.00	4,114.85	4,003.03	4,002.82	20.62	76.82	-116.14	-1,142.33	-4,817.29	5,378.63	5,282.03	96.60	55.678	
4,400.00	4,208.95	4,095.81	4,095.60	21.17	78.70	-116.44	-1,142.36	-4,817.29	5,394.37	5,295.38	98.99	54.495	
4,500.00	4,303.05	4,188.55	4,188.34	21.72	80.58	-116.74	-1,142.44	-4,817.29	5,410.31	5,308.93	101.37	53.370	
4,600.00	4,397.15	4,281.25	4,281.04	22.27	82.46	-117.04	-1,142.57	-4,817.29	5,426.43	5,322.67	103.76	52.299	
4,700.00	4,491.25	4,373.91	4,373.70	22.82	84.34	-117.34	-1,142.76	-4,817.29	5,442.74	5,336.60	106.14	51.280	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design:		Rosa Unit 34 - (O) Rosa Unit #171 - OH - OH-INC											Offset Site Error:		0.00 usft				
Survey Program:		95-A027Ua_INC-ONLY							Rule Assigned:							Offset Well Error:		0.00 usft	
Reference		Offset		Semi Major Axis		Highside		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)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor							
4,800.00	4,585.35	4,466.53	4,466.32	23.37	86.22	-117.64	-1,143.00	-4,817.29	5,459.23	5,350.72	108.52	50.307							
4,900.00	4,679.45	4,559.12	4,558.91	23.93	88.10	-117.94	-1,143.30	-4,817.29	5,475.92	5,365.02	110.89	49.379							
5,000.00	4,773.55	4,651.67	4,651.45	24.48	89.98	-118.24	-1,143.64	-4,817.29	5,492.79	5,379.52	113.27	48.493							
5,100.00	4,867.65	4,756.03	4,755.65	25.03	92.18	-118.56	-1,143.86	-4,817.29	5,509.74	5,393.77	115.97	47.510							
5,200.00	4,961.75	4,850.12	4,849.75	25.58	94.23	-118.86	-1,143.86	-4,817.29	5,526.77	5,408.25	118.52	46.633							
5,300.00	5,055.85	4,944.22	4,943.85	26.13	96.28	-119.15	-1,143.86	-4,817.29	5,543.95	5,422.89	121.06	45.795							
5,400.00	5,149.95	5,038.32	5,037.95	26.68	98.33	-119.44	-1,143.86	-4,817.29	5,561.28	5,437.67	123.60	44.993							
5,500.00	5,244.05	5,132.42	5,132.05	27.24	100.38	-119.73	-1,143.86	-4,817.29	5,578.76	5,452.61	126.15	44.224							
5,600.00	5,338.15	5,226.52	5,226.15	27.79	102.43	-120.02	-1,143.86	-4,817.29	5,596.39	5,467.71	128.69	43.488							
5,665.73	5,400.00	5,288.37	5,288.00	28.15	103.78	-120.21	-1,143.86	-4,817.29	5,608.06	5,477.71	130.36	43.020							
5,700.00	5,432.28	5,320.66	5,320.28	28.34	104.48	-120.36	-1,143.86	-4,817.29	5,614.12	5,482.90	131.23	42.781							
5,800.00	5,526.87	5,415.25	5,414.87	28.88	106.55	-120.78	-1,143.86	-4,817.29	5,631.32	5,497.54	133.77	42.097							
5,900.00	5,622.01	5,510.38	5,510.01	29.41	108.62	-121.18	-1,143.86	-4,817.29	5,647.75	5,511.44	136.31	41.433							
6,000.00	5,717.67	5,606.04	5,605.67	29.92	110.70	-121.56	-1,143.86	-4,817.29	5,663.41	5,524.56	138.85	40.787							
6,100.00	5,813.83	5,702.20	5,701.83	30.41	112.80	-121.92	-1,143.86	-4,817.29	5,678.27	5,536.87	141.39	40.160							
6,200.00	5,910.44	5,798.82	5,798.44	30.89	114.90	-122.25	-1,143.86	-4,817.29	5,692.30	5,548.37	143.93	39.549							
6,300.00	6,007.50	5,895.87	5,895.50	31.36	117.02	-122.57	-1,143.86	-4,817.29	5,705.48	5,559.02	146.47	38.954							
6,400.00	6,104.96	5,993.33	5,992.96	31.80	119.14	-122.86	-1,143.86	-4,817.29	5,717.80	5,568.80	149.00	38.374							
6,500.00	6,202.80	6,028.00	6,027.37	32.24	119.90	-123.02	-1,143.86	-4,817.29	5,729.59	5,579.48	150.11	38.168							
6,600.00	6,300.98	6,028.00	6,027.37	32.66	119.90	-123.12	-1,143.86	-4,817.29	5,742.05	5,591.65	150.40	38.179							
6,700.00	6,399.48	6,028.00	6,027.37	33.06	119.90	-123.24	-1,143.86	-4,817.29	5,755.28	5,604.65	150.63	38.208							
6,722.82	6,422.00	6,028.00	6,027.37	33.15	119.90	-123.26	-1,143.86	-4,817.29	5,758.40	5,607.73	150.68	38.217							
6,750.00	6,448.76	6,028.00	6,027.37	33.26	119.90	-113.17	-1,143.86	-4,817.29	5,762.04	5,611.31	150.73	38.228							
6,800.00	6,497.51	6,028.00	6,027.37	33.48	119.90	-101.35	-1,143.86	-4,817.29	5,768.18	5,617.34	150.84	38.240							
6,850.00	6,545.40	6,028.00	6,027.37	33.72	119.90	-94.37	-1,143.86	-4,817.29	5,773.57	5,622.60	150.96	38.245							
6,900.00	6,592.13	6,028.00	6,027.37	33.97	119.90	-89.84	-1,143.86	-4,817.29	5,778.17	5,627.06	151.10	38.240							
6,950.00	6,637.40	6,028.00	6,027.37	34.25	119.90	-86.72	-1,143.86	-4,817.29	5,781.95	5,630.70	151.25	38.227							
7,000.00	6,680.94	6,028.00	6,027.37	34.54	119.90	-84.46	-1,143.86	-4,817.29	5,784.90	5,633.48	151.42	38.204							
7,050.00	6,722.48	6,028.00	6,027.37	34.85	119.90	-82.79	-1,143.86	-4,817.29	5,787.01	5,635.41	151.60	38.173							
7,100.00	6,761.76	6,028.00	6,027.37	35.17	119.90	-81.55	-1,143.86	-4,817.29	5,788.25	5,636.45	151.80	38.131							
7,150.00	6,798.55	6,028.00	6,027.37	35.51	119.90	-80.63	-1,143.86	-4,817.29	5,788.62	5,636.61	152.01	38.081							
7,200.00	6,832.61	6,028.00	6,027.37	35.86	119.90	-79.97	-1,143.86	-4,817.29	5,788.11	5,635.88	152.24	38.020							
7,250.00	6,863.74	6,028.00	6,027.37	36.22	119.90	-79.52	-1,143.86	-4,817.29	5,786.74	5,634.26	152.49	37.949							
7,300.00	6,891.74	6,028.00	6,027.37	36.59	119.90	-79.26	-1,143.86	-4,817.29	5,784.51	5,631.76	152.75	37.869							
7,350.00	6,916.44	6,028.00	6,027.37	36.98	119.90	-79.16	-1,143.86	-4,817.29	5,781.43	5,628.39	153.04	37.778							
7,400.00	6,937.69	6,028.00	6,027.37	37.37	119.90	-79.21	-1,143.86	-4,817.29	5,777.52	5,624.18	153.34	37.677							
7,450.00	6,955.36	6,028.00	6,027.37	37.78	119.90	-79.39	-1,143.86	-4,817.29	5,772.80	5,619.13	153.67	37.567							
7,500.00	6,969.34	6,028.00	6,027.37	38.19	119.90	-79.69	-1,143.86	-4,817.29	5,767.30	5,613.29	154.01	37.447							
7,550.00	6,979.53	6,028.00	6,027.37	38.62	119.90	-80.12	-1,143.86	-4,817.29	5,761.05	5,606.68	154.37	37.319							
7,600.00	6,985.89	6,028.00	6,027.37	39.05	119.90	-80.65	-1,143.86	-4,817.29	5,754.09	5,599.33	154.75	37.182							
7,650.00	6,988.37	6,028.00	6,027.37	39.48	119.90	-81.29	-1,143.86	-4,817.29	5,746.45	5,591.30	155.15	37.038							
7,657.25	6,988.40	6,028.00	6,027.37	39.54	119.90	-81.40	-1,143.86	-4,817.29	5,745.29	5,590.08	155.21	37.016							
7,700.00	6,988.37	6,028.00	6,027.37	39.92	119.90	-81.40	-1,143.86	-4,817.29	5,738.56	5,583.00	155.56	36.890							
7,800.00	6,988.30	6,028.00	6,027.37	40.82	119.90	-81.40	-1,143.86	-4,817.29	5,724.04	5,567.65	156.40	36.599							
7,900.00	6,988.23	6,028.00	6,027.37	41.77	119.90	-81.40	-1,143.86	-4,817.29	5,711.24	5,553.98	157.26	36.317							
8,000.00	6,988.16	6,028.00	6,027.37	42.75	119.90	-81.40	-1,143.86	-4,817.29	5,700.16	5,542.02	158.14	36.045							
8,100.00	6,988.09	6,028.00	6,027.37	43.76	119.90	-81.40	-1,143.86	-4,817.29	5,690.82	5,531.78	159.04	35.782							
8,152.35	6,988.06	6,028.00	6,027.37	44.30	119.90	-81.40	-1,143.86	-4,817.29	5,686.62	5,527.11	159.52	35.649							
8,200.00	6,988.02	6,028.00	6,027.37	44.79	119.90	-81.37	-1,143.86	-4,817.29	5,682.44	5,522.49	159.95	35.526							
8,300.00	6,987.95	6,028.00	6,027.37	45.83	119.90	-81.30	-1,143.86	-4,817.29	5,669.88	5,509.00	160.87	35.244							
8,400.00	6,987.88	6,028.00	6,027.37	46.85	119.90	-81.19	-1,143.86	-4,817.29	5,652.22	5,490.42	161.80	34.933							
8,500.00	6,987.80	6,028.00	6,027.37	47.85	119.90	-81.05	-1,143.86	-4,817.29	5,629.50	5,466.78	162.72	34.595							

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171 - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		95-A027Ua_INC-ONLY										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		
8,600.00	6,987.73	6,028.00	6,027.37	48.83	119.90	-80.87	-1,143.86	-4,817.29	5,601.78	5,438.13	163.64	34.231		
8,700.00	6,987.65	6,028.00	6,027.37	49.79	119.90	-80.65	-1,143.86	-4,817.29	5,569.10	5,404.55	164.56	33.843		
8,800.00	6,987.57	6,028.00	6,027.37	50.72	119.90	-80.39	-1,143.86	-4,817.29	5,531.55	5,366.10	165.45	33.433		
8,900.00	6,987.50	6,028.00	6,027.37	51.62	119.90	-80.08	-1,143.86	-4,817.29	5,489.21	5,322.88	166.33	33.001		
9,000.00	6,987.42	6,028.00	6,027.37	52.48	119.90	-79.70	-1,143.86	-4,817.29	5,442.18	5,274.99	167.19	32.551		
9,100.00	6,987.34	6,028.00	6,027.37	53.30	119.90	-79.27	-1,143.86	-4,817.29	5,390.57	5,222.55	168.02	32.083		
9,200.00	6,987.27	6,028.00	6,027.37	54.08	119.90	-78.75	-1,143.86	-4,817.29	5,334.49	5,165.67	168.82	31.599		
9,215.33	6,987.26	6,028.00	6,027.37	54.20	119.90	-78.67	-1,143.86	-4,817.29	5,325.51	5,156.57	168.94	31.523		
9,300.00	6,987.20	6,028.00	6,027.37	54.85	119.90	-78.67	-1,143.86	-4,817.29	5,276.06	5,106.46	169.60	31.109		
9,400.00	6,987.12	6,028.00	6,027.37	55.65	119.90	-78.67	-1,143.86	-4,817.29	5,218.83	5,048.43	170.39	30.628		
9,500.00	6,987.05	6,028.00	6,027.37	56.48	119.90	-78.67	-1,143.86	-4,817.29	5,162.90	4,991.69	171.21	30.156		
9,600.00	6,986.98	6,028.00	6,027.37	57.35	119.90	-78.67	-1,143.86	-4,817.29	5,108.31	4,936.27	172.04	29.693		
9,700.00	6,986.90	6,028.00	6,027.37	58.24	119.90	-78.67	-1,143.86	-4,817.29	5,055.12	4,882.23	172.88	29.240		
9,800.00	6,986.83	6,028.00	6,027.37	59.17	119.90	-78.67	-1,143.86	-4,817.29	5,003.35	4,829.61	173.75	28.797		
9,900.00	6,986.75	6,028.00	6,027.37	60.12	119.90	-78.67	-1,143.86	-4,817.29	4,953.07	4,778.44	174.62	28.364		
10,000.00	6,986.68	6,028.00	6,027.37	61.10	119.90	-78.67	-1,143.86	-4,817.29	4,904.31	4,728.79	175.51	27.943		
10,100.00	6,986.61	6,028.00	6,027.37	62.11	119.90	-78.67	-1,143.86	-4,817.29	4,857.11	4,680.70	176.41	27.533		
10,200.00	6,986.53	6,028.00	6,027.37	63.14	119.90	-78.67	-1,143.86	-4,817.29	4,811.54	4,634.21	177.32	27.134		
10,300.00	6,986.46	6,028.00	6,027.37	64.20	119.90	-78.67	-1,143.86	-4,817.29	4,767.62	4,589.38	178.25	26.747		
10,400.00	6,986.39	6,028.00	6,027.37	65.28	119.90	-78.67	-1,143.86	-4,817.29	4,725.42	4,546.24	179.18	26.373		
10,500.00	6,986.31	6,028.00	6,027.37	66.38	119.90	-78.67	-1,143.86	-4,817.29	4,684.97	4,504.85	180.11	26.012		
10,600.00	6,986.24	6,028.00	6,027.37	67.50	119.90	-78.67	-1,143.86	-4,817.29	4,646.32	4,465.26	181.05	25.663		
10,700.00	6,986.17	6,028.00	6,027.37	68.64	119.90	-78.67	-1,143.86	-4,817.29	4,609.51	4,427.52	181.99	25.328		
10,800.00	6,986.09	6,028.00	6,027.37	69.80	119.90	-78.67	-1,143.86	-4,817.29	4,574.60	4,391.66	182.94	25.006		
10,900.00	6,986.02	6,028.00	6,027.37	70.98	119.90	-78.67	-1,143.86	-4,817.29	4,541.61	4,357.73	183.88	24.699		
11,000.00	6,985.95	6,028.00	6,027.37	72.17	119.90	-78.67	-1,143.86	-4,817.29	4,510.61	4,325.79	184.82	24.405		
11,100.00	6,985.87	6,028.00	6,027.37	73.38	119.90	-78.67	-1,143.86	-4,817.29	4,481.62	4,295.87	185.76	24.126		
11,200.00	6,985.80	6,028.00	6,027.37	74.61	119.90	-78.67	-1,143.86	-4,817.29	4,454.69	4,268.01	186.68	23.862		
11,300.00	6,985.72	6,028.00	6,027.37	75.85	119.90	-78.67	-1,143.86	-4,817.29	4,429.85	4,242.25	187.60	23.613		
11,400.00	6,985.65	6,028.00	6,027.37	77.10	119.90	-78.67	-1,143.86	-4,817.29	4,407.15	4,218.64	188.51	23.379		
11,500.00	6,985.58	6,028.00	6,027.37	78.37	119.90	-78.67	-1,143.86	-4,817.29	4,386.60	4,197.20	189.40	23.160		
11,600.00	6,985.50	6,028.00	6,027.37	79.65	119.90	-78.67	-1,143.86	-4,817.29	4,368.25	4,177.97	190.28	22.957		
11,700.00	6,985.43	6,028.00	6,027.37	80.94	119.90	-78.67	-1,143.86	-4,817.29	4,352.12	4,160.98	191.14	22.770		
11,800.00	6,985.36	6,028.00	6,027.37	82.24	119.90	-78.67	-1,143.86	-4,817.29	4,338.24	4,146.26	191.98	22.598		
11,900.00	6,985.28	6,028.00	6,027.37	83.56	119.90	-78.67	-1,143.86	-4,817.29	4,326.62	4,133.83	192.79	22.442		
12,000.00	6,985.21	6,028.00	6,027.37	84.88	119.90	-78.67	-1,143.86	-4,817.29	4,317.29	4,123.70	193.58	22.302		
12,100.00	6,985.14	6,028.00	6,027.37	86.21	119.90	-78.67	-1,143.86	-4,817.29	4,310.26	4,115.91	194.35	22.178		
12,200.00	6,985.06	6,028.00	6,027.37	87.56	119.90	-78.67	-1,143.86	-4,817.29	4,305.54	4,110.45	195.09	22.070		
12,300.00	6,984.99	6,028.00	6,027.37	88.91	119.90	-78.67	-1,143.86	-4,817.29	4,303.14	4,107.34	195.80	21.977		
12,353.31	6,984.95	6,028.00	6,027.37	89.63	119.90	-78.67	-1,143.86	-4,817.29	4,302.81	4,106.64	196.17	21.935 CC		
12,400.00	6,984.92	6,028.00	6,027.37	90.27	119.90	-78.67	-1,143.86	-4,817.29	4,303.06	4,106.58	196.48	21.901 ES		
12,500.00	6,984.84	6,028.00	6,027.37	91.64	119.90	-78.67	-1,143.86	-4,817.29	4,305.31	4,108.18	197.12	21.841		
12,600.00	6,984.77	6,028.00	6,027.37	93.01	119.90	-78.67	-1,143.86	-4,817.29	4,309.87	4,112.14	197.74	21.796		
12,700.00	6,984.69	6,028.00	6,027.37	94.40	119.90	-78.67	-1,143.86	-4,817.29	4,316.75	4,118.44	198.32	21.767		
12,800.00	6,984.62	6,028.00	6,027.37	95.79	119.90	-78.67	-1,143.86	-4,817.29	4,325.93	4,127.07	198.86	21.754 SF		
12,900.00	6,984.55	6,028.00	6,027.37	97.18	119.90	-78.67	-1,143.86	-4,817.29	4,337.40	4,138.03	199.37	21.756		
13,000.00	6,984.47	6,028.00	6,027.37	98.59	119.90	-78.67	-1,143.86	-4,817.29	4,351.13	4,151.29	199.84	21.773		
13,100.00	6,984.40	6,028.00	6,027.37	100.00	119.90	-78.67	-1,143.86	-4,817.29	4,367.12	4,166.84	200.28	21.805		
13,200.00	6,984.33	6,028.00	6,027.37	101.41	119.90	-78.67	-1,143.86	-4,817.29	4,385.32	4,184.64	200.68	21.852		
13,300.00	6,984.25	6,028.00	6,027.37	102.83	119.90	-78.67	-1,143.86	-4,817.29	4,405.72	4,204.67	201.05	21.914		
13,400.00	6,984.18	6,028.00	6,027.37	104.26	119.90	-78.67	-1,143.86	-4,817.29	4,428.29	4,226.91	201.38	21.990		
13,500.00	6,984.11	6,028.00	6,027.37	105.69	119.90	-78.67	-1,143.86	-4,817.29	4,452.98	4,251.31	201.67	22.080		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171 - OH - OH-INC													Offset Site Error:	0.00 usft	
Survey Program:		95-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)				
13,600.00	6,984.03	6,028.00	6,027.37	107.13	119.90	-78.67	-1,143.86	-4,817.29	4,479.78	4,277.84	201.94	22.184			
13,700.00	6,983.96	6,028.00	6,027.37	108.57	119.90	-78.67	-1,143.86	-4,817.29	4,508.63	4,306.47	202.16	22.302			
13,800.00	6,983.88	6,028.00	6,027.37	110.02	119.90	-78.67	-1,143.86	-4,817.29	4,539.50	4,337.14	202.36	22.433			
13,900.00	6,983.81	6,028.00	6,027.37	111.47	119.90	-78.67	-1,143.86	-4,817.29	4,572.35	4,369.83	202.52	22.577			
14,000.00	6,983.74	6,028.00	6,027.37	112.92	119.90	-78.67	-1,143.86	-4,817.29	4,607.14	4,404.49	202.66	22.734			
14,100.00	6,983.66	6,028.00	6,027.37	114.38	119.90	-78.67	-1,143.86	-4,817.29	4,643.82	4,441.06	202.76	22.903			
14,200.00	6,983.59	6,028.00	6,027.37	115.85	119.90	-78.67	-1,143.86	-4,817.29	4,682.35	4,479.52	202.83	23.085			
14,300.00	6,983.52	6,028.00	6,027.37	117.31	119.90	-78.67	-1,143.86	-4,817.29	4,722.69	4,519.80	202.88	23.278			
14,400.00	6,983.44	6,028.00	6,027.37	118.78	119.90	-78.67	-1,143.86	-4,817.29	4,764.78	4,561.87	202.91	23.483			
14,500.00	6,983.37	6,028.00	6,027.37	120.26	119.90	-78.67	-1,143.86	-4,817.29	4,808.58	4,605.68	202.91	23.699			
14,600.00	6,983.30	6,028.00	6,027.37	121.74	119.90	-78.67	-1,143.86	-4,817.29	4,854.05	4,651.17	202.88	23.926			
14,700.00	6,983.22	6,028.00	6,027.37	123.22	119.90	-78.67	-1,143.86	-4,817.29	4,901.14	4,698.30	202.84	24.163			
14,800.00	6,983.15	6,028.00	6,027.37	124.70	119.90	-78.67	-1,143.86	-4,817.29	4,949.80	4,747.03	202.77	24.411			
14,900.00	6,983.08	6,028.00	6,027.37	126.19	119.90	-78.67	-1,143.86	-4,817.29	4,999.98	4,797.30	202.68	24.669			
15,000.00	6,983.00	6,028.00	6,027.37	127.68	119.90	-78.67	-1,143.86	-4,817.29	5,051.65	4,849.07	202.58	24.936			
15,100.00	6,982.93	6,028.00	6,027.37	129.17	119.90	-78.67	-1,143.86	-4,817.29	5,104.75	4,902.29	202.46	25.213			
15,200.00	6,982.85	6,028.00	6,027.37	130.67	119.90	-78.67	-1,143.86	-4,817.29	5,159.25	4,956.92	202.33	25.499			
15,300.00	6,982.78	6,028.00	6,027.37	132.16	119.90	-78.67	-1,143.86	-4,817.29	5,215.09	5,012.91	202.18	25.794			
15,400.00	6,982.71	6,028.00	6,027.37	133.66	119.90	-78.67	-1,143.86	-4,817.29	5,272.24	5,070.22	202.02	26.098			
15,500.00	6,982.63	6,028.00	6,027.37	135.17	119.90	-78.67	-1,143.86	-4,817.29	5,330.65	5,128.81	201.85	26.410			
15,600.00	6,982.56	6,028.00	6,027.37	136.67	119.90	-78.67	-1,143.86	-4,817.29	5,390.29	5,188.62	201.66	26.729			
15,700.00	6,982.49	6,028.00	6,027.37	138.18	119.90	-78.67	-1,143.86	-4,817.29	5,451.10	5,249.63	201.47	27.057			
15,800.00	6,982.41	6,028.00	6,027.37	139.69	119.90	-78.67	-1,143.86	-4,817.29	5,513.06	5,311.80	201.27	27.392			
15,900.00	6,982.34	6,028.00	6,027.37	141.20	119.90	-78.67	-1,143.86	-4,817.29	5,576.13	5,375.07	201.06	27.734			
16,000.00	6,982.27	6,028.00	6,027.37	142.71	119.90	-78.67	-1,143.86	-4,817.29	5,640.26	5,439.42	200.84	28.083			
16,100.00	6,982.19	6,028.00	6,027.37	144.23	119.90	-78.67	-1,143.86	-4,817.29	5,705.43	5,504.81	200.62	28.439			
16,200.00	6,982.12	6,028.00	6,027.37	145.75	119.90	-78.67	-1,143.86	-4,817.29	5,771.59	5,571.20	200.39	28.802			
16,300.00	6,982.05	6,028.00	6,027.37	147.27	119.90	-78.67	-1,143.86	-4,817.29	5,838.71	5,638.55	200.16	29.171			
16,400.00	6,981.97	6,028.00	6,027.37	148.79	119.90	-78.67	-1,143.86	-4,817.29	5,906.77	5,706.85	199.92	29.545			
16,500.00	6,981.90	6,028.00	6,027.37	150.31	119.90	-78.67	-1,143.86	-4,817.29	5,975.72	5,776.04	199.68	29.926			
16,600.00	6,981.82	6,028.00	6,027.37	151.84	119.90	-78.67	-1,143.86	-4,817.29	6,045.54	5,846.10	199.44	30.313			
16,700.00	6,981.75	6,028.00	6,027.37	153.36	119.90	-78.67	-1,143.86	-4,817.29	6,116.20	5,917.01	199.19	30.705			
16,800.00	6,981.68	6,028.00	6,027.37	154.89	119.90	-78.67	-1,143.86	-4,817.29	6,187.67	5,988.72	198.95	31.102			
16,900.00	6,981.60	6,028.00	6,027.37	156.42	119.90	-78.67	-1,143.86	-4,817.29	6,259.92	6,061.22	198.70	31.504			
17,000.00	6,981.53	6,028.00	6,027.37	157.95	119.90	-78.67	-1,143.86	-4,817.29	6,332.92	6,134.47	198.45	31.911			
17,100.00	6,981.46	6,028.00	6,027.37	159.49	119.90	-78.67	-1,143.86	-4,817.29	6,406.66	6,208.45	198.21	32.323			
17,200.00	6,981.38	6,028.00	6,027.37	161.02	119.90	-78.67	-1,143.86	-4,817.29	6,481.10	6,283.14	197.96	32.740			
17,300.00	6,981.31	6,028.00	6,027.37	162.56	119.90	-78.67	-1,143.86	-4,817.29	6,556.21	6,358.50	197.71	33.161			
17,400.00	6,981.24	6,028.00	6,027.37	164.09	119.90	-78.67	-1,143.86	-4,817.29	6,631.99	6,434.53	197.46	33.586			
17,500.00	6,981.16	6,028.00	6,027.37	165.63	119.90	-78.67	-1,143.86	-4,817.29	6,708.40	6,511.18	197.22	34.015			
17,600.00	6,981.09	6,028.00	6,027.37	167.17	119.90	-78.67	-1,143.86	-4,817.29	6,785.42	6,588.45	196.97	34.448			
17,700.00	6,981.01	6,028.00	6,027.37	168.71	119.90	-78.67	-1,143.86	-4,817.29	6,863.04	6,666.31	196.73	34.885			
17,800.00	6,980.94	6,028.00	6,027.37	170.25	119.90	-78.67	-1,143.86	-4,817.29	6,941.23	6,744.74	196.49	35.326			
17,900.00	6,980.87	6,028.00	6,027.37	171.80	119.90	-78.67	-1,143.86	-4,817.29	7,019.97	6,823.72	196.25	35.770			
18,000.00	6,980.79	6,028.00	6,027.37	173.34	119.90	-78.67	-1,143.86	-4,817.29	7,099.25	6,903.23	196.01	36.218			
18,100.00	6,980.72	6,028.00	6,027.37	174.89	119.90	-78.67	-1,143.86	-4,817.29	7,179.04	6,983.26	195.78	36.669			
18,200.00	6,980.65	6,028.00	6,027.37	176.43	119.90	-78.67	-1,143.86	-4,817.29	7,259.34	7,063.79	195.55	37.123			
18,300.00	6,980.57	6,028.00	6,027.37	177.98	119.90	-78.67	-1,143.86	-4,817.29	7,340.12	7,144.80	195.32	37.580			
18,400.00	6,980.50	6,028.00	6,027.37	179.53	119.90	-78.67	-1,143.86	-4,817.29	7,421.37	7,226.27	195.09	38.040			
18,500.00	6,980.43	6,028.00	6,027.37	181.08	119.90	-78.67	-1,143.86	-4,817.29	7,503.07	7,308.20	194.87	38.503			
18,600.00	6,980.35	6,028.00	6,027.37	182.63	119.90	-78.67	-1,143.86	-4,817.29	7,585.21	7,390.56	194.65	38.969			
18,700.00	6,980.28	6,028.00	6,027.37	184.18	119.90	-78.67	-1,143.86	-4,817.29	7,667.77	7,473.34	194.43	39.437			

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171 - OH - OH-INC												Offset Site Error:	0.00 usft		
Survey Program:		95-A027Ua_INC-ONLY				Offset		Semi Major Axis		Distance		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		
18,800.00	6,980.21	6,028.00	6,027.37	185.73	119.90	-78.67	-1,143.86	-4,817.29	7,750.74	7,556.53	194.21	39.908			
18,900.00	6,980.13	6,028.00	6,027.37	187.28	119.90	-78.67	-1,143.86	-4,817.29	7,834.12	7,640.11	194.00	40.382			
19,000.00	6,980.06	6,028.00	6,027.37	188.84	119.90	-78.67	-1,143.86	-4,817.29	7,917.87	7,724.08	193.79	40.857			
19,100.00	6,979.98	6,028.00	6,027.37	190.39	119.90	-78.67	-1,143.86	-4,817.29	8,002.00	7,808.41	193.59	41.335			
19,200.00	6,979.91	6,028.00	6,027.37	191.95	119.90	-78.67	-1,143.86	-4,817.29	8,086.49	7,893.11	193.39	41.815			
19,300.00	6,979.84	6,028.00	6,027.37	193.51	119.90	-78.67	-1,143.86	-4,817.29	8,171.34	7,978.15	193.19	42.297			
19,400.00	6,979.76	6,028.00	6,027.37	195.06	119.90	-78.67	-1,143.86	-4,817.29	8,256.52	8,063.52	192.99	42.782			
19,500.00	6,979.69	6,028.00	6,027.37	196.62	119.90	-78.67	-1,143.86	-4,817.29	8,342.03	8,149.23	192.80	43.268			
19,600.00	6,979.62	6,028.00	6,027.37	198.18	119.90	-78.67	-1,143.86	-4,817.29	8,427.85	8,235.24	192.61	43.756			
19,700.00	6,979.54	6,028.00	6,027.37	199.74	119.90	-78.67	-1,143.86	-4,817.29	8,513.99	8,321.57	192.43	44.245			
19,800.00	6,979.47	6,028.00	6,027.37	201.30	119.90	-78.67	-1,143.86	-4,817.29	8,600.43	8,408.19	192.24	44.737			
19,900.00	6,979.40	6,028.00	6,027.37	202.86	119.90	-78.67	-1,143.86	-4,817.29	8,687.16	8,495.09	192.07	45.230			
20,000.00	6,979.32	6,028.00	6,027.37	204.42	119.90	-78.67	-1,143.86	-4,817.29	8,774.17	8,582.28	191.89	45.725			
20,100.00	6,979.25	6,028.00	6,027.37	205.98	119.90	-78.67	-1,143.86	-4,817.29	8,861.46	8,669.74	191.72	46.221			
20,200.00	6,979.18	6,028.00	6,027.37	207.55	119.90	-78.67	-1,143.86	-4,817.29	8,949.01	8,757.46	191.55	46.719			
20,300.00	6,979.10	6,028.00	6,027.37	209.11	119.90	-78.67	-1,143.86	-4,817.29	9,036.82	8,845.44	191.38	47.218			
20,400.00	6,979.03	6,028.00	6,027.37	210.68	119.90	-78.67	-1,143.86	-4,817.29	9,124.88	8,933.66	191.22	47.719			
20,500.00	6,978.95	6,028.00	6,027.37	212.24	119.90	-78.67	-1,143.86	-4,817.29	9,213.19	9,022.12	191.06	48.221			
20,600.00	6,978.88	6,028.00	6,027.37	213.81	119.90	-78.67	-1,143.86	-4,817.29	9,301.73	9,110.82	190.91	48.724			
20,700.00	6,978.81	6,028.00	6,027.37	215.37	119.90	-78.67	-1,143.86	-4,817.29	9,390.50	9,199.74	190.76	49.228			
20,800.00	6,978.73	6,028.00	6,027.37	216.94	119.90	-78.67	-1,143.86	-4,817.29	9,479.49	9,288.89	190.61	49.733			
20,900.00	6,978.66	6,028.00	6,027.37	218.51	119.90	-78.67	-1,143.86	-4,817.29	9,568.71	9,378.25	190.46	50.240			
21,000.00	6,978.59	6,028.00	6,027.37	220.07	119.90	-78.67	-1,143.86	-4,817.29	9,658.13	9,467.81	190.32	50.748			
21,100.00	6,978.51	6,028.00	6,027.37	221.64	119.90	-78.67	-1,143.86	-4,817.29	9,747.76	9,557.58	190.18	51.256			
21,200.00	6,978.44	6,028.00	6,027.37	223.21	119.90	-78.67	-1,143.86	-4,817.29	9,837.59	9,647.55	190.04	51.766			
21,300.00	6,978.37	6,028.00	6,027.37	224.78	119.90	-78.67	-1,143.86	-4,817.29	9,927.61	9,737.71	189.91	52.276			
21,400.00	6,978.29	6,028.00	6,027.37	226.35	119.90	-78.67	-1,143.86	-4,817.29	10,017.83	9,828.05	189.78	52.788			
21,500.00	6,978.22	6,028.00	6,027.37	227.92	119.90	-78.67	-1,143.86	-4,817.29	10,108.22	9,918.57	189.65	53.300			
21,600.00	6,978.14	6,028.00	6,027.37	229.49	119.90	-78.67	-1,143.86	-4,817.29	10,198.80	10,009.28	189.52	53.813			
21,700.00	6,978.07	6,028.00	6,027.37	231.06	119.90	-78.67	-1,143.86	-4,817.29	10,289.55	10,100.15	189.40	54.327			
21,800.00	6,978.00	6,028.00	6,027.37	232.63	119.90	-78.67	-1,143.86	-4,817.29	10,380.47	10,191.19	189.28	54.841			
21,900.00	6,977.92	6,028.00	6,027.37	234.21	119.90	-78.67	-1,143.86	-4,817.29	10,471.56	10,282.39	189.17	55.356			
22,000.00	6,977.85	6,028.00	6,027.37	235.78	119.90	-78.67	-1,143.86	-4,817.29	10,562.81	10,373.75	189.05	55.872			
22,100.00	6,977.78	6,028.00	6,027.37	237.35	119.90	-78.67	-1,143.86	-4,817.29	10,654.21	10,465.27	188.94	56.389			
22,200.00	6,977.70	6,028.00	6,027.37	238.92	119.90	-78.67	-1,143.86	-4,817.29	10,745.77	10,556.93	188.83	56.906			
22,300.00	6,977.63	6,028.00	6,027.37	240.50	119.90	-78.67	-1,143.86	-4,817.29	10,837.48	10,648.75	188.73	57.423			
22,400.00	6,977.56	6,028.00	6,027.37	242.07	119.90	-78.67	-1,143.86	-4,817.29	10,929.33	10,740.70	188.63	57.941			
22,500.00	6,977.48	6,028.00	6,027.37	243.65	119.90	-78.67	-1,143.86	-4,817.29	11,021.32	10,832.80	188.53	58.460			
22,600.00	6,977.41	6,028.00	6,027.37	245.22	119.90	-78.67	-1,143.86	-4,817.29	11,113.46	10,925.03	188.43	58.979			
22,700.00	6,977.34	6,028.00	6,027.37	246.80	119.90	-78.67	-1,143.86	-4,817.29	11,205.72	11,017.39	188.34	59.499			
22,800.00	6,977.26	6,028.00	6,027.37	248.37	119.90	-78.67	-1,143.86	-4,817.29	11,298.12	11,109.88	188.24	60.019			
22,900.00	6,977.19	6,028.00	6,027.37	249.95	119.90	-78.67	-1,143.86	-4,817.29	11,390.65	11,202.50	188.15	60.539			
23,000.00	6,977.11	6,028.00	6,027.37	251.53	119.90	-78.67	-1,143.86	-4,817.29	11,483.30	11,295.24	188.07	61.060			
23,100.00	6,977.04	6,028.00	6,027.37	253.10	119.90	-78.67	-1,143.86	-4,817.29	11,576.08	11,388.10	187.98	61.581			
23,155.65	6,977.00	6,028.00	6,027.37	253.98	119.90	-78.67	-1,143.86	-4,817.29	11,627.76	11,439.83	187.94	61.871			
23,156.15	6,977.00	6,028.00	6,027.37	254.06	119.90	-78.67	-1,143.86	-4,817.29	11,628.23	11,438.19	190.04	61.189			

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171A - OH - OH-SVY														Offset Site Error: 0.00 usft
Survey Program: 561-MWD OWSG Rev5														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	-103.20	-1,148.03	-4,893.12	5,027.21					
100.00	100.00	0.00	0.00	0.25	0.00	-103.20	-1,148.03	-4,893.12	5,026.00	5,025.75	0.25	N/A		
111.00	111.00	0.00	0.00	0.29	0.00	-103.20	-1,148.03	-4,893.12	5,025.99	5,025.70	0.29	N/A CC, ES		
200.00	200.00	0.00	0.00	0.61	0.00	-103.20	-1,148.03	-4,893.12	5,026.78	5,026.17	0.61	8,228.821		
300.00	300.00	0.00	0.00	0.97	0.00	-103.20	-1,148.03	-4,893.12	5,029.54	5,028.57	0.97	5,178.077		
400.00	400.00	0.00	0.00	1.33	0.00	-103.20	-1,148.03	-4,893.12	5,034.29	5,032.96	1.33	3,781.901		
500.00	500.00	0.00	0.00	1.68	0.00	-103.20	-1,148.03	-4,893.12	5,041.02	5,039.33	1.69	2,983.082		
581.61	581.60	176.72	176.61	1.98	10.97	-113.11	-1,148.27	-4,898.36	5,040.18	5,027.30	12.88	391.222		
600.00	599.98	183.60	183.48	2.04	11.40	-113.09	-1,148.29	-4,898.77	5,041.51	5,028.13	13.38	376.879		
700.00	699.84	220.93	220.73	2.41	13.72	-112.94	-1,148.40	-4,901.31	5,050.23	5,034.17	16.06	314.479		
800.00	799.45	258.07	257.75	2.77	16.02	-112.76	-1,148.53	-4,904.29	5,061.54	5,042.80	18.73	270.207		
900.00	898.70	294.95	294.47	3.13	18.31	-112.54	-1,148.69	-4,907.71	5,075.40	5,054.01	21.39	237.251		
1,000.00	997.47	331.50	330.82	3.50	20.58	-112.28	-1,148.86	-4,911.54	5,091.81	5,067.77	24.04	211.832		
1,100.00	1,095.63	367.69	366.75	3.89	22.83	-109.61	-1,149.05	-4,915.78	5,110.30	5,083.64	26.66	191.663		
1,200.00	1,193.09	561.00	557.68	4.29	34.83	-107.94	-1,150.41	-4,945.78	5,136.95	5,097.98	38.97	131.812		
1,300.00	1,289.73	561.00	557.68	4.72	34.83	-106.29	-1,150.41	-4,945.78	5,156.13	5,116.74	39.40	130.878		
1,400.00	1,385.42	561.00	557.68	5.16	34.83	-104.86	-1,150.41	-4,945.78	5,177.60	5,137.78	39.82	130.028		
1,496.97	1,477.20	561.00	557.68	5.62	34.83	-103.63	-1,150.41	-4,945.78	5,200.55	5,160.32	40.23	129.271		
1,500.00	1,480.05	561.00	557.68	5.63	34.83	-103.63	-1,150.41	-4,945.78	5,201.30	5,161.06	40.24	129.247		
1,600.00	1,574.15	561.00	557.68	6.12	34.83	-103.63	-1,150.41	-4,945.78	5,226.99	5,186.32	40.66	128.542		
1,700.00	1,668.25	575.53	571.95	6.62	34.87	-103.68	-1,150.53	-4,948.54	5,254.40	5,213.29	41.11	127.812		
1,800.00	1,762.35	682.00	676.53	7.12	34.92	-104.03	-1,151.42	-4,968.47	5,282.06	5,240.45	41.61	126.945		
1,900.00	1,856.45	712.00	705.89	7.64	34.94	-104.12	-1,151.03	-4,974.61	5,310.75	5,268.71	42.04	126.315		
2,000.00	1,950.55	712.00	705.89	8.16	34.94	-104.12	-1,151.03	-4,974.61	5,340.81	5,298.36	42.45	125.824		
2,100.00	2,044.65	744.31	737.32	8.68	34.97	-104.21	-1,150.11	-4,982.05	5,372.13	5,329.24	42.89	125.256		
2,200.00	2,138.75	773.00	765.06	9.21	34.99	-104.29	-1,149.02	-4,989.28	5,404.83	5,361.51	43.32	124.763		
2,300.00	2,232.85	803.00	794.00	9.74	35.01	-104.36	-1,147.94	-4,997.12	5,438.63	5,394.90	43.74	124.351		
2,400.00	2,326.95	834.00	823.86	10.27	35.02	-104.44	-1,147.00	-5,005.37	5,473.40	5,429.26	44.14	123.988		
2,500.00	2,421.05	864.00	852.63	10.81	35.03	-104.52	-1,145.81	-5,013.81	5,509.29	5,464.75	44.55	123.673		
2,600.00	2,515.15	894.00	881.22	11.34	35.05	-104.59	-1,144.19	-5,022.73	5,546.30	5,501.35	44.95	123.400		
2,700.00	2,609.25	937.32	922.35	11.88	35.07	-104.68	-1,141.50	-5,036.11	5,584.19	5,538.83	45.36	123.098		
2,800.00	2,703.35	955.00	939.07	12.42	35.08	-104.71	-1,140.44	-5,041.73	5,623.17	5,577.44	45.72	122.978		
2,900.00	2,797.45	988.85	970.96	12.96	35.11	-104.78	-1,138.44	-5,052.89	5,663.18	5,617.06	46.12	122.792		
3,000.00	2,891.55	1,017.00	997.34	13.51	35.13	-104.84	-1,136.75	-5,062.56	5,704.30	5,657.80	46.49	122.686		
3,100.00	2,985.65	1,017.00	997.34	14.05	35.13	-104.84	-1,136.75	-5,062.56	5,746.61	5,699.83	46.79	122.826		
3,200.00	3,079.75	1,070.96	1,047.59	14.60	35.19	-104.94	-1,133.51	-5,081.97	5,789.56	5,742.31	47.24	122.546		
3,300.00	3,173.85	1,109.00	1,082.76	15.14	35.24	-105.01	-1,131.24	-5,096.28	5,833.67	5,786.03	47.65	122.438		
3,400.00	3,267.95	1,163.15	1,132.63	15.69	35.29	-105.10	-1,127.78	-5,117.10	5,878.51	5,830.42	48.09	122.237		
3,500.00	3,362.05	1,203.00	1,169.26	16.23	35.33	-105.17	-1,124.93	-5,132.53	5,923.69	5,875.21	48.49	122.172		
3,600.00	3,456.15	1,240.48	1,203.52	16.78	35.38	-105.23	-1,121.99	-5,147.43	5,969.65	5,920.77	48.88	122.124		
3,700.00	3,550.25	1,297.00	1,254.58	17.33	35.45	-105.30	-1,117.04	-5,171.16	6,016.92	5,967.57	49.35	121.926		
3,800.00	3,644.35	1,297.00	1,254.58	17.88	35.45	-105.30	-1,117.04	-5,171.16	6,064.53	6,014.94	49.59	122.302		
3,900.00	3,738.45	1,340.45	1,293.70	18.42	35.52	-105.36	-1,113.83	-5,189.78	6,113.19	6,063.17	50.02	122.209		
4,000.00	3,832.55	1,410.86	1,357.67	18.97	35.63	-105.50	-1,111.93	-5,219.12	6,162.23	6,111.66	50.57	121.861		
4,100.00	3,926.65	1,481.00	1,421.57	19.52	35.72	-105.64	-1,111.23	-5,248.02	6,211.40	6,160.32	51.08	121.598		
4,200.00	4,020.75	1,551.42	1,485.66	20.07	35.79	-105.79	-1,110.52	-5,277.20	6,260.82	6,209.24	51.58	121.380		
4,300.00	4,114.85	1,603.94	1,533.31	20.62	35.85	-105.89	-1,109.80	-5,299.27	6,310.68	6,258.67	52.01	121.330		
4,400.00	4,208.95	1,670.00	1,592.93	21.17	35.93	-106.01	-1,108.26	-5,327.68	6,361.12	6,308.61	52.51	121.147		
4,500.00	4,303.05	1,710.89	1,629.67	21.72	35.98	-106.08	-1,106.92	-5,345.59	6,411.94	6,359.04	52.90	121.213		
4,600.00	4,397.15	1,776.43	1,688.34	22.27	36.07	-106.18	-1,104.17	-5,374.66	6,463.12	6,409.72	53.40	121.029		
4,700.00	4,491.25	1,844.22	1,748.74	22.82	36.16	-106.27	-1,100.40	-5,405.20	6,514.56	6,460.63	53.92	120.814		
4,800.00	4,585.35	1,889.83	1,789.14	23.37	36.22	-106.32	-1,097.18	-5,426.13	6,566.35	6,512.00	54.35	120.810		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171A - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		561-MWD OWSG Rev5					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	
4,900.00	4,679.45	1,949.00	1,840.98	23.93	36.32	-106.37	-1,091.78	-5,454.14	6,618.78	6,563.92	54.86	120.644		
5,000.00	4,773.55	1,992.53	1,878.87	24.48	36.39	-106.41	-1,087.30	-5,475.10	6,671.60	6,616.31	55.29	120.662		
5,100.00	4,867.65	2,317.41	2,163.35	25.03	36.94	-106.64	-1,051.88	-5,627.86	6,724.27	6,666.98	57.29	117.377		
5,200.00	4,961.75	2,409.80	2,245.49	25.58	37.11	-106.72	-1,042.60	-5,669.12	6,774.14	6,716.12	58.01	116.768		
5,300.00	5,055.85	2,506.00	2,331.56	26.13	37.30	-106.81	-1,034.24	-5,711.25	6,823.59	6,764.82	58.77	116.108		
5,400.00	5,149.95	2,549.14	2,370.26	26.68	37.41	-106.86	-1,031.11	-5,730.04	6,873.44	6,814.18	59.25	116.004		
5,500.00	5,244.05	3,337.00	3,088.56	27.24	39.41	-107.74	-967.00	-6,042.30	6,920.74	6,856.78	63.96	108.197		
5,600.00	5,338.15	3,337.00	3,088.56	27.79	39.41	-107.74	-967.00	-6,042.30	6,962.71	6,898.45	64.26	108.352		
5,665.73	5,400.00	3,337.00	3,088.56	28.15	39.41	-107.74	-967.00	-6,042.30	6,990.93	6,926.49	64.45	108.474		
5,700.00	5,432.28	3,337.00	3,088.56	28.34	39.41	-107.90	-967.00	-6,042.30	7,005.82	6,941.28	64.54	108.546		
5,800.00	5,526.87	3,337.00	3,088.56	28.88	39.41	-108.36	-967.00	-6,042.30	7,049.71	6,984.91	64.80	108.784		
5,900.00	5,622.01	3,337.00	3,088.56	29.41	39.41	-108.83	-967.00	-6,042.30	7,094.25	7,029.21	65.05	109.067		
6,000.00	5,717.67	3,337.00	3,088.56	29.92	39.41	-109.31	-967.00	-6,042.30	7,139.41	7,074.15	65.26	109.393		
6,100.00	5,813.83	3,337.00	3,088.56	30.41	39.41	-109.80	-967.00	-6,042.30	7,185.17	7,119.71	65.46	109.763		
6,200.00	5,910.44	3,337.00	3,088.56	30.89	39.41	-110.29	-967.00	-6,042.30	7,231.50	7,165.86	65.64	110.173		
6,300.00	6,007.50	3,337.00	3,088.56	31.36	39.41	-110.79	-967.00	-6,042.30	7,278.38	7,212.58	65.79	110.624		
6,400.00	6,104.96	3,337.00	3,088.56	31.80	39.41	-111.29	-967.00	-6,042.30	7,325.78	7,259.85	65.93	111.113		
6,500.00	6,202.80	3,337.00	3,088.56	32.24	39.41	-111.80	-967.00	-6,042.30	7,373.68	7,307.63	66.05	111.641		
6,600.00	6,300.98	3,337.00	3,088.56	32.66	39.41	-112.31	-967.00	-6,042.30	7,422.05	7,355.90	66.15	112.205		
6,700.00	6,399.48	3,337.00	3,088.56	33.06	39.41	-112.82	-967.00	-6,042.30	7,470.87	7,404.64	66.23	112.805		
6,722.82	6,422.00	3,337.00	3,088.56	33.15	39.41	-112.94	-967.00	-6,042.30	7,482.07	7,415.83	66.24	112.948		
6,750.00	6,448.76	3,337.00	3,088.56	33.26	39.41	-101.97	-967.00	-6,042.30	7,495.23	7,428.97	66.26	113.112		
6,800.00	6,497.51	3,337.00	3,088.56	33.48	39.41	-88.64	-967.00	-6,042.30	7,518.36	7,452.04	66.31	113.376		
6,850.00	6,545.40	3,337.00	3,088.56	33.72	39.41	-80.27	-967.00	-6,042.30	7,539.97	7,473.60	66.38	113.591		
6,900.00	6,592.13	3,337.00	3,088.56	33.97	39.41	-74.50	-967.00	-6,042.30	7,559.96	7,493.51	66.46	113.755		
6,950.00	6,637.40	3,337.00	3,088.56	34.25	39.41	-70.24	-967.00	-6,042.30	7,578.22	7,511.66	66.55	113.868		
7,000.00	6,680.94	3,337.00	3,088.56	34.54	39.41	-66.97	-967.00	-6,042.30	7,594.63	7,527.97	66.66	113.930		
7,050.00	6,722.48	3,337.00	3,088.56	34.85	39.41	-64.39	-967.00	-6,042.30	7,609.12	7,542.34	66.78	113.940		
7,100.00	6,761.76	3,337.00	3,088.56	35.17	39.41	-62.34	-967.00	-6,042.30	7,621.60	7,554.69	66.92	113.898		
7,150.00	6,798.55	3,337.00	3,088.56	35.51	39.41	-60.71	-967.00	-6,042.30	7,632.02	7,564.95	67.06	113.803		
7,200.00	6,832.61	3,337.00	3,088.56	35.86	39.41	-59.42	-967.00	-6,042.30	7,640.30	7,573.08	67.22	113.656		
7,250.00	6,863.74	3,337.00	3,088.56	36.22	39.41	-58.43	-967.00	-6,042.30	7,646.41	7,579.02	67.40	113.456		
7,300.00	6,891.74	3,337.00	3,088.56	36.59	39.41	-57.71	-967.00	-6,042.30	7,650.32	7,582.74	67.58	113.204		
7,350.00	6,916.44	3,337.00	3,088.56	36.98	39.41	-57.24	-967.00	-6,042.30	7,652.01	7,584.23	67.78	112.899		
7,400.00	6,937.69	3,337.00	3,088.56	37.37	39.41	-56.99	-967.00	-6,042.30	7,651.46	7,583.47	67.99	112.542		
7,450.00	6,955.36	3,337.00	3,088.56	37.78	39.41	-56.95	-967.00	-6,042.30	7,648.68	7,580.47	68.21	112.134		
7,500.00	6,969.34	3,337.00	3,088.56	38.19	39.41	-57.13	-967.00	-6,042.30	7,643.69	7,575.24	68.44	111.677		
7,550.00	6,979.53	3,337.00	3,088.56	38.62	39.41	-57.51	-967.00	-6,042.30	7,636.50	7,567.81	68.69	111.173		
7,600.00	6,985.89	3,337.00	3,088.56	39.05	39.41	-58.10	-967.00	-6,042.30	7,627.17	7,558.22	68.95	110.624		
7,650.00	6,988.37	3,337.00	3,088.56	39.48	39.41	-58.90	-967.00	-6,042.30	7,615.73	7,546.52	69.21	110.033		
7,657.25	6,988.40	3,337.00	3,088.56	39.54	39.41	-59.04	-967.00	-6,042.30	7,613.90	7,544.65	69.25	109.943		
7,700.00	6,988.37	3,337.00	3,088.56	39.92	39.41	-59.04	-967.00	-6,042.30	7,603.11	7,533.62	69.49	109.418		
7,800.00	6,988.30	3,337.00	3,088.56	40.82	39.41	-59.04	-967.00	-6,042.30	7,578.73	7,508.67	70.05	108.188		
7,900.00	6,988.23	3,337.00	3,088.56	41.77	39.41	-59.04	-967.00	-6,042.30	7,555.59	7,484.95	70.64	106.962		
8,000.00	6,988.16	3,337.00	3,088.56	42.75	39.41	-59.04	-967.00	-6,042.30	7,533.71	7,462.47	71.25	105.744		
8,100.00	6,988.09	3,337.00	3,088.56	43.76	39.41	-59.04	-967.00	-6,042.30	7,513.10	7,441.23	71.87	104.536		
8,152.35	6,988.06	3,337.00	3,088.56	44.30	39.41	-59.04	-967.00	-6,042.30	7,502.82	7,430.61	72.20	103.911		
8,200.00	6,988.02	3,337.00	3,088.56	44.79	39.41	-58.83	-967.00	-6,042.30	7,493.10	7,420.59	72.51	103.339		
8,300.00	6,987.95	3,337.00	3,088.56	45.83	39.41	-58.33	-967.00	-6,042.30	7,469.35	7,396.20	73.14	102.118		
8,400.00	6,987.88	3,337.00	3,088.56	46.85	39.41	-57.71	-967.00	-6,042.30	7,441.10	7,367.34	73.77	100.873		
8,500.00	6,987.80	3,337.00	3,088.56	47.85	39.41	-56.96	-967.00	-6,042.30	7,408.46	7,334.09	74.37	99.613		
8,600.00	6,987.73	3,337.00	3,088.56	48.83	39.41	-56.09	-967.00	-6,042.30	7,371.51	7,296.56	74.96	98.343		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171A - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program:		561-MWD OWSG Rev5						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)
8,700.00	6,987.65	3,337.00	3,088.56	49.79	39.41	-55.07	-967.00	-6,042.30	7,330.39	7,254.87	75.52	97.070	
8,800.00	6,987.57	3,337.00	3,088.56	50.72	39.41	-53.90	-967.00	-6,042.30	7,285.21	7,209.16	76.05	95.799	
8,900.00	6,987.50	3,337.00	3,088.56	51.62	39.41	-52.55	-967.00	-6,042.30	7,236.12	7,159.58	76.54	94.536	
9,000.00	6,987.42	3,337.00	3,088.56	52.48	39.41	-51.01	-967.00	-6,042.30	7,183.30	7,106.29	77.00	93.287	
9,100.00	6,987.34	3,337.00	3,088.56	53.30	39.41	-49.27	-967.00	-6,042.30	7,126.90	7,049.48	77.42	92.056	
9,200.00	6,987.27	3,337.00	3,088.56	54.08	39.41	-47.28	-967.00	-6,042.30	7,067.13	6,989.34	77.79	90.848	
9,215.33	6,987.26	3,337.00	3,088.56	54.20	39.41	-46.96	-967.00	-6,042.30	7,057.69	6,979.84	77.84	90.664	
9,300.00	6,987.20	3,337.00	3,088.56	54.85	39.41	-46.96	-967.00	-6,042.30	7,005.62	6,927.48	78.13	89.662	
9,400.00	6,987.12	3,337.00	3,088.56	55.65	39.41	-46.96	-967.00	-6,042.30	6,944.95	6,866.46	78.48	88.489	
9,500.00	6,987.05	3,337.00	3,088.56	56.48	39.41	-46.96	-967.00	-6,042.30	6,885.19	6,806.35	78.84	87.328	
9,600.00	6,986.98	3,337.00	3,088.56	57.35	39.41	-46.96	-967.00	-6,042.30	6,826.38	6,747.17	79.21	86.180	
9,700.00	6,986.90	3,337.00	3,088.56	58.24	39.41	-46.96	-967.00	-6,042.30	6,768.54	6,688.95	79.59	85.045	
9,800.00	6,986.83	3,337.00	3,088.56	59.17	39.41	-46.96	-967.00	-6,042.30	6,711.69	6,631.71	79.97	83.924	
9,900.00	6,986.75	3,337.00	3,088.56	60.12	39.41	-46.96	-967.00	-6,042.30	6,655.85	6,575.48	80.37	82.819	
10,000.00	6,986.68	3,337.00	3,088.56	61.10	39.41	-46.96	-967.00	-6,042.30	6,601.06	6,520.29	80.77	81.729	
10,100.00	6,986.61	3,337.00	3,088.56	62.11	39.41	-46.96	-967.00	-6,042.30	6,547.33	6,466.16	81.18	80.656	
10,200.00	6,986.53	3,337.00	3,088.56	63.14	39.41	-46.96	-967.00	-6,042.30	6,494.71	6,413.11	81.59	79.601	
10,300.00	6,986.46	3,337.00	3,088.56	64.20	39.41	-46.96	-967.00	-6,042.30	6,443.20	6,361.19	82.01	78.563	
10,400.00	6,986.39	3,337.00	3,088.56	65.28	39.41	-46.96	-967.00	-6,042.30	6,392.84	6,310.40	82.44	77.545	
10,500.00	6,986.31	3,337.00	3,088.56	66.38	39.41	-46.96	-967.00	-6,042.30	6,343.66	6,260.79	82.87	76.546	
10,600.00	6,986.24	3,337.00	3,088.56	67.50	39.41	-46.96	-967.00	-6,042.30	6,295.69	6,212.37	83.31	75.568	
10,700.00	6,986.17	3,337.00	3,088.56	68.64	39.41	-46.96	-967.00	-6,042.30	6,248.94	6,165.19	83.75	74.610	
10,800.00	6,986.09	3,337.00	3,088.56	69.80	39.41	-46.96	-967.00	-6,042.30	6,203.46	6,119.26	84.20	73.675	
10,900.00	6,986.02	3,337.00	3,088.56	70.98	39.41	-46.96	-967.00	-6,042.30	6,159.26	6,074.61	84.65	72.761	
11,000.00	6,985.95	3,337.00	3,088.56	72.17	39.41	-46.96	-967.00	-6,042.30	6,116.38	6,031.28	85.10	71.870	
11,100.00	6,985.87	3,337.00	3,088.56	73.38	39.41	-46.96	-967.00	-6,042.30	6,074.85	5,989.29	85.56	71.003	
11,200.00	6,985.80	3,337.00	3,088.56	74.61	39.41	-46.96	-967.00	-6,042.30	6,034.68	5,948.67	86.01	70.159	
11,300.00	6,985.72	3,337.00	3,088.56	75.85	39.41	-46.96	-967.00	-6,042.30	5,995.91	5,909.44	86.47	69.340	
11,400.00	6,985.65	3,337.00	3,088.56	77.10	39.41	-46.96	-967.00	-6,042.30	5,958.57	5,871.64	86.93	68.545	
11,500.00	6,985.58	3,337.00	3,088.56	78.37	39.41	-46.96	-967.00	-6,042.30	5,922.69	5,835.30	87.39	67.776	
11,600.00	6,985.50	3,337.00	3,088.56	79.65	39.41	-46.96	-967.00	-6,042.30	5,888.28	5,800.44	87.84	67.031	
11,700.00	6,985.43	3,337.00	3,088.56	80.94	39.41	-46.96	-967.00	-6,042.30	5,855.38	5,767.08	88.30	66.313	
11,800.00	6,985.36	3,337.00	3,088.56	82.24	39.41	-46.96	-967.00	-6,042.30	5,824.01	5,735.25	88.75	65.621	
11,900.00	6,985.28	3,337.00	3,088.56	83.56	39.41	-46.96	-967.00	-6,042.30	5,794.19	5,704.99	89.20	64.955	
12,000.00	6,985.21	3,337.00	3,088.56	84.88	39.41	-46.96	-967.00	-6,042.30	5,765.96	5,676.31	89.65	64.315	
12,100.00	6,985.14	3,337.00	3,088.56	86.21	39.41	-46.96	-967.00	-6,042.30	5,739.33	5,649.23	90.10	63.702	
12,200.00	6,985.06	3,337.00	3,088.56	87.56	39.41	-46.96	-967.00	-6,042.30	5,714.33	5,623.79	90.54	63.116	
12,300.00	6,984.99	3,337.00	3,088.56	88.91	39.41	-46.96	-967.00	-6,042.30	5,690.97	5,600.00	90.97	62.557	
12,400.00	6,984.92	3,337.00	3,088.56	90.27	39.41	-46.96	-967.00	-6,042.30	5,669.28	5,577.88	91.40	62.024	
12,500.00	6,984.84	3,337.00	3,088.56	91.64	39.41	-46.96	-967.00	-6,042.30	5,649.28	5,557.45	91.83	61.518	
12,600.00	6,984.77	3,337.00	3,088.56	93.01	39.41	-46.96	-967.00	-6,042.30	5,630.98	5,538.73	92.25	61.038	
12,700.00	6,984.69	3,337.00	3,088.56	94.40	39.41	-46.96	-967.00	-6,042.30	5,614.41	5,521.74	92.67	60.585	
12,800.00	6,984.62	3,337.00	3,088.56	95.79	39.41	-46.96	-967.00	-6,042.30	5,599.57	5,506.49	93.08	60.158	
12,900.00	6,984.55	3,337.00	3,088.56	97.18	39.41	-46.96	-967.00	-6,042.30	5,586.49	5,493.00	93.49	59.757	
13,000.00	6,984.47	3,337.00	3,088.56	98.59	39.41	-46.96	-967.00	-6,042.30	5,575.16	5,481.28	93.89	59.381	
13,100.00	6,984.40	3,337.00	3,088.56	100.00	39.41	-46.96	-967.00	-6,042.30	5,565.61	5,471.33	94.28	59.031	
13,200.00	6,984.33	3,337.00	3,088.56	101.41	39.41	-46.96	-967.00	-6,042.30	5,557.85	5,463.18	94.67	58.706	
13,300.00	6,984.25	3,337.00	3,088.56	102.83	39.41	-46.96	-967.00	-6,042.30	5,551.87	5,456.82	95.06	58.405	
13,400.00	6,984.18	3,337.00	3,088.56	104.26	39.41	-46.96	-967.00	-6,042.30	5,547.69	5,452.26	95.44	58.128	
13,500.00	6,984.11	3,337.00	3,088.56	105.69	39.41	-46.96	-967.00	-6,042.30	5,545.32	5,449.50	95.82	57.875	
13,581.92	6,984.05	3,337.00	3,088.56	106.87	39.41	-46.96	-967.00	-6,042.30	5,544.71	5,448.59	96.12	57.685	
13,600.00	6,984.03	3,337.00	3,088.56	107.13	39.41	-46.96	-967.00	-6,042.30	5,544.74	5,448.55	96.19	57.645	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171A - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program:		561-MWD OWSG Rev5						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)
13,700.00	6,983.96	3,337.00	3,088.56	108.57	39.41	-46.96	-967.00	-6,042.30	5,545.97	5,449.41	96.56	57.437	
13,800.00	6,983.88	3,337.00	3,088.56	110.02	39.41	-46.96	-967.00	-6,042.30	5,549.00	5,452.07	96.92	57.252	
13,900.00	6,983.81	3,337.00	3,088.56	111.47	39.41	-46.96	-967.00	-6,042.30	5,553.83	5,456.54	97.29	57.087	
14,000.00	6,983.74	3,337.00	3,088.56	112.92	39.41	-46.96	-967.00	-6,042.30	5,560.45	5,462.80	97.65	56.944	
14,100.00	6,983.66	3,337.00	3,088.56	114.38	39.41	-46.96	-967.00	-6,042.30	5,568.86	5,470.85	98.01	56.820	
14,200.00	6,983.59	3,337.00	3,088.56	115.85	39.41	-46.96	-967.00	-6,042.30	5,579.05	5,480.69	98.37	56.717	
14,300.00	6,983.52	3,337.00	3,088.56	117.31	39.41	-46.96	-967.00	-6,042.30	5,591.02	5,492.29	98.72	56.632	
14,400.00	6,983.44	3,337.00	3,088.56	118.78	39.41	-46.96	-967.00	-6,042.30	5,604.74	5,505.65	99.08	56.567	
14,500.00	6,983.37	3,337.00	3,088.56	120.26	39.41	-46.96	-967.00	-6,042.30	5,620.20	5,520.76	99.44	56.519	
14,600.00	6,983.30	3,337.00	3,088.56	121.74	39.41	-46.96	-967.00	-6,042.30	5,637.40	5,537.61	99.80	56.489	
14,700.00	6,983.22	3,337.00	3,088.56	123.22	39.41	-46.96	-967.00	-6,042.30	5,656.32	5,556.16	100.15	56.477 SF	
14,800.00	6,983.15	3,337.00	3,088.56	124.70	39.41	-46.96	-967.00	-6,042.30	5,676.93	5,576.42	100.51	56.482	
14,900.00	6,983.08	3,337.00	3,088.56	126.19	39.41	-46.96	-967.00	-6,042.30	5,699.22	5,598.36	100.86	56.504	
15,000.00	6,983.00	3,337.00	3,088.56	127.68	39.41	-46.96	-967.00	-6,042.30	5,723.18	5,621.96	101.22	56.542	
15,100.00	6,982.93	3,337.00	3,088.56	129.17	39.41	-46.96	-967.00	-6,042.30	5,748.77	5,647.20	101.57	56.597	
15,200.00	6,982.85	3,337.00	3,088.56	130.67	39.41	-46.96	-967.00	-6,042.30	5,775.99	5,674.06	101.93	56.668	
15,300.00	6,982.78	3,337.00	3,088.56	132.16	39.41	-46.96	-967.00	-6,042.30	5,804.79	5,702.52	102.28	56.755	
15,400.00	6,982.71	3,337.00	3,088.56	133.66	39.41	-46.96	-967.00	-6,042.30	5,835.17	5,732.55	102.63	56.858	
15,500.00	6,982.63	3,337.00	3,088.56	135.17	39.41	-46.96	-967.00	-6,042.30	5,867.10	5,764.13	102.97	56.977	
15,600.00	6,982.56	3,337.00	3,088.56	136.67	39.41	-46.96	-967.00	-6,042.30	5,900.55	5,797.23	103.32	57.112	
15,700.00	6,982.49	3,337.00	3,088.56	138.18	39.41	-46.96	-967.00	-6,042.30	5,935.49	5,831.84	103.65	57.263	
15,800.00	6,982.41	3,337.00	3,088.56	139.69	39.41	-46.96	-967.00	-6,042.30	5,971.91	5,867.92	103.99	57.429	
15,900.00	6,982.34	3,337.00	3,088.56	141.20	39.41	-46.96	-967.00	-6,042.30	6,009.77	5,905.45	104.32	57.611	
16,000.00	6,982.27	3,337.00	3,088.56	142.71	39.41	-46.96	-967.00	-6,042.30	6,049.04	5,944.40	104.64	57.808	
16,100.00	6,982.19	3,337.00	3,088.56	144.23	39.41	-46.96	-967.00	-6,042.30	6,089.71	5,984.75	104.96	58.021	
16,200.00	6,982.12	3,337.00	3,088.56	145.75	39.41	-46.96	-967.00	-6,042.30	6,131.73	6,026.47	105.27	58.250	
16,300.00	6,982.05	3,337.00	3,088.56	147.27	39.41	-46.96	-967.00	-6,042.30	6,175.09	6,069.53	105.57	58.494	
16,400.00	6,981.97	3,337.00	3,088.56	148.79	39.41	-46.96	-967.00	-6,042.30	6,219.76	6,113.90	105.86	58.753	
16,500.00	6,981.90	3,337.00	3,088.56	150.31	39.41	-46.96	-967.00	-6,042.30	6,265.70	6,159.55	106.15	59.027	
16,600.00	6,981.82	3,337.00	3,088.56	151.84	39.41	-46.96	-967.00	-6,042.30	6,312.89	6,206.47	106.43	59.316	
16,700.00	6,981.75	3,337.00	3,088.56	153.36	39.41	-46.96	-967.00	-6,042.30	6,361.31	6,254.61	106.70	59.620	
16,800.00	6,981.68	3,337.00	3,088.56	154.89	39.41	-46.96	-967.00	-6,042.30	6,410.92	6,303.96	106.96	59.938	
16,900.00	6,981.60	3,337.00	3,088.56	156.42	39.41	-46.96	-967.00	-6,042.30	6,461.69	6,354.48	107.21	60.271	
17,000.00	6,981.53	3,337.00	3,088.56	157.95	39.41	-46.96	-967.00	-6,042.30	6,513.61	6,406.16	107.45	60.618	
17,100.00	6,981.46	3,337.00	3,088.56	159.49	39.41	-46.96	-967.00	-6,042.30	6,566.64	6,458.95	107.69	60.979	
17,200.00	6,981.38	3,337.00	3,088.56	161.02	39.41	-46.96	-967.00	-6,042.30	6,620.75	6,512.84	107.91	61.354	
17,300.00	6,981.31	3,337.00	3,088.56	162.56	39.41	-46.96	-967.00	-6,042.30	6,675.92	6,567.80	108.13	61.742	
17,400.00	6,981.24	3,337.00	3,088.56	164.09	39.41	-46.96	-967.00	-6,042.30	6,732.13	6,623.80	108.33	62.144	
17,500.00	6,981.16	3,337.00	3,088.56	165.63	39.41	-46.96	-967.00	-6,042.30	6,789.34	6,680.81	108.53	62.559	
17,600.00	6,981.09	3,337.00	3,088.56	167.17	39.41	-46.96	-967.00	-6,042.30	6,847.54	6,738.82	108.72	62.986	
17,700.00	6,981.01	3,337.00	3,088.56	168.71	39.41	-46.96	-967.00	-6,042.30	6,906.69	6,797.80	108.89	63.426	
17,800.00	6,980.94	3,337.00	3,088.56	170.25	39.41	-46.96	-967.00	-6,042.30	6,966.78	6,857.72	109.06	63.878	
17,900.00	6,980.87	3,337.00	3,088.56	171.80	39.41	-46.96	-967.00	-6,042.30	7,027.78	6,918.55	109.23	64.342	
18,000.00	6,980.79	3,337.00	3,088.56	173.34	39.41	-46.96	-967.00	-6,042.30	7,089.66	6,980.28	109.38	64.818	
18,100.00	6,980.72	3,337.00	3,088.56	174.89	39.41	-46.96	-967.00	-6,042.30	7,152.40	7,042.88	109.52	65.305	
18,200.00	6,980.65	3,337.00	3,088.56	176.43	39.41	-46.96	-967.00	-6,042.30	7,215.99	7,106.33	109.66	65.803	
18,300.00	6,980.57	3,337.00	3,088.56	177.98	39.41	-46.96	-967.00	-6,042.30	7,280.39	7,170.60	109.79	66.312	
18,400.00	6,980.50	3,337.00	3,088.56	179.53	39.41	-46.96	-967.00	-6,042.30	7,345.59	7,235.68	109.91	66.832	
18,500.00	6,980.43	3,337.00	3,088.56	181.08	39.41	-46.96	-967.00	-6,042.30	7,411.57	7,301.54	110.03	67.362	
18,600.00	6,980.35	3,337.00	3,088.56	182.63	39.41	-46.96	-967.00	-6,042.30	7,478.30	7,368.17	110.13	67.902	
18,700.00	6,980.28	3,337.00	3,088.56	184.18	39.41	-46.96	-967.00	-6,042.30	7,545.76	7,435.53	110.23	68.452	
18,800.00	6,980.21	3,337.00	3,088.56	185.73	39.41	-46.96	-967.00	-6,042.30	7,613.95	7,503.62	110.33	69.012	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171A - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		561-MWD OWSG Rev5					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)				
18,900.00	6,980.13	3,337.00	3,088.56	187.28	39.41	-46.96	-967.00	-6,042.30	7,682.82	7,572.41	110.42	69.580		
19,000.00	6,980.06	3,337.00	3,088.56	188.84	39.41	-46.96	-967.00	-6,042.30	7,752.38	7,641.88	110.50	70.158		
19,100.00	6,979.98	3,337.00	3,088.56	190.39	39.41	-46.96	-967.00	-6,042.30	7,822.60	7,712.02	110.57	70.745		
19,200.00	6,979.91	3,337.00	3,088.56	191.95	39.41	-46.96	-967.00	-6,042.30	7,893.46	7,782.81	110.65	71.340		
19,300.00	6,979.84	3,337.00	3,088.56	193.51	39.41	-46.96	-967.00	-6,042.30	7,964.94	7,854.23	110.71	71.943		
19,400.00	6,979.76	3,337.00	3,088.56	195.06	39.41	-46.96	-967.00	-6,042.30	8,037.03	7,926.26	110.77	72.555		
19,500.00	6,979.69	3,337.00	3,088.56	196.62	39.41	-46.96	-967.00	-6,042.30	8,109.72	7,998.89	110.83	73.174		
19,600.00	6,979.62	3,337.00	3,088.56	198.18	39.41	-46.96	-967.00	-6,042.30	8,182.98	8,072.10	110.88	73.801		
19,700.00	6,979.54	3,337.00	3,088.56	199.74	39.41	-46.96	-967.00	-6,042.30	8,256.80	8,145.87	110.93	74.435		
19,800.00	6,979.47	3,337.00	3,088.56	201.30	39.41	-46.96	-967.00	-6,042.30	8,331.17	8,220.20	110.97	75.077		
19,900.00	6,979.40	3,337.00	3,088.56	202.86	39.41	-46.96	-967.00	-6,042.30	8,406.07	8,295.06	111.01	75.725		
20,000.00	6,979.32	3,337.00	3,088.56	204.42	39.41	-46.96	-967.00	-6,042.30	8,481.48	8,370.44	111.04	76.380		
20,100.00	6,979.25	3,337.00	3,088.56	205.98	39.41	-46.96	-967.00	-6,042.30	8,557.41	8,446.33	111.07	77.042		
20,200.00	6,979.18	3,337.00	3,088.56	207.55	39.41	-46.96	-967.00	-6,042.30	8,633.82	8,522.72	111.10	77.710		
20,300.00	6,979.10	3,337.00	3,088.56	209.11	39.41	-46.96	-967.00	-6,042.30	8,710.71	8,599.58	111.13	78.385		
20,400.00	6,979.03	3,337.00	3,088.56	210.68	39.41	-46.96	-967.00	-6,042.30	8,788.06	8,676.91	111.15	79.065		
20,500.00	6,978.95	3,337.00	3,088.56	212.24	39.41	-46.96	-967.00	-6,042.30	8,865.87	8,754.70	111.17	79.751		
20,600.00	6,978.88	3,337.00	3,088.56	213.81	39.41	-46.96	-967.00	-6,042.30	8,944.12	8,832.93	111.19	80.443		
20,700.00	6,978.81	3,337.00	3,088.56	215.37	39.41	-46.96	-967.00	-6,042.30	9,022.80	8,911.60	111.20	81.140		
20,800.00	6,978.73	3,337.00	3,088.56	216.94	39.41	-46.96	-967.00	-6,042.30	9,101.90	8,990.68	111.21	81.842		
20,900.00	6,978.66	3,337.00	3,088.56	218.51	39.41	-46.96	-967.00	-6,042.30	9,181.40	9,070.18	111.22	82.550		
21,000.00	6,978.59	3,337.00	3,088.56	220.07	39.41	-46.96	-967.00	-6,042.30	9,261.30	9,150.07	111.23	83.263		
21,100.00	6,978.51	3,337.00	3,088.56	221.64	39.41	-46.96	-967.00	-6,042.30	9,341.59	9,230.36	111.24	83.980		
21,200.00	6,978.44	3,337.00	3,088.56	223.21	39.41	-46.96	-967.00	-6,042.30	9,422.26	9,311.02	111.24	84.702		
21,300.00	6,978.37	3,337.00	3,088.56	224.78	39.41	-46.96	-967.00	-6,042.30	9,503.29	9,392.05	111.24	85.428		
21,400.00	6,978.29	3,337.00	3,088.56	226.35	39.41	-46.96	-967.00	-6,042.30	9,584.69	9,473.44	111.24	86.159		
21,500.00	6,978.22	3,337.00	3,088.56	227.92	39.41	-46.96	-967.00	-6,042.30	9,666.43	9,555.18	111.24	86.894		
21,600.00	6,978.14	3,337.00	3,088.56	229.49	39.41	-46.96	-967.00	-6,042.30	9,748.51	9,637.27	111.24	87.634		
21,700.00	6,978.07	3,337.00	3,088.56	231.06	39.41	-46.96	-967.00	-6,042.30	9,830.92	9,719.68	111.24	88.377		
21,800.00	6,978.00	3,337.00	3,088.56	232.63	39.41	-46.96	-967.00	-6,042.30	9,913.66	9,802.43	111.24	89.124		
21,900.00	6,977.92	3,337.00	3,088.56	234.21	39.41	-46.96	-967.00	-6,042.30	9,996.71	9,885.48	111.23	89.874		
22,000.00	6,977.85	3,337.00	3,088.56	235.78	39.41	-46.96	-967.00	-6,042.30	10,080.07	9,968.85	111.22	90.628		
22,100.00	6,977.78	3,337.00	3,088.56	237.35	39.41	-46.96	-967.00	-6,042.30	10,163.74	10,052.52	111.22	91.386		
22,200.00	6,977.70	3,337.00	3,088.56	238.92	39.41	-46.96	-967.00	-6,042.30	10,247.69	10,136.48	111.21	92.147		
22,300.00	6,977.63	3,337.00	3,088.56	240.50	39.41	-46.96	-967.00	-6,042.30	10,331.93	10,220.73	111.20	92.911		
22,400.00	6,977.56	3,337.00	3,088.56	242.07	39.41	-46.96	-967.00	-6,042.30	10,416.45	10,305.25	111.19	93.678		
22,500.00	6,977.48	3,337.00	3,088.56	243.65	39.41	-46.96	-967.00	-6,042.30	10,501.24	10,390.05	111.18	94.448		
22,600.00	6,977.41	3,337.00	3,088.56	245.22	39.41	-46.96	-967.00	-6,042.30	10,586.29	10,475.12	111.18	95.222		
22,700.00	6,977.34	3,337.00	3,088.56	246.80	39.41	-46.96	-967.00	-6,042.30	10,671.61	10,560.44	111.17	95.997		
22,800.00	6,977.26	3,337.00	3,088.56	248.37	39.41	-46.96	-967.00	-6,042.30	10,757.18	10,646.02	111.16	96.776		
22,900.00	6,977.19	3,337.00	3,088.56	249.95	39.41	-46.96	-967.00	-6,042.30	10,842.99	10,731.85	111.15	97.557		
23,000.00	6,977.11	3,337.00	3,088.56	251.53	39.41	-46.96	-967.00	-6,042.30	10,929.05	10,817.91	111.13	98.341		
23,100.00	6,977.04	3,337.00	3,088.56	253.10	39.41	-46.96	-967.00	-6,042.30	11,015.34	10,904.21	111.12	99.127		
23,155.65	6,977.00	3,337.00	3,088.56	253.98	39.41	-46.96	-967.00	-6,042.30	11,063.46	10,952.34	111.12	99.565		
23,156.15	6,977.00	3,337.00	3,088.56	254.06	39.41	-46.96	-967.00	-6,042.30	11,063.89	10,951.83	112.07	98.725		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171B - OH - OH-SVY													Offset Site Error: 0.00 usft
Survey Program: 324-MWD OWSG Rev5													Offset Well Error: 0.00 usft
Reference													
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	37.09	37.09	0.00	0.41	-72.88	1,404.56	-4,560.38	4,771.78				
100.00	100.00	132.20	132.20	0.25	1.47	-72.88	1,404.59	-4,560.46	4,771.87	4,770.15	1.72	2,777.213	
200.00	200.00	227.31	227.31	0.61	2.52	-72.88	1,404.64	-4,560.64	4,772.06	4,768.93	3.13	1,523.577	
300.00	300.00	324.00	324.00	0.97	3.60	-72.88	1,404.72	-4,560.92	4,772.36	4,767.80	4.56	1,045.757	
400.00	400.00	413.28	413.28	1.33	3.76	-72.88	1,405.00	-4,561.21	4,772.77	4,767.68	5.08	939.091	
500.00	500.00	496.88	496.88	1.68	3.86	-72.88	1,405.03	-4,561.83	4,773.49	4,767.94	5.55	860.654	
600.00	599.98	565.00	564.97	2.04	3.98	-82.89	1,403.83	-4,563.23	4,774.64	4,768.63	6.01	794.139	
700.00	699.84	600.55	600.46	2.41	4.39	-82.91	1,402.27	-4,564.63	4,776.32	4,769.75	6.57	726.912	
800.00	799.45	655.00	654.64	2.77	5.23	-82.98	1,398.05	-4,567.91	4,778.71	4,771.60	7.11	672.245	
900.00	898.70	712.50	711.58	3.13	6.11	-83.09	1,391.58	-4,572.48	4,781.62	4,773.89	7.73	618.526	
1,000.00	997.47	776.82	774.96	3.50	6.81	-83.27	1,382.47	-4,578.54	4,784.89	4,776.57	8.32	574.855	
1,100.00	1,095.63	836.00	833.03	3.89	7.19	-81.10	1,372.95	-4,584.82	4,788.19	4,779.32	8.87	539.580	
1,200.00	1,193.09	911.44	906.91	4.29	7.40	-79.72	1,360.27	-4,593.38	4,791.02	4,781.56	9.46	506.309	
1,300.00	1,289.73	967.56	961.80	4.72	7.57	-78.70	1,350.71	-4,600.08	4,793.47	4,783.43	10.04	477.404	
1,400.00	1,385.42	1,020.00	1,012.88	5.16	7.73	-77.97	1,341.05	-4,606.96	4,795.82	4,785.19	10.64	450.849	
1,496.97	1,477.20	1,067.58	1,059.06	5.62	7.93	-77.46	1,331.77	-4,613.68	4,798.07	4,786.82	11.25	426.321	
1,500.00	1,480.05	1,069.11	1,060.54	5.63	7.93	-77.47	1,331.46	-4,613.90	4,798.15	4,786.87	11.27	425.586	
1,600.00	1,574.15	1,113.00	1,103.02	6.12	8.12	-77.75	1,322.57	-4,620.47	4,801.11	4,789.19	11.91	402.952	
1,700.00	1,668.25	1,172.23	1,160.11	6.62	8.35	-78.14	1,309.92	-4,629.88	4,805.24	4,792.60	12.63	380.312	
1,800.00	1,762.35	1,232.54	1,217.94	7.12	8.59	-78.55	1,296.16	-4,640.04	4,810.52	4,797.15	13.37	359.684	
1,900.00	1,856.45	1,300.00	1,282.37	7.64	8.85	-79.02	1,279.92	-4,651.70	4,816.68	4,802.52	14.16	340.249	
2,000.00	1,950.55	1,356.10	1,335.70	8.16	9.07	-79.41	1,265.70	-4,661.73	4,823.88	4,808.96	14.92	323.413	
2,100.00	2,044.65	1,408.66	1,385.40	8.68	9.27	-79.79	1,251.71	-4,671.60	4,832.31	4,816.64	15.67	308.393	
2,200.00	2,138.75	1,470.68	1,443.76	9.21	9.52	-80.24	1,234.52	-4,683.59	4,841.83	4,825.34	16.48	293.730	
2,300.00	2,232.85	1,522.28	1,492.11	9.74	9.72	-80.62	1,219.70	-4,693.84	4,852.45	4,835.19	17.26	281.138	
2,400.00	2,326.95	1,578.00	1,544.09	10.27	9.94	-81.03	1,203.22	-4,705.34	4,864.39	4,846.29	18.06	269.336	
2,500.00	2,421.05	1,631.88	1,594.14	10.81	10.13	-81.43	1,186.88	-4,716.74	4,877.39	4,858.53	18.86	258.571	
2,600.00	2,515.15	1,670.00	1,629.48	11.34	10.27	-81.72	1,175.11	-4,724.88	4,891.54	4,871.96	19.58	249.830	
2,700.00	2,609.25	1,720.04	1,675.62	11.88	10.49	-82.10	1,159.21	-4,735.92	4,906.95	4,886.57	20.39	240.707	
2,800.00	2,703.35	1,764.00	1,715.84	12.42	10.67	-82.44	1,144.68	-4,746.12	4,923.89	4,902.73	21.15	232.778	
2,900.00	2,797.45	1,795.95	1,744.93	12.96	10.81	-82.69	1,133.91	-4,753.77	4,942.19	4,920.33	21.86	226.120	
3,000.00	2,891.55	1,858.00	1,801.24	13.51	11.09	-83.17	1,112.77	-4,769.02	4,961.87	4,939.13	22.75	218.122	
3,100.00	2,985.65	1,858.00	1,801.24	14.05	11.09	-83.17	1,112.77	-4,769.02	4,982.84	4,959.60	23.23	214.454	
3,200.00	3,079.75	1,915.52	1,853.24	14.60	11.31	-83.62	1,093.07	-4,783.73	5,005.05	4,980.94	24.10	207.641	
3,300.00	3,173.85	1,983.00	1,914.02	15.14	11.58	-84.15	1,069.97	-4,801.79	5,028.90	5,003.87	25.03	200.880	
3,400.00	3,267.95	1,998.48	1,927.93	15.69	11.64	-84.27	1,064.69	-4,806.02	5,053.71	5,028.10	25.60	197.382	
3,500.00	3,362.05	2,310.46	2,211.88	16.23	12.97	-86.62	961.29	-4,883.35	5,076.89	5,048.70	28.19	180.081	
3,600.00	3,456.15	2,365.21	2,261.97	16.78	13.20	-87.03	943.15	-4,895.99	5,100.27	5,071.25	29.02	175.721	
3,700.00	3,550.25	2,493.78	2,380.15	17.33	13.76	-87.96	902.02	-4,925.46	5,124.32	5,093.99	30.33	168.925	
3,800.00	3,644.35	2,686.18	2,558.46	17.88	14.65	-89.33	841.97	-4,965.63	5,146.93	5,114.86	32.08	160.463	
3,900.00	3,738.45	2,729.00	2,598.03	18.42	14.85	-89.64	828.04	-4,974.24	5,170.26	5,137.44	32.82	157.513	
4,000.00	3,832.55	2,772.55	2,638.18	18.97	15.06	-89.95	813.78	-4,983.26	5,194.79	5,161.21	33.57	154.739	
4,100.00	3,926.65	2,854.56	2,713.70	19.52	15.48	-90.54	787.13	-5,000.91	5,220.59	5,186.01	34.58	150.991	
4,200.00	4,020.75	2,978.78	2,828.71	20.07	16.14	-91.41	747.87	-5,026.61	5,246.27	5,210.41	35.86	146.307	
4,300.00	4,114.85	3,081.87	2,924.66	20.62	16.69	-92.11	716.43	-5,047.41	5,272.11	5,235.14	36.98	142.585	
4,400.00	4,208.95	3,163.77	3,001.10	21.17	17.14	-92.66	691.93	-5,063.63	5,298.25	5,260.31	37.95	139.630	
4,500.00	4,303.05	3,236.67	3,069.02	21.72	17.56	-93.15	669.89	-5,078.31	5,325.32	5,286.45	38.87	137.012	
4,600.00	4,397.15	3,321.39	3,147.53	22.27	18.08	-93.73	642.66	-5,094.83	5,352.79	5,312.91	39.88	134.210	
4,700.00	4,491.25	3,382.00	3,203.94	22.82	18.48	-94.13	624.09	-5,106.95	5,381.05	5,340.31	40.74	132.076	
4,800.00	4,585.35	3,724.80	3,526.44	23.37	20.42	-96.31	526.36	-5,169.29	5,408.39	5,365.01	43.38	124.674	
4,900.00	4,679.45	3,781.78	3,580.67	23.93	20.72	-96.65	511.59	-5,178.61	5,434.20	5,390.04	44.16	123.055	
5,000.00	4,773.55	4,359.00	4,143.48	24.48	24.00	-99.59	415.24	-5,254.83	5,452.93	5,404.67	48.25	113.005	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171B - OH - OH-SVY													Offset Site Error: 0.00 usft				
Survey Program: Reference		324-MWD OWSG Rev5 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				
5,100.00	4,867.65	4,359.00	4,143.48	25.03	24.00	-99.59	415.24	-5,254.83	5,472.73	5,423.97	48.76	112.241					
5,200.00	4,961.75	4,395.84	4,179.90	25.58	24.15	-99.74	412.23	-5,259.50	5,493.80	5,444.40	49.41	111.199					
5,300.00	5,055.85	4,451.00	4,234.30	26.13	24.38	-99.95	409.35	-5,268.14	5,516.65	5,466.52	50.13	110.058					
5,400.00	5,149.95	4,451.00	4,234.30	26.68	24.38	-99.95	409.35	-5,268.14	5,540.14	5,489.54	50.60	109.495					
5,500.00	5,244.05	4,451.00	4,234.30	27.24	24.38	-99.95	409.35	-5,268.14	5,565.32	5,514.27	51.05	109.011					
5,600.00	5,338.15	4,535.54	4,317.40	27.79	25.08	-100.26	406.47	-5,283.41	5,591.05	5,538.90	52.14	107.225					
5,665.73	5,400.00	4,569.06	4,350.29	28.15	25.43	-100.37	405.34	-5,289.74	5,608.53	5,555.83	52.69	106.437					
5,700.00	5,432.28	4,586.53	4,367.43	28.34	25.63	-100.53	404.76	-5,293.11	5,617.77	5,564.79	52.98	106.037					
5,800.00	5,526.87	4,637.66	4,417.52	28.88	26.27	-100.98	403.07	-5,303.20	5,645.06	5,591.26	53.81	104.914					
5,900.00	5,622.01	4,688.98	4,467.72	29.41	26.96	-101.42	401.40	-5,313.71	5,672.85	5,618.23	54.62	103.855					
6,000.00	5,717.67	4,821.00	4,596.51	29.92	28.78	-102.08	397.21	-5,342.46	5,702.11	5,646.02	56.10	101.643					
6,100.00	5,813.83	4,821.00	4,596.51	30.41	28.78	-102.36	397.21	-5,342.46	5,729.90	5,673.44	56.47	101.476					
6,200.00	5,910.44	5,259.48	5,026.52	30.89	30.26	-103.55	399.78	-5,427.14	5,753.92	5,694.66	59.26	97.096					
6,300.00	6,007.50	5,667.88	5,430.46	31.36	31.44	-104.47	412.20	-5,485.49	5,772.94	5,711.32	61.61	93.696					
6,400.00	6,104.96	5,750.31	5,512.31	31.80	31.68	-104.77	414.15	-5,495.07	5,789.68	5,727.29	62.40	92.787					
6,500.00	6,202.80	5,828.01	5,589.44	32.24	31.90	-105.06	415.80	-5,504.33	5,806.37	5,743.22	63.14	91.954					
6,600.00	6,300.98	5,905.84	5,666.67	32.66	32.13	-105.33	417.25	-5,513.82	5,822.97	5,759.09	63.88	91.158					
6,700.00	6,399.48	6,096.82	5,856.25	33.06	32.83	-105.70	421.17	-5,536.58	5,839.12	5,773.92	65.20	89.556					
6,722.82	6,422.00	6,182.73	5,941.64	33.15	33.17	-105.82	423.88	-5,545.60	5,842.31	5,776.59	65.72	88.899					
6,750.00	6,448.76	6,285.44	6,043.80	33.26	33.60	-95.92	427.94	-5,555.34	5,845.45	5,779.11	66.33	88.124					
6,800.00	6,497.51	6,235.17	5,993.92	33.48	33.38	-84.24	427.18	-5,548.99	5,847.88	5,781.58	66.31	88.194					
6,850.00	6,545.40	6,388.00	6,145.89	33.72	33.90	-77.91	432.76	-5,563.92	5,850.13	5,782.96	67.17	87.090					
6,900.00	6,592.13	6,388.00	6,145.89	33.97	33.90	-73.82	432.76	-5,563.92	5,849.64	5,782.19	67.44	86.734					
6,950.00	6,637.40	6,388.00	6,145.89	34.25	33.90	-71.19	432.76	-5,563.92	5,847.35	5,779.62	67.73	86.333					
7,000.00	6,680.94	6,388.00	6,145.89	34.54	33.90	-69.49	432.76	-5,563.92	5,843.27	5,775.24	68.03	85.890					
7,050.00	6,722.48	6,388.00	6,145.89	34.85	33.90	-68.44	432.76	-5,563.92	5,837.44	5,769.09	68.35	85.405					
7,100.00	6,761.76	6,388.00	6,145.89	35.17	33.90	-67.87	432.76	-5,563.92	5,829.86	5,761.18	68.68	84.882					
7,150.00	6,798.55	6,388.00	6,145.89	35.51	33.90	-67.70	432.76	-5,563.92	5,820.60	5,751.57	69.03	84.323					
7,200.00	6,832.61	6,388.00	6,145.89	35.86	33.90	-67.85	432.76	-5,563.92	5,809.69	5,740.31	69.39	83.730					
7,250.00	6,863.74	6,388.00	6,145.89	36.22	33.90	-68.28	432.76	-5,563.92	5,797.20	5,727.44	69.76	83.106					
7,300.00	6,891.74	6,388.00	6,145.89	36.59	33.90	-68.97	432.76	-5,563.92	5,783.18	5,713.04	70.14	82.452					
7,350.00	6,916.44	6,388.00	6,145.89	36.98	33.90	-69.89	432.76	-5,563.92	5,767.73	5,697.19	70.53	81.773					
7,400.00	6,937.69	6,388.00	6,145.89	37.37	33.90	-71.03	432.76	-5,563.92	5,750.91	5,679.98	70.94	81.069					
7,450.00	6,955.36	6,388.00	6,145.89	37.78	33.90	-72.38	432.76	-5,563.92	5,732.83	5,661.48	71.35	80.346					
7,500.00	6,969.34	6,388.00	6,145.89	38.19	33.90	-73.92	432.76	-5,563.92	5,713.58	5,641.81	71.77	79.605					
7,550.00	6,979.53	6,388.00	6,145.89	38.62	33.90	-75.65	432.76	-5,563.92	5,693.28	5,621.07	72.20	78.850					
7,600.00	6,985.89	6,388.00	6,145.89	39.05	33.90	-77.56	432.76	-5,563.92	5,672.02	5,599.38	72.64	78.086					
7,650.00	6,988.37	6,388.00	6,145.89	39.48	33.90	-79.63	432.76	-5,563.92	5,649.95	5,576.87	73.08	77.315					
7,657.25	6,988.40	6,388.00	6,145.89	39.54	33.90	-79.95	432.76	-5,563.92	5,646.68	5,573.54	73.14	77.202					
7,700.00	6,988.37	6,388.00	6,145.89	39.92	33.90	-79.95	432.76	-5,563.92	5,627.54	5,554.02	73.52	76.545					
7,800.00	6,988.30	6,388.00	6,145.89	40.82	33.90	-79.95	432.76	-5,563.92	5,583.77	5,509.34	74.43	75.024					
7,900.00	6,988.23	6,388.00	6,145.89	41.77	33.90	-79.95	432.76	-5,563.92	5,541.46	5,466.10	75.36	73.531					
8,000.00	6,988.16	6,388.00	6,145.89	42.75	33.90	-79.95	432.76	-5,563.92	5,500.65	5,424.32	76.33	72.069					
8,100.00	6,988.09	6,388.00	6,145.89	43.76	33.90	-79.95	432.76	-5,563.92	5,461.36	5,384.05	77.31	70.640					
8,152.35	6,988.06	6,388.00	6,145.89	44.30	33.90	-79.95	432.76	-5,563.92	5,441.41	5,363.57	77.84	69.906					
8,200.00	6,988.02	6,388.00	6,145.89	44.79	33.90	-79.81	432.76	-5,563.92	5,422.91	5,344.59	78.32	69.240					
8,300.00	6,987.95	6,388.00	6,145.89	45.83	33.90	-79.48	432.76	-5,563.92	5,380.58	5,301.25	79.33	67.829					
8,400.00	6,987.88	6,388.00	6,145.89	46.85	33.90	-79.08	432.76	-5,563.92	5,333.60	5,253.28	80.32	66.404					
8,500.00	6,987.80	6,388.00	6,145.89	47.85	33.90	-78.62	432.76	-5,563.92	5,282.08	5,200.78	81.30	64.972					
8,600.00	6,987.73	6,388.00	6,145.89	48.83	33.90	-78.08	432.76	-5,563.92	5,226.13	5,143.88	82.25	63.536					
8,700.00	6,987.65	6,388.00	6,145.89	49.79	33.90	-77.44	432.76	-5,563.92	5,165.89	5,082.71	83.18	62.102					
8,800.00	6,987.57	6,388.00	6,145.89	50.72	33.90	-76.69	432.76	-5,563.92	5,101.51	5,017.43	84.08	60.673					

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171B - OH - OH-SVY													Offset Site Error: 0.00 usft			
Survey Program: Reference		324-MWD OWSG Rev5 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			
8,900.00	6,987.50	6,388.00	6,145.89	51.62	33.90	-75.80	432.76	-5,563.92	5,033.15	4,948.20	84.94	59.253				
9,000.00	6,987.42	6,388.00	6,145.89	52.48	33.90	-74.75	432.76	-5,563.92	4,960.98	4,875.21	85.76	57.845				
9,100.00	6,987.34	6,388.00	6,145.89	53.30	33.90	-73.48	432.76	-5,563.92	4,885.19	4,798.65	86.54	56.453				
9,200.00	6,987.27	6,388.00	6,145.89	54.08	33.90	-71.93	432.76	-5,563.92	4,805.99	4,718.74	87.25	55.080				
9,215.33	6,987.26	6,388.00	6,145.89	54.20	33.90	-71.67	432.76	-5,563.92	4,793.56	4,706.20	87.36	54.871				
9,300.00	6,987.20	6,388.00	6,145.89	54.85	33.90	-71.67	432.76	-5,563.92	4,724.97	4,637.03	87.94	53.727				
9,400.00	6,987.12	6,388.00	6,145.89	55.65	33.90	-71.67	432.76	-5,563.92	4,644.64	4,555.99	88.65	52.391				
9,500.00	6,987.05	6,388.00	6,145.89	56.48	33.90	-71.67	432.76	-5,563.92	4,565.09	4,475.71	89.39	51.071				
9,600.00	6,986.98	6,388.00	6,145.89	57.35	33.90	-71.67	432.76	-5,563.92	4,486.36	4,396.22	90.14	49.769				
9,700.00	6,986.90	6,388.00	6,145.89	58.24	33.90	-71.67	432.76	-5,563.92	4,408.49	4,317.57	90.92	48.486				
9,800.00	6,986.83	6,388.00	6,145.89	59.17	33.90	-71.67	432.76	-5,563.92	4,331.53	4,239.81	91.73	47.222				
9,900.00	6,986.75	6,388.00	6,145.89	60.12	33.90	-71.67	432.76	-5,563.92	4,255.53	4,162.98	92.55	45.979				
10,000.00	6,986.68	6,388.00	6,145.89	61.10	33.90	-71.67	432.76	-5,563.92	4,180.54	4,087.14	93.41	44.757				
10,100.00	6,986.61	6,388.00	6,145.89	62.11	33.90	-71.67	432.76	-5,563.92	4,106.61	4,012.33	94.28	43.557				
10,200.00	6,986.53	6,388.00	6,145.89	63.14	33.90	-71.67	432.76	-5,563.92	4,033.81	3,938.63	95.18	42.381				
10,300.00	6,986.46	6,388.00	6,145.89	64.20	33.90	-71.67	432.76	-5,563.92	3,962.20	3,866.10	96.10	41.229				
10,400.00	6,986.39	6,388.00	6,145.89	65.28	33.90	-71.67	432.76	-5,563.92	3,891.84	3,794.79	97.05	40.103				
10,500.00	6,986.31	6,388.00	6,145.89	66.38	33.90	-71.67	432.76	-5,563.92	3,822.79	3,724.78	98.01	39.003				
10,600.00	6,986.24	6,388.00	6,145.89	67.50	33.90	-71.67	432.76	-5,563.92	3,755.15	3,656.15	99.00	37.931				
10,700.00	6,986.17	6,388.00	6,145.89	68.64	33.90	-71.67	432.76	-5,563.92	3,688.97	3,588.96	100.01	36.887				
10,800.00	6,986.09	6,388.00	6,145.89	69.80	33.90	-71.67	432.76	-5,563.92	3,624.34	3,523.31	101.03	35.873				
10,900.00	6,986.02	6,388.00	6,145.89	70.98	33.90	-71.67	432.76	-5,563.92	3,561.35	3,459.28	102.07	34.891				
11,000.00	6,985.95	6,388.00	6,145.89	72.17	33.90	-71.67	432.76	-5,563.92	3,500.08	3,396.96	103.12	33.940				
11,100.00	6,985.87	6,388.00	6,145.89	73.38	33.90	-71.67	432.76	-5,563.92	3,440.63	3,336.44	104.19	33.023				
11,200.00	6,985.80	6,388.00	6,145.89	74.61	33.90	-71.67	432.76	-5,563.92	3,383.09	3,277.83	105.26	32.141				
11,300.00	6,985.72	6,388.00	6,145.89	75.85	33.90	-71.67	432.76	-5,563.92	3,327.56	3,221.23	106.33	31.294				
11,400.00	6,985.65	6,388.00	6,145.89	77.10	33.90	-71.67	432.76	-5,563.92	3,274.15	3,166.74	107.41	30.483				
11,500.00	6,985.58	6,388.00	6,145.89	78.37	33.90	-71.67	432.76	-5,563.92	3,222.95	3,114.47	108.48	29.711				
11,600.00	6,985.50	6,388.00	6,145.89	79.65	33.90	-71.67	432.76	-5,563.92	3,174.08	3,064.54	109.54	28.977				
11,700.00	6,985.43	6,388.00	6,145.89	80.94	33.90	-71.67	432.76	-5,563.92	3,127.64	3,017.06	110.58	28.284				
11,800.00	6,985.36	6,388.00	6,145.89	82.24	33.90	-71.67	432.76	-5,563.92	3,083.75	2,972.15	111.60	27.631				
11,900.00	6,985.28	6,388.00	6,145.89	83.56	33.90	-71.67	432.76	-5,563.92	3,042.51	2,929.92	112.60	27.021				
12,000.00	6,985.21	6,388.00	6,145.89	84.88	33.90	-71.67	432.76	-5,563.92	3,004.04	2,890.48	113.56	26.454				
12,100.00	6,985.14	6,388.00	6,145.89	86.21	33.90	-71.67	432.76	-5,563.92	2,968.44	2,853.96	114.48	25.930				
12,200.00	6,985.06	6,388.00	6,145.89	87.56	33.90	-71.67	432.76	-5,563.92	2,935.81	2,820.46	115.35	25.452				
12,300.00	6,984.99	6,388.00	6,145.89	88.91	33.90	-71.67	432.76	-5,563.92	2,906.26	2,790.10	116.17	25.018				
12,400.00	6,984.92	6,388.00	6,145.89	90.27	33.90	-71.67	432.76	-5,563.92	2,879.88	2,762.96	116.92	24.631				
12,500.00	6,984.84	6,388.00	6,145.89	91.64	33.90	-71.67	432.76	-5,563.92	2,856.76	2,739.16	117.61	24.291				
12,600.00	6,984.77	6,388.00	6,145.89	93.01	33.90	-71.67	432.76	-5,563.92	2,836.98	2,718.76	118.22	23.998				
12,700.00	6,984.69	6,388.00	6,145.89	94.40	33.90	-71.67	432.76	-5,563.92	2,820.61	2,701.86	118.75	23.753				
12,800.00	6,984.62	6,388.00	6,145.89	95.79	33.90	-71.67	432.76	-5,563.92	2,807.70	2,688.51	119.19	23.556				
12,900.00	6,984.55	6,388.00	6,145.89	97.18	33.90	-71.67	432.76	-5,563.92	2,798.31	2,678.76	119.55	23.407				
13,000.00	6,984.47	6,388.00	6,145.89	98.59	33.90	-71.67	432.76	-5,563.92	2,792.48	2,672.66	119.82	23.306				
13,100.00	6,984.40	6,388.00	6,145.89	100.00	33.90	-71.67	432.76	-5,563.92	2,790.21	2,670.23	119.99	23.254				
13,113.17	6,984.39	6,388.00	6,145.89	100.18	33.90	-71.67	432.76	-5,563.92	2,790.18	2,670.18	120.00	23.251	CC, ES			
13,200.00	6,984.33	6,388.00	6,145.89	101.41	33.90	-71.67	432.76	-5,563.92	2,791.53	2,671.47	120.06	23.250	SF			
13,300.00	6,984.25	6,388.00	6,145.89	102.83	33.90	-71.67	432.76	-5,563.92	2,796.43	2,676.38	120.05	23.294				
13,400.00	6,984.18	6,388.00	6,145.89	104.26	33.90	-71.67	432.76	-5,563.92	2,804.89	2,684.95	119.94	23.386				
13,500.00	6,984.11	6,388.00	6,145.89	105.69	33.90	-71.67	432.76	-5,563.92	2,816.87	2,697.13	119.74	23.525				
13,600.00	6,984.03	6,388.00	6,145.89	107.13	33.90	-71.67	432.76	-5,563.92	2,832.34	2,712.89	119.45	23.711				
13,700.00	6,983.96	6,388.00	6,145.89	108.57	33.90	-71.67	432.76	-5,563.92	2,851.23	2,732.14	119.08	23.943				
13,800.00	6,983.88	6,388.00	6,145.89	110.02	33.90	-71.67	432.76	-5,563.92	2,873.48	2,754.84	118.64	24.221				

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171B - OH - OH-SVY													Offset Site Error: 0.00 usft
Survey Program: 324-MWD OWSG Rev5													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)			
13,900.00	6,983.81	6,388.00	6,145.89	111.47	33.90	-71.67	432.76	-5,563.92	2,899.00	2,780.88	118.12	24.543	
14,000.00	6,983.74	6,388.00	6,145.89	112.92	33.90	-71.67	432.76	-5,563.92	2,927.73	2,810.19	117.54	24.908	
14,100.00	6,983.66	6,388.00	6,145.89	114.38	33.90	-71.67	432.76	-5,563.92	2,959.55	2,842.65	116.90	25.317	
14,200.00	6,983.59	6,388.00	6,145.89	115.85	33.90	-71.67	432.76	-5,563.92	2,994.38	2,878.17	116.21	25.767	
14,300.00	6,983.52	6,388.00	6,145.89	117.31	33.90	-71.67	432.76	-5,563.92	3,032.11	2,916.64	115.48	26.258	
14,400.00	6,983.44	6,388.00	6,145.89	118.78	33.90	-71.67	432.76	-5,563.92	3,072.63	2,957.93	114.70	26.788	
14,500.00	6,983.37	6,388.00	6,145.89	120.26	33.90	-71.67	432.76	-5,563.92	3,115.84	3,001.94	113.90	27.357	
14,600.00	6,983.30	6,388.00	6,145.89	121.74	33.90	-71.67	432.76	-5,563.92	3,161.61	3,048.55	113.07	27.963	
14,700.00	6,983.22	6,388.00	6,145.89	123.22	33.90	-71.67	432.76	-5,563.92	3,209.85	3,097.64	112.21	28.605	
14,800.00	6,983.15	6,388.00	6,145.89	124.70	33.90	-71.67	432.76	-5,563.92	3,260.45	3,149.10	111.35	29.282	
14,900.00	6,983.08	6,388.00	6,145.89	126.19	33.90	-71.67	432.76	-5,563.92	3,313.29	3,202.82	110.47	29.992	
15,000.00	6,983.00	6,388.00	6,145.89	127.68	33.90	-71.67	432.76	-5,563.92	3,368.27	3,258.68	109.59	30.735	
15,100.00	6,982.93	6,388.00	6,145.89	129.17	33.90	-71.67	432.76	-5,563.92	3,425.29	3,316.58	108.71	31.509	
15,200.00	6,982.85	6,388.00	6,145.89	130.67	33.90	-71.67	432.76	-5,563.92	3,484.25	3,376.42	107.83	32.312	
15,300.00	6,982.78	6,388.00	6,145.89	132.16	33.90	-71.67	432.76	-5,563.92	3,545.05	3,438.09	106.96	33.145	
15,400.00	6,982.71	6,388.00	6,145.89	133.66	33.90	-71.67	432.76	-5,563.92	3,607.59	3,501.50	106.09	34.005	
15,500.00	6,982.63	6,388.00	6,145.89	135.17	33.90	-71.67	432.76	-5,563.92	3,671.80	3,566.56	105.23	34.892	
15,600.00	6,982.56	6,388.00	6,145.89	136.67	33.90	-71.67	432.76	-5,563.92	3,737.57	3,633.18	104.39	35.803	
15,700.00	6,982.49	6,388.00	6,145.89	138.18	33.90	-71.67	432.76	-5,563.92	3,804.84	3,701.28	103.56	36.739	
15,800.00	6,982.41	6,388.00	6,145.89	139.69	33.90	-71.67	432.76	-5,563.92	3,873.53	3,770.77	102.75	37.698	
15,900.00	6,982.34	6,388.00	6,145.89	141.20	33.90	-71.67	432.76	-5,563.92	3,943.55	3,841.59	101.96	38.678	
16,000.00	6,982.27	6,388.00	6,145.89	142.71	33.90	-71.67	432.76	-5,563.92	4,014.84	3,913.66	101.18	39.680	
16,100.00	6,982.19	6,388.00	6,145.89	144.23	33.90	-71.67	432.76	-5,563.92	4,087.33	3,986.91	100.42	40.701	
16,200.00	6,982.12	6,388.00	6,145.89	145.75	33.90	-71.67	432.76	-5,563.92	4,160.97	4,061.29	99.68	41.742	
16,300.00	6,982.05	6,388.00	6,145.89	147.27	33.90	-71.67	432.76	-5,563.92	4,235.69	4,136.72	98.96	42.800	
16,400.00	6,981.97	6,388.00	6,145.89	148.79	33.90	-71.67	432.76	-5,563.92	4,311.43	4,213.16	98.27	43.875	
16,500.00	6,981.90	6,388.00	6,145.89	150.31	33.90	-71.67	432.76	-5,563.92	4,388.14	4,290.55	97.59	44.967	
16,600.00	6,981.82	6,388.00	6,145.89	151.84	33.90	-71.67	432.76	-5,563.92	4,465.77	4,368.85	96.93	46.073	
16,700.00	6,981.75	6,388.00	6,145.89	153.36	33.90	-71.67	432.76	-5,563.92	4,544.28	4,447.99	96.29	47.194	
16,800.00	6,981.68	6,388.00	6,145.89	154.89	33.90	-71.67	432.76	-5,563.92	4,623.62	4,527.95	95.67	48.329	
16,900.00	6,981.60	6,388.00	6,145.89	156.42	33.90	-71.67	432.76	-5,563.92	4,703.75	4,608.68	95.07	49.477	
17,000.00	6,981.53	6,388.00	6,145.89	157.95	33.90	-71.67	432.76	-5,563.92	4,784.62	4,690.13	94.49	50.636	
17,100.00	6,981.46	6,388.00	6,145.89	159.49	33.90	-71.67	432.76	-5,563.92	4,866.21	4,772.28	93.93	51.808	
17,200.00	6,981.38	6,388.00	6,145.89	161.02	33.90	-71.67	432.76	-5,563.92	4,948.47	4,855.08	93.39	52.989	
17,300.00	6,981.31	6,388.00	6,145.89	162.56	33.90	-71.67	432.76	-5,563.92	5,031.37	4,938.51	92.86	54.181	
17,400.00	6,981.24	6,388.00	6,145.89	164.09	33.90	-71.67	432.76	-5,563.92	5,114.89	5,022.53	92.36	55.383	
17,500.00	6,981.16	6,388.00	6,145.89	165.63	33.90	-71.67	432.76	-5,563.92	5,198.98	5,107.12	91.87	56.593	
17,600.00	6,981.09	6,388.00	6,145.89	167.17	33.90	-71.67	432.76	-5,563.92	5,283.64	5,192.24	91.39	57.812	
17,700.00	6,981.01	6,388.00	6,145.89	168.71	33.90	-71.67	432.76	-5,563.92	5,368.81	5,277.88	90.94	59.038	
17,800.00	6,980.94	6,388.00	6,145.89	170.25	33.90	-71.67	432.76	-5,563.92	5,454.50	5,364.00	90.50	60.271	
17,900.00	6,980.87	6,388.00	6,145.89	171.80	33.90	-71.67	432.76	-5,563.92	5,540.66	5,450.58	90.08	61.511	
18,000.00	6,980.79	6,388.00	6,145.89	173.34	33.90	-71.67	432.76	-5,563.92	5,627.28	5,537.61	89.67	62.758	
18,100.00	6,980.72	6,388.00	6,145.89	174.89	33.90	-71.67	432.76	-5,563.92	5,714.34	5,625.06	89.27	64.009	
18,200.00	6,980.65	6,388.00	6,145.89	176.43	33.90	-71.67	432.76	-5,563.92	5,801.81	5,712.92	88.89	65.267	
18,300.00	6,980.57	6,388.00	6,145.89	177.98	33.90	-71.67	432.76	-5,563.92	5,889.68	5,801.16	88.53	66.529	
18,400.00	6,980.50	6,388.00	6,145.89	179.53	33.90	-71.67	432.76	-5,563.92	5,977.94	5,889.76	88.18	67.795	
18,500.00	6,980.43	6,388.00	6,145.89	181.08	33.90	-71.67	432.76	-5,563.92	6,066.56	5,978.72	87.84	69.066	
18,600.00	6,980.35	6,388.00	6,145.89	182.63	33.90	-71.67	432.76	-5,563.92	6,155.52	6,068.01	87.51	70.340	
18,700.00	6,980.28	6,388.00	6,145.89	184.18	33.90	-71.67	432.76	-5,563.92	6,244.83	6,157.63	87.20	71.618	
18,800.00	6,980.21	6,388.00	6,145.89	185.73	33.90	-71.67	432.76	-5,563.92	6,334.45	6,247.55	86.89	72.898	
18,900.00	6,980.13	6,388.00	6,145.89	187.28	33.90	-71.67	432.76	-5,563.92	6,424.37	6,337.77	86.60	74.181	
19,000.00	6,980.06	6,388.00	6,145.89	188.84	33.90	-71.67	432.76	-5,563.92	6,514.59	6,428.27	86.32	75.467	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171B - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		324-MWD OWSG Rev5					Rule Assigned:						Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Offset Wellbore Centre		Distance						
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
19,100.00	6,979.98	6,388.00	6,145.89	190.39	33.90	-71.67	432.76	-5,563.92	6,605.10	6,519.04	86.06	76.754		
19,200.00	6,979.91	6,388.00	6,145.89	191.95	33.90	-71.67	432.76	-5,563.92	6,695.87	6,610.07	85.80	78.044		
19,300.00	6,979.84	6,388.00	6,145.89	193.51	33.90	-71.67	432.76	-5,563.92	6,786.90	6,701.35	85.55	79.334		
19,400.00	6,979.76	6,388.00	6,145.89	195.06	33.90	-71.67	432.76	-5,563.92	6,878.18	6,792.87	85.31	80.626		
19,500.00	6,979.69	6,388.00	6,145.89	196.62	33.90	-71.67	432.76	-5,563.92	6,969.70	6,884.62	85.08	81.919		
19,600.00	6,979.62	6,388.00	6,145.89	198.18	33.90	-71.67	432.76	-5,563.92	7,061.45	6,976.59	84.86	83.213		
19,700.00	6,979.54	6,388.00	6,145.89	199.74	33.90	-71.67	432.76	-5,563.92	7,153.43	7,068.78	84.65	84.507		
19,800.00	6,979.47	6,388.00	6,145.89	201.30	33.90	-71.67	432.76	-5,563.92	7,245.61	7,161.17	84.45	85.802		
19,900.00	6,979.40	6,388.00	6,145.89	202.86	33.90	-71.67	432.76	-5,563.92	7,338.00	7,253.75	84.25	87.097		
20,000.00	6,979.32	6,388.00	6,145.89	204.42	33.90	-71.67	432.76	-5,563.92	7,430.59	7,346.52	84.06	88.391		
20,100.00	6,979.25	6,388.00	6,145.89	205.98	33.90	-71.67	432.76	-5,563.92	7,523.36	7,439.48	83.89	89.685		
20,200.00	6,979.18	6,388.00	6,145.89	207.55	33.90	-71.67	432.76	-5,563.92	7,616.32	7,532.61	83.71	90.979		
20,300.00	6,979.10	6,388.00	6,145.89	209.11	33.90	-71.67	432.76	-5,563.92	7,709.46	7,625.91	83.55	92.272		
20,400.00	6,979.03	6,388.00	6,145.89	210.68	33.90	-71.67	432.76	-5,563.92	7,802.76	7,719.37	83.39	93.565		
20,500.00	6,978.95	6,388.00	6,145.89	212.24	33.90	-71.67	432.76	-5,563.92	7,896.23	7,812.99	83.24	94.856		
20,600.00	6,978.88	6,388.00	6,145.89	213.81	33.90	-71.67	432.76	-5,563.92	7,989.86	7,906.76	83.10	96.147		
20,700.00	6,978.81	6,388.00	6,145.89	215.37	33.90	-71.67	432.76	-5,563.92	8,083.64	8,000.67	82.96	97.436		
20,800.00	6,978.73	6,388.00	6,145.89	216.94	33.90	-71.67	432.76	-5,563.92	8,177.56	8,094.73	82.83	98.724		
20,900.00	6,978.66	6,388.00	6,145.89	218.51	33.90	-71.67	432.76	-5,563.92	8,271.63	8,188.92	82.71	100.010		
21,000.00	6,978.59	6,388.00	6,145.89	220.07	33.90	-71.67	432.76	-5,563.92	8,365.84	8,283.25	82.59	101.294		
21,100.00	6,978.51	6,388.00	6,145.89	221.64	33.90	-71.67	432.76	-5,563.92	8,460.18	8,377.70	82.48	102.577		
21,200.00	6,978.44	6,388.00	6,145.89	223.21	33.90	-71.67	432.76	-5,563.92	8,554.65	8,472.28	82.37	103.858		
21,300.00	6,978.37	6,388.00	6,145.89	224.78	33.90	-71.67	432.76	-5,563.92	8,649.24	8,566.98	82.27	105.138		
21,400.00	6,978.29	6,388.00	6,145.89	226.35	33.90	-71.67	432.76	-5,563.92	8,743.96	8,661.79	82.17	106.415		
21,500.00	6,978.22	6,388.00	6,145.89	227.92	33.90	-71.67	432.76	-5,563.92	8,838.78	8,756.71	82.08	107.690		
21,600.00	6,978.14	6,388.00	6,145.89	229.49	33.90	-71.67	432.76	-5,563.92	8,933.73	8,851.74	81.99	108.962		
21,700.00	6,978.07	6,388.00	6,145.89	231.06	33.90	-71.67	432.76	-5,563.92	9,028.78	8,946.87	81.91	110.233		
21,800.00	6,978.00	6,388.00	6,145.89	232.63	33.90	-71.67	432.76	-5,563.92	9,123.94	9,042.11	81.83	111.501		
21,900.00	6,977.92	6,388.00	6,145.89	234.21	33.90	-71.67	432.76	-5,563.92	9,219.20	9,137.44	81.75	112.766		
22,000.00	6,977.85	6,388.00	6,145.89	235.78	33.90	-71.67	432.76	-5,563.92	9,314.56	9,232.87	81.69	114.029		
22,100.00	6,977.78	6,388.00	6,145.89	237.35	33.90	-71.67	432.76	-5,563.92	9,410.01	9,328.39	81.62	115.290		
22,200.00	6,977.70	6,388.00	6,145.89	238.92	33.90	-71.67	432.76	-5,563.92	9,505.56	9,424.00	81.56	116.547		
22,300.00	6,977.63	6,388.00	6,145.89	240.50	33.90	-71.67	432.76	-5,563.92	9,601.20	9,519.70	81.50	117.802		
22,400.00	6,977.56	6,388.00	6,145.89	242.07	33.90	-71.67	432.76	-5,563.92	9,696.93	9,615.48	81.45	119.054		
22,500.00	6,977.48	6,388.00	6,145.89	243.65	33.90	-71.67	432.76	-5,563.92	9,792.74	9,711.34	81.40	120.303		
22,600.00	6,977.41	6,388.00	6,145.89	245.22	33.90	-71.67	432.76	-5,563.92	9,888.64	9,807.28	81.35	121.550		
22,700.00	6,977.34	6,388.00	6,145.89	246.80	33.90	-71.67	432.76	-5,563.92	9,984.61	9,903.30	81.31	122.793		
22,800.00	6,977.26	6,388.00	6,145.89	248.37	33.90	-71.67	432.76	-5,563.92	10,080.67	9,999.40	81.27	124.033		
22,900.00	6,977.19	6,388.00	6,145.89	249.95	33.90	-71.67	432.76	-5,563.92	10,176.80	10,095.56	81.24	125.270		
23,000.00	6,977.11	6,388.00	6,145.89	251.53	33.90	-71.67	432.76	-5,563.92	10,273.00	10,191.80	81.21	126.504		
23,100.00	6,977.04	6,388.00	6,145.89	253.10	33.90	-71.67	432.76	-5,563.92	10,369.28	10,288.10	81.18	127.735		
23,155.65	6,977.00	6,388.00	6,145.89	253.98	33.90	-71.67	432.76	-5,563.92	10,422.89	10,341.73	81.16	128.419		
23,156.15	6,977.00	6,388.00	6,145.89	254.06	33.90	-71.67	432.76	-5,563.92	10,423.37	10,338.90	84.47	123.397		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171C - OH - OH-SVY													Offset Site Error: 0.00 usft
Survey Program: 288-MWD OWSG Rev5													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	39.00	39.00	0.00	0.79	-73.03	1,400.41	-4,589.37	4,798.28				
100.00	100.00	139.00	139.00	0.25	2.82	-73.03	1,400.41	-4,589.37	4,798.28	4,795.21	3.07	1,565.001	
200.00	200.00	239.00	239.00	0.61	4.84	-73.03	1,400.41	-4,589.37	4,798.28	4,792.83	5.45	880.492	
210.00	210.00	249.00	249.00	0.65	5.04	-73.03	1,400.41	-4,589.37	4,798.28	4,792.59	5.69	843.595	
300.00	300.00	311.42	311.42	0.97	5.85	-73.03	1,400.46	-4,589.43	4,798.43	4,791.61	6.81	704.114	
400.00	400.00	385.99	385.99	1.33	5.97	-73.03	1,400.61	-4,590.10	4,799.33	4,792.04	7.29	658.570	
500.00	500.00	459.69	459.67	1.68	6.10	-73.04	1,400.12	-4,591.25	4,800.65	4,792.89	7.76	618.572	
600.00	599.98	515.89	515.85	2.04	6.15	-83.03	1,399.42	-4,592.71	4,802.55	4,794.38	8.17	587.574	
700.00	699.84	562.00	561.92	2.41	6.18	-83.02	1,398.41	-4,594.42	4,804.94	4,796.37	8.57	560.369	
800.00	799.45	622.00	621.80	2.77	6.28	-83.06	1,396.41	-4,597.67	4,808.08	4,799.07	9.01	533.649	
900.00	898.70	643.65	643.37	3.13	6.34	-83.03	1,395.52	-4,599.21	4,812.02	4,802.61	9.41	511.387	
1,000.00	997.47	682.00	681.54	3.50	6.45	-83.03	1,393.71	-4,602.51	4,817.00	4,807.15	9.84	489.300	
1,100.00	1,095.63	712.57	711.90	3.89	6.55	-80.67	1,392.01	-4,605.62	4,822.49	4,812.20	10.29	468.744	
1,200.00	1,193.09	742.00	741.07	4.29	6.65	-78.98	1,390.10	-4,608.99	4,828.07	4,817.33	10.74	449.544	
1,300.00	1,289.73	773.90	772.62	4.72	6.76	-77.73	1,387.81	-4,613.13	4,833.85	4,822.62	11.23	430.500	
1,400.00	1,385.42	803.00	801.31	5.16	6.87	-76.77	1,385.56	-4,617.43	4,839.92	4,828.19	11.73	412.635	
1,496.97	1,477.20	826.75	824.67	5.62	6.97	-76.01	1,383.61	-4,621.29	4,846.08	4,833.85	12.23	396.209	
1,500.00	1,480.05	827.59	825.49	5.63	6.97	-76.01	1,383.54	-4,621.43	4,846.28	4,834.03	12.25	395.712	
1,600.00	1,574.15	863.00	860.20	6.12	7.11	-76.20	1,380.44	-4,627.73	4,853.61	4,840.79	12.82	378.705	
1,700.00	1,668.25	863.00	860.20	6.62	7.11	-76.20	1,380.44	-4,627.73	4,862.56	4,849.28	13.28	366.121	
1,800.00	1,762.35	924.00	919.61	7.12	7.36	-76.54	1,374.59	-4,640.25	4,873.09	4,859.12	13.97	348.813	
1,900.00	1,856.45	924.00	919.61	7.64	7.36	-76.54	1,374.59	-4,640.25	4,885.01	4,870.57	14.44	338.245	
2,000.00	1,950.55	960.37	954.78	8.16	7.51	-76.74	1,370.72	-4,648.65	4,898.57	4,883.52	15.06	325.370	
2,100.00	2,044.65	986.00	979.46	8.68	7.61	-76.89	1,367.76	-4,654.89	4,913.58	4,897.96	15.63	314.397	
2,200.00	2,138.75	1,016.13	1,008.34	9.21	7.74	-77.07	1,364.02	-4,662.61	4,930.08	4,913.86	16.23	303.806	
2,300.00	2,232.85	1,049.00	1,039.66	9.74	7.88	-77.26	1,359.63	-4,671.59	4,948.15	4,931.31	16.84	293.837	
2,400.00	2,326.95	1,049.00	1,039.66	10.27	7.88	-77.26	1,359.63	-4,671.59	4,967.80	4,950.50	17.30	287.123	
2,500.00	2,421.05	1,087.06	1,075.65	10.81	8.06	-77.49	1,354.22	-4,682.71	4,988.83	4,970.89	17.95	277.951	
2,600.00	2,515.15	1,110.00	1,097.21	11.34	8.16	-77.64	1,350.84	-4,689.79	5,011.49	4,992.97	18.52	270.627	
2,700.00	2,609.25	1,110.00	1,097.21	11.88	8.16	-77.64	1,350.84	-4,689.79	5,035.84	5,016.87	18.96	265.550	
2,800.00	2,703.35	1,146.12	1,130.89	12.42	8.34	-77.86	1,345.32	-4,701.61	5,061.46	5,041.84	19.62	257.997	
2,900.00	2,797.45	1,173.00	1,155.72	12.96	8.48	-78.03	1,341.04	-4,710.98	5,088.81	5,068.59	20.22	251.727	
3,000.00	2,891.55	1,173.00	1,155.72	13.51	8.48	-78.03	1,341.04	-4,710.98	5,117.65	5,097.01	20.64	247.931	
3,100.00	2,985.65	1,197.85	1,178.48	14.05	8.62	-78.19	1,337.00	-4,720.08	5,147.98	5,126.74	21.23	242.432	
3,200.00	3,079.75	1,235.00	1,212.15	14.60	8.82	-78.43	1,330.79	-4,734.50	5,180.04	5,158.13	21.91	236.380	
3,300.00	3,173.85	1,235.00	1,212.15	15.14	8.82	-78.43	1,330.79	-4,734.50	5,213.19	5,190.87	22.32	233.589	
3,400.00	3,267.95	1,235.00	1,212.15	15.69	8.82	-78.43	1,330.79	-4,734.50	5,248.03	5,225.32	22.71	231.076	
3,500.00	3,362.05	1,264.58	1,238.63	16.23	8.99	-78.62	1,325.63	-4,746.63	5,284.16	5,260.83	23.33	226.535	
3,600.00	3,456.15	1,297.00	1,267.29	16.78	9.17	-78.83	1,319.60	-4,760.53	5,321.84	5,297.88	23.96	222.108	
3,700.00	3,550.25	1,297.00	1,267.29	17.33	9.17	-78.83	1,319.60	-4,760.53	5,360.69	5,336.36	24.33	220.329	
3,800.00	3,644.35	1,297.00	1,267.29	17.88	9.17	-78.83	1,319.60	-4,760.53	5,401.10	5,376.41	24.69	218.758	
3,900.00	3,738.45	1,327.07	1,293.53	18.42	9.33	-79.03	1,313.79	-4,774.03	5,442.63	5,417.34	25.29	215.203	
4,000.00	3,832.55	1,359.00	1,321.01	18.97	9.50	-79.24	1,307.53	-4,789.03	5,485.73	5,459.82	25.90	211.771	
4,100.00	3,926.65	1,359.00	1,321.01	19.52	9.50	-79.24	1,307.53	-4,789.03	5,529.82	5,503.58	26.24	210.742	
4,200.00	4,020.75	1,359.00	1,321.01	20.07	9.50	-79.24	1,307.53	-4,789.03	5,575.36	5,548.80	26.57	209.872	
4,300.00	4,114.85	1,388.12	1,345.73	20.62	9.65	-79.44	1,301.61	-4,803.22	5,621.99	5,594.86	27.13	207.224	
4,400.00	4,208.95	1,421.00	1,373.27	21.17	9.81	-79.66	1,294.54	-4,819.75	5,669.95	5,642.23	27.72	204.523	
4,500.00	4,303.05	1,421.00	1,373.27	21.72	9.81	-79.66	1,294.54	-4,819.75	5,718.85	5,690.82	28.03	204.058	
4,600.00	4,397.15	1,421.00	1,373.27	22.27	9.81	-79.66	1,294.54	-4,819.75	5,769.06	5,740.74	28.32	203.716	
4,700.00	4,491.25	1,421.00	1,373.27	22.82	9.81	-79.66	1,294.54	-4,819.75	5,820.57	5,791.96	28.60	203.489	
4,800.00	4,585.35	1,456.39	1,402.37	23.37	9.99	-79.91	1,286.57	-4,838.23	5,872.70	5,843.49	29.21	201.056	
4,900.00	4,679.45	1,482.00	1,423.04	23.93	10.11	-80.08	1,280.61	-4,852.13	5,926.29	5,896.57	29.72	199.402	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171C - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		288-MWD OWSG Rev5							Rule Assigned:				Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance			Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)			
5,000.00	4,773.55	1,482.00	1,423.04	24.48	10.11	-80.08	1,280.61	-4,852.13	5,980.76	5,950.78	29.98	199.461		
5,100.00	4,867.65	1,482.00	1,423.04	25.03	10.11	-80.08	1,280.61	-4,852.13	6,036.40	6,006.16	30.24	199.610		
5,200.00	4,961.75	1,482.00	1,423.04	25.58	10.11	-80.08	1,280.61	-4,852.13	6,093.16	6,062.67	30.49	199.843		
5,300.00	5,055.85	1,512.30	1,447.07	26.13	10.27	-80.29	1,273.34	-4,869.10	6,150.58	6,119.54	31.04	198.129		
5,400.00	5,149.95	1,543.00	1,470.91	26.68	10.43	-80.51	1,265.72	-4,886.87	6,209.35	6,177.75	31.60	196.506		
5,500.00	5,244.05	1,543.00	1,470.91	27.24	10.43	-80.51	1,265.72	-4,886.87	6,268.71	6,236.88	31.83	196.941		
5,600.00	5,338.15	1,543.00	1,470.91	27.79	10.43	-80.51	1,265.72	-4,886.87	6,329.09	6,297.03	32.06	197.441		
5,665.73	5,400.00	1,543.00	1,470.91	28.15	10.43	-80.51	1,265.72	-4,886.87	6,369.32	6,337.12	32.20	197.806		
5,700.00	5,432.28	1,543.00	1,470.91	28.34	10.43	-80.77	1,265.72	-4,886.87	6,390.48	6,358.20	32.27	198.011		
5,800.00	5,526.87	1,543.00	1,470.91	28.88	10.43	-81.56	1,265.72	-4,886.87	6,453.00	6,420.52	32.48	198.700		
5,900.00	5,622.01	1,604.00	1,516.87	29.41	10.72	-82.78	1,249.57	-4,923.57	6,516.37	6,483.08	33.29	195.768		
6,000.00	5,717.67	1,604.00	1,516.87	29.92	10.72	-83.61	1,249.57	-4,923.57	6,580.52	6,547.06	33.46	196.681		
6,100.00	5,813.83	1,604.00	1,516.87	30.41	10.72	-84.47	1,249.57	-4,923.57	6,645.70	6,612.08	33.61	197.712		
6,200.00	5,910.44	1,624.84	1,532.22	30.89	10.79	-85.47	1,243.71	-4,936.40	6,711.77	6,677.84	33.94	197.774		
6,300.00	6,007.50	1,667.00	1,562.95	31.36	10.95	-86.62	1,231.35	-4,962.48	6,778.63	6,744.19	34.44	196.845		
6,400.00	6,104.96	1,667.00	1,562.95	31.80	10.95	-87.53	1,231.35	-4,962.48	6,846.02	6,811.48	34.55	198.159		
6,500.00	6,202.80	1,695.14	1,583.24	32.24	11.03	-88.62	1,222.77	-4,979.98	6,914.11	6,879.23	34.87	198.261		
6,600.00	6,300.98	1,729.00	1,607.44	32.66	11.15	-89.75	1,212.18	-5,001.18	6,982.80	6,947.57	35.24	198.160		
6,700.00	6,399.48	1,747.08	1,620.27	33.06	11.22	-90.80	1,206.44	-5,012.54	7,051.99	7,016.53	35.46	198.872		
6,722.82	6,422.00	1,754.97	1,625.86	33.15	11.26	-91.06	1,203.92	-5,017.50	7,067.85	7,032.30	35.54	198.859		
6,750.00	6,448.76	1,764.41	1,632.54	33.26	11.35	-79.85	1,200.90	-5,023.45	7,086.43	7,050.80	35.64	198.842		
6,800.00	6,497.51	1,791.00	1,651.31	33.48	11.70	-66.31	1,192.34	-5,040.22	7,118.98	7,083.09	35.89	198.357		
6,850.00	6,545.40	1,791.00	1,651.31	33.72	11.70	-57.76	1,192.34	-5,040.22	7,149.22	7,113.27	35.95	198.878		
6,900.00	6,592.13	1,811.88	1,666.00	33.97	11.95	-52.05	1,185.58	-5,053.44	7,177.01	7,140.82	36.19	198.303		
6,950.00	6,637.40	1,825.87	1,675.80	34.25	12.12	-47.90	1,181.03	-5,062.33	7,202.23	7,165.84	36.39	197.906		
7,000.00	6,680.94	2,224.49	1,961.64	34.54	17.17	-47.10	1,051.10	-5,307.78	7,223.48	7,183.51	39.97	180.719		
7,050.00	6,722.48	2,259.00	1,986.92	34.85	17.60	-44.87	1,040.01	-5,328.47	7,241.45	7,201.05	40.40	179.237		
7,100.00	6,761.76	2,259.00	1,986.92	35.17	17.60	-42.97	1,040.01	-5,328.47	7,256.47	7,215.94	40.53	179.034		
7,150.00	6,798.55	2,281.94	2,003.68	35.51	17.90	-41.63	1,032.61	-5,342.27	7,268.55	7,227.67	40.88	177.810		
7,200.00	6,832.61	2,300.08	2,016.92	35.86	18.14	-40.61	1,026.77	-5,353.22	7,277.61	7,236.42	41.19	176.671		
7,250.00	6,863.74	2,317.47	2,029.60	36.22	18.36	-39.88	1,021.20	-5,363.74	7,283.62	7,242.11	41.51	175.459		
7,300.00	6,891.74	2,334.00	2,041.63	36.59	18.58	-39.40	1,015.91	-5,373.77	7,286.56	7,244.73	41.83	174.182		
7,350.00	6,916.44	6,990.00	6,107.28	36.98	73.87	-68.76	481.06	-7,138.90	7,268.97	7,174.33	94.64	76.808		
7,400.00	6,937.69	6,990.00	6,107.28	37.37	73.87	-70.23	481.06	-7,138.90	7,248.75	7,153.79	94.95	76.341		
7,450.00	6,955.36	6,990.00	6,107.28	37.78	73.87	-71.93	481.06	-7,138.90	7,227.16	7,131.90	95.27	75.860		
7,500.00	6,969.34	6,990.00	6,107.28	38.19	73.87	-73.87	481.06	-7,138.90	7,204.35	7,108.76	95.59	75.369		
7,550.00	6,979.53	6,990.00	6,107.28	38.62	73.87	-76.02	481.06	-7,138.90	7,180.42	7,084.51	95.91	74.868		
7,600.00	6,985.89	6,990.00	6,107.28	39.05	73.87	-78.38	481.06	-7,138.90	7,155.53	7,059.30	96.23	74.359		
7,650.00	6,988.37	6,990.00	6,107.28	39.48	73.87	-80.92	481.06	-7,138.90	7,129.81	7,033.26	96.55	73.847		
7,657.25	6,988.40	6,990.00	6,107.28	39.54	73.87	-81.31	481.06	-7,138.90	7,126.02	7,029.42	96.60	73.772		
7,700.00	6,988.37	6,990.00	6,107.28	39.92	73.87	-81.31	481.06	-7,138.90	7,103.73	7,006.86	96.87	73.333		
7,800.00	6,988.30	6,990.00	6,107.28	40.82	73.87	-81.31	481.06	-7,138.90	7,052.33	6,954.79	97.53	72.307		
7,900.00	6,988.23	6,990.00	6,107.28	41.77	73.87	-81.31	481.06	-7,138.90	7,001.98	6,903.75	98.23	71.284		
8,000.00	6,988.16	6,990.00	6,107.28	42.75	73.87	-81.31	481.06	-7,138.90	6,952.70	6,853.75	98.95	70.266		
8,100.00	6,988.09	6,990.00	6,107.28	43.76	73.87	-81.31	481.06	-7,138.90	6,904.52	6,804.82	99.70	69.254		
8,152.35	6,988.06	6,990.00	6,107.28	44.30	73.87	-81.31	481.06	-7,138.90	6,879.74	6,779.64	100.10	68.728		
8,200.00	6,988.02	6,990.00	6,107.28	44.79	73.87	-81.15	481.06	-7,138.90	6,856.77	6,756.30	100.47	68.246		
8,300.00	6,987.95	6,990.00	6,107.28	45.83	73.87	-80.77	481.06	-7,138.90	6,804.96	6,703.71	101.25	67.210		
8,400.00	6,987.88	6,990.00	6,107.28	46.85	73.87	-80.33	481.06	-7,138.90	6,748.40	6,646.38	102.02	66.148		
8,500.00	6,987.80	6,990.00	6,107.28	47.85	73.87	-79.79	481.06	-7,138.90	6,687.25	6,584.47	102.78	65.064		
8,600.00	6,987.73	6,990.00	6,107.28	48.83	73.87	-79.16	481.06	-7,138.90	6,621.67	6,518.15	103.52	63.964		
8,700.00	6,987.65	6,990.00	6,107.28	49.79	73.87	-78.41	481.06	-7,138.90	6,551.88	6,447.64	104.24	62.854		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171C - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		288-MWD OWSG Rev5					Rule Assigned:				Offset Well Error:	0.00 usft		
Reference	Offset	Semi Maior Axis		Offset Wellbore Centre		Distance				Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
8,800.00	6,987.57	6,990.00	6,107.28	50.72	73.87	-77.50	481.06	-7,138.90	6,478.06	6,373.13	104.93	61.737		
8,900.00	6,987.50	6,990.00	6,107.28	51.62	73.87	-76.39	481.06	-7,138.90	6,400.46	6,294.87	105.59	60.619		
9,000.00	6,987.42	6,990.00	6,107.28	52.48	73.87	-75.02	481.06	-7,138.90	6,319.31	6,213.11	106.20	59.504		
9,100.00	6,987.34	6,990.00	6,107.28	53.30	73.87	-73.30	481.06	-7,138.90	6,234.88	6,128.11	106.77	58.396		
9,200.00	6,987.27	6,990.00	6,107.28	54.08	73.87	-71.10	481.06	-7,138.90	6,147.45	6,040.17	107.29	57.300		
9,215.33	6,987.26	6,990.00	6,107.28	54.20	73.87	-70.71	481.06	-7,138.90	6,133.81	6,026.44	107.36	57.133		
9,300.00	6,987.20	6,990.00	6,107.28	54.85	73.87	-70.71	481.06	-7,138.90	6,058.38	5,950.60	107.77	56.215		
9,400.00	6,987.12	6,990.00	6,107.28	55.65	73.87	-70.71	481.06	-7,138.90	5,969.61	5,861.33	108.27	55.135		
9,500.00	6,987.05	6,990.00	6,107.28	56.48	73.87	-70.71	481.06	-7,138.90	5,881.20	5,772.41	108.79	54.060		
9,600.00	6,986.98	6,990.00	6,107.28	57.35	73.87	-70.71	481.06	-7,138.90	5,793.17	5,683.84	109.33	52.988		
9,700.00	6,986.90	6,990.00	6,107.28	58.24	73.87	-70.71	481.06	-7,138.90	5,705.53	5,595.64	109.89	51.922		
9,800.00	6,986.83	6,990.00	6,107.28	59.17	73.87	-70.71	481.06	-7,138.90	5,618.31	5,507.84	110.47	50.860		
9,900.00	6,986.75	6,990.00	6,107.28	60.12	73.87	-70.71	481.06	-7,138.90	5,531.52	5,420.45	111.07	49.804		
10,000.00	6,986.68	6,990.00	6,107.28	61.10	73.87	-70.71	481.06	-7,138.90	5,445.18	5,333.49	111.69	48.754		
10,100.00	6,986.61	6,990.00	6,107.28	62.11	73.87	-70.71	481.06	-7,138.90	5,359.32	5,246.98	112.33	47.709		
10,200.00	6,986.53	6,990.00	6,107.28	63.14	73.87	-70.71	481.06	-7,138.90	5,273.95	5,160.95	113.00	46.671		
10,300.00	6,986.46	6,990.00	6,107.28	64.20	73.87	-70.71	481.06	-7,138.90	5,189.11	5,075.41	113.70	45.640		
10,400.00	6,986.39	6,990.00	6,107.28	65.28	73.87	-70.71	481.06	-7,138.90	5,104.82	4,990.40	114.42	44.617		
10,500.00	6,986.31	6,990.00	6,107.28	66.38	73.87	-70.71	481.06	-7,138.90	5,021.10	4,905.94	115.16	43.600		
10,600.00	6,986.24	6,990.00	6,107.28	67.50	73.87	-70.71	481.06	-7,138.90	4,937.99	4,822.05	115.94	42.592		
10,700.00	6,986.17	6,990.00	6,107.28	68.64	73.87	-70.71	481.06	-7,138.90	4,855.52	4,738.78	116.74	41.592		
10,800.00	6,986.09	6,990.00	6,107.28	69.80	73.87	-70.71	481.06	-7,138.90	4,773.71	4,656.14	117.57	40.602		
10,900.00	6,986.02	6,990.00	6,107.28	70.98	73.87	-70.71	481.06	-7,138.90	4,692.61	4,574.17	118.44	39.621		
11,000.00	6,985.95	6,990.00	6,107.28	72.17	73.87	-70.71	481.06	-7,138.90	4,612.26	4,492.92	119.34	38.649		
11,100.00	6,985.87	6,990.00	6,107.28	73.38	73.87	-70.71	481.06	-7,138.90	4,532.68	4,412.42	120.27	37.689		
11,200.00	6,985.80	6,990.00	6,107.28	74.61	73.87	-70.71	481.06	-7,138.90	4,453.93	4,332.70	121.23	36.739		
11,300.00	6,985.72	6,990.00	6,107.28	75.85	73.87	-70.71	481.06	-7,138.90	4,376.05	4,253.82	122.23	35.801		
11,400.00	6,985.65	6,990.00	6,107.28	77.10	73.87	-70.71	481.06	-7,138.90	4,299.08	4,175.81	123.27	34.876		
11,500.00	6,985.58	6,990.00	6,107.28	78.37	73.87	-70.71	481.06	-7,138.90	4,223.08	4,098.73	124.34	33.963		
11,600.00	6,985.50	6,990.00	6,107.28	79.65	73.87	-70.71	481.06	-7,138.90	4,148.09	4,022.64	125.46	33.064		
11,700.00	6,985.43	6,990.00	6,107.28	80.94	73.87	-70.71	481.06	-7,138.90	4,074.18	3,947.57	126.61	32.179		
11,800.00	6,985.36	6,990.00	6,107.28	82.24	73.87	-70.71	481.06	-7,138.90	4,001.41	3,873.60	127.81	31.308		
11,900.00	6,985.28	6,990.00	6,107.28	83.56	73.87	-70.71	481.06	-7,138.90	3,929.83	3,800.79	129.04	30.454		
12,000.00	6,985.21	6,990.00	6,107.28	84.88	73.87	-70.71	481.06	-7,138.90	3,859.51	3,729.19	130.32	29.616		
12,100.00	6,985.14	6,990.00	6,107.28	86.21	73.87	-70.71	481.06	-7,138.90	3,790.53	3,658.89	131.64	28.795		
12,200.00	6,985.06	6,990.00	6,107.28	87.56	73.87	-70.71	481.06	-7,138.90	3,722.96	3,589.96	133.00	27.992		
12,300.00	6,984.99	6,990.00	6,107.28	88.91	73.87	-70.71	481.06	-7,138.90	3,656.88	3,522.47	134.41	27.207		
12,400.00	6,984.92	6,990.00	6,107.28	90.27	73.87	-70.71	481.06	-7,138.90	3,592.36	3,456.50	135.86	26.442		
12,500.00	6,984.84	6,990.00	6,107.28	91.64	73.87	-70.71	481.06	-7,138.90	3,529.49	3,392.15	137.35	25.698		
12,600.00	6,984.77	6,990.00	6,107.28	93.01	73.87	-70.71	481.06	-7,138.90	3,468.37	3,329.50	138.87	24.975		
12,700.00	6,984.69	6,990.00	6,107.28	94.40	73.87	-70.71	481.06	-7,138.90	3,409.09	3,268.65	140.44	24.274		
12,800.00	6,984.62	6,990.00	6,107.28	95.79	73.87	-70.71	481.06	-7,138.90	3,351.75	3,209.70	142.05	23.596		
12,900.00	6,984.55	6,990.00	6,107.28	97.18	73.87	-70.71	481.06	-7,138.90	3,296.44	3,152.75	143.68	22.942		
13,000.00	6,984.47	6,990.00	6,107.28	98.59	73.87	-70.71	481.06	-7,138.90	3,243.27	3,097.92	145.35	22.313		
13,100.00	6,984.40	6,990.00	6,107.28	100.00	73.87	-70.71	481.06	-7,138.90	3,192.35	3,045.31	147.04	21.710		
13,200.00	6,984.33	6,990.00	6,107.28	101.41	73.87	-70.71	481.06	-7,138.90	3,143.79	2,995.03	148.75	21.134		
13,300.00	6,984.25	6,990.00	6,107.28	102.83	73.87	-70.71	481.06	-7,138.90	3,097.69	2,947.21	150.48	20.585		
13,400.00	6,984.18	6,990.00	6,107.28	104.26	73.87	-70.71	481.06	-7,138.90	3,054.17	2,901.96	152.21	20.065		
13,500.00	6,984.11	6,990.00	6,107.28	105.69	73.87	-70.71	481.06	-7,138.90	3,013.35	2,859.40	153.94	19.574		
13,600.00	6,984.03	6,990.00	6,107.28	107.13	73.87	-70.71	481.06	-7,138.90	2,975.33	2,819.66	155.66	19.114		
13,700.00	6,983.96	6,990.00	6,107.28	108.57	73.87	-70.71	481.06	-7,138.90	2,940.21	2,782.85	157.36	18.684		
13,800.00	6,983.88	6,990.00	6,107.28	110.02	73.87	-70.71	481.06	-7,138.90	2,908.12	2,749.08	159.03	18.286		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171C - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		288-MWD OWSG Rev5					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	
13,900.00	6,983.81	6,990.00	6,107.28	111.47	73.87	-70.71	481.06	-7,138.90	2,879.14	2,718.48	160.66	17.920		
14,000.00	6,983.74	6,990.00	6,107.28	112.92	73.87	-70.71	481.06	-7,138.90	2,853.37	2,691.14	162.24	17.588		
14,100.00	6,983.66	6,990.00	6,107.28	114.38	73.87	-70.71	481.06	-7,138.90	2,830.91	2,667.16	163.75	17.288		
14,200.00	6,983.59	6,990.00	6,107.28	115.85	73.87	-70.71	481.06	-7,138.90	2,811.82	2,646.64	165.18	17.023		
14,300.00	6,983.52	6,990.00	6,107.28	117.31	73.87	-70.71	481.06	-7,138.90	2,796.18	2,629.66	166.52	16.792		
14,400.00	6,983.44	6,990.00	6,107.28	118.78	73.87	-70.71	481.06	-7,138.90	2,784.05	2,616.28	167.76	16.595		
14,500.00	6,983.37	6,990.00	6,107.28	120.26	73.87	-70.71	481.06	-7,138.90	2,775.47	2,606.57	168.90	16.433		
14,600.00	6,983.30	6,990.00	6,107.28	121.74	73.87	-70.71	481.06	-7,138.90	2,770.47	2,600.56	169.91	16.306		
14,688.53	6,983.23	6,990.00	6,107.28	123.05	73.87	-70.71	481.06	-7,138.90	2,769.06	2,598.35	170.70	16.222	CC	
14,700.00	6,983.22	6,990.00	6,107.28	123.22	73.87	-70.71	481.06	-7,138.90	2,769.08	2,598.28	170.80	16.213	ES	
14,800.00	6,983.15	6,990.00	6,107.28	124.70	73.87	-70.71	481.06	-7,138.90	2,771.30	2,599.75	171.55	16.155		
14,900.00	6,983.08	6,990.00	6,107.28	126.19	73.87	-70.71	481.06	-7,138.90	2,777.12	2,604.95	172.16	16.131	SF	
15,000.00	6,983.00	6,990.00	6,107.28	127.68	73.87	-70.71	481.06	-7,138.90	2,786.52	2,613.88	172.64	16.141		
15,100.00	6,982.93	6,990.00	6,107.28	129.17	73.87	-70.71	481.06	-7,138.90	2,799.46	2,626.49	172.97	16.184		
15,200.00	6,982.85	6,990.00	6,107.28	130.67	73.87	-70.71	481.06	-7,138.90	2,815.90	2,642.73	173.17	16.261		
15,300.00	6,982.78	6,990.00	6,107.28	132.16	73.87	-70.71	481.06	-7,138.90	2,835.77	2,662.54	173.22	16.371		
15,400.00	6,982.71	6,990.00	6,107.28	133.66	73.87	-70.71	481.06	-7,138.90	2,859.00	2,685.85	173.15	16.512		
15,500.00	6,982.63	6,990.00	6,107.28	135.17	73.87	-70.71	481.06	-7,138.90	2,885.51	2,712.57	172.94	16.685		
15,600.00	6,982.56	6,990.00	6,107.28	136.67	73.87	-70.71	481.06	-7,138.90	2,915.21	2,742.59	172.62	16.888		
15,700.00	6,982.49	6,990.00	6,107.28	138.18	73.87	-70.71	481.06	-7,138.90	2,948.01	2,775.83	172.18	17.122		
15,800.00	6,982.41	6,990.00	6,107.28	139.69	73.87	-70.71	481.06	-7,138.90	2,983.80	2,812.16	171.64	17.384		
15,900.00	6,982.34	6,990.00	6,107.28	141.20	73.87	-70.71	481.06	-7,138.90	3,022.47	2,851.47	171.00	17.675		
16,000.00	6,982.27	6,990.00	6,107.28	142.71	73.87	-70.71	481.06	-7,138.90	3,063.92	2,893.65	170.28	17.994		
16,100.00	6,982.19	6,990.00	6,107.28	144.23	73.87	-70.71	481.06	-7,138.90	3,108.04	2,938.56	169.48	18.339		
16,200.00	6,982.12	6,990.00	6,107.28	145.75	73.87	-70.71	481.06	-7,138.90	3,154.71	2,986.10	168.61	18.710		
16,300.00	6,982.05	6,990.00	6,107.28	147.27	73.87	-70.71	481.06	-7,138.90	3,203.83	3,036.14	167.68	19.106		
16,400.00	6,981.97	6,990.00	6,107.28	148.79	73.87	-70.71	481.06	-7,138.90	3,255.27	3,088.56	166.71	19.527		
16,500.00	6,981.90	6,990.00	6,107.28	150.31	73.87	-70.71	481.06	-7,138.90	3,308.94	3,143.25	165.69	19.970		
16,600.00	6,981.82	6,990.00	6,107.28	151.84	73.87	-70.71	481.06	-7,138.90	3,364.73	3,200.08	164.64	20.437		
16,700.00	6,981.75	6,990.00	6,107.28	153.36	73.87	-70.71	481.06	-7,138.90	3,422.53	3,258.96	163.57	20.924		
16,800.00	6,981.68	6,990.00	6,107.28	154.89	73.87	-70.71	481.06	-7,138.90	3,482.24	3,319.77	162.47	21.433		
16,900.00	6,981.60	6,990.00	6,107.28	156.42	73.87	-70.71	481.06	-7,138.90	3,543.77	3,382.41	161.36	21.962		
17,000.00	6,981.53	6,990.00	6,107.28	157.95	73.87	-70.71	481.06	-7,138.90	3,607.02	3,446.78	160.24	22.510		
17,100.00	6,981.46	6,990.00	6,107.28	159.49	73.87	-70.71	481.06	-7,138.90	3,671.90	3,512.79	159.11	23.077		
17,200.00	6,981.38	6,990.00	6,107.28	161.02	73.87	-70.71	481.06	-7,138.90	3,738.34	3,580.35	157.99	23.662		
17,300.00	6,981.31	6,990.00	6,107.28	162.56	73.87	-70.71	481.06	-7,138.90	3,806.24	3,649.37	156.87	24.264		
17,400.00	6,981.24	6,990.00	6,107.28	164.09	73.87	-70.71	481.06	-7,138.90	3,875.53	3,719.77	155.76	24.882		
17,500.00	6,981.16	6,990.00	6,107.28	165.63	73.87	-70.71	481.06	-7,138.90	3,946.14	3,791.48	154.66	25.515		
17,600.00	6,981.09	6,990.00	6,107.28	167.17	73.87	-70.71	481.06	-7,138.90	4,018.00	3,864.43	153.57	26.164		
17,700.00	6,981.01	6,990.00	6,107.28	168.71	73.87	-70.71	481.06	-7,138.90	4,091.04	3,938.55	152.50	26.827		
17,800.00	6,980.94	6,990.00	6,107.28	170.25	73.87	-70.71	481.06	-7,138.90	4,165.20	4,013.76	151.44	27.504		
17,900.00	6,980.87	6,990.00	6,107.28	171.80	73.87	-70.71	481.06	-7,138.90	4,240.43	4,090.02	150.40	28.194		
18,000.00	6,980.79	6,990.00	6,107.28	173.34	73.87	-70.71	481.06	-7,138.90	4,316.65	4,167.27	149.38	28.896		
18,100.00	6,980.72	6,990.00	6,107.28	174.89	73.87	-70.71	481.06	-7,138.90	4,393.84	4,245.45	148.39	29.611		
18,200.00	6,980.65	6,990.00	6,107.28	176.43	73.87	-70.71	481.06	-7,138.90	4,471.92	4,324.51	147.41	30.337		
18,300.00	6,980.57	6,990.00	6,107.28	177.98	73.87	-70.71	481.06	-7,138.90	4,550.87	4,404.41	146.46	31.073		
18,400.00	6,980.50	6,990.00	6,107.28	179.53	73.87	-70.71	481.06	-7,138.90	4,630.62	4,485.10	145.52	31.821		
18,500.00	6,980.43	6,990.00	6,107.28	181.08	73.87	-70.71	481.06	-7,138.90	4,711.15	4,566.54	144.61	32.578		
18,600.00	6,980.35	6,990.00	6,107.28	182.63	73.87	-70.71	481.06	-7,138.90	4,792.42	4,648.69	143.73	33.344		
18,700.00	6,980.28	6,990.00	6,107.28	184.18	73.87	-70.71	481.06	-7,138.90	4,874.38	4,731.52	142.86	34.120		
18,800.00	6,980.21	6,990.00	6,107.28	185.73	73.87	-70.71	481.06	-7,138.90	4,957.00	4,814.98	142.02	34.904		
18,900.00	6,980.13	6,990.00	6,107.28	187.28	73.87	-70.71	481.06	-7,138.90	5,040.25	4,899.05	141.20	35.696		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171C - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program:		288-MWD OWSG Rev5						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)
19,000.00	6,980.06	6,990.00	6,107.28	188.84	73.87	-70.71	481.06	-7,138.90	5,124.10	4,983.70	140.40	36.496	
19,100.00	6,979.98	6,990.00	6,107.28	190.39	73.87	-70.71	481.06	-7,138.90	5,208.53	5,068.90	139.63	37.303	
19,200.00	6,979.91	6,990.00	6,107.28	191.95	73.87	-70.71	481.06	-7,138.90	5,293.49	5,154.61	138.88	38.117	
19,300.00	6,979.84	6,990.00	6,107.28	193.51	73.87	-70.71	481.06	-7,138.90	5,378.97	5,240.83	138.14	38.937	
19,400.00	6,979.76	6,990.00	6,107.28	195.06	73.87	-70.71	481.06	-7,138.90	5,464.95	5,327.51	137.43	39.764	
19,500.00	6,979.69	6,990.00	6,107.28	196.62	73.87	-70.71	481.06	-7,138.90	5,551.39	5,414.65	136.74	40.597	
19,600.00	6,979.62	6,990.00	6,107.28	198.18	73.87	-70.71	481.06	-7,138.90	5,638.28	5,502.21	136.07	41.435	
19,700.00	6,979.54	6,990.00	6,107.28	199.74	73.87	-70.71	481.06	-7,138.90	5,725.60	5,590.18	135.42	42.279	
19,800.00	6,979.47	6,990.00	6,107.28	201.30	73.87	-70.71	481.06	-7,138.90	5,813.33	5,678.54	134.79	43.128	
19,900.00	6,979.40	6,990.00	6,107.28	202.86	73.87	-70.71	481.06	-7,138.90	5,901.45	5,767.27	134.18	43.981	
20,000.00	6,979.32	6,990.00	6,107.28	204.42	73.87	-70.71	481.06	-7,138.90	5,989.94	5,856.35	133.59	44.839	
20,100.00	6,979.25	6,990.00	6,107.28	205.98	73.87	-70.71	481.06	-7,138.90	6,078.79	5,945.78	133.01	45.700	
20,200.00	6,979.18	6,990.00	6,107.28	207.55	73.87	-70.71	481.06	-7,138.90	6,167.98	6,035.52	132.46	46.566	
20,300.00	6,979.10	6,990.00	6,107.28	209.11	73.87	-70.71	481.06	-7,138.90	6,257.50	6,125.58	131.92	47.436	
20,400.00	6,979.03	6,990.00	6,107.28	210.68	73.87	-70.71	481.06	-7,138.90	6,347.33	6,215.94	131.39	48.308	
20,500.00	6,978.95	6,990.00	6,107.28	212.24	73.87	-70.71	481.06	-7,138.90	6,437.46	6,306.57	130.88	49.184	
20,600.00	6,978.88	6,990.00	6,107.28	213.81	73.87	-70.71	481.06	-7,138.90	6,527.88	6,397.48	130.39	50.063	
20,700.00	6,978.81	6,990.00	6,107.28	215.37	73.87	-70.71	481.06	-7,138.90	6,618.57	6,488.65	129.92	50.945	
20,800.00	6,978.73	6,990.00	6,107.28	216.94	73.87	-70.71	481.06	-7,138.90	6,709.53	6,580.07	129.45	51.830	
20,900.00	6,978.66	6,990.00	6,107.28	218.51	73.87	-70.71	481.06	-7,138.90	6,800.74	6,671.73	129.01	52.717	
21,000.00	6,978.59	6,990.00	6,107.28	220.07	73.87	-70.71	481.06	-7,138.90	6,892.19	6,763.62	128.57	53.606	
21,100.00	6,978.51	6,990.00	6,107.28	221.64	73.87	-70.71	481.06	-7,138.90	6,983.88	6,855.73	128.15	54.497	
21,200.00	6,978.44	6,990.00	6,107.28	223.21	73.87	-70.71	481.06	-7,138.90	7,075.80	6,948.05	127.75	55.390	
21,300.00	6,978.37	6,990.00	6,107.28	224.78	73.87	-70.71	481.06	-7,138.90	7,167.93	7,040.58	127.35	56.284	
21,400.00	6,978.29	6,990.00	6,107.28	226.35	73.87	-70.71	481.06	-7,138.90	7,260.27	7,133.30	126.97	57.180	
21,500.00	6,978.22	6,990.00	6,107.28	227.92	73.87	-70.71	481.06	-7,138.90	7,352.81	7,226.21	126.60	58.078	
21,600.00	6,978.14	6,990.00	6,107.28	229.49	73.87	-70.71	481.06	-7,138.90	7,445.54	7,319.30	126.25	58.977	
21,700.00	6,978.07	6,990.00	6,107.28	231.06	73.87	-70.71	481.06	-7,138.90	7,538.46	7,412.56	125.90	59.877	
21,800.00	6,978.00	6,990.00	6,107.28	232.63	73.87	-70.71	481.06	-7,138.90	7,631.56	7,505.99	125.56	60.778	
21,900.00	6,977.92	6,990.00	6,107.28	234.21	73.87	-70.71	481.06	-7,138.90	7,724.83	7,599.59	125.24	61.680	
22,000.00	6,977.85	6,990.00	6,107.28	235.78	73.87	-70.71	481.06	-7,138.90	7,818.27	7,693.34	124.93	62.582	
22,100.00	6,977.78	6,990.00	6,107.28	237.35	73.87	-70.71	481.06	-7,138.90	7,911.86	7,787.24	124.62	63.486	
22,200.00	6,977.70	6,990.00	6,107.28	238.92	73.87	-70.71	481.06	-7,138.90	8,005.61	7,881.28	124.33	64.389	
22,300.00	6,977.63	6,990.00	6,107.28	240.50	73.87	-70.71	481.06	-7,138.90	8,099.52	7,975.47	124.05	65.294	
22,400.00	6,977.56	6,990.00	6,107.28	242.07	73.87	-70.71	481.06	-7,138.90	8,193.56	8,069.79	123.77	66.198	
22,500.00	6,977.48	6,990.00	6,107.28	243.65	73.87	-70.71	481.06	-7,138.90	8,287.75	8,164.24	123.51	67.103	
22,600.00	6,977.41	6,990.00	6,107.28	245.22	73.87	-70.71	481.06	-7,138.90	8,382.07	8,258.82	123.25	68.008	
22,700.00	6,977.34	6,990.00	6,107.28	246.80	73.87	-70.71	481.06	-7,138.90	8,476.52	8,353.51	123.00	68.913	
22,800.00	6,977.26	6,990.00	6,107.28	248.37	73.87	-70.71	481.06	-7,138.90	8,571.09	8,448.33	122.76	69.818	
22,900.00	6,977.19	6,990.00	6,107.28	249.95	73.87	-70.71	481.06	-7,138.90	8,665.79	8,543.26	122.53	70.722	
23,000.00	6,977.11	6,990.00	6,107.28	251.53	73.87	-70.71	481.06	-7,138.90	8,760.61	8,638.30	122.31	71.627	
23,100.00	6,977.04	6,990.00	6,107.28	253.10	73.87	-70.71	481.06	-7,138.90	8,855.54	8,733.44	122.09	72.531	
23,155.65	6,977.00	6,990.00	6,107.28	253.98	73.87	-70.71	481.06	-7,138.90	8,908.41	8,786.44	121.98	73.034	
23,156.15	6,977.00	6,990.00	6,107.28	254.06	73.87	-70.71	481.06	-7,138.90	8,908.89	8,784.19	124.70	71.444	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #226 - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program: 406-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Rule Assigned:		Warning					
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.00	0.00	0.00	0.00	0.00	0.00	-97.14	-1,106.79	-8,838.56	8,908.49				
100.00	100.00	0.00	0.00	0.25	0.00	-97.14	-1,106.79	-8,838.56	8,907.63	8,907.37	0.25	N/A	
145.66	145.66	18.66	18.66	0.41	0.33	-97.14	-1,106.79	-8,838.56	8,907.59	8,906.84	0.75	N/A	
200.00	200.00	73.00	73.00	0.61	1.29	-97.14	-1,106.79	-8,838.56	8,907.59	8,905.68	1.90	4,681.047	
300.00	300.00	173.00	173.00	0.97	3.07	-97.14	-1,106.79	-8,838.56	8,907.59	8,903.55	4.03	2,208.662	
400.00	400.00	273.00	273.00	1.33	4.84	-97.14	-1,106.79	-8,838.56	8,907.59	8,901.42	6.16	1,445.299	
500.00	500.00	373.00	373.00	1.68	6.61	-97.14	-1,106.79	-8,838.56	8,907.59	8,899.29	8.29	1,074.075	
600.00	599.98	472.98	472.98	2.04	8.40	-107.14	-1,106.79	-8,838.56	8,908.10	8,897.66	10.44	853.068	
700.00	699.84	572.84	572.84	2.41	10.20	-107.14	-1,106.79	-8,838.56	8,909.64	8,897.04	12.60	707.151	
800.00	799.45	672.45	672.45	2.77	11.99	-107.15	-1,106.79	-8,838.56	8,912.22	8,897.47	14.75	604.041	
900.00	898.70	771.03	771.03	3.13	13.77	-107.15	-1,106.50	-8,838.56	8,915.80	8,898.91	16.90	527.687	
1,000.00	997.47	868.93	868.93	3.50	15.53	-107.15	-1,106.59	-8,838.56	8,920.48	8,901.45	19.03	468.659	
1,100.00	1,095.63	966.21	966.20	3.89	17.29	-104.80	-1,106.76	-8,838.56	8,925.80	8,904.63	21.17	421.575	
1,200.00	1,193.09	1,066.11	1,066.09	4.29	19.19	-103.13	-1,106.79	-8,838.56	8,931.31	8,907.83	23.48	380.357	
1,300.00	1,289.73	1,162.74	1,162.73	4.72	21.06	-101.90	-1,106.79	-8,838.56	8,937.04	8,911.28	25.76	346.893	
1,400.00	1,385.42	1,257.75	1,257.73	5.16	22.89	-100.97	-1,106.26	-8,838.56	8,942.96	8,914.92	28.03	318.996	
1,496.97	1,477.20	1,347.48	1,347.46	5.62	24.62	-100.26	-1,106.38	-8,838.56	8,949.04	8,918.83	30.21	296.187	
1,500.00	1,480.05	1,350.27	1,350.25	5.63	24.67	-100.27	-1,106.39	-8,838.56	8,949.24	8,918.95	30.28	295.527	
1,600.00	1,574.15	1,442.16	1,442.14	6.12	26.44	-100.47	-1,106.66	-8,838.56	8,955.74	8,923.20	32.54	275.255	
1,700.00	1,668.25	1,541.31	1,541.25	6.62	28.44	-100.68	-1,106.79	-8,838.56	8,962.35	8,927.31	35.03	255.820	
1,800.00	1,762.35	1,635.41	1,635.35	7.12	30.39	-100.88	-1,106.79	-8,838.56	8,969.06	8,931.58	37.48	239.320	
1,900.00	1,856.45	1,729.51	1,729.45	7.64	32.33	-101.08	-1,106.79	-8,838.56	8,975.89	8,935.96	39.93	224.806	
2,000.00	1,950.55	1,820.52	1,820.44	8.16	34.21	-101.27	-1,105.65	-8,838.56	8,982.66	8,940.34	42.32	212.265	
2,100.00	2,044.65	1,910.40	1,910.32	8.68	36.06	-101.46	-1,105.96	-8,838.56	8,989.79	8,945.10	44.69	201.159	
2,200.00	2,138.75	2,000.10	2,000.02	9.21	37.91	-101.65	-1,106.53	-8,838.56	8,997.09	8,950.03	47.06	191.179	
2,300.00	2,232.85	2,106.00	2,105.85	9.74	40.17	-101.88	-1,106.79	-8,838.56	9,004.44	8,954.60	49.84	180.658	
2,400.00	2,326.95	2,200.10	2,199.95	10.27	42.21	-102.08	-1,106.79	-8,838.56	9,011.89	8,959.48	52.40	171.981	
2,500.00	2,421.05	2,294.13	2,293.98	10.81	44.24	-102.27	-1,105.65	-8,838.56	9,019.24	8,964.28	54.96	164.109	
2,600.00	2,515.15	2,383.34	2,383.18	11.34	46.17	-102.46	-1,105.78	-8,838.56	9,026.95	8,969.53	57.41	157.225	
2,700.00	2,609.25	2,472.36	2,472.20	11.88	48.09	-102.65	-1,106.18	-8,838.56	9,034.83	8,974.96	59.87	150.916	
2,800.00	2,703.35	2,576.60	2,576.35	12.42	50.35	-102.87	-1,106.79	-8,838.56	9,042.86	8,980.20	62.65	144.329	
2,900.00	2,797.45	2,670.70	2,670.45	12.96	52.40	-103.06	-1,106.79	-8,838.56	9,050.90	8,985.66	65.24	138.732	
3,000.00	2,891.55	2,764.80	2,764.55	13.51	54.46	-103.26	-1,106.79	-8,838.56	9,059.06	8,991.24	67.83	133.563	
3,100.00	2,985.65	2,858.90	2,858.65	14.05	56.51	-103.46	-1,106.79	-8,838.56	9,067.34	8,996.93	70.41	128.774	
3,200.00	3,079.75	2,953.00	2,952.75	14.60	58.56	-103.65	-1,106.79	-8,838.56	9,075.74	9,002.74	73.00	124.326	
3,300.00	3,173.85	3,047.10	3,046.85	15.14	60.62	-103.85	-1,106.79	-8,838.56	9,084.26	9,008.68	75.59	120.183	
3,400.00	3,267.95	3,135.00	3,134.64	15.69	62.54	-104.03	-1,106.79	-8,838.56	9,092.90	9,014.86	78.04	116.518	
3,500.00	3,362.05	3,135.00	3,134.64	16.23	62.54	-104.03	-1,106.79	-8,838.56	9,102.21	9,023.65	78.56	115.863	
3,600.00	3,456.15	3,135.00	3,134.64	16.78	62.54	-104.03	-1,106.79	-8,838.56	9,112.60	9,033.53	79.07	115.243	
3,700.00	3,550.25	3,135.00	3,134.64	17.33	62.54	-104.03	-1,106.79	-8,838.56	9,124.08	9,044.50	79.58	114.658	
3,800.00	3,644.35	3,135.00	3,134.64	17.88	62.54	-104.03	-1,106.79	-8,838.56	9,136.63	9,056.56	80.07	114.106	
3,900.00	3,738.45	3,135.00	3,134.64	18.42	62.54	-104.03	-1,106.79	-8,838.56	9,150.27	9,069.71	80.56	113.588	
4,000.00	3,832.55	3,135.00	3,134.64	18.97	62.54	-104.03	-1,106.79	-8,838.56	9,164.97	9,083.94	81.03	113.102	
4,100.00	3,926.65	3,135.00	3,134.64	19.52	62.54	-104.03	-1,106.79	-8,838.56	9,180.74	9,099.24	81.50	112.648	
4,200.00	4,020.75	3,135.00	3,134.64	20.07	62.54	-104.03	-1,106.79	-8,838.56	9,197.57	9,115.62	81.96	112.224	
4,300.00	4,114.85	3,135.00	3,134.64	20.62	62.54	-104.03	-1,106.79	-8,838.56	9,215.46	9,133.05	82.40	111.832	
4,400.00	4,208.95	3,135.00	3,134.64	21.17	62.54	-104.03	-1,106.79	-8,838.56	9,234.39	9,151.55	82.84	111.468	
4,500.00	4,303.05	3,135.00	3,134.64	21.72	62.54	-104.03	-1,106.79	-8,838.56	9,254.37	9,171.09	83.27	111.134	
4,600.00	4,397.15	3,135.00	3,134.64	22.27	62.54	-104.03	-1,106.79	-8,838.56	9,275.38	9,191.68	83.69	110.829	
4,700.00	4,491.25	3,135.00	3,134.64	22.82	62.54	-104.03	-1,106.79	-8,838.56	9,297.41	9,213.31	84.10	110.551	
4,800.00	4,585.35	3,135.00	3,134.64	23.37	62.54	-104.03	-1,106.79	-8,838.56	9,320.47	9,235.97	84.50	110.301	
4,900.00	4,679.45	3,135.00	3,134.64	23.93	62.54	-104.03	-1,106.79	-8,838.56	9,344.55	9,259.65	84.89	110.078	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #226 - OH - OH-INC													Offset Site Error:	0.00 usft	
Survey Program:		406-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		
5,000.00	4,773.55	3,135.00	3,134.64	24.48	62.54	-104.03	-1,106.79	-8,838.56	9,369.62	9,284.35	85.27	109.880			
5,100.00	4,867.65	3,135.00	3,134.64	25.03	62.54	-104.03	-1,106.79	-8,838.56	9,395.70	9,310.06	85.64	109.709			
5,200.00	4,961.75	3,135.00	3,134.64	25.58	62.54	-104.03	-1,106.79	-8,838.56	9,422.76	9,336.76	86.00	109.562			
5,300.00	5,055.85	3,135.00	3,134.64	26.13	62.54	-104.03	-1,106.79	-8,838.56	9,450.81	9,364.45	86.36	109.440			
5,400.00	5,149.95	3,135.00	3,134.64	26.68	62.54	-104.03	-1,106.79	-8,838.56	9,479.83	9,393.13	86.70	109.341			
5,500.00	5,244.05	3,135.00	3,134.64	27.24	62.54	-104.03	-1,106.79	-8,838.56	9,509.81	9,422.77	87.03	109.267			
5,600.00	5,338.15	3,135.00	3,134.64	27.79	62.54	-104.03	-1,106.79	-8,838.56	9,540.74	9,453.38	87.36	109.215			
5,665.73	5,400.00	3,135.00	3,134.64	28.15	62.54	-104.03	-1,106.79	-8,838.56	9,561.59	9,474.02	87.57	109.193			
5,700.00	5,432.28	3,135.00	3,134.64	28.34	62.54	-104.15	-1,106.79	-8,838.56	9,572.59	9,484.92	87.67	109.186			
5,800.00	5,526.87	3,135.00	3,134.64	28.88	62.54	-104.48	-1,106.79	-8,838.56	9,605.07	9,517.10	87.97	109.189			
5,900.00	5,622.01	3,135.00	3,134.64	29.41	62.54	-104.82	-1,106.79	-8,838.56	9,638.06	9,549.82	88.24	109.226			
6,000.00	5,717.67	3,135.00	3,134.64	29.92	62.54	-105.16	-1,106.79	-8,838.56	9,671.55	9,583.06	88.49	109.297			
6,100.00	5,813.83	3,135.00	3,134.64	30.41	62.54	-105.51	-1,106.79	-8,838.56	9,705.53	9,616.82	88.72	109.400			
6,200.00	5,910.44	3,135.00	3,134.64	30.89	62.54	-105.86	-1,106.79	-8,838.56	9,739.98	9,651.06	88.92	109.535			
6,300.00	6,007.50	3,135.00	3,134.64	31.36	62.54	-106.22	-1,106.79	-8,838.56	9,774.89	9,685.79	89.10	109.702			
6,400.00	6,104.96	3,135.00	3,134.64	31.80	62.54	-106.58	-1,106.79	-8,838.56	9,810.24	9,720.97	89.27	109.900			
6,500.00	6,202.80	3,135.00	3,134.64	32.24	62.54	-106.95	-1,106.79	-8,838.56	9,846.01	9,756.61	89.40	110.128			
6,600.00	6,300.98	3,135.00	3,134.64	32.66	62.54	-107.32	-1,106.79	-8,838.56	9,882.19	9,792.67	89.52	110.387			
6,700.00	6,399.48	3,135.00	3,134.64	33.06	62.54	-107.69	-1,106.79	-8,838.56	9,918.77	9,829.15	89.62	110.676			
6,722.82	6,422.00	3,135.00	3,134.64	33.15	62.54	-107.78	-1,106.79	-8,838.56	9,927.17	9,837.53	89.64	110.746			
6,750.00	6,448.76	3,135.00	3,134.64	33.26	62.54	-97.21	-1,106.79	-8,838.56	9,936.93	9,847.26	89.66	110.824			
6,800.00	6,497.51	3,135.00	3,134.64	33.48	62.54	-84.61	-1,106.79	-8,838.56	9,953.49	9,863.76	89.73	110.930			
6,850.00	6,545.40	3,135.00	3,134.64	33.72	62.54	-76.96	-1,106.79	-8,838.56	9,968.17	9,878.35	89.81	110.987			
6,900.00	6,592.13	3,135.00	3,134.64	33.97	62.54	-71.87	-1,106.79	-8,838.56	9,980.89	9,890.97	89.92	110.995			
6,950.00	6,637.40	3,135.00	3,134.64	34.25	62.54	-68.28	-1,106.79	-8,838.56	9,991.58	9,901.53	90.05	110.955			
7,000.00	6,680.94	3,135.00	3,134.64	34.54	62.54	-65.65	-1,106.79	-8,838.56	10,000.17	9,909.97	90.20	110.865			
7,050.00	6,722.48	3,135.00	3,134.64	34.85	62.54	-63.70	-1,106.79	-8,838.56	10,006.63	9,916.26	90.37	110.727			
7,100.00	6,761.76	3,135.00	3,134.64	35.17	62.54	-62.26	-1,106.79	-8,838.56	10,010.92	9,920.35	90.56	110.542			
7,150.00	6,798.55	3,135.00	3,134.64	35.51	62.54	-61.22	-1,106.79	-8,838.56	10,013.00	9,922.23	90.77	110.309			
7,200.00	6,832.61	3,135.00	3,134.64	35.86	62.54	-60.53	-1,106.79	-8,838.56	10,012.88	9,921.88	91.00	110.029			
7,250.00	6,863.74	3,135.00	3,134.64	36.22	62.54	-60.13	-1,106.79	-8,838.56	10,010.55	9,919.30	91.25	109.703			
7,300.00	6,891.74	3,135.00	3,134.64	36.59	62.54	-60.00	-1,106.79	-8,838.56	10,006.02	9,914.50	91.52	109.333			
7,350.00	6,916.44	3,135.00	3,134.64	36.98	62.54	-60.12	-1,106.79	-8,838.56	9,999.32	9,907.51	91.80	108.919			
7,400.00	6,937.69	3,135.00	3,134.64	37.37	62.54	-60.47	-1,106.79	-8,838.56	9,990.48	9,898.38	92.11	108.464			
7,450.00	6,955.36	3,135.00	3,134.64	37.78	62.54	-61.05	-1,106.79	-8,838.56	9,979.57	9,887.14	92.43	107.968			
7,500.00	6,969.34	3,135.00	3,134.64	38.19	62.54	-61.86	-1,106.79	-8,838.56	9,966.62	9,873.85	92.77	107.436			
7,550.00	6,979.53	3,135.00	3,134.64	38.62	62.54	-62.90	-1,106.79	-8,838.56	9,951.73	9,858.60	93.12	106.868			
7,600.00	6,985.89	3,135.00	3,134.64	39.05	62.54	-64.16	-1,106.79	-8,838.56	9,934.96	9,841.47	93.49	106.269			
7,650.00	6,988.37	3,135.00	3,134.64	39.48	62.54	-65.66	-1,106.79	-8,838.56	9,916.42	9,822.55	93.87	105.642			
7,657.25	6,988.40	3,135.00	3,134.64	39.54	62.54	-65.89	-1,106.79	-8,838.56	9,913.59	9,819.67	93.92	105.548			
7,700.00	6,988.37	3,135.00	3,134.64	39.92	62.54	-65.89	-1,106.79	-8,838.56	9,896.88	9,802.62	94.26	105.000			
7,800.00	6,988.30	3,135.00	3,134.64	40.82	62.54	-65.89	-1,106.79	-8,838.56	9,858.41	9,763.35	95.05	103.714			
7,900.00	6,988.23	3,135.00	3,134.64	41.77	62.54	-65.89	-1,106.79	-8,838.56	9,820.80	9,724.92	95.88	102.429			
8,000.00	6,988.16	3,135.00	3,134.64	42.75	62.54	-65.89	-1,106.79	-8,838.56	9,784.07	9,687.34	96.73	101.148			
8,100.00	6,988.09	3,135.00	3,134.64	43.76	62.54	-65.89	-1,106.79	-8,838.56	9,748.23	9,650.62	97.61	99.873			
8,152.35	6,988.06	3,135.00	3,134.64	44.30	62.54	-65.89	-1,106.79	-8,838.56	9,729.82	9,631.75	98.07	99.209			
8,200.00	6,988.02	3,135.00	3,134.64	44.79	62.54	-65.59	-1,106.79	-8,838.56	9,712.61	9,614.11	98.50	98.604			
8,300.00	6,987.95	3,135.00	3,134.64	45.83	62.54	-64.87	-1,106.79	-8,838.56	9,672.80	9,573.41	99.39	97.324			
8,400.00	6,987.88	3,135.00	3,134.64	46.85	62.54	-64.01	-1,106.79	-8,838.56	9,628.11	9,527.85	100.25	96.036			
8,500.00	6,987.80	3,135.00	3,134.64	47.85	62.54	-62.99	-1,106.79	-8,838.56	9,578.69	9,477.60	101.09	94.749			
8,600.00	6,987.73	3,135.00	3,134.64	48.83	62.54	-61.81	-1,106.79	-8,838.56	9,524.72	9,422.82	101.90	93.469			
8,700.00	6,987.65	3,135.00	3,134.64	49.79	62.54	-60.42	-1,106.79	-8,838.56	9,466.38	9,363.71	102.67	92.200			

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #226 - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		406-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		
8,800.00	6,987.57	3,135.00	3,134.64	50.72	62.54	-58.81	-1,106.79	-8,838.56	9,403.87	9,300.47	103.40	90.950		
8,900.00	6,987.50	3,135.00	3,134.64	51.62	62.54	-56.92	-1,106.79	-8,838.56	9,337.42	9,233.35	104.07	89.722		
9,000.00	6,987.42	3,135.00	3,134.64	52.48	62.54	-54.71	-1,106.79	-8,838.56	9,267.27	9,162.59	104.69	88.522		
9,100.00	6,987.34	3,135.00	3,134.64	53.30	62.54	-52.12	-1,106.79	-8,838.56	9,193.69	9,088.45	105.25	87.355		
9,200.00	6,987.27	3,135.00	3,134.64	54.08	62.54	-49.08	-1,106.79	-8,838.56	9,116.95	9,011.22	105.73	86.225		
9,215.33	6,987.26	3,135.00	3,134.64	54.20	62.54	-48.57	-1,106.79	-8,838.56	9,104.93	8,999.12	105.80	86.054		
9,300.00	6,987.20	3,135.00	3,134.64	54.85	62.54	-48.57	-1,106.79	-8,838.56	9,038.48	8,932.30	106.18	85.123		
9,400.00	6,987.12	3,135.00	3,134.64	55.65	62.54	-48.57	-1,106.79	-8,838.56	8,960.40	8,853.76	106.64	84.026		
9,500.00	6,987.05	3,135.00	3,134.64	56.48	62.54	-48.57	-1,106.79	-8,838.56	8,882.76	8,775.65	107.11	82.934		
9,600.00	6,986.98	3,135.00	3,134.64	57.35	62.54	-48.57	-1,106.79	-8,838.56	8,805.57	8,697.98	107.59	81.846		
9,700.00	6,986.90	3,135.00	3,134.64	58.24	62.54	-48.57	-1,106.79	-8,838.56	8,728.84	8,620.76	108.08	80.763		
9,800.00	6,986.83	3,135.00	3,134.64	59.17	62.54	-48.57	-1,106.79	-8,838.56	8,652.59	8,544.00	108.58	79.686		
9,900.00	6,986.75	3,135.00	3,134.64	60.12	62.54	-48.57	-1,106.79	-8,838.56	8,576.82	8,467.72	109.10	78.614		
10,000.00	6,986.68	3,135.00	3,134.64	61.10	62.54	-48.57	-1,106.79	-8,838.56	8,501.56	8,391.93	109.63	77.547		
10,100.00	6,986.61	3,135.00	3,134.64	62.11	62.54	-48.57	-1,106.79	-8,838.56	8,426.81	8,316.64	110.17	76.488		
10,200.00	6,986.53	3,135.00	3,134.64	63.14	62.54	-48.57	-1,106.79	-8,838.56	8,352.59	8,241.86	110.73	75.434		
10,300.00	6,986.46	3,135.00	3,134.64	64.20	62.54	-48.57	-1,106.79	-8,838.56	8,278.91	8,167.62	111.29	74.388		
10,400.00	6,986.39	3,135.00	3,134.64	65.28	62.54	-48.57	-1,106.79	-8,838.56	8,205.79	8,093.92	111.87	73.349		
10,500.00	6,986.31	3,135.00	3,134.64	66.38	62.54	-48.57	-1,106.79	-8,838.56	8,133.24	8,020.78	112.47	72.317		
10,600.00	6,986.24	3,135.00	3,134.64	67.50	62.54	-48.57	-1,106.79	-8,838.56	8,061.28	7,948.21	113.07	71.294		
10,700.00	6,986.17	3,135.00	3,134.64	68.64	62.54	-48.57	-1,106.79	-8,838.56	7,989.93	7,876.24	113.69	70.279		
10,800.00	6,986.09	3,135.00	3,134.64	69.80	62.54	-48.57	-1,106.79	-8,838.56	7,919.19	7,804.87	114.32	69.272		
10,900.00	6,986.02	3,135.00	3,134.64	70.98	62.54	-48.57	-1,106.79	-8,838.56	7,849.09	7,734.12	114.96	68.275		
11,000.00	6,985.95	3,135.00	3,134.64	72.17	62.54	-48.57	-1,106.79	-8,838.56	7,779.64	7,664.02	115.62	67.287		
11,100.00	6,985.87	3,135.00	3,134.64	73.38	62.54	-48.57	-1,106.79	-8,838.56	7,710.86	7,594.58	116.29	66.308		
11,200.00	6,985.80	3,135.00	3,134.64	74.61	62.54	-48.57	-1,106.79	-8,838.56	7,642.78	7,525.81	116.97	65.340		
11,300.00	6,985.72	3,135.00	3,134.64	75.85	62.54	-48.57	-1,106.79	-8,838.56	7,575.40	7,457.74	117.66	64.382		
11,400.00	6,985.65	3,135.00	3,134.64	77.10	62.54	-48.57	-1,106.79	-8,838.56	7,508.75	7,390.38	118.37	63.434		
11,500.00	6,985.58	3,135.00	3,134.64	78.37	62.54	-48.57	-1,106.79	-8,838.56	7,442.84	7,323.75	119.09	62.498		
11,600.00	6,985.50	3,135.00	3,134.64	79.65	62.54	-48.57	-1,106.79	-8,838.56	7,377.71	7,257.89	119.82	61.573		
11,700.00	6,985.43	3,135.00	3,134.64	80.94	62.54	-48.57	-1,106.79	-8,838.56	7,313.36	7,192.79	120.56	60.659		
11,800.00	6,985.36	3,135.00	3,134.64	82.24	62.54	-48.57	-1,106.79	-8,838.56	7,249.81	7,128.49	121.32	59.758		
11,900.00	6,985.28	3,135.00	3,134.64	83.56	62.54	-48.57	-1,106.79	-8,838.56	7,187.10	7,065.01	122.09	58.868		
12,000.00	6,985.21	3,135.00	3,134.64	84.88	62.54	-48.57	-1,106.79	-8,838.56	7,125.24	7,002.37	122.87	57.991		
12,100.00	6,985.14	3,135.00	3,134.64	86.21	62.54	-48.57	-1,106.79	-8,838.56	7,064.25	6,940.60	123.66	57.127		
12,200.00	6,985.06	3,135.00	3,134.64	87.56	62.54	-48.57	-1,106.79	-8,838.56	7,004.16	6,879.70	124.46	56.276		
12,300.00	6,984.99	3,135.00	3,134.64	88.91	62.54	-48.57	-1,106.79	-8,838.56	6,944.99	6,819.72	125.27	55.439		
12,400.00	6,984.92	3,135.00	3,134.64	90.27	62.54	-48.57	-1,106.79	-8,838.56	6,886.77	6,760.67	126.10	54.615		
12,500.00	6,984.84	3,135.00	3,134.64	91.64	62.54	-48.57	-1,106.79	-8,838.56	6,829.51	6,702.58	126.93	53.805		
12,600.00	6,984.77	3,135.00	3,134.64	93.01	62.54	-48.57	-1,106.79	-8,838.56	6,773.24	6,645.47	127.78	53.009		
12,700.00	6,984.69	3,135.00	3,134.64	94.40	62.54	-48.57	-1,106.79	-8,838.56	6,717.99	6,589.36	128.63	52.227		
12,800.00	6,984.62	3,135.00	3,134.64	95.79	62.54	-48.57	-1,106.79	-8,838.56	6,663.79	6,534.30	129.49	51.461		
12,900.00	6,984.55	3,135.00	3,134.64	97.18	62.54	-48.57	-1,106.79	-8,838.56	6,610.65	6,480.29	130.36	50.709		
13,000.00	6,984.47	3,135.00	3,134.64	98.59	62.54	-48.57	-1,106.79	-8,838.56	6,558.61	6,427.36	131.25	49.972		
13,100.00	6,984.40	3,135.00	3,134.64	100.00	62.54	-48.57	-1,106.79	-8,838.56	6,507.68	6,375.55	132.13	49.251		
13,200.00	6,984.33	3,135.00	3,134.64	101.41	62.54	-48.57	-1,106.79	-8,838.56	6,457.91	6,324.88	133.03	48.545		
13,300.00	6,984.25	3,135.00	3,134.64	102.83	62.54	-48.57	-1,106.79	-8,838.56	6,409.31	6,275.38	133.93	47.855		
13,400.00	6,984.18	3,135.00	3,134.64	104.26	62.54	-48.57	-1,106.79	-8,838.56	6,361.91	6,227.07	134.84	47.181		
13,500.00	6,984.11	3,135.00	3,134.64	105.69	62.54	-48.57	-1,106.79	-8,838.56	6,315.73	6,179.98	135.75	46.524		
13,600.00	6,984.03	3,135.00	3,134.64	107.13	62.54	-48.57	-1,106.79	-8,838.56	6,270.81	6,134.14	136.67	45.882		
13,700.00	6,983.96	3,135.00	3,134.64	108.57	62.54	-48.57	-1,106.79	-8,838.56	6,227.18	6,089.58	137.60	45.257		
13,800.00	6,983.88	3,135.00	3,134.64	110.02	62.54	-48.57	-1,106.79	-8,838.56	6,184.85	6,046.33	138.52	44.649		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #226 - OH - OH-INC											Offset Site Error: 0.00 usft			
Survey Program: Reference		406-A027Ua_INC-ONLY Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Rule Assigned: Distance				Offset Well Error: 0.00 usft	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
13,900.00	6,983.81	3,135.00	3,134.64	111.47	62.54	-48.57	-1,106.79	-8,838.56	6,143.86	6,004.41	139.45	44.057		
14,000.00	6,983.74	3,135.00	3,134.64	112.92	62.54	-48.57	-1,106.79	-8,838.56	6,104.23	5,963.85	140.38	43.483		
14,100.00	6,983.66	3,135.00	3,134.64	114.38	62.54	-48.57	-1,106.79	-8,838.56	6,065.99	5,924.67	141.32	42.925		
14,200.00	6,983.59	3,135.00	3,134.64	115.85	62.54	-48.57	-1,106.79	-8,838.56	6,029.17	5,886.92	142.25	42.385		
14,300.00	6,983.52	3,135.00	3,134.64	117.31	62.54	-48.57	-1,106.79	-8,838.56	5,993.79	5,850.61	143.18	41.862		
14,400.00	6,983.44	3,135.00	3,134.64	118.78	62.54	-48.57	-1,106.79	-8,838.56	5,959.87	5,815.76	144.11	41.356		
14,500.00	6,983.37	3,135.00	3,134.64	120.26	62.54	-48.57	-1,106.79	-8,838.56	5,927.46	5,782.42	145.04	40.868		
14,600.00	6,983.30	3,135.00	3,134.64	121.74	62.54	-48.57	-1,106.79	-8,838.56	5,896.56	5,750.59	145.97	40.397		
14,700.00	6,983.22	3,135.00	3,134.64	123.22	62.54	-48.57	-1,106.79	-8,838.56	5,867.20	5,720.31	146.89	39.944		
14,800.00	6,983.15	3,135.00	3,134.64	124.70	62.54	-48.57	-1,106.79	-8,838.56	5,839.40	5,691.60	147.80	39.508		
14,900.00	6,983.08	3,135.00	3,134.64	126.19	62.54	-48.57	-1,106.79	-8,838.56	5,813.20	5,664.48	148.71	39.090		
15,000.00	6,983.00	3,135.00	3,134.64	127.68	62.54	-48.57	-1,106.79	-8,838.56	5,788.60	5,638.98	149.62	38.690		
15,100.00	6,982.93	3,135.00	3,134.64	129.17	62.54	-48.57	-1,106.79	-8,838.56	5,765.63	5,615.12	150.51	38.307		
15,200.00	6,982.85	3,135.00	3,134.64	130.67	62.54	-48.57	-1,106.79	-8,838.56	5,744.31	5,592.92	151.40	37.942		
15,300.00	6,982.78	3,135.00	3,134.64	132.16	62.54	-48.57	-1,106.79	-8,838.56	5,724.66	5,572.39	152.27	37.595		
15,400.00	6,982.71	3,135.00	3,134.64	133.66	62.54	-48.57	-1,106.79	-8,838.56	5,706.70	5,553.56	153.14	37.266		
15,500.00	6,982.63	3,135.00	3,134.64	135.17	62.54	-48.57	-1,106.79	-8,838.56	5,690.43	5,536.44	153.99	36.954		
15,600.00	6,982.56	3,135.00	3,134.64	136.67	62.54	-48.57	-1,106.79	-8,838.56	5,675.88	5,521.05	154.83	36.659		
15,700.00	6,982.49	3,135.00	3,134.64	138.18	62.54	-48.57	-1,106.79	-8,838.56	5,663.06	5,507.41	155.65	36.382		
15,800.00	6,982.41	3,135.00	3,134.64	139.69	62.54	-48.57	-1,106.79	-8,838.56	5,651.98	5,495.52	156.46	36.123		
15,900.00	6,982.34	3,135.00	3,134.64	141.20	62.54	-48.57	-1,106.79	-8,838.56	5,642.65	5,485.39	157.26	35.881		
16,000.00	6,982.27	3,135.00	3,134.64	142.71	62.54	-48.57	-1,106.79	-8,838.56	5,635.08	5,477.04	158.04	35.657		
16,100.00	6,982.19	3,135.00	3,134.64	144.23	62.54	-48.57	-1,106.79	-8,838.56	5,629.28	5,470.48	158.80	35.449		
16,200.00	6,982.12	3,135.00	3,134.64	145.75	62.54	-48.57	-1,106.79	-8,838.56	5,625.25	5,465.71	159.54	35.259		
16,300.00	6,982.05	3,135.00	3,134.64	147.27	62.54	-48.57	-1,106.79	-8,838.56	5,622.99	5,462.73	160.26	35.086		
16,376.86	6,981.99	3,135.00	3,134.64	148.44	62.54	-48.57	-1,106.79	-8,838.56	5,622.47	5,461.66	160.81	34.964	CC	
16,400.00	6,981.97	3,135.00	3,134.64	148.79	62.54	-48.57	-1,106.79	-8,838.56	5,622.51	5,461.55	160.97	34.930	ES	
16,500.00	6,981.90	3,135.00	3,134.64	150.31	62.54	-48.57	-1,106.79	-8,838.56	5,623.81	5,462.16	161.65	34.790		
16,600.00	6,981.82	3,135.00	3,134.64	151.84	62.54	-48.57	-1,106.79	-8,838.56	5,626.89	5,464.58	162.31	34.667		
16,700.00	6,981.75	3,135.00	3,134.64	153.36	62.54	-48.57	-1,106.79	-8,838.56	5,631.74	5,468.79	162.95	34.561		
16,800.00	6,981.68	3,135.00	3,134.64	154.89	62.54	-48.57	-1,106.79	-8,838.56	5,638.37	5,474.80	163.57	34.471		
16,900.00	6,981.60	3,135.00	3,134.64	156.42	62.54	-48.57	-1,106.79	-8,838.56	5,646.75	5,482.59	164.16	34.398		
17,000.00	6,981.53	3,135.00	3,134.64	157.95	62.54	-48.57	-1,106.79	-8,838.56	5,656.89	5,492.16	164.73	34.340		
17,100.00	6,981.46	3,135.00	3,134.64	159.49	62.54	-48.57	-1,106.79	-8,838.56	5,668.78	5,503.50	165.28	34.299		
17,200.00	6,981.38	3,135.00	3,134.64	161.02	62.54	-48.57	-1,106.79	-8,838.56	5,682.40	5,516.60	165.80	34.273		
17,300.00	6,981.31	3,135.00	3,134.64	162.56	62.54	-48.57	-1,106.79	-8,838.56	5,697.75	5,531.45	166.29	34.263	SF	
17,400.00	6,981.24	3,135.00	3,134.64	164.09	62.54	-48.57	-1,106.79	-8,838.56	5,714.80	5,548.03	166.77	34.268		
17,500.00	6,981.16	3,135.00	3,134.64	165.63	62.54	-48.57	-1,106.79	-8,838.56	5,733.55	5,566.33	167.22	34.288		
17,600.00	6,981.09	3,135.00	3,134.64	167.17	62.54	-48.57	-1,106.79	-8,838.56	5,753.97	5,586.33	167.64	34.324		
17,700.00	6,981.01	3,135.00	3,134.64	168.71	62.54	-48.57	-1,106.79	-8,838.56	5,776.05	5,608.02	168.04	34.374		
17,800.00	6,980.94	3,135.00	3,134.64	170.25	62.54	-48.57	-1,106.79	-8,838.56	5,799.78	5,631.37	168.41	34.439		
17,900.00	6,980.87	3,135.00	3,134.64	171.80	62.54	-48.57	-1,106.79	-8,838.56	5,825.12	5,656.37	168.76	34.518		
18,000.00	6,980.79	3,135.00	3,134.64	173.34	62.54	-48.57	-1,106.79	-8,838.56	5,852.07	5,682.99	169.08	34.611		
18,100.00	6,980.72	3,135.00	3,134.64	174.89	62.54	-48.57	-1,106.79	-8,838.56	5,880.59	5,711.21	169.38	34.719		
18,200.00	6,980.65	3,135.00	3,134.64	176.43	62.54	-48.57	-1,106.79	-8,838.56	5,910.66	5,741.01	169.65	34.840		
18,300.00	6,980.57	3,135.00	3,134.64	177.98	62.54	-48.57	-1,106.79	-8,838.56	5,942.27	5,772.37	169.90	34.975		
18,400.00	6,980.50	3,135.00	3,134.64	179.53	62.54	-48.57	-1,106.79	-8,838.56	5,975.38	5,805.25	170.13	35.122		
18,500.00	6,980.43	3,135.00	3,134.64	181.08	62.54	-48.57	-1,106.79	-8,838.56	6,009.98	5,839.64	170.33	35.284		
18,600.00	6,980.35	3,135.00	3,134.64	182.63	62.54	-48.57	-1,106.79	-8,838.56	6,046.03	5,875.51	170.51	35.458		
18,700.00	6,980.28	3,135.00	3,134.64	184.18	62.54	-48.57	-1,106.79	-8,838.56	6,083.51	5,912.84	170.67	35.644		
18,800.00	6,980.21	3,135.00	3,134.64	185.73	62.54	-48.57	-1,106.79	-8,838.56	6,122.39	5,951.58	170.81	35.843		
18,900.00	6,980.13	3,135.00	3,134.64	187.28	62.54	-48.57	-1,106.79	-8,838.56	6,162.66	5,991.73	170.93	36.054		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #226 - OH - OH-INC													Offset Site Error: 0.00 usft
Survey Program: 406-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)			
19,000.00	6,980.06	3,135.00	3,134.64	188.84	62.54	-48.57	-1,106.79	-8,838.56	6,204.27	6,033.25	171.02	36.277	
19,100.00	6,979.98	3,135.00	3,134.64	190.39	62.54	-48.57	-1,106.79	-8,838.56	6,247.21	6,076.11	171.10	36.512	
19,200.00	6,979.91	3,135.00	3,134.64	191.95	62.54	-48.57	-1,106.79	-8,838.56	6,291.44	6,120.28	171.16	36.759	
19,300.00	6,979.84	3,135.00	3,134.64	193.51	62.54	-48.57	-1,106.79	-8,838.56	6,336.94	6,165.75	171.19	37.016	
19,400.00	6,979.76	3,135.00	3,134.64	195.06	62.54	-48.57	-1,106.79	-8,838.56	6,383.69	6,212.47	171.21	37.285	
19,500.00	6,979.69	3,135.00	3,134.64	196.62	62.54	-48.57	-1,106.79	-8,838.56	6,431.65	6,260.43	171.22	37.564	
19,600.00	6,979.62	3,135.00	3,134.64	198.18	62.54	-48.57	-1,106.79	-8,838.56	6,480.80	6,309.59	171.20	37.855	
19,700.00	6,979.54	3,135.00	3,134.64	199.74	62.54	-48.57	-1,106.79	-8,838.56	6,531.11	6,359.93	171.17	38.155	
19,800.00	6,979.47	3,135.00	3,134.64	201.30	62.54	-48.57	-1,106.79	-8,838.56	6,582.55	6,411.42	171.13	38.466	
19,900.00	6,979.40	3,135.00	3,134.64	202.86	62.54	-48.57	-1,106.79	-8,838.56	6,635.10	6,464.04	171.07	38.786	
20,000.00	6,979.32	3,135.00	3,134.64	204.42	62.54	-48.57	-1,106.79	-8,838.56	6,688.74	6,517.74	171.00	39.116	
20,100.00	6,979.25	3,135.00	3,134.64	205.98	62.54	-48.57	-1,106.79	-8,838.56	6,743.43	6,572.52	170.91	39.456	
20,200.00	6,979.18	3,135.00	3,134.64	207.55	62.54	-48.57	-1,106.79	-8,838.56	6,799.15	6,628.34	170.81	39.805	
20,300.00	6,979.10	3,135.00	3,134.64	209.11	62.54	-48.57	-1,106.79	-8,838.56	6,855.88	6,685.18	170.70	40.163	
20,400.00	6,979.03	3,135.00	3,134.64	210.68	62.54	-48.57	-1,106.79	-8,838.56	6,913.59	6,743.01	170.58	40.531	
20,500.00	6,978.95	3,135.00	3,134.64	212.24	62.54	-48.57	-1,106.79	-8,838.56	6,972.26	6,801.81	170.44	40.906	
20,600.00	6,978.88	3,135.00	3,134.64	213.81	62.54	-48.57	-1,106.79	-8,838.56	7,031.86	6,861.55	170.30	41.290	
20,700.00	6,978.81	3,135.00	3,134.64	215.37	62.54	-48.57	-1,106.79	-8,838.56	7,092.36	6,922.21	170.15	41.683	
20,800.00	6,978.73	3,135.00	3,134.64	216.94	62.54	-48.57	-1,106.79	-8,838.56	7,153.76	6,983.77	169.99	42.083	
20,900.00	6,978.66	3,135.00	3,134.64	218.51	62.54	-48.57	-1,106.79	-8,838.56	7,216.02	7,046.19	169.82	42.492	
21,000.00	6,978.59	3,135.00	3,134.64	220.07	62.54	-48.57	-1,106.79	-8,838.56	7,279.11	7,109.47	169.64	42.908	
21,100.00	6,978.51	3,135.00	3,134.64	221.64	62.54	-48.57	-1,106.79	-8,838.56	7,343.03	7,173.57	169.46	43.332	
21,200.00	6,978.44	3,135.00	3,134.64	223.21	62.54	-48.57	-1,106.79	-8,838.56	7,407.75	7,238.48	169.27	43.763	
21,300.00	6,978.37	3,135.00	3,134.64	224.78	62.54	-48.57	-1,106.79	-8,838.56	7,473.24	7,304.17	169.07	44.201	
21,400.00	6,978.29	3,135.00	3,134.64	226.35	62.54	-48.57	-1,106.79	-8,838.56	7,539.50	7,370.62	168.87	44.646	
21,500.00	6,978.22	3,135.00	3,134.64	227.92	62.54	-48.57	-1,106.79	-8,838.56	7,606.49	7,437.82	168.67	45.098	
21,600.00	6,978.14	3,135.00	3,134.64	229.49	62.54	-48.57	-1,106.79	-8,838.56	7,674.20	7,505.74	168.45	45.557	
21,700.00	6,978.07	3,135.00	3,134.64	231.06	62.54	-48.57	-1,106.79	-8,838.56	7,742.60	7,574.37	168.24	46.022	
21,800.00	6,978.00	3,135.00	3,134.64	232.63	62.54	-48.57	-1,106.79	-8,838.56	7,811.69	7,643.67	168.02	46.493	
21,900.00	6,977.92	3,135.00	3,134.64	234.21	62.54	-48.57	-1,106.79	-8,838.56	7,881.44	7,713.65	167.79	46.971	
22,000.00	6,977.85	3,135.00	3,134.64	235.78	62.54	-48.57	-1,106.79	-8,838.56	7,951.84	7,784.27	167.57	47.455	
22,100.00	6,977.78	3,135.00	3,134.64	237.35	62.54	-48.57	-1,106.79	-8,838.56	8,022.87	7,855.53	167.34	47.944	
22,200.00	6,977.70	3,135.00	3,134.64	238.92	62.54	-48.57	-1,106.79	-8,838.56	8,094.51	7,927.40	167.11	48.440	
22,300.00	6,977.63	3,135.00	3,134.64	240.50	62.54	-48.57	-1,106.79	-8,838.56	8,166.74	7,999.87	166.87	48.940	
22,400.00	6,977.56	3,135.00	3,134.64	242.07	62.54	-48.57	-1,106.79	-8,838.56	8,239.56	8,072.92	166.64	49.447	
22,500.00	6,977.48	3,135.00	3,134.64	243.65	62.54	-48.57	-1,106.79	-8,838.56	8,312.94	8,146.54	166.40	49.958	
22,600.00	6,977.41	3,135.00	3,134.64	245.22	62.54	-48.57	-1,106.79	-8,838.56	8,386.87	8,220.71	166.16	50.475	
22,700.00	6,977.34	3,135.00	3,134.64	246.80	62.54	-48.57	-1,106.79	-8,838.56	8,461.33	8,295.41	165.92	50.997	
22,800.00	6,977.26	3,135.00	3,134.64	248.37	62.54	-48.57	-1,106.79	-8,838.56	8,536.32	8,370.64	165.68	51.523	
22,900.00	6,977.19	3,135.00	3,134.64	249.95	62.54	-48.57	-1,106.79	-8,838.56	8,611.82	8,446.38	165.44	52.055	
23,000.00	6,977.11	3,135.00	3,134.64	251.53	62.54	-48.57	-1,106.79	-8,838.56	8,687.81	8,522.61	165.20	52.591	
23,100.00	6,977.04	3,135.00	3,134.64	253.10	62.54	-48.57	-1,106.79	-8,838.56	8,764.28	8,599.33	164.96	53.131	
23,155.65	6,977.00	3,135.00	3,134.64	253.98	62.54	-48.57	-1,106.79	-8,838.56	8,807.05	8,642.23	164.82	53.434	
23,156.15	6,977.00	3,135.00	3,134.64	254.06	62.54	-48.57	-1,106.79	-8,838.56	8,807.43	8,642.32	165.11	53.343	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #226A - OH - OH-SVY													Offset Site Error: 0.00 usft
Survey Program: 200-MWD OWSG Rev5													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	5,392.00	3,078.35	0.00	62.35	-86.71	481.62	-8,386.62	8,959.51				
100.00	100.00	5,392.00	3,078.35	0.25	62.35	-86.71	481.62	-8,386.62	8,925.23	8,893.96	31.27	285.409	
200.00	200.00	5,392.00	3,078.35	0.61	62.35	-86.71	481.62	-8,386.62	8,891.95	8,860.48	31.46	282.609	
300.00	300.00	5,392.00	3,078.35	0.97	62.35	-86.71	481.62	-8,386.62	8,859.66	8,827.92	31.74	279.109	
400.00	400.00	5,392.00	3,078.35	1.33	62.35	-86.71	481.62	-8,386.62	8,828.39	8,796.33	32.07	275.294	
500.00	500.00	5,392.00	3,078.35	1.68	62.35	-86.71	481.62	-8,386.62	8,798.15	8,765.73	32.42	271.372	
600.00	599.98	5,392.00	3,078.35	2.04	62.35	-97.31	481.62	-8,386.62	8,769.15	8,736.37	32.78	267.541	
700.00	699.84	5,392.00	3,078.35	2.41	62.35	-97.88	481.62	-8,386.62	8,741.62	8,708.50	33.12	263.918	
800.00	799.45	5,392.00	3,078.35	2.77	62.35	-98.42	481.62	-8,386.62	8,715.61	8,682.15	33.46	260.491	
900.00	898.70	5,392.00	3,078.35	3.13	62.35	-98.91	481.62	-8,386.62	8,691.17	8,657.39	33.79	257.247	
1,000.00	997.47	5,392.00	3,078.35	3.50	62.35	-99.38	481.62	-8,386.62	8,668.35	8,634.24	34.11	254.165	
1,100.00	1,095.63	5,392.00	3,078.35	3.89	62.35	-97.45	481.62	-8,386.62	8,646.74	8,612.32	34.42	251.205	
1,200.00	1,193.09	5,392.00	3,078.35	4.29	62.35	-96.18	481.62	-8,386.62	8,625.97	8,591.24	34.73	248.338	
1,300.00	1,289.73	5,392.00	3,078.35	4.72	62.35	-95.32	481.62	-8,386.62	8,606.06	8,571.01	35.05	245.552	
1,400.00	1,385.42	5,392.00	3,078.35	5.16	62.35	-94.72	481.62	-8,386.62	8,587.04	8,551.68	35.36	242.827	
1,496.97	1,477.20	5,392.00	3,078.35	5.62	62.35	-94.31	481.62	-8,386.62	8,569.48	8,533.81	35.67	240.228	
1,500.00	1,480.05	5,392.00	3,078.35	5.63	62.35	-94.31	481.62	-8,386.62	8,568.95	8,533.27	35.68	240.147	
1,600.00	1,574.15	5,392.00	3,078.35	6.12	62.35	-94.31	481.62	-8,386.62	8,551.89	8,515.88	36.01	237.487	
1,700.00	1,668.25	5,392.00	3,078.35	6.62	62.35	-94.31	481.62	-8,386.62	8,535.98	8,499.63	36.35	234.845	
1,800.00	1,762.35	5,392.00	3,078.35	7.12	62.35	-94.31	481.62	-8,386.62	8,521.20	8,484.51	36.69	232.238	
1,900.00	1,856.45	5,392.00	3,078.35	7.64	62.35	-94.31	481.62	-8,386.62	8,507.58	8,470.54	37.04	229.679	
2,000.00	1,950.55	5,392.00	3,078.35	8.16	62.35	-94.31	481.62	-8,386.62	8,495.11	8,457.72	37.39	227.174	
2,100.00	2,044.65	5,392.00	3,078.35	8.68	62.35	-94.31	481.62	-8,386.62	8,483.81	8,446.06	37.75	224.732	
2,200.00	2,138.75	5,392.00	3,078.35	9.21	62.35	-94.31	481.62	-8,386.62	8,473.66	8,435.56	38.11	222.354	
2,300.00	2,232.85	5,392.00	3,078.35	9.74	62.35	-94.31	481.62	-8,386.62	8,464.69	8,426.22	38.47	220.045	
2,400.00	2,326.95	5,392.00	3,078.35	10.27	62.35	-94.31	481.62	-8,386.62	8,456.89	8,418.06	38.83	217.807	
2,500.00	2,421.05	5,392.00	3,078.35	10.81	62.35	-94.31	481.62	-8,386.62	8,450.27	8,411.08	39.19	215.639	
2,600.00	2,515.15	5,392.00	3,078.35	11.34	62.35	-94.31	481.62	-8,386.62	8,444.82	8,405.28	39.55	213.544	
2,700.00	2,609.25	5,392.00	3,078.35	11.88	62.35	-94.31	481.62	-8,386.62	8,440.56	8,400.66	39.90	211.520	
2,800.00	2,703.35	5,392.00	3,078.35	12.42	62.35	-94.31	481.62	-8,386.62	8,437.48	8,397.22	40.26	209.567	
2,900.00	2,797.45	5,392.00	3,078.35	12.96	62.35	-94.31	481.62	-8,386.62	8,435.59	8,394.97	40.62	207.685	
3,000.00	2,891.55	5,392.00	3,078.35	13.51	62.35	-94.31	481.62	-8,386.62	8,434.88	8,393.90	40.97	205.873	
3,009.92	2,900.89	5,392.00	3,078.35	13.56	62.35	-94.31	481.62	-8,386.62	8,434.87	8,393.86	41.01	205.697	
3,100.00	2,985.65	5,392.00	3,078.35	14.05	62.35	-94.31	481.62	-8,386.62	8,435.35	8,394.03	41.32	204.130	
3,200.00	3,079.75	5,392.00	3,078.35	14.60	62.35	-94.31	481.62	-8,386.62	8,437.01	8,395.34	41.67	202.456	
3,300.00	3,173.85	5,392.00	3,078.35	15.14	62.35	-94.31	481.62	-8,386.62	8,439.86	8,397.84	42.02	200.848	
3,400.00	3,267.95	5,392.00	3,078.35	15.69	62.35	-94.31	481.62	-8,386.62	8,443.88	8,401.52	42.37	199.306	
3,500.00	3,362.05	5,392.00	3,078.35	16.23	62.35	-94.31	481.62	-8,386.62	8,449.09	8,406.39	42.71	197.828	
3,600.00	3,456.15	5,392.00	3,078.35	16.78	62.35	-94.31	481.62	-8,386.62	8,455.48	8,412.44	43.05	196.413	
3,700.00	3,550.25	5,392.00	3,078.35	17.33	62.35	-94.31	481.62	-8,386.62	8,463.05	8,419.66	43.39	195.060	
3,800.00	3,644.35	5,392.00	3,078.35	17.88	62.35	-94.31	481.62	-8,386.62	8,471.79	8,428.07	43.72	193.768	
3,900.00	3,738.45	5,392.00	3,078.35	18.42	62.35	-94.31	481.62	-8,386.62	8,481.70	8,437.65	44.05	192.534	
4,000.00	3,832.55	5,392.00	3,078.35	18.97	62.35	-94.31	481.62	-8,386.62	8,492.78	8,448.40	44.38	191.358	
4,100.00	3,926.65	5,392.00	3,078.35	19.52	62.35	-94.31	481.62	-8,386.62	8,505.02	8,460.31	44.71	190.238	
4,200.00	4,020.75	5,392.00	3,078.35	20.07	62.35	-94.31	481.62	-8,386.62	8,518.41	8,473.38	45.03	189.173	
4,300.00	4,114.85	5,392.00	3,078.35	20.62	62.35	-94.31	481.62	-8,386.62	8,532.96	8,487.61	45.35	188.161	
4,400.00	4,208.95	5,392.00	3,078.35	21.17	62.35	-94.31	481.62	-8,386.62	8,548.65	8,502.98	45.67	187.202	
4,500.00	4,303.05	5,392.00	3,078.35	21.72	62.35	-94.31	481.62	-8,386.62	8,565.48	8,519.50	45.98	186.293	
4,600.00	4,397.15	5,392.00	3,078.35	22.27	62.35	-94.31	481.62	-8,386.62	8,583.44	8,537.15	46.29	185.433	
4,700.00	4,491.25	5,392.00	3,078.35	22.82	62.35	-94.31	481.62	-8,386.62	8,602.52	8,555.93	46.60	184.622	
4,800.00	4,585.35	5,392.00	3,078.35	23.37	62.35	-94.31	481.62	-8,386.62	8,622.73	8,575.83	46.90	183.857	
4,900.00	4,679.45	5,392.00	3,078.35	23.93	62.35	-94.31	481.62	-8,386.62	8,644.04	8,596.84	47.20	183.137	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #226A - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program:		200-MWD OWSG Rev5						Rule Assigned:				Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			Minimum Separation (usft)
5,000.00	4,773.55	5,392.00	3,078.35	24.48	62.35	-94.31	481.62	-8,386.62	8,666.46	8,618.96	47.50	182.462	
5,100.00	4,867.65	5,392.00	3,078.35	25.03	62.35	-94.31	481.62	-8,386.62	8,689.96	8,642.17	47.79	181.829	
5,200.00	4,961.75	5,392.00	3,078.35	25.58	62.35	-94.31	481.62	-8,386.62	8,714.56	8,666.47	48.08	181.239	
5,300.00	5,055.85	5,392.00	3,078.35	26.13	62.35	-94.31	481.62	-8,386.62	8,740.22	8,691.85	48.37	180.688	
5,400.00	5,149.95	5,392.00	3,078.35	26.68	62.35	-94.31	481.62	-8,386.62	8,766.96	8,718.30	48.66	180.177	
5,500.00	5,244.05	5,392.00	3,078.35	27.24	62.35	-94.31	481.62	-8,386.62	8,794.74	8,745.80	48.94	179.703	
5,600.00	5,338.15	5,392.00	3,078.35	27.79	62.35	-94.31	481.62	-8,386.62	8,823.58	8,774.36	49.22	179.267	
5,665.73	5,400.00	5,392.00	3,078.35	28.15	62.35	-94.31	481.62	-8,386.62	8,843.10	8,793.69	49.40	179.000	
5,700.00	5,432.28	5,392.00	3,078.35	28.34	62.35	-94.42	481.62	-8,386.62	8,853.44	8,803.95	49.50	178.868	
5,800.00	5,526.87	5,392.00	3,078.35	28.88	62.35	-94.74	481.62	-8,386.62	8,884.23	8,834.46	49.77	178.518	
5,900.00	5,622.01	5,392.00	3,078.35	29.41	62.35	-95.07	481.62	-8,386.62	8,915.89	8,865.87	50.03	178.220	
6,000.00	5,717.67	5,392.00	3,078.35	29.92	62.35	-95.41	481.62	-8,386.62	8,948.42	8,898.14	50.28	177.973	
6,100.00	5,813.83	5,392.00	3,078.35	30.41	62.35	-95.77	481.62	-8,386.62	8,981.79	8,931.26	50.52	177.776	
6,200.00	5,910.44	5,392.00	3,078.35	30.89	62.35	-96.13	481.62	-8,386.62	9,015.97	8,965.22	50.76	177.629	
6,300.00	6,007.50	5,392.00	3,078.35	31.36	62.35	-96.50	481.62	-8,386.62	9,050.96	8,999.98	50.98	177.529	
6,400.00	6,104.96	5,392.00	3,078.35	31.80	62.35	-96.88	481.62	-8,386.62	9,086.73	9,035.53	51.20	177.478	
6,500.00	6,202.80	5,392.00	3,078.35	32.24	62.35	-97.27	481.62	-8,386.62	9,123.27	9,071.86	51.41	177.472	
6,600.00	6,300.98	5,392.00	3,078.35	32.66	62.35	-97.67	481.62	-8,386.62	9,160.54	9,108.93	51.61	177.510	
6,700.00	6,399.48	5,392.00	3,078.35	33.06	62.35	-98.08	481.62	-8,386.62	9,198.54	9,146.74	51.80	177.593	
6,722.82	6,422.00	5,392.00	3,078.35	33.15	62.35	-98.17	481.62	-8,386.62	9,207.31	9,155.47	51.84	177.618	
6,750.00	6,448.76	5,392.00	3,078.35	33.26	62.35	-87.66	481.62	-8,386.62	9,217.45	9,165.56	51.89	177.640	
6,800.00	6,497.51	5,392.00	3,078.35	33.48	62.35	-75.20	481.62	-8,386.62	9,234.36	9,182.37	51.99	177.622	
6,850.00	6,545.40	5,392.00	3,078.35	33.72	62.35	-67.70	481.62	-8,386.62	9,248.93	9,196.83	52.10	177.526	
6,900.00	6,592.13	5,392.00	3,078.35	33.97	62.35	-62.77	481.62	-8,386.62	9,261.10	9,208.88	52.22	177.354	
6,950.00	6,637.40	5,392.00	3,078.35	34.25	62.35	-59.35	481.62	-8,386.62	9,270.78	9,218.44	52.35	177.106	
7,000.00	6,680.94	5,392.00	3,078.35	34.54	62.35	-56.90	481.62	-8,386.62	9,277.94	9,225.46	52.48	176.784	
7,050.00	6,722.48	5,392.00	3,078.35	34.85	62.35	-55.12	481.62	-8,386.62	9,282.52	9,229.90	52.63	176.389	
7,100.00	6,761.76	5,392.00	3,078.35	35.17	62.35	-53.86	481.62	-8,386.62	9,284.52	9,231.74	52.78	175.922	
7,150.00	6,798.55	5,392.00	3,078.35	35.51	62.35	-53.01	481.62	-8,386.62	9,283.91	9,230.97	52.93	175.385	
7,200.00	6,832.61	5,392.00	3,078.35	35.86	62.35	-52.50	481.62	-8,386.62	9,280.70	9,227.60	53.10	174.777	
7,250.00	6,863.74	5,392.00	3,078.35	36.22	62.35	-52.30	481.62	-8,386.62	9,274.90	9,221.63	53.27	174.102	
7,300.00	6,891.74	5,392.00	3,078.35	36.59	62.35	-52.38	481.62	-8,386.62	9,266.55	9,213.10	53.45	173.360	
7,350.00	6,916.44	5,392.00	3,078.35	36.98	62.35	-52.72	481.62	-8,386.62	9,255.70	9,202.06	53.64	172.553	
7,400.00	6,937.69	5,392.00	3,078.35	37.37	62.35	-53.31	481.62	-8,386.62	9,242.39	9,188.56	53.83	171.684	
7,450.00	6,955.36	5,392.00	3,078.35	37.78	62.35	-54.16	481.62	-8,386.62	9,226.71	9,172.68	54.03	170.756	
7,500.00	6,969.34	5,392.00	3,078.35	38.19	62.35	-55.27	481.62	-8,386.62	9,208.74	9,154.49	54.24	169.771	
7,550.00	6,979.53	5,392.00	3,078.35	38.62	62.35	-56.64	481.62	-8,386.62	9,188.57	9,134.11	54.46	168.736	
7,600.00	6,985.89	5,392.00	3,078.35	39.05	62.35	-58.30	481.62	-8,386.62	9,166.31	9,111.64	54.67	167.654	
7,650.00	6,988.37	5,392.00	3,078.35	39.48	62.35	-60.24	481.62	-8,386.62	9,142.09	9,087.19	54.90	166.530	
7,657.25	6,988.40	5,392.00	3,078.35	39.54	62.35	-60.54	481.62	-8,386.62	9,138.42	9,083.49	54.93	166.360	
7,700.00	6,988.37	5,392.00	3,078.35	39.92	62.35	-60.54	481.62	-8,386.62	9,116.76	9,061.64	55.13	165.382	
7,800.00	6,988.30	5,392.00	3,078.35	40.82	62.35	-60.54	481.62	-8,386.62	9,066.68	9,011.08	55.61	163.055	
7,900.00	6,988.23	5,392.00	3,078.35	41.77	62.35	-60.54	481.62	-8,386.62	9,017.43	8,961.31	56.12	160.682	
8,000.00	6,988.16	5,392.00	3,078.35	42.75	62.35	-60.54	481.62	-8,386.62	8,969.03	8,912.36	56.67	158.269	
8,100.00	6,988.09	5,392.00	3,078.35	43.76	62.35	-60.54	481.62	-8,386.62	8,921.48	8,864.22	57.25	155.821	
8,152.35	6,988.06	5,392.00	3,078.35	44.30	62.35	-60.54	481.62	-8,386.62	8,896.93	8,839.36	57.57	154.528	
8,200.00	6,988.02	5,392.00	3,078.35	44.79	62.35	-60.03	481.62	-8,386.62	8,874.20	8,816.32	57.87	153.342	
8,300.00	6,987.95	5,392.00	3,078.35	45.83	62.35	-58.83	481.62	-8,386.62	8,823.23	8,764.73	58.50	150.827	
8,400.00	6,987.88	5,392.00	3,078.35	46.85	62.35	-57.43	481.62	-8,386.62	8,768.02	8,708.90	59.13	148.295	
8,500.00	6,987.80	5,392.00	3,078.35	47.85	62.35	-55.82	481.62	-8,386.62	8,708.76	8,649.01	59.74	145.768	
8,600.00	6,987.73	5,392.00	3,078.35	48.83	62.35	-53.95	481.62	-8,386.62	8,645.64	8,585.29	60.35	143.262	
8,700.00	6,987.65	5,392.00	3,078.35	49.79	62.35	-51.79	481.62	-8,386.62	8,578.91	8,517.98	60.93	140.794	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #226A - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		200-MWD OWSG Rev5					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	
8,800.00	6,987.57	5,392.00	3,078.35	50.72	62.35	-49.29	481.62	-8,386.62	8,508.80	8,447.31	61.49	138.380		
8,900.00	6,987.50	5,392.00	3,078.35	51.62	62.35	-46.41	481.62	-8,386.62	8,435.57	8,373.56	62.01	136.034		
9,000.00	6,987.42	5,392.00	3,078.35	52.48	62.35	-43.08	481.62	-8,386.62	8,359.50	8,297.01	62.49	133.769		
9,100.00	6,987.34	5,392.00	3,078.35	53.30	62.35	-39.26	481.62	-8,386.62	8,280.90	8,217.97	62.93	131.598		
9,200.00	6,987.27	5,392.00	3,078.35	54.08	62.35	-34.88	481.62	-8,386.62	8,200.07	8,136.77	63.31	129.531		
9,215.33	6,987.26	5,392.00	3,078.35	54.20	62.35	-34.15	481.62	-8,386.62	8,187.51	8,124.15	63.36	129.222		
9,300.00	6,987.20	5,392.00	3,078.35	54.85	62.35	-34.15	481.62	-8,386.62	8,118.13	8,054.47	63.65	127.536		
9,400.00	6,987.12	5,392.00	3,078.35	55.65	62.35	-34.15	481.62	-8,386.62	8,036.56	7,972.54	64.01	125.542		
9,500.00	6,987.05	5,392.00	3,078.35	56.48	62.35	-34.15	481.62	-8,386.62	7,955.41	7,891.02	64.39	123.546		
9,600.00	6,986.98	5,392.00	3,078.35	57.35	62.35	-34.15	481.62	-8,386.62	7,874.70	7,809.91	64.79	121.547		
9,700.00	6,986.90	5,392.00	3,078.35	58.24	62.35	-34.15	481.62	-8,386.62	7,794.44	7,729.24	65.20	119.548		
9,800.00	6,986.83	5,392.00	3,078.35	59.17	62.35	-34.15	481.62	-8,386.62	7,714.63	7,649.00	65.63	117.549		
9,900.00	6,986.75	5,392.00	3,078.35	60.12	62.35	-34.15	481.62	-8,386.62	7,635.31	7,569.23	66.08	115.550		
10,000.00	6,986.68	5,392.00	3,078.35	61.10	62.35	-34.15	481.62	-8,386.62	7,556.47	7,489.92	66.55	113.552		
10,100.00	6,986.61	5,392.00	3,078.35	62.11	62.35	-34.15	481.62	-8,386.62	7,478.14	7,411.10	67.03	111.558		
10,200.00	6,986.53	5,392.00	3,078.35	63.14	62.35	-34.15	481.62	-8,386.62	7,400.33	7,332.79	67.54	109.566		
10,300.00	6,986.46	5,392.00	3,078.35	64.20	62.35	-34.15	481.62	-8,386.62	7,323.06	7,254.99	68.07	107.579		
10,400.00	6,986.39	5,392.00	3,078.35	65.28	62.35	-34.15	481.62	-8,386.62	7,246.35	7,177.72	68.62	105.598		
10,500.00	6,986.31	5,392.00	3,078.35	66.38	62.35	-34.15	481.62	-8,386.62	7,170.20	7,101.01	69.19	103.623		
10,600.00	6,986.24	5,392.00	3,078.35	67.50	62.35	-34.15	481.62	-8,386.62	7,094.66	7,024.87	69.79	101.656		
10,700.00	6,986.17	5,392.00	3,078.35	68.64	62.35	-34.15	481.62	-8,386.62	7,019.72	6,949.31	70.41	99.698		
10,800.00	6,986.09	5,392.00	3,078.35	69.80	62.35	-34.15	481.62	-8,386.62	6,945.42	6,874.36	71.05	97.751		
10,900.00	6,986.02	5,392.00	3,078.35	70.98	62.35	-34.15	481.62	-8,386.62	6,871.76	6,800.04	71.72	95.815		
11,000.00	6,985.95	5,392.00	3,078.35	72.17	62.35	-34.15	481.62	-8,386.62	6,798.78	6,726.37	72.41	93.891		
11,100.00	6,985.87	5,392.00	3,078.35	73.38	62.35	-34.15	481.62	-8,386.62	6,726.50	6,653.37	73.13	91.982		
11,200.00	6,985.80	5,392.00	3,078.35	74.61	62.35	-34.15	481.62	-8,386.62	6,654.93	6,581.06	73.87	90.088		
11,300.00	6,985.72	5,392.00	3,078.35	75.85	62.35	-34.15	481.62	-8,386.62	6,584.10	6,509.46	74.64	88.210		
11,400.00	6,985.65	5,392.00	3,078.35	77.10	62.35	-34.15	481.62	-8,386.62	6,514.04	6,438.61	75.44	86.351		
11,500.00	6,985.58	5,392.00	3,078.35	78.37	62.35	-34.15	481.62	-8,386.62	6,444.77	6,368.51	76.26	84.511		
11,600.00	6,985.50	5,392.00	3,078.35	79.65	62.35	-34.15	481.62	-8,386.62	6,376.32	6,299.21	77.11	82.692		
11,700.00	6,985.43	5,392.00	3,078.35	80.94	62.35	-34.15	481.62	-8,386.62	6,308.70	6,230.72	77.99	80.895		
11,800.00	6,985.36	5,392.00	3,078.35	82.24	62.35	-34.15	481.62	-8,386.62	6,241.96	6,163.07	78.89	79.121		
11,900.00	6,985.28	5,392.00	3,078.35	83.56	62.35	-34.15	481.62	-8,386.62	6,176.11	6,096.29	79.82	77.372		
12,000.00	6,985.21	5,392.00	3,078.35	84.88	62.35	-34.15	481.62	-8,386.62	6,111.19	6,030.41	80.78	75.649		
12,100.00	6,985.14	5,392.00	3,078.35	86.21	62.35	-34.15	481.62	-8,386.62	6,047.23	5,965.46	81.77	73.953		
12,200.00	6,985.06	5,392.00	3,078.35	87.56	62.35	-34.15	481.62	-8,386.62	5,984.26	5,901.47	82.79	72.286		
12,300.00	6,984.99	5,392.00	3,078.35	88.91	62.35	-34.15	481.62	-8,386.62	5,922.30	5,838.47	83.83	70.648		
12,400.00	6,984.92	5,392.00	3,078.35	90.27	62.35	-34.15	481.62	-8,386.62	5,861.40	5,776.50	84.90	69.041		
12,500.00	6,984.84	5,392.00	3,078.35	91.64	62.35	-34.15	481.62	-8,386.62	5,801.58	5,715.58	85.99	67.466		
12,600.00	6,984.77	5,392.00	3,078.35	93.01	62.35	-34.15	481.62	-8,386.62	5,742.88	5,655.76	87.11	65.923		
12,700.00	6,984.69	5,392.00	3,078.35	94.40	62.35	-34.15	481.62	-8,386.62	5,685.33	5,597.07	88.26	64.415		
12,800.00	6,984.62	5,392.00	3,078.35	95.79	62.35	-34.15	481.62	-8,386.62	5,628.97	5,539.53	89.43	62.941		
12,900.00	6,984.55	5,392.00	3,078.35	97.18	62.35	-34.15	481.62	-8,386.62	5,573.83	5,483.20	90.63	61.502		
13,000.00	6,984.47	5,392.00	3,078.35	98.59	62.35	-34.15	481.62	-8,386.62	5,519.96	5,428.11	91.85	60.100		
13,100.00	6,984.40	5,392.00	3,078.35	100.00	62.35	-34.15	481.62	-8,386.62	5,467.38	5,374.29	93.09	58.735		
13,200.00	6,984.33	5,392.00	3,078.35	101.41	62.35	-34.15	481.62	-8,386.62	5,416.14	5,321.79	94.35	57.408		
13,300.00	6,984.25	5,392.00	3,078.35	102.83	62.35	-34.15	481.62	-8,386.62	5,366.27	5,270.65	95.62	56.118		
13,400.00	6,984.18	5,392.00	3,078.35	104.26	62.35	-34.15	481.62	-8,386.62	5,317.82	5,220.90	96.92	54.868		
13,500.00	6,984.11	5,392.00	3,078.35	105.69	62.35	-34.15	481.62	-8,386.62	5,270.82	5,172.59	98.23	53.656		
13,600.00	6,984.03	5,392.00	3,078.35	107.13	62.35	-34.15	481.62	-8,386.62	5,225.31	5,125.75	99.56	52.484		
13,700.00	6,983.96	5,392.00	3,078.35	108.57	62.35	-34.15	481.62	-8,386.62	5,181.33	5,080.43	100.90	51.352		
13,800.00	6,983.88	5,392.00	3,078.35	110.02	62.35	-34.15	481.62	-8,386.62	5,138.92	5,036.67	102.25	50.259		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #226A - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		200-MWD OWSG Rev5					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	
13,900.00	6,983.81	5,392.00	3,078.35	111.47	62.35	-34.15	481.62	-8,386.62	5,098.12	4,994.51	103.61	49.207		
14,000.00	6,983.74	5,392.00	3,078.35	112.92	62.35	-34.15	481.62	-8,386.62	5,058.97	4,954.00	104.97	48.195		
14,100.00	6,983.66	5,392.00	3,078.35	114.38	62.35	-34.15	481.62	-8,386.62	5,021.50	4,915.16	106.34	47.223		
14,200.00	6,983.59	5,392.00	3,078.35	115.85	62.35	-34.15	481.62	-8,386.62	4,985.76	4,878.06	107.70	46.291		
14,300.00	6,983.52	5,392.00	3,078.35	117.31	62.35	-34.15	481.62	-8,386.62	4,951.78	4,842.71	109.07	45.400		
14,400.00	6,983.44	5,392.00	3,078.35	118.78	62.35	-34.15	481.62	-8,386.62	4,919.60	4,809.17	110.43	44.548		
14,500.00	6,983.37	5,392.00	3,078.35	120.26	62.35	-34.15	481.62	-8,386.62	4,889.25	4,777.46	111.79	43.737		
14,600.00	6,983.30	5,392.00	3,078.35	121.74	62.35	-34.15	481.62	-8,386.62	4,860.77	4,747.64	113.13	42.965		
14,700.00	6,983.22	5,392.00	3,078.35	123.22	62.35	-34.15	481.62	-8,386.62	4,834.19	4,719.73	114.47	42.232		
14,800.00	6,983.15	5,392.00	3,078.35	124.70	62.35	-34.15	481.62	-8,386.62	4,809.55	4,693.76	115.78	41.539		
14,900.00	6,983.08	5,392.00	3,078.35	126.19	62.35	-34.15	481.62	-8,386.62	4,786.86	4,669.78	117.08	40.885		
15,000.00	6,983.00	5,392.00	3,078.35	127.68	62.35	-34.15	481.62	-8,386.62	4,766.17	4,647.81	118.36	40.269		
15,100.00	6,982.93	5,392.00	3,078.35	129.17	62.35	-34.15	481.62	-8,386.62	4,747.49	4,627.88	119.61	39.690		
15,200.00	6,982.85	5,392.00	3,078.35	130.67	62.35	-34.15	481.62	-8,386.62	4,730.86	4,610.02	120.84	39.150		
15,300.00	6,982.78	5,392.00	3,078.35	132.16	62.35	-34.15	481.62	-8,386.62	4,716.29	4,594.25	122.04	38.647		
15,400.00	6,982.71	5,392.00	3,078.35	133.66	62.35	-34.15	481.62	-8,386.62	4,703.79	4,580.59	123.20	38.180		
15,500.00	6,982.63	5,392.00	3,078.35	135.17	62.35	-34.15	481.62	-8,386.62	4,693.40	4,569.07	124.33	37.750		
15,600.00	6,982.56	5,392.00	3,078.35	136.67	62.35	-34.15	481.62	-8,386.62	4,685.12	4,559.70	125.42	37.355		
15,700.00	6,982.49	5,392.00	3,078.35	138.18	62.35	-34.15	481.62	-8,386.62	4,678.96	4,552.48	126.47	36.996		
15,800.00	6,982.41	5,392.00	3,078.35	139.69	62.35	-34.15	481.62	-8,386.62	4,674.93	4,547.45	127.48	36.671		
15,900.00	6,982.34	5,392.00	3,078.35	141.20	62.35	-34.15	481.62	-8,386.62	4,673.04	4,544.59	128.45	36.380		
15,938.38	6,982.31	5,392.00	3,078.35	141.78	62.35	-34.15	481.62	-8,386.62	4,672.88	4,544.07	128.81	36.277	CC	
16,000.00	6,982.27	5,392.00	3,078.35	142.71	62.35	-34.15	481.62	-8,386.62	4,673.29	4,543.91	129.37	36.122	ES	
16,100.00	6,982.19	5,392.00	3,078.35	144.23	62.35	-34.15	481.62	-8,386.62	4,675.68	4,545.43	130.25	35.898		
16,200.00	6,982.12	5,392.00	3,078.35	145.75	62.35	-34.15	481.62	-8,386.62	4,680.20	4,549.12	131.08	35.706		
16,300.00	6,982.05	5,392.00	3,078.35	147.27	62.35	-34.15	481.62	-8,386.62	4,686.85	4,555.00	131.85	35.546		
16,400.00	6,981.97	5,392.00	3,078.35	148.79	62.35	-34.15	481.62	-8,386.62	4,695.63	4,563.04	132.58	35.417		
16,500.00	6,981.90	5,392.00	3,078.35	150.31	62.35	-34.15	481.62	-8,386.62	4,706.51	4,573.25	133.26	35.318		
16,600.00	6,981.82	5,392.00	3,078.35	151.84	62.35	-34.15	481.62	-8,386.62	4,719.49	4,585.60	133.89	35.250		
16,700.00	6,981.75	5,392.00	3,078.35	153.36	62.35	-34.15	481.62	-8,386.62	4,734.54	4,600.08	134.46	35.211		
16,800.00	6,981.68	5,392.00	3,078.35	154.89	62.35	-34.15	481.62	-8,386.62	4,751.65	4,616.67	134.99	35.201	SF	
16,900.00	6,981.60	5,392.00	3,078.35	156.42	62.35	-34.15	481.62	-8,386.62	4,770.80	4,635.34	135.46	35.219		
17,000.00	6,981.53	5,392.00	3,078.35	157.95	62.35	-34.15	481.62	-8,386.62	4,791.96	4,656.07	135.89	35.265		
17,100.00	6,981.46	5,392.00	3,078.35	159.49	62.35	-34.15	481.62	-8,386.62	4,815.10	4,678.84	136.26	35.338		
17,200.00	6,981.38	5,362.73	3,079.67	161.02	61.71	-34.30	467.84	-8,412.41	4,840.11	4,703.48	136.63	35.425		
17,300.00	6,981.31	5,237.58	3,084.91	162.56	58.98	-34.93	409.82	-8,523.17	4,865.66	4,728.57	137.10	35.490		
17,400.00	6,981.24	5,100.76	3,091.84	164.09	56.01	-35.61	347.47	-8,644.77	4,890.31	4,752.74	137.57	35.547		
17,500.00	6,981.16	4,966.87	3,098.65	165.63	53.11	-36.25	288.36	-8,764.70	4,914.37	4,776.36	138.01	35.608		
17,600.00	6,981.09	4,912.01	3,101.32	167.17	51.92	-36.50	264.19	-8,813.88	4,938.92	4,800.57	138.35	35.700		
17,700.00	6,981.01	4,829.20	3,105.04	168.71	50.15	-36.89	227.36	-8,887.95	4,964.27	4,825.56	138.71	35.789		
17,800.00	6,980.94	4,699.00	3,110.25	170.25	47.36	-37.46	171.62	-9,005.50	4,989.06	4,849.97	139.09	35.870		
17,900.00	6,980.87	4,635.00	3,111.87	171.80	45.99	-37.73	145.18	-9,063.75	5,014.30	4,874.95	139.36	35.982		
18,000.00	6,980.79	4,614.25	3,112.13	173.34	45.56	-37.81	136.44	-9,082.57	5,040.82	4,901.26	139.56	36.119		
18,100.00	6,980.72	4,573.00	3,112.58	174.89	44.69	-37.99	118.76	-9,119.84	5,068.49	4,928.72	139.77	36.264		
18,200.00	6,980.65	4,509.00	3,112.58	176.43	43.35	-38.24	91.28	-9,177.63	5,097.13	4,957.14	139.99	36.410		
18,300.00	6,980.57	4,289.83	3,112.51	177.98	38.86	-39.09	0.43	-9,377.05	5,125.09	4,984.63	140.46	36.489		
18,400.00	6,980.50	4,184.14	3,114.57	179.53	36.75	-39.51	-43.62	-9,473.10	5,152.03	5,011.22	140.80	36.590		
18,500.00	6,980.43	4,100.26	3,116.69	181.08	35.12	-39.84	-78.82	-9,549.20	5,178.97	5,037.84	141.13	36.697		
18,600.00	6,980.35	4,030.92	3,119.73	182.63	33.82	-40.13	-109.35	-9,611.38	5,206.31	5,064.86	141.45	36.806		
18,700.00	6,980.28	3,998.00	3,121.31	184.18	33.21	-40.28	-124.16	-9,640.74	5,234.49	5,092.85	141.64	36.957		
18,800.00	6,980.21	3,959.48	3,122.71	185.73	32.52	-40.44	-141.59	-9,675.07	5,263.80	5,121.98	141.82	37.116		
18,900.00	6,980.13	3,934.00	3,123.12	187.28	32.06	-40.55	-153.10	-9,697.79	5,294.42	5,152.50	141.92	37.305		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #226A - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		200-MWD OWSG Rev5						Rule Assigned:					Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
19,000.00	6,980.06	3,907.41	3,123.21	188.84	31.60	-40.65	-165.19	-9,721.47	5,326.31	5,184.30	142.01	37.507		
19,100.00	6,979.98	3,870.00	3,122.88	190.39	30.95	-40.80	-182.52	-9,754.62	5,359.51	5,217.38	142.13	37.709		
19,200.00	6,979.91	3,870.00	3,122.88	191.95	30.95	-40.80	-182.52	-9,754.62	5,393.90	5,251.87	142.03	37.977		
19,300.00	6,979.84	3,806.00	3,121.16	193.51	29.87	-41.05	-212.61	-9,811.08	5,429.35	5,287.09	142.26	38.164		
19,400.00	6,979.76	3,773.48	3,119.76	195.06	29.35	-41.17	-227.89	-9,839.76	5,465.78	5,323.47	142.31	38.407		
19,500.00	6,979.69	3,487.00	3,107.81	196.62	25.14	-42.18	-356.57	-10,095.35	5,500.78	5,356.85	143.93	38.220		
19,600.00	6,979.62	3,487.00	3,107.81	198.18	25.14	-42.18	-356.57	-10,095.35	5,535.39	5,391.60	143.79	38.496		
19,700.00	6,979.54	3,454.39	3,106.35	199.74	24.74	-42.28	-370.51	-10,124.79	5,570.68	5,426.90	143.79	38.743		
19,800.00	6,979.47	3,427.00	3,103.68	201.30	24.41	-42.36	-382.48	-10,149.27	5,608.11	5,464.37	143.74	39.017		
19,900.00	6,979.40	3,427.00	3,103.68	202.86	24.41	-42.36	-382.48	-10,149.27	5,646.43	5,502.90	143.53	39.341		
20,000.00	6,979.32	3,427.00	3,103.68	204.42	24.41	-42.36	-382.48	-10,149.27	5,686.24	5,542.96	143.29	39.684		
20,100.00	6,979.25	3,427.00	3,103.68	205.98	24.41	-42.36	-382.48	-10,149.27	5,727.53	5,584.51	143.02	40.047		
20,200.00	6,979.18	3,411.85	3,101.54	207.55	24.24	-42.40	-389.17	-10,162.69	5,770.02	5,627.17	142.85	40.393		
20,300.00	6,979.10	3,395.00	3,098.47	209.11	24.05	-42.44	-396.62	-10,177.50	5,813.97	5,671.30	142.67	40.752		
20,400.00	6,979.03	3,395.00	3,098.47	210.68	24.05	-42.44	-396.62	-10,177.50	5,859.00	5,716.66	142.33	41.164		
20,500.00	6,978.95	3,395.00	3,098.47	212.24	24.05	-42.44	-396.62	-10,177.50	5,905.38	5,763.40	141.98	41.593		
20,600.00	6,978.88	3,395.00	3,098.47	213.81	24.05	-42.44	-396.62	-10,177.50	5,953.08	5,811.47	141.61	42.039		
20,700.00	6,978.81	3,363.00	3,090.64	215.37	23.72	-42.50	-410.72	-10,205.13	6,001.89	5,860.39	141.50	42.416		
20,800.00	6,978.73	3,363.00	3,090.64	216.94	23.72	-42.50	-410.72	-10,205.13	6,051.68	5,910.58	141.10	42.890		
20,900.00	6,978.66	3,363.00	3,090.64	218.51	23.72	-42.50	-410.72	-10,205.13	6,102.70	5,962.02	140.68	43.381		
21,000.00	6,978.59	3,344.71	3,085.19	220.07	23.54	-42.53	-418.63	-10,220.69	6,154.79	6,014.37	140.42	43.831		
21,100.00	6,978.51	3,330.00	3,080.46	221.64	23.39	-42.54	-424.85	-10,233.15	6,207.82	6,067.71	140.12	44.305		
21,200.00	6,978.44	3,298.00	3,069.30	223.21	23.10	-42.57	-437.96	-10,260.12	6,261.73	6,121.76	139.98	44.735		
21,300.00	6,978.37	3,298.00	3,069.30	224.78	23.10	-42.57	-437.96	-10,260.12	6,316.52	6,177.01	139.51	45.275		
21,400.00	6,978.29	3,266.00	3,057.05	226.35	22.84	-42.58	-450.88	-10,286.71	6,372.33	6,232.97	139.36	45.727		
21,500.00	6,978.22	3,266.00	3,057.05	227.92	22.84	-42.58	-450.88	-10,286.71	6,428.88	6,290.00	138.88	46.291		
21,600.00	6,978.14	3,266.00	3,057.05	229.49	22.84	-42.58	-450.88	-10,286.71	6,486.47	6,348.08	138.39	46.870		
21,700.00	6,978.07	3,266.00	3,057.05	231.06	22.84	-42.58	-450.88	-10,286.71	6,545.09	6,407.19	137.90	47.463		
21,800.00	6,978.00	3,235.00	3,043.62	232.63	22.60	-42.58	-463.36	-10,311.70	6,604.56	6,466.84	137.72	47.956		
21,900.00	6,977.92	3,235.00	3,043.62	234.21	22.60	-42.58	-463.36	-10,311.70	6,664.77	6,527.55	137.22	48.571		
22,000.00	6,977.85	3,235.00	3,043.62	235.78	22.60	-42.58	-463.36	-10,311.70	6,725.92	6,589.22	136.71	49.200		
22,100.00	6,977.78	3,235.00	3,043.62	237.35	22.60	-42.58	-463.36	-10,311.70	6,788.00	6,651.81	136.19	49.841		
22,200.00	6,977.70	3,218.11	3,035.60	238.92	22.49	-42.58	-470.10	-10,324.94	6,850.78	6,714.92	135.87	50.423		
22,300.00	6,977.63	3,203.00	3,028.14	240.50	22.38	-42.58	-476.17	-10,336.60	6,914.42	6,778.91	135.52	51.023		
22,400.00	6,977.56	3,203.00	3,028.14	242.07	22.38	-42.58	-476.17	-10,336.60	6,978.77	6,843.77	135.00	51.696		
22,500.00	6,977.48	3,187.89	3,020.47	243.65	22.29	-42.57	-482.24	-10,348.11	7,043.85	6,909.20	134.65	52.312		
22,600.00	6,977.41	3,171.00	3,011.69	245.22	22.19	-42.56	-489.00	-10,360.86	7,109.61	6,975.28	134.33	52.927		
22,700.00	6,977.34	3,171.00	3,011.69	246.80	22.19	-42.56	-489.00	-10,360.86	7,176.05	7,042.24	133.81	53.630		
22,800.00	6,977.26	3,153.09	3,002.09	248.37	22.09	-42.55	-496.11	-10,374.20	7,243.10	7,109.60	133.50	54.256		
22,900.00	6,977.19	3,139.00	2,994.31	249.95	22.01	-42.53	-501.65	-10,384.56	7,310.84	7,177.69	133.15	54.908		
23,000.00	6,977.11	3,139.00	2,994.31	251.53	22.01	-42.53	-501.65	-10,384.56	7,379.21	7,246.58	132.63	55.638		
23,100.00	6,977.04	3,107.00	2,975.98	253.10	21.85	-42.50	-514.01	-10,407.70	7,448.18	7,315.68	132.51	56.210		
23,155.65	6,977.00	3,107.00	2,975.98	253.98	21.85	-42.50	-514.01	-10,407.70	7,486.76	7,354.54	132.22	56.624		
23,156.15	6,977.00	3,107.00	2,975.98	254.06	21.85	-42.50	-514.01	-10,407.70	7,487.11	7,354.88	132.23	56.623		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #228A - OH - OH-SVY														Offset Site Error: 0.00 usft
Survey Program: 352-MWD OWSG Rev5														Offset Well Error: 0.00 usft
Rule Assigned:														
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
0.00	0.00	0.00	0.00	0.00	0.00	-106.10	-1,482.67	-5,138.51	5,349.35					
100.00	100.00	0.00	0.00	0.25	0.00	-106.10	-1,482.67	-5,138.51	5,348.16	5,347.90	0.25	N/A		
200.00	200.00	92.33	92.33	0.61	1.10	-106.10	-1,482.77	-5,138.42	5,348.09	5,346.38	1.70	3,143.652		
300.00	300.00	199.70	199.70	0.97	2.37	-106.10	-1,483.11	-5,138.11	5,347.90	5,344.57	3.33	1,606.442		
400.00	400.00	307.06	307.05	1.33	3.64	-106.11	-1,483.70	-5,137.58	5,347.57	5,342.62	4.96	1,078.839		
496.96	496.96	383.00	382.99	1.67	4.21	-106.11	-1,484.21	-5,137.16	5,347.27	5,341.41	5.86	911.736 CC		
500.00	500.00	383.00	382.99	1.68	4.21	-106.11	-1,484.21	-5,137.16	5,347.27	5,341.40	5.88	910.045		
600.00	599.98	435.06	435.05	2.04	4.23	-116.10	-1,484.10	-5,137.44	5,348.52	5,342.26	6.25	855.107		
700.00	699.84	474.00	473.98	2.41	4.25	-116.04	-1,483.38	-5,138.19	5,352.28	5,345.65	6.63	807.293		
800.00	799.45	505.00	504.94	2.77	4.28	-115.93	-1,482.32	-5,139.33	5,358.79	5,351.78	7.01	764.762		
900.00	898.70	550.13	549.95	3.13	4.32	-115.79	-1,480.09	-5,141.70	5,367.94	5,360.54	7.40	725.680		
1,000.00	997.47	580.54	580.21	3.50	4.36	-115.59	-1,477.98	-5,143.93	5,379.85	5,372.06	7.79	690.952		
1,100.00	1,095.63	617.10	616.49	3.89	4.40	-112.97	-1,474.89	-5,147.20	5,394.03	5,385.84	8.19	658.716		
1,200.00	1,193.09	657.00	655.94	4.29	4.46	-111.00	-1,470.77	-5,151.44	5,409.97	5,401.36	8.61	628.559		
1,300.00	1,289.73	688.00	686.49	4.72	4.50	-109.40	-1,467.06	-5,155.16	5,427.60	5,418.57	9.04	600.726		
1,400.00	1,385.42	732.59	730.23	5.16	4.59	-108.08	-1,460.91	-5,161.29	5,446.95	5,437.44	9.50	573.255		
1,496.97	1,477.20	770.05	766.76	5.62	4.66	-106.95	-1,455.06	-5,167.12	5,467.34	5,457.37	9.97	548.323		
1,500.00	1,480.05	780.00	776.43	5.63	4.68	-106.96	-1,453.39	-5,168.77	5,468.02	5,458.02	10.00	546.867		
1,600.00	1,574.15	811.00	806.44	6.12	4.75	-106.99	-1,447.84	-5,174.22	5,490.40	5,479.91	10.49	523.186		
1,700.00	1,668.25	842.00	836.27	6.62	4.83	-107.02	-1,441.79	-5,180.10	5,513.89	5,502.88	11.00	501.182		
1,800.00	1,762.35	874.00	866.86	7.12	4.91	-107.05	-1,435.04	-5,186.63	5,538.45	5,526.93	11.52	480.658		
1,900.00	1,856.45	905.00	896.29	7.64	4.99	-107.06	-1,428.07	-5,193.42	5,564.12	5,552.07	12.05	461.725		
2,000.00	1,950.55	951.44	940.02	8.16	5.12	-107.07	-1,416.92	-5,204.36	5,590.82	5,578.18	12.63	442.572		
2,100.00	2,044.65	999.00	984.45	8.68	5.25	-107.08	-1,404.84	-5,216.29	5,618.48	5,605.24	13.24	424.509		
2,200.00	2,138.75	1,041.52	1,023.73	9.21	5.38	-107.07	-1,393.08	-5,227.57	5,646.95	5,633.11	13.85	407.862		
2,300.00	2,232.85	1,078.15	1,057.25	9.74	5.50	-107.05	-1,382.48	-5,237.80	5,676.41	5,661.96	14.45	392.920		
2,400.00	2,326.95	1,110.81	1,086.77	10.27	5.61	-107.03	-1,372.32	-5,247.43	5,706.85	5,691.80	15.05	379.292		
2,500.00	2,421.05	1,155.00	1,126.30	10.81	5.76	-106.99	-1,358.11	-5,261.14	5,738.35	5,722.64	15.72	365.126		
2,600.00	2,515.15	1,202.03	1,167.70	11.34	6.00	-106.94	-1,341.81	-5,276.38	5,770.63	5,754.17	16.46	350.546		
2,700.00	2,609.25	1,263.84	1,221.27	11.88	6.25	-106.85	-1,318.97	-5,297.07	5,803.50	5,786.19	17.30	335.385		
2,800.00	2,703.35	1,311.00	1,261.52	12.42	6.43	-106.77	-1,300.65	-5,313.44	5,837.09	5,819.02	18.07	323.060		
2,900.00	2,797.45	1,336.45	1,282.98	12.96	6.59	-106.72	-1,290.48	-5,322.59	5,871.60	5,852.92	18.69	314.209		
3,000.00	2,891.55	1,374.00	1,314.38	13.51	6.92	-106.65	-1,275.32	-5,336.53	5,907.17	5,887.73	19.44	303.871		
3,100.00	2,985.65	1,405.00	1,340.10	14.05	7.17	-106.58	-1,262.65	-5,348.31	5,943.61	5,923.50	20.12	295.451		
3,200.00	3,079.75	1,436.00	1,365.60	14.60	7.43	-106.52	-1,249.75	-5,360.34	5,980.92	5,960.12	20.80	287.573		
3,300.00	3,173.85	1,464.38	1,388.76	15.14	7.70	-106.45	-1,237.91	-5,371.68	6,019.28	5,997.80	21.47	280.301		
3,400.00	3,267.95	1,498.00	1,416.09	15.69	8.03	-106.38	-1,224.07	-5,385.54	6,058.72	6,036.51	22.20	272.894		
3,500.00	3,362.05	1,516.87	1,431.36	16.23	8.21	-106.34	-1,216.36	-5,393.50	6,099.11	6,076.33	22.78	267.778		
3,600.00	3,456.15	1,561.00	1,466.91	16.78	8.63	-106.24	-1,198.31	-5,412.42	6,140.39	6,116.79	23.59	260.243		
3,700.00	3,550.25	1,621.69	1,515.38	17.33	9.25	-106.10	-1,173.09	-5,438.83	6,182.25	6,157.65	24.60	251.308		
3,800.00	3,644.35	1,698.21	1,575.65	17.88	10.07	-105.91	-1,140.10	-5,472.51	6,224.42	6,198.62	25.80	241.274		
3,900.00	3,738.45	1,764.12	1,627.21	18.42	10.79	-105.75	-1,111.28	-5,501.74	6,266.91	6,240.01	26.90	232.996		
4,000.00	3,832.55	3,253.00	2,925.31	18.97	22.92	-104.54	-625.28	-5,965.73	6,294.36	6,254.53	39.83	158.035		
4,100.00	3,926.65	3,253.00	2,925.31	19.52	22.92	-104.54	-625.28	-5,965.73	6,317.31	6,276.99	40.32	156.668		
4,200.00	4,020.75	3,253.00	2,925.31	20.07	22.92	-104.54	-625.28	-5,965.73	6,341.75	6,300.95	40.81	155.416		
4,300.00	4,114.85	3,253.00	2,925.31	20.62	22.92	-104.54	-625.28	-5,965.73	6,367.68	6,326.40	41.28	154.274		
4,400.00	4,208.95	3,253.00	2,925.31	21.17	22.92	-104.54	-625.28	-5,965.73	6,395.06	6,353.32	41.73	153.236		
4,500.00	4,303.05	3,253.00	2,925.31	21.72	22.92	-104.54	-625.28	-5,965.73	6,423.88	6,381.70	42.18	152.298		
4,600.00	4,397.15	3,253.00	2,925.31	22.27	22.92	-104.54	-625.28	-5,965.73	6,454.12	6,411.50	42.61	151.456		
4,700.00	4,491.25	3,253.00	2,925.31	22.82	22.92	-104.54	-625.28	-5,965.73	6,485.76	6,442.72	43.04	150.705		
4,800.00	4,585.35	3,253.00	2,925.31	23.37	22.92	-104.54	-625.28	-5,965.73	6,518.78	6,475.33	43.45	150.042		
4,900.00	4,679.45	3,253.00	2,925.31	23.93	22.92	-104.54	-625.28	-5,965.73	6,553.16	6,509.32	43.85	149.462		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #228A - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		352-MWD OWSG Rev5					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		
5,000.00	4,773.55	3,253.00	2,925.31	24.48	22.92	-104.54	-625.28	-5,965.73	6,588.88	6,544.65	44.23	148.962		
5,100.00	4,867.65	3,253.00	2,925.31	25.03	22.92	-104.54	-625.28	-5,965.73	6,625.92	6,581.31	44.61	148.538		
5,200.00	4,961.75	3,253.00	2,925.31	25.58	22.92	-104.54	-625.28	-5,965.73	6,664.25	6,619.28	44.97	148.188		
5,300.00	5,055.85	3,253.00	2,925.31	26.13	22.92	-104.54	-625.28	-5,965.73	6,703.86	6,658.53	45.32	147.907		
5,400.00	5,149.95	3,253.00	2,925.31	26.68	22.92	-104.54	-625.28	-5,965.73	6,744.71	6,699.05	45.67	147.694		
5,500.00	5,244.05	3,253.00	2,925.31	27.24	22.92	-104.54	-625.28	-5,965.73	6,786.80	6,740.80	46.00	147.545		
5,600.00	5,338.15	3,253.00	2,925.31	27.79	22.92	-104.54	-625.28	-5,965.73	6,830.08	6,783.76	46.32	147.457		
5,665.73	5,400.00	3,253.00	2,925.31	28.15	22.92	-104.54	-625.28	-5,965.73	6,859.18	6,812.66	46.52	147.433		
5,700.00	5,432.28	3,253.00	2,925.31	28.34	22.92	-104.71	-625.28	-5,965.73	6,874.53	6,827.90	46.63	147.432		
5,800.00	5,526.87	3,253.00	2,925.31	28.88	22.92	-105.20	-625.28	-5,965.73	6,919.83	6,872.91	46.92	147.488		
5,900.00	5,622.01	3,253.00	2,925.31	29.41	22.92	-105.70	-625.28	-5,965.73	6,965.86	6,918.67	47.18	147.629		
6,000.00	5,717.67	3,253.00	2,925.31	29.92	22.92	-106.21	-625.28	-5,965.73	7,012.60	6,965.17	47.43	147.852		
6,100.00	5,813.83	3,253.00	2,925.31	30.41	22.92	-106.72	-625.28	-5,965.73	7,060.02	7,012.37	47.65	148.154		
6,200.00	5,910.44	3,253.00	2,925.31	30.89	22.92	-107.25	-625.28	-5,965.73	7,108.10	7,060.24	47.86	148.532		
6,300.00	6,007.50	3,253.00	2,925.31	31.36	22.92	-107.78	-625.28	-5,965.73	7,156.79	7,108.76	48.04	148.984		
6,400.00	6,104.96	3,253.00	2,925.31	31.80	22.92	-108.32	-625.28	-5,965.73	7,206.09	7,157.89	48.20	149.507		
6,500.00	6,202.80	3,253.00	2,925.31	32.24	22.92	-108.86	-625.28	-5,965.73	7,255.95	7,207.61	48.34	150.098		
6,600.00	6,300.98	3,253.00	2,925.31	32.66	22.92	-109.42	-625.28	-5,965.73	7,306.36	7,257.90	48.47	150.755		
6,700.00	6,399.48	3,253.00	2,925.31	33.06	22.92	-109.97	-625.28	-5,965.73	7,357.29	7,308.72	48.57	151.476		
6,722.82	6,422.00	3,253.00	2,925.31	33.15	22.92	-110.10	-625.28	-5,965.73	7,368.98	7,320.39	48.59	151.650		
6,750.00	6,448.76	3,253.00	2,925.31	33.26	22.92	-99.09	-625.28	-5,965.73	7,382.70	7,334.08	48.62	151.846		
6,800.00	6,497.51	3,253.00	2,925.31	33.48	22.92	-85.72	-625.28	-5,965.73	7,406.77	7,358.08	48.69	152.131		
6,850.00	6,545.40	3,253.00	2,925.31	33.72	22.92	-77.33	-625.28	-5,965.73	7,429.19	7,380.42	48.77	152.317		
6,900.00	6,592.13	3,253.00	2,925.31	33.97	22.92	-71.55	-625.28	-5,965.73	7,449.85	7,400.97	48.88	152.405		
6,950.00	6,637.40	3,253.00	2,925.31	34.25	22.92	-67.30	-625.28	-5,965.73	7,468.63	7,419.63	49.01	152.395		
7,000.00	6,680.94	3,253.00	2,925.31	34.54	22.92	-64.04	-625.28	-5,965.73	7,485.44	7,436.28	49.15	152.288		
7,050.00	6,722.48	3,253.00	2,925.31	34.85	22.92	-61.49	-625.28	-5,965.73	7,500.17	7,450.86	49.32	152.086		
7,100.00	6,761.76	3,253.00	2,925.31	35.17	22.92	-59.47	-625.28	-5,965.73	7,512.76	7,463.27	49.49	151.790		
7,150.00	6,798.55	3,253.00	2,925.31	35.51	22.92	-57.87	-625.28	-5,965.73	7,523.13	7,473.44	49.69	151.403		
7,200.00	6,832.61	3,253.00	2,925.31	35.86	22.92	-56.62	-625.28	-5,965.73	7,531.24	7,481.34	49.90	150.925		
7,250.00	6,863.74	3,253.00	2,925.31	36.22	22.92	-55.67	-625.28	-5,965.73	7,537.04	7,486.91	50.13	150.359		
7,300.00	6,891.74	3,253.00	2,925.31	36.59	22.92	-54.99	-625.28	-5,965.73	7,540.49	7,490.12	50.37	149.706		
7,350.00	6,916.44	3,253.00	2,925.31	36.98	22.92	-54.56	-625.28	-5,965.73	7,541.58	7,490.96	50.62	148.971		
7,400.00	6,937.69	3,253.00	2,925.31	37.37	22.92	-54.35	-625.28	-5,965.73	7,540.31	7,489.42	50.89	148.155		
7,450.00	6,955.36	3,253.00	2,925.31	37.78	22.92	-54.37	-625.28	-5,965.73	7,536.68	7,485.51	51.18	147.262		
7,500.00	6,969.34	3,253.00	2,925.31	38.19	22.92	-54.60	-625.28	-5,965.73	7,530.72	7,479.24	51.48	146.297		
7,550.00	6,979.53	3,253.00	2,925.31	38.62	22.92	-55.04	-625.28	-5,965.73	7,522.44	7,470.66	51.78	145.264		
7,600.00	6,985.89	3,253.00	2,925.31	39.05	22.92	-55.69	-625.28	-5,965.73	7,511.90	7,459.79	52.10	144.171		
7,650.00	6,988.37	3,253.00	2,925.31	39.48	22.92	-56.56	-625.28	-5,965.73	7,499.15	7,446.72	52.43	143.021		
7,657.25	6,988.40	3,253.00	2,925.31	39.54	22.92	-56.70	-625.28	-5,965.73	7,497.12	7,444.64	52.48	142.848		
7,700.00	6,988.37	3,253.00	2,925.31	39.92	22.92	-56.70	-625.28	-5,965.73	7,485.14	7,432.37	52.77	141.843		
7,800.00	6,988.30	3,253.00	2,925.31	40.82	22.92	-56.70	-625.28	-5,965.73	7,458.00	7,404.54	53.46	139.500		
7,900.00	6,988.23	3,253.00	2,925.31	41.77	22.92	-56.70	-625.28	-5,965.73	7,432.11	7,377.93	54.18	137.179		
8,000.00	6,988.16	3,253.00	2,925.31	42.75	22.92	-56.70	-625.28	-5,965.73	7,407.47	7,352.55	54.92	134.886		
8,100.00	6,988.09	3,253.00	2,925.31	43.76	22.92	-56.70	-625.28	-5,965.73	7,384.11	7,328.43	55.68	132.627		
8,152.35	6,988.06	3,253.00	2,925.31	44.30	22.92	-56.70	-625.28	-5,965.73	7,372.39	7,316.31	56.08	131.462		
8,200.00	6,988.02	3,253.00	2,925.31	44.79	22.92	-56.46	-625.28	-5,965.73	7,361.38	7,304.93	56.45	130.406		
8,300.00	6,987.95	3,253.00	2,925.31	45.83	22.92	-55.85	-625.28	-5,965.73	7,335.08	7,277.86	57.22	128.197		
8,400.00	6,987.88	3,253.00	2,925.31	46.85	22.92	-55.13	-625.28	-5,965.73	7,304.48	7,246.51	57.97	126.009		
8,500.00	6,987.80	3,253.00	2,925.31	47.85	22.92	-54.27	-625.28	-5,965.73	7,269.70	7,211.00	58.70	123.852		
8,600.00	6,987.73	3,253.00	2,925.31	48.83	22.92	-53.28	-625.28	-5,965.73	7,230.83	7,171.43	59.40	121.733		
8,700.00	6,987.65	3,253.00	2,925.31	49.79	22.92	-52.13	-625.28	-5,965.73	7,188.01	7,127.94	60.07	119.659		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #228A - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		352-MWD OWSG Rev5					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		
8,800.00	6,987.57	3,253.00	2,925.31	50.72	22.92	-50.82	-625.28	-5,965.73	7,141.38	7,080.67	60.71	117.638		
8,900.00	6,987.50	3,253.00	2,925.31	51.62	22.92	-49.33	-625.28	-5,965.73	7,091.09	7,029.79	61.30	115.675		
9,000.00	6,987.42	3,253.00	2,925.31	52.48	22.92	-47.64	-625.28	-5,965.73	7,037.30	6,975.45	61.85	113.776		
9,100.00	6,987.34	3,253.00	2,925.31	53.30	22.92	-45.74	-625.28	-5,965.73	6,980.21	6,917.86	62.35	111.946		
9,200.00	6,987.27	3,253.00	2,925.31	54.08	22.92	-43.59	-625.28	-5,965.73	6,920.01	6,857.21	62.80	110.190		
9,215.33	6,987.26	3,253.00	2,925.31	54.20	22.92	-43.24	-625.28	-5,965.73	6,910.52	6,847.66	62.87	109.925		
9,300.00	6,987.20	3,253.00	2,925.31	54.85	22.92	-43.24	-625.28	-5,965.73	6,858.24	6,795.03	63.22	108.490		
9,400.00	6,987.12	3,253.00	2,925.31	55.65	22.92	-43.24	-625.28	-5,965.73	6,797.34	6,733.70	63.64	106.810		
9,500.00	6,987.05	3,253.00	2,925.31	56.48	22.92	-43.24	-625.28	-5,965.73	6,737.37	6,673.30	64.07	105.149		
9,600.00	6,986.98	3,253.00	2,925.31	57.35	22.92	-43.24	-625.28	-5,965.73	6,678.36	6,613.84	64.52	103.508		
9,700.00	6,986.90	3,253.00	2,925.31	58.24	22.92	-43.24	-625.28	-5,965.73	6,620.33	6,555.36	64.98	101.887		
9,800.00	6,986.83	3,253.00	2,925.31	59.17	22.92	-43.24	-625.28	-5,965.73	6,563.32	6,497.87	65.44	100.288		
9,900.00	6,986.75	3,253.00	2,925.31	60.12	22.92	-43.24	-625.28	-5,965.73	6,507.34	6,441.42	65.92	98.712		
10,000.00	6,986.68	3,253.00	2,925.31	61.10	22.92	-43.24	-625.28	-5,965.73	6,452.43	6,386.02	66.41	97.161		
10,100.00	6,986.61	3,253.00	2,925.31	62.11	22.92	-43.24	-625.28	-5,965.73	6,398.60	6,331.70	66.91	95.635		
10,200.00	6,986.53	3,253.00	2,925.31	63.14	22.92	-43.24	-625.28	-5,965.73	6,345.90	6,278.49	67.41	94.135		
10,300.00	6,986.46	3,253.00	2,925.31	64.20	22.92	-43.24	-625.28	-5,965.73	6,294.35	6,226.42	67.93	92.663		
10,400.00	6,986.39	3,253.00	2,925.31	65.28	22.92	-43.24	-625.28	-5,965.73	6,243.97	6,175.52	68.45	91.220		
10,500.00	6,986.31	3,253.00	2,925.31	66.38	22.92	-43.24	-625.28	-5,965.73	6,194.79	6,125.81	68.98	89.807		
10,600.00	6,986.24	3,253.00	2,925.31	67.50	22.92	-43.24	-625.28	-5,965.73	6,146.85	6,077.34	69.52	88.424		
10,700.00	6,986.17	3,253.00	2,925.31	68.64	22.92	-43.24	-625.28	-5,965.73	6,100.17	6,030.12	70.06	87.072		
10,800.00	6,986.09	3,253.00	2,925.31	69.80	22.92	-43.24	-625.28	-5,965.73	6,054.79	5,984.18	70.61	85.753		
10,900.00	6,986.02	3,253.00	2,925.31	70.98	22.92	-43.24	-625.28	-5,965.73	6,010.72	5,939.56	71.16	84.467		
11,000.00	6,985.95	3,253.00	2,925.31	72.17	22.92	-43.24	-625.28	-5,965.73	5,968.01	5,896.29	71.72	83.215		
11,100.00	6,985.87	3,253.00	2,925.31	73.38	22.92	-43.24	-625.28	-5,965.73	5,926.67	5,854.40	72.28	81.998		
11,200.00	6,985.80	3,253.00	2,925.31	74.61	22.92	-43.24	-625.28	-5,965.73	5,886.75	5,813.91	72.84	80.816		
11,300.00	6,985.72	3,253.00	2,925.31	75.85	22.92	-43.24	-625.28	-5,965.73	5,848.26	5,774.85	73.41	79.670		
11,400.00	6,985.65	3,253.00	2,925.31	77.10	22.92	-43.24	-625.28	-5,965.73	5,811.24	5,737.26	73.97	78.560		
11,500.00	6,985.58	3,253.00	2,925.31	78.37	22.92	-43.24	-625.28	-5,965.73	5,775.71	5,701.17	74.54	77.488		
11,600.00	6,985.50	3,253.00	2,925.31	79.65	22.92	-43.24	-625.28	-5,965.73	5,741.70	5,666.60	75.10	76.453		
11,700.00	6,985.43	3,253.00	2,925.31	80.94	22.92	-43.24	-625.28	-5,965.73	5,709.24	5,633.58	75.66	75.455		
11,800.00	6,985.36	3,253.00	2,925.31	82.24	22.92	-43.24	-625.28	-5,965.73	5,678.36	5,602.14	76.22	74.496		
11,900.00	6,985.28	3,253.00	2,925.31	83.56	22.92	-43.24	-625.28	-5,965.73	5,649.08	5,572.30	76.78	73.576		
12,000.00	6,985.21	3,253.00	2,925.31	84.88	22.92	-43.24	-625.28	-5,965.73	5,621.43	5,544.10	77.33	72.694		
12,100.00	6,985.14	3,253.00	2,925.31	86.21	22.92	-43.24	-625.28	-5,965.73	5,595.42	5,517.55	77.88	71.851		
12,200.00	6,985.06	3,253.00	2,925.31	87.56	22.92	-43.24	-625.28	-5,965.73	5,571.10	5,492.68	78.41	71.047		
12,300.00	6,984.99	3,253.00	2,925.31	88.91	22.92	-43.24	-625.28	-5,965.73	5,548.46	5,469.52	78.95	70.283		
12,400.00	6,984.92	3,253.00	2,925.31	90.27	22.92	-43.24	-625.28	-5,965.73	5,527.55	5,448.08	79.47	69.557		
12,500.00	6,984.84	3,253.00	2,925.31	91.64	22.92	-43.24	-625.28	-5,965.73	5,508.37	5,428.39	79.98	68.871		
12,600.00	6,984.77	3,253.00	2,925.31	93.01	22.92	-43.24	-625.28	-5,965.73	5,490.94	5,410.46	80.48	68.224		
12,700.00	6,984.69	3,253.00	2,925.31	94.40	22.92	-43.24	-625.28	-5,965.73	5,475.29	5,394.31	80.98	67.617		
12,800.00	6,984.62	3,253.00	2,925.31	95.79	22.92	-43.24	-625.28	-5,965.73	5,461.42	5,379.96	81.46	67.048		
12,900.00	6,984.55	3,253.00	2,925.31	97.18	22.92	-43.24	-625.28	-5,965.73	5,449.35	5,367.43	81.92	66.518		
13,000.00	6,984.47	3,253.00	2,925.31	98.59	22.92	-43.24	-625.28	-5,965.73	5,439.10	5,356.72	82.38	66.027		
13,100.00	6,984.40	3,253.00	2,925.31	100.00	22.92	-43.24	-625.28	-5,965.73	5,430.66	5,347.84	82.82	65.573		
13,200.00	6,984.33	3,253.00	2,925.31	101.41	22.92	-43.24	-625.28	-5,965.73	5,424.06	5,340.82	83.24	65.158		
13,300.00	6,984.25	3,253.00	2,925.31	102.83	22.92	-43.24	-625.28	-5,965.73	5,419.29	5,335.64	83.66	64.781		
13,400.00	6,984.18	3,253.00	2,925.31	104.26	22.92	-43.24	-625.28	-5,965.73	5,416.37	5,332.32	84.05	64.440		
13,500.00	6,984.11	3,253.00	2,925.31	105.69	22.92	-43.24	-625.28	-5,965.73	5,415.29	5,330.86	84.43	64.137		
13,508.34	6,984.10	3,253.00	2,925.31	105.81	22.92	-43.24	-625.28	-5,965.73	5,415.29	5,330.82	84.46	64.113 ES		
13,600.00	6,984.03	3,253.00	2,925.31	107.13	22.92	-43.24	-625.28	-5,965.73	5,416.06	5,331.26	84.80	63.869		
13,700.00	6,983.96	3,253.00	2,925.31	108.57	22.92	-43.24	-625.28	-5,965.73	5,418.68	5,333.53	85.15	63.637		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #228A - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		352-MWD OWSG Rev5					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	
13,800.00	6,983.88	3,253.00	2,925.31	110.02	22.92	-43.24	-625.28	-5,965.73	5,423.14	5,337.65	85.48	63.441		
13,900.00	6,983.81	3,253.00	2,925.31	111.47	22.92	-43.24	-625.28	-5,965.73	5,429.43	5,343.63	85.80	63.279		
14,000.00	6,983.74	3,253.00	2,925.31	112.92	22.92	-43.24	-625.28	-5,965.73	5,437.56	5,351.46	86.10	63.151		
14,100.00	6,983.66	3,253.00	2,925.31	114.38	22.92	-43.24	-625.28	-5,965.73	5,447.51	5,361.12	86.39	63.056		
14,200.00	6,983.59	3,253.00	2,925.31	115.85	22.92	-43.24	-625.28	-5,965.73	5,459.28	5,372.62	86.66	62.993		
14,300.00	6,983.52	3,253.00	2,925.31	117.31	22.92	-43.24	-625.28	-5,965.73	5,472.85	5,385.93	86.92	62.963 SF		
14,400.00	6,983.44	3,253.00	2,925.31	118.78	22.92	-43.24	-625.28	-5,965.73	5,488.21	5,401.04	87.17	62.963		
14,500.00	6,983.37	3,253.00	2,925.31	120.26	22.92	-43.24	-625.28	-5,965.73	5,505.34	5,417.94	87.40	62.993		
14,600.00	6,983.30	3,253.00	2,925.31	121.74	22.92	-43.24	-625.28	-5,965.73	5,524.23	5,436.61	87.61	63.053		
14,700.00	6,983.22	3,253.00	2,925.31	123.22	22.92	-43.24	-625.28	-5,965.73	5,544.85	5,457.04	87.82	63.142		
14,800.00	6,983.15	3,253.00	2,925.31	124.70	22.92	-43.24	-625.28	-5,965.73	5,567.20	5,479.19	88.01	63.258		
14,900.00	6,983.08	3,253.00	2,925.31	126.19	22.92	-43.24	-625.28	-5,965.73	5,591.25	5,503.06	88.19	63.402		
15,000.00	6,983.00	3,253.00	2,925.31	127.68	22.92	-43.24	-625.28	-5,965.73	5,616.97	5,528.62	88.36	63.571		
15,100.00	6,982.93	3,253.00	2,925.31	129.17	22.92	-43.24	-625.28	-5,965.73	5,644.35	5,555.84	88.52	63.766		
15,200.00	6,982.85	3,253.00	2,925.31	130.67	22.92	-43.24	-625.28	-5,965.73	5,673.36	5,584.70	88.67	63.985		
15,300.00	6,982.78	3,253.00	2,925.31	132.16	22.92	-43.24	-625.28	-5,965.73	5,703.98	5,615.17	88.81	64.228		
15,400.00	6,982.71	3,253.00	2,925.31	133.66	22.92	-43.24	-625.28	-5,965.73	5,736.18	5,647.23	88.94	64.493		
15,500.00	6,982.63	3,253.00	2,925.31	135.17	22.92	-43.24	-625.28	-5,965.73	5,769.93	5,680.86	89.07	64.781		
15,600.00	6,982.56	3,253.00	2,925.31	136.67	22.92	-43.24	-625.28	-5,965.73	5,805.20	5,716.02	89.19	65.090		
15,700.00	6,982.49	3,253.00	2,925.31	138.18	22.92	-43.24	-625.28	-5,965.73	5,841.98	5,752.68	89.30	65.420		
15,800.00	6,982.41	3,253.00	2,925.31	139.69	22.92	-43.24	-625.28	-5,965.73	5,880.22	5,790.82	89.41	65.769		
15,900.00	6,982.34	3,253.00	2,925.31	141.20	22.92	-43.24	-625.28	-5,965.73	5,919.91	5,830.41	89.51	66.139		
16,000.00	6,982.27	3,253.00	2,925.31	142.71	22.92	-43.24	-625.28	-5,965.73	5,961.02	5,871.41	89.60	66.527		
16,100.00	6,982.19	3,253.00	2,925.31	144.23	22.92	-43.24	-625.28	-5,965.73	6,003.50	5,913.81	89.69	66.933		
16,200.00	6,982.12	3,253.00	2,925.31	145.75	22.92	-43.24	-625.28	-5,965.73	6,047.34	5,957.56	89.78	67.358		
16,300.00	6,982.05	3,253.00	2,925.31	147.27	22.92	-43.24	-625.28	-5,965.73	6,092.51	6,002.65	89.86	67.799		
16,400.00	6,981.97	3,253.00	2,925.31	148.79	22.92	-43.24	-625.28	-5,965.73	6,138.98	6,049.04	89.94	68.258		
16,500.00	6,981.90	3,253.00	2,925.31	150.31	22.92	-43.24	-625.28	-5,965.73	6,186.71	6,096.70	90.01	68.734		
16,600.00	6,981.82	3,253.00	2,925.31	151.84	22.92	-43.24	-625.28	-5,965.73	6,235.68	6,145.60	90.08	69.226		
16,700.00	6,981.75	3,253.00	2,925.31	153.36	22.92	-43.24	-625.28	-5,965.73	6,285.86	6,195.72	90.14	69.733		
16,800.00	6,981.68	3,253.00	2,925.31	154.89	22.92	-43.24	-625.28	-5,965.73	6,337.22	6,247.02	90.20	70.257		
16,900.00	6,981.60	3,253.00	2,925.31	156.42	22.92	-43.24	-625.28	-5,965.73	6,389.73	6,299.48	90.26	70.795		
17,000.00	6,981.53	3,253.00	2,925.31	157.95	22.92	-43.24	-625.28	-5,965.73	6,443.37	6,353.06	90.31	71.349		
17,100.00	6,981.46	3,253.00	2,925.31	159.49	22.92	-43.24	-625.28	-5,965.73	6,498.10	6,407.75	90.35	71.918		
17,200.00	6,981.38	3,253.00	2,925.31	161.02	22.92	-43.24	-625.28	-5,965.73	6,553.91	6,463.51	90.40	72.501		
17,300.00	6,981.31	3,253.00	2,925.31	162.56	22.92	-43.24	-625.28	-5,965.73	6,610.75	6,520.31	90.44	73.098		
17,400.00	6,981.24	3,253.00	2,925.31	164.09	22.92	-43.24	-625.28	-5,965.73	6,668.61	6,578.14	90.47	73.710		
17,500.00	6,981.16	3,253.00	2,925.31	165.63	22.92	-43.24	-625.28	-5,965.73	6,727.46	6,636.96	90.50	74.335		
17,600.00	6,981.09	3,253.00	2,925.31	167.17	22.92	-43.24	-625.28	-5,965.73	6,787.27	6,696.74	90.53	74.974		
17,700.00	6,981.01	3,253.00	2,925.31	168.71	22.92	-43.24	-625.28	-5,965.73	6,848.02	6,757.47	90.55	75.626		
17,800.00	6,980.94	3,253.00	2,925.31	170.25	22.92	-43.24	-625.28	-5,965.73	6,909.68	6,819.11	90.57	76.290		
17,900.00	6,980.87	3,253.00	2,925.31	171.80	22.92	-43.24	-625.28	-5,965.73	6,972.23	6,881.65	90.59	76.968		
18,000.00	6,980.79	3,253.00	2,925.31	173.34	22.92	-43.24	-625.28	-5,965.73	7,035.65	6,945.05	90.60	77.658		
18,100.00	6,980.72	3,253.00	2,925.31	174.89	22.92	-43.24	-625.28	-5,965.73	7,099.91	7,009.30	90.61	78.360		
18,200.00	6,980.65	3,253.00	2,925.31	176.43	22.92	-43.24	-625.28	-5,965.73	7,164.98	7,074.37	90.61	79.075		
18,300.00	6,980.57	3,253.00	2,925.31	177.98	22.92	-43.24	-625.28	-5,965.73	7,230.86	7,140.25	90.61	79.800		
18,400.00	6,980.50	3,253.00	2,925.31	179.53	22.92	-43.24	-625.28	-5,965.73	7,297.51	7,206.90	90.61	80.538		
18,500.00	6,980.43	3,253.00	2,925.31	181.08	22.92	-43.24	-625.28	-5,965.73	7,364.92	7,274.31	90.60	81.286		
18,600.00	6,980.35	3,253.00	2,925.31	182.63	22.92	-43.24	-625.28	-5,965.73	7,433.06	7,342.46	90.60	82.045		
18,700.00	6,980.28	3,253.00	2,925.31	184.18	22.92	-43.24	-625.28	-5,965.73	7,501.91	7,411.32	90.59	82.815		
18,800.00	6,980.21	3,253.00	2,925.31	185.73	22.92	-43.24	-625.28	-5,965.73	7,571.46	7,480.89	90.57	83.595		
18,900.00	6,980.13	3,253.00	2,925.31	187.28	22.92	-43.24	-625.28	-5,965.73	7,641.68	7,551.13	90.56	84.385		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #228A - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		352-MWD OWSG Rev5					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	
19,000.00	6,980.06	3,253.00	2,925.31	188.84	22.92	-43.24	-625.28	-5,965.73	7,712.56	7,622.03	90.54	85.185		
19,100.00	6,979.98	3,253.00	2,925.31	190.39	22.92	-43.24	-625.28	-5,965.73	7,784.09	7,693.57	90.52	85.995		
19,200.00	6,979.91	3,253.00	2,925.31	191.95	22.92	-43.24	-625.28	-5,965.73	7,856.23	7,765.73	90.50	86.814		
19,300.00	6,979.84	3,253.00	2,925.31	193.51	22.92	-43.24	-625.28	-5,965.73	7,928.98	7,838.51	90.47	87.642		
19,400.00	6,979.76	3,253.00	2,925.31	195.06	22.92	-43.24	-625.28	-5,965.73	8,002.31	7,911.87	90.44	88.478		
19,500.00	6,979.69	3,253.00	2,925.31	196.62	22.92	-43.24	-625.28	-5,965.73	8,076.22	7,985.80	90.42	89.324		
19,600.00	6,979.62	3,253.00	2,925.31	198.18	22.92	-43.24	-625.28	-5,965.73	8,150.68	8,060.30	90.39	90.177		
19,700.00	6,979.54	3,253.00	2,925.31	199.74	22.92	-43.24	-625.28	-5,965.73	8,225.69	8,135.34	90.35	91.039		
19,800.00	6,979.47	3,253.00	2,925.31	201.30	22.92	-43.24	-625.28	-5,965.73	8,301.22	8,210.90	90.32	91.908		
19,900.00	6,979.40	3,253.00	2,925.31	202.86	22.92	-43.24	-625.28	-5,965.73	8,377.27	8,286.98	90.29	92.785		
20,000.00	6,979.32	3,253.00	2,925.31	204.42	22.92	-43.24	-625.28	-5,965.73	8,453.81	8,363.56	90.25	93.669		
20,100.00	6,979.25	3,253.00	2,925.31	205.98	22.92	-43.24	-625.28	-5,965.73	8,530.84	8,440.63	90.22	94.561		
20,200.00	6,979.18	3,253.00	2,925.31	207.55	22.92	-43.24	-625.28	-5,965.73	8,608.35	8,518.17	90.18	95.459		
20,300.00	6,979.10	3,253.00	2,925.31	209.11	22.92	-43.24	-625.28	-5,965.73	8,686.31	8,596.17	90.14	96.364		
20,400.00	6,979.03	3,253.00	2,925.31	210.68	22.92	-43.24	-625.28	-5,965.73	8,764.72	8,674.62	90.10	97.276		
20,500.00	6,978.95	3,253.00	2,925.31	212.24	22.92	-43.24	-625.28	-5,965.73	8,843.56	8,753.50	90.06	98.194		
20,600.00	6,978.88	3,253.00	2,925.31	213.81	22.92	-43.24	-625.28	-5,965.73	8,922.83	8,832.81	90.02	99.118		
20,700.00	6,978.81	3,253.00	2,925.31	215.37	22.92	-43.24	-625.28	-5,965.73	9,002.52	8,912.53	89.98	100.048		
20,800.00	6,978.73	3,253.00	2,925.31	216.94	22.92	-43.24	-625.28	-5,965.73	9,082.60	8,992.66	89.94	100.983		
20,900.00	6,978.66	3,253.00	2,925.31	218.51	22.92	-43.24	-625.28	-5,965.73	9,163.08	9,073.17	89.90	101.924		
21,000.00	6,978.59	3,253.00	2,925.31	220.07	22.92	-43.24	-625.28	-5,965.73	9,243.93	9,154.07	89.86	102.870		
21,100.00	6,978.51	3,253.00	2,925.31	221.64	22.92	-43.24	-625.28	-5,965.73	9,325.16	9,235.34	89.82	103.822		
21,200.00	6,978.44	3,253.00	2,925.31	223.21	22.92	-43.24	-625.28	-5,965.73	9,406.75	9,316.97	89.78	104.778		
21,300.00	6,978.37	3,253.00	2,925.31	224.78	22.92	-43.24	-625.28	-5,965.73	9,488.69	9,398.96	89.74	105.739		
21,400.00	6,978.29	3,253.00	2,925.31	226.35	22.92	-43.24	-625.28	-5,965.73	9,570.98	9,481.28	89.70	106.705		
21,500.00	6,978.22	3,253.00	2,925.31	227.92	22.92	-43.24	-625.28	-5,965.73	9,653.60	9,563.94	89.65	107.675		
21,600.00	6,978.14	3,253.00	2,925.31	229.49	22.92	-43.24	-625.28	-5,965.73	9,736.54	9,646.93	89.61	108.650		
21,700.00	6,978.07	3,253.00	2,925.31	231.06	22.92	-43.24	-625.28	-5,965.73	9,819.81	9,730.23	89.57	109.628		
21,800.00	6,978.00	3,253.00	2,925.31	232.63	22.92	-43.24	-625.28	-5,965.73	9,903.38	9,813.85	89.53	110.611		
21,900.00	6,977.92	3,253.00	2,925.31	234.21	22.92	-43.24	-625.28	-5,965.73	9,987.26	9,897.76	89.49	111.597		
22,000.00	6,977.85	3,253.00	2,925.31	235.78	22.92	-43.24	-625.28	-5,965.73	10,071.43	9,981.97	89.45	112.587		
22,100.00	6,977.78	3,253.00	2,925.31	237.35	22.92	-43.24	-625.28	-5,965.73	10,155.88	10,066.47	89.42	113.581		
22,200.00	6,977.70	3,253.00	2,925.31	238.92	22.92	-43.24	-625.28	-5,965.73	10,240.62	10,151.24	89.38	114.578		
22,300.00	6,977.63	3,253.00	2,925.31	240.50	22.92	-43.24	-625.28	-5,965.73	10,325.63	10,236.29	89.34	115.578		
22,400.00	6,977.56	3,253.00	2,925.31	242.07	22.92	-43.24	-625.28	-5,965.73	10,410.90	10,321.60	89.30	116.581		
22,500.00	6,977.48	3,253.00	2,925.31	243.65	22.92	-43.24	-625.28	-5,965.73	10,496.44	10,407.18	89.27	117.587		
22,600.00	6,977.41	3,253.00	2,925.31	245.22	22.92	-43.24	-625.28	-5,965.73	10,582.23	10,493.00	89.23	118.596		
22,700.00	6,977.34	3,253.00	2,925.31	246.80	22.92	-43.24	-625.28	-5,965.73	10,668.27	10,579.07	89.19	119.608		
22,800.00	6,977.26	3,253.00	2,925.31	248.37	22.92	-43.24	-625.28	-5,965.73	10,754.55	10,665.39	89.16	120.622		
22,900.00	6,977.19	3,253.00	2,925.31	249.95	22.92	-43.24	-625.28	-5,965.73	10,841.06	10,751.94	89.13	121.639		
23,000.00	6,977.11	3,253.00	2,925.31	251.53	22.92	-43.24	-625.28	-5,965.73	10,927.81	10,838.71	89.09	122.658		
23,100.00	6,977.04	3,253.00	2,925.31	253.10	22.92	-43.24	-625.28	-5,965.73	11,014.77	10,925.72	89.06	123.679		
23,155.65	6,977.00	3,253.00	2,925.31	253.98	22.92	-43.24	-625.28	-5,965.73	11,063.27	10,974.23	89.04	124.249		
23,156.15	6,977.00	3,253.00	2,925.31	254.06	22.92	-43.24	-625.28	-5,965.73	11,063.71	10,973.64	90.07	122.837		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #336 - OH - OH-INC													Offset Site Error: 0.00 usft
Survey Program: 359-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	-158.13	-184.22	-73.96	200.48				
100.00	100.00	72.00	72.00	0.25	1.33	-158.13	-184.22	-73.96	198.51	196.93	1.58	125.478	
200.00	200.00	172.00	172.00	0.61	3.18	-158.13	-184.22	-73.96	198.51	194.72	3.79	52.392	
300.00	300.00	272.00	272.00	0.97	5.03	-158.13	-184.22	-73.96	198.51	192.52	6.00	33.108	
400.00	400.00	372.00	372.00	1.33	6.88	-158.13	-184.22	-73.96	198.51	190.30	8.21	24.179	
500.00	500.00	472.00	472.00	1.68	8.79	-158.13	-184.22	-73.96	198.51	188.04	10.47	18.959	CC
600.00	599.98	571.98	571.98	2.04	10.69	-168.22	-184.22	-73.96	200.22	187.49	12.73	15.727	ES
700.00	699.84	671.63	671.62	2.41	12.58	-168.45	-183.71	-73.96	204.87	189.89	14.99	13.670	
800.00	799.45	770.90	770.89	2.77	14.47	-168.90	-183.91	-73.96	213.60	196.37	17.24	12.391	
900.00	898.70	870.74	870.70	3.13	16.39	-169.48	-184.22	-73.96	225.87	206.35	19.52	11.572	
1,000.00	997.47	969.50	969.47	3.50	18.39	-170.11	-184.22	-73.96	241.27	219.38	21.89	11.023	
1,100.00	1,095.63	1,067.67	1,067.63	3.89	20.38	-168.41	-184.22	-73.96	259.97	235.73	24.25	10.723	
1,200.00	1,193.09	1,164.94	1,164.90	4.29	22.35	-167.46	-183.32	-73.96	281.02	254.43	26.59	10.569	SF
1,300.00	1,289.73	1,260.90	1,260.86	4.72	24.30	-167.10	-183.50	-73.96	306.30	277.39	28.91	10.596	
1,400.00	1,385.42	1,355.80	1,355.75	5.16	26.22	-167.07	-183.89	-73.96	335.02	303.81	31.21	10.736	
1,496.97	1,477.20	1,449.30	1,449.20	5.62	28.24	-167.25	-184.22	-73.96	365.90	332.32	33.59	10.894	
1,500.00	1,480.05	1,452.15	1,452.05	5.63	28.30	-167.28	-184.22	-73.96	366.91	333.24	33.67	10.897	
1,600.00	1,574.15	1,546.25	1,546.15	6.12	30.50	-168.35	-184.22	-73.96	400.07	363.83	36.24	11.038	
1,700.00	1,668.25	1,640.35	1,640.25	6.62	32.71	-169.25	-184.22	-73.96	433.34	394.52	38.82	11.162	
1,800.00	1,762.35	1,734.06	1,733.94	7.12	34.90	-169.98	-182.96	-73.96	465.46	424.06	41.40	11.244	
1,900.00	1,856.45	1,826.79	1,826.67	7.64	37.07	-170.66	-183.17	-73.96	499.08	455.13	43.95	11.357	
2,000.00	1,950.55	1,919.34	1,919.22	8.16	39.23	-171.25	-183.63	-73.96	533.01	486.52	46.49	11.464	
2,100.00	2,044.65	2,016.93	2,016.65	8.68	41.59	-171.80	-184.22	-73.96	567.09	517.85	49.25	11.515	
2,200.00	2,138.75	2,111.03	2,110.75	9.21	44.14	-172.26	-184.22	-73.96	600.65	548.45	52.19	11.509	
2,300.00	2,232.85	2,198.04	2,197.74	9.74	46.51	-172.63	-183.83	-73.96	633.89	578.96	54.92	11.541	
2,400.00	2,326.95	2,298.35	2,298.95	10.27	49.44	-173.04	-184.22	-73.96	667.84	609.57	58.27	11.461	
2,500.00	2,421.05	2,393.45	2,393.05	10.81	52.23	-173.37	-184.22	-73.96	701.47	640.01	61.46	11.414	
2,600.00	2,515.15	2,487.55	2,487.15	11.34	55.02	-173.68	-184.22	-73.96	735.12	670.47	64.65	11.371	
2,700.00	2,609.25	2,579.41	2,578.96	11.88	57.75	-173.92	-181.67	-73.96	766.27	698.50	67.76	11.308	
2,800.00	2,703.35	2,669.34	2,668.88	12.42	60.42	-174.17	-182.18	-73.96	800.47	729.65	70.82	11.303	
2,900.00	2,797.45	2,758.96	2,758.47	12.96	63.08	-174.41	-183.14	-73.96	835.16	761.31	73.86	11.308	
3,000.00	2,891.55	2,864.36	2,863.55	13.51	66.30	-174.66	-184.22	-73.96	869.86	792.35	77.51	11.223	
3,100.00	2,985.65	2,958.46	2,957.65	14.05	69.33	-174.86	-184.22	-73.96	903.58	822.64	80.94	11.163	
3,200.00	3,079.75	2,977.00	2,976.06	14.60	69.93	-174.90	-184.22	-73.96	940.35	858.88	81.47	11.542	
3,300.00	3,173.85	2,977.00	2,976.06	15.14	69.93	-174.90	-184.22	-73.96	985.77	905.09	80.68	12.219	
3,400.00	3,267.95	2,977.00	2,976.06	15.69	69.93	-174.90	-184.22	-73.96	1,038.85	959.46	79.39	13.085	
3,500.00	3,362.05	2,977.00	2,976.06	16.23	69.93	-174.90	-184.22	-73.96	1,098.49	1,020.70	77.79	14.121	
3,600.00	3,456.15	2,977.00	2,976.06	16.78	69.93	-174.90	-184.22	-73.96	1,163.68	1,087.66	76.02	15.307	
3,700.00	3,550.25	2,977.00	2,976.06	17.33	69.93	-174.90	-184.22	-73.96	1,233.54	1,159.36	74.18	16.629	
3,800.00	3,644.35	2,977.00	2,976.06	17.88	69.93	-174.90	-184.22	-73.96	1,307.33	1,234.99	72.34	18.071	
3,900.00	3,738.45	2,977.00	2,976.06	18.42	69.93	-174.90	-184.22	-73.96	1,384.41	1,313.85	70.55	19.622	
4,000.00	3,832.55	2,977.00	2,976.06	18.97	69.93	-174.90	-184.22	-73.96	1,464.26	1,395.41	68.85	21.269	
4,100.00	3,926.65	2,977.00	2,976.06	19.52	69.93	-174.90	-184.22	-73.96	1,546.46	1,479.22	67.23	23.002	
4,200.00	4,020.75	2,977.00	2,976.06	20.07	69.93	-174.90	-184.22	-73.96	1,630.64	1,564.92	65.72	24.812	
4,300.00	4,114.85	2,977.00	2,976.06	20.62	69.93	-174.90	-184.22	-73.96	1,716.53	1,652.22	64.31	26.691	
4,400.00	4,208.95	2,977.00	2,976.06	21.17	69.93	-174.90	-184.22	-73.96	1,803.87	1,740.86	63.01	28.630	
4,500.00	4,303.05	2,977.00	2,976.06	21.72	69.93	-174.90	-184.22	-73.96	1,892.46	1,830.67	61.80	30.624	
4,600.00	4,397.15	2,977.00	2,976.06	22.27	69.93	-174.90	-184.22	-73.96	1,982.14	1,921.46	60.68	32.665	
4,700.00	4,491.25	2,977.00	2,976.06	22.82	69.93	-174.90	-184.22	-73.96	2,072.77	2,013.12	59.65	34.749	
4,800.00	4,585.35	2,977.00	2,976.06	23.37	69.93	-174.90	-184.22	-73.96	2,164.22	2,105.52	58.70	36.869	
4,900.00	4,679.45	2,977.00	2,976.06	23.93	69.93	-174.90	-184.22	-73.96	2,256.39	2,198.57	57.82	39.021	
5,000.00	4,773.55	2,977.00	2,976.06	24.48	69.93	-174.90	-184.22	-73.96	2,349.21	2,292.19	57.02	41.201	

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

SDT

Anticollision Report

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Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #336 - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program:		359-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	
5,100.00	4,867.65	2,977.00	2,976.06	25.03	69.93	-174.90	-184.22	-73.96	2,442.59	2,386.32	56.28	43.404	
5,200.00	4,961.75	2,977.00	2,976.06	25.58	69.93	-174.90	-184.22	-73.96	2,536.48	2,480.89	55.59	45.627	
5,300.00	5,055.85	2,977.00	2,976.06	26.13	69.93	-174.90	-184.22	-73.96	2,630.82	2,575.86	54.96	47.865	
5,400.00	5,149.95	2,977.00	2,976.06	26.68	69.93	-174.90	-184.22	-73.96	2,725.56	2,671.18	54.38	50.117	
5,500.00	5,244.05	2,977.00	2,976.06	27.24	69.93	-174.90	-184.22	-73.96	2,820.66	2,766.81	53.85	52.378	
5,600.00	5,338.15	2,977.00	2,976.06	27.79	69.93	-174.90	-184.22	-73.96	2,916.10	2,862.73	53.36	54.647	
5,665.73	5,400.00	2,977.00	2,976.06	28.15	69.93	-174.90	-184.22	-73.96	2,978.99	2,925.92	53.06	56.141	
5,700.00	5,432.28	2,977.00	2,976.06	28.34	69.93	-175.00	-184.22	-73.96	3,011.80	2,958.89	52.91	56.922	
5,800.00	5,526.87	2,977.00	2,976.06	28.88	69.93	-175.27	-184.22	-73.96	3,107.38	3,054.91	52.47	59.223	
5,900.00	5,622.01	2,977.00	2,976.06	29.41	69.93	-175.53	-184.22	-73.96	3,202.73	3,150.70	52.03	61.555	
6,000.00	5,717.67	2,977.00	2,976.06	29.92	69.93	-175.76	-184.22	-73.96	3,297.84	3,246.25	51.60	63.917	
6,100.00	5,813.83	2,977.00	2,976.06	30.41	69.93	-175.98	-184.22	-73.96	3,392.71	3,341.54	51.16	66.311	
6,200.00	5,910.44	2,977.00	2,976.06	30.89	69.93	-176.18	-184.22	-73.96	3,487.31	3,436.58	50.74	68.735	
6,300.00	6,007.50	2,977.00	2,976.06	31.36	69.93	-176.36	-184.22	-73.96	3,581.66	3,531.35	50.31	71.192	
6,400.00	6,104.96	2,977.00	2,976.06	31.80	69.93	-176.53	-184.22	-73.96	3,675.73	3,625.84	49.89	73.680	
6,500.00	6,202.80	2,977.00	2,976.06	32.24	69.93	-176.69	-184.22	-73.96	3,769.53	3,720.06	49.47	76.200	
6,600.00	6,300.98	2,977.00	2,976.06	32.66	69.93	-176.84	-184.22	-73.96	3,863.04	3,813.99	49.05	78.753	
6,700.00	6,399.48	2,977.00	2,976.06	33.06	69.93	-176.98	-184.22	-73.96	3,956.26	3,907.62	48.64	81.338	
6,722.82	6,422.00	2,977.00	2,976.06	33.15	69.93	-177.01	-184.22	-73.96	3,977.50	3,928.95	48.54	81.934	
6,750.00	6,448.76	2,977.00	2,976.06	33.26	69.93	-161.91	-184.22	-73.96	4,002.90	3,954.46	48.44	82.633	
6,800.00	6,497.51	2,977.00	2,976.06	33.48	69.93	-138.78	-184.22	-73.96	4,050.21	4,001.93	48.29	83.875	
6,850.00	6,545.40	2,977.00	2,976.06	33.72	69.93	-118.07	-184.22	-73.96	4,097.99	4,049.81	48.18	85.060	
6,900.00	6,592.13	2,977.00	2,976.06	33.97	69.93	-98.82	-184.22	-73.96	4,145.92	4,097.82	48.11	86.183	
6,950.00	6,637.40	2,977.00	2,976.06	34.25	69.93	-82.00	-184.22	-73.96	4,193.72	4,145.65	48.07	87.237	
7,000.00	6,680.94	2,977.00	2,976.06	34.54	69.93	-68.38	-184.22	-73.96	4,241.10	4,193.03	48.08	88.216	
7,050.00	6,722.48	2,977.00	2,976.06	34.85	69.93	-57.86	-184.22	-73.96	4,287.79	4,239.67	48.12	89.113	
7,100.00	6,761.76	2,977.00	2,976.06	35.17	69.93	-49.86	-184.22	-73.96	4,333.52	4,285.33	48.19	89.923	
7,150.00	6,798.55	2,977.00	2,976.06	35.51	69.93	-43.75	-184.22	-73.96	4,378.05	4,329.75	48.30	90.641	
7,200.00	6,832.61	2,977.00	2,976.06	35.86	69.93	-39.02	-184.22	-73.96	4,421.14	4,372.69	48.44	91.262	
7,250.00	6,863.74	2,977.00	2,976.06	36.22	69.93	-35.31	-184.22	-73.96	4,462.57	4,413.95	48.62	91.781	
7,300.00	6,891.74	2,977.00	2,976.06	36.59	69.93	-32.37	-184.22	-73.96	4,502.14	4,453.31	48.83	92.196	
7,350.00	6,916.44	2,977.00	2,976.06	36.98	69.93	-30.01	-184.22	-73.96	4,539.66	4,490.58	49.08	92.502	
7,400.00	6,937.69	2,977.00	2,976.06	37.37	69.93	-28.09	-184.22	-73.96	4,574.94	4,525.59	49.35	92.698	
7,450.00	6,955.36	2,977.00	2,976.06	37.78	69.93	-26.54	-184.22	-73.96	4,607.83	4,558.16	49.66	92.780	
7,500.00	6,969.34	2,977.00	2,976.06	38.19	69.93	-25.28	-184.22	-73.96	4,638.17	4,588.16	50.01	92.748	
7,550.00	6,979.53	2,977.00	2,976.06	38.62	69.93	-24.26	-184.22	-73.96	4,665.82	4,615.44	50.39	92.602	
7,600.00	6,985.89	2,977.00	2,976.06	39.05	69.93	-23.45	-184.22	-73.96	4,690.67	4,639.88	50.80	92.342	
7,650.00	6,988.37	2,977.00	2,976.06	39.48	69.93	-22.81	-184.22	-73.96	4,712.61	4,661.37	51.24	91.971	
7,657.25	6,988.40	2,977.00	2,976.06	39.54	69.93	-22.73	-184.22	-73.96	4,715.55	4,664.24	51.30	91.917	
7,700.00	6,988.37	2,977.00	2,976.06	39.92	69.93	-22.73	-184.22	-73.96	4,732.82	4,681.11	51.71	91.526	
7,800.00	6,988.30	2,977.00	2,976.06	40.82	69.93	-22.73	-184.22	-73.96	4,774.48	4,721.79	52.69	90.621	
7,900.00	6,988.23	2,977.00	2,976.06	41.77	69.93	-22.73	-184.22	-73.96	4,817.85	4,764.17	53.68	89.744	
8,000.00	6,988.16	2,977.00	2,976.06	42.75	69.93	-22.73	-184.22	-73.96	4,862.90	4,808.20	54.70	88.903	
8,100.00	6,988.09	2,977.00	2,976.06	43.76	69.93	-22.73	-184.22	-73.96	4,909.56	4,853.84	55.73	88.103	
8,152.35	6,988.06	2,977.00	2,976.06	44.30	69.93	-22.73	-184.22	-73.96	4,934.63	4,878.36	56.27	87.703	
8,200.00	6,988.02	2,977.00	2,976.06	44.79	69.93	-23.69	-184.22	-73.96	4,957.54	4,900.79	56.75	87.354	
8,300.00	6,987.95	2,977.00	2,976.06	45.83	69.93	-25.65	-184.22	-73.96	5,004.92	4,947.17	57.75	86.664	
8,400.00	6,987.88	2,977.00	2,976.06	46.85	69.93	-27.52	-184.22	-73.96	5,051.20	4,992.48	58.72	86.026	
8,500.00	6,987.80	2,977.00	2,976.06	47.85	69.93	-29.30	-184.22	-73.96	5,096.17	5,036.51	59.65	85.430	
8,600.00	6,987.73	2,977.00	2,976.06	48.83	69.93	-30.97	-184.22	-73.96	5,139.65	5,079.09	60.56	84.867	
8,700.00	6,987.65	2,977.00	2,976.06	49.79	69.93	-32.54	-184.22	-73.96	5,181.48	5,120.04	61.44	84.330	
8,800.00	6,987.57	2,977.00	2,976.06	50.72	69.93	-34.00	-184.22	-73.96	5,221.49	5,159.19	62.30	83.814	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #336 - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		359-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)			
8,900.00	6,987.50	2,977.00	2,976.06	51.62	69.93	-35.36	-184.22	-73.96	5,259.53	5,196.40	63.13	83.311		
9,000.00	6,987.42	2,977.00	2,976.06	52.48	69.93	-36.61	-184.22	-73.96	5,295.46	5,231.52	63.94	82.818		
9,100.00	6,987.34	2,977.00	2,976.06	53.30	69.93	-37.75	-184.22	-73.96	5,329.15	5,264.42	64.73	82.330		
9,200.00	6,987.27	2,977.00	2,976.06	54.08	69.93	-38.79	-184.22	-73.96	5,360.47	5,294.98	65.50	81.844		
9,215.33	6,987.26	2,977.00	2,976.06	54.20	69.93	-38.94	-184.22	-73.96	5,365.06	5,299.45	65.61	81.772		
9,300.00	6,987.20	2,977.00	2,976.06	54.85	69.93	-38.94	-184.22	-73.96	5,390.83	5,324.57	66.26	81.359		
9,400.00	6,987.12	2,977.00	2,976.06	55.65	69.93	-38.94	-184.22	-73.96	5,422.82	5,355.77	67.05	80.879		
9,500.00	6,987.05	2,977.00	2,976.06	56.48	69.93	-38.94	-184.22	-73.96	5,456.45	5,388.60	67.86	80.411		
9,600.00	6,986.98	2,977.00	2,976.06	57.35	69.93	-38.94	-184.22	-73.96	5,491.70	5,423.02	68.68	79.959		
9,700.00	6,986.90	2,977.00	2,976.06	58.24	69.93	-38.94	-184.22	-73.96	5,528.53	5,459.01	69.52	79.526		
9,800.00	6,986.83	2,977.00	2,976.06	59.17	69.93	-38.94	-184.22	-73.96	5,566.92	5,496.55	70.36	79.115		
9,900.00	6,986.75	2,977.00	2,976.06	60.12	69.93	-38.94	-184.22	-73.96	5,606.82	5,535.61	71.22	78.729		
10,000.00	6,986.68	2,977.00	2,976.06	61.10	69.93	-38.94	-184.22	-73.96	5,648.22	5,576.14	72.07	78.367		
10,100.00	6,986.61	2,977.00	2,976.06	62.11	69.93	-38.94	-184.22	-73.96	5,691.07	5,618.14	72.93	78.033		
10,200.00	6,986.53	2,977.00	2,976.06	63.14	69.93	-38.94	-184.22	-73.96	5,735.34	5,661.55	73.79	77.726		
10,300.00	6,986.46	2,977.00	2,976.06	64.20	69.93	-38.94	-184.22	-73.96	5,781.01	5,706.36	74.64	77.447		
10,400.00	6,986.39	2,977.00	2,976.06	65.28	69.93	-38.94	-184.22	-73.96	5,828.03	5,752.54	75.50	77.197		
10,500.00	6,986.31	2,977.00	2,976.06	66.38	69.93	-38.94	-184.22	-73.96	5,876.38	5,800.04	76.34	76.975		
10,600.00	6,986.24	2,977.00	2,976.06	67.50	69.93	-38.94	-184.22	-73.96	5,926.02	5,848.84	77.18	76.782		
10,700.00	6,986.17	2,977.00	2,976.06	68.64	69.93	-38.94	-184.22	-73.96	5,976.93	5,898.92	78.01	76.618		
10,800.00	6,986.09	2,977.00	2,976.06	69.80	69.93	-38.94	-184.22	-73.96	6,029.06	5,950.23	78.83	76.481		
10,900.00	6,986.02	2,977.00	2,976.06	70.98	69.93	-38.94	-184.22	-73.96	6,082.39	6,002.75	79.64	76.372		
11,000.00	6,985.95	2,977.00	2,976.06	72.17	69.93	-38.94	-184.22	-73.96	6,136.88	6,056.44	80.44	76.291		
11,100.00	6,985.87	2,977.00	2,976.06	73.38	69.93	-38.94	-184.22	-73.96	6,192.52	6,111.29	81.23	76.236		
11,200.00	6,985.80	2,977.00	2,976.06	74.61	69.93	-38.94	-184.22	-73.96	6,249.25	6,167.25	82.00	76.206		
11,300.00	6,985.72	2,977.00	2,976.06	75.85	69.93	-38.94	-184.22	-73.96	6,307.06	6,224.30	82.77	76.202		
11,400.00	6,985.65	2,977.00	2,976.06	77.10	69.93	-38.94	-184.22	-73.96	6,365.92	6,282.40	83.52	76.222		
11,500.00	6,985.58	2,977.00	2,976.06	78.37	69.93	-38.94	-184.22	-73.96	6,425.80	6,341.54	84.25	76.267		
11,600.00	6,985.50	2,977.00	2,976.06	79.65	69.93	-38.94	-184.22	-73.96	6,486.66	6,401.68	84.98	76.334		
11,700.00	6,985.43	2,977.00	2,976.06	80.94	69.93	-38.94	-184.22	-73.96	6,548.48	6,462.80	85.69	76.423		
11,800.00	6,985.36	2,977.00	2,976.06	82.24	69.93	-38.94	-184.22	-73.96	6,611.24	6,524.86	86.38	76.535		
11,900.00	6,985.28	2,977.00	2,976.06	83.56	69.93	-38.94	-184.22	-73.96	6,674.91	6,587.85	87.06	76.667		
12,000.00	6,985.21	2,977.00	2,976.06	84.88	69.93	-38.94	-184.22	-73.96	6,739.46	6,651.73	87.73	76.819		
12,100.00	6,985.14	2,977.00	2,976.06	86.21	69.93	-38.94	-184.22	-73.96	6,804.87	6,716.48	88.39	76.991		
12,200.00	6,985.06	2,977.00	2,976.06	87.56	69.93	-38.94	-184.22	-73.96	6,871.11	6,782.08	89.03	77.181		
12,300.00	6,984.99	2,977.00	2,976.06	88.91	69.93	-38.94	-184.22	-73.96	6,938.16	6,848.51	89.65	77.390		
12,400.00	6,984.92	2,977.00	2,976.06	90.27	69.93	-38.94	-184.22	-73.96	7,005.99	6,915.73	90.26	77.616		
12,500.00	6,984.84	2,977.00	2,976.06	91.64	69.93	-38.94	-184.22	-73.96	7,074.59	6,983.73	90.86	77.860		
12,600.00	6,984.77	2,977.00	2,976.06	93.01	69.93	-38.94	-184.22	-73.96	7,143.93	7,052.48	91.45	78.119		
12,700.00	6,984.69	2,977.00	2,976.06	94.40	69.93	-38.94	-184.22	-73.96	7,213.99	7,121.97	92.02	78.394		
12,800.00	6,984.62	2,977.00	2,976.06	95.79	69.93	-38.94	-184.22	-73.96	7,284.75	7,192.16	92.58	78.684		
12,900.00	6,984.55	2,977.00	2,976.06	97.18	69.93	-38.94	-184.22	-73.96	7,356.18	7,263.05	93.13	78.988		
13,000.00	6,984.47	2,977.00	2,976.06	98.59	69.93	-38.94	-184.22	-73.96	7,428.28	7,334.61	93.67	79.307		
13,100.00	6,984.40	2,977.00	2,976.06	100.00	69.93	-38.94	-184.22	-73.96	7,501.01	7,406.83	94.19	79.639		
13,200.00	6,984.33	2,977.00	2,976.06	101.41	69.93	-38.94	-184.22	-73.96	7,574.37	7,479.67	94.70	79.983		
13,300.00	6,984.25	2,977.00	2,976.06	102.83	69.93	-38.94	-184.22	-73.96	7,648.33	7,553.14	95.20	80.341		
13,400.00	6,984.18	2,977.00	2,976.06	104.26	69.93	-38.94	-184.22	-73.96	7,722.88	7,627.20	95.69	80.710		
13,500.00	6,984.11	2,977.00	2,976.06	105.69	69.93	-38.94	-184.22	-73.96	7,798.00	7,701.84	96.16	81.091		
13,600.00	6,984.03	2,977.00	2,976.06	107.13	69.93	-38.94	-184.22	-73.96	7,873.67	7,777.04	96.63	81.483		
13,700.00	6,983.96	2,977.00	2,976.06	108.57	69.93	-38.94	-184.22	-73.96	7,949.88	7,852.80	97.09	81.885		
13,800.00	6,983.88	2,977.00	2,976.06	110.02	69.93	-38.94	-184.22	-73.96	8,026.61	7,929.08	97.53	82.298		
13,900.00	6,983.81	2,977.00	2,976.06	111.47	69.93	-38.94	-184.22	-73.96	8,103.85	8,005.89	97.97	82.721		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #336 - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		359-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)			
14,000.00	6,983.74	2,977.00	2,976.06	112.92	69.93	-38.94	-184.22	-73.96	8,181.58	8,083.19	98.39	83.153		
14,100.00	6,983.66	2,977.00	2,976.06	114.38	69.93	-38.94	-184.22	-73.96	8,259.79	8,160.99	98.81	83.595		
14,200.00	6,983.59	2,977.00	2,976.06	115.85	69.93	-38.94	-184.22	-73.96	8,338.47	8,239.26	99.21	84.045		
14,300.00	6,983.52	2,977.00	2,976.06	117.31	69.93	-38.94	-184.22	-73.96	8,417.60	8,317.99	99.61	84.504		
14,400.00	6,983.44	2,977.00	2,976.06	118.78	69.93	-38.94	-184.22	-73.96	8,497.17	8,397.17	100.00	84.971		
14,500.00	6,983.37	2,977.00	2,976.06	120.26	69.93	-38.94	-184.22	-73.96	8,577.17	8,476.79	100.38	85.446		
14,600.00	6,983.30	2,977.00	2,976.06	121.74	69.93	-38.94	-184.22	-73.96	8,657.58	8,556.83	100.75	85.928		
14,700.00	6,983.22	2,977.00	2,976.06	123.22	69.93	-38.94	-184.22	-73.96	8,738.40	8,637.28	101.12	86.418		
14,800.00	6,983.15	2,977.00	2,976.06	124.70	69.93	-38.94	-184.22	-73.96	8,819.61	8,718.13	101.47	86.915		
14,900.00	6,983.08	2,977.00	2,976.06	126.19	69.93	-38.94	-184.22	-73.96	8,901.20	8,799.38	101.82	87.419		
15,000.00	6,983.00	2,977.00	2,976.06	127.68	69.93	-38.94	-184.22	-73.96	8,983.17	8,881.00	102.16	87.929		
15,100.00	6,982.93	2,977.00	2,976.06	129.17	69.93	-38.94	-184.22	-73.96	9,065.49	8,963.00	102.50	88.445		
15,200.00	6,982.85	2,977.00	2,976.06	130.67	69.93	-38.94	-184.22	-73.96	9,148.17	9,045.35	102.83	88.968		
15,300.00	6,982.78	2,977.00	2,976.06	132.16	69.93	-38.94	-184.22	-73.96	9,231.20	9,128.05	103.15	89.496		
15,400.00	6,982.71	2,977.00	2,976.06	133.66	69.93	-38.94	-184.22	-73.96	9,314.55	9,211.09	103.46	90.030		
15,500.00	6,982.63	2,977.00	2,976.06	135.17	69.93	-38.94	-184.22	-73.96	9,398.23	9,294.47	103.77	90.569		
15,600.00	6,982.56	2,977.00	2,976.06	136.67	69.93	-38.94	-184.22	-73.96	9,482.23	9,378.16	104.07	91.114		
15,700.00	6,982.49	2,977.00	2,976.06	138.18	69.93	-38.94	-184.22	-73.96	9,566.53	9,462.17	104.37	91.664		
15,800.00	6,982.41	2,977.00	2,976.06	139.69	69.93	-38.94	-184.22	-73.96	9,651.14	9,546.48	104.66	92.218		
15,900.00	6,982.34	2,977.00	2,976.06	141.20	69.93	-38.94	-184.22	-73.96	9,736.04	9,631.10	104.94	92.777		
16,000.00	6,982.27	2,977.00	2,976.06	142.71	69.93	-38.94	-184.22	-73.96	9,821.22	9,716.00	105.22	93.341		
16,100.00	6,982.19	2,977.00	2,976.06	144.23	69.93	-38.94	-184.22	-73.96	9,906.67	9,801.18	105.49	93.909		
16,200.00	6,982.12	2,977.00	2,976.06	145.75	69.93	-38.94	-184.22	-73.96	9,992.40	9,886.64	105.76	94.481		
16,300.00	6,982.05	2,977.00	2,976.06	147.27	69.93	-38.94	-184.22	-73.96	10,078.39	9,972.37	106.02	95.057		
16,400.00	6,981.97	2,977.00	2,976.06	148.79	69.93	-38.94	-184.22	-73.96	10,164.64	10,058.35	106.28	95.637		
16,500.00	6,981.90	2,977.00	2,976.06	150.31	69.93	-38.94	-184.22	-73.96	10,251.14	10,144.60	106.54	96.221		
16,600.00	6,981.82	2,977.00	2,976.06	151.84	69.93	-38.94	-184.22	-73.96	10,337.88	10,231.09	106.79	96.808		
16,700.00	6,981.75	2,977.00	2,976.06	153.36	69.93	-38.94	-184.22	-73.96	10,424.85	10,317.82	107.03	97.399		
16,800.00	6,981.68	2,977.00	2,976.06	154.89	69.93	-38.94	-184.22	-73.96	10,512.06	10,404.79	107.27	97.993		
16,900.00	6,981.60	2,977.00	2,976.06	156.42	69.93	-38.94	-184.22	-73.96	10,599.50	10,491.99	107.51	98.590		
17,000.00	6,981.53	2,977.00	2,976.06	157.95	69.93	-38.94	-184.22	-73.96	10,687.15	10,579.41	107.74	99.190		
17,100.00	6,981.46	2,977.00	2,976.06	159.49	69.93	-38.94	-184.22	-73.96	10,775.03	10,667.05	107.97	99.793		
17,200.00	6,981.38	2,977.00	2,976.06	161.02	69.93	-38.94	-184.22	-73.96	10,863.11	10,754.91	108.20	100.400		
17,300.00	6,981.31	2,977.00	2,976.06	162.56	69.93	-38.94	-184.22	-73.96	10,951.39	10,842.97	108.42	101.008		
17,400.00	6,981.24	2,977.00	2,976.06	164.09	69.93	-38.94	-184.22	-73.96	11,039.88	10,931.24	108.64	101.620		
17,500.00	6,981.16	2,977.00	2,976.06	165.63	69.93	-38.94	-184.22	-73.96	11,128.56	11,019.70	108.85	102.234		
17,600.00	6,981.09	2,977.00	2,976.06	167.17	69.93	-38.94	-184.22	-73.96	11,217.43	11,108.36	109.07	102.850		
17,700.00	6,981.01	2,977.00	2,976.06	168.71	69.93	-38.94	-184.22	-73.96	11,306.48	11,197.21	109.27	103.469		
17,800.00	6,980.94	2,977.00	2,976.06	170.25	69.93	-38.94	-184.22	-73.96	11,395.72	11,286.24	109.48	104.090		
17,900.00	6,980.87	2,977.00	2,976.06	171.80	69.93	-38.94	-184.22	-73.96	11,485.14	11,375.45	109.68	104.713		
18,000.00	6,980.79	2,977.00	2,976.06	173.34	69.93	-38.94	-184.22	-73.96	11,574.72	11,464.84	109.88	105.338		
18,100.00	6,980.72	2,977.00	2,976.06	174.89	69.93	-38.94	-184.22	-73.96	11,664.48	11,554.40	110.08	105.966		
18,200.00	6,980.65	2,977.00	2,976.06	176.43	69.93	-38.94	-184.22	-73.96	11,754.41	11,644.13	110.27	106.595		
18,300.00	6,980.57	2,977.00	2,976.06	177.98	69.93	-38.94	-184.22	-73.96	11,844.49	11,734.03	110.46	107.226		
18,400.00	6,980.50	2,977.00	2,976.06	179.53	69.93	-38.94	-184.22	-73.96	11,934.73	11,824.08	110.65	107.858		
18,500.00	6,980.43	2,977.00	2,976.06	181.08	69.93	-38.94	-184.22	-73.96	12,025.13	11,914.29	110.84	108.493		
18,600.00	6,980.35	2,977.00	2,976.06	182.63	69.93	-38.94	-184.22	-73.96	12,115.68	12,004.66	111.02	109.129		
18,700.00	6,980.28	2,977.00	2,976.06	184.18	69.93	-38.94	-184.22	-73.96	12,206.37	12,095.17	111.20	109.766		
18,800.00	6,980.21	2,977.00	2,976.06	185.73	69.93	-38.94	-184.22	-73.96	12,297.21	12,185.83	111.38	110.405		
18,900.00	6,980.13	2,977.00	2,976.06	187.28	69.93	-38.94	-184.22	-73.96	12,388.19	12,276.63	111.56	111.045		
19,000.00	6,980.06	2,977.00	2,976.06	188.84	69.93	-38.94	-184.22	-73.96	12,479.31	12,367.58	111.73	111.687		
19,100.00	6,979.98	2,977.00	2,976.06	190.39	69.93	-38.94	-184.22	-73.96	12,570.57	12,458.66	111.91	112.330		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #336 - OH - OH-INC													Offset Site Error:	0.00 usft		
Survey Program:		359-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			
19,200.00	6,979.91	2,977.00	2,976.06	191.95	69.93	-38.94	-184.22	-73.96	12,661.95	12,549.87	112.08	112.974				
19,300.00	6,979.84	2,977.00	2,976.06	193.51	69.93	-38.94	-184.22	-73.96	12,753.47	12,641.22	112.25	113.619				
19,400.00	6,979.76	2,977.00	2,976.06	195.06	69.93	-38.94	-184.22	-73.96	12,845.11	12,732.70	112.41	114.266				
19,500.00	6,979.69	2,977.00	2,976.06	196.62	69.93	-38.94	-184.22	-73.96	12,936.88	12,824.30	112.58	114.913				
19,600.00	6,979.62	2,977.00	2,976.06	198.18	69.93	-38.94	-184.22	-73.96	13,028.76	12,916.02	112.74	115.562				
19,700.00	6,979.54	2,977.00	2,976.06	199.74	69.93	-38.94	-184.22	-73.96	13,120.77	13,007.86	112.90	116.211				
19,800.00	6,979.47	2,977.00	2,976.06	201.30	69.93	-38.94	-184.22	-73.96	13,212.89	13,099.82	113.06	116.861				
19,900.00	6,979.40	2,977.00	2,976.06	202.86	69.93	-38.94	-184.22	-73.96	13,305.12	13,191.90	113.22	117.512				
20,000.00	6,979.32	2,977.00	2,976.06	204.42	69.93	-38.94	-184.22	-73.96	13,397.47	13,284.09	113.38	118.164				
20,100.00	6,979.25	2,977.00	2,976.06	205.98	69.93	-38.94	-184.22	-73.96	13,489.93	13,376.39	113.54	118.817				
20,200.00	6,979.18	2,977.00	2,976.06	207.55	69.93	-38.94	-184.22	-73.96	13,582.49	13,468.80	113.69	119.470				
20,300.00	6,979.10	2,977.00	2,976.06	209.11	69.93	-38.94	-184.22	-73.96	13,675.16	13,561.32	113.84	120.124				
20,400.00	6,979.03	2,977.00	2,976.06	210.68	69.93	-38.94	-184.22	-73.96	13,767.93	13,653.93	113.99	120.779				
20,500.00	6,978.95	2,977.00	2,976.06	212.24	69.93	-38.94	-184.22	-73.96	13,860.80	13,746.66	114.14	121.434				
20,600.00	6,978.88	2,977.00	2,976.06	213.81	69.93	-38.94	-184.22	-73.96	13,953.77	13,839.48	114.29	122.090				
20,700.00	6,978.81	2,977.00	2,976.06	215.37	69.93	-38.94	-184.22	-73.96	14,046.83	13,932.39	114.44	122.746				
20,800.00	6,978.73	2,977.00	2,976.06	216.94	69.93	-38.94	-184.22	-73.96	14,139.99	14,025.41	114.58	123.402				
20,900.00	6,978.66	2,977.00	2,976.06	218.51	69.93	-38.94	-184.22	-73.96	14,233.25	14,118.52	114.73	124.059				
21,000.00	6,978.59	2,977.00	2,976.06	220.07	69.93	-38.94	-184.22	-73.96	14,326.59	14,211.72	114.87	124.717				
21,100.00	6,978.51	2,977.00	2,976.06	221.64	69.93	-38.94	-184.22	-73.96	14,420.02	14,305.01	115.02	125.375				
21,200.00	6,978.44	2,977.00	2,976.06	223.21	69.93	-38.94	-184.22	-73.96	14,513.55	14,398.39	115.16	126.033				
21,300.00	6,978.37	2,977.00	2,976.06	224.78	69.93	-38.94	-184.22	-73.96	14,607.15	14,491.86	115.30	126.691				
21,400.00	6,978.29	2,977.00	2,976.06	226.35	69.93	-38.94	-184.22	-73.96	14,700.84	14,585.41	115.44	127.350				
21,500.00	6,978.22	2,977.00	2,976.06	227.92	69.93	-38.94	-184.22	-73.96	14,794.62	14,679.04	115.58	128.008				
21,600.00	6,978.14	2,977.00	2,976.06	229.49	69.93	-38.94	-184.22	-73.96	14,888.47	14,772.76	115.71	128.667				
21,700.00	6,978.07	2,977.00	2,976.06	231.06	69.93	-38.94	-184.22	-73.96	14,982.41	14,866.56	115.85	129.327				
21,800.00	6,978.00	2,977.00	2,976.06	232.63	69.93	-38.94	-184.22	-73.96	15,076.42	14,960.43	115.99	129.986				
21,900.00	6,977.92	2,977.00	2,976.06	234.21	69.93	-38.94	-184.22	-73.96	15,170.51	15,054.39	116.12	130.645				
22,000.00	6,977.85	2,977.00	2,976.06	235.78	69.93	-38.94	-184.22	-73.96	15,264.67	15,148.42	116.25	131.304				
22,100.00	6,977.78	2,977.00	2,976.06	237.35	69.93	-38.94	-184.22	-73.96	15,358.91	15,242.52	116.39	131.964				
22,200.00	6,977.70	2,977.00	2,976.06	238.92	69.93	-38.94	-184.22	-73.96	15,453.22	15,336.70	116.52	132.623				
22,300.00	6,977.63	2,977.00	2,976.06	240.50	69.93	-38.94	-184.22	-73.96	15,547.60	15,430.95	116.65	133.283				
22,400.00	6,977.56	2,977.00	2,976.06	242.07	69.93	-38.94	-184.22	-73.96	15,642.05	15,525.27	116.78	133.942				
22,500.00	6,977.48	2,977.00	2,976.06	243.65	69.93	-38.94	-184.22	-73.96	15,736.57	15,619.66	116.91	134.601				
22,600.00	6,977.41	2,977.00	2,976.06	245.22	69.93	-38.94	-184.22	-73.96	15,831.16	15,714.12	117.04	135.261				
22,700.00	6,977.34	2,977.00	2,976.06	246.80	69.93	-38.94	-184.22	-73.96	15,925.81	15,808.64	117.17	135.920				
22,800.00	6,977.26	2,977.00	2,976.06	248.37	69.93	-38.94	-184.22	-73.96	16,020.53	15,903.23	117.30	136.579				
22,900.00	6,977.19	2,977.00	2,976.06	249.95	69.93	-38.94	-184.22	-73.96	16,115.31	15,997.89	117.43	137.237				
23,000.00	6,977.11	2,977.00	2,976.06	251.53	69.93	-38.94	-184.22	-73.96	16,210.16	16,092.60	117.55	137.896				
23,100.00	6,977.04	2,977.00	2,976.06	253.10	69.93	-38.94	-184.22	-73.96	16,305.06	16,187.38	117.68	138.554				
23,155.65	6,977.00	2,977.00	2,976.06	253.98	69.93	-38.94	-184.22	-73.96	16,357.91	16,240.16	117.75	138.921				
23,156.15	6,977.00	2,977.00	2,976.06	254.06	69.93	-38.94	-184.22	-73.96	16,358.38	16,238.01	120.38	135.895				

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #336A - OH - OH-INC													Offset Site Error: 0.00 usft
Survey Program: 343-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	-110.60	-905.30	-2,408.49	2,574.20				
100.00	100.00	22.00	22.00	0.25	0.41	-110.60	-905.30	-2,408.49	2,573.01	2,572.36	0.66	3,911.567	
200.00	200.00	122.00	122.00	0.61	2.26	-110.60	-905.30	-2,408.49	2,573.01	2,570.15	2.86	898.164	
300.00	300.00	222.00	222.00	0.97	4.10	-110.60	-905.30	-2,408.49	2,573.01	2,567.94	5.07	507.328	
400.00	400.00	322.00	322.00	1.33	5.95	-110.60	-905.30	-2,408.49	2,573.01	2,565.74	7.28	353.501	
500.00	500.00	422.00	422.00	1.68	7.94	-110.60	-905.30	-2,408.49	2,573.01	2,563.39	9.63	267.273 CC	
600.00	599.98	521.98	521.98	2.04	9.97	-120.62	-905.30	-2,408.49	2,573.90	2,561.89	12.01	214.282 ES	
700.00	699.84	621.36	621.36	2.41	11.98	-120.66	-904.77	-2,408.49	2,576.38	2,562.00	14.39	179.102	
800.00	799.45	719.39	719.39	2.77	13.97	-120.75	-904.90	-2,408.49	2,580.90	2,564.16	16.73	154.238	
900.00	898.70	817.02	817.01	3.13	15.95	-120.87	-905.21	-2,408.49	2,587.29	2,568.21	19.08	135.618	
1,000.00	997.47	919.53	919.47	3.50	18.29	-121.04	-905.30	-2,408.49	2,595.44	2,573.65	21.79	119.113	
1,100.00	1,095.63	1,017.70	1,017.63	3.89	20.60	-118.85	-905.30	-2,408.49	2,605.04	2,580.56	24.48	106.396	
1,200.00	1,193.09	1,113.65	1,113.57	4.29	22.86	-117.34	-904.02	-2,408.49	2,615.29	2,588.15	27.14	96.365	
1,300.00	1,289.73	1,206.02	1,205.93	4.72	25.04	-116.31	-904.36	-2,408.49	2,627.33	2,597.60	29.73	88.387	
1,400.00	1,385.42	1,297.26	1,297.16	5.16	27.19	-115.60	-905.07	-2,408.49	2,640.79	2,608.48	32.30	81.753	
1,496.97	1,477.20	1,399.41	1,399.20	5.62	29.48	-115.22	-905.30	-2,408.49	2,654.90	2,619.87	35.03	75.789	
1,500.00	1,480.05	1,402.26	1,402.05	5.63	29.55	-115.24	-905.30	-2,408.49	2,655.36	2,620.25	35.11	75.634	
1,600.00	1,574.15	1,496.36	1,496.15	6.12	31.63	-115.86	-905.30	-2,408.49	2,670.68	2,633.03	37.65	70.930	
1,700.00	1,668.25	1,589.31	1,589.08	6.62	33.69	-116.44	-903.68	-2,408.49	2,685.66	2,645.48	40.18	66.842	
1,800.00	1,762.35	1,677.95	1,677.71	7.12	35.65	-117.02	-903.97	-2,408.49	2,701.77	2,659.16	42.62	63.399	
1,900.00	1,856.45	1,766.31	1,766.06	7.64	37.61	-117.61	-904.68	-2,408.49	2,718.42	2,673.37	45.05	60.345	
2,000.00	1,950.55	1,872.86	1,872.55	8.16	39.79	-118.30	-905.30	-2,408.49	2,735.32	2,687.61	47.71	57.331	
2,100.00	2,044.65	1,966.96	1,966.65	8.68	41.55	-118.89	-905.30	-2,408.49	2,752.28	2,702.32	49.96	55.093	
2,200.00	2,138.75	2,061.06	2,060.75	9.21	43.31	-119.48	-905.30	-2,408.49	2,769.55	2,717.35	52.20	53.052	
2,300.00	2,232.85	2,153.83	2,153.52	9.74	45.05	-120.03	-904.38	-2,408.49	2,786.68	2,732.25	54.43	51.199	
2,400.00	2,326.95	2,245.07	2,244.75	10.27	46.76	-120.59	-904.56	-2,408.49	2,804.64	2,748.02	56.62	49.533	
2,500.00	2,421.05	2,336.17	2,335.85	10.81	48.47	-121.14	-904.93	-2,408.49	2,822.99	2,764.18	58.81	48.000	
2,600.00	2,515.15	2,437.49	2,437.15	11.34	50.40	-121.75	-905.30	-2,408.49	2,841.62	2,780.39	61.23	46.409	
2,700.00	2,609.25	2,530.68	2,530.34	11.88	52.23	-122.29	-905.06	-2,408.49	2,860.23	2,796.69	63.54	45.013	
2,800.00	2,703.35	2,619.63	2,619.28	12.42	53.98	-122.81	-905.26	-2,408.49	2,879.35	2,813.58	65.77	43.780	
2,900.00	2,797.45	2,719.81	2,719.45	12.96	56.24	-123.39	-905.30	-2,408.49	2,898.65	2,830.13	68.51	42.307	
3,000.00	2,891.55	2,809.00	2,808.60	13.51	58.29	-123.89	-905.30	-2,408.49	2,918.20	2,847.16	71.03	41.082 SF	
3,100.00	2,985.65	2,809.00	2,808.60	14.05	58.29	-123.89	-905.30	-2,408.49	2,939.67	2,868.24	71.43	41.154	
3,200.00	3,079.75	2,809.00	2,808.60	14.60	58.29	-123.89	-905.30	-2,408.49	2,964.36	2,892.61	71.75	41.314	
3,300.00	3,173.85	2,809.00	2,808.60	15.14	58.29	-123.89	-905.30	-2,408.49	2,992.19	2,920.19	72.00	41.558	
3,400.00	3,267.95	2,809.00	2,808.60	15.69	58.29	-123.89	-905.30	-2,408.49	3,023.07	2,950.89	72.18	41.881	
3,500.00	3,362.05	2,809.00	2,808.60	16.23	58.29	-123.89	-905.30	-2,408.49	3,056.92	2,984.62	72.30	42.283	
3,600.00	3,456.15	2,809.00	2,808.60	16.78	58.29	-123.89	-905.30	-2,408.49	3,093.63	3,021.27	72.35	42.758	
3,700.00	3,550.25	2,809.00	2,808.60	17.33	58.29	-123.89	-905.30	-2,408.49	3,133.10	3,060.75	72.35	43.305	
3,800.00	3,644.35	2,809.00	2,808.60	17.88	58.29	-123.89	-905.30	-2,408.49	3,175.23	3,102.93	72.30	43.920	
3,900.00	3,738.45	2,809.00	2,808.60	18.42	58.29	-123.89	-905.30	-2,408.49	3,219.91	3,147.72	72.19	44.602	
4,000.00	3,832.55	2,809.00	2,808.60	18.97	58.29	-123.89	-905.30	-2,408.49	3,267.05	3,195.00	72.05	45.346	
4,100.00	3,926.65	2,809.00	2,808.60	19.52	58.29	-123.89	-905.30	-2,408.49	3,316.53	3,244.67	71.86	46.151	
4,200.00	4,020.75	2,809.00	2,808.60	20.07	58.29	-123.89	-905.30	-2,408.49	3,368.26	3,296.61	71.64	47.014	
4,300.00	4,114.85	2,809.00	2,808.60	20.62	58.29	-123.89	-905.30	-2,408.49	3,422.12	3,350.73	71.40	47.932	
4,400.00	4,208.95	2,809.00	2,808.60	21.17	58.29	-123.89	-905.30	-2,408.49	3,478.03	3,406.91	71.12	48.903	
4,500.00	4,303.05	2,809.00	2,808.60	21.72	58.29	-123.89	-905.30	-2,408.49	3,535.88	3,465.06	70.82	49.926	
4,600.00	4,397.15	2,809.00	2,808.60	22.27	58.29	-123.89	-905.30	-2,408.49	3,595.59	3,525.08	70.51	50.997	
4,700.00	4,491.25	2,809.00	2,808.60	22.82	58.29	-123.89	-905.30	-2,408.49	3,657.05	3,586.88	70.17	52.114	
4,800.00	4,585.35	2,809.00	2,808.60	23.37	58.29	-123.89	-905.30	-2,408.49	3,720.19	3,650.36	69.83	53.276	
4,900.00	4,679.45	2,809.00	2,808.60	23.93	58.29	-123.89	-905.30	-2,408.49	3,784.91	3,715.44	69.47	54.480	
5,000.00	4,773.55	2,809.00	2,808.60	24.48	58.29	-123.89	-905.30	-2,408.49	3,851.15	3,782.04	69.11	55.725	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #336A - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		343-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	
5,100.00	4,867.65	2,809.00	2,808.60	25.03	58.29	-123.89	-905.30	-2,408.49	3,918.82	3,850.07	68.74	57.007		
5,200.00	4,961.75	2,809.00	2,808.60	25.58	58.29	-123.89	-905.30	-2,408.49	3,987.84	3,919.47	68.37	58.327		
5,300.00	5,055.85	2,809.00	2,808.60	26.13	58.29	-123.89	-905.30	-2,408.49	4,058.16	3,990.16	68.00	59.680		
5,400.00	5,149.95	2,809.00	2,808.60	26.68	58.29	-123.89	-905.30	-2,408.49	4,129.70	4,062.08	67.63	61.067		
5,500.00	5,244.05	2,809.00	2,808.60	27.24	58.29	-123.89	-905.30	-2,408.49	4,202.41	4,135.15	67.25	62.485		
5,600.00	5,338.15	2,809.00	2,808.60	27.79	58.29	-123.89	-905.30	-2,408.49	4,276.21	4,209.32	66.89	63.932		
5,665.73	5,400.00	2,809.00	2,808.60	28.15	58.29	-123.89	-905.30	-2,408.49	4,325.30	4,258.65	66.65	64.898		
5,700.00	5,432.28	2,809.00	2,808.60	28.34	58.29	-124.22	-905.30	-2,408.49	4,351.03	4,284.50	66.52	65.407		
5,800.00	5,526.87	2,809.00	2,808.60	28.88	58.29	-125.16	-905.30	-2,408.49	4,426.33	4,360.18	66.15	66.914		
5,900.00	5,622.01	2,809.00	2,808.60	29.41	58.29	-126.10	-905.30	-2,408.49	4,501.95	4,436.19	65.77	68.453		
6,000.00	5,717.67	2,809.00	2,808.60	29.92	58.29	-127.03	-905.30	-2,408.49	4,577.85	4,512.48	65.38	70.024		
6,100.00	5,813.83	2,809.00	2,808.60	30.41	58.29	-127.96	-905.30	-2,408.49	4,653.99	4,589.01	64.98	71.627		
6,200.00	5,910.44	2,809.00	2,808.60	30.89	58.29	-128.89	-905.30	-2,408.49	4,730.33	4,665.76	64.57	73.260		
6,300.00	6,007.50	2,809.00	2,808.60	31.36	58.29	-129.81	-905.30	-2,408.49	4,806.84	4,742.68	64.15	74.925		
6,400.00	6,104.96	2,809.00	2,808.60	31.80	58.29	-130.72	-905.30	-2,408.49	4,883.49	4,819.76	63.74	76.622		
6,500.00	6,202.80	2,809.00	2,808.60	32.24	58.29	-131.62	-905.30	-2,408.49	4,960.26	4,896.95	63.31	78.348		
6,600.00	6,300.98	2,809.00	2,808.60	32.66	58.29	-132.51	-905.30	-2,408.49	5,037.11	4,974.23	62.88	80.106		
6,700.00	6,399.48	2,809.00	2,808.60	33.06	58.29	-133.39	-905.30	-2,408.49	5,114.02	5,051.58	62.45	81.894		
6,722.82	6,422.00	2,809.00	2,808.60	33.15	58.29	-133.59	-905.30	-2,408.49	5,131.58	5,069.24	62.35	82.308		
6,750.00	6,448.76	2,809.00	2,808.60	33.26	58.29	-120.91	-905.30	-2,408.49	5,152.47	5,090.24	62.23	82.797		
6,800.00	6,497.51	2,809.00	2,808.60	33.48	58.29	-104.40	-905.30	-2,408.49	5,190.71	5,128.68	62.03	83.681		
6,850.00	6,545.40	2,809.00	2,808.60	33.72	58.29	-92.90	-905.30	-2,408.49	5,228.52	5,166.67	61.85	84.541		
6,900.00	6,592.13	2,809.00	2,808.60	33.97	58.29	-84.14	-905.30	-2,408.49	5,265.66	5,203.98	61.68	85.371		
6,950.00	6,637.40	2,809.00	2,808.60	34.25	58.29	-77.09	-905.30	-2,408.49	5,301.94	5,240.41	61.53	86.166		
7,000.00	6,680.94	2,809.00	2,808.60	34.54	58.29	-71.24	-905.30	-2,408.49	5,337.13	5,275.73	61.40	86.922		
7,050.00	6,722.48	2,809.00	2,808.60	34.85	58.29	-66.30	-905.30	-2,408.49	5,371.06	5,309.77	61.29	87.633		
7,100.00	6,761.76	2,809.00	2,808.60	35.17	58.29	-62.11	-905.30	-2,408.49	5,403.53	5,342.33	61.20	88.294		
7,150.00	6,798.55	2,809.00	2,808.60	35.51	58.29	-58.52	-905.30	-2,408.49	5,434.38	5,373.25	61.13	88.901		
7,200.00	6,832.61	2,809.00	2,808.60	35.86	58.29	-55.45	-905.30	-2,408.49	5,463.44	5,402.36	61.08	89.449		
7,250.00	6,863.74	2,809.00	2,808.60	36.22	58.29	-52.83	-905.30	-2,408.49	5,490.56	5,429.51	61.05	89.932		
7,300.00	6,891.74	2,809.00	2,808.60	36.59	58.29	-50.60	-905.30	-2,408.49	5,515.61	5,454.56	61.05	90.346		
7,350.00	6,916.44	2,809.00	2,808.60	36.98	58.29	-48.70	-905.30	-2,408.49	5,538.46	5,477.39	61.07	90.687		
7,400.00	6,937.69	2,809.00	2,808.60	37.37	58.29	-47.11	-905.30	-2,408.49	5,559.00	5,497.87	61.12	90.950		
7,450.00	6,955.36	2,809.00	2,808.60	37.78	58.29	-45.79	-905.30	-2,408.49	5,577.12	5,515.92	61.20	91.134		
7,500.00	6,969.34	2,809.00	2,808.60	38.19	58.29	-44.71	-905.30	-2,408.49	5,592.75	5,531.44	61.30	91.234		
7,550.00	6,979.53	2,809.00	2,808.60	38.62	58.29	-43.86	-905.30	-2,408.49	5,605.80	5,544.36	61.43	91.250		
7,600.00	6,985.89	2,809.00	2,808.60	39.05	58.29	-43.22	-905.30	-2,408.49	5,616.21	5,554.61	61.59	91.181		
7,650.00	6,988.37	2,809.00	2,808.60	39.48	58.29	-42.78	-905.30	-2,408.49	5,623.93	5,562.15	61.78	91.026		
7,657.25	6,988.40	2,809.00	2,808.60	39.54	58.29	-42.73	-905.30	-2,408.49	5,624.83	5,563.01	61.81	90.998		
7,700.00	6,988.37	2,809.00	2,808.60	39.92	58.29	-42.73	-905.30	-2,408.49	5,630.09	5,568.10	62.00	90.815		
7,800.00	6,988.30	2,809.00	2,808.60	40.82	58.29	-42.73	-905.30	-2,408.49	5,643.66	5,581.20	62.45	90.365		
7,900.00	6,988.23	2,809.00	2,808.60	41.77	58.29	-42.73	-905.30	-2,408.49	5,658.96	5,596.00	62.95	89.894		
8,000.00	6,988.16	2,809.00	2,808.60	42.75	58.29	-42.73	-905.30	-2,408.49	5,675.98	5,612.49	63.48	89.408		
8,100.00	6,988.09	2,809.00	2,808.60	43.76	58.29	-42.73	-905.30	-2,408.49	5,694.70	5,630.65	64.05	88.912		
8,152.35	6,988.06	2,809.00	2,808.60	44.30	58.29	-42.73	-905.30	-2,408.49	5,705.18	5,640.82	64.36	88.651		
8,200.00	6,988.02	2,809.00	2,808.60	44.79	58.29	-43.01	-905.30	-2,408.49	5,714.59	5,649.95	64.64	88.412		
8,300.00	6,987.95	2,809.00	2,808.60	45.83	58.29	-43.53	-905.30	-2,408.49	5,732.12	5,666.91	65.21	87.899		
8,400.00	6,987.88	2,809.00	2,808.60	46.85	58.29	-43.96	-905.30	-2,408.49	5,746.61	5,680.83	65.77	87.372		
8,500.00	6,987.80	2,809.00	2,808.60	47.85	58.29	-44.29	-905.30	-2,408.49	5,758.00	5,691.68	66.31	86.832		
8,600.00	6,987.73	2,809.00	2,808.60	48.83	58.29	-44.53	-905.30	-2,408.49	5,766.25	5,699.42	66.83	86.280		
8,700.00	6,987.65	2,809.00	2,808.60	49.79	58.29	-44.68	-905.30	-2,408.49	5,771.36	5,704.03	67.33	85.718		
8,800.00	6,987.57	2,809.00	2,808.60	50.72	58.29	-44.74	-905.30	-2,408.49	5,773.28	5,705.48	67.80	85.147		

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #336A - OH - OH-INC													Offset Site Error:	0.00 usft		
Survey Program:		343-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)	Distance Ellipses (usft)	Minimum Separation (usft)	Separation Factor				
8,900.00	6,987.50	2,809.00	2,808.60	51.62	58.29	-44.70	-905.30	-2,408.49	5,772.03	5,703.78	68.25	84.570				
9,000.00	6,987.42	2,809.00	2,808.60	52.48	58.29	-44.58	-905.30	-2,408.49	5,767.60	5,698.92	68.67	83.989				
9,100.00	6,987.34	2,809.00	2,808.60	53.30	58.29	-44.37	-905.30	-2,408.49	5,760.00	5,690.94	69.06	83.406				
9,200.00	6,987.27	2,809.00	2,808.60	54.08	58.29	-44.06	-905.30	-2,408.49	5,749.27	5,679.85	69.42	82.824				
9,215.33	6,987.26	2,809.00	2,808.60	54.20	58.29	-44.01	-905.30	-2,408.49	5,747.35	5,677.88	69.47	82.735				
9,300.00	6,987.20	2,809.00	2,808.60	54.85	58.29	-44.01	-905.30	-2,408.49	5,737.16	5,667.40	69.76	82.242				
9,400.00	6,987.12	2,809.00	2,808.60	55.65	58.29	-44.01	-905.30	-2,408.49	5,726.71	5,656.57	70.13	81.657				
9,500.00	6,987.05	2,809.00	2,808.60	56.48	58.29	-44.01	-905.30	-2,408.49	5,717.99	5,647.45	70.53	81.069				
9,600.00	6,986.98	2,809.00	2,808.60	57.35	58.29	-44.01	-905.30	-2,408.49	5,711.00	5,640.04	70.96	80.481				
9,700.00	6,986.90	2,809.00	2,808.60	58.24	58.29	-44.01	-905.30	-2,408.49	5,705.77	5,634.35	71.42	79.895				
9,800.00	6,986.83	2,809.00	2,808.60	59.17	58.29	-44.01	-905.30	-2,408.49	5,702.28	5,630.38	71.90	79.314				
9,900.00	6,986.75	2,809.00	2,808.60	60.12	58.29	-44.01	-905.30	-2,408.49	5,700.54	5,628.14	72.40	78.738				
9,948.99	6,986.72	2,809.00	2,808.60	60.60	58.29	-44.01	-905.30	-2,408.49	5,700.33	5,627.67	72.66	78.456				
10,000.00	6,986.68	2,809.00	2,808.60	61.10	58.29	-44.01	-905.30	-2,408.49	5,700.56	5,627.63	72.93	78.170				
10,100.00	6,986.61	2,809.00	2,808.60	62.11	58.29	-44.01	-905.30	-2,408.49	5,702.33	5,628.86	73.47	77.612				
10,200.00	6,986.53	2,809.00	2,808.60	63.14	58.29	-44.01	-905.30	-2,408.49	5,705.85	5,631.81	74.04	77.065				
10,300.00	6,986.46	2,809.00	2,808.60	64.20	58.29	-44.01	-905.30	-2,408.49	5,711.13	5,636.50	74.62	76.531				
10,400.00	6,986.39	2,809.00	2,808.60	65.28	58.29	-44.01	-905.30	-2,408.49	5,718.14	5,642.92	75.23	76.012				
10,500.00	6,986.31	2,809.00	2,808.60	66.38	58.29	-44.01	-905.30	-2,408.49	5,726.90	5,651.06	75.84	75.509				
10,600.00	6,986.24	2,809.00	2,808.60	67.50	58.29	-44.01	-905.30	-2,408.49	5,737.38	5,660.91	76.48	75.023				
10,700.00	6,986.17	2,809.00	2,808.60	68.64	58.29	-44.01	-905.30	-2,408.49	5,749.59	5,672.47	77.12	74.555				
10,800.00	6,986.09	2,809.00	2,808.60	69.80	58.29	-44.01	-905.30	-2,408.49	5,763.50	5,685.73	77.77	74.106				
10,900.00	6,986.02	2,809.00	2,808.60	70.98	58.29	-44.01	-905.30	-2,408.49	5,779.12	5,700.68	78.44	73.678				
11,000.00	6,985.95	2,809.00	2,808.60	72.17	58.29	-44.01	-905.30	-2,408.49	5,796.41	5,717.30	79.11	73.271				
11,100.00	6,985.87	2,809.00	2,808.60	73.38	58.29	-44.01	-905.30	-2,408.49	5,815.37	5,735.59	79.79	72.885				
11,200.00	6,985.80	2,809.00	2,808.60	74.61	58.29	-44.01	-905.30	-2,408.49	5,835.99	5,755.52	80.47	72.522				
11,300.00	6,985.72	2,809.00	2,808.60	75.85	58.29	-44.01	-905.30	-2,408.49	5,858.24	5,777.08	81.16	72.182				
11,400.00	6,985.65	2,809.00	2,808.60	77.10	58.29	-44.01	-905.30	-2,408.49	5,882.11	5,800.26	81.85	71.865				
11,500.00	6,985.58	2,809.00	2,808.60	78.37	58.29	-44.01	-905.30	-2,408.49	5,907.57	5,825.03	82.54	71.571				
11,600.00	6,985.50	2,809.00	2,808.60	79.65	58.29	-44.01	-905.30	-2,408.49	5,934.61	5,851.38	83.23	71.300				
11,700.00	6,985.43	2,809.00	2,808.60	80.94	58.29	-44.01	-905.30	-2,408.49	5,963.20	5,879.28	83.93	71.054				
11,800.00	6,985.36	2,809.00	2,808.60	82.24	58.29	-44.01	-905.30	-2,408.49	5,993.33	5,908.71	84.61	70.831				
11,900.00	6,985.28	2,809.00	2,808.60	83.56	58.29	-44.01	-905.30	-2,408.49	6,024.96	5,939.66	85.30	70.632				
12,000.00	6,985.21	2,809.00	2,808.60	84.88	58.29	-44.01	-905.30	-2,408.49	6,058.09	5,972.10	85.98	70.456				
12,100.00	6,985.14	2,809.00	2,808.60	86.21	58.29	-44.01	-905.30	-2,408.49	6,092.67	6,006.01	86.66	70.305				
12,200.00	6,985.06	2,809.00	2,808.60	87.56	58.29	-44.01	-905.30	-2,408.49	6,128.69	6,041.35	87.33	70.176				
12,300.00	6,984.99	2,809.00	2,808.60	88.91	58.29	-44.01	-905.30	-2,408.49	6,166.12	6,078.12	88.00	70.070				
12,400.00	6,984.92	2,809.00	2,808.60	90.27	58.29	-44.01	-905.30	-2,408.49	6,204.93	6,116.28	88.66	69.988				
12,500.00	6,984.84	2,809.00	2,808.60	91.64	58.29	-44.01	-905.30	-2,408.49	6,245.11	6,155.80	89.31	69.928				
12,600.00	6,984.77	2,809.00	2,808.60	93.01	58.29	-44.01	-905.30	-2,408.49	6,286.62	6,196.67	89.95	69.889				
12,700.00	6,984.69	2,809.00	2,808.60	94.40	58.29	-44.01	-905.30	-2,408.49	6,329.44	6,238.85	90.58	69.873				
12,800.00	6,984.62	2,809.00	2,808.60	95.79	58.29	-44.01	-905.30	-2,408.49	6,373.54	6,282.33	91.21	69.878				
12,900.00	6,984.55	2,809.00	2,808.60	97.18	58.29	-44.01	-905.30	-2,408.49	6,418.89	6,327.07	91.82	69.904				
13,000.00	6,984.47	2,809.00	2,808.60	98.59	58.29	-44.01	-905.30	-2,408.49	6,465.48	6,373.05	92.43	69.951				
13,100.00	6,984.40	2,809.00	2,808.60	100.00	58.29	-44.01	-905.30	-2,408.49	6,513.26	6,420.24	93.02	70.017				
13,200.00	6,984.33	2,809.00	2,808.60	101.41	58.29	-44.01	-905.30	-2,408.49	6,562.23	6,468.62	93.61	70.104				
13,300.00	6,984.25	2,809.00	2,808.60	102.83	58.29	-44.01	-905.30	-2,408.49	6,612.34	6,518.16	94.18	70.209				
13,400.00	6,984.18	2,809.00	2,808.60	104.26	58.29	-44.01	-905.30	-2,408.49	6,663.57	6,568.83	94.74	70.333				
13,500.00	6,984.11	2,809.00	2,808.60	105.69	58.29	-44.01	-905.30	-2,408.49	6,715.91	6,620.61	95.29	70.476				
13,600.00	6,984.03	2,809.00	2,808.60	107.13	58.29	-44.01	-905.30	-2,408.49	6,769.31	6,673.48	95.83	70.636				
13,700.00	6,983.96	2,809.00	2,808.60	108.57	58.29	-44.01	-905.30	-2,408.49	6,823.77	6,727.41	96.36	70.813				
13,800.00	6,983.88	2,809.00	2,808.60	110.02	58.29	-44.01	-905.30	-2,408.49	6,879.25	6,782.37	96.88	71.008				

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #336A - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		343-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)	
13,900.00	6,983.81	2,809.00	2,808.60	111.47	58.29	-44.01	-905.30	-2,408.49	6,935.72	6,838.33	97.39	71.218		
14,000.00	6,983.74	2,809.00	2,808.60	112.92	58.29	-44.01	-905.30	-2,408.49	6,993.17	6,895.29	97.88	71.445		
14,100.00	6,983.66	2,809.00	2,808.60	114.38	58.29	-44.01	-905.30	-2,408.49	7,051.57	6,953.20	98.37	71.687		
14,200.00	6,983.59	2,809.00	2,808.60	115.85	58.29	-44.01	-905.30	-2,408.49	7,110.89	7,012.06	98.84	71.945		
14,300.00	6,983.52	2,809.00	2,808.60	117.31	58.29	-44.01	-905.30	-2,408.49	7,171.12	7,071.82	99.30	72.216		
14,400.00	6,983.44	2,809.00	2,808.60	118.78	58.29	-44.01	-905.30	-2,408.49	7,232.24	7,132.48	99.75	72.502		
14,500.00	6,983.37	2,809.00	2,808.60	120.26	58.29	-44.01	-905.30	-2,408.49	7,294.21	7,194.01	100.19	72.802		
14,600.00	6,983.30	2,809.00	2,808.60	121.74	58.29	-44.01	-905.30	-2,408.49	7,357.01	7,256.39	100.62	73.116		
14,700.00	6,983.22	2,809.00	2,808.60	123.22	58.29	-44.01	-905.30	-2,408.49	7,420.64	7,319.59	101.04	73.442		
14,800.00	6,983.15	2,809.00	2,808.60	124.70	58.29	-44.01	-905.30	-2,408.49	7,485.05	7,383.60	101.45	73.780		
14,900.00	6,983.08	2,809.00	2,808.60	126.19	58.29	-44.01	-905.30	-2,408.49	7,550.25	7,448.40	101.85	74.131		
15,000.00	6,983.00	2,809.00	2,808.60	127.68	58.29	-44.01	-905.30	-2,408.49	7,616.20	7,513.96	102.24	74.494		
15,100.00	6,982.93	2,809.00	2,808.60	129.17	58.29	-44.01	-905.30	-2,408.49	7,682.88	7,580.26	102.62	74.868		
15,200.00	6,982.85	2,809.00	2,808.60	130.67	58.29	-44.01	-905.30	-2,408.49	7,750.28	7,647.29	102.99	75.254		
15,300.00	6,982.78	2,809.00	2,808.60	132.16	58.29	-44.01	-905.30	-2,408.49	7,818.38	7,715.03	103.35	75.650		
15,400.00	6,982.71	2,809.00	2,808.60	133.66	58.29	-44.01	-905.30	-2,408.49	7,887.16	7,783.45	103.70	76.056		
15,500.00	6,982.63	2,809.00	2,808.60	135.17	58.29	-44.01	-905.30	-2,408.49	7,956.60	7,852.55	104.05	76.473		
15,600.00	6,982.56	2,809.00	2,808.60	136.67	58.29	-44.01	-905.30	-2,408.49	8,026.68	7,922.30	104.38	76.899		
15,700.00	6,982.49	2,809.00	2,808.60	138.18	58.29	-44.01	-905.30	-2,408.49	8,097.40	7,992.69	104.71	77.335		
15,800.00	6,982.41	2,809.00	2,808.60	139.69	58.29	-44.01	-905.30	-2,408.49	8,168.72	8,063.70	105.02	77.780		
15,900.00	6,982.34	2,809.00	2,808.60	141.20	58.29	-44.01	-905.30	-2,408.49	8,240.65	8,135.31	105.33	78.233		
16,000.00	6,982.27	2,809.00	2,808.60	142.71	58.29	-44.01	-905.30	-2,408.49	8,313.15	8,207.51	105.64	78.696		
16,100.00	6,982.19	2,809.00	2,808.60	144.23	58.29	-44.01	-905.30	-2,408.49	8,386.22	8,280.29	105.93	79.167		
16,200.00	6,982.12	2,809.00	2,808.60	145.75	58.29	-44.01	-905.30	-2,408.49	8,459.84	8,353.62	106.22	79.645		
16,300.00	6,982.05	2,809.00	2,808.60	147.27	58.29	-44.01	-905.30	-2,408.49	8,533.99	8,427.49	106.50	80.132		
16,400.00	6,981.97	2,809.00	2,808.60	148.79	58.29	-44.01	-905.30	-2,408.49	8,608.67	8,501.90	106.77	80.626		
16,500.00	6,981.90	2,809.00	2,808.60	150.31	58.29	-44.01	-905.30	-2,408.49	8,683.86	8,576.82	107.04	81.128		
16,600.00	6,981.82	2,809.00	2,808.60	151.84	58.29	-44.01	-905.30	-2,408.49	8,759.55	8,652.25	107.30	81.636		
16,700.00	6,981.75	2,809.00	2,808.60	153.36	58.29	-44.01	-905.30	-2,408.49	8,835.72	8,728.16	107.55	82.152		
16,800.00	6,981.68	2,809.00	2,808.60	154.89	58.29	-44.01	-905.30	-2,408.49	8,912.35	8,804.55	107.80	82.674		
16,900.00	6,981.60	2,809.00	2,808.60	156.42	58.29	-44.01	-905.30	-2,408.49	8,989.45	8,881.41	108.04	83.202		
17,000.00	6,981.53	2,809.00	2,808.60	157.95	58.29	-44.01	-905.30	-2,408.49	9,067.00	8,958.72	108.28	83.737		
17,100.00	6,981.46	2,809.00	2,808.60	159.49	58.29	-44.01	-905.30	-2,408.49	9,144.98	9,036.47	108.51	84.277		
17,200.00	6,981.38	2,809.00	2,808.60	161.02	58.29	-44.01	-905.30	-2,408.49	9,223.39	9,114.65	108.74	84.824		
17,300.00	6,981.31	2,809.00	2,808.60	162.56	58.29	-44.01	-905.30	-2,408.49	9,302.21	9,193.25	108.96	85.376		
17,400.00	6,981.24	2,809.00	2,808.60	164.09	58.29	-44.01	-905.30	-2,408.49	9,381.43	9,272.26	109.17	85.934		
17,500.00	6,981.16	2,809.00	2,808.60	165.63	58.29	-44.01	-905.30	-2,408.49	9,461.05	9,351.67	109.38	86.496		
17,600.00	6,981.09	2,809.00	2,808.60	167.17	58.29	-44.01	-905.30	-2,408.49	9,541.05	9,431.47	109.59	87.064		
17,700.00	6,981.01	2,809.00	2,808.60	168.71	58.29	-44.01	-905.30	-2,408.49	9,621.43	9,511.64	109.79	87.637		
17,800.00	6,980.94	2,809.00	2,808.60	170.25	58.29	-44.01	-905.30	-2,408.49	9,702.17	9,592.19	109.98	88.215		
17,900.00	6,980.87	2,809.00	2,808.60	171.80	58.29	-44.01	-905.30	-2,408.49	9,783.27	9,673.09	110.18	88.797		
18,000.00	6,980.79	2,809.00	2,808.60	173.34	58.29	-44.01	-905.30	-2,408.49	9,864.71	9,754.35	110.36	89.384		
18,100.00	6,980.72	2,809.00	2,808.60	174.89	58.29	-44.01	-905.30	-2,408.49	9,946.49	9,835.94	110.55	89.975		
18,200.00	6,980.65	2,809.00	2,808.60	176.43	58.29	-44.01	-905.30	-2,408.49	10,028.60	9,917.88	110.73	90.570		
18,300.00	6,980.57	2,809.00	2,808.60	177.98	58.29	-44.01	-905.30	-2,408.49	10,111.04	10,000.13	110.90	91.170		
18,400.00	6,980.50	2,809.00	2,808.60	179.53	58.29	-44.01	-905.30	-2,408.49	10,193.79	10,082.71	111.08	91.773		
18,500.00	6,980.43	2,809.00	2,808.60	181.08	58.29	-44.01	-905.30	-2,408.49	10,276.84	10,165.60	111.25	92.380		
18,600.00	6,980.35	2,809.00	2,808.60	182.63	58.29	-44.01	-905.30	-2,408.49	10,360.20	10,248.79	111.41	92.990		
18,700.00	6,980.28	2,809.00	2,808.60	184.18	58.29	-44.01	-905.30	-2,408.49	10,443.84	10,332.27	111.57	93.605		
18,800.00	6,980.21	2,809.00	2,808.60	185.73	58.29	-44.01	-905.30	-2,408.49	10,527.78	10,416.04	111.73	94.222		
18,900.00	6,980.13	2,809.00	2,808.60	187.28	58.29	-44.01	-905.30	-2,408.49	10,611.99	10,500.10	111.89	94.843		
19,000.00	6,980.06	2,809.00	2,808.60	188.84	58.29	-44.01	-905.30	-2,408.49	10,696.47	10,584.43	112.04	95.467		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #336A - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		343-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)			
19,100.00	6,979.98	2,809.00	2,808.60	190.39	58.29	-44.01	-905.30	-2,408.49	10,781.22	10,669.03	112.19	96.094		
19,200.00	6,979.91	2,809.00	2,808.60	191.95	58.29	-44.01	-905.30	-2,408.49	10,866.23	10,753.89	112.34	96.724		
19,300.00	6,979.84	2,809.00	2,808.60	193.51	58.29	-44.01	-905.30	-2,408.49	10,951.49	10,839.00	112.49	97.357		
19,400.00	6,979.76	2,809.00	2,808.60	195.06	58.29	-44.01	-905.30	-2,408.49	11,037.00	10,924.37	112.63	97.993		
19,500.00	6,979.69	2,809.00	2,808.60	196.62	58.29	-44.01	-905.30	-2,408.49	11,122.75	11,009.98	112.77	98.631		
19,600.00	6,979.62	2,809.00	2,808.60	198.18	58.29	-44.01	-905.30	-2,408.49	11,208.73	11,095.82	112.91	99.272		
19,700.00	6,979.54	2,809.00	2,808.60	199.74	58.29	-44.01	-905.30	-2,408.49	11,294.95	11,181.91	113.04	99.916		
19,800.00	6,979.47	2,809.00	2,808.60	201.30	58.29	-44.01	-905.30	-2,408.49	11,381.39	11,268.21	113.18	100.562		
19,900.00	6,979.40	2,809.00	2,808.60	202.86	58.29	-44.01	-905.30	-2,408.49	11,468.06	11,354.75	113.31	101.210		
20,000.00	6,979.32	2,809.00	2,808.60	204.42	58.29	-44.01	-905.30	-2,408.49	11,554.93	11,441.50	113.44	101.860		
20,100.00	6,979.25	2,809.00	2,808.60	205.98	58.29	-44.01	-905.30	-2,408.49	11,642.02	11,528.46	113.57	102.513		
20,200.00	6,979.18	2,809.00	2,808.60	207.55	58.29	-44.01	-905.30	-2,408.49	11,729.32	11,615.63	113.69	103.168		
20,300.00	6,979.10	2,809.00	2,808.60	209.11	58.29	-44.01	-905.30	-2,408.49	11,816.81	11,703.00	113.82	103.824		
20,400.00	6,979.03	2,809.00	2,808.60	210.68	58.29	-44.01	-905.30	-2,408.49	11,904.51	11,790.57	113.94	104.483		
20,500.00	6,978.95	2,809.00	2,808.60	212.24	58.29	-44.01	-905.30	-2,408.49	11,992.39	11,878.34	114.06	105.143		
20,600.00	6,978.88	2,809.00	2,808.60	213.81	58.29	-44.01	-905.30	-2,408.49	12,080.47	11,966.29	114.18	105.805		
20,700.00	6,978.81	2,809.00	2,808.60	215.37	58.29	-44.01	-905.30	-2,408.49	12,168.73	12,054.43	114.29	106.469		
20,800.00	6,978.73	2,809.00	2,808.60	216.94	58.29	-44.01	-905.30	-2,408.49	12,257.17	12,142.76	114.41	107.135		
20,900.00	6,978.66	2,809.00	2,808.60	218.51	58.29	-44.01	-905.30	-2,408.49	12,345.78	12,231.26	114.52	107.802		
21,000.00	6,978.59	2,809.00	2,808.60	220.07	58.29	-44.01	-905.30	-2,408.49	12,434.57	12,319.93	114.64	108.470		
21,100.00	6,978.51	2,809.00	2,808.60	221.64	58.29	-44.01	-905.30	-2,408.49	12,523.53	12,408.78	114.75	109.140		
21,200.00	6,978.44	2,809.00	2,808.60	223.21	58.29	-44.01	-905.30	-2,408.49	12,612.65	12,497.79	114.86	109.812		
21,300.00	6,978.37	2,809.00	2,808.60	224.78	58.29	-44.01	-905.30	-2,408.49	12,701.93	12,586.97	114.97	110.485		
21,400.00	6,978.29	2,809.00	2,808.60	226.35	58.29	-44.01	-905.30	-2,408.49	12,791.38	12,676.30	115.07	111.159		
21,500.00	6,978.22	2,809.00	2,808.60	227.92	58.29	-44.01	-905.30	-2,408.49	12,880.98	12,765.80	115.18	111.834		
21,600.00	6,978.14	2,809.00	2,808.60	229.49	58.29	-44.01	-905.30	-2,408.49	12,970.73	12,855.44	115.28	112.510		
21,700.00	6,978.07	2,809.00	2,808.60	231.06	58.29	-44.01	-905.30	-2,408.49	13,060.63	12,945.24	115.39	113.188		
21,800.00	6,978.00	2,809.00	2,808.60	232.63	58.29	-44.01	-905.30	-2,408.49	13,150.67	13,035.18	115.49	113.866		
21,900.00	6,977.92	2,809.00	2,808.60	234.21	58.29	-44.01	-905.30	-2,408.49	13,240.86	13,125.26	115.59	114.546		
22,000.00	6,977.85	2,809.00	2,808.60	235.78	58.29	-44.01	-905.30	-2,408.49	13,331.19	13,215.49	115.70	115.227		
22,100.00	6,977.78	2,809.00	2,808.60	237.35	58.29	-44.01	-905.30	-2,408.49	13,421.65	13,305.86	115.80	115.908		
22,200.00	6,977.70	2,809.00	2,808.60	238.92	58.29	-44.01	-905.30	-2,408.49	13,512.25	13,396.36	115.90	116.590		
22,300.00	6,977.63	2,809.00	2,808.60	240.50	58.29	-44.01	-905.30	-2,408.49	13,602.98	13,486.99	115.99	117.273		
22,400.00	6,977.56	2,809.00	2,808.60	242.07	58.29	-44.01	-905.30	-2,408.49	13,693.84	13,577.75	116.09	117.957		
22,500.00	6,977.48	2,809.00	2,808.60	243.65	58.29	-44.01	-905.30	-2,408.49	13,784.83	13,668.64	116.19	118.642		
22,600.00	6,977.41	2,809.00	2,808.60	245.22	58.29	-44.01	-905.30	-2,408.49	13,875.94	13,759.66	116.28	119.327		
22,700.00	6,977.34	2,809.00	2,808.60	246.80	58.29	-44.01	-905.30	-2,408.49	13,967.17	13,850.79	116.38	120.013		
22,800.00	6,977.26	2,809.00	2,808.60	248.37	58.29	-44.01	-905.30	-2,408.49	14,058.53	13,942.05	116.48	120.700		
22,900.00	6,977.19	2,809.00	2,808.60	249.95	58.29	-44.01	-905.30	-2,408.49	14,149.99	14,033.43	116.57	121.387		
23,000.00	6,977.11	2,809.00	2,808.60	251.53	58.29	-44.01	-905.30	-2,408.49	14,241.58	14,124.92	116.66	122.075		
23,100.00	6,977.04	2,809.00	2,808.60	253.10	58.29	-44.01	-905.30	-2,408.49	14,333.27	14,216.52	116.76	122.763		
23,155.65	6,977.00	2,809.00	2,808.60	253.98	58.29	-44.01	-905.30	-2,408.49	14,384.35	14,267.55	116.81	123.146		
23,156.15	6,977.00	2,809.00	2,808.60	254.06	58.29	-44.01	-905.30	-2,408.49	14,384.81	14,266.23	118.58	121.309		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #350A - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program: 100-MWD OWSG Rev5												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	284.33	284.32	0.00	1.81	89.56	55.75	7,239.80	7,240.05				
100.00	100.00	365.50	365.49	0.25	2.14	89.56	56.16	7,240.15	7,240.48	7,238.17	2.31	3,133.705 ES	
200.00	200.00	428.38	428.37	0.61	2.37	89.55	56.29	7,240.61	7,241.24	7,238.35	2.89	2,501.999	
300.00	300.00	500.00	499.98	0.97	2.61	89.56	56.22	7,241.74	7,242.74	7,239.24	3.50	2,070.322	
400.00	400.00	542.38	542.35	1.33	2.75	89.56	56.16	7,242.66	7,244.73	7,240.73	4.00	1,811.872	
500.00	500.00	600.00	599.95	1.68	2.93	89.56	56.22	7,244.03	7,247.18	7,242.63	4.55	1,593.075	
600.00	599.98	669.77	669.70	2.04	3.16	79.51	56.33	7,246.03	7,249.79	7,244.65	5.14	1,411.165	
700.00	699.84	700.00	699.91	2.41	3.26	79.47	56.35	7,247.07	7,252.48	7,246.89	5.59	1,296.524	
800.00	799.45	765.79	765.64	2.77	3.48	79.46	56.23	7,249.79	7,255.14	7,248.97	6.17	1,175.227	
900.00	898.70	800.00	799.81	3.13	3.59	79.43	56.07	7,251.49	7,258.01	7,251.36	6.65	1,091.173	
1,000.00	997.47	844.45	844.18	3.50	3.77	79.43	55.75	7,254.07	7,261.06	7,253.83	7.23	1,004.577	
1,100.00	1,095.63	900.00	899.59	3.89	4.02	81.81	55.18	7,257.95	7,264.89	7,257.02	7.87	923.240	
1,200.00	1,193.09	929.80	929.30	4.29	4.15	83.46	54.81	7,260.26	7,269.66	7,261.26	8.40	865.231	
1,300.00	1,289.73	1,000.00	999.27	4.72	4.45	84.77	53.80	7,265.90	7,275.27	7,266.13	9.14	796.193	
1,400.00	1,385.42	1,040.55	1,039.66	5.16	4.59	85.73	53.20	7,269.38	7,281.75	7,272.03	9.72	749.189	
1,496.97	1,477.20	1,100.00	1,098.84	5.62	4.80	86.50	52.41	7,275.00	7,289.10	7,278.72	10.38	702.322	
1,500.00	1,480.05	1,100.00	1,098.84	5.63	4.80	86.50	52.41	7,275.00	7,289.34	7,278.95	10.39	701.380	
1,600.00	1,574.15	1,100.00	1,098.84	6.12	4.80	86.50	52.41	7,275.00	7,297.85	7,286.98	10.87	671.403	
1,700.00	1,668.25	1,158.61	1,157.11	6.62	5.05	86.67	51.57	7,281.19	7,307.14	7,295.53	11.61	629.309	
1,800.00	1,762.35	1,200.00	1,198.22	7.12	5.22	86.78	50.83	7,285.97	7,317.39	7,305.10	12.29	595.631	
1,900.00	1,856.45	1,260.13	1,257.89	7.64	5.48	86.95	49.66	7,293.26	7,328.35	7,315.30	13.05	561.605	
2,000.00	1,950.55	1,300.00	1,297.45	8.16	5.64	87.06	48.85	7,298.20	7,339.88	7,326.16	13.73	534.708	
2,100.00	2,044.65	1,353.63	1,350.62	8.68	5.87	87.21	47.73	7,305.17	7,352.14	7,337.67	14.47	508.167	
2,200.00	2,138.75	1,400.00	1,396.52	9.21	6.07	87.34	46.74	7,311.64	7,365.29	7,350.12	15.18	485.230	
2,300.00	2,232.85	1,438.55	1,434.65	9.74	6.23	87.45	45.96	7,317.29	7,379.24	7,363.38	15.86	465.291	
2,400.00	2,326.95	1,500.00	1,495.37	10.27	6.50	87.62	44.98	7,326.67	7,393.93	7,377.28	16.65	444.182	
2,500.00	2,421.05	1,500.00	1,495.37	10.81	6.50	87.62	44.98	7,326.67	7,409.46	7,392.31	17.15	432.073	
2,600.00	2,515.15	1,567.02	1,561.49	11.34	6.79	87.80	44.11	7,337.58	7,425.57	7,407.61	17.97	413.291	
2,700.00	2,609.25	1,600.00	1,593.97	11.88	6.94	87.89	43.69	7,343.26	7,442.66	7,424.03	18.62	399.638	
2,800.00	2,703.35	1,653.90	1,647.00	12.42	7.18	88.03	42.85	7,352.89	7,460.49	7,441.10	19.38	384.891	
2,900.00	2,797.45	1,700.00	1,692.30	12.96	7.38	88.16	41.87	7,361.39	7,479.03	7,458.93	20.10	372.006	
3,000.00	2,891.55	1,753.92	1,745.22	13.51	7.61	88.31	40.47	7,371.60	7,498.26	7,477.41	20.85	359.658	
3,100.00	2,985.65	1,800.00	1,790.40	14.05	7.80	88.43	39.10	7,380.55	7,518.12	7,496.57	21.55	348.796	
3,200.00	3,079.75	1,838.62	1,828.22	14.60	7.98	88.54	37.84	7,388.28	7,538.75	7,516.51	22.25	338.890	
3,300.00	3,173.85	1,900.00	1,888.18	15.14	8.26	88.71	35.65	7,401.21	7,560.37	7,537.31	23.05	327.930	
3,400.00	3,267.95	1,900.00	1,888.18	15.69	8.26	88.71	35.65	7,401.21	7,582.58	7,559.05	23.54	322.164	
3,500.00	3,362.05	1,963.74	1,950.32	16.23	8.57	88.89	33.33	7,415.25	7,605.59	7,581.23	24.36	312.224	
3,600.00	3,456.15	2,000.00	1,985.62	16.78	8.74	88.99	32.06	7,423.41	7,629.25	7,604.21	25.03	304.788	
3,700.00	3,550.25	2,040.37	2,024.87	17.33	8.93	89.10	30.59	7,432.76	7,653.68	7,627.95	25.73	297.434	
3,800.00	3,644.35	2,100.00	2,082.65	17.88	9.23	89.27	28.10	7,447.27	7,679.16	7,652.61	26.54	289.334	
3,900.00	3,738.45	2,100.00	2,082.65	18.42	9.23	89.27	28.10	7,447.27	7,705.17	7,678.16	27.00	285.341	
4,000.00	3,832.55	2,155.77	2,136.55	18.97	9.50	89.42	25.82	7,461.41	7,732.04	7,704.26	27.79	278.254	
4,100.00	3,926.65	2,200.00	2,179.25	19.52	9.72	89.54	24.32	7,472.84	7,759.50	7,731.00	28.50	272.229	
4,200.00	4,020.75	2,240.99	2,218.76	20.07	9.92	89.65	23.05	7,483.70	7,787.66	7,758.47	29.19	266.783	
4,300.00	4,114.85	2,300.00	2,275.46	20.62	10.21	89.81	21.14	7,499.91	7,816.70	7,786.72	29.98	260.721	
4,400.00	4,208.95	2,300.00	2,275.46	21.17	10.21	89.81	21.14	7,499.91	7,846.34	7,815.91	30.42	257.914	
4,500.00	4,303.05	2,370.67	2,343.19	21.72	10.55	89.99	19.11	7,519.97	7,876.61	7,845.33	31.28	251.804	
4,600.00	4,397.15	2,425.11	2,395.28	22.27	10.81	90.13	17.92	7,535.75	7,907.44	7,875.40	32.03	246.841	
4,700.00	4,491.25	2,479.20	2,446.96	22.82	11.06	90.26	16.88	7,551.68	7,938.79	7,906.01	32.78	242.195	
4,800.00	4,585.35	2,500.00	2,466.82	23.37	11.16	90.31	16.51	7,557.88	7,970.78	7,937.46	33.32	239.187	
4,900.00	4,679.45	2,568.19	2,531.79	23.93	11.48	90.48	15.09	7,578.52	8,003.24	7,969.08	34.15	234.347	
5,000.00	4,773.55	2,600.00	2,562.03	24.48	11.63	90.56	14.27	7,588.34	8,036.44	8,001.68	34.76	231.212	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #350A - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program:		100-MWD OWSG Rev5						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)			
5,100.00	4,867.65	2,651.72	2,611.12	25.03	11.88	90.69	12.57	7,604.54	8,070.26	8,034.77	35.49	227.422	
5,200.00	4,961.75	2,700.00	2,656.85	25.58	12.11	90.82	10.46	7,619.89	8,104.73	8,068.54	36.19	223.948	
5,300.00	5,055.85	2,700.00	2,656.85	26.13	12.11	90.82	10.46	7,619.89	8,139.99	8,103.40	36.59	222.452	
5,400.00	5,149.95	2,760.09	2,713.58	26.68	12.41	90.98	7.09	7,639.42	8,175.73	8,138.34	37.38	218.702	
5,500.00	5,244.05	2,800.00	2,751.12	27.24	12.61	91.08	4.38	7,652.68	8,212.31	8,174.27	38.04	215.895	
5,600.00	5,338.15	2,800.00	2,751.12	27.79	12.61	91.08	4.38	7,652.68	8,249.69	8,211.26	38.43	214.694	
5,665.73	5,400.00	2,800.00	2,751.12	28.15	12.61	91.08	4.38	7,652.68	8,274.82	8,236.14	38.68	213.954	
5,700.00	5,432.28	2,842.27	2,790.72	28.34	12.85	91.34	1.21	7,667.11	8,287.71	8,248.58	39.12	211.830	
5,800.00	5,526.87	2,900.00	2,844.49	28.88	13.18	91.91	-3.40	7,687.62	8,326.80	8,286.88	39.93	208.543	
5,900.00	5,622.01	2,900.00	2,844.49	29.41	13.18	92.34	-3.40	7,687.62	8,366.14	8,325.86	40.28	207.719	
6,000.00	5,717.67	2,900.00	2,844.49	29.92	13.18	92.78	-3.40	7,687.62	8,406.42	8,365.81	40.60	207.035	
6,100.00	5,813.83	2,956.81	2,897.10	30.41	13.49	93.35	-7.73	7,708.60	8,447.14	8,405.81	41.33	204.384	
6,200.00	5,910.44	3,645.00	3,540.64	30.89	17.80	95.00	-41.36	7,947.01	8,485.60	8,438.33	47.26	179.538	
6,300.00	6,007.50	3,645.00	3,540.64	31.36	17.80	95.37	-41.36	7,947.01	8,520.71	8,473.13	47.58	179.094	
6,400.00	6,104.96	3,645.00	3,540.64	31.80	17.80	95.76	-41.36	7,947.01	8,556.69	8,508.82	47.87	178.751	
6,500.00	6,202.80	3,645.00	3,540.64	32.24	17.80	96.15	-41.36	7,947.01	8,593.52	8,545.38	48.14	178.505	
6,600.00	6,300.98	3,645.00	3,540.64	32.66	17.80	96.56	-41.36	7,947.01	8,631.18	8,582.79	48.39	178.353	
6,700.00	6,399.48	3,645.00	3,540.64	33.06	17.80	96.97	-41.36	7,947.01	8,669.65	8,621.03	48.63	178.291	
6,722.82	6,422.00	3,645.00	3,540.64	33.15	17.80	97.06	-41.36	7,947.01	8,678.54	8,629.87	48.68	178.290	
6,750.00	6,448.76	3,645.00	3,540.64	33.26	17.80	106.24	-41.36	7,947.01	8,689.63	8,640.89	48.74	178.289 SF	
6,800.00	6,497.51	3,645.00	3,540.64	33.48	17.80	116.23	-41.36	7,947.01	8,712.49	8,663.62	48.87	178.295	
6,850.00	6,545.40	3,645.00	3,540.64	33.72	17.80	121.17	-41.36	7,947.01	8,738.38	8,689.37	49.01	178.315	
6,900.00	6,592.13	3,645.00	3,540.64	33.97	17.80	123.38	-41.36	7,947.01	8,767.11	8,717.96	49.16	178.354	
6,950.00	6,637.40	3,645.00	3,540.64	34.25	17.80	123.88	-41.36	7,947.01	8,798.49	8,749.17	49.32	178.411	
7,000.00	6,680.94	3,645.00	3,540.64	34.54	17.80	123.12	-41.36	7,947.01	8,832.29	8,782.80	49.48	178.484	
7,050.00	6,722.48	3,645.00	3,540.64	34.85	17.80	121.31	-41.36	7,947.01	8,868.28	8,818.61	49.66	178.574	
7,100.00	6,761.76	3,645.00	3,540.64	35.17	17.80	118.52	-41.36	7,947.01	8,906.20	8,856.36	49.84	178.679	
7,150.00	6,798.55	3,645.00	3,540.64	35.51	17.80	114.75	-41.36	7,947.01	8,945.81	8,895.78	50.03	178.795	
7,200.00	6,832.61	3,645.00	3,540.64	35.86	17.80	109.97	-41.36	7,947.01	8,986.84	8,936.61	50.23	178.920	
7,250.00	6,863.74	3,645.00	3,540.64	36.22	17.80	104.19	-41.36	7,947.01	9,029.02	8,978.59	50.43	179.052	
7,300.00	6,891.74	3,645.00	3,540.64	36.59	17.80	97.46	-41.36	7,947.01	9,072.07	9,021.44	50.63	179.187	
7,350.00	6,916.44	3,645.00	3,540.64	36.98	17.80	89.94	-41.36	7,947.01	9,115.72	9,064.88	50.83	179.321	
7,400.00	6,937.69	3,645.00	3,540.64	37.37	17.80	81.94	-41.36	7,947.01	9,159.69	9,108.65	51.04	179.451	
7,450.00	6,955.36	3,645.00	3,540.64	37.78	17.80	73.84	-41.36	7,947.01	9,203.71	9,152.46	51.25	179.572	
7,500.00	6,969.34	3,645.00	3,540.64	38.19	17.80	66.05	-41.36	7,947.01	9,247.51	9,196.04	51.47	179.681	
7,550.00	6,979.53	3,645.00	3,540.64	38.62	17.80	58.85	-41.36	7,947.01	9,290.82	9,239.14	51.68	179.774	
7,600.00	6,985.89	3,645.00	3,540.64	39.05	17.80	52.44	-41.36	7,947.01	9,333.38	9,281.49	51.90	179.846	
7,650.00	6,988.37	3,645.00	3,540.64	39.48	17.80	46.84	-41.36	7,947.01	9,374.95	9,322.84	52.11	179.894	
7,657.25	6,988.40	3,645.00	3,540.64	39.54	17.80	46.09	-41.36	7,947.01	9,380.88	9,328.74	52.14	179.904	
7,700.00	6,988.37	3,645.00	3,540.64	39.92	17.80	46.09	-41.36	7,947.01	9,415.81	9,363.47	52.33	179.922	
7,800.00	6,988.30	3,645.00	3,540.64	40.82	17.80	46.09	-41.36	7,947.01	9,497.75	9,444.98	52.77	179.970	
7,900.00	6,988.23	3,645.00	3,540.64	41.77	17.80	46.09	-41.36	7,947.01	9,580.04	9,526.82	53.21	180.029	
8,000.00	6,988.16	3,645.00	3,540.64	42.75	17.80	46.09	-41.36	7,947.01	9,662.66	9,609.01	53.65	180.100	
8,100.00	6,988.09	3,645.00	3,540.64	43.76	17.80	46.09	-41.36	7,947.01	9,745.60	9,691.52	54.09	180.184	
8,152.35	6,988.06	3,645.00	3,540.64	44.30	17.80	46.09	-41.36	7,947.01	9,789.15	9,734.84	54.31	180.234	
8,200.00	6,988.02	3,645.00	3,540.64	44.79	17.80	44.00	-41.36	7,947.01	9,829.17	9,774.66	54.51	180.304	
8,300.00	6,987.95	3,645.00	3,540.64	45.83	17.80	38.94	-41.36	7,947.01	9,915.22	9,860.32	54.90	180.613	
8,400.00	6,987.88	3,645.00	3,540.64	46.85	17.80	32.80	-41.36	7,947.01	10,003.64	9,948.41	55.23	181.138	
8,500.00	6,987.80	3,645.00	3,540.64	47.85	17.80	25.44	-41.36	7,947.01	10,093.95	10,038.45	55.50	181.877	
8,600.00	6,987.73	3,645.00	3,540.64	48.83	17.80	16.86	-41.36	7,947.01	10,185.67	10,129.95	55.71	182.823	
8,700.00	6,987.65	3,645.00	3,540.64	49.79	17.80	7.24	-41.36	7,947.01	10,278.31	10,222.44	55.87	183.967	
8,800.00	6,987.57	3,645.00	3,540.64	50.72	17.80	-2.95	-41.36	7,947.01	10,371.41	10,315.44	55.97	185.299	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #350A - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		100-MWD OWSG Rev5					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	
8,900.00	6,987.50	3,645.00	3,540.64	51.62	17.80	-13.04	-41.36	7,947.01	10,464.51	10,408.50	56.02	186.811		
9,000.00	6,987.42	3,645.00	3,540.64	52.48	17.80	-22.42	-41.36	7,947.01	10,557.16	10,501.16	56.01	188.490		
9,100.00	6,987.34	3,645.00	3,540.64	53.30	17.80	-30.68	-41.36	7,947.01	10,648.93	10,592.98	55.95	190.325		
9,200.00	6,987.27	3,645.00	3,540.64	54.08	17.80	-37.70	-41.36	7,947.01	10,739.40	10,683.55	55.85	192.302		
9,215.33	6,987.26	3,645.00	3,540.64	54.20	17.80	-38.67	-41.36	7,947.01	10,753.12	10,697.30	55.83	192.620		
9,300.00	6,987.20	3,645.00	3,540.64	54.85	17.80	-38.67	-41.36	7,947.01	10,828.89	10,773.18	55.72	194.359		
9,400.00	6,987.12	3,645.00	3,540.64	55.65	17.80	-38.67	-41.36	7,947.01	10,918.55	10,862.96	55.59	196.404		
9,500.00	6,987.05	3,645.00	3,540.64	56.48	17.80	-38.67	-41.36	7,947.01	11,008.39	10,952.91	55.47	198.441		
9,600.00	6,986.98	3,645.00	3,540.64	57.35	17.80	-38.67	-41.36	7,947.01	11,098.40	11,043.03	55.36	200.469		
9,700.00	6,986.90	3,645.00	3,540.64	58.24	17.80	-38.67	-41.36	7,947.01	11,188.58	11,133.32	55.26	202.488		
9,800.00	6,986.83	3,645.00	3,540.64	59.17	17.80	-38.67	-41.36	7,947.01	11,278.92	11,223.77	55.15	204.497		
9,900.00	6,986.75	3,645.00	3,540.64	60.12	17.80	-38.67	-41.36	7,947.01	11,369.43	11,314.37	55.06	206.498		
10,000.00	6,986.68	3,645.00	3,540.64	61.10	17.80	-38.67	-41.36	7,947.01	11,460.09	11,405.13	54.97	208.489		
10,100.00	6,986.61	3,645.00	3,540.64	62.11	17.80	-38.67	-41.36	7,947.01	11,550.91	11,496.03	54.88	210.470		
10,200.00	6,986.53	3,645.00	3,540.64	63.14	17.80	-38.67	-41.36	7,947.01	11,641.88	11,587.08	54.80	212.442		
10,300.00	6,986.46	3,645.00	3,540.64	64.20	17.80	-38.67	-41.36	7,947.01	11,733.00	11,678.27	54.72	214.403		
10,400.00	6,986.39	2,900.00	2,844.49	65.28	13.18	-33.72	-3.40	7,687.62	11,822.19	11,773.17	49.02	241.195		
10,500.00	6,986.31	2,900.00	2,844.49	66.38	13.18	-33.72	-3.40	7,687.62	11,911.42	11,862.43	48.99	243.153		
10,600.00	6,986.24	2,900.00	2,844.49	67.50	13.18	-33.72	-3.40	7,687.62	12,000.82	11,951.86	48.96	245.095		
10,700.00	6,986.17	2,900.00	2,844.49	68.64	13.18	-33.72	-3.40	7,687.62	12,090.39	12,041.44	48.94	247.024		
10,800.00	6,986.09	2,900.00	2,844.49	69.80	13.18	-33.72	-3.40	7,687.62	12,180.12	12,131.19	48.93	248.937		
10,900.00	6,986.02	2,900.00	2,844.49	70.98	13.18	-33.72	-3.40	7,687.62	12,270.01	12,221.09	48.92	250.837		
11,000.00	6,985.95	2,900.00	2,844.49	72.17	13.18	-33.72	-3.40	7,687.62	12,360.05	12,311.14	48.91	252.721		
11,100.00	6,985.87	2,859.07	2,806.41	73.38	12.95	-33.46	-0.10	7,672.98	12,449.91	12,401.28	48.63	256.011		
11,200.00	6,985.80	2,851.97	2,799.78	74.61	12.91	-33.42	0.46	7,670.49	12,540.13	12,491.55	48.58	258.113		
11,300.00	6,985.72	2,844.95	2,793.23	75.85	12.87	-33.38	1.00	7,668.04	12,630.48	12,581.94	48.54	260.196		
11,400.00	6,985.65	2,800.00	2,751.12	77.10	12.61	-33.11	4.38	7,652.68	12,721.24	12,672.98	48.26	263.609		
11,500.00	6,985.58	2,800.00	2,751.12	78.37	12.61	-33.11	4.38	7,652.68	12,811.74	12,763.47	48.27	265.412		
11,600.00	6,985.50	2,800.00	2,751.12	79.65	12.61	-33.11	4.38	7,652.68	12,902.38	12,854.09	48.29	267.201		
11,700.00	6,985.43	2,800.00	2,751.12	80.94	12.61	-33.11	4.38	7,652.68	12,993.16	12,944.86	48.31	268.976		
11,800.00	6,985.36	2,800.00	2,751.12	82.24	12.61	-33.11	4.38	7,652.68	13,084.07	13,035.75	48.33	270.737		
11,900.00	6,985.28	2,800.00	2,751.12	83.56	12.61	-33.11	4.38	7,652.68	13,175.12	13,126.77	48.35	272.484		
12,000.00	6,985.21	2,800.00	2,751.12	84.88	12.61	-33.11	4.38	7,652.68	13,266.29	13,217.92	48.38	274.217		
12,100.00	6,985.14	2,800.00	2,751.12	86.21	12.61	-33.11	4.38	7,652.68	13,357.59	13,309.19	48.41	275.937		
12,200.00	6,985.06	2,800.00	2,751.12	87.56	12.61	-33.11	4.38	7,652.68	13,449.02	13,400.58	48.44	277.643		
12,300.00	6,984.99	2,800.00	2,751.12	88.91	12.61	-33.11	4.38	7,652.68	13,540.56	13,492.09	48.47	279.337		
12,400.00	6,984.92	2,800.00	2,751.12	90.27	12.61	-33.11	4.38	7,652.68	13,632.23	13,583.72	48.51	281.017		
12,500.00	6,984.84	2,754.41	2,708.22	91.64	12.38	-32.83	7.45	7,637.55	13,723.71	13,675.40	48.32	284.039		
12,600.00	6,984.77	2,746.04	2,700.33	93.01	12.34	-32.78	7.96	7,634.81	13,815.49	13,767.17	48.32	285.936		
12,700.00	6,984.69	2,737.74	2,692.50	94.40	12.30	-32.74	8.45	7,632.09	13,907.36	13,859.04	48.32	287.818		
12,800.00	6,984.62	2,700.00	2,656.85	95.79	12.11	-32.52	10.46	7,619.89	13,999.44	13,951.27	48.18	290.574		
12,900.00	6,984.55	2,700.00	2,656.85	97.18	12.11	-32.52	10.46	7,619.89	14,091.44	14,043.21	48.23	292.174		
13,000.00	6,984.47	2,700.00	2,656.85	98.59	12.11	-32.52	10.46	7,619.89	14,183.54	14,135.26	48.28	293.761		
13,100.00	6,984.40	2,700.00	2,656.85	100.00	12.11	-32.52	10.46	7,619.89	14,275.75	14,227.41	48.34	295.337		
13,200.00	6,984.33	2,700.00	2,656.85	101.41	12.11	-32.52	10.46	7,619.89	14,368.06	14,319.67	48.39	296.901		
13,300.00	6,984.25	2,700.00	2,656.85	102.83	12.11	-32.52	10.46	7,619.89	14,460.48	14,412.03	48.45	298.453		
13,400.00	6,984.18	2,700.00	2,656.85	104.26	12.11	-32.52	10.46	7,619.89	14,552.99	14,504.48	48.51	299.994		
13,500.00	6,984.11	2,700.00	2,656.85	105.69	12.11	-32.52	10.46	7,619.89	14,645.61	14,597.03	48.57	301.523		
13,600.00	6,984.03	2,656.01	2,615.19	107.13	11.90	-32.27	12.40	7,605.89	14,738.11	14,689.67	48.44	304.238		
13,700.00	6,983.96	2,646.07	2,605.77	108.57	11.85	-32.22	12.78	7,602.76	14,830.81	14,782.34	48.47	306.009		
13,800.00	6,983.88	2,636.20	2,596.40	110.02	11.80	-32.16	13.14	7,599.65	14,923.58	14,875.09	48.49	307.765		
13,900.00	6,983.81	2,600.00	2,562.03	111.47	11.63	-31.97	14.27	7,588.34	15,016.50	14,968.10	48.40	310.230		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #350A - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		100-MWD OWSG Rev5					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)	
14,000.00	6,983.74	2,600.00	2,562.03	112.92	11.63	-31.97	14.27	7,588.34	15,109.38	15,060.90	48.48	311.686		
14,100.00	6,983.66	2,600.00	2,562.03	114.38	11.63	-31.97	14.27	7,588.34	15,202.34	15,153.79	48.55	313.132		
14,200.00	6,983.59	2,600.00	2,562.03	115.85	11.63	-31.97	14.27	7,588.34	15,295.39	15,246.77	48.62	314.567		
14,300.00	6,983.52	2,600.00	2,562.03	117.31	11.63	-31.97	14.27	7,588.34	15,388.53	15,339.83	48.70	315.993		
14,400.00	6,983.44	2,600.00	2,562.03	118.78	11.63	-31.97	14.27	7,588.34	15,481.75	15,432.98	48.78	317.409		
14,500.00	6,983.37	2,600.00	2,562.03	120.26	11.63	-31.97	14.27	7,588.34	15,575.06	15,526.21	48.85	318.815		
14,600.00	6,983.30	2,558.84	2,522.89	121.74	11.44	-31.75	15.31	7,575.66	15,668.28	15,619.51	48.77	321.273		
14,700.00	6,983.22	2,549.41	2,513.92	123.22	11.39	-31.70	15.53	7,572.78	15,761.66	15,712.85	48.81	322.896		
14,800.00	6,983.15	2,540.05	2,505.00	124.70	11.35	-31.65	15.73	7,569.93	15,855.11	15,806.25	48.86	324.505		
14,900.00	6,983.08	2,500.00	2,466.82	126.19	11.16	-31.44	16.51	7,557.88	15,948.71	15,899.92	48.79	326.893		
15,000.00	6,983.00	2,500.00	2,466.82	127.68	11.16	-31.44	16.51	7,557.88	16,042.23	15,993.36	48.87	328.234		
15,100.00	6,982.93	2,500.00	2,466.82	129.17	11.16	-31.44	16.51	7,557.88	16,135.83	16,086.87	48.96	329.566		
15,200.00	6,982.85	2,500.00	2,466.82	130.67	11.16	-31.44	16.51	7,557.88	16,229.50	16,180.45	49.05	330.890		
15,300.00	6,982.78	2,500.00	2,466.82	132.16	11.16	-31.44	16.51	7,557.88	16,323.25	16,274.11	49.14	332.206		
15,400.00	6,982.71	2,500.00	2,466.82	133.66	11.16	-31.44	16.51	7,557.88	16,417.07	16,367.84	49.22	333.513		
15,500.00	6,982.63	2,466.33	2,434.68	135.17	11.00	-31.27	17.12	7,547.87	16,510.88	16,461.69	49.19	335.625		
15,600.00	6,982.56	2,453.73	2,422.64	136.67	10.94	-31.20	17.36	7,544.15	16,604.78	16,555.54	49.24	337.215		
15,700.00	6,982.49	2,441.22	2,410.68	138.18	10.88	-31.14	17.60	7,540.47	16,698.72	16,649.43	49.29	338.792		
15,800.00	6,982.41	2,400.00	2,371.27	139.69	10.69	-30.93	18.44	7,528.43	16,792.77	16,743.53	49.24	341.036		
15,900.00	6,982.34	2,400.00	2,371.27	141.20	10.69	-30.93	18.44	7,528.43	16,886.77	16,837.43	49.34	342.285		
16,000.00	6,982.27	2,400.00	2,371.27	142.71	10.69	-30.93	18.44	7,528.43	16,980.84	16,931.41	49.43	343.526		
16,100.00	6,982.19	2,400.00	2,371.27	144.23	10.69	-30.93	18.44	7,528.43	17,074.97	17,025.44	49.53	344.760		
16,200.00	6,982.12	2,400.00	2,371.27	145.75	10.69	-30.93	18.44	7,528.43	17,169.17	17,119.55	49.62	345.987		
16,300.00	6,982.05	2,366.90	2,339.59	147.27	10.53	-30.76	19.20	7,518.89	17,263.37	17,213.76	49.60	348.022		
16,400.00	6,981.97	2,354.61	2,327.82	148.79	10.47	-30.70	19.52	7,515.37	17,357.63	17,307.97	49.66	349.529		
16,500.00	6,981.90	2,342.43	2,316.14	150.31	10.41	-30.64	19.85	7,511.89	17,451.94	17,402.22	49.72	351.023		
16,600.00	6,981.82	2,330.34	2,304.55	151.84	10.35	-30.58	20.20	7,508.46	17,546.29	17,496.52	49.78	352.503		
16,700.00	6,981.75	2,300.00	2,275.46	153.36	10.21	-30.42	21.14	7,499.91	17,640.71	17,590.94	49.77	354.410		
16,800.00	6,981.68	2,300.00	2,275.46	154.89	10.21	-30.42	21.14	7,499.91	17,735.13	17,685.25	49.88	355.578		
16,900.00	6,981.60	2,300.00	2,275.46	156.42	10.21	-30.42	21.14	7,499.91	17,829.61	17,779.63	49.98	356.740		
17,000.00	6,981.53	2,300.00	2,275.46	157.95	10.21	-30.42	21.14	7,499.91	17,924.15	17,874.07	50.08	357.896		
17,100.00	6,981.46	2,300.00	2,275.46	159.49	10.21	-30.42	21.14	7,499.91	18,018.75	17,968.56	50.19	359.046		
17,200.00	6,981.38	2,300.00	2,275.46	161.02	10.21	-30.42	21.14	7,499.91	18,113.40	18,063.11	50.29	360.189		
17,300.00	6,981.31	2,300.00	2,275.46	162.56	10.21	-30.42	21.14	7,499.91	18,208.11	18,157.72	50.39	361.327		
17,400.00	6,981.24	2,300.00	2,275.46	164.09	10.21	-30.42	21.14	7,499.91	18,302.88	18,252.39	50.50	362.459		
17,500.00	6,981.16	2,300.00	2,275.46	165.63	10.21	-30.42	21.14	7,499.91	18,397.71	18,347.11	50.60	363.585		
17,600.00	6,981.09	2,256.04	2,233.24	167.17	9.99	-30.20	22.57	7,487.77	18,492.34	18,441.77	50.57	365.678		
17,700.00	6,981.01	2,250.35	2,227.76	168.71	9.97	-30.17	22.75	7,486.23	18,587.20	18,536.54	50.66	366.911		
17,800.00	6,980.94	2,244.70	2,222.32	170.25	9.94	-30.15	22.93	7,484.70	18,682.11	18,631.36	50.75	368.136		
17,900.00	6,980.87	2,200.00	2,179.25	171.80	9.72	-29.93	24.32	7,472.84	18,777.26	18,726.54	50.72	370.210		
18,000.00	6,980.79	2,200.00	2,179.25	173.34	9.72	-29.93	24.32	7,472.84	18,872.21	18,821.38	50.83	371.292		
18,100.00	6,980.72	2,200.00	2,179.25	174.89	9.72	-29.93	24.32	7,472.84	18,967.21	18,916.27	50.94	372.369		
18,200.00	6,980.65	2,200.00	2,179.25	176.43	9.72	-29.93	24.32	7,472.84	19,062.26	19,011.21	51.04	373.440		
18,300.00	6,980.57	2,200.00	2,179.25	177.98	9.72	-29.93	24.32	7,472.84	19,157.36	19,106.20	51.15	374.507		
18,400.00	6,980.50	2,200.00	2,179.25	179.53	9.72	-29.93	24.32	7,472.84	19,252.51	19,201.25	51.26	375.569		
18,500.00	6,980.43	2,200.00	2,179.25	181.08	9.72	-29.93	24.32	7,472.84	19,347.71	19,296.34	51.37	376.625		
18,600.00	6,980.35	2,200.00	2,179.25	182.63	9.72	-29.93	24.32	7,472.84	19,442.95	19,391.47	51.48	377.677		
18,700.00	6,980.28	2,200.00	2,179.25	184.18	9.72	-29.93	24.32	7,472.84	19,538.25	19,486.66	51.59	378.724		
18,800.00	6,980.21	2,200.00	2,179.25	185.73	9.72	-29.93	24.32	7,472.84	19,633.59	19,581.89	51.70	379.766		
18,900.00	6,980.13	2,200.00	2,179.25	187.28	9.72	-29.93	24.32	7,472.84	19,728.98	19,677.17	51.81	380.803		
19,000.00	6,980.06	2,162.52	2,143.07	188.84	9.54	-29.74	25.57	7,463.14	19,824.32	19,772.51	51.81	382.645		
19,100.00	6,979.98	2,152.81	2,133.69	190.39	9.49	-29.69	25.93	7,460.65	19,919.74	19,867.85	51.89	383.875		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #350A - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		100-MWD OWSG Rev5						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	
19,200.00	6,979.91	2,143.18	2,124.38	191.95	9.44	-29.65	26.29	7,458.19	20,015.19	19,963.22	51.97	385.095		
19,300.00	6,979.84	2,133.62	2,115.15	193.51	9.39	-29.60	26.67	7,455.75	20,110.68	20,058.62	52.06	386.305		
19,400.00	6,979.76	2,100.00	2,082.65	195.06	9.23	-29.44	28.10	7,447.27	20,206.24	20,154.16	52.08	388.006		
19,500.00	6,979.69	2,100.00	2,082.65	196.62	9.23	-29.44	28.10	7,447.27	20,301.76	20,249.57	52.19	389.002		
19,600.00	6,979.62	2,100.00	2,082.65	198.18	9.23	-29.44	28.10	7,447.27	20,397.33	20,345.03	52.30	389.993		
19,700.00	6,979.54	2,100.00	2,082.65	199.74	9.23	-29.44	28.10	7,447.27	20,492.94	20,440.53	52.41	390.981		
19,800.00	6,979.47	2,100.00	2,082.65	201.30	9.23	-29.44	28.10	7,447.27	20,588.60	20,536.07	52.53	391.964		
19,900.00	6,979.40	2,100.00	2,082.65	202.86	9.23	-29.44	28.10	7,447.27	20,684.29	20,631.65	52.64	392.943		
20,000.00	6,979.32	2,100.00	2,082.65	204.42	9.23	-29.44	28.10	7,447.27	20,780.02	20,727.27	52.75	393.917		
20,100.00	6,979.25	2,100.00	2,082.65	205.98	9.23	-29.44	28.10	7,447.27	20,875.80	20,822.93	52.87	394.888		
20,200.00	6,979.18	2,100.00	2,082.65	207.55	9.23	-29.44	28.10	7,447.27	20,971.61	20,918.63	52.98	395.854		
20,300.00	6,979.10	2,100.00	2,082.65	209.11	9.23	-29.44	28.10	7,447.27	21,067.46	21,014.37	53.09	396.816		
20,400.00	6,979.03	2,100.00	2,082.65	210.68	9.23	-29.44	28.10	7,447.27	21,163.35	21,110.15	53.20	397.775		
20,500.00	6,978.95	2,100.00	2,082.65	212.24	9.23	-29.44	28.10	7,447.27	21,259.28	21,205.97	53.32	398.729		
20,600.00	6,978.88	2,100.00	2,082.65	213.81	9.23	-29.44	28.10	7,447.27	21,355.25	21,301.82	53.43	399.679		
20,700.00	6,978.81	2,100.00	2,082.65	215.37	9.23	-29.44	28.10	7,447.27	21,451.25	21,397.71	53.54	400.625		
20,800.00	6,978.73	2,056.11	2,040.14	216.94	9.01	-29.22	29.97	7,436.51	21,547.00	21,493.45	53.55	402.391		
20,900.00	6,978.66	2,052.44	2,036.58	218.51	8.99	-29.20	30.11	7,435.63	21,643.02	21,589.37	53.65	403.393		
21,000.00	6,978.59	2,048.80	2,033.05	220.07	8.98	-29.19	30.26	7,434.76	21,739.08	21,685.32	53.76	404.391		
21,100.00	6,978.51	2,045.18	2,029.53	221.64	8.96	-29.17	30.40	7,433.90	21,835.17	21,781.31	53.86	405.384		
21,200.00	6,978.44	2,000.00	1,985.62	223.21	8.74	-28.95	32.06	7,423.41	21,931.55	21,877.68	53.87	407.155		
21,300.00	6,978.37	2,000.00	1,985.62	224.78	8.74	-28.95	32.06	7,423.41	22,027.66	21,973.68	53.98	408.067		
21,400.00	6,978.29	2,000.00	1,985.62	226.35	8.74	-28.95	32.06	7,423.41	22,123.80	22,069.70	54.10	408.975		
21,500.00	6,978.22	2,000.00	1,985.62	227.92	8.74	-28.95	32.06	7,423.41	22,219.97	22,165.76	54.21	409.880		
21,600.00	6,978.14	2,000.00	1,985.62	229.49	8.74	-28.95	32.06	7,423.41	22,316.18	22,261.85	54.33	410.781		
21,700.00	6,978.07	2,000.00	1,985.62	231.06	8.74	-28.95	32.06	7,423.41	22,412.42	22,357.98	54.44	411.679		
21,800.00	6,978.00	2,000.00	1,985.62	232.63	8.74	-28.95	32.06	7,423.41	22,508.70	22,454.14	54.56	412.573		
21,900.00	6,977.92	2,000.00	1,985.62	234.21	8.74	-28.95	32.06	7,423.41	22,605.00	22,550.33	54.67	413.463		
22,000.00	6,977.85	2,000.00	1,985.62	235.78	8.74	-28.95	32.06	7,423.41	22,701.34	22,646.55	54.79	414.350		
22,100.00	6,977.78	2,000.00	1,985.62	237.35	8.74	-28.95	32.06	7,423.41	22,797.71	22,742.81	54.90	415.234		
22,200.00	6,977.70	2,000.00	1,985.62	238.92	8.74	-28.95	32.06	7,423.41	22,894.11	22,839.10	55.02	416.113		
22,300.00	6,977.63	2,000.00	1,985.62	240.50	8.74	-28.95	32.06	7,423.41	22,990.55	22,935.41	55.13	416.990		
22,400.00	6,977.56	2,000.00	1,985.62	242.07	8.74	-28.95	32.06	7,423.41	23,087.01	23,031.76	55.25	417.863		
22,500.00	6,977.48	2,000.00	1,985.62	243.65	8.74	-28.95	32.06	7,423.41	23,183.50	23,128.14	55.37	418.732		
22,600.00	6,977.41	2,000.00	1,985.62	245.22	8.74	-28.95	32.06	7,423.41	23,280.02	23,224.54	55.48	419.598		
22,700.00	6,977.34	2,000.00	1,985.62	246.80	8.74	-28.95	32.06	7,423.41	23,376.58	23,320.98	55.60	420.460		
22,800.00	6,977.26	2,000.00	1,985.62	248.37	8.74	-28.95	32.06	7,423.41	23,473.16	23,417.44	55.71	421.319		
22,900.00	6,977.19	1,965.34	1,951.88	249.95	8.57	-28.79	33.27	7,415.61	23,569.68	23,513.93	55.76	422.714		
23,000.00	6,977.11	1,958.36	1,945.07	251.53	8.54	-28.76	33.52	7,414.05	23,666.28	23,610.42	55.86	423.672		
23,100.00	6,977.04	1,951.42	1,938.31	253.10	8.51	-28.73	33.77	7,412.51	23,762.91	23,706.94	55.96	424.624		
23,155.65	6,977.00	1,947.57	1,934.56	253.98	8.49	-28.71	33.90	7,411.65	23,816.69	23,760.67	56.02	425.152		
23,156.15	6,977.00	1,947.54	1,934.53	254.06	8.49	-28.71	33.90	7,411.65	23,817.17	23,758.09	59.08	403.156		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #46 - OH - OH-INC													Offset Site Error: 0.00 usft
Survey Program: 60-A027Ua_INC-ONLY													Offset Well Error: 0.00 usft
Reference	Offset	Semi Major Axis		Rule Assigned:		Distance		Warning					
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.00	0.00	0.00	0.00	0.00	0.00	158.51	-169.29	66.65	185.47				
100.00	100.00	64.00	64.00	0.25	1.14	158.51	-169.29	66.65	181.94	180.55	1.39	131.264	
197.64	197.64	161.64	161.64	0.60	2.90	158.50	-169.18	66.65	181.84	178.34	3.50	52.009 CC	
200.00	200.00	163.99	163.99	0.61	2.94	158.50	-169.18	66.65	181.84	178.29	3.55	51.264	
300.00	300.00	264.00	264.00	0.97	4.74	158.51	-169.29	66.65	181.94	176.23	5.71	31.864	
400.00	400.00	364.00	364.00	1.33	6.69	158.51	-169.29	66.65	181.94	173.92	8.02	22.692	
500.00	500.00	464.00	464.00	1.68	8.64	158.51	-169.29	66.65	181.94	171.61	10.33	17.620	
600.00	599.98	563.74	563.73	2.04	10.59	148.73	-168.85	66.65	183.02	170.39	12.63	14.492 ES	
700.00	699.84	663.26	663.25	2.41	12.53	149.53	-169.09	66.65	187.74	172.81	14.93	12.575	
800.00	799.45	763.50	763.45	2.77	14.55	150.78	-169.29	66.65	195.49	178.18	17.32	11.288	
900.00	898.70	862.75	862.70	3.13	16.63	152.33	-169.29	66.65	206.23	186.46	19.76	10.434	
1,000.00	997.47	960.73	960.68	3.50	18.69	154.03	-168.68	66.65	219.64	197.45	22.19	9.899	
1,100.00	1,095.63	1,059.73	1,059.63	3.89	20.76	158.30	-169.29	66.65	237.71	213.08	24.63	9.650	
1,200.00	1,193.09	1,157.19	1,157.09	4.29	22.68	161.68	-169.29	66.65	258.80	231.88	26.93	9.611 SF	
1,300.00	1,289.73	1,253.83	1,253.73	4.72	24.59	164.47	-169.29	66.65	283.47	254.26	29.20	9.706	
1,400.00	1,385.42	1,349.52	1,349.42	5.16	26.47	166.77	-169.29	66.65	311.65	280.18	31.47	9.904	
1,496.97	1,477.20	1,441.13	1,441.01	5.62	28.28	168.61	-167.73	66.65	340.74	307.10	33.64	10.129	
1,500.00	1,480.05	1,443.95	1,443.84	5.63	28.33	168.64	-167.73	66.65	341.75	308.03	33.71	10.137	
1,600.00	1,574.15	1,537.21	1,537.09	6.12	30.17	169.65	-167.89	66.65	375.21	339.29	35.92	10.446	
1,700.00	1,668.25	1,630.32	1,630.20	6.62	32.00	170.50	-168.26	66.65	408.98	370.85	38.13	10.726	
1,800.00	1,762.35	1,723.28	1,723.15	7.12	33.83	171.23	-168.84	66.65	443.02	402.69	40.34	10.983	
1,900.00	1,856.45	1,820.62	1,820.45	7.64	35.70	171.87	-169.29	66.65	476.98	434.39	42.59	11.200	
2,000.00	1,950.55	1,914.72	1,914.55	8.16	37.42	172.41	-169.29	66.65	510.54	465.84	44.70	11.422	
2,100.00	2,044.65	2,008.71	2,008.55	8.68	39.15	172.88	-168.82	66.65	543.66	496.85	46.81	11.614	
2,200.00	2,138.75	2,101.74	2,101.58	9.21	40.85	173.29	-168.92	66.65	577.39	528.49	48.90	11.807	
2,300.00	2,232.85	2,194.65	2,194.48	9.74	42.56	173.66	-169.20	66.65	611.31	560.32	50.99	11.988	
2,400.00	2,326.95	2,291.13	2,290.95	10.27	44.28	174.00	-169.29	66.65	645.07	591.95	53.12	12.143	
2,500.00	2,421.05	2,385.23	2,385.05	10.81	45.96	174.30	-169.29	66.65	678.76	623.57	55.19	12.299	
2,600.00	2,515.15	2,479.33	2,479.15	11.34	47.63	174.57	-169.29	66.65	712.46	655.20	57.26	12.443	
2,700.00	2,609.25	2,573.43	2,573.25	11.88	49.30	174.81	-169.29	66.65	746.17	686.84	59.33	12.577	
2,800.00	2,703.35	2,666.77	2,666.58	12.42	50.96	175.03	-168.54	66.65	779.14	717.75	61.38	12.693	
2,900.00	2,797.45	2,759.93	2,759.75	12.96	52.62	175.24	-168.68	66.65	813.01	749.58	63.43	12.817	
3,000.00	2,891.55	2,853.03	2,852.84	13.51	54.28	175.43	-168.93	66.65	847.00	781.52	65.48	12.934	
3,100.00	2,985.65	2,946.05	2,945.86	14.05	55.93	175.60	-169.28	66.65	881.11	813.57	67.53	13.047	
3,200.00	3,079.75	3,043.95	3,043.75	14.60	57.68	175.77	-169.29	66.65	914.87	845.18	69.70	13.127	
3,300.00	3,173.85	3,138.05	3,137.85	15.14	59.36	175.92	-169.29	66.65	948.64	876.86	71.78	13.216	
3,400.00	3,267.95	3,231.86	3,231.67	15.69	61.04	176.06	-169.03	66.65	982.14	908.28	73.85	13.298	
3,500.00	3,362.05	3,325.13	3,324.93	16.23	62.70	176.19	-169.09	66.65	1,015.97	940.05	75.92	13.382	
3,600.00	3,456.15	3,418.33	3,418.14	16.78	64.37	176.31	-169.23	66.65	1,049.89	971.91	77.99	13.463	
3,700.00	3,550.25	3,514.46	3,514.25	17.33	66.29	176.43	-169.29	66.65	1,083.73	1,003.42	80.31	13.494	
3,800.00	3,644.35	3,608.56	3,608.35	17.88	68.25	176.54	-169.29	66.65	1,117.52	1,034.84	82.68	13.517	
3,900.00	3,738.45	3,702.66	3,702.45	18.42	70.21	176.64	-169.29	66.65	1,151.31	1,066.26	85.04	13.538	
4,000.00	3,832.55	3,796.76	3,796.55	18.97	72.17	176.74	-169.29	66.65	1,185.10	1,097.69	87.41	13.558	
4,100.00	3,926.65	3,890.24	3,890.03	19.52	74.12	176.82	-168.44	66.65	1,218.04	1,128.28	89.76	13.570	
4,200.00	4,020.75	3,983.04	3,982.83	20.07	76.06	176.91	-168.54	66.65	1,251.93	1,159.84	92.09	13.594	
4,300.00	4,114.85	4,075.78	4,075.57	20.62	77.99	176.99	-168.73	66.65	1,285.92	1,191.49	94.43	13.618	
4,400.00	4,208.95	4,168.45	4,168.24	21.17	79.92	177.07	-169.01	66.65	1,320.01	1,223.25	96.76	13.642	
4,500.00	4,303.05	4,267.39	4,267.05	21.72	82.06	177.14	-169.29	66.65	1,354.09	1,254.77	99.32	13.634	
4,600.00	4,397.15	4,359.05	4,358.71	22.27	84.22	177.21	-168.62	66.65	1,387.22	1,285.34	101.88	13.616	
4,700.00	4,491.25	4,455.66	4,455.25	22.82	86.52	177.28	-169.29	66.65	1,421.70	1,317.11	104.59	13.594	
4,800.00	4,585.35	4,549.76	4,549.35	23.37	88.95	177.34	-169.29	66.65	1,455.51	1,348.08	107.43	13.548	
4,900.00	4,679.45	4,636.61	4,636.19	23.93	91.21	177.40	-168.53	66.65	1,488.57	1,378.50	110.06	13.525	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #46 - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program:		60-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)		
5,000.00	4,773.55	4,738.11	4,737.55	24.48	93.84	177.46	-169.29	66.65	1,523.13	1,409.99	113.13	13.463	
5,100.00	4,867.65	4,829.81	4,829.23	25.03	96.25	177.51	-168.32	66.65	1,555.97	1,440.02	115.94	13.420	
5,200.00	4,961.75	4,926.41	4,925.75	25.58	98.79	177.57	-169.29	66.65	1,590.75	1,471.86	118.89	13.380	
5,300.00	5,055.85	5,019.58	5,018.91	26.13	101.12	177.62	-168.68	66.65	1,623.96	1,502.33	121.62	13.352	
5,400.00	5,149.95	5,114.69	5,113.95	26.68	103.49	177.67	-169.29	66.65	1,658.38	1,533.97	124.41	13.330	
5,500.00	5,244.05	5,208.79	5,208.05	27.24	105.78	177.71	-169.29	66.65	1,692.20	1,565.09	127.11	13.313	
5,600.00	5,338.15	5,283.52	5,282.76	27.79	107.60	177.75	-168.94	66.65	1,725.78	1,596.51	129.26	13.351	
5,665.73	5,400.00	5,364.81	5,364.00	28.15	109.45	177.79	-169.29	66.65	1,748.25	1,616.79	131.45	13.299	
5,700.00	5,432.28	5,397.09	5,396.28	28.34	110.16	177.81	-169.29	66.65	1,759.74	1,627.43	132.30	13.301	
5,800.00	5,526.87	5,491.68	5,490.87	28.88	112.25	177.86	-169.29	66.65	1,792.17	1,657.38	134.79	13.296	
5,900.00	5,622.01	5,494.00	5,493.16	29.41	112.30	177.87	-169.29	66.65	1,825.31	1,690.54	134.77	13.544	
6,000.00	5,717.67	5,494.00	5,493.16	29.92	112.30	177.89	-169.29	66.65	1,861.63	1,727.28	134.36	13.856	
6,100.00	5,813.83	5,494.00	5,493.16	30.41	112.30	177.90	-169.29	66.65	1,900.94	1,767.30	133.64	14.224	
6,200.00	5,910.44	5,494.00	5,493.16	30.89	112.30	177.92	-169.29	66.65	1,943.05	1,810.38	132.66	14.646	
6,300.00	6,007.50	5,494.00	5,493.16	31.36	112.30	177.94	-169.29	66.65	1,987.75	1,856.30	131.45	15.121	
6,400.00	6,104.96	5,494.00	5,493.16	31.80	112.30	177.96	-169.29	66.65	2,034.88	1,904.84	130.05	15.647	
6,500.00	6,202.80	5,494.00	5,493.16	32.24	112.30	177.98	-169.29	66.65	2,084.25	1,955.78	128.47	16.224	
6,600.00	6,300.98	5,494.00	5,493.16	32.66	112.30	178.00	-169.29	66.65	2,135.70	2,008.94	126.75	16.850	
6,700.00	6,399.48	5,494.00	5,493.16	33.06	112.30	178.02	-169.29	66.65	2,189.05	2,064.13	124.91	17.524	
6,722.82	6,422.00	5,494.00	5,493.16	33.15	112.30	178.03	-169.29	66.65	2,201.48	2,077.00	124.48	17.685	
6,750.00	6,448.76	5,494.00	5,493.16	33.26	112.30	-170.95	-169.29	66.65	2,216.77	2,092.80	123.97	17.882	
6,800.00	6,497.51	5,494.00	5,493.16	33.48	112.30	-157.01	-169.29	66.65	2,247.05	2,123.99	123.05	18.261	
6,850.00	6,545.40	5,494.00	5,493.16	33.72	112.30	-147.34	-169.29	66.65	2,279.87	2,157.69	122.19	18.659	
6,900.00	6,592.13	5,494.00	5,493.16	33.97	112.30	-139.49	-169.29	66.65	2,314.93	2,193.56	121.38	19.072	
6,950.00	6,637.40	5,494.00	5,493.16	34.25	112.30	-132.36	-169.29	66.65	2,351.92	2,231.29	120.63	19.497	
7,000.00	6,680.94	5,494.00	5,493.16	34.54	112.30	-125.38	-169.29	66.65	2,390.51	2,270.55	119.96	19.928	
7,050.00	6,722.48	5,494.00	5,493.16	34.85	112.30	-118.26	-169.29	66.65	2,430.41	2,311.05	119.36	20.361	
7,100.00	6,761.76	5,494.00	5,493.16	35.17	112.30	-110.89	-169.29	66.65	2,471.31	2,352.46	118.85	20.793	
7,150.00	6,798.55	5,494.00	5,493.16	35.51	112.30	-103.29	-169.29	66.65	2,512.91	2,394.48	118.43	21.218	
7,200.00	6,832.61	5,494.00	5,493.16	35.86	112.30	-95.61	-169.29	66.65	2,554.94	2,436.84	118.10	21.634	
7,250.00	6,863.74	5,494.00	5,493.16	36.22	112.30	-88.04	-169.29	66.65	2,597.11	2,479.26	117.85	22.037	
7,300.00	6,891.74	5,494.00	5,493.16	36.59	112.30	-80.81	-169.29	66.65	2,639.18	2,521.48	117.70	22.424	
7,350.00	6,916.44	5,494.00	5,493.16	36.98	112.30	-74.08	-169.29	66.65	2,680.87	2,563.25	117.63	22.791	
7,400.00	6,937.69	5,494.00	5,493.16	37.37	112.30	-68.00	-169.29	66.65	2,721.98	2,604.34	117.64	23.138	
7,450.00	6,955.36	5,494.00	5,493.16	37.78	112.30	-62.60	-169.29	66.65	2,762.27	2,644.52	117.74	23.460	
7,500.00	6,969.34	5,494.00	5,493.16	38.19	112.30	-57.88	-169.29	66.65	2,801.53	2,683.61	117.92	23.758	
7,550.00	6,979.53	5,494.00	5,493.16	38.62	112.30	-53.80	-169.29	66.65	2,839.57	2,721.40	118.17	24.029	
7,600.00	6,985.89	5,494.00	5,493.16	39.05	112.30	-50.31	-169.29	66.65	2,876.21	2,757.71	118.50	24.272	
7,650.00	6,988.37	5,494.00	5,493.16	39.48	112.30	-47.33	-169.29	66.65	2,911.28	2,792.39	118.89	24.487	
7,657.25	6,988.40	5,494.00	5,493.16	39.54	112.30	-46.94	-169.29	66.65	2,916.23	2,797.28	118.95	24.517	
7,700.00	6,988.37	5,494.00	5,493.16	39.92	112.30	-46.94	-169.29	66.65	2,945.45	2,826.13	119.32	24.685	
7,800.00	6,988.30	5,494.00	5,493.16	40.82	112.30	-46.94	-169.29	66.65	3,015.06	2,894.89	120.17	25.089	
7,900.00	6,988.23	5,494.00	5,493.16	41.77	112.30	-46.94	-169.29	66.65	3,086.35	2,965.35	121.00	25.508	
8,000.00	6,988.16	5,494.00	5,493.16	42.75	112.30	-46.94	-169.29	66.65	3,159.19	3,037.41	121.78	25.941	
8,100.00	6,988.09	5,494.00	5,493.16	43.76	112.30	-46.94	-169.29	66.65	3,233.49	3,110.95	122.54	26.387	
8,152.35	6,988.06	5,494.00	5,493.16	44.30	112.30	-46.94	-169.29	66.65	3,272.93	3,150.00	122.92	26.626	
8,200.00	6,988.02	5,494.00	5,493.16	44.79	112.30	-48.40	-169.29	66.65	3,308.75	3,185.50	123.26	26.844	
8,300.00	6,987.95	5,494.00	5,493.16	45.83	112.30	-51.21	-169.29	66.65	3,382.34	3,258.42	123.92	27.295	
8,400.00	6,987.88	5,494.00	5,493.16	46.85	112.30	-53.69	-169.29	66.65	3,453.58	3,329.05	124.53	27.733	
8,500.00	6,987.80	5,494.00	5,493.16	47.85	112.30	-55.87	-169.29	66.65	3,522.28	3,397.19	125.10	28.156	
8,600.00	6,987.73	5,494.00	5,493.16	48.83	112.30	-57.79	-169.29	66.65	3,588.26	3,462.64	125.62	28.563	
8,700.00	6,987.65	5,494.00	5,493.16	49.79	112.30	-59.49	-169.29	66.65	3,651.36	3,525.24	126.12	28.952	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #46 - OH - OH-INC													Offset Site Error:	0.00 usft		
Survey Program:		60-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			
8,800.00	6,987.57	5,494.00	5,493.16	50.72	112.30	-60.99	-169.29	66.65	3,711.42	3,584.84	126.58	29.320				
8,900.00	6,987.50	5,494.00	5,493.16	51.62	112.30	-62.30	-169.29	66.65	3,768.30	3,641.28	127.02	29.666				
9,000.00	6,987.42	5,494.00	5,493.16	52.48	112.30	-63.46	-169.29	66.65	3,821.87	3,694.43	127.44	29.989				
9,100.00	6,987.34	5,494.00	5,493.16	53.30	112.30	-64.48	-169.29	66.65	3,872.02	3,744.18	127.84	30.289				
9,200.00	6,987.27	5,494.00	5,493.16	54.08	112.30	-65.38	-169.29	66.65	3,918.63	3,790.42	128.22	30.563				
9,215.33	6,987.26	5,494.00	5,493.16	54.20	112.30	-65.51	-169.29	66.65	3,925.46	3,797.19	128.27	30.603				
9,300.00	6,987.20	5,494.00	5,493.16	54.85	112.30	-65.51	-169.29	66.65	3,963.66	3,835.07	128.59	30.825				
9,400.00	6,987.12	5,494.00	5,493.16	55.65	112.30	-65.51	-169.29	66.65	4,010.60	3,881.63	128.98	31.096				
9,500.00	6,987.05	5,494.00	5,493.16	56.48	112.30	-65.51	-169.29	66.65	4,059.47	3,930.10	129.37	31.378				
9,600.00	6,986.98	5,494.00	5,493.16	57.35	112.30	-65.51	-169.29	66.65	4,110.19	3,980.41	129.78	31.670				
9,700.00	6,986.90	5,494.00	5,493.16	58.24	112.30	-65.51	-169.29	66.65	4,162.70	4,032.51	130.19	31.974				
9,800.00	6,986.83	5,494.00	5,493.16	59.17	112.30	-65.51	-169.29	66.65	4,216.92	4,086.31	130.61	32.287				
9,900.00	6,986.75	5,494.00	5,493.16	60.12	112.30	-65.51	-169.29	66.65	4,272.79	4,141.77	131.02	32.611				
10,000.00	6,986.68	5,494.00	5,493.16	61.10	112.30	-65.51	-169.29	66.65	4,330.26	4,198.82	131.44	32.945				
10,100.00	6,986.61	5,494.00	5,493.16	62.11	112.30	-65.51	-169.29	66.65	4,389.25	4,257.39	131.85	33.289				
10,200.00	6,986.53	5,494.00	5,493.16	63.14	112.30	-65.51	-169.29	66.65	4,449.70	4,317.44	132.27	33.642				
10,300.00	6,986.46	5,494.00	5,493.16	64.20	112.30	-65.51	-169.29	66.65	4,511.57	4,378.89	132.68	34.005				
10,400.00	6,986.39	5,494.00	5,493.16	65.28	112.30	-65.51	-169.29	66.65	4,574.78	4,441.70	133.08	34.376				
10,500.00	6,986.31	5,494.00	5,493.16	66.38	112.30	-65.51	-169.29	66.65	4,639.29	4,505.81	133.48	34.757				
10,600.00	6,986.24	5,494.00	5,493.16	67.50	112.30	-65.51	-169.29	66.65	4,705.03	4,571.16	133.87	35.146				
10,700.00	6,986.17	5,494.00	5,493.16	68.64	112.30	-65.51	-169.29	66.65	4,771.97	4,637.71	134.26	35.543				
10,800.00	6,986.09	5,494.00	5,493.16	69.80	112.30	-65.51	-169.29	66.65	4,840.05	4,705.41	134.64	35.948				
10,900.00	6,986.02	5,494.00	5,493.16	70.98	112.30	-65.51	-169.29	66.65	4,909.22	4,774.21	135.01	36.362				
11,000.00	6,985.95	5,494.00	5,493.16	72.17	112.30	-65.51	-169.29	66.65	4,979.44	4,844.06	135.38	36.782				
11,100.00	6,985.87	5,494.00	5,493.16	73.38	112.30	-65.51	-169.29	66.65	5,050.66	4,914.93	135.73	37.210				
11,200.00	6,985.80	5,494.00	5,493.16	74.61	112.30	-65.51	-169.29	66.65	5,122.84	4,986.76	136.08	37.645				
11,300.00	6,985.72	5,494.00	5,493.16	75.85	112.30	-65.51	-169.29	66.65	5,195.95	5,059.52	136.43	38.086				
11,400.00	6,985.65	5,494.00	5,493.16	77.10	112.30	-65.51	-169.29	66.65	5,269.94	5,133.18	136.76	38.534				
11,500.00	6,985.58	5,494.00	5,493.16	78.37	112.30	-65.51	-169.29	66.65	5,344.78	5,207.69	137.09	38.988				
11,600.00	6,985.50	5,494.00	5,493.16	79.65	112.30	-65.51	-169.29	66.65	5,420.42	5,283.02	137.41	39.448				
11,700.00	6,985.43	5,494.00	5,493.16	80.94	112.30	-65.51	-169.29	66.65	5,496.85	5,359.13	137.72	39.914				
11,800.00	6,985.36	5,494.00	5,493.16	82.24	112.30	-65.51	-169.29	66.65	5,574.02	5,436.00	138.02	40.386				
11,900.00	6,985.28	5,494.00	5,493.16	83.56	112.30	-65.51	-169.29	66.65	5,651.91	5,513.59	138.32	40.862				
12,000.00	6,985.21	5,494.00	5,493.16	84.88	112.30	-65.51	-169.29	66.65	5,730.48	5,591.88	138.61	41.344				
12,100.00	6,985.14	5,494.00	5,493.16	86.21	112.30	-65.51	-169.29	66.65	5,809.72	5,670.83	138.89	41.831				
12,200.00	6,985.06	5,494.00	5,493.16	87.56	112.30	-65.51	-169.29	66.65	5,889.58	5,750.42	139.16	42.322				
12,300.00	6,984.99	5,494.00	5,493.16	88.91	112.30	-65.51	-169.29	66.65	5,970.05	5,830.62	139.43	42.818				
12,400.00	6,984.92	5,494.00	5,493.16	90.27	112.30	-65.51	-169.29	66.65	6,051.11	5,911.42	139.69	43.318				
12,500.00	6,984.84	5,494.00	5,493.16	91.64	112.30	-65.51	-169.29	66.65	6,132.72	5,992.77	139.95	43.822				
12,600.00	6,984.77	5,494.00	5,493.16	93.01	112.30	-65.51	-169.29	66.65	6,214.87	6,074.68	140.20	44.330				
12,700.00	6,984.69	5,494.00	5,493.16	94.40	112.30	-65.51	-169.29	66.65	6,297.54	6,157.10	140.44	44.842				
12,800.00	6,984.62	5,494.00	5,493.16	95.79	112.30	-65.51	-169.29	66.65	6,380.70	6,240.03	140.68	45.357				
12,900.00	6,984.55	5,494.00	5,493.16	97.18	112.30	-65.51	-169.29	66.65	6,464.34	6,323.43	140.91	45.876				
13,000.00	6,984.47	5,494.00	5,493.16	98.59	112.30	-65.51	-169.29	66.65	6,548.44	6,407.31	141.14	46.398				
13,100.00	6,984.40	5,494.00	5,493.16	100.00	112.30	-65.51	-169.29	66.65	6,632.98	6,491.63	141.36	46.923				
13,200.00	6,984.33	5,494.00	5,493.16	101.41	112.30	-65.51	-169.29	66.65	6,717.95	6,576.38	141.57	47.452				
13,300.00	6,984.25	5,494.00	5,493.16	102.83	112.30	-65.51	-169.29	66.65	6,803.32	6,661.54	141.79	47.983				
13,400.00	6,984.18	5,494.00	5,493.16	104.26	112.30	-65.51	-169.29	66.65	6,889.09	6,747.10	141.99	48.517				
13,500.00	6,984.11	5,494.00	5,493.16	105.69	112.30	-65.51	-169.29	66.65	6,975.24	6,833.04	142.20	49.054				
13,600.00	6,984.03	5,494.00	5,493.16	107.13	112.30	-65.51	-169.29	66.65	7,061.75	6,919.36	142.39	49.593				
13,700.00	6,983.96	5,494.00	5,493.16	108.57	112.30	-65.51	-169.29	66.65	7,148.61	7,006.03	142.59	50.135				
13,800.00	6,983.88	5,494.00	5,493.16	110.02	112.30	-65.51	-169.29	66.65	7,235.82	7,093.04	142.78	50.679				

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #46 - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program:		60-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)		
13,900.00	6,983.81	5,494.00	5,493.16	111.47	112.30	-65.51	-169.29	66.65	7,323.35	7,180.38	142.96	51.225	
14,000.00	6,983.74	5,494.00	5,493.16	112.92	112.30	-65.51	-169.29	66.65	7,411.19	7,268.05	143.15	51.773	
14,100.00	6,983.66	5,494.00	5,493.16	114.38	112.30	-65.51	-169.29	66.65	7,499.34	7,356.02	143.33	52.324	
14,200.00	6,983.59	5,494.00	5,493.16	115.85	112.30	-65.51	-169.29	66.65	7,587.79	7,444.28	143.50	52.876	
14,300.00	6,983.52	5,494.00	5,493.16	117.31	112.30	-65.51	-169.29	66.65	7,676.51	7,532.84	143.67	53.430	
14,400.00	6,983.44	5,494.00	5,493.16	118.78	112.30	-65.51	-169.29	66.65	7,765.52	7,621.67	143.84	53.986	
14,500.00	6,983.37	5,494.00	5,493.16	120.26	112.30	-65.51	-169.29	66.65	7,854.78	7,710.77	144.01	54.543	
14,600.00	6,983.30	5,494.00	5,493.16	121.74	112.30	-65.51	-169.29	66.65	7,944.30	7,800.13	144.17	55.102	
14,700.00	6,983.22	5,494.00	5,493.16	123.22	112.30	-65.51	-169.29	66.65	8,034.07	7,889.74	144.33	55.663	
14,800.00	6,983.15	5,494.00	5,493.16	124.70	112.30	-65.51	-169.29	66.65	8,124.08	7,979.59	144.49	56.225	
14,900.00	6,983.08	5,494.00	5,493.16	126.19	112.30	-65.51	-169.29	66.65	8,214.32	8,069.67	144.65	56.788	
15,000.00	6,983.00	5,494.00	5,493.16	127.68	112.30	-65.51	-169.29	66.65	8,304.78	8,159.98	144.80	57.353	
15,100.00	6,982.93	5,494.00	5,493.16	129.17	112.30	-65.51	-169.29	66.65	8,395.46	8,250.51	144.95	57.919	
15,200.00	6,982.85	5,494.00	5,493.16	130.67	112.30	-65.51	-169.29	66.65	8,486.35	8,341.25	145.10	58.486	
15,300.00	6,982.78	5,494.00	5,493.16	132.16	112.30	-65.51	-169.29	66.65	8,577.44	8,432.19	145.25	59.054	
15,400.00	6,982.71	5,494.00	5,493.16	133.66	112.30	-65.51	-169.29	66.65	8,668.73	8,523.34	145.39	59.623	
15,500.00	6,982.63	5,494.00	5,493.16	135.17	112.30	-65.51	-169.29	66.65	8,760.21	8,614.67	145.54	60.193	
15,600.00	6,982.56	5,494.00	5,493.16	136.67	112.30	-65.51	-169.29	66.65	8,851.87	8,706.20	145.68	60.764	
15,700.00	6,982.49	5,494.00	5,493.16	138.18	112.30	-65.51	-169.29	66.65	8,943.71	8,797.90	145.81	61.336	
15,800.00	6,982.41	5,494.00	5,493.16	139.69	112.30	-65.51	-169.29	66.65	9,035.73	8,889.77	145.95	61.909	
15,900.00	6,982.34	5,494.00	5,493.16	141.20	112.30	-65.51	-169.29	66.65	9,127.91	8,981.82	146.09	62.482	
16,000.00	6,982.27	5,494.00	5,493.16	142.71	112.30	-65.51	-169.29	66.65	9,220.25	9,074.03	146.22	63.057	
16,100.00	6,982.19	5,494.00	5,493.16	144.23	112.30	-65.51	-169.29	66.65	9,312.76	9,166.40	146.35	63.632	
16,200.00	6,982.12	5,494.00	5,493.16	145.75	112.30	-65.51	-169.29	66.65	9,405.41	9,258.93	146.48	64.207	
16,300.00	6,982.05	5,494.00	5,493.16	147.27	112.30	-65.51	-169.29	66.65	9,498.22	9,351.61	146.61	64.784	
16,400.00	6,981.97	5,494.00	5,493.16	148.79	112.30	-65.51	-169.29	66.65	9,591.17	9,444.43	146.74	65.361	
16,500.00	6,981.90	5,494.00	5,493.16	150.31	112.30	-65.51	-169.29	66.65	9,684.26	9,537.39	146.87	65.938	
16,600.00	6,981.82	5,494.00	5,493.16	151.84	112.30	-65.51	-169.29	66.65	9,777.49	9,630.49	147.00	66.516	
16,700.00	6,981.75	5,494.00	5,493.16	153.36	112.30	-65.51	-169.29	66.65	9,870.85	9,723.73	147.12	67.094	
16,800.00	6,981.68	5,494.00	5,493.16	154.89	112.30	-65.51	-169.29	66.65	9,964.34	9,817.09	147.24	67.673	
16,900.00	6,981.60	5,494.00	5,493.16	156.42	112.30	-65.51	-169.29	66.65	10,057.95	9,910.59	147.37	68.252	
17,000.00	6,981.53	5,494.00	5,493.16	157.95	112.30	-65.51	-169.29	66.65	10,151.69	10,004.20	147.49	68.831	
17,100.00	6,981.46	5,494.00	5,493.16	159.49	112.30	-65.51	-169.29	66.65	10,245.54	10,097.93	147.61	69.411	
17,200.00	6,981.38	5,494.00	5,493.16	161.02	112.30	-65.51	-169.29	66.65	10,339.51	10,191.78	147.73	69.991	
17,300.00	6,981.31	5,494.00	5,493.16	162.56	112.30	-65.51	-169.29	66.65	10,433.59	10,285.75	147.85	70.571	
17,400.00	6,981.24	5,494.00	5,493.16	164.09	112.30	-65.51	-169.29	66.65	10,527.78	10,379.82	147.96	71.151	
17,500.00	6,981.16	5,494.00	5,493.16	165.63	112.30	-65.51	-169.29	66.65	10,622.08	10,474.00	148.08	71.732	
17,600.00	6,981.09	5,494.00	5,493.16	167.17	112.30	-65.51	-169.29	66.65	10,716.48	10,568.28	148.20	72.312	
17,700.00	6,981.01	5,494.00	5,493.16	168.71	112.30	-65.51	-169.29	66.65	10,810.98	10,662.67	148.31	72.893	
17,800.00	6,980.94	5,494.00	5,493.16	170.25	112.30	-65.51	-169.29	66.65	10,905.58	10,757.15	148.43	73.474	
17,900.00	6,980.87	5,494.00	5,493.16	171.80	112.30	-65.51	-169.29	66.65	11,000.27	10,851.73	148.54	74.055	
18,000.00	6,980.79	5,494.00	5,493.16	173.34	112.30	-65.51	-169.29	66.65	11,095.06	10,946.41	148.65	74.636	
18,100.00	6,980.72	5,494.00	5,493.16	174.89	112.30	-65.51	-169.29	66.65	11,189.94	11,041.17	148.77	75.218	
18,200.00	6,980.65	5,494.00	5,493.16	176.43	112.30	-65.51	-169.29	66.65	11,284.91	11,136.03	148.88	75.799	
18,300.00	6,980.57	5,494.00	5,493.16	177.98	112.30	-65.51	-169.29	66.65	11,379.96	11,230.97	148.99	76.380	
18,400.00	6,980.50	5,494.00	5,493.16	179.53	112.30	-65.51	-169.29	66.65	11,475.10	11,325.99	149.10	76.961	
18,500.00	6,980.43	5,494.00	5,493.16	181.08	112.30	-65.51	-169.29	66.65	11,570.32	11,421.10	149.21	77.542	
18,600.00	6,980.35	5,494.00	5,493.16	182.63	112.30	-65.51	-169.29	66.65	11,665.62	11,516.29	149.32	78.123	
18,700.00	6,980.28	5,494.00	5,493.16	184.18	112.30	-65.51	-169.29	66.65	11,760.99	11,611.56	149.43	78.704	
18,800.00	6,980.21	5,494.00	5,493.16	185.73	112.30	-65.51	-169.29	66.65	11,856.45	11,706.90	149.54	79.284	
18,900.00	6,980.13	5,494.00	5,493.16	187.28	112.30	-65.51	-169.29	66.65	11,951.97	11,802.32	149.65	79.865	
19,000.00	6,980.06	5,494.00	5,493.16	188.84	112.30	-65.51	-169.29	66.65	12,047.57	11,897.81	149.76	80.445	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #46 - OH - OH-INC													Offset Site Error:	0.00 usft		
Survey Program:		60-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			
19,100.00	6,979.98	5,494.00	5,493.16	190.39	112.30	-65.51	-169.29	66.65	12,143.25	11,993.38	149.87	81.026				
19,200.00	6,979.91	5,494.00	5,493.16	191.95	112.30	-65.51	-169.29	66.65	12,238.99	12,089.01	149.98	81.606				
19,300.00	6,979.84	5,494.00	5,493.16	193.51	112.30	-65.51	-169.29	66.65	12,334.79	12,184.71	150.08	82.186				
19,400.00	6,979.76	5,494.00	5,493.16	195.06	112.30	-65.51	-169.29	66.65	12,430.67	12,280.48	150.19	82.765				
19,500.00	6,979.69	5,494.00	5,493.16	196.62	112.30	-65.51	-169.29	66.65	12,526.61	12,376.31	150.30	83.344				
19,600.00	6,979.62	5,494.00	5,493.16	198.18	112.30	-65.51	-169.29	66.65	12,622.61	12,472.20	150.41	83.924				
19,700.00	6,979.54	5,494.00	5,493.16	199.74	112.30	-65.51	-169.29	66.65	12,718.67	12,568.16	150.51	84.502				
19,800.00	6,979.47	5,494.00	5,493.16	201.30	112.30	-65.51	-169.29	66.65	12,814.80	12,664.18	150.62	85.081				
19,900.00	6,979.40	5,494.00	5,493.16	202.86	112.30	-65.51	-169.29	66.65	12,910.98	12,760.25	150.73	85.659				
20,000.00	6,979.32	5,494.00	5,493.16	204.42	112.30	-65.51	-169.29	66.65	13,007.22	12,856.39	150.83	86.237				
20,100.00	6,979.25	5,494.00	5,493.16	205.98	112.30	-65.51	-169.29	66.65	13,103.51	12,952.58	150.94	86.815				
20,200.00	6,979.18	5,494.00	5,493.16	207.55	112.30	-65.51	-169.29	66.65	13,199.87	13,048.82	151.04	87.392				
20,300.00	6,979.10	5,494.00	5,493.16	209.11	112.30	-65.51	-169.29	66.65	13,296.27	13,145.12	151.15	87.969				
20,400.00	6,979.03	5,494.00	5,493.16	210.68	112.30	-65.51	-169.29	66.65	13,392.73	13,241.48	151.25	88.545				
20,500.00	6,978.95	5,494.00	5,493.16	212.24	112.30	-65.51	-169.29	66.65	13,489.24	13,337.88	151.36	89.121				
20,600.00	6,978.88	5,494.00	5,493.16	213.81	112.30	-65.51	-169.29	66.65	13,585.80	13,434.33	151.46	89.697				
20,700.00	6,978.81	5,494.00	5,493.16	215.37	112.30	-65.51	-169.29	66.65	13,682.41	13,530.84	151.57	90.272				
20,800.00	6,978.73	5,494.00	5,493.16	216.94	112.30	-65.51	-169.29	66.65	13,779.07	13,627.39	151.67	90.847				
20,900.00	6,978.66	5,494.00	5,493.16	218.51	112.30	-65.51	-169.29	66.65	13,875.77	13,723.99	151.78	91.422				
21,000.00	6,978.59	5,494.00	5,493.16	220.07	112.30	-65.51	-169.29	66.65	13,972.52	13,820.64	151.88	91.996				
21,100.00	6,978.51	5,494.00	5,493.16	221.64	112.30	-65.51	-169.29	66.65	14,069.32	13,917.33	151.99	92.569				
21,200.00	6,978.44	5,494.00	5,493.16	223.21	112.30	-65.51	-169.29	66.65	14,166.16	14,014.07	152.09	93.142				
21,300.00	6,978.37	5,494.00	5,493.16	224.78	112.30	-65.51	-169.29	66.65	14,263.05	14,110.85	152.20	93.715				
21,400.00	6,978.29	5,494.00	5,493.16	226.35	112.30	-65.51	-169.29	66.65	14,359.97	14,207.67	152.30	94.287				
21,500.00	6,978.22	5,494.00	5,493.16	227.92	112.30	-65.51	-169.29	66.65	14,456.94	14,304.54	152.40	94.859				
21,600.00	6,978.14	5,494.00	5,493.16	229.49	112.30	-65.51	-169.29	66.65	14,553.95	14,401.44	152.51	95.430				
21,700.00	6,978.07	5,494.00	5,493.16	231.06	112.30	-65.51	-169.29	66.65	14,651.00	14,498.39	152.61	96.001				
21,800.00	6,978.00	5,494.00	5,493.16	232.63	112.30	-65.51	-169.29	66.65	14,748.09	14,595.38	152.72	96.571				
21,900.00	6,977.92	5,494.00	5,493.16	234.21	112.30	-65.51	-169.29	66.65	14,845.22	14,692.40	152.82	97.141				
22,000.00	6,977.85	5,494.00	5,493.16	235.78	112.30	-65.51	-169.29	66.65	14,942.39	14,789.46	152.93	97.710				
22,100.00	6,977.78	5,494.00	5,493.16	237.35	112.30	-65.51	-169.29	66.65	15,039.59	14,886.56	153.03	98.278				
22,200.00	6,977.70	5,494.00	5,493.16	238.92	112.30	-65.51	-169.29	66.65	15,136.83	14,983.70	153.14	98.846				
22,300.00	6,977.63	5,494.00	5,493.16	240.50	112.30	-65.51	-169.29	66.65	15,234.11	15,080.87	153.24	99.414				
22,400.00	6,977.56	5,494.00	5,493.16	242.07	112.30	-65.51	-169.29	66.65	15,331.42	15,178.08	153.34	99.981				
22,500.00	6,977.48	5,494.00	5,493.16	243.65	112.30	-65.51	-169.29	66.65	15,428.77	15,275.32	153.45	100.547				
22,600.00	6,977.41	5,494.00	5,493.16	245.22	112.30	-65.51	-169.29	66.65	15,526.15	15,372.59	153.55	101.113				
22,700.00	6,977.34	5,494.00	5,493.16	246.80	112.30	-65.51	-169.29	66.65	15,623.56	15,469.90	153.66	101.678				
22,800.00	6,977.26	5,494.00	5,493.16	248.37	112.30	-65.51	-169.29	66.65	15,721.00	15,567.24	153.76	102.242				
22,900.00	6,977.19	5,494.00	5,493.16	249.95	112.30	-65.51	-169.29	66.65	15,818.48	15,664.61	153.87	102.806				
23,000.00	6,977.11	5,494.00	5,493.16	251.53	112.30	-65.51	-169.29	66.65	15,915.99	15,762.02	153.97	103.370				
23,100.00	6,977.04	5,494.00	5,493.16	253.10	112.30	-65.51	-169.29	66.65	16,013.53	15,859.45	154.08	103.932				
23,155.65	6,977.00	5,494.00	5,493.16	253.98	112.30	-65.51	-169.29	66.65	16,067.82	15,913.69	154.13	104.245				
23,156.15	6,977.00	5,494.00	5,493.16	254.06	112.30	-65.51	-169.29	66.65	16,068.31	15,910.25	158.06	101.659				

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #80B - OH - OH-SVY													Offset Site Error: 0.00 usft
Survey Program: 300-MWD OWSG Rev5													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	-109.68	-890.41	-2,489.20	2,644.44				
100.00	100.00	34.44	34.44	0.25	0.36	-109.68	-890.42	-2,489.21	2,643.67	2,643.06	0.61	4,322.773	
200.00	200.00	130.12	130.12	0.61	1.36	-109.68	-890.56	-2,489.30	2,643.81	2,641.84	1.97	1,341.174	
300.00	300.00	225.79	225.79	0.97	2.37	-109.69	-890.87	-2,489.50	2,644.12	2,640.79	3.33	793.800	
400.00	400.00	321.41	321.41	1.33	3.19	-109.70	-891.34	-2,489.81	2,644.59	2,640.08	4.51	586.370	
500.00	500.00	653.92	652.49	1.68	3.61	-109.25	-867.54	-2,484.46	2,640.46	2,635.29	5.18	510.152	
600.00	599.98	787.29	783.37	2.04	3.87	-118.94	-842.35	-2,480.56	2,632.17	2,626.49	5.68	463.034	
700.00	699.84	869.79	863.51	2.41	4.07	-118.74	-822.78	-2,479.35	2,625.52	2,619.35	6.18	425.185	
800.00	799.45	948.00	938.79	2.77	4.30	-118.50	-801.59	-2,479.76	2,621.38	2,614.68	6.70	391.172	
900.00	898.70	1,027.99	1,014.84	3.13	4.57	-118.18	-776.95	-2,481.99	2,619.89	2,612.61	7.28	359.779	
916.40	914.94	1,044.00	1,029.94	3.19	4.63	-118.11	-771.65	-2,482.61	2,619.87	2,612.48	7.39	354.519 CC, ES	
1,000.00	997.47	1,107.00	1,089.05	3.50	4.84	-117.81	-750.06	-2,485.59	2,620.82	2,612.91	7.91	331.429	
1,100.00	1,095.63	1,171.00	1,148.44	3.89	5.09	-115.09	-726.58	-2,489.68	2,624.03	2,615.49	8.54	307.347	
1,200.00	1,193.09	1,224.28	1,197.72	4.29	5.28	-113.08	-706.79	-2,494.00	2,629.65	2,620.49	9.16	287.002	
1,300.00	1,289.73	1,411.89	1,371.64	4.72	6.02	-111.12	-637.84	-2,507.58	2,635.32	2,624.87	10.45	252.244	
1,400.00	1,385.42	1,492.33	1,445.27	5.16	6.37	-109.79	-605.92	-2,513.15	2,640.62	2,629.31	11.31	233.446	
1,496.97	1,477.20	1,648.04	1,587.38	5.62	7.10	-108.57	-543.17	-2,523.36	2,646.18	2,633.55	12.64	209.401	
1,500.00	1,480.05	1,648.93	1,588.19	5.63	7.11	-108.56	-542.79	-2,523.42	2,646.32	2,633.66	12.66	209.066	
1,600.00	1,574.15	1,731.95	1,662.31	6.12	7.60	-108.32	-505.82	-2,528.94	2,651.09	2,637.42	13.68	193.852	
1,700.00	1,668.25	1,818.45	1,738.63	6.62	8.20	-108.02	-465.72	-2,535.80	2,656.58	2,641.82	14.76	179.938	
1,800.00	1,762.35	1,933.77	1,842.09	7.12	8.97	-107.71	-415.36	-2,543.51	2,661.72	2,645.68	16.03	166.019	
1,900.00	1,856.45	2,102.50	1,994.14	7.64	10.10	-107.29	-342.94	-2,553.43	2,666.90	2,649.24	17.66	150.976	
2,000.00	1,950.55	2,200.35	2,083.96	8.16	10.70	-107.14	-304.20	-2,555.73	2,669.16	2,650.38	18.78	142.118	
2,100.00	2,044.65	2,268.90	2,147.26	8.68	11.12	-107.06	-277.99	-2,557.93	2,672.57	2,652.85	19.71	135.583	
2,200.00	2,138.75	2,358.78	2,230.96	9.21	11.64	-106.98	-245.35	-2,560.99	2,676.73	2,655.98	20.75	129.011	
2,300.00	2,232.85	2,463.00	2,328.80	9.74	12.21	-106.95	-209.60	-2,563.89	2,680.82	2,658.99	21.84	122.751	
2,400.00	2,326.95	2,570.14	2,430.22	10.27	12.76	-106.97	-175.13	-2,566.18	2,684.87	2,661.96	22.91	117.170	
2,500.00	2,421.05	2,658.16	2,514.13	10.81	13.18	-107.02	-148.59	-2,567.66	2,689.00	2,665.14	23.87	112.673	
2,600.00	2,515.15	2,750.39	2,602.71	11.34	13.59	-107.13	-122.96	-2,568.73	2,693.28	2,668.47	24.81	108.576	
2,700.00	2,609.25	2,834.55	2,684.03	11.88	13.94	-107.26	-101.30	-2,569.62	2,698.01	2,672.33	25.68	105.051	
2,800.00	2,703.35	2,929.72	2,776.51	12.42	14.31	-107.46	-78.92	-2,571.01	2,703.70	2,677.12	26.58	101.727	
2,900.00	2,797.45	2,999.00	2,844.30	12.96	14.55	-107.64	-64.62	-2,571.61	2,709.65	2,682.31	27.34	99.119	
3,000.00	2,891.55	3,086.39	2,930.23	13.51	14.81	-107.92	-48.76	-2,572.55	2,716.52	2,688.39	28.13	96.583	
3,100.00	2,985.65	3,159.00	3,001.98	14.05	15.00	-108.19	-37.68	-2,573.12	2,724.01	2,695.18	28.83	94.476	
3,200.00	3,079.75	3,283.95	3,125.90	14.60	15.27	-108.72	-21.64	-2,573.70	2,732.07	2,702.42	29.65	92.153	
3,300.00	3,173.85	3,369.53	3,210.91	15.14	15.45	-109.10	-11.84	-2,573.30	2,739.70	2,709.36	30.34	90.290	
3,400.00	3,267.95	3,432.72	3,273.74	15.69	15.59	-109.40	-5.06	-2,573.22	2,748.09	2,717.12	30.98	88.720	
3,500.00	3,362.05	3,508.00	3,348.66	16.23	15.76	-109.76	2.22	-2,573.76	2,757.73	2,726.11	31.62	87.216	
3,600.00	3,456.15	3,586.98	3,427.43	16.78	15.97	-110.17	7.96	-2,574.45	2,768.37	2,736.13	32.24	85.874	
3,700.00	3,550.25	3,653.01	3,493.38	17.33	16.16	-110.54	11.04	-2,575.02	2,780.04	2,747.24	32.80	84.767	
3,800.00	3,644.35	3,742.70	3,583.02	17.88	16.40	-111.07	13.72	-2,575.76	2,792.50	2,759.14	33.36	83.697	
3,900.00	3,738.45	3,839.62	3,679.92	18.42	19.56	-111.66	15.66	-2,576.28	2,805.31	2,768.39	36.92	75.974	
4,000.00	3,832.55	3,934.51	3,774.79	18.97	26.78	-112.24	17.55	-2,576.77	2,818.42	2,773.77	44.65	63.120	
4,100.00	3,926.65	4,029.38	3,869.64	19.52	34.01	-112.81	19.40	-2,577.25	2,831.82	2,779.44	52.38	54.064	
4,200.00	4,020.75	4,124.24	3,964.48	20.07	41.23	-113.37	21.24	-2,577.71	2,845.52	2,785.41	60.11	47.341	
4,300.00	4,114.85	4,219.08	4,059.31	20.62	48.45	-113.93	23.05	-2,578.16	2,859.50	2,791.67	67.83	42.156	
4,400.00	4,208.95	4,313.91	4,154.11	21.17	55.66	-114.49	24.84	-2,578.59	2,873.77	2,798.22	75.55	38.037	
4,500.00	4,303.05	4,408.72	4,248.91	21.72	62.88	-115.04	26.60	-2,579.01	2,888.33	2,805.06	83.27	34.686	
4,600.00	4,397.15	4,503.51	4,343.69	22.27	70.10	-115.59	28.34	-2,579.42	2,903.16	2,812.18	90.98	31.908	
4,700.00	4,491.25	4,598.29	4,438.45	22.82	77.31	-116.13	30.05	-2,579.81	2,918.27	2,819.57	98.70	29.569	
4,800.00	4,585.35	4,693.06	4,533.20	23.37	84.52	-116.67	31.74	-2,580.19	2,933.65	2,827.25	106.40	27.571	
4,900.00	4,679.45	4,787.81	4,627.93	23.93	91.74	-117.20	33.41	-2,580.55	2,949.30	2,835.19	114.11	25.847	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #80B - OH - OH-SVY											Offset Site Error: 0.00 usft			
Survey Program: Reference		300-MWD OWSG Rev5 Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Rule Assigned: Distance				Offset Well Error: 0.00 usft	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
5,000.00	4,773.55	4,882.54	4,722.65	24.48	98.95	-117.73	35.05	-2,580.90	2,965.21	2,843.41	121.81	24.344		
5,100.00	4,867.65	4,977.26	4,817.35	25.03	106.16	-118.25	36.67	-2,581.24	2,981.39	2,851.89	129.50	23.022		
5,200.00	4,961.75	5,071.96	4,912.04	25.58	113.37	-118.77	38.27	-2,581.56	2,997.82	2,860.63	137.20	21.851		
5,300.00	5,055.85	5,166.65	5,006.72	26.13	120.57	-119.28	39.84	-2,581.87	3,014.51	2,869.63	144.89	20.806		
5,400.00	5,149.95	5,261.32	5,101.37	26.68	127.78	-119.79	41.38	-2,582.16	3,031.45	2,878.88	152.57	19.869		
5,500.00	5,244.05	5,355.97	5,196.02	27.24	134.99	-120.29	42.91	-2,582.44	3,048.64	2,888.38	160.26	19.024		
5,600.00	5,338.15	5,450.61	5,290.65	27.79	142.19	-120.79	44.41	-2,582.70	3,066.07	2,898.14	167.94	18.257		
5,665.73	5,400.00	5,512.81	5,352.83	28.15	146.93	-121.12	45.38	-2,582.87	3,077.66	2,904.68	172.98	17.792		
5,700.00	5,432.28	5,545.27	5,385.29	28.34	149.40	-121.34	45.88	-2,582.96	3,083.69	2,908.08	175.61	17.559		
5,800.00	5,526.87	5,640.34	5,480.35	28.88	156.63	-121.95	47.34	-2,583.19	3,100.84	2,917.52	183.31	16.915		
5,900.00	5,622.01	5,735.93	5,575.93	29.41	163.91	-122.54	48.78	-2,583.42	3,117.28	2,926.23	191.04	16.317		
6,000.00	5,717.67	5,832.00	5,671.99	29.92	171.22	-123.08	50.21	-2,583.63	3,132.97	2,934.17	198.80	15.760		
6,100.00	5,813.83	5,928.53	5,768.50	30.41	178.57	-123.59	51.61	-2,583.83	3,147.87	2,941.30	206.57	15.238		
6,200.00	5,910.44	6,025.48	5,865.45	30.89	185.95	-124.07	53.00	-2,584.01	3,161.96	2,947.59	214.37	14.750		
6,300.00	6,007.50	6,122.84	5,962.79	31.36	193.36	-124.51	54.37	-2,584.18	3,175.20	2,953.00	222.19	14.290		
6,400.00	6,104.96	6,220.56	6,060.51	31.80	200.80	-124.92	55.72	-2,584.34	3,187.55	2,957.52	230.03	13.857		
6,500.00	6,202.80	6,318.63	6,158.57	32.24	208.27	-125.29	57.05	-2,584.48	3,199.00	2,961.12	237.88	13.448		
6,600.00	6,300.98	6,417.01	6,256.94	32.66	215.76	-125.63	58.36	-2,584.61	3,209.52	2,963.77	245.74	13.060		
6,700.00	6,399.48	6,515.89	6,355.81	33.06	222.11	-125.93	59.65	-2,584.72	3,219.08	2,966.62	252.45	12.751		
6,722.82	6,422.00	6,538.54	6,378.46	33.15	223.33	-126.00	59.95	-2,584.75	3,221.12	2,967.36	253.76	12.693		
6,750.00	6,448.76	6,565.45	6,405.37	33.26	224.79	-116.09	60.31	-2,584.78	3,223.39	2,968.07	255.32	12.625		
6,800.00	6,497.51	6,614.53	6,454.44	33.48	227.45	-104.68	60.97	-2,584.84	3,226.83	2,968.65	258.18	12.498		
6,850.00	6,545.40	6,662.77	6,502.67	33.72	230.07	-98.17	61.62	-2,584.90	3,229.34	2,968.33	261.01	12.372		
6,900.00	6,592.13	6,709.88	6,549.78	33.97	232.62	-94.18	62.26	-2,584.95	3,230.96	2,967.15	263.80	12.248		
6,950.00	6,637.40	6,755.58	6,595.48	34.25	235.10	-91.65	62.89	-2,585.01	3,231.72	2,965.18	266.54	12.125		
7,000.00	6,680.94	6,799.57	6,639.47	34.54	237.48	-90.02	63.50	-2,585.07	3,231.69	2,962.50	269.19	12.005		
7,050.00	6,722.48	6,841.60	6,681.49	34.85	239.76	-89.00	64.08	-2,585.12	3,230.95	2,959.20	271.75	11.889		
7,100.00	6,761.76	6,881.40	6,721.29	35.17	241.92	-88.41	64.64	-2,585.17	3,229.58	2,955.37	274.21	11.778		
7,150.00	6,798.55	6,918.73	6,758.62	35.51	243.94	-88.13	65.17	-2,585.22	3,227.67	2,951.13	276.54	11.671		
7,200.00	6,832.61	6,953.36	6,793.24	35.86	245.82	-88.08	65.67	-2,585.27	3,225.33	2,946.58	278.74	11.571		
7,250.00	6,863.74	6,985.07	6,824.94	36.22	247.54	-88.19	66.12	-2,585.31	3,222.65	2,941.86	280.80	11.477		
7,300.00	6,891.74	7,013.66	6,853.54	36.59	249.09	-88.42	66.53	-2,585.35	3,219.75	2,937.06	282.69	11.390		
7,350.00	6,916.44	7,038.97	6,878.84	36.98	250.46	-88.71	66.90	-2,585.38	3,216.73	2,932.31	284.41	11.310		
7,400.00	6,937.69	7,060.83	6,900.70	37.37	251.65	-89.05	67.22	-2,585.41	3,213.67	2,927.71	285.96	11.238		
7,450.00	6,955.36	7,079.11	6,918.98	37.78	252.64	-89.40	67.49	-2,585.44	3,210.68	2,923.37	287.31	11.175		
7,500.00	6,969.34	7,093.70	6,933.56	38.19	253.43	-89.73	67.70	-2,585.46	3,207.83	2,919.37	288.46	11.120		
7,550.00	6,979.53	7,104.50	6,944.36	38.62	254.02	-90.04	67.86	-2,585.48	3,205.19	2,915.78	289.41	11.075		
7,600.00	6,985.89	7,111.44	6,951.31	39.05	254.39	-90.30	67.96	-2,585.49	3,202.82	2,912.68	290.15	11.039		
7,650.00	6,988.37	7,114.49	6,954.35	39.48	254.56	-90.51	68.01	-2,585.49	3,200.76	2,910.10	290.66	11.012		
7,657.25	6,988.40	7,114.61	6,954.47	39.54	254.56	-90.54	68.01	-2,585.49	3,200.49	2,909.77	290.72	11.009		
7,700.00	6,988.37	7,115.05	6,954.91	39.92	254.59	-90.55	68.01	-2,585.49	3,199.19	2,908.15	291.04	10.992		
7,775.76	6,988.32	7,115.84	6,955.70	40.60	254.63	-90.56	68.02	-2,585.49	3,198.29	2,906.67	291.62	10.967		
7,800.00	6,988.30	7,116.10	6,955.96	40.82	254.64	-90.57	68.03	-2,585.49	3,198.39	2,906.58	291.80	10.961		
7,900.00	6,988.23	7,117.14	6,957.00	41.77	254.70	-90.59	68.04	-2,585.49	3,200.71	2,908.14	292.56	10.940		
8,000.00	6,988.16	7,118.18	6,958.04	42.75	254.76	-90.60	68.06	-2,585.49	3,206.14	2,912.82	293.32	10.930		
8,100.00	6,988.09	7,119.23	6,959.09	43.76	254.81	-90.62	68.07	-2,585.50	3,214.69	2,920.62	294.07	10.932		
8,152.35	6,988.06	7,119.77	6,959.63	44.30	254.84	-90.63	68.08	-2,585.50	3,220.39	2,925.93	294.46	10.937		
8,200.00	6,988.02	7,120.26	6,960.12	44.79	254.87	-90.64	68.09	-2,585.50	3,225.52	2,930.71	294.81	10.941		
8,300.00	6,987.95	7,121.24	6,961.10	45.83	254.92	-90.66	68.10	-2,585.50	3,233.43	2,937.89	295.53	10.941		
8,400.00	6,987.88	7,122.13	6,961.99	46.85	254.97	-90.67	68.12	-2,585.50	3,237.45	2,941.19	296.25	10.928		
8,500.00	6,987.80	7,122.94	6,962.80	47.85	255.02	-90.69	68.13	-2,585.50	3,237.57	2,940.61	296.96	10.902		
8,600.00	6,987.73	7,123.67	6,963.53	48.83	255.05	-90.71	68.14	-2,585.50	3,233.81	2,936.16	297.65	10.864		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #80B - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		300-MWD OWSG Rev5					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		
8,700.00	6,987.65	7,124.30	6,964.16	49.79	255.09	-90.73	68.15	-2,585.50	3,226.16	2,927.83	298.33	10.814		
8,800.00	6,987.57	7,124.85	6,964.71	50.72	255.12	-90.75	68.16	-2,585.50	3,214.63	2,915.65	298.98	10.752		
8,900.00	6,987.50	7,125.29	6,965.15	51.62	255.14	-90.77	68.16	-2,585.50	3,199.24	2,899.62	299.62	10.678		
9,000.00	6,987.42	7,125.64	6,965.50	52.48	255.16	-90.79	68.17	-2,585.51	3,180.01	2,879.78	300.23	10.592		
9,100.00	6,987.34	7,125.89	6,965.75	53.30	255.18	-90.81	68.17	-2,585.51	3,156.96	2,856.15	300.81	10.495		
9,200.00	6,987.27	7,126.04	6,965.90	54.08	255.18	-90.83	68.18	-2,585.51	3,130.12	2,828.76	301.36	10.387		
9,215.33	6,987.26	7,126.05	6,965.91	54.20	255.18	-90.83	68.18	-2,585.51	3,125.67	2,824.23	301.44	10.369		
9,300.00	6,987.20	7,126.12	6,965.98	54.85	255.19	-90.83	68.18	-2,585.51	3,101.92	2,800.04	301.88	10.275		
9,400.00	6,987.12	7,126.20	6,966.06	55.65	255.19	-90.83	68.18	-2,585.51	3,076.64	2,774.24	302.39	10.174		
9,500.00	6,987.05	7,126.28	6,966.14	56.48	255.20	-90.84	68.18	-2,585.51	3,054.42	2,751.53	302.89	10.084		
9,600.00	6,986.98	7,126.36	6,966.22	57.35	255.20	-90.84	68.18	-2,585.51	3,035.33	2,731.97	303.36	10.006		
9,700.00	6,986.90	7,126.44	6,966.30	58.24	255.21	-90.84	68.18	-2,585.51	3,019.44	2,715.62	303.82	9.938		
9,800.00	6,986.83	7,126.52	6,966.38	59.17	255.21	-90.84	68.18	-2,585.51	3,006.79	2,702.55	304.24	9.883		
9,900.00	6,986.75	7,126.60	6,966.46	60.12	255.21	-90.84	68.18	-2,585.51	2,997.43	2,692.78	304.65	9.839		
10,000.00	6,986.68	7,126.68	6,966.54	61.10	255.22	-90.84	68.18	-2,585.51	2,991.38	2,686.36	305.02	9.807		
10,100.00	6,986.61	7,126.76	6,966.62	62.11	255.22	-90.84	68.19	-2,585.51	2,988.66	2,683.31	305.35	9.788		
10,131.12	6,986.58	7,126.79	6,966.65	62.43	255.22	-90.84	68.19	-2,585.51	2,988.50	2,683.05	305.46	9.784		
10,200.00	6,986.53	7,126.84	6,966.70	63.14	255.23	-90.85	68.19	-2,585.51	2,989.30	2,683.64	305.66	9.780 SF		
10,300.00	6,986.46	7,126.92	6,966.78	64.20	255.23	-90.85	68.19	-2,585.51	2,993.27	2,687.34	305.93	9.784		
10,400.00	6,986.39	7,127.00	6,966.86	65.28	255.24	-90.85	68.19	-2,585.51	3,000.57	2,694.41	306.16	9.801		
10,500.00	6,986.31	7,127.08	6,966.94	66.38	255.24	-90.85	68.19	-2,585.51	3,011.18	2,704.82	306.36	9.829		
10,600.00	6,986.24	7,127.16	6,967.03	67.50	255.24	-90.85	68.19	-2,585.51	3,025.06	2,718.54	306.52	9.869		
10,700.00	6,986.17	7,127.25	6,967.11	68.64	255.25	-90.85	68.19	-2,585.51	3,042.16	2,735.52	306.64	9.921		
10,800.00	6,986.09	7,127.33	6,967.19	69.80	255.25	-90.86	68.19	-2,585.51	3,062.44	2,755.71	306.73	9.984		
10,900.00	6,986.02	7,127.41	6,967.27	70.98	255.26	-90.86	68.20	-2,585.51	3,085.83	2,779.04	306.79	10.058		
11,000.00	6,985.95	7,127.49	6,967.35	72.17	255.26	-90.86	68.20	-2,585.51	3,112.25	2,805.44	306.81	10.144		
11,100.00	6,985.87	7,127.57	6,967.43	73.38	255.27	-90.86	68.20	-2,585.51	3,141.63	2,834.83	306.80	10.240		
11,200.00	6,985.80	7,127.65	6,967.51	74.61	255.27	-90.86	68.20	-2,585.51	3,173.90	2,867.14	306.76	10.346		
11,300.00	6,985.72	7,127.73	6,967.59	75.85	255.28	-90.86	68.20	-2,585.51	3,208.96	2,902.26	306.70	10.463		
11,400.00	6,985.65	7,127.81	6,967.67	77.10	255.28	-90.86	68.20	-2,585.51	3,246.72	2,940.11	306.61	10.589		
11,500.00	6,985.58	7,127.89	6,967.75	78.37	255.28	-90.87	68.20	-2,585.51	3,287.09	2,980.60	306.49	10.725		
11,600.00	6,985.50	7,127.97	6,967.83	79.65	255.29	-90.87	68.20	-2,585.51	3,329.98	3,023.62	306.36	10.869		
11,700.00	6,985.43	7,128.05	6,967.91	80.94	255.29	-90.87	68.20	-2,585.51	3,375.28	3,069.07	306.21	11.023		
11,800.00	6,985.36	7,128.13	6,967.99	82.24	255.30	-90.87	68.21	-2,585.51	3,422.91	3,116.87	306.04	11.184		
11,900.00	6,985.28	7,128.21	6,968.07	83.56	255.30	-90.87	68.21	-2,585.51	3,472.76	3,166.90	305.86	11.354		
12,000.00	6,985.21	7,128.29	6,968.15	84.88	255.31	-90.87	68.21	-2,585.51	3,524.75	3,219.08	305.67	11.531		
12,100.00	6,985.14	7,128.37	6,968.23	86.21	255.31	-90.88	68.21	-2,585.51	3,578.77	3,273.31	305.46	11.716		
12,200.00	6,985.06	7,128.45	6,968.32	87.56	255.31	-90.88	68.21	-2,585.51	3,634.75	3,329.50	305.25	11.907		
12,300.00	6,984.99	7,128.54	6,968.40	88.91	255.32	-90.88	68.21	-2,585.51	3,692.58	3,387.55	305.03	12.106		
12,400.00	6,984.92	7,128.62	6,968.48	90.27	255.32	-90.88	68.21	-2,585.51	3,752.19	3,447.39	304.81	12.310		
12,500.00	6,984.84	7,128.70	6,968.56	91.64	255.33	-90.88	68.21	-2,585.51	3,813.49	3,508.91	304.58	12.521		
12,600.00	6,984.77	7,128.78	6,968.64	93.01	255.33	-90.88	68.22	-2,585.51	3,876.40	3,572.05	304.35	12.737		
12,700.00	6,984.69	7,128.86	6,968.72	94.40	255.34	-90.88	68.22	-2,585.51	3,940.85	3,636.73	304.12	12.958		
12,800.00	6,984.62	7,128.94	6,968.80	95.79	255.34	-90.89	68.22	-2,585.51	4,006.75	3,702.86	303.89	13.185		
12,900.00	6,984.55	7,129.02	6,968.88	97.18	255.35	-90.89	68.22	-2,585.51	4,074.04	3,770.39	303.66	13.417		
13,000.00	6,984.47	7,129.10	6,968.96	98.59	255.35	-90.89	68.22	-2,585.51	4,142.66	3,839.23	303.43	13.653		
13,100.00	6,984.40	7,129.18	6,969.04	100.00	255.35	-90.89	68.22	-2,585.51	4,212.53	3,909.33	303.20	13.894		
13,200.00	6,984.33	7,129.26	6,969.12	101.41	255.36	-90.89	68.22	-2,585.51	4,283.59	3,980.61	302.98	14.138		
13,300.00	6,984.25	7,129.34	6,969.20	102.83	255.36	-90.89	68.22	-2,585.51	4,355.79	4,053.04	302.76	14.387		
13,400.00	6,984.18	7,129.42	6,969.28	104.26	255.37	-90.90	68.23	-2,585.51	4,429.07	4,126.53	302.54	14.640		
13,500.00	6,984.11	7,129.50	6,969.36	105.69	255.37	-90.90	68.23	-2,585.51	4,503.39	4,201.06	302.33	14.896		
13,600.00	6,984.03	7,129.59	6,969.45	107.13	255.38	-90.90	68.23	-2,585.51	4,578.67	4,276.55	302.12	15.155		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #80B - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		300-MWD OWSG Rev5					Rule Assigned:						Offset Well Error:	0.00 usft
Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Reference (usft)	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)				
13,700.00	6,983.96	7,129.67	6,969.53	108.57	255.38	-90.90	68.23	-2,585.51	4,654.89	4,352.98	301.92	15.418		
13,800.00	6,983.88	7,129.75	6,969.61	110.02	255.38	-90.90	68.23	-2,585.51	4,732.00	4,430.28	301.72	15.683		
13,900.00	6,983.81	7,129.83	6,969.69	111.47	255.39	-90.90	68.23	-2,585.51	4,809.95	4,508.42	301.53	15.952		
14,000.00	6,983.74	7,129.91	6,969.77	112.92	255.39	-90.90	68.23	-2,585.51	4,888.70	4,587.36	301.34	16.223		
14,100.00	6,983.66	7,129.99	6,969.85	114.38	255.40	-90.91	68.23	-2,585.51	4,968.21	4,667.06	301.16	16.497		
14,200.00	6,983.59	7,130.07	6,969.93	115.85	255.40	-90.91	68.23	-2,585.51	5,048.46	4,747.48	300.98	16.773		
14,300.00	6,983.52	7,130.15	6,970.01	117.31	255.41	-90.91	68.24	-2,585.51	5,129.39	4,828.59	300.81	17.052		
14,400.00	6,983.44	7,130.23	6,970.09	118.78	255.41	-90.91	68.24	-2,585.51	5,210.99	4,910.35	300.64	17.333		
14,500.00	6,983.37	7,130.31	6,970.17	120.26	255.42	-90.91	68.24	-2,585.51	5,293.22	4,992.74	300.48	17.616		
14,600.00	6,983.30	7,130.39	6,970.25	121.74	255.42	-90.91	68.24	-2,585.51	5,376.06	5,075.73	300.33	17.901		
14,700.00	6,983.22	7,130.47	6,970.33	123.22	255.42	-90.92	68.24	-2,585.51	5,459.47	5,159.29	300.18	18.187		
14,800.00	6,983.15	7,130.56	6,970.42	124.70	255.43	-90.92	68.24	-2,585.51	5,543.42	5,243.39	300.03	18.476		
14,900.00	6,983.08	7,130.64	6,970.50	126.19	255.43	-90.92	68.24	-2,585.51	5,627.91	5,328.01	299.89	18.766		
15,000.00	6,983.00	7,130.72	6,970.58	127.68	255.44	-90.92	68.24	-2,585.51	5,712.89	5,413.13	299.76	19.058		
15,100.00	6,982.93	7,130.80	6,970.66	129.17	255.44	-90.92	68.25	-2,585.51	5,798.35	5,498.72	299.63	19.352		
15,200.00	6,982.85	7,130.88	6,970.74	130.67	255.45	-90.92	68.25	-2,585.51	5,884.27	5,584.76	299.51	19.646		
15,300.00	6,982.78	7,130.96	6,970.82	132.16	255.45	-90.92	68.25	-2,585.51	5,970.63	5,671.24	299.39	19.943		
15,400.00	6,982.71	7,131.04	6,970.90	133.66	255.45	-90.93	68.25	-2,585.51	6,057.41	5,758.13	299.28	20.240		
15,500.00	6,982.63	7,131.12	6,970.98	135.17	255.46	-90.93	68.25	-2,585.51	6,144.59	5,845.42	299.17	20.539		
15,600.00	6,982.56	7,131.20	6,971.06	136.67	255.46	-90.93	68.25	-2,585.51	6,232.15	5,933.09	299.07	20.839		
15,700.00	6,982.49	7,131.28	6,971.14	138.18	255.47	-90.93	68.25	-2,585.51	6,320.09	6,021.12	298.97	21.140		
15,800.00	6,982.41	7,131.36	6,971.22	139.69	255.47	-90.93	68.25	-2,585.51	6,408.38	6,109.51	298.87	21.442		
15,900.00	6,982.34	7,131.45	6,971.30	141.20	255.48	-90.93	68.26	-2,585.51	6,497.01	6,198.22	298.78	21.745		
16,000.00	6,982.27	7,131.53	6,971.39	142.71	255.48	-90.94	68.26	-2,585.51	6,585.96	6,287.26	298.70	22.049		
16,100.00	6,982.19	7,131.61	6,971.47	144.23	255.49	-90.94	68.26	-2,585.51	6,675.22	6,376.61	298.61	22.354		
16,200.00	6,982.12	7,131.69	6,971.55	145.75	255.49	-90.94	68.26	-2,585.51	6,764.79	6,466.26	298.54	22.660		
16,300.00	6,982.05	7,131.77	6,971.63	147.27	255.49	-90.94	68.26	-2,585.51	6,854.65	6,556.18	298.46	22.967		
16,400.00	6,981.97	7,131.85	6,971.71	148.79	255.50	-90.94	68.26	-2,585.51	6,944.78	6,646.39	298.39	23.274		
16,500.00	6,981.90	7,131.93	6,971.79	150.31	255.50	-90.94	68.26	-2,585.51	7,035.18	6,736.85	298.33	23.582		
16,600.00	6,981.82	7,132.01	6,971.87	151.84	255.51	-90.94	68.26	-2,585.51	7,125.83	6,827.57	298.26	23.891		
16,700.00	6,981.75	7,132.09	6,971.95	153.36	255.51	-90.95	68.26	-2,585.51	7,216.74	6,918.53	298.21	24.200		
16,800.00	6,981.68	7,132.17	6,972.03	154.89	255.52	-90.95	68.27	-2,585.51	7,307.88	7,009.72	298.15	24.511		
16,900.00	6,981.60	7,132.25	6,972.11	156.42	255.52	-90.95	68.27	-2,585.51	7,399.25	7,101.15	298.10	24.821		
17,000.00	6,981.53	7,132.34	6,972.20	157.95	255.52	-90.95	68.27	-2,585.51	7,490.83	7,192.78	298.05	25.133		
17,100.00	6,981.46	7,132.42	6,972.28	159.49	255.53	-90.95	68.27	-2,585.51	7,582.64	7,284.63	298.01	25.445		
17,200.00	6,981.38	7,132.50	6,972.36	161.02	255.53	-90.95	68.27	-2,585.51	7,674.64	7,376.68	297.96	25.757		
17,300.00	6,981.31	7,132.58	6,972.44	162.56	255.54	-90.96	68.27	-2,585.52	7,766.85	7,468.92	297.93	26.070		
17,400.00	6,981.24	7,132.66	6,972.52	164.09	255.54	-90.96	68.27	-2,585.52	7,859.24	7,561.35	297.89	26.383		
17,500.00	6,981.16	7,132.74	6,972.60	165.63	255.55	-90.96	68.27	-2,585.52	7,951.82	7,653.96	297.86	26.697		
17,600.00	6,981.09	7,132.82	6,972.68	167.17	255.55	-90.96	68.28	-2,585.52	8,044.58	7,746.75	297.83	27.011		
17,700.00	6,981.01	7,132.90	6,972.76	168.71	255.56	-90.96	68.28	-2,585.52	8,137.51	7,839.71	297.80	27.325		
17,800.00	6,980.94	7,132.98	6,972.84	170.25	255.56	-90.96	68.28	-2,585.52	8,230.60	7,932.82	297.78	27.640		
17,900.00	6,980.87	7,133.07	6,972.93	171.80	255.56	-90.97	68.28	-2,585.52	8,323.86	8,026.10	297.76	27.955		
18,000.00	6,980.79	7,133.15	6,973.01	173.34	255.57	-90.97	68.28	-2,585.52	8,417.26	8,119.53	297.74	28.271		
18,100.00	6,980.72	7,133.23	6,973.09	174.89	255.57	-90.97	68.28	-2,585.52	8,510.82	8,213.10	297.72	28.587		
18,200.00	6,980.65	7,133.31	6,973.17	176.43	255.58	-90.97	68.28	-2,585.52	8,604.53	8,306.82	297.71	28.903		
18,300.00	6,980.57	7,133.39	6,973.25	177.98	255.58	-90.97	68.28	-2,585.52	8,698.37	8,400.68	297.70	29.219		
18,400.00	6,980.50	7,133.47	6,973.33	179.53	255.59	-90.97	68.28	-2,585.52	8,792.35	8,494.67	297.69	29.536		
18,500.00	6,980.43	7,133.55	6,973.41	181.08	255.59	-90.97	68.29	-2,585.52	8,886.46	8,588.78	297.68	29.852		
18,600.00	6,980.35	7,133.63	6,973.49	182.63	255.60	-90.98	68.29	-2,585.52	8,980.70	8,683.03	297.68	30.169		
18,700.00	6,980.28	7,133.71	6,973.57	184.18	255.60	-90.98	68.29	-2,585.52	9,075.06	8,777.39	297.67	30.487		
18,800.00	6,980.21	7,133.80	6,973.66	185.73	255.60	-90.98	68.29	-2,585.52	9,169.54	8,871.87	297.67	30.804		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #80B - OH - OH-SVY													Offset Site Error:	0.00 usft	
Survey Program:		300-MWD OWSG Rev5					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			
18,900.00	6,980.13	7,133.88	6,973.74	187.28	255.61	-90.98	68.29	-2,585.52	9,264.14	8,966.47	297.68	31.122			
19,000.00	6,980.06	7,133.96	6,973.82	188.84	255.61	-90.98	68.29	-2,585.52	9,358.85	9,061.17	297.68	31.439			
19,100.00	6,979.98	7,134.04	6,973.90	190.39	255.62	-90.98	68.29	-2,585.52	9,453.67	9,155.98	297.69	31.757			
19,200.00	6,979.91	7,134.12	6,973.98	191.95	255.62	-90.99	68.29	-2,585.52	9,548.59	9,250.90	297.69	32.075			
19,300.00	6,979.84	7,134.20	6,974.06	193.51	255.63	-90.99	68.30	-2,585.52	9,643.62	9,345.92	297.70	32.393			
19,400.00	6,979.76	7,134.28	6,974.14	195.06	255.63	-90.99	68.30	-2,585.52	9,738.75	9,441.03	297.72	32.711			
19,500.00	6,979.69	7,134.36	6,974.22	196.62	255.63	-90.99	68.30	-2,585.52	9,833.97	9,536.24	297.73	33.030			
19,600.00	6,979.62	7,134.44	6,974.30	198.18	255.64	-90.99	68.30	-2,585.52	9,929.29	9,631.54	297.75	33.348			
19,700.00	6,979.54	7,134.53	6,974.39	199.74	255.64	-90.99	68.30	-2,585.52	10,024.70	9,726.93	297.76	33.667			
19,800.00	6,979.47	7,134.61	6,974.47	201.30	255.65	-90.99	68.30	-2,585.52	10,120.19	9,822.41	297.78	33.985			
19,900.00	6,979.40	7,134.69	6,974.55	202.86	255.65	-91.00	68.30	-2,585.52	10,215.78	9,917.97	297.80	34.304			
20,000.00	6,979.32	7,134.77	6,974.63	204.42	255.66	-91.00	68.30	-2,585.52	10,311.44	10,013.62	297.83	34.622			
20,100.00	6,979.25	7,134.85	6,974.71	205.98	255.66	-91.00	68.31	-2,585.52	10,407.19	10,109.34	297.85	34.941			
20,200.00	6,979.18	7,134.93	6,974.79	207.55	255.67	-91.00	68.31	-2,585.52	10,503.02	10,205.14	297.88	35.260			
20,300.00	6,979.10	7,135.01	6,974.87	209.11	255.67	-91.00	68.31	-2,585.52	10,598.92	10,301.02	297.90	35.578			
20,400.00	6,979.03	7,135.09	6,974.95	210.68	255.67	-91.00	68.31	-2,585.52	10,694.90	10,396.97	297.93	35.897			
20,500.00	6,978.95	7,135.18	6,975.04	212.24	255.68	-91.01	68.31	-2,585.52	10,790.96	10,492.99	297.96	36.216			
20,600.00	6,978.88	7,135.26	6,975.12	213.81	255.68	-91.01	68.31	-2,585.52	10,887.08	10,589.08	298.00	36.534			
20,700.00	6,978.81	7,135.34	6,975.20	215.37	255.69	-91.01	68.31	-2,585.52	10,983.27	10,685.24	298.03	36.853			
20,800.00	6,978.73	7,135.42	6,975.28	216.94	255.69	-91.01	68.31	-2,585.52	11,079.53	10,781.47	298.06	37.172			
20,900.00	6,978.66	7,135.50	6,975.36	218.51	255.70	-91.01	68.31	-2,585.52	11,175.86	10,877.76	298.10	37.490			
21,000.00	6,978.59	7,135.58	6,975.44	220.07	255.70	-91.01	68.32	-2,585.52	11,272.25	10,974.11	298.14	37.809			
21,100.00	6,978.51	7,135.66	6,975.52	221.64	255.71	-91.01	68.32	-2,585.52	11,368.70	11,070.52	298.18	38.127			
21,200.00	6,978.44	7,135.75	6,975.60	223.21	255.71	-91.02	68.32	-2,585.52	11,465.21	11,167.00	298.22	38.446			
21,300.00	6,978.37	7,135.83	6,975.69	224.78	255.71	-91.02	68.32	-2,585.52	11,561.79	11,263.53	298.26	38.764			
21,400.00	6,978.29	7,135.91	6,975.77	226.35	255.72	-91.02	68.32	-2,585.52	11,658.42	11,360.12	298.30	39.083			
21,500.00	6,978.22	7,135.99	6,975.85	227.92	255.72	-91.02	68.32	-2,585.52	11,755.10	11,456.76	298.34	39.401			
21,600.00	6,978.14	7,136.07	6,975.93	229.49	255.73	-91.02	68.32	-2,585.52	11,851.85	11,553.46	298.39	39.719			
21,700.00	6,978.07	7,136.15	6,976.01	231.06	255.73	-91.02	68.32	-2,585.52	11,948.64	11,650.20	298.44	40.038			
21,800.00	6,978.00	7,136.23	6,976.09	232.63	255.74	-91.03	68.33	-2,585.52	12,045.49	11,747.00	298.48	40.356			
21,900.00	6,977.92	7,136.31	6,976.17	234.21	255.74	-91.03	68.33	-2,585.52	12,142.39	11,843.85	298.53	40.674			
22,000.00	6,977.85	7,136.40	6,976.26	235.78	255.74	-91.03	68.33	-2,585.52	12,239.34	11,940.75	298.58	40.991			
22,100.00	6,977.78	7,136.48	6,976.34	237.35	255.75	-91.03	68.33	-2,585.52	12,336.33	12,037.70	298.63	41.309			
22,200.00	6,977.70	7,136.56	6,976.42	238.92	255.75	-91.03	68.33	-2,585.52	12,433.38	12,134.69	298.69	41.627			
22,300.00	6,977.63	7,136.64	6,976.50	240.50	255.76	-91.03	68.33	-2,585.52	12,530.47	12,231.73	298.74	41.945			
22,400.00	6,977.56	7,136.72	6,976.58	242.07	255.76	-91.04	68.33	-2,585.52	12,627.61	12,328.81	298.79	42.262			
22,500.00	6,977.48	7,136.80	6,976.66	243.65	255.77	-91.04	68.33	-2,585.52	12,724.79	12,425.94	298.85	42.579			
22,600.00	6,977.41	7,136.88	6,976.74	245.22	255.77	-91.04	68.34	-2,585.52	12,822.01	12,523.11	298.90	42.897			
22,700.00	6,977.34	7,136.97	6,976.82	246.80	255.78	-91.04	68.34	-2,585.52	12,919.28	12,620.32	298.96	43.214			
22,800.00	6,977.26	7,137.05	6,976.91	248.37	255.78	-91.04	68.34	-2,585.52	13,016.59	12,717.57	299.02	43.531			
22,900.00	6,977.19	7,137.13	6,976.99	249.95	255.78	-91.04	68.34	-2,585.52	13,113.94	12,814.86	299.08	43.848			
23,000.00	6,977.11	7,137.21	6,977.07	251.53	255.79	-91.04	68.34	-2,585.52	13,211.32	12,912.18	299.14	44.164			
23,100.00	6,977.04	7,137.29	6,977.15	253.10	255.79	-91.05	68.34	-2,585.52	13,308.75	13,009.55	299.20	44.481			
23,155.65	6,977.00	7,137.34	6,977.20	253.98	255.80	-91.05	68.34	-2,585.52	13,362.99	13,063.75	299.23	44.657			
23,156.15	6,977.00	7,137.34	6,977.20	254.06	255.80	-91.05	68.34	-2,585.52	13,363.48	13,060.11	303.36	44.051			

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #95 - OH - OH-INC												Offset Site Error:	0.00 usft		
Survey Program:		235-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 Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
0.00	0.00	429.01	429.00	0.00	9.13	94.21	-450.60	6,126.83	6,143.38						
100.00	100.00	528.47	528.44	0.25	11.25	94.20	-449.49	6,126.83	6,143.29	6,131.80	11.50	534.273			
200.00	200.00	626.98	626.95	0.61	13.34	94.20	-449.78	6,126.83	6,143.32	6,129.36	13.95	440.268			
300.00	300.00	725.50	725.46	0.97	15.44	94.20	-450.39	6,126.83	6,143.36	6,126.95	16.41	374.393			
400.00	400.00	829.09	829.00	1.33	17.65	94.21	-450.60	6,126.83	6,143.38	6,124.40	18.97	323.811			
500.00	500.00	929.09	929.00	1.68	19.77	94.21	-450.60	6,126.83	6,143.38	6,121.92	21.46	286.286			
600.00	599.98	1,028.62	1,028.52	2.04	21.89	84.22	-449.52	6,126.83	6,143.12	6,119.18	23.93	256.659			
700.00	699.84	1,126.92	1,126.82	2.41	23.98	84.28	-449.79	6,126.83	6,142.61	6,116.23	26.38	232.809			
800.00	799.45	1,224.93	1,224.81	2.77	26.07	84.38	-450.39	6,126.83	6,141.80	6,112.97	28.83	213.028			
900.00	898.70	1,327.87	1,327.70	3.13	28.33	84.52	-450.60	6,126.83	6,140.62	6,109.17	31.46	195.210			
1,000.00	997.47	1,426.63	1,426.47	3.50	30.52	84.69	-450.60	6,126.83	6,139.13	6,105.11	34.02	180.452			
1,100.00	1,095.63	1,524.23	1,524.05	3.89	32.68	87.24	-449.55	6,126.83	6,137.72	6,101.15	36.57	167.826			
1,200.00	1,193.09	1,619.84	1,619.66	4.29	34.80	89.15	-449.82	6,126.83	6,137.05	6,097.96	39.10	156.978			
1,245.40	1,237.08	1,662.94	1,662.76	4.49	35.76	89.88	-450.05	6,126.83	6,136.98	6,096.74	40.24	152.501	CC		
1,300.00	1,289.73	1,714.48	1,714.29	4.72	36.90	90.66	-450.42	6,126.83	6,137.09	6,095.47	41.62	147.471			
1,400.00	1,385.42	1,814.68	1,814.42	5.16	39.19	91.90	-450.60	6,126.83	6,137.80	6,093.45	44.35	138.382			
1,496.97	1,477.20	1,906.46	1,906.20	5.62	41.31	92.92	-450.60	6,126.83	6,139.20	6,092.27	46.93	130.823			
1,500.00	1,480.05	1,909.31	1,909.05	5.63	41.38	92.93	-450.60	6,126.83	6,139.26	6,092.25	47.01	130.600			
1,600.00	1,574.15	2,002.93	2,002.66	6.12	43.54	93.21	-449.24	6,126.83	6,141.04	6,091.38	49.66	123.668			
1,700.00	1,668.25	2,094.29	2,094.00	6.62	45.65	93.50	-449.49	6,126.83	6,143.18	6,090.91	52.26	117.540			
1,800.00	1,762.35	2,185.39	2,185.09	7.12	47.75	93.79	-450.10	6,126.83	6,145.54	6,090.67	54.87	111.993			
1,900.00	1,856.45	2,285.83	2,285.45	7.64	50.12	94.11	-450.60	6,126.83	6,148.08	6,090.33	57.75	106.452			
2,000.00	1,950.55	2,379.93	2,379.55	8.16	52.38	94.41	-450.60	6,126.83	6,150.75	6,090.22	60.54	101.605	ES		
2,100.00	2,044.65	2,474.03	2,473.65	8.68	54.64	94.70	-450.60	6,126.83	6,153.61	6,090.29	63.32	97.180			
2,200.00	2,138.75	2,565.26	2,564.86	9.21	56.84	94.98	-449.36	6,126.83	6,156.48	6,090.43	66.04	93.221			
2,300.00	2,232.85	2,655.77	2,655.36	9.74	59.02	95.27	-449.84	6,126.83	6,159.77	6,091.02	68.75	89.600			
2,400.00	2,326.95	2,756.48	2,755.95	10.27	61.46	95.59	-450.60	6,126.83	6,163.28	6,091.56	71.72	85.937			
2,500.00	2,421.05	2,850.58	2,850.05	10.81	63.82	95.88	-450.60	6,126.83	6,166.87	6,092.26	74.61	82.655			
2,600.00	2,515.15	2,944.68	2,944.15	11.34	66.17	96.18	-450.60	6,126.83	6,170.65	6,093.14	77.50	79.619			
2,700.00	2,609.25	3,036.25	3,035.70	11.88	68.47	96.45	-449.02	6,126.83	6,174.34	6,094.01	80.33	76.859			
2,800.00	2,703.35	3,125.36	3,124.79	12.42	70.70	96.73	-449.45	6,126.83	6,178.55	6,095.45	83.10	74.348			
2,900.00	2,797.45	3,214.18	3,213.60	12.96	72.93	97.02	-450.29	6,126.83	6,183.03	6,097.16	85.87	72.008			
3,000.00	2,891.55	3,321.25	3,320.55	13.51	75.78	97.35	-450.60	6,126.83	6,187.58	6,098.32	89.25	69.325			
3,100.00	2,985.65	3,410.00	3,409.29	14.05	78.19	97.62	-449.87	6,126.83	6,192.13	6,099.93	92.20	67.162			
3,200.00	3,079.75	3,509.57	3,508.75	14.60	80.92	97.94	-450.60	6,126.83	6,197.13	6,101.66	95.47	64.911			
3,300.00	3,173.85	3,603.67	3,602.85	15.14	83.67	98.23	-450.60	6,126.83	6,202.18	6,103.42	98.76	62.799			
3,400.00	3,267.95	3,697.77	3,696.95	15.69	86.42	98.52	-450.60	6,126.83	6,207.41	6,105.36	102.05	60.826			
3,500.00	3,362.05	3,787.74	3,786.88	16.23	89.06	98.78	-448.49	6,126.83	6,212.38	6,107.16	105.22	59.040			
3,600.00	3,456.15	3,873.80	3,872.93	16.78	91.57	99.05	-449.02	6,126.83	6,218.09	6,109.81	108.28	57.427			
3,700.00	3,550.25	3,959.52	3,958.61	17.33	94.08	99.32	-450.07	6,126.83	6,224.10	6,112.78	111.32	55.910			
3,800.00	3,644.35	4,074.47	4,073.35	17.88	97.20	99.68	-450.60	6,126.83	6,230.13	6,115.15	114.98	54.185			
3,900.00	3,738.45	4,168.57	4,167.45	18.42	99.67	99.97	-450.60	6,126.83	6,236.25	6,118.26	117.99	52.854			
4,000.00	3,832.55	4,260.75	4,259.59	18.97	102.09	100.23	-448.43	6,126.83	6,242.05	6,121.10	120.95	51.608			
4,100.00	3,926.65	4,345.95	4,344.77	19.52	104.33	100.50	-448.79	6,126.83	6,248.61	6,124.89	123.73	50.504			
4,200.00	4,020.75	4,430.81	4,429.61	20.07	106.56	100.76	-449.66	6,126.83	6,255.49	6,129.00	126.49	49.454			
4,300.00	4,114.85	4,515.18	4,514.35	20.62	109.40	101.12	-450.60	6,126.83	6,262.52	6,132.65	129.87	48.222			
4,400.00	4,208.95	4,609.28	4,608.45	21.17	111.57	101.41	-450.60	6,126.83	6,269.53	6,136.95	132.58	47.288			
4,500.00	4,303.05	4,703.38	4,702.05	21.72	113.75	101.69	-450.60	6,126.83	6,276.71	6,141.41	135.30	46.393			
4,600.00	4,397.15	4,821.60	4,820.25	22.27	115.79	101.95	-449.38	6,126.83	6,283.74	6,145.87	137.87	45.577			
4,700.00	4,491.25	4,909.08	4,907.73	22.82	117.82	102.22	-449.86	6,126.83	6,291.41	6,150.98	140.43	44.801			
4,800.00	4,585.35	5,015.79	5,014.35	23.37	120.29	102.55	-450.60	6,126.83	6,299.29	6,155.86	143.44	43.917			
4,900.00	4,679.45	5,109.89	5,108.45	23.93	122.47	102.83	-450.60	6,126.83	6,307.17	6,161.02	146.15	43.156			

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #95 - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program: 235-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)			
5,000.00	4,773.55	5,203.99	5,202.55	24.48	124.64	103.11	-450.60	6,126.83	6,315.21	6,166.36	148.86	42.424	
5,100.00	4,867.65	5,293.79	5,292.33	25.03	126.72	103.37	-449.30	6,126.83	6,323.05	6,171.58	151.47	41.745	
5,200.00	4,961.75	5,380.73	5,379.26	25.58	128.73	103.63	-449.66	6,126.83	6,331.55	6,177.54	154.01	41.111	
5,300.00	5,055.85	5,467.45	5,465.97	26.13	130.74	103.90	-450.36	6,126.83	6,340.33	6,183.78	156.55	40.501	
5,400.00	5,149.95	5,580.51	5,578.95	26.68	133.45	104.24	-450.60	6,126.83	6,349.10	6,189.30	159.79	39.733	
5,500.00	5,244.05	5,674.61	5,673.05	27.24	135.73	104.51	-450.60	6,126.83	6,357.99	6,195.39	162.60	39.103	
5,600.00	5,338.15	5,768.71	5,767.15	27.79	138.00	104.79	-450.60	6,126.83	6,367.05	6,201.65	165.40	38.494	
5,665.73	5,400.00	5,830.56	5,829.00	28.15	139.50	104.98	-450.60	6,126.83	6,373.10	6,205.85	167.25	38.106	
5,700.00	5,432.28	5,862.85	5,861.28	28.34	140.28	105.10	-450.60	6,126.83	6,376.25	6,208.04	168.21	37.907	
5,800.00	5,526.87	5,957.43	5,955.87	28.88	142.57	105.45	-450.60	6,126.83	6,385.25	6,214.24	171.01	37.339	
5,900.00	5,622.01	5,990.00	5,988.29	29.41	143.36	105.63	-450.60	6,126.83	6,394.25	6,221.97	172.28	37.116	
6,000.00	5,717.67	5,990.00	5,988.29	29.92	143.36	105.73	-450.60	6,126.83	6,404.24	6,231.54	172.70	37.082	
6,100.00	5,813.83	5,990.00	5,988.29	30.41	143.36	105.83	-450.60	6,126.83	6,415.31	6,242.23	173.07	37.067 SF	
6,200.00	5,910.44	5,990.00	5,988.29	30.89	143.36	105.95	-450.60	6,126.83	6,427.44	6,254.04	173.39	37.069	
6,300.00	6,007.50	5,990.00	5,988.29	31.36	143.36	106.08	-450.60	6,126.83	6,440.62	6,266.96	173.66	37.088	
6,400.00	6,104.96	5,990.00	5,988.29	31.80	143.36	106.22	-450.60	6,126.83	6,454.85	6,280.98	173.87	37.125	
6,500.00	6,202.80	5,990.00	5,988.29	32.24	143.36	106.37	-450.60	6,126.83	6,470.12	6,296.09	174.03	37.179	
6,600.00	6,300.98	5,990.00	5,988.29	32.66	143.36	106.52	-450.60	6,126.83	6,486.40	6,312.27	174.13	37.250	
6,700.00	6,399.48	5,990.00	5,988.29	33.06	143.36	106.69	-450.60	6,126.83	6,503.69	6,329.51	174.19	37.337	
6,722.82	6,422.00	5,990.00	5,988.29	33.15	143.36	106.73	-450.60	6,126.83	6,507.78	6,333.59	174.19	37.360	
6,750.00	6,448.76	5,990.00	5,988.29	33.26	143.36	116.31	-450.60	6,126.83	6,513.26	6,339.06	174.20	37.390	
6,800.00	6,497.51	5,990.00	5,988.29	33.48	143.36	127.10	-450.60	6,126.83	6,526.31	6,352.09	174.21	37.461	
6,850.00	6,545.40	5,990.00	5,988.29	33.72	143.36	132.97	-450.60	6,126.83	6,543.14	6,368.89	174.24	37.552	
6,900.00	6,592.13	5,990.00	5,988.29	33.97	143.36	136.24	-450.60	6,126.83	6,563.60	6,389.33	174.27	37.663	
6,950.00	6,637.40	5,990.00	5,988.29	34.25	143.36	137.97	-450.60	6,126.83	6,587.55	6,413.23	174.31	37.791	
7,000.00	6,680.94	5,990.00	5,988.29	34.54	143.36	138.64	-450.60	6,126.83	6,614.79	6,440.43	174.36	37.937	
7,050.00	6,722.48	5,990.00	5,988.29	34.85	143.36	138.48	-450.60	6,126.83	6,645.12	6,470.70	174.42	38.098	
7,100.00	6,761.76	5,990.00	5,988.29	35.17	143.36	137.59	-450.60	6,126.83	6,678.31	6,503.83	174.49	38.274	
7,150.00	6,798.55	5,990.00	5,988.29	35.51	143.36	135.98	-450.60	6,126.83	6,714.12	6,539.56	174.56	38.463	
7,200.00	6,832.61	5,990.00	5,988.29	35.86	143.36	133.59	-450.60	6,126.83	6,752.28	6,577.64	174.64	38.663	
7,250.00	6,863.74	5,990.00	5,988.29	36.22	143.36	130.31	-450.60	6,126.83	6,792.53	6,617.79	174.74	38.873	
7,300.00	6,891.74	5,990.00	5,988.29	36.59	143.36	125.96	-450.60	6,126.83	6,834.57	6,659.73	174.84	39.090	
7,350.00	6,916.44	5,990.00	5,988.29	36.98	143.36	120.32	-450.60	6,126.83	6,878.13	6,703.17	174.96	39.313	
7,400.00	6,937.69	5,990.00	5,988.29	37.37	143.36	113.16	-450.60	6,126.83	6,922.89	6,747.81	175.08	39.541	
7,450.00	6,955.36	5,990.00	5,988.29	37.78	143.36	104.31	-450.60	6,126.83	6,968.58	6,793.37	175.22	39.772	
7,500.00	6,969.34	5,990.00	5,988.29	38.19	143.36	93.89	-450.60	6,126.83	7,014.89	6,839.53	175.36	40.003	
7,550.00	6,979.53	5,990.00	5,988.29	38.62	143.36	82.44	-450.60	6,126.83	7,061.52	6,886.01	175.52	40.233	
7,600.00	6,985.89	5,990.00	5,988.29	39.05	143.36	70.89	-450.60	6,126.83	7,108.20	6,932.51	175.68	40.461	
7,650.00	6,988.37	5,990.00	5,988.29	39.48	143.36	60.21	-450.60	6,126.83	7,154.62	6,978.76	175.86	40.684	
7,657.25	6,988.40	5,990.00	5,988.29	39.54	143.36	58.77	-450.60	6,126.83	7,161.31	6,985.43	175.88	40.716	
7,700.00	6,988.37	5,990.00	5,988.29	39.92	143.36	58.77	-450.60	6,126.83	7,200.76	7,024.72	176.04	40.904	
7,800.00	6,988.30	5,990.00	5,988.29	40.82	143.36	58.77	-450.60	6,126.83	7,293.20	7,116.80	176.40	41.345	
7,900.00	6,988.23	5,990.00	5,988.29	41.77	143.36	58.77	-450.60	6,126.83	7,385.83	7,209.07	176.75	41.786	
8,000.00	6,988.16	5,990.00	5,988.29	42.75	143.36	58.77	-450.60	6,126.83	7,478.65	7,301.55	177.10	42.228	
8,100.00	6,988.09	5,990.00	5,988.29	43.76	143.36	58.77	-450.60	6,126.83	7,571.65	7,394.21	177.44	42.670	
8,152.35	6,988.06	5,990.00	5,988.29	44.30	143.36	58.77	-450.60	6,126.83	7,620.41	7,442.79	177.62	42.903	
8,200.00	6,988.02	5,990.00	5,988.29	44.79	143.36	56.00	-450.60	6,126.83	7,665.07	7,487.30	177.78	43.117	
8,300.00	6,987.95	5,990.00	5,988.29	45.83	143.36	48.37	-450.60	6,126.83	7,760.26	7,582.20	178.06	43.583	
8,400.00	6,987.88	5,990.00	5,988.29	46.85	143.36	37.13	-450.60	6,126.83	7,857.00	7,678.72	178.28	44.071	
8,500.00	6,987.80	5,990.00	5,988.29	47.85	143.36	20.85	-450.60	6,126.83	7,954.78	7,776.33	178.45	44.578	
8,600.00	6,987.73	5,990.00	5,988.29	48.83	143.36	-0.12	-450.60	6,126.83	8,053.08	7,874.52	178.56	45.101	
8,700.00	6,987.65	5,990.00	5,988.29	49.79	143.36	-21.31	-450.60	6,126.83	8,151.42	7,972.81	178.61	45.638	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #95 - OH - OH-INC													Offset Site Error:	0.00 usft		
Survey Program:		235-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)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor				
8,800.00	6,987.57	5,990.00	5,988.29	50.72	143.36	-37.98	-450.60	6,126.83	8,249.32	8,070.71	178.61	46.186				
8,900.00	6,987.50	5,990.00	5,988.29	51.62	143.36	-49.55	-450.60	6,126.83	8,346.34	8,167.78	178.56	46.743				
9,000.00	6,987.42	5,990.00	5,988.29	52.48	143.36	-57.40	-450.60	6,126.83	8,442.04	8,263.58	178.46	47.305				
9,100.00	6,987.34	5,990.00	5,988.29	53.30	143.36	-62.88	-450.60	6,126.83	8,536.00	8,357.68	178.32	47.869				
9,200.00	6,987.27	5,990.00	5,988.29	54.08	143.36	-66.83	-450.60	6,126.83	8,627.83	8,449.70	178.14	48.433				
9,215.33	6,987.26	5,990.00	5,988.29	54.20	143.36	-67.34	-450.60	6,126.83	8,641.70	8,463.59	178.11	48.520				
9,300.00	6,987.20	5,990.00	5,988.29	54.85	143.36	-67.34	-450.60	6,126.83	8,718.19	8,540.26	177.94	48.996				
9,400.00	6,987.12	5,990.00	5,988.29	55.65	143.36	-67.34	-450.60	6,126.83	8,808.73	8,630.98	177.75	49.557				
9,500.00	6,987.05	5,990.00	5,988.29	56.48	143.36	-67.34	-450.60	6,126.83	8,899.47	8,721.90	177.57	50.119				
9,600.00	6,986.98	5,990.00	5,988.29	57.35	143.36	-67.34	-450.60	6,126.83	8,990.41	8,813.01	177.39	50.680				
9,700.00	6,986.90	5,990.00	5,988.29	58.24	143.36	-67.34	-450.60	6,126.83	9,081.53	8,904.31	177.23	51.242				
9,800.00	6,986.83	5,990.00	5,988.29	59.17	143.36	-67.34	-450.60	6,126.83	9,172.85	8,995.77	177.07	51.803				
9,900.00	6,986.75	5,990.00	5,988.29	60.12	143.36	-67.34	-450.60	6,126.83	9,264.34	9,087.42	176.92	52.364				
10,000.00	6,986.68	5,990.00	5,988.29	61.10	143.36	-67.34	-450.60	6,126.83	9,356.00	9,179.22	176.78	52.925				
10,100.00	6,986.61	5,990.00	5,988.29	62.11	143.36	-67.34	-450.60	6,126.83	9,447.84	9,271.19	176.64	53.486				
10,200.00	6,986.53	5,990.00	5,988.29	63.14	143.36	-67.34	-450.60	6,126.83	9,539.83	9,363.32	176.51	54.046				
10,300.00	6,986.46	5,990.00	5,988.29	64.20	143.36	-67.34	-450.60	6,126.83	9,631.99	9,455.60	176.39	54.606				
10,400.00	6,986.39	5,990.00	5,988.29	65.28	143.36	-67.34	-450.60	6,126.83	9,724.30	9,548.03	176.28	55.165				
10,500.00	6,986.31	5,990.00	5,988.29	66.38	143.36	-67.34	-450.60	6,126.83	9,816.77	9,640.60	176.17	55.725				
10,600.00	6,986.24	5,990.00	5,988.29	67.50	143.36	-67.34	-450.60	6,126.83	9,909.38	9,733.32	176.06	56.283				
10,700.00	6,986.17	5,990.00	5,988.29	68.64	143.36	-67.34	-450.60	6,126.83	10,002.13	9,826.16	175.97	56.841				
10,800.00	6,986.09	5,990.00	5,988.29	69.80	143.36	-67.34	-450.60	6,126.83	10,095.02	9,919.15	175.87	57.399				
10,900.00	6,986.02	5,990.00	5,988.29	70.98	143.36	-67.34	-450.60	6,126.83	10,188.05	10,012.26	175.79	57.956				
11,000.00	6,985.95	5,990.00	5,988.29	72.17	143.36	-67.34	-450.60	6,126.83	10,281.20	10,105.49	175.71	58.513				
11,100.00	6,985.87	5,990.00	5,988.29	73.38	143.36	-67.34	-450.60	6,126.83	10,374.49	10,198.85	175.63	59.069				
11,200.00	6,985.80	5,990.00	5,988.29	74.61	143.36	-67.34	-450.60	6,126.83	10,467.89	10,292.33	175.56	59.625				
11,300.00	6,985.72	5,990.00	5,988.29	75.85	143.36	-67.34	-450.60	6,126.83	10,561.42	10,385.92	175.50	60.180				
11,400.00	6,985.65	5,990.00	5,988.29	77.10	143.36	-67.34	-450.60	6,126.83	10,655.07	10,479.63	175.44	60.734				
11,500.00	6,985.58	5,990.00	5,988.29	78.37	143.36	-67.34	-450.60	6,126.83	10,748.83	10,573.44	175.38	61.288				
11,600.00	6,985.50	5,990.00	5,988.29	79.65	143.36	-67.34	-450.60	6,126.83	10,842.70	10,667.37	175.33	61.841				
11,700.00	6,985.43	5,990.00	5,988.29	80.94	143.36	-67.34	-450.60	6,126.83	10,936.68	10,761.39	175.29	62.393				
11,800.00	6,985.36	5,990.00	5,988.29	82.24	143.36	-67.34	-450.60	6,126.83	11,030.77	10,855.52	175.24	62.945				
11,900.00	6,985.28	5,990.00	5,988.29	83.56	143.36	-67.34	-450.60	6,126.83	11,124.96	10,949.75	175.21	63.496				
12,000.00	6,985.21	5,990.00	5,988.29	84.88	143.36	-67.34	-450.60	6,126.83	11,219.25	11,044.07	175.17	64.047				
12,100.00	6,985.14	5,990.00	5,988.29	86.21	143.36	-67.34	-450.60	6,126.83	11,313.63	11,138.49	175.14	64.597				
12,200.00	6,985.06	5,990.00	5,988.29	87.56	143.36	-67.34	-450.60	6,126.83	11,408.12	11,233.00	175.12	65.146				
12,300.00	6,984.99	5,990.00	5,988.29	88.91	143.36	-67.34	-450.60	6,126.83	11,502.69	11,327.60	175.10	65.694				
12,400.00	6,984.92	5,990.00	5,988.29	90.27	143.36	-67.34	-450.60	6,126.83	11,597.36	11,422.28	175.08	66.242				
12,500.00	6,984.84	5,990.00	5,988.29	91.64	143.36	-67.34	-450.60	6,126.83	11,692.12	11,517.06	175.06	66.788				
12,600.00	6,984.77	5,990.00	5,988.29	93.01	143.36	-67.34	-450.60	6,126.83	11,786.96	11,611.91	175.05	67.335				
12,700.00	6,984.69	5,990.00	5,988.29	94.40	143.36	-67.34	-450.60	6,126.83	11,881.89	11,706.85	175.04	67.880				
12,800.00	6,984.62	5,990.00	5,988.29	95.79	143.36	-67.34	-450.60	6,126.83	11,976.90	11,801.86	175.04	68.425				
12,900.00	6,984.55	5,990.00	5,988.29	97.18	143.36	-67.34	-450.60	6,126.83	12,071.99	11,896.96	175.04	68.969				
13,000.00	6,984.47	5,990.00	5,988.29	98.59	143.36	-67.34	-450.60	6,126.83	12,167.16	11,992.12	175.04	69.512				
13,100.00	6,984.40	5,990.00	5,988.29	100.00	143.36	-67.34	-450.60	6,126.83	12,262.41	12,087.37	175.04	70.054				
13,200.00	6,984.33	5,990.00	5,988.29	101.41	143.36	-67.34	-450.60	6,126.83	12,357.73	12,182.68	175.05	70.596				
13,300.00	6,984.25	5,990.00	5,988.29	102.83	143.36	-67.34	-450.60	6,126.83	12,453.12	12,278.07	175.06	71.137				
13,400.00	6,984.18	5,990.00	5,988.29	104.26	143.36	-67.34	-450.60	6,126.83	12,548.59	12,373.52	175.07	71.677				
13,500.00	6,984.11	5,990.00	5,988.29	105.69	143.36	-67.34	-450.60	6,126.83	12,644.13	12,469.04	175.09	72.217				
13,600.00	6,984.03	5,990.00	5,988.29	107.13	143.36	-67.34	-450.60	6,126.83	12,739.73	12,564.63	175.10	72.755				
13,700.00	6,983.96	5,990.00	5,988.29	108.57	143.36	-67.34	-450.60	6,126.83	12,835.41	12,660.28	175.12	73.293				
13,800.00	6,983.88	5,990.00	5,988.29	110.02	143.36	-67.34	-450.60	6,126.83	12,931.14	12,756.00	175.15	73.830				

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #95 - OH - OH-INC													Offset Site Error:	0.00 usft	
Survey Program:		235-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 Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
13,900.00	6,983.81	5,990.00	5,988.29	111.47	143.36	-67.34	-450.60	6,126.83	13,026.95	12,851.77	175.17	74.367			
14,000.00	6,983.74	5,990.00	5,988.29	112.92	143.36	-67.34	-450.60	6,126.83	13,122.81	12,947.61	175.20	74.902			
14,100.00	6,983.66	5,990.00	5,988.29	114.38	143.36	-67.34	-450.60	6,126.83	13,218.74	13,043.51	175.23	75.437			
14,200.00	6,983.59	5,990.00	5,988.29	115.85	143.36	-67.34	-450.60	6,126.83	13,314.72	13,139.46	175.26	75.971			
14,300.00	6,983.52	5,990.00	5,988.29	117.31	143.36	-67.34	-450.60	6,126.83	13,410.77	13,235.47	175.29	76.504			
14,400.00	6,983.44	5,990.00	5,988.29	118.78	143.36	-67.34	-450.60	6,126.83	13,506.87	13,331.54	175.33	77.037			
14,500.00	6,983.37	5,990.00	5,988.29	120.26	143.36	-67.34	-450.60	6,126.83	13,603.03	13,427.66	175.37	77.568			
14,600.00	6,983.30	5,990.00	5,988.29	121.74	143.36	-67.34	-450.60	6,126.83	13,699.24	13,523.83	175.41	78.099			
14,700.00	6,983.22	5,990.00	5,988.29	123.22	143.36	-67.34	-450.60	6,126.83	13,795.51	13,620.06	175.45	78.629			
14,800.00	6,983.15	5,990.00	5,988.29	124.70	143.36	-67.34	-450.60	6,126.83	13,891.83	13,716.33	175.49	79.159			
14,900.00	6,983.08	5,990.00	5,988.29	126.19	143.36	-67.34	-450.60	6,126.83	13,988.20	13,812.66	175.54	79.687			
15,000.00	6,983.00	5,990.00	5,988.29	127.68	143.36	-67.34	-450.60	6,126.83	14,084.62	13,909.03	175.59	80.215			
15,100.00	6,982.93	5,990.00	5,988.29	129.17	143.36	-67.34	-450.60	6,126.83	14,181.09	14,005.46	175.63	80.742			
15,200.00	6,982.85	5,990.00	5,988.29	130.67	143.36	-67.34	-450.60	6,126.83	14,277.61	14,101.93	175.68	81.268			
15,300.00	6,982.78	5,990.00	5,988.29	132.16	143.36	-67.34	-450.60	6,126.83	14,374.18	14,198.44	175.74	81.794			
15,400.00	6,982.71	5,990.00	5,988.29	133.66	143.36	-67.34	-450.60	6,126.83	14,470.79	14,295.00	175.79	82.318			
15,500.00	6,982.63	5,990.00	5,988.29	135.17	143.36	-67.34	-450.60	6,126.83	14,567.45	14,391.61	175.85	82.842			
15,600.00	6,982.56	5,990.00	5,988.29	136.67	143.36	-67.34	-450.60	6,126.83	14,664.16	14,488.26	175.90	83.366			
15,700.00	6,982.49	5,990.00	5,988.29	138.18	143.36	-67.34	-450.60	6,126.83	14,760.91	14,584.95	175.96	83.888			
15,800.00	6,982.41	5,990.00	5,988.29	139.69	143.36	-67.34	-450.60	6,126.83	14,857.70	14,681.68	176.02	84.410			
15,900.00	6,982.34	5,990.00	5,988.29	141.20	143.36	-67.34	-450.60	6,126.83	14,954.53	14,778.45	176.08	84.930			
16,000.00	6,982.27	5,990.00	5,988.29	142.71	143.36	-67.34	-450.60	6,126.83	15,051.41	14,875.27	176.14	85.450			
16,100.00	6,982.19	5,990.00	5,988.29	144.23	143.36	-67.34	-450.60	6,126.83	15,148.32	14,972.12	176.21	85.970			
16,200.00	6,982.12	5,990.00	5,988.29	145.75	143.36	-67.34	-450.60	6,126.83	15,245.28	15,069.01	176.27	86.488			
16,300.00	6,982.05	5,990.00	5,988.29	147.27	143.36	-67.34	-450.60	6,126.83	15,342.27	15,165.94	176.34	87.006			
16,400.00	6,981.97	5,990.00	5,988.29	148.79	143.36	-67.34	-450.60	6,126.83	15,439.31	15,262.90	176.40	87.523			
16,500.00	6,981.90	5,990.00	5,988.29	150.31	143.36	-67.34	-450.60	6,126.83	15,536.38	15,359.91	176.47	88.039			
16,600.00	6,981.82	5,990.00	5,988.29	151.84	143.36	-67.34	-450.60	6,126.83	15,633.49	15,456.95	176.54	88.555			
16,700.00	6,981.75	5,990.00	5,988.29	153.36	143.36	-67.34	-450.60	6,126.83	15,730.63	15,554.02	176.61	89.070			
16,800.00	6,981.68	5,990.00	5,988.29	154.89	143.36	-67.34	-450.60	6,126.83	15,827.81	15,651.13	176.68	89.584			
16,900.00	6,981.60	5,990.00	5,988.29	156.42	143.36	-67.34	-450.60	6,126.83	15,925.02	15,748.27	176.75	90.097			
17,000.00	6,981.53	5,990.00	5,988.29	157.95	143.36	-67.34	-450.60	6,126.83	16,022.27	15,845.44	176.83	90.609			
17,100.00	6,981.46	5,990.00	5,988.29	159.49	143.36	-67.34	-450.60	6,126.83	16,119.55	15,942.65	176.90	91.121			
17,200.00	6,981.38	5,990.00	5,988.29	161.02	143.36	-67.34	-450.60	6,126.83	16,216.87	16,039.89	176.98	91.632			
17,300.00	6,981.31	5,990.00	5,988.29	162.56	143.36	-67.34	-450.60	6,126.83	16,314.22	16,137.16	177.05	92.142			
17,400.00	6,981.24	5,990.00	5,988.29	164.09	143.36	-67.34	-450.60	6,126.83	16,411.60	16,234.47	177.13	92.652			
17,500.00	6,981.16	5,990.00	5,988.29	165.63	143.36	-67.34	-450.60	6,126.83	16,509.01	16,331.80	177.21	93.160			
17,600.00	6,981.09	5,990.00	5,988.29	167.17	143.36	-67.34	-450.60	6,126.83	16,606.45	16,429.16	177.29	93.668			
17,700.00	6,981.01	5,990.00	5,988.29	168.71	143.36	-67.34	-450.60	6,126.83	16,703.92	16,526.55	177.37	94.176			
17,800.00	6,980.94	5,990.00	5,988.29	170.25	143.36	-67.34	-450.60	6,126.83	16,801.43	16,623.97	177.45	94.682			
17,900.00	6,980.87	5,990.00	5,988.29	171.80	143.36	-67.34	-450.60	6,126.83	16,898.96	16,721.42	177.53	95.188			
18,000.00	6,980.79	5,990.00	5,988.29	173.34	143.36	-67.34	-450.60	6,126.83	16,996.52	16,818.90	177.62	95.693			
18,100.00	6,980.72	5,990.00	5,988.29	174.89	143.36	-67.34	-450.60	6,126.83	17,094.10	16,916.41	177.70	96.197			
18,200.00	6,980.65	5,990.00	5,988.29	176.43	143.36	-67.34	-450.60	6,126.83	17,191.72	17,013.94	177.78	96.700			
18,300.00	6,980.57	5,990.00	5,988.29	177.98	143.36	-67.34	-450.60	6,126.83	17,289.36	17,111.49	177.87	97.203			
18,400.00	6,980.50	5,990.00	5,988.29	179.53	143.36	-67.34	-450.60	6,126.83	17,387.03	17,209.08	177.95	97.705			
18,500.00	6,980.43	5,990.00	5,988.29	181.08	143.36	-67.34	-450.60	6,126.83	17,484.73	17,306.69	178.04	98.207			
18,600.00	6,980.35	5,990.00	5,988.29	182.63	143.36	-67.34	-450.60	6,126.83	17,582.45	17,404.32	178.13	98.707			
18,700.00	6,980.28	5,990.00	5,988.29	184.18	143.36	-67.34	-450.60	6,126.83	17,680.20	17,501.98	178.22	99.207			
18,800.00	6,980.21	5,990.00	5,988.29	185.73	143.36	-67.34	-450.60	6,126.83	17,777.97	17,599.67	178.30	99.706			
18,900.00	6,980.13	5,990.00	5,988.29	187.28	143.36	-67.34	-450.60	6,126.83	17,875.77	17,697.37	178.39	100.204			
19,000.00	6,980.06	5,990.00	5,988.29	188.84	143.36	-67.34	-450.60	6,126.83	17,973.59	17,795.11	178.48	100.702			

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #95 - OH - OH-INC													Offset Site Error:	0.00 usft	
Survey Program:		235-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		
19,100.00	6,979.98	5,990.00	5,988.29	190.39	143.36	-67.34	-450.60	6,126.83	18,071.43	17,892.86	178.57	101.199			
19,200.00	6,979.91	5,990.00	5,988.29	191.95	143.36	-67.34	-450.60	6,126.83	18,169.30	17,990.64	178.66	101.695			
19,300.00	6,979.84	5,990.00	5,988.29	193.51	143.36	-67.34	-450.60	6,126.83	18,267.20	18,088.44	178.76	102.190			
19,400.00	6,979.76	5,990.00	5,988.29	195.06	143.36	-67.34	-450.60	6,126.83	18,365.11	18,186.26	178.85	102.685			
19,500.00	6,979.69	5,990.00	5,988.29	196.62	143.36	-67.34	-450.60	6,126.83	18,463.05	18,284.10	178.94	103.179			
19,600.00	6,979.62	5,990.00	5,988.29	198.18	143.36	-67.34	-450.60	6,126.83	18,561.01	18,381.97	179.04	103.672			
19,700.00	6,979.54	5,990.00	5,988.29	199.74	143.36	-67.34	-450.60	6,126.83	18,658.99	18,479.86	179.13	104.165			
19,800.00	6,979.47	5,990.00	5,988.29	201.30	143.36	-67.34	-450.60	6,126.83	18,756.99	18,577.76	179.22	104.657			
19,900.00	6,979.40	5,990.00	5,988.29	202.86	143.36	-67.34	-450.60	6,126.83	18,855.01	18,675.69	179.32	105.148			
20,000.00	6,979.32	5,990.00	5,988.29	204.42	143.36	-67.34	-450.60	6,126.83	18,953.05	18,773.64	179.41	105.638			
20,100.00	6,979.25	5,990.00	5,988.29	205.98	143.36	-67.34	-450.60	6,126.83	19,051.12	18,871.61	179.51	106.128			
20,200.00	6,979.18	5,990.00	5,988.29	207.55	143.36	-67.34	-450.60	6,126.83	19,149.20	18,969.59	179.61	106.617			
20,300.00	6,979.10	5,990.00	5,988.29	209.11	143.36	-67.34	-450.60	6,126.83	19,247.31	19,067.60	179.71	107.105			
20,400.00	6,979.03	5,990.00	5,988.29	210.68	143.36	-67.34	-450.60	6,126.83	19,345.43	19,165.63	179.80	107.592			
20,500.00	6,978.95	5,990.00	5,988.29	212.24	143.36	-67.34	-450.60	6,126.83	19,443.57	19,263.67	179.90	108.079			
20,600.00	6,978.88	5,990.00	5,988.29	213.81	143.36	-67.34	-450.60	6,126.83	19,541.73	19,361.73	180.00	108.565			
20,700.00	6,978.81	5,990.00	5,988.29	215.37	143.36	-67.34	-450.60	6,126.83	19,639.91	19,459.81	180.10	109.051			
20,800.00	6,978.73	5,990.00	5,988.29	216.94	143.36	-67.34	-450.60	6,126.83	19,738.11	19,557.91	180.20	109.535			
20,900.00	6,978.66	5,990.00	5,988.29	218.51	143.36	-67.34	-450.60	6,126.83	19,836.32	19,656.03	180.30	110.019			
21,000.00	6,978.59	5,990.00	5,988.29	220.07	143.36	-67.34	-450.60	6,126.83	19,934.56	19,754.16	180.40	110.502			
21,100.00	6,978.51	5,990.00	5,988.29	221.64	143.36	-67.34	-450.60	6,126.83	20,032.81	19,852.31	180.50	110.985			
21,200.00	6,978.44	5,990.00	5,988.29	223.21	143.36	-67.34	-450.60	6,126.83	20,131.08	19,950.48	180.60	111.467			
21,300.00	6,978.37	5,990.00	5,988.29	224.78	143.36	-67.34	-450.60	6,126.83	20,229.36	20,048.66	180.70	111.948			
21,400.00	6,978.29	5,990.00	5,988.29	226.35	143.36	-67.34	-450.60	6,126.83	20,327.66	20,146.86	180.81	112.428			
21,500.00	6,978.22	5,990.00	5,988.29	227.92	143.36	-67.34	-450.60	6,126.83	20,425.98	20,245.07	180.91	112.908			
21,600.00	6,978.14	5,990.00	5,988.29	229.49	143.36	-67.34	-450.60	6,126.83	20,524.32	20,343.31	181.01	113.387			
21,700.00	6,978.07	5,990.00	5,988.29	231.06	143.36	-67.34	-450.60	6,126.83	20,622.67	20,441.55	181.11	113.865			
21,800.00	6,978.00	5,990.00	5,988.29	232.63	143.36	-67.34	-450.60	6,126.83	20,721.03	20,539.82	181.22	114.343			
21,900.00	6,977.92	5,990.00	5,988.29	234.21	143.36	-67.34	-450.60	6,126.83	20,819.42	20,638.09	181.32	114.820			
22,000.00	6,977.85	5,990.00	5,988.29	235.78	143.36	-67.34	-450.60	6,126.83	20,917.81	20,736.39	181.43	115.296			
22,100.00	6,977.78	5,990.00	5,988.29	237.35	143.36	-67.34	-450.60	6,126.83	21,016.23	20,834.69	181.53	115.771			
22,200.00	6,977.70	5,990.00	5,988.29	238.92	143.36	-67.34	-450.60	6,126.83	21,114.65	20,933.02	181.64	116.246			
22,300.00	6,977.63	5,990.00	5,988.29	240.50	143.36	-67.34	-450.60	6,126.83	21,213.10	21,031.35	181.74	116.720			
22,400.00	6,977.56	5,990.00	5,988.29	242.07	143.36	-67.34	-450.60	6,126.83	21,311.55	21,129.70	181.85	117.193			
22,500.00	6,977.48	5,990.00	5,988.29	243.65	143.36	-67.34	-450.60	6,126.83	21,410.02	21,228.07	181.96	117.666			
22,600.00	6,977.41	5,990.00	5,988.29	245.22	143.36	-67.34	-450.60	6,126.83	21,508.51	21,326.45	182.06	118.138			
22,700.00	6,977.34	5,990.00	5,988.29	246.80	143.36	-67.34	-450.60	6,126.83	21,607.01	21,424.84	182.17	118.609			
22,800.00	6,977.26	5,990.00	5,988.29	248.37	143.36	-67.34	-450.60	6,126.83	21,705.52	21,523.24	182.28	119.080			
22,900.00	6,977.19	5,990.00	5,988.29	249.95	143.36	-67.34	-450.60	6,126.83	21,804.05	21,621.66	182.39	119.550			
23,000.00	6,977.11	5,990.00	5,988.29	251.53	143.36	-67.34	-450.60	6,126.83	21,902.59	21,720.09	182.49	120.019			
23,100.00	6,977.04	5,990.00	5,988.29	253.10	143.36	-67.34	-450.60	6,126.83	22,001.14	21,818.54	182.60	120.487			
23,155.65	6,977.00	5,990.00	5,988.29	253.98	143.36	-67.34	-450.60	6,126.83	22,055.99	21,873.33	182.66	120.748			
23,156.15	6,977.00	5,990.00	5,988.29	254.06	143.36	-67.34	-450.60	6,126.83	22,056.49	21,869.36	187.12	117.872			

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit 072B - OH - OH-SVY													Offset Site Error: 0.00 usft
Survey Program: 358-APC_ISCWSA REV 2 MWD													Offset Well Error: 0.00 usft
Reference													
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)			
0.00	0.00	0.00	0.00	0.00	0.00	-52.80	2,980.48	-3,927.05	4,930.09				
100.00	100.00	77.11	77.11	0.25	0.08	-52.80	2,980.40	-3,927.05	4,929.96	4,929.63	0.33	N/A	
200.00	200.00	185.70	185.70	0.61	0.20	-52.81	2,980.02	-3,927.05	4,929.75	4,928.94	0.81	6,080.193	
300.00	300.00	294.30	294.30	0.97	0.32	-52.81	2,979.32	-3,927.06	4,929.37	4,928.08	1.29	3,830.170	
400.00	400.00	375.20	375.19	1.33	0.43	-52.82	2,978.57	-3,927.13	4,928.92	4,927.17	1.75	2,813.310	
407.18	407.18	378.19	378.18	1.35	0.43	-52.82	2,978.53	-3,927.16	4,928.92	4,927.13	1.78	2,762.468	
500.00	500.00	419.00	418.98	1.68	0.52	-52.83	2,977.96	-3,927.97	4,929.49	4,927.29	2.20	2,237.539	
600.00	599.98	437.67	437.63	2.04	0.56	-62.82	2,977.70	-3,928.66	4,930.62	4,928.02	2.60	1,895.231	
700.00	699.84	461.71	461.64	2.41	0.62	-62.83	2,977.35	-3,929.97	4,931.70	4,928.69	3.01	1,637.550	
800.00	799.45	480.00	479.88	2.77	0.67	-62.84	2,977.12	-3,931.26	4,932.76	4,929.34	3.41	1,446.077	
900.00	898.70	510.00	509.75	3.13	0.75	-62.88	2,976.81	-3,934.00	4,933.83	4,929.99	3.84	1,283.804	
1,000.00	997.47	522.61	522.28	3.50	0.78	-62.89	2,976.74	-3,935.38	4,934.93	4,930.68	4.24	1,163.110	
1,100.00	1,095.63	541.00	540.54	3.89	0.83	-60.57	2,976.76	-3,937.62	4,935.75	4,931.08	4.67	1,057.759	
1,200.00	1,193.09	572.00	571.23	4.29	0.92	-58.97	2,977.06	-3,941.99	4,935.99	4,930.86	5.13	961.526	
1,300.00	1,289.73	572.00	571.23	4.72	0.92	-57.70	2,977.06	-3,941.99	4,935.46	4,929.92	5.54	891.197	
1,400.00	1,385.42	602.00	600.79	5.16	1.01	-56.85	2,977.65	-3,947.02	4,934.41	4,928.37	6.04	817.463	
1,496.97	1,477.20	602.00	600.79	5.62	1.01	-56.11	2,977.65	-3,947.02	4,932.79	4,926.33	6.46	763.536	
1,500.00	1,480.05	602.00	600.79	5.63	1.01	-56.11	2,977.65	-3,947.02	4,932.74	4,926.27	6.47	761.915	
1,600.00	1,574.15	633.00	631.19	6.12	1.11	-56.24	2,978.55	-3,953.03	4,931.64	4,924.63	7.01	703.548	
1,614.34	1,587.65	633.00	631.19	6.19	1.11	-56.24	2,978.55	-3,953.03	4,931.62	4,924.55	7.08	697.020	
1,700.00	1,668.25	648.93	646.75	6.62	1.16	-56.31	2,979.11	-3,956.41	4,932.25	4,924.73	7.51	656.399	
1,800.00	1,762.35	664.00	661.42	7.12	1.21	-56.37	2,979.66	-3,959.80	4,934.52	4,926.50	8.02	615.218	
1,900.00	1,856.45	694.00	690.52	7.64	1.33	-56.51	2,980.78	-3,967.01	4,938.36	4,929.78	8.58	575.551	
2,000.00	1,950.55	725.00	720.44	8.16	1.47	-56.65	2,981.85	-3,975.06	4,943.73	4,934.58	9.15	540.239	
2,100.00	2,044.65	756.00	750.21	8.68	1.63	-56.80	2,982.83	-3,983.63	4,950.58	4,940.86	9.73	508.890	
2,200.00	2,138.75	799.94	792.22	9.21	1.87	-57.02	2,983.91	-3,996.48	4,958.75	4,948.39	10.36	478.523	
2,300.00	2,232.85	831.66	822.42	9.74	2.05	-57.18	2,984.46	-4,006.17	4,968.15	4,957.20	10.95	453.586	
2,400.00	2,326.95	848.00	837.89	10.27	2.15	-57.26	2,984.73	-4,011.40	4,979.11	4,967.63	11.48	433.581	
2,500.00	2,421.05	879.00	867.07	10.81	2.35	-57.42	2,985.26	-4,021.86	4,991.70	4,979.63	12.08	413.280	
2,600.00	2,515.15	879.00	867.07	11.34	2.35	-57.42	2,985.26	-4,021.86	5,005.96	4,993.42	12.53	399.361	
2,700.00	2,609.25	910.00	895.96	11.88	2.57	-57.59	2,985.80	-4,033.08	5,021.74	5,008.61	13.13	382.488	
2,800.00	2,703.35	940.00	923.64	12.42	2.80	-57.75	2,986.21	-4,044.64	5,039.19	5,025.47	13.72	367.216	
2,900.00	2,797.45	940.00	923.64	12.96	2.80	-57.75	2,986.21	-4,044.64	5,058.20	5,044.03	14.16	357.122	
3,000.00	2,891.55	971.00	951.95	13.51	3.05	-57.92	2,986.49	-4,057.26	5,078.67	5,063.91	14.76	344.099	
3,100.00	2,985.65	1,000.00	978.17	14.05	3.29	-58.09	2,986.73	-4,069.66	5,100.78	5,085.44	15.35	332.406	
3,200.00	3,079.75	1,011.47	988.47	14.60	3.40	-58.16	2,986.85	-4,074.71	5,124.36	5,108.53	15.83	323.690	
3,300.00	3,173.85	1,031.00	1,005.93	15.14	3.57	-58.27	2,987.07	-4,083.46	5,149.47	5,133.11	16.36	314.855	
3,400.00	3,267.95	1,062.00	1,033.44	15.69	3.86	-58.45	2,987.41	-4,097.74	5,176.01	5,159.07	16.94	305.499	
3,500.00	3,362.05	1,079.32	1,048.71	16.23	4.03	-58.55	2,987.62	-4,105.92	5,203.97	5,186.52	17.45	298.286	
3,600.00	3,456.15	1,091.00	1,058.95	16.78	4.15	-58.62	2,987.78	-4,111.51	5,233.38	5,215.47	17.91	292.243	
3,700.00	3,550.25	1,122.00	1,085.90	17.33	4.46	-58.80	2,988.26	-4,126.83	5,264.28	5,245.80	18.48	284.809	
3,800.00	3,644.35	1,122.00	1,085.90	17.88	4.46	-58.80	2,988.26	-4,126.83	5,296.61	5,277.75	18.86	280.855	
3,900.00	3,738.45	1,152.00	1,111.56	18.42	4.79	-58.98	2,988.88	-4,142.35	5,330.49	5,311.08	19.42	274.504	
4,000.00	3,832.55	1,152.00	1,111.56	18.97	4.79	-58.98	2,988.88	-4,142.35	5,365.71	5,345.93	19.78	271.306	
4,100.00	3,926.65	1,182.00	1,136.86	19.52	5.13	-59.16	2,989.67	-4,158.47	5,402.40	5,382.07	20.33	265.788	
4,200.00	4,020.75	1,182.00	1,136.86	20.07	5.13	-59.16	2,989.67	-4,158.47	5,440.38	5,419.72	20.67	263.228	
4,300.00	4,114.85	1,214.00	1,163.51	20.62	5.51	-59.35	2,990.50	-4,176.15	5,479.59	5,458.37	21.22	258.225	
4,400.00	4,208.95	1,244.00	1,188.29	21.17	5.87	-59.53	2,991.08	-4,193.05	5,519.93	5,498.18	21.75	253.739	
4,500.00	4,303.05	1,283.11	1,220.36	21.72	6.36	-59.77	2,991.60	-4,215.44	5,561.31	5,538.96	22.35	248.843	
4,600.00	4,397.15	1,349.16	1,274.18	22.27	7.18	-60.18	2,992.28	-4,253.70	5,603.57	5,580.44	23.14	242.208	
4,700.00	4,491.25	1,421.92	1,333.53	22.82	8.04	-60.62	2,993.07	-4,295.80	5,646.23	5,622.28	23.95	235.761	
4,800.00	4,585.35	1,435.00	1,344.17	23.37	8.20	-60.70	2,993.21	-4,303.40	5,689.76	5,665.42	24.34	233.771	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit 072B - OH - OH-SVY													Offset Site Error:	0.00 usft	
Survey Program:		358-APC_ISCWSA REV 2 MWD										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)					
4,900.00	4,679.45	1,467.00	1,370.00	23.93	8.62	-60.89	2,993.53	-4,322.29	5,734.38	5,709.51	24.87	230.589			
5,000.00	4,773.55	1,499.00	1,395.64	24.48	9.04	-61.09	2,994.00	-4,341.42	5,780.07	5,754.68	25.39	227.677			
5,100.00	4,867.65	1,547.38	1,434.32	25.03	9.68	-61.37	2,994.95	-4,370.48	5,826.52	5,800.50	26.02	223.897			
5,200.00	4,961.75	1,594.00	1,471.43	25.58	10.30	-61.65	2,996.11	-4,398.67	5,873.81	5,847.17	26.64	220.483			
5,300.00	5,055.85	1,641.58	1,509.12	26.13	10.93	-61.93	2,997.24	-4,427.69	5,921.87	5,894.61	27.26	217.244			
5,400.00	5,149.95	1,690.00	1,547.37	26.68	11.58	-62.21	2,997.89	-4,457.36	5,970.45	5,942.57	27.88	214.122			
5,500.00	5,244.05	1,742.40	1,588.70	27.24	12.29	-62.52	2,999.11	-4,489.55	6,019.70	5,991.17	28.53	210.993			
5,600.00	5,338.15	1,766.44	1,607.59	27.79	12.62	-62.65	2,999.83	-4,504.41	6,069.76	6,040.80	28.96	209.596			
5,665.73	5,400.00	1,786.00	1,622.83	28.15	12.90	-62.76	3,000.38	-4,516.65	6,103.22	6,073.95	29.27	208.522			
5,700.00	5,432.28	1,786.00	1,622.83	28.34	12.90	-62.95	3,000.38	-4,516.65	6,120.85	6,091.50	29.35	208.549			
5,800.00	5,526.87	6,050.45	5,537.69	28.88	38.09	-80.55	2,919.30	-5,628.52	5,861.42	5,815.66	45.76	128.092			
5,900.00	5,622.01	6,143.36	5,630.52	29.41	38.15	-80.80	2,915.44	-5,628.75	5,855.49	5,809.15	46.34	126.372			
6,000.00	5,717.67	6,236.91	5,724.00	29.92	38.21	-81.05	2,911.65	-5,628.99	5,850.04	5,803.14	46.91	124.720			
6,100.00	5,813.83	6,331.08	5,818.10	30.41	38.28	-81.28	2,907.92	-5,629.21	5,845.05	5,797.58	47.47	123.133			
6,200.00	5,910.44	6,425.84	5,912.78	30.89	38.34	-81.51	2,904.25	-5,629.44	5,840.49	5,792.47	48.03	121.611			
6,300.00	6,007.50	6,521.14	6,008.02	31.36	38.41	-81.73	2,900.65	-5,629.66	5,836.34	5,787.77	48.58	120.150			
6,400.00	6,104.96	6,616.97	6,103.77	31.80	38.47	-81.93	2,897.13	-5,629.87	5,832.58	5,783.46	49.12	118.749			
6,500.00	6,202.80	6,713.27	6,200.02	32.24	38.54	-82.12	2,893.68	-5,630.08	5,829.17	5,779.52	49.65	117.405			
6,600.00	6,300.98	6,810.02	6,296.71	32.66	38.60	-82.30	2,890.31	-5,630.29	5,826.11	5,775.93	50.17	116.118			
6,700.00	6,399.48	6,907.19	6,393.82	33.06	38.67	-82.47	2,887.02	-5,630.49	5,823.37	5,772.68	50.69	114.884			
6,722.82	6,422.00	6,929.42	6,416.04	33.15	38.68	-82.51	2,886.28	-5,630.53	5,822.79	5,771.98	50.81	114.610			
6,750.00	6,448.76	6,955.82	6,442.43	33.26	38.70	-72.84	2,885.41	-5,630.58	5,821.62	5,770.67	50.95	114.271			
6,800.00	6,497.51	7,003.88	6,490.46	33.48	38.73	-61.90	2,883.84	-5,630.68	5,816.94	5,765.72	51.22	113.577			
6,850.00	6,545.40	7,051.01	6,537.56	33.72	38.77	-55.90	2,882.32	-5,630.77	5,809.02	5,757.52	51.50	112.797			
6,900.00	6,592.13	7,096.93	6,583.46	33.97	38.80	-52.49	2,880.87	-5,630.86	5,797.93	5,746.13	51.79	111.940			
6,950.00	6,637.40	7,141.35	6,627.86	34.25	38.83	-50.61	2,879.48	-5,630.95	5,783.74	5,731.64	52.10	111.014			
7,000.00	6,680.94	7,184.01	6,670.50	34.54	38.86	-49.74	2,878.16	-5,631.03	5,766.56	5,714.15	52.41	110.024			
7,050.00	6,722.48	7,224.64	6,711.11	34.85	38.88	-49.64	2,876.93	-5,631.10	5,746.51	5,693.78	52.73	108.979			
7,100.00	6,761.76	7,262.99	6,749.44	35.17	38.91	-50.14	2,875.78	-5,631.17	5,723.73	5,670.68	53.05	107.886			
7,150.00	6,798.55	7,298.83	6,785.26	35.51	38.93	-51.19	2,874.72	-5,631.24	5,698.38	5,645.00	53.38	106.751			
7,200.00	6,832.61	7,331.93	6,818.35	35.86	38.96	-52.75	2,873.75	-5,631.30	5,670.64	5,616.93	53.71	105.580			
7,250.00	6,863.74	7,362.09	6,848.50	36.22	38.98	-54.81	2,872.87	-5,631.35	5,640.68	5,586.64	54.04	104.381			
7,300.00	6,891.74	7,389.12	6,875.52	36.59	39.00	-57.37	2,872.10	-5,631.40	5,608.71	5,554.34	54.37	103.159			
7,350.00	6,916.44	7,412.86	6,899.25	36.98	39.01	-60.45	2,871.42	-5,631.44	5,574.94	5,520.24	54.70	101.921			
7,400.00	6,937.69	7,433.15	6,919.53	37.37	39.03	-64.07	2,870.85	-5,631.47	5,539.60	5,484.57	55.03	100.671			
7,450.00	6,955.36	7,449.86	6,936.24	37.78	39.04	-68.22	2,870.38	-5,631.50	5,502.90	5,447.55	55.35	99.416			
7,500.00	6,969.34	7,462.90	6,949.27	38.19	39.05	-72.88	2,870.02	-5,631.52	5,465.09	5,409.41	55.68	98.160			
7,550.00	6,979.53	7,472.17	6,958.54	38.62	39.05	-78.01	2,869.76	-5,631.54	5,426.40	5,370.41	55.99	96.910			
7,600.00	6,985.89	7,477.62	6,963.98	39.05	39.06	-83.53	2,869.61	-5,631.55	5,387.08	5,330.77	56.31	95.671			
7,650.00	6,988.37	7,479.20	6,965.57	39.48	39.06	-89.31	2,869.57	-5,631.55	5,347.37	5,290.75	56.62	94.447			
7,657.25	6,988.40	7,479.11	6,965.48	39.54	39.06	-90.16	2,869.57	-5,631.55	5,341.59	5,284.93	56.66	94.270			
7,700.00	6,988.37	7,478.33	6,964.69	39.92	39.06	-90.15	2,869.59	-5,631.55	5,307.58	5,250.66	56.93	93.236			
7,800.00	6,988.30	7,476.50	6,962.86	40.82	39.06	-90.11	2,869.64	-5,631.55	5,228.54	5,170.97	57.57	90.816			
7,900.00	6,988.23	7,474.67	6,961.03	41.77	39.05	-90.08	2,869.69	-5,631.54	5,150.22	5,091.96	58.26	88.402			
8,000.00	6,988.16	7,472.83	6,959.20	42.75	39.05	-90.05	2,869.74	-5,631.54	5,072.66	5,013.67	58.99	85.995			
8,100.00	6,988.09	7,470.99	6,957.36	43.76	39.05	-90.02	2,869.79	-5,631.54	4,995.90	4,936.14	59.76	83.600			
8,152.35	6,988.06	7,470.03	6,956.40	44.30	39.05	-90.00	2,869.82	-5,631.54	4,956.05	4,895.87	60.18	82.352			
8,200.00	6,988.02	7,469.17	6,955.54	44.79	39.05	-89.99	2,869.84	-5,631.53	4,919.46	4,858.89	60.57	81.220			
8,300.00	6,987.95	7,467.48	6,953.85	45.83	39.05	-89.95	2,869.89	-5,631.53	4,840.06	4,778.69	61.37	78.869			
8,400.00	6,987.88	7,465.94	6,952.31	46.85	39.05	-89.92	2,869.93	-5,631.53	4,757.28	4,695.15	62.14	76.561			
8,500.00	6,987.80	7,464.58	6,950.94	47.85	39.05	-89.88	2,869.97	-5,631.53	4,671.37	4,608.50	62.87	74.307			
8,600.00	6,987.73	7,463.38	6,949.75	48.83	39.05	-89.83	2,870.00	-5,631.52	4,582.56	4,519.02	63.55	72.114			

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit 072B - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		358-APC_ISCWSA REV 2 MWD					Rule Assigned:						Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Offset Wellbore Centre		Distance						
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
8,700.00	6,987.65	7,462.37	6,948.74	49.79	39.05	-89.77	2,870.03	-5,631.52	4,491.15	4,426.98	64.17	69.992		
8,800.00	6,987.57	7,461.54	6,947.91	50.72	39.05	-89.70	2,870.06	-5,631.52	4,397.42	4,332.70	64.72	67.946		
8,900.00	6,987.50	7,460.89	6,947.27	51.62	39.04	-89.59	2,870.07	-5,631.52	4,301.70	4,236.51	65.19	65.984		
9,000.00	6,987.42	7,460.45	6,946.82	52.48	39.04	-89.41	2,870.09	-5,631.52	4,204.34	4,138.76	65.58	64.111		
9,100.00	6,987.34	7,460.20	6,946.57	53.30	39.04	-89.07	2,870.09	-5,631.52	4,105.70	4,039.83	65.87	62.334		
9,200.00	6,987.27	7,460.14	6,946.51	54.08	39.04	-88.02	2,870.09	-5,631.52	4,006.19	3,940.15	66.04	60.659		
9,215.33	6,987.26	7,460.15	6,946.52	54.20	39.04	-87.62	2,870.09	-5,631.52	3,990.89	3,924.83	66.06	60.411		
9,300.00	6,987.20	7,460.21	6,946.58	54.85	39.04	-87.64	2,870.09	-5,631.52	3,906.34	3,840.19	66.15	59.052		
9,400.00	6,987.12	7,460.28	6,946.65	55.65	39.04	-87.66	2,870.09	-5,631.52	3,806.49	3,740.23	66.26	57.447		
9,500.00	6,987.05	7,460.36	6,946.73	56.48	39.04	-87.68	2,870.09	-5,631.52	3,706.65	3,640.27	66.38	55.843		
9,600.00	6,986.98	7,460.43	6,946.80	57.35	39.04	-87.70	2,870.09	-5,631.52	3,606.82	3,540.32	66.50	54.238		
9,700.00	6,986.90	7,460.50	6,946.87	58.24	39.04	-87.72	2,870.08	-5,631.52	3,507.00	3,440.37	66.63	52.634		
9,800.00	6,986.83	7,460.58	6,946.95	59.17	39.04	-87.74	2,870.08	-5,631.52	3,407.19	3,340.42	66.77	51.031		
9,900.00	6,986.75	7,460.65	6,947.02	60.12	39.04	-87.76	2,870.08	-5,631.52	3,307.39	3,240.47	66.91	49.428		
10,000.00	6,986.68	7,460.72	6,947.09	61.10	39.04	-87.78	2,870.08	-5,631.52	3,207.60	3,140.53	67.07	47.826		
10,100.00	6,986.61	7,460.79	6,947.17	62.11	39.04	-87.80	2,870.08	-5,631.52	3,107.82	3,040.59	67.23	46.225		
10,200.00	6,986.53	7,460.87	6,947.24	63.14	39.04	-87.81	2,870.07	-5,631.52	3,008.07	2,940.66	67.41	44.624		
10,300.00	6,986.46	7,460.94	6,947.31	64.20	39.04	-87.83	2,870.07	-5,631.52	2,908.32	2,840.73	67.60	43.025		
10,400.00	6,986.39	7,461.01	6,947.38	65.28	39.04	-87.85	2,870.07	-5,631.52	2,808.60	2,740.80	67.80	41.426		
10,500.00	6,986.31	7,461.09	6,947.46	66.38	39.04	-87.87	2,870.07	-5,631.52	2,708.89	2,640.88	68.01	39.828		
10,600.00	6,986.24	7,461.16	6,947.53	67.50	39.04	-87.89	2,870.07	-5,631.52	2,609.21	2,540.97	68.25	38.232		
10,700.00	6,986.17	7,461.23	6,947.60	68.64	39.04	-87.91	2,870.06	-5,631.52	2,509.56	2,441.06	68.50	36.637		
10,800.00	6,986.09	7,461.31	6,947.68	69.80	39.04	-87.93	2,870.06	-5,631.52	2,409.93	2,341.16	68.77	35.043		
10,900.00	6,986.02	7,461.38	6,947.75	70.98	39.04	-87.95	2,870.06	-5,631.52	2,310.34	2,241.27	69.07	33.451		
11,000.00	6,985.95	7,461.45	6,947.82	72.17	39.04	-87.97	2,870.06	-5,631.52	2,210.78	2,141.39	69.39	31.860		
11,100.00	6,985.87	7,461.52	6,947.89	73.38	39.05	-87.99	2,870.06	-5,631.52	2,111.26	2,041.52	69.74	30.272		
11,200.00	6,985.80	7,461.60	6,947.97	74.61	39.05	-88.01	2,870.05	-5,631.52	2,011.79	1,941.66	70.13	28.686		
11,300.00	6,985.72	7,461.67	6,948.04	75.85	39.05	-88.03	2,870.05	-5,631.52	1,912.38	1,841.81	70.56	27.102		
11,400.00	6,985.65	7,461.74	6,948.11	77.10	39.05	-88.05	2,870.05	-5,631.52	1,813.03	1,741.99	71.04	25.521		
11,500.00	6,985.58	7,461.82	6,948.19	78.37	39.05	-88.07	2,870.05	-5,631.52	1,713.75	1,642.18	71.58	23.943		
11,600.00	6,985.50	7,461.89	6,948.26	79.65	39.05	-88.09	2,870.05	-5,631.52	1,614.57	1,542.39	72.18	22.369		
11,700.00	6,985.43	7,461.96	6,948.33	80.94	39.05	-88.11	2,870.04	-5,631.52	1,515.49	1,442.63	72.86	20.799		
11,800.00	6,985.36	7,462.03	6,948.41	82.24	39.05	-88.13	2,870.04	-5,631.52	1,416.55	1,342.90	73.65	19.234		
11,900.00	6,985.28	7,462.11	6,948.48	83.56	39.05	-88.15	2,870.04	-5,631.52	1,317.76	1,243.21	74.55	17.676		
12,000.00	6,985.21	7,462.18	6,948.55	84.88	39.05	-88.17	2,870.04	-5,631.52	1,219.17	1,143.56	75.61	16.124		
12,100.00	6,985.14	7,462.25	6,948.62	86.21	39.05	-88.19	2,870.04	-5,631.52	1,120.83	1,043.97	76.86	14.582		
12,200.00	6,985.06	7,462.33	6,948.70	87.56	39.05	-88.21	2,870.03	-5,631.52	1,022.81	944.45	78.36	13.052		
12,300.00	6,984.99	7,462.40	6,948.77	88.91	39.05	-88.23	2,870.03	-5,631.52	925.22	845.02	80.20	11.537		
12,400.00	6,984.92	7,462.47	6,948.84	90.27	39.05	-88.25	2,870.03	-5,631.52	828.20	745.72	82.47	10.042		
12,500.00	6,984.84	7,462.54	6,948.91	91.64	39.05	-88.27	2,870.03	-5,631.52	731.98	646.61	85.37	8.574		
12,600.00	6,984.77	7,462.62	6,948.99	93.01	39.05	-88.29	2,870.03	-5,631.52	636.93	547.79	89.14	7.145		
12,700.00	6,984.69	7,462.69	6,949.06	94.40	39.05	-88.31	2,870.02	-5,631.52	543.66	449.47	94.18	5.772		
12,800.00	6,984.62	7,462.76	6,949.13	95.79	39.05	-88.33	2,870.02	-5,631.52	453.26	352.16	101.11	4.483		
12,900.00	6,984.55	7,462.84	6,949.21	97.18	39.05	-88.35	2,870.02	-5,631.52	367.87	257.17	110.70	3.323		
13,000.00	6,984.47	7,462.91	6,949.28	98.59	39.05	-88.37	2,870.02	-5,631.52	291.92	168.60	123.31	2.367		
13,100.00	6,984.40	7,462.98	6,949.35	100.00	39.05	-88.39	2,870.02	-5,631.52	234.73	99.31	135.42	1.733		
13,200.00	6,984.33	7,463.05	6,949.42	101.41	39.05	-88.41	2,870.01	-5,631.52	212.09	78.76	133.33	1.591	CC, ES, SF	
13,204.45	6,984.32	7,463.06	6,949.43	101.48	39.05	-88.41	2,870.01	-5,631.52	212.13	79.46	132.66	1.599		
13,300.00	6,984.25	7,463.13	6,949.50	102.83	39.05	-88.43	2,870.01	-5,631.52	234.24	124.55	109.69	2.135		
13,400.00	6,984.18	7,463.20	6,949.57	104.26	39.05	-88.44	2,870.01	-5,631.52	291.12	207.55	83.57	3.484		
13,500.00	6,984.11	7,463.27	6,949.64	105.69	39.05	-88.46	2,870.01	-5,631.52	366.93	300.18	66.75	5.497		
13,600.00	6,984.03	7,463.35	6,949.72	107.13	39.05	-88.48	2,870.01	-5,631.52	452.24	394.09	58.15	7.778		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit 072B - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program:		358-APC_ISCWSA REV 2 MWD						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)
13,700.00	6,983.96	7,463.42	6,949.79	108.57	39.05	-88.50	2,870.00	-5,631.52	542.59	488.21	54.38	9.978	
13,800.00	6,983.88	7,463.49	6,949.86	110.02	39.05	-88.52	2,870.00	-5,631.52	635.84	582.81	53.03	11.990	
13,900.00	6,983.81	7,463.56	6,949.93	111.47	39.05	-88.54	2,870.00	-5,631.52	730.87	678.08	52.79	13.845	
14,000.00	6,983.74	7,463.64	6,950.01	112.92	39.05	-88.56	2,870.00	-5,631.52	827.08	774.03	53.04	15.593	
14,100.00	6,983.66	7,463.71	6,950.08	114.38	39.05	-88.58	2,870.00	-5,631.52	924.09	870.59	53.50	17.274	
14,200.00	6,983.59	7,463.78	6,950.15	115.85	39.05	-88.60	2,869.99	-5,631.52	1,021.68	967.65	54.02	18.912	
14,300.00	6,983.52	7,463.85	6,950.22	117.31	39.05	-88.62	2,869.99	-5,631.52	1,119.69	1,065.13	54.56	20.523	
14,400.00	6,983.44	7,463.93	6,950.30	118.78	39.05	-88.64	2,869.99	-5,631.52	1,218.03	1,162.95	55.08	22.115	
14,500.00	6,983.37	7,464.00	6,950.37	120.26	39.05	-88.66	2,869.99	-5,631.52	1,316.61	1,261.05	55.57	23.693	
14,600.00	6,983.30	7,464.07	6,950.44	121.74	39.05	-88.68	2,869.99	-5,631.52	1,415.40	1,359.37	56.03	25.262	
14,700.00	6,983.22	7,464.15	6,950.51	123.22	39.05	-88.70	2,869.98	-5,631.53	1,514.35	1,457.89	56.46	26.824	
14,800.00	6,983.15	7,464.22	6,950.59	124.70	39.05	-88.72	2,869.98	-5,631.53	1,613.42	1,556.57	56.85	28.380	
14,900.00	6,983.08	7,464.29	6,950.66	126.19	39.05	-88.74	2,869.98	-5,631.53	1,712.60	1,655.38	57.22	29.931	
15,000.00	6,983.00	7,464.36	6,950.73	127.68	39.05	-88.76	2,869.98	-5,631.53	1,811.88	1,754.31	57.56	31.478	
15,100.00	6,982.93	7,464.44	6,950.80	129.17	39.05	-88.78	2,869.98	-5,631.53	1,911.22	1,853.35	57.88	33.021	
15,200.00	6,982.85	7,464.51	6,950.88	130.67	39.05	-88.80	2,869.97	-5,631.53	2,010.64	1,952.46	58.18	34.561	
15,300.00	6,982.78	7,464.58	6,950.95	132.16	39.05	-88.82	2,869.97	-5,631.53	2,110.11	2,051.65	58.45	36.098	
15,400.00	6,982.71	7,464.65	6,951.02	133.66	39.05	-88.84	2,869.97	-5,631.53	2,209.62	2,150.91	58.72	37.633	
15,500.00	6,982.63	7,464.73	6,951.10	135.17	39.05	-88.86	2,869.97	-5,631.53	2,309.18	2,250.22	58.96	39.164	
15,600.00	6,982.56	7,464.80	6,951.17	136.67	39.05	-88.88	2,869.97	-5,631.53	2,408.77	2,349.58	59.19	40.693	
15,700.00	6,982.49	7,464.87	6,951.24	138.18	39.05	-88.90	2,869.96	-5,631.53	2,508.40	2,448.99	59.41	42.220	
15,800.00	6,982.41	7,464.94	6,951.31	139.69	39.05	-88.92	2,869.96	-5,631.53	2,608.06	2,548.44	59.62	43.743	
15,900.00	6,982.34	7,465.02	6,951.39	141.20	39.05	-88.94	2,869.96	-5,631.53	2,707.74	2,647.92	59.82	45.265	
16,000.00	6,982.27	7,465.09	6,951.46	142.71	39.05	-88.96	2,869.96	-5,631.53	2,807.44	2,747.43	60.01	46.783	
16,100.00	6,982.19	7,465.16	6,951.53	144.23	39.05	-88.97	2,869.96	-5,631.53	2,907.17	2,846.98	60.19	48.300	
16,200.00	6,982.12	7,465.23	6,951.60	145.75	39.05	-88.99	2,869.95	-5,631.53	3,006.91	2,946.55	60.36	49.814	
16,300.00	6,982.05	7,465.31	6,951.68	147.27	39.05	-89.01	2,869.95	-5,631.53	3,106.67	3,046.14	60.53	51.325	
16,400.00	6,981.97	7,465.38	6,951.75	148.79	39.05	-89.03	2,869.95	-5,631.53	3,206.44	3,145.75	60.69	52.833	
16,500.00	6,981.90	7,465.45	6,951.82	150.31	39.05	-89.05	2,869.95	-5,631.53	3,306.23	3,245.39	60.84	54.340	
16,600.00	6,981.82	7,465.52	6,951.89	151.84	39.05	-89.07	2,869.95	-5,631.53	3,406.03	3,345.04	60.99	55.843	
16,700.00	6,981.75	7,465.60	6,951.97	153.36	39.05	-89.09	2,869.94	-5,631.53	3,505.84	3,444.70	61.14	57.344	
16,800.00	6,981.68	7,465.67	6,952.04	154.89	39.05	-89.11	2,869.94	-5,631.53	3,605.66	3,544.39	61.28	58.843	
16,900.00	6,981.60	7,465.74	6,952.11	156.42	39.05	-89.13	2,869.94	-5,631.53	3,705.49	3,644.08	61.41	60.338	
17,000.00	6,981.53	7,465.81	6,952.18	157.95	39.05	-89.15	2,869.94	-5,631.53	3,805.33	3,743.79	61.54	61.832	
17,100.00	6,981.46	7,465.89	6,952.26	159.49	39.05	-89.17	2,869.94	-5,631.53	3,905.18	3,843.51	61.67	63.322	
17,200.00	6,981.38	7,465.96	6,952.33	161.02	39.05	-89.19	2,869.93	-5,631.53	4,005.04	3,943.24	61.80	64.810	
17,300.00	6,981.31	7,466.03	6,952.40	162.56	39.05	-89.21	2,869.93	-5,631.53	4,104.90	4,042.98	61.92	66.295	
17,400.00	6,981.24	7,466.10	6,952.47	164.09	39.05	-89.23	2,869.93	-5,631.53	4,204.77	4,142.73	62.04	67.777	
17,500.00	6,981.16	7,466.18	6,952.55	165.63	39.05	-89.25	2,869.93	-5,631.53	4,304.65	4,242.49	62.15	69.257	
17,600.00	6,981.09	7,466.25	6,952.62	167.17	39.05	-89.27	2,869.93	-5,631.53	4,404.53	4,342.26	62.27	70.734	
17,700.00	6,981.01	7,466.32	6,952.69	168.71	39.05	-89.29	2,869.92	-5,631.53	4,504.41	4,442.03	62.38	72.208	
17,800.00	6,980.94	7,466.39	6,952.76	170.25	39.05	-89.31	2,869.92	-5,631.53	4,604.31	4,541.81	62.49	73.679	
17,900.00	6,980.87	7,466.47	6,952.83	171.80	39.05	-89.33	2,869.92	-5,631.53	4,704.20	4,641.60	62.60	75.147	
18,000.00	6,980.79	7,466.54	6,952.91	173.34	39.05	-89.35	2,869.92	-5,631.53	4,804.10	4,741.40	62.71	76.613	
18,100.00	6,980.72	7,466.61	6,952.98	174.89	39.05	-89.37	2,869.92	-5,631.53	4,904.01	4,841.20	62.81	78.075	
18,200.00	6,980.65	7,466.68	6,953.05	176.43	39.05	-89.39	2,869.91	-5,631.53	5,003.92	4,941.00	62.91	79.535	
18,300.00	6,980.57	7,466.76	6,953.12	177.98	39.05	-89.41	2,869.91	-5,631.53	5,103.83	5,040.81	63.02	80.992	
18,400.00	6,980.50	7,466.83	6,953.20	179.53	39.05	-89.42	2,869.91	-5,631.53	5,203.74	5,140.63	63.12	82.445	
18,500.00	6,980.43	7,466.90	6,953.27	181.08	39.05	-89.44	2,869.91	-5,631.53	5,303.66	5,240.44	63.22	83.896	
18,600.00	6,980.35	7,466.97	6,953.34	182.63	39.05	-89.46	2,869.90	-5,631.53	5,403.58	5,340.27	63.32	85.344	
18,700.00	6,980.28	7,467.05	6,953.41	184.18	39.05	-89.48	2,869.90	-5,631.53	5,503.51	5,440.09	63.41	86.789	
18,800.00	6,980.21	7,467.12	6,953.49	185.73	39.05	-89.50	2,869.90	-5,631.53	5,603.43	5,539.93	63.51	88.231	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit 072B - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program: 358-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)			
18,900.00	6,980.13	7,467.19	6,953.56	187.28	39.05	-89.52	2,869.90	-5,631.53	5,703.36	5,639.76	63.60	89.670	
19,000.00	6,980.06	7,467.26	6,953.63	188.84	39.05	-89.54	2,869.90	-5,631.53	5,803.30	5,739.60	63.70	91.105	
19,100.00	6,979.98	7,467.33	6,953.70	190.39	39.05	-89.56	2,869.89	-5,631.53	5,903.23	5,839.44	63.79	92.538	
19,200.00	6,979.91	7,467.41	6,953.77	191.95	39.05	-89.58	2,869.89	-5,631.53	6,003.17	5,939.28	63.89	93.968	
19,300.00	6,979.84	7,467.48	6,953.85	193.51	39.05	-89.60	2,869.89	-5,631.53	6,103.10	6,039.13	63.98	95.394	
19,400.00	6,979.76	7,467.55	6,953.92	195.06	39.05	-89.62	2,869.89	-5,631.53	6,203.05	6,138.98	64.07	96.817	
19,500.00	6,979.69	7,467.62	6,953.99	196.62	39.05	-89.64	2,869.89	-5,631.53	6,302.99	6,238.83	64.16	98.237	
19,600.00	6,979.62	7,467.70	6,954.06	198.18	39.05	-89.66	2,869.88	-5,631.53	6,402.93	6,338.68	64.25	99.654	
19,700.00	6,979.54	7,467.77	6,954.14	199.74	39.05	-89.68	2,869.88	-5,631.53	6,502.88	6,438.54	64.34	101.068	
19,800.00	6,979.47	7,467.84	6,954.21	201.30	39.05	-89.70	2,869.88	-5,631.53	6,602.83	6,538.39	64.43	102.479	
19,900.00	6,979.40	7,467.91	6,954.28	202.86	39.05	-89.72	2,869.88	-5,631.53	6,702.77	6,638.25	64.52	103.886	
20,000.00	6,979.32	7,467.99	6,954.35	204.42	39.05	-89.74	2,869.88	-5,631.53	6,802.73	6,738.12	64.61	105.291	
20,100.00	6,979.25	7,468.06	6,954.43	205.98	39.05	-89.76	2,869.87	-5,631.53	6,902.68	6,837.98	64.70	106.692	
20,200.00	6,979.18	7,468.13	6,954.50	207.55	39.05	-89.78	2,869.87	-5,631.53	7,002.63	6,937.85	64.79	108.089	
20,300.00	6,979.10	7,468.20	6,954.57	209.11	39.05	-89.80	2,869.87	-5,631.53	7,102.59	7,037.71	64.87	109.484	
20,400.00	6,979.03	7,468.27	6,954.64	210.68	39.05	-89.82	2,869.87	-5,631.53	7,202.54	7,137.58	64.96	110.875	
20,500.00	6,978.95	7,468.35	6,954.71	212.24	39.05	-89.83	2,869.87	-5,631.53	7,302.50	7,237.45	65.05	112.263	
20,600.00	6,978.88	7,468.42	6,954.79	213.81	39.05	-89.85	2,869.86	-5,631.53	7,402.46	7,337.32	65.14	113.647	
20,700.00	6,978.81	7,468.49	6,954.86	215.37	39.05	-89.87	2,869.86	-5,631.53	7,502.42	7,437.19	65.22	115.028	
20,800.00	6,978.73	7,468.56	6,954.93	216.94	39.05	-89.89	2,869.86	-5,631.53	7,602.38	7,537.07	65.31	116.406	
20,900.00	6,978.66	7,468.64	6,955.00	218.51	39.05	-89.91	2,869.86	-5,631.53	7,702.34	7,636.94	65.40	117.781	
21,000.00	6,978.59	7,468.71	6,955.07	220.07	39.05	-89.93	2,869.86	-5,631.53	7,802.30	7,736.82	65.48	119.152	
21,100.00	6,978.51	7,468.78	6,955.15	221.64	39.05	-89.95	2,869.85	-5,631.53	7,902.26	7,836.70	65.57	120.520	
21,200.00	6,978.44	7,468.85	6,955.22	223.21	39.05	-89.97	2,869.85	-5,631.53	8,002.23	7,936.58	65.65	121.884	
21,300.00	6,978.37	7,468.92	6,955.29	224.78	39.05	-89.99	2,869.85	-5,631.53	8,102.19	8,036.45	65.74	123.246	
21,400.00	6,978.29	7,469.00	6,955.36	226.35	39.05	-90.01	2,869.85	-5,631.53	8,202.16	8,136.33	65.83	124.603	
21,500.00	6,978.22	7,469.07	6,955.44	227.92	39.05	-90.03	2,869.85	-5,631.53	8,302.13	8,236.22	65.91	125.957	
21,600.00	6,978.14	7,469.14	6,955.51	229.49	39.05	-90.05	2,869.84	-5,631.53	8,402.10	8,336.10	66.00	127.308	
21,700.00	6,978.07	7,469.21	6,955.58	231.06	39.05	-90.07	2,869.84	-5,631.53	8,502.06	8,435.98	66.08	128.656	
21,800.00	6,978.00	7,469.28	6,955.65	232.63	39.05	-90.09	2,869.84	-5,631.53	8,602.03	8,535.86	66.17	130.000	
21,900.00	6,977.92	7,469.36	6,955.72	234.21	39.05	-90.11	2,869.84	-5,631.53	8,702.00	8,635.75	66.26	131.340	
22,000.00	6,977.85	7,469.43	6,955.80	235.78	39.05	-90.13	2,869.84	-5,631.53	8,801.97	8,735.63	66.34	132.677	
22,100.00	6,977.78	7,469.50	6,955.87	237.35	39.05	-90.15	2,869.83	-5,631.53	8,901.94	8,835.52	66.43	134.011	
22,200.00	6,977.70	7,469.57	6,955.94	238.92	39.05	-90.17	2,869.83	-5,631.53	9,001.92	8,935.40	66.51	135.341	
22,300.00	6,977.63	7,469.64	6,956.01	240.50	39.05	-90.19	2,869.83	-5,631.53	9,101.89	9,035.29	66.60	136.667	
22,400.00	6,977.56	7,469.72	6,956.08	242.07	39.05	-90.20	2,869.83	-5,631.53	9,201.86	9,135.18	66.68	137.991	
22,500.00	6,977.48	7,469.79	6,956.16	243.65	39.05	-90.22	2,869.83	-5,631.53	9,301.84	9,235.07	66.77	139.310	
22,600.00	6,977.41	7,469.86	6,956.23	245.22	39.05	-90.24	2,869.82	-5,631.53	9,401.81	9,334.95	66.86	140.626	
22,700.00	6,977.34	7,469.93	6,956.30	246.80	39.05	-90.26	2,869.82	-5,631.53	9,501.79	9,434.84	66.94	141.939	
22,800.00	6,977.26	7,470.01	6,956.37	248.37	39.05	-90.28	2,869.82	-5,631.53	9,601.76	9,534.73	67.03	143.248	
22,900.00	6,977.19	7,470.08	6,956.44	249.95	39.05	-90.30	2,869.82	-5,631.54	9,701.74	9,634.62	67.12	144.554	
23,000.00	6,977.11	7,470.15	6,956.52	251.53	39.05	-90.32	2,869.82	-5,631.54	9,801.71	9,734.51	67.20	145.856	
23,100.00	6,977.04	7,470.22	6,956.59	253.10	39.05	-90.34	2,869.81	-5,631.54	9,901.69	9,834.40	67.29	147.154	
23,155.65	6,977.00	7,470.26	6,956.63	253.98	39.05	-90.35	2,869.81	-5,631.54	9,957.33	9,889.99	67.34	147.875	
23,156.15	6,977.00	7,470.26	6,956.63	254.06	39.05	-90.35	2,869.81	-5,631.54	9,957.83	9,886.31	71.52	139.233	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit 148 COM - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		248-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 Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
0.00	0.00	0.00	0.00	0.00	0.00	-85.09	1,209.72	-14,081.40	14,133.32					
100.00	100.00	61.00	61.00	0.25	1.13	-85.09	1,209.72	-14,081.40	14,133.27	14,131.89	1.38	N/A		
200.00	200.00	161.00	161.00	0.61	2.98	-85.09	1,209.72	-14,081.40	14,133.27	14,129.68	3.59	3,941.651		
300.00	300.00	261.00	261.00	0.97	4.85	-85.09	1,209.72	-14,081.40	14,133.27	14,127.45	5.82	2,430.326		
400.00	400.00	361.00	361.00	1.33	6.87	-85.09	1,209.72	-14,081.40	14,133.27	14,125.07	8.20	1,724.115		
500.00	500.00	464.54	464.53	1.68	8.97	-85.09	1,209.88	-14,081.40	14,133.28	14,122.63	10.65	1,326.954		
508.92	508.92	473.83	473.83	1.72	9.15	-95.09	1,209.85	-14,081.40	14,133.28	14,122.41	10.87	1,300.094		
600.00	599.98	561.01	560.98	2.04	11.14	-95.09	1,209.72	-14,081.40	14,133.42	14,120.24	13.18	1,072.347		
700.00	699.84	663.82	663.78	2.41	13.63	-95.10	1,210.39	-14,081.40	14,133.95	14,117.91	16.03	881.463		
800.00	799.45	774.68	774.62	2.77	16.33	-95.13	1,209.59	-14,081.40	14,134.67	14,115.58	19.09	740.521		
900.00	898.70	859.83	859.70	3.13	18.64	-95.15	1,209.72	-14,081.40	14,135.77	14,114.00	21.77	649.469		
1,000.00	997.47	961.39	961.24	3.50	21.36	-95.18	1,211.00	-14,081.40	14,137.30	14,112.44	24.86	568.615		
1,100.00	1,095.63	1,070.70	1,070.53	3.89	24.29	-92.88	1,210.21	-14,081.40	14,138.57	14,110.39	28.18	501.714		
1,200.00	1,193.09	1,154.38	1,154.09	4.29	26.50	-91.25	1,209.72	-14,081.40	14,139.32	14,108.52	30.80	459.100		
1,300.00	1,289.73	1,251.01	1,250.73	4.72	29.04	-90.07	1,209.72	-14,081.40	14,139.61	14,105.86	33.75	418.922		
1,400.00	1,385.42	1,346.70	1,346.42	5.16	31.54	-89.20	1,209.72	-14,081.40	14,139.40	14,102.70	36.70	385.227		
1,496.97	1,477.20	1,444.20	1,443.87	5.62	34.10	-88.57	1,211.38	-14,081.40	14,138.87	14,099.16	39.71	356.029		
1,500.00	1,480.05	1,447.24	1,446.91	5.63	34.18	-88.58	1,211.36	-14,081.40	14,138.84	14,099.03	39.81	355.185		
1,600.00	1,574.15	1,547.36	1,547.01	6.12	36.80	-88.72	1,210.49	-14,081.40	14,137.92	14,095.01	42.92	329.418		
1,700.00	1,668.25	1,629.74	1,629.25	6.62	38.88	-88.83	1,209.72	-14,081.40	14,137.09	14,091.60	45.50	310.730		
1,800.00	1,762.35	1,723.84	1,723.35	7.12	41.06	-88.96	1,209.72	-14,081.40	14,136.40	14,088.22	48.18	293.396		
1,900.00	1,856.45	1,817.94	1,817.45	7.64	43.24	-89.09	1,209.72	-14,081.40	14,135.79	14,084.92	50.87	277.858		
2,000.00	1,950.55	1,914.81	1,914.30	8.16	45.48	-89.22	1,211.26	-14,081.40	14,135.35	14,081.72	53.64	263.542		
2,100.00	2,044.65	2,013.13	2,012.60	8.68	47.75	-89.36	1,210.70	-14,081.40	14,134.87	14,078.43	56.44	250.460		
2,200.00	2,138.75	2,111.09	2,110.55	9.21	50.02	-89.49	1,209.63	-14,081.40	14,134.44	14,075.21	59.23	238.633		
2,300.00	2,232.85	2,194.46	2,193.85	9.74	51.77	-89.61	1,209.72	-14,081.40	14,134.16	14,072.65	61.51	229.795		
2,400.00	2,326.95	2,288.56	2,287.95	10.27	53.76	-89.74	1,209.72	-14,081.40	14,133.95	14,069.92	64.03	220.745		
2,500.00	2,421.05	2,384.22	2,383.61	10.81	55.78	-89.86	1,210.63	-14,081.40	14,133.87	14,067.29	66.58	212.270		
2,600.00	2,515.15	2,480.77	2,480.14	11.34	57.82	-90.00	1,210.23	-14,081.40	14,133.81	14,064.64	69.16	204.361		
2,645.78	2,558.23	2,524.88	2,524.25	11.59	58.75	-90.06	1,209.93	-14,081.40	14,133.80	14,063.46	70.34	200.937		
2,700.00	2,609.25	2,570.93	2,570.25	11.88	59.68	-90.12	1,209.72	-14,081.40	14,133.82	14,062.25	71.56	197.499		
2,800.00	2,703.35	2,665.03	2,664.35	12.42	61.49	-90.25	1,209.72	-14,081.40	14,133.94	14,060.02	73.91	191.225		
2,900.00	2,797.45	2,759.13	2,758.45	12.96	63.30	-90.38	1,209.72	-14,081.40	14,134.14	14,057.87	76.26	185.337		
3,000.00	2,891.55	2,854.33	2,853.65	13.51	65.13	-90.51	1,210.73	-14,081.40	14,134.45	14,055.82	78.63	179.750		
3,100.00	2,985.65	2,950.06	2,949.37	14.05	66.97	-90.64	1,210.37	-14,081.40	14,134.80	14,053.78	81.02	174.468		
3,200.00	3,079.75	3,041.47	3,040.75	14.60	68.72	-90.77	1,209.72	-14,081.40	14,135.22	14,051.90	83.32	169.658		
3,300.00	3,173.85	3,135.57	3,134.85	15.14	70.29	-90.90	1,209.72	-14,081.40	14,135.74	14,050.32	85.42	165.477		
3,400.00	3,267.95	3,229.67	3,228.95	15.69	71.85	-91.03	1,209.72	-14,081.40	14,136.35	14,048.81	87.53	161.496		
3,500.00	3,362.05	3,323.77	3,323.05	16.23	73.41	-91.16	1,209.72	-14,081.40	14,137.03	14,047.39	89.64	157.703		
3,600.00	3,456.15	3,418.09	3,417.37	16.78	74.98	-91.28	1,210.42	-14,081.40	14,137.81	14,046.06	91.76	154.079		
3,700.00	3,550.25	3,512.53	3,511.81	17.33	76.55	-91.41	1,210.30	-14,081.40	14,138.66	14,044.78	93.87	150.614		
3,800.00	3,644.35	3,606.89	3,606.17	17.88	78.12	-91.54	1,210.06	-14,081.40	14,139.58	14,043.59	95.99	147.304		
3,900.00	3,738.45	3,700.18	3,699.45	18.42	79.67	-91.67	1,209.72	-14,081.40	14,140.58	14,042.49	98.09	144.155		
4,000.00	3,832.55	3,794.28	3,793.55	18.97	81.34	-91.80	1,209.72	-14,081.40	14,141.67	14,041.36	100.31	140.977		
4,100.00	3,926.65	3,888.54	3,887.81	19.52	83.02	-91.93	1,209.83	-14,081.40	14,142.84	14,040.31	102.53	137.934		
4,200.00	4,020.75	3,982.49	3,981.75	20.07	84.90	-92.06	1,209.72	-14,081.40	14,144.09	14,039.13	104.96	134.756		
4,300.00	4,114.85	4,076.59	4,075.85	20.62	87.31	-92.19	1,209.72	-14,081.40	14,145.43	14,037.50	107.93	131.063		
4,400.00	4,208.95	4,170.83	4,170.08	21.17	89.74	-92.32	1,210.16	-14,081.40	14,146.84	14,035.94	110.90	127.564		
4,500.00	4,303.05	4,264.93	4,264.18	21.72	92.16	-92.45	1,209.75	-14,081.40	14,148.34	14,034.47	113.87	124.252		
4,600.00	4,397.15	4,358.99	4,358.09	22.27	95.16	-92.57	1,210.57	-14,081.40	14,149.91	14,032.49	117.42	120.506		
4,700.00	4,491.25	4,453.28	4,452.25	22.82	98.23	-92.70	1,209.72	-14,081.40	14,151.57	14,030.53	121.04	116.917		
4,800.00	4,585.35	4,545.85	4,544.78	23.37	101.32	-92.83	1,209.87	-14,081.40	14,153.30	14,028.62	124.68	113.514		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit 148 COM - OH - OH-INC											Offset Site Error: 0.00 usft
Survey Program: 248-A027Ua_INC-ONLY											Offset Well Error: 0.00 usft
Rule Assigned:											
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	Highside Toolface (°)	Offset Wellbore Centre	+N/-S (usft)	+E/-W (usft)	Distance	Warning
				(usft)	(usft)						
4,900.00	4,679.45	4,640.71	4,639.53	23.93	104.60	-92.96	1,210.43	-14,081.40	14,155.11	14,026.60	128.51
5,000.00	4,773.55	4,735.87	4,734.55	24.48	107.96	-93.09	1,209.72	-14,081.40	14,157.02	14,024.60	106.909
5,100.00	4,867.65	4,830.12	4,828.65	25.03	111.38	-93.22	1,209.72	-14,081.40	14,159.00	14,022.61	103.815
5,200.00	4,961.75	4,919.63	4,918.11	25.58	114.70	-93.34	1,209.99	-14,081.40	14,161.05	14,020.79	100.961
5,300.00	5,055.85	5,018.49	5,016.85	26.13	118.50	-93.48	1,209.72	-14,081.40	14,163.19	14,018.59	97.943
5,400.00	5,149.95	5,106.27	5,104.56	26.68	121.88	-93.59	1,210.03	-14,081.40	14,165.41	14,016.87	95.365
5,500.00	5,244.05	5,203.76	5,201.81	27.24	125.66	-93.73	1,210.49	-14,081.40	14,167.70	14,014.83	92.677
5,600.00	5,338.15	5,301.25	5,299.15	27.79	129.34	-93.86	1,209.72	-14,081.40	14,170.10	14,012.99	90.196
5,665.73	5,400.00	5,358.54	5,356.40	28.15	131.46	-93.94	1,210.52	-14,081.40	14,171.68	14,012.10	88.805
5,700.00	5,432.28	5,387.05	5,384.89	28.34	132.51	-93.99	1,210.03	-14,081.40	14,172.54	14,011.72	88.125
5,800.00	5,526.87	5,486.35	5,484.02	28.88	136.11	-94.14	1,210.36	-14,081.40	14,174.97	14,010.02	85.934
5,900.00	5,622.01	5,585.45	5,583.01	29.41	139.69	-94.29	1,209.72	-14,081.40	14,177.37	14,008.31	83.861
6,000.00	5,717.67	5,678.56	5,676.07	29.92	143.06	-94.41	1,211.15	-14,081.40	14,179.63	14,006.69	81.993
6,100.00	5,813.83	5,777.56	5,774.83	30.41	146.65	-94.55	1,209.72	-14,081.40	14,181.91	14,004.89	80.116
6,200.00	5,910.44	5,874.18	5,871.44	30.89	150.27	-94.67	1,209.72	-14,081.40	14,184.06	14,002.94	78.313
6,300.00	6,007.50	5,964.52	5,961.73	31.36	153.66	-94.78	1,210.83	-14,081.40	14,186.06	14,001.09	76.693
6,400.00	6,104.96	6,069.01	6,065.96	31.80	157.64	-94.90	1,209.72	-14,081.40	14,188.04	13,998.65	74.913
6,500.00	6,202.80	6,163.01	6,159.91	32.24	161.29	-94.99	1,211.07	-14,081.40	14,189.81	13,996.33	73.341
6,600.00	6,300.98	6,265.33	6,261.98	32.66	165.24	-95.09	1,209.72	-14,081.40	14,191.56	13,993.72	71.730
6,700.00	6,399.48	6,352.41	6,349.02	33.06	168.54	-95.16	1,210.15	-14,081.40	14,193.11	13,991.57	70.423
6,722.82	6,422.00	6,386.51	6,383.00	33.15	169.81	-95.19	1,209.72	-14,081.40	14,193.47	13,990.56	69.952
6,750.00	6,448.76	6,413.27	6,409.76	33.26	170.79	-85.43	1,209.72	-14,081.40	14,193.46	13,989.46	69.577
6,800.00	6,497.51	6,462.02	6,458.51	33.48	172.59	-74.33	1,209.72	-14,081.40	14,191.31	13,985.30	68.887
6,850.00	6,545.40	6,504.23	6,500.68	33.72	174.14	-68.16	1,210.74	-14,081.40	14,186.37	13,978.57	68.269
6,900.00	6,592.13	6,544.17	6,540.60	33.97	175.60	-64.58	1,210.20	-14,081.40	14,178.80	13,969.27	67.670
6,950.00	6,637.40	6,602.13	6,598.40	34.25	177.74	-62.56	1,209.72	-14,081.40	14,168.58	13,956.63	66.851
7,000.00	6,680.94	6,644.67	6,640.92	34.54	179.30	-61.51	1,210.60	-14,081.40	14,155.71	13,941.90	66.207
7,050.00	6,722.48	6,678.10	6,674.33	34.85	180.53	-61.17	1,210.37	-14,081.40	14,140.42	13,925.06	65.661
7,100.00	6,761.76	6,726.67	6,722.76	35.17	182.28	-61.45	1,209.72	-14,081.40	14,122.76	13,905.33	64.954
7,150.00	6,798.55	6,763.45	6,759.55	35.51	183.51	-62.19	1,209.72	-14,081.40	14,102.81	13,883.81	64.396
7,200.00	6,832.61	6,797.52	6,793.61	35.86	184.64	-63.35	1,209.72	-14,081.40	14,080.73	13,860.24	63.860
7,250.00	6,863.74	6,828.64	6,824.74	36.22	185.68	-64.92	1,209.72	-14,081.40	14,056.67	13,834.77	63.347
7,300.00	6,891.74	6,856.64	6,852.74	36.59	186.62	-66.86	1,209.72	-14,081.40	14,030.79	13,807.58	62.859
7,350.00	6,916.44	6,880.00	6,876.05	36.98	187.40	-69.15	1,211.59	-14,081.40	14,003.13	13,778.76	62.410
7,400.00	6,937.69	6,898.54	6,894.58	37.37	188.02	-71.79	1,211.54	-14,081.40	13,974.12	13,748.74	62.001
7,450.00	6,955.36	6,913.79	6,909.83	37.78	188.53	-74.77	1,211.45	-14,081.40	13,943.83	13,717.54	61.618
7,500.00	6,969.34	6,925.70	6,921.74	38.19	188.92	-78.05	1,211.36	-14,081.40	13,912.44	13,685.35	61.263
7,550.00	6,979.53	6,934.25	6,930.28	38.62	189.21	-81.60	1,211.29	-14,081.40	13,880.16	13,652.37	60.936
7,600.00	6,985.89	6,939.42	6,935.45	39.05	189.38	-85.40	1,211.23	-14,081.40	13,847.17	13,618.81	60.637
7,650.00	6,988.37	6,941.23	6,937.26	39.48	189.44	-89.38	1,211.21	-14,081.40	13,813.70	13,584.87	60.367
7,657.25	6,988.40	6,941.21	6,937.24	39.54	189.44	-89.97	1,211.21	-14,081.40	13,808.81	13,579.93	60.330
7,700.00	6,988.37	6,940.92	6,936.95	39.92	189.43	-89.97	1,211.22	-14,081.40	13,780.04	13,550.82	60.116
7,800.00	6,988.30	6,940.24	6,936.27	40.82	189.41	-89.96	1,211.22	-14,081.40	13,713.02	13,482.99	59.613
7,900.00	6,988.23	6,939.57	6,935.60	41.77	189.39	-89.96	1,211.23	-14,081.40	13,646.40	13,415.54	59.110
8,000.00	6,988.16	6,938.91	6,934.94	42.75	189.37	-89.96	1,211.24	-14,081.40	13,580.20	13,348.47	58.606
8,100.00	6,988.09	6,938.26	6,934.29	43.76	189.34	-89.95	1,211.25	-14,081.40	13,514.40	13,281.80	58.102
8,152.35	6,988.06	6,937.93	6,933.96	44.30	189.33	-89.95	1,211.25	-14,081.40	13,480.13	13,247.06	57.838
8,200.00	6,988.02	6,937.63	6,933.66	44.79	189.32	-89.95	1,211.25	-14,081.40	13,448.44	13,214.94	57.597
8,300.00	6,987.95	6,937.05	6,933.08	45.83	189.30	-89.95	1,211.26	-14,081.40	13,378.47	13,144.10	57.084
8,400.00	6,987.88	6,936.52	6,932.55	46.85	189.29	-89.94	1,211.26	-14,081.40	13,304.03	13,068.83	56.566
8,500.00	6,987.80	6,936.04	6,932.07	47.85	189.27	-89.94	1,211.27	-14,081.40	13,225.41	12,989.43	56.045
8,600.00	6,987.73	6,935.62	6,931.65	48.83	189.26	-89.93	1,211.27	-14,081.40	13,142.93	12,906.22	55.523

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit 148 COM - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program:		248-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)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
8,700.00	6,987.65	6,935.25	6,931.28	49.79	189.24	-89.92	1,211.28	-14,081.40	13,056.91	12,819.53	237.38	55.004	
8,800.00	6,987.57	6,934.93	6,930.96	50.72	189.23	-89.91	1,211.28	-14,081.40	12,967.72	12,729.73	237.98	54.490	
8,900.00	6,987.50	6,934.67	6,930.70	51.62	189.22	-89.89	1,211.28	-14,081.40	12,875.71	12,637.20	238.51	53.983	
9,000.00	6,987.42	6,934.46	6,930.49	52.48	189.22	-89.87	1,211.28	-14,081.40	12,781.30	12,542.33	238.97	53.486	
9,100.00	6,987.34	6,934.31	6,930.34	53.30	189.21	-89.83	1,211.29	-14,081.40	12,684.88	12,445.54	239.33	53.001	
9,200.00	6,987.27	6,934.21	6,930.24	54.08	189.21	-89.76	1,211.29	-14,081.40	12,586.89	12,347.27	239.61	52.530	
9,215.33	6,987.26	6,934.20	6,930.23	54.20	189.21	-89.74	1,211.29	-14,081.40	12,571.75	12,332.10	239.65	52.459	
9,300.00	6,987.20	6,934.15	6,930.18	54.85	189.21	-89.74	1,211.29	-14,081.40	12,488.10	12,248.27	239.84	52.069	
9,400.00	6,987.12	6,934.08	6,930.11	55.65	189.20	-89.73	1,211.29	-14,081.40	12,389.33	12,149.27	240.06	51.609	
9,500.00	6,987.05	6,934.02	6,930.05	56.48	189.20	-89.73	1,211.29	-14,081.40	12,290.58	12,050.28	240.29	51.148	
9,600.00	6,986.98	6,933.96	6,929.99	57.35	189.20	-89.73	1,211.29	-14,081.40	12,191.84	11,951.31	240.53	50.688	
9,700.00	6,986.90	6,933.89	6,929.92	58.24	189.20	-89.73	1,211.29	-14,081.40	12,093.13	11,852.36	240.77	50.227	
9,800.00	6,986.83	6,933.83	6,929.86	59.17	189.20	-89.73	1,211.29	-14,081.40	11,994.44	11,753.42	241.01	49.767	
9,900.00	6,986.75	6,933.77	6,929.80	60.12	189.19	-89.72	1,211.29	-14,081.40	11,895.77	11,654.50	241.26	49.307	
10,000.00	6,986.68	6,933.70	6,929.73	61.10	189.19	-89.72	1,211.29	-14,081.40	11,797.12	11,555.60	241.52	48.846	
10,100.00	6,986.61	6,933.64	6,929.67	62.11	189.19	-89.72	1,211.29	-14,081.40	11,698.49	11,456.72	241.77	48.386	
10,200.00	6,986.53	6,933.57	6,929.61	63.14	189.19	-89.72	1,211.29	-14,081.40	11,599.89	11,357.85	242.04	47.926	
10,300.00	6,986.46	6,933.51	6,929.54	64.20	189.19	-89.72	1,211.29	-14,081.40	11,501.32	11,259.01	242.31	47.466	
10,400.00	6,986.39	6,933.45	6,929.48	65.28	189.18	-89.72	1,211.29	-14,081.40	11,402.76	11,160.18	242.58	47.006	
10,500.00	6,986.31	6,933.38	6,929.42	66.38	189.18	-89.71	1,211.29	-14,081.40	11,304.24	11,061.37	242.86	46.546	
10,600.00	6,986.24	6,933.32	6,929.35	67.50	189.18	-89.71	1,211.30	-14,081.40	11,205.74	10,962.59	243.15	46.086	
10,700.00	6,986.17	6,933.26	6,929.29	68.64	189.18	-89.71	1,211.30	-14,081.40	11,107.26	10,863.82	243.44	45.626	
10,800.00	6,986.09	6,933.19	6,929.23	69.80	189.17	-89.71	1,211.30	-14,081.40	11,008.82	10,765.08	243.74	45.166	
10,900.00	6,986.02	6,933.13	6,929.16	70.98	189.17	-89.71	1,211.30	-14,081.40	10,910.40	10,666.35	244.04	44.707	
11,000.00	6,985.95	6,933.07	6,929.10	72.17	189.17	-89.70	1,211.30	-14,081.40	10,812.01	10,567.66	244.35	44.247	
11,100.00	6,985.87	6,933.01	6,929.04	73.38	189.17	-89.70	1,211.30	-14,081.40	10,713.65	10,468.98	244.67	43.788	
11,200.00	6,985.80	6,932.94	6,928.97	74.61	189.17	-89.70	1,211.30	-14,081.40	10,615.32	10,370.33	244.99	43.329	
11,300.00	6,985.72	6,932.88	6,928.91	75.85	189.16	-89.70	1,211.30	-14,081.40	10,517.02	10,271.70	245.32	42.870	
11,400.00	6,985.65	6,932.82	6,928.85	77.10	189.16	-89.70	1,211.30	-14,081.40	10,418.76	10,173.10	245.66	42.411	
11,500.00	6,985.58	6,932.75	6,928.78	78.37	189.16	-89.70	1,211.30	-14,081.40	10,320.53	10,074.52	246.00	41.953	
11,600.00	6,985.50	6,932.69	6,928.72	79.65	189.16	-89.69	1,211.30	-14,081.40	10,222.33	9,975.98	246.35	41.495	
11,700.00	6,985.43	6,932.63	6,928.66	80.94	189.16	-89.69	1,211.30	-14,081.40	10,124.17	9,877.46	246.71	41.036	
11,800.00	6,985.36	6,932.56	6,928.59	82.24	189.15	-89.69	1,211.30	-14,081.40	10,026.04	9,778.96	247.08	40.578	
11,900.00	6,985.28	6,932.50	6,928.53	83.56	189.15	-89.69	1,211.30	-14,081.40	9,927.95	9,680.50	247.45	40.121	
12,000.00	6,985.21	6,932.44	6,928.47	84.88	189.15	-89.69	1,211.30	-14,081.40	9,829.90	9,582.07	247.83	39.663	
12,100.00	6,985.14	6,932.37	6,928.40	86.21	189.15	-89.68	1,211.30	-14,081.40	9,731.90	9,483.67	248.23	39.206	
12,200.00	6,985.06	6,932.31	6,928.34	87.56	189.15	-89.68	1,211.31	-14,081.40	9,633.93	9,385.30	248.62	38.749	
12,300.00	6,984.99	6,932.25	6,928.28	88.91	189.14	-89.68	1,211.31	-14,081.40	9,536.00	9,286.97	249.03	38.292	
12,400.00	6,984.92	6,932.18	6,928.22	90.27	189.14	-89.68	1,211.31	-14,081.40	9,438.12	9,188.67	249.45	37.836	
12,500.00	6,984.84	6,932.12	6,928.15	91.64	189.14	-89.68	1,211.31	-14,081.40	9,340.28	9,090.40	249.88	37.380	
12,600.00	6,984.77	6,932.06	6,928.09	93.01	189.14	-89.67	1,211.31	-14,081.40	9,242.49	8,992.17	250.31	36.924	
12,700.00	6,984.69	6,931.99	6,928.03	94.40	189.13	-89.67	1,211.31	-14,081.40	9,144.74	8,893.98	250.76	36.469	
12,800.00	6,984.62	6,931.93	6,927.96	95.79	189.13	-89.67	1,211.31	-14,081.40	9,047.05	8,795.83	251.21	36.013	
12,900.00	6,984.55	6,931.87	6,927.90	97.18	189.13	-89.67	1,211.31	-14,081.40	8,949.40	8,697.72	251.68	35.559	
13,000.00	6,984.47	6,931.81	6,927.84	98.59	189.13	-89.67	1,211.31	-14,081.40	8,851.81	8,599.65	252.16	35.104	
13,100.00	6,984.40	6,931.74	6,927.77	100.00	189.13	-89.67	1,211.31	-14,081.40	8,754.27	8,501.63	252.65	34.650	
13,200.00	6,984.33	6,931.68	6,927.71	101.41	189.12	-89.66	1,211.31	-14,081.40	8,656.79	8,403.65	253.15	34.197	
13,300.00	6,984.25	6,931.62	6,927.65	102.83	189.12	-89.66	1,211.31	-14,081.40	8,559.37	8,305.71	253.66	33.744	
13,400.00	6,984.18	6,931.55	6,927.59	104.26	189.12	-89.66	1,211.31	-14,081.40	8,462.01	8,207.82	254.18	33.291	
13,500.00	6,984.11	6,931.49	6,927.52	105.69	189.12	-89.66	1,211.31	-14,081.40	8,364.71	8,109.99	254.72	32.839	
13,600.00	6,984.03	6,931.43	6,927.46	107.13	189.12	-89.66	1,211.31	-14,081.40	8,267.47	8,012.20	255.27	32.387	
13,700.00	6,983.96	6,931.36	6,927.40	108.57	189.11	-89.65	1,211.31	-14,081.40	8,170.30	7,914.47	255.83	31.936	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit 148 COM - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program:		248-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)
13,800.00	6,983.88	6,931.30	6,927.33	110.02	189.11	-89.65	1,211.31	-14,081.40	8,073.20	7,816.79	256.41	31.486	
13,900.00	6,983.81	6,931.24	6,927.27	111.47	189.11	-89.65	1,211.32	-14,081.40	7,976.17	7,719.17	257.00	31.035	
14,000.00	6,983.74	6,931.18	6,927.21	112.92	189.11	-89.65	1,211.32	-14,081.40	7,879.22	7,621.61	257.61	30.586	
14,100.00	6,983.66	6,931.11	6,927.14	114.38	189.11	-89.65	1,211.32	-14,081.40	7,782.34	7,524.11	258.23	30.137	
14,200.00	6,983.59	6,931.05	6,927.08	115.85	189.10	-89.64	1,211.32	-14,081.40	7,685.54	7,426.67	258.87	29.689	
14,300.00	6,983.52	6,930.99	6,927.02	117.31	189.10	-89.64	1,211.32	-14,081.40	7,588.83	7,329.30	259.53	29.241	
14,400.00	6,983.44	6,930.92	6,926.96	118.78	189.10	-89.64	1,211.32	-14,081.40	7,492.20	7,232.00	260.20	28.794	
14,500.00	6,983.37	6,930.86	6,926.89	120.26	189.10	-89.64	1,211.32	-14,081.40	7,395.66	7,134.77	260.89	28.348	
14,600.00	6,983.30	6,930.80	6,926.83	121.74	189.09	-89.64	1,211.32	-14,081.40	7,299.22	7,037.62	261.60	27.902	
14,700.00	6,983.22	6,930.74	6,926.77	123.22	189.09	-89.64	1,211.32	-14,081.40	7,202.87	6,940.54	262.33	27.458	
14,800.00	6,983.15	6,930.67	6,926.71	124.70	189.09	-89.63	1,211.32	-14,081.40	7,106.62	6,843.54	263.08	27.014	
14,900.00	6,983.08	6,930.61	6,926.64	126.19	189.09	-89.63	1,211.32	-14,081.40	7,010.48	6,746.63	263.84	26.570	
15,000.00	6,983.00	6,930.55	6,926.58	127.68	189.09	-89.63	1,211.32	-14,081.40	6,914.45	6,649.81	264.64	26.128	
15,100.00	6,982.93	6,930.48	6,926.52	129.17	189.08	-89.63	1,211.32	-14,081.40	6,818.53	6,553.08	265.45	25.687	
15,200.00	6,982.85	6,930.42	6,926.45	130.67	189.08	-89.63	1,211.32	-14,081.40	6,722.73	6,456.44	266.28	25.246	
15,300.00	6,982.78	6,930.36	6,926.39	132.16	189.08	-89.62	1,211.32	-14,081.40	6,627.05	6,359.91	267.15	24.807	
15,400.00	6,982.71	6,930.30	6,926.33	133.66	189.08	-89.62	1,211.32	-14,081.40	6,531.50	6,263.47	268.03	24.369	
15,500.00	6,982.63	6,930.23	6,926.27	135.17	189.08	-89.62	1,211.32	-14,081.40	6,436.09	6,167.15	268.94	23.931	
15,600.00	6,982.56	6,930.17	6,926.20	136.67	189.07	-89.62	1,211.33	-14,081.40	6,340.82	6,070.94	269.88	23.495	
15,700.00	6,982.49	6,930.11	6,926.14	138.18	189.07	-89.62	1,211.33	-14,081.40	6,245.70	5,974.85	270.85	23.060	
15,800.00	6,982.41	6,930.05	6,926.08	139.69	189.07	-89.62	1,211.33	-14,081.40	6,150.74	5,878.89	271.84	22.626	
15,900.00	6,982.34	6,929.98	6,926.02	141.20	189.07	-89.61	1,211.33	-14,081.40	6,055.93	5,783.06	272.87	22.193	
16,000.00	6,982.27	6,929.92	6,925.95	142.71	189.07	-89.61	1,211.33	-14,081.40	5,961.30	5,687.37	273.93	21.762	
16,100.00	6,982.19	6,929.86	6,925.89	144.23	189.06	-89.61	1,211.33	-14,081.40	5,866.84	5,591.82	275.02	21.332	
16,200.00	6,982.12	6,929.79	6,925.83	145.75	189.06	-89.61	1,211.33	-14,081.40	5,772.57	5,496.42	276.15	20.904	
16,300.00	6,982.05	6,929.73	6,925.76	147.27	189.06	-89.61	1,211.33	-14,081.40	5,678.50	5,401.18	277.32	20.477	
16,400.00	6,981.97	6,929.67	6,925.70	148.79	189.06	-89.60	1,211.33	-14,081.40	5,584.63	5,306.11	278.52	20.051	
16,500.00	6,981.90	6,929.61	6,925.64	150.31	189.05	-89.60	1,211.33	-14,081.40	5,490.98	5,211.22	279.76	19.628	
16,600.00	6,981.82	6,929.54	6,925.58	151.84	189.05	-89.60	1,211.33	-14,081.40	5,397.55	5,116.51	281.04	19.206	
16,700.00	6,981.75	6,929.48	6,925.51	153.36	189.05	-89.60	1,211.33	-14,081.40	5,304.37	5,022.00	282.37	18.785	
16,800.00	6,981.68	6,929.42	6,925.45	154.89	189.05	-89.60	1,211.33	-14,081.40	5,211.44	4,927.70	283.74	18.367	
16,900.00	6,981.60	6,929.36	6,925.39	156.42	189.05	-89.59	1,211.33	-14,081.40	5,118.77	4,833.61	285.16	17.951	
17,000.00	6,981.53	6,929.29	6,925.33	157.95	189.04	-89.59	1,211.33	-14,081.40	5,026.39	4,739.76	286.62	17.536	
17,100.00	6,981.46	6,929.23	6,925.26	159.49	189.04	-89.59	1,211.33	-14,081.40	4,934.30	4,646.15	288.14	17.124	
17,200.00	6,981.38	6,929.17	6,925.20	161.02	189.04	-89.59	1,211.33	-14,081.40	4,842.53	4,552.81	289.72	16.715	
17,300.00	6,981.31	6,929.11	6,925.14	162.56	189.04	-89.59	1,211.33	-14,081.40	4,751.09	4,459.74	291.35	16.307	
17,400.00	6,981.24	6,929.04	6,925.08	164.09	189.04	-89.59	1,211.34	-14,081.40	4,660.00	4,366.96	293.04	15.902	
17,500.00	6,981.16	6,928.98	6,925.01	165.63	189.03	-89.58	1,211.34	-14,081.40	4,569.28	4,274.49	294.79	15.500	
17,600.00	6,981.09	6,928.92	6,924.95	167.17	189.03	-89.58	1,211.34	-14,081.40	4,478.96	4,182.36	296.60	15.101	
17,700.00	6,981.01	6,928.86	6,924.89	168.71	189.03	-89.58	1,211.34	-14,081.40	4,389.06	4,090.57	298.48	14.704	
17,800.00	6,980.94	6,928.79	6,924.83	170.25	189.03	-89.58	1,211.34	-14,081.40	4,299.60	3,999.16	300.44	14.311	
17,900.00	6,980.87	6,928.73	6,924.76	171.80	189.03	-89.58	1,211.34	-14,081.40	4,210.62	3,908.15	302.47	13.921	
18,000.00	6,980.79	6,928.67	6,924.70	173.34	189.02	-89.57	1,211.34	-14,081.40	4,122.14	3,817.57	304.57	13.534	
18,100.00	6,980.72	6,928.61	6,924.64	174.89	189.02	-89.57	1,211.34	-14,081.40	4,034.21	3,727.45	306.75	13.151	
18,200.00	6,980.65	6,928.54	6,924.58	176.43	189.02	-89.57	1,211.34	-14,081.40	3,946.84	3,637.82	309.02	12.772	
18,300.00	6,980.57	6,928.48	6,924.52	177.98	189.02	-89.57	1,211.34	-14,081.40	3,860.09	3,548.71	311.38	12.397	
18,400.00	6,980.50	6,928.42	6,924.45	179.53	189.02	-89.57	1,211.34	-14,081.40	3,774.00	3,460.17	313.83	12.026	
18,500.00	6,980.43	6,928.36	6,924.39	181.08	189.01	-89.57	1,211.34	-14,081.40	3,688.61	3,372.24	316.37	11.659	
18,600.00	6,980.35	6,928.29	6,924.33	182.63	189.01	-89.56	1,211.34	-14,081.40	3,603.96	3,284.95	319.01	11.297	
18,700.00	6,980.28	6,928.23	6,924.27	184.18	189.01	-89.56	1,211.34	-14,081.40	3,520.13	3,198.38	321.75	10.940	
18,800.00	6,980.21	6,928.17	6,924.20	185.73	189.01	-89.56	1,211.34	-14,081.40	3,437.16	3,112.56	324.60	10.589	
18,900.00	6,980.13	6,928.11	6,924.14	187.28	189.00	-89.56	1,211.34	-14,081.40	3,355.12	3,027.56	327.56	10.243	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit 148 COM - OH - OH-INC												Offset Site Error:	0.00 usft		
Survey Program: 248-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		
19,000.00	6,980.06	6,928.05	6,924.08	188.84	189.00	-89.56	1,211.34	-14,081.40	3,274.07	2,943.45	330.62	9.903			
19,100.00	6,979.98	6,927.98	6,924.02	190.39	189.00	-89.55	1,211.34	-14,081.40	3,194.11	2,860.30	333.80	9.569			
19,200.00	6,979.91	6,927.92	6,923.95	191.95	189.00	-89.55	1,211.35	-14,081.40	3,115.30	2,778.20	337.10	9.242			
19,300.00	6,979.84	6,927.86	6,923.89	193.51	189.00	-89.55	1,211.35	-14,081.40	3,037.73	2,697.23	340.50	8.921			
19,400.00	6,979.76	6,927.80	6,923.83	195.06	188.99	-89.55	1,211.35	-14,081.40	2,961.51	2,617.48	344.03	8.608			
19,500.00	6,979.69	6,927.73	6,923.77	196.62	188.99	-89.55	1,211.35	-14,081.40	2,886.75	2,539.08	347.67	8.303			
19,600.00	6,979.62	6,927.67	6,923.71	198.18	188.99	-89.55	1,211.35	-14,081.40	2,813.55	2,462.13	351.42	8.006			
19,700.00	6,979.54	6,927.61	6,923.64	199.74	188.99	-89.54	1,211.35	-14,081.40	2,742.05	2,386.77	355.27	7.718			
19,800.00	6,979.47	6,927.55	6,923.58	201.30	188.99	-89.54	1,211.35	-14,081.40	2,672.37	2,313.15	359.23	7.439			
19,900.00	6,979.40	6,927.49	6,923.52	202.86	188.98	-89.54	1,211.35	-14,081.40	2,604.67	2,241.41	363.27	7.170			
20,000.00	6,979.32	6,927.42	6,923.46	204.42	188.98	-89.54	1,211.35	-14,081.40	2,539.11	2,171.72	367.38	6.911			
20,100.00	6,979.25	6,927.36	6,923.39	205.98	188.98	-89.54	1,211.35	-14,081.40	2,475.85	2,104.29	371.56	6.663			
20,200.00	6,979.18	6,927.30	6,923.33	207.55	188.98	-89.53	1,211.35	-14,081.40	2,415.07	2,039.30	375.77	6.427			
20,300.00	6,979.10	6,927.24	6,923.27	209.11	188.98	-89.53	1,211.35	-14,081.40	2,356.97	1,976.98	379.99	6.203			
20,400.00	6,979.03	6,927.17	6,923.21	210.68	188.97	-89.53	1,211.35	-14,081.40	2,301.75	1,917.56	384.19	5.991			
20,500.00	6,978.95	6,927.11	6,923.15	212.24	188.97	-89.53	1,211.35	-14,081.40	2,249.63	1,861.29	388.34	5.793			
20,600.00	6,978.88	6,927.05	6,923.08	213.81	188.97	-89.53	1,211.35	-14,081.40	2,200.81	1,808.43	392.38	5.609			
20,700.00	6,978.81	6,926.99	6,923.02	215.37	188.97	-89.52	1,211.35	-14,081.40	2,155.53	1,759.24	396.29	5.439			
20,800.00	6,978.73	6,926.93	6,922.96	216.94	188.97	-89.52	1,211.35	-14,081.40	2,114.02	1,714.02	400.00	5.285			
20,900.00	6,978.66	6,926.86	6,922.90	218.51	188.96	-89.52	1,211.35	-14,081.40	2,076.49	1,673.04	403.45	5.147			
21,000.00	6,978.59	6,926.80	6,922.84	220.07	188.96	-89.52	1,211.36	-14,081.40	2,043.17	1,636.57	406.60	5.025			
21,100.00	6,978.51	6,926.74	6,922.77	221.64	188.96	-89.52	1,211.36	-14,081.40	2,014.28	1,604.89	409.38	4.920			
21,200.00	6,978.44	6,926.68	6,922.71	223.21	188.96	-89.52	1,211.36	-14,081.40	1,989.99	1,578.25	411.75	4.833			
21,300.00	6,978.37	6,926.62	6,922.65	224.78	188.95	-89.51	1,211.36	-14,081.40	1,970.49	1,556.85	413.63	4.764			
21,400.00	6,978.29	6,926.55	6,922.59	226.35	188.95	-89.51	1,211.36	-14,081.40	1,955.90	1,540.90	415.01	4.713			
21,500.00	6,978.22	6,926.49	6,922.53	227.92	188.95	-89.51	1,211.36	-14,081.40	1,946.36	1,530.53	415.83	4.681			
21,600.00	6,978.14	6,926.43	6,922.46	229.49	188.95	-89.51	1,211.36	-14,081.40	1,941.92	1,525.85	416.07	4.667			
21,636.25	6,978.12	6,926.41	6,922.44	230.06	188.95	-89.51	1,211.36	-14,081.40	1,941.58	1,525.57	416.02	4.667	CC, ES, SF		
21,700.00	6,978.07	6,926.37	6,922.40	231.06	188.95	-89.51	1,211.36	-14,081.40	1,942.63	1,526.90	415.73	4.673			
21,800.00	6,978.00	6,926.31	6,922.34	232.63	188.94	-89.50	1,211.36	-14,081.40	1,948.48	1,533.66	414.82	4.697			
21,900.00	6,977.92	6,926.24	6,922.28	234.21	188.94	-89.50	1,211.36	-14,081.40	1,959.42	1,546.08	413.34	4.740			
22,000.00	6,977.85	6,926.18	6,922.22	235.78	188.94	-89.50	1,211.36	-14,081.40	1,975.36	1,564.04	411.32	4.802			
22,100.00	6,977.78	6,926.12	6,922.15	237.35	188.94	-89.50	1,211.36	-14,081.40	1,996.20	1,587.38	408.82	4.883			
22,200.00	6,977.70	6,926.06	6,922.09	238.92	188.94	-89.50	1,211.36	-14,081.40	2,021.77	1,615.89	405.88	4.981			
22,300.00	6,977.63	6,926.00	6,922.03	240.50	188.93	-89.50	1,211.36	-14,081.40	2,051.90	1,649.35	402.55	5.097			
22,400.00	6,977.56	6,925.93	6,921.97	242.07	188.93	-89.49	1,211.36	-14,081.40	2,086.40	1,687.50	398.90	5.230			
22,500.00	6,977.48	6,925.87	6,921.91	243.65	188.93	-89.49	1,211.36	-14,081.40	2,125.04	1,730.06	394.98	5.380			
22,600.00	6,977.41	6,925.81	6,921.84	245.22	188.93	-89.49	1,211.36	-14,081.40	2,167.62	1,776.77	390.85	5.546			
22,700.00	6,977.34	6,925.75	6,921.78	246.80	188.93	-89.49	1,211.36	-14,081.40	2,213.89	1,827.32	386.57	5.727			
22,800.00	6,977.26	6,925.69	6,921.72	248.37	188.92	-89.49	1,211.36	-14,081.40	2,263.64	1,881.46	382.18	5.923			
22,900.00	6,977.19	6,925.62	6,921.66	249.95	188.92	-89.48	1,211.37	-14,081.40	2,316.64	1,938.91	377.73	6.133			
23,000.00	6,977.11	6,925.56	6,921.60	251.53	188.92	-89.48	1,211.37	-14,081.40	2,372.67	1,999.41	373.26	6.357			
23,100.00	6,977.04	6,925.50	6,921.53	253.10	188.92	-89.48	1,211.37	-14,081.40	2,431.52	2,062.72	368.81	6.593			
23,155.65	6,977.00	6,925.47	6,921.50	253.98	188.92	-89.48	1,211.37	-14,081.40	2,465.43	2,099.08	366.34	6.730			
23,156.15	6,977.00	6,925.47	6,921.50	254.06	188.92	-89.48	1,211.37	-14,081.40	2,465.74	2,099.19	366.54	6.727			

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #674H - OH - Prelim 5												Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HRGM+MS												Offset Well Error:	0.00 usft
Reference												Rule Assigned:	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	0.00	0.00	0.00	0.00	-151.10	-17.48	-9.65	19.96				
100.00	100.00	100.00	100.00	0.25	0.25	-151.10	-17.48	-9.65	19.96	19.46	0.50	39.774	
200.00	200.00	200.00	200.00	0.61	0.61	-151.10	-17.48	-9.65	19.96	18.74	1.22	16.378	
300.00	300.00	300.00	300.00	0.97	0.97	-151.10	-17.48	-9.65	19.96	18.03	1.94	10.312	
400.00	400.00	400.00	400.00	1.33	1.33	-151.10	-17.48	-9.65	19.96	17.31	2.65	7.525	
500.00	500.00	500.00	500.00	1.68	1.68	-151.10	-17.48	-9.65	19.96	16.59	3.37	5.924 CC, ES	
600.00	599.98	600.30	600.30	2.04	2.04	-162.01	-17.03	-9.67	21.24	17.15	4.09	5.196	
700.00	699.84	700.96	700.89	2.41	2.41	-161.60	-13.50	-9.81	23.19	18.38	4.80	4.826	
800.00	799.45	801.66	801.33	2.77	2.77	-159.68	-6.44	-10.11	25.45	19.93	5.52	4.610	
900.00	898.70	902.39	901.50	3.13	3.14	-156.68	4.15	-10.55	28.07	21.83	6.24	4.500	
1,000.00	997.47	1,003.15	1,001.26	3.50	3.51	-152.98	18.26	-11.13	31.13	24.17	6.96	4.473	
1,100.00	1,095.63	1,103.95	1,100.50	3.89	3.89	-147.11	35.87	-11.87	34.45	26.76	7.70	4.476	
1,200.00	1,193.09	1,204.09	1,198.62	4.29	4.28	-143.67	55.88	-12.70	38.43	29.97	8.46	4.543	
1,300.00	1,289.73	1,303.88	1,296.37	4.72	4.68	-144.16	75.95	-13.54	44.75	35.52	9.23	4.849	
1,400.00	1,385.42	1,403.42	1,393.87	5.16	5.08	-147.01	95.96	-14.37	53.68	43.69	10.00	5.370	
1,496.97	1,477.20	1,499.59	1,488.07	5.62	5.48	-150.68	115.30	-15.18	65.15	54.41	10.74	6.068	
1,500.00	1,480.05	1,502.59	1,491.01	5.63	5.49	-150.82	115.90	-15.20	65.56	54.79	10.76	6.091	
1,600.00	1,574.15	1,601.54	1,587.94	6.12	5.90	-154.74	135.80	-16.03	79.10	67.58	11.53	6.863	
1,700.00	1,668.25	1,700.50	1,684.88	6.62	6.31	-157.50	155.70	-16.86	92.90	80.61	12.30	7.555	
1,800.00	1,762.35	1,799.46	1,781.81	7.12	6.73	-159.55	175.60	-17.69	106.86	93.79	13.07	8.174	
1,900.00	1,856.45	1,898.42	1,878.74	7.64	7.15	-161.12	195.50	-18.52	120.92	107.07	13.85	8.728	
2,000.00	1,950.55	1,997.38	1,975.68	8.16	7.57	-162.37	215.39	-19.35	135.05	120.41	14.64	9.226	
2,100.00	2,044.65	2,096.34	2,072.61	8.68	7.99	-163.38	235.29	-20.17	149.23	133.81	15.43	9.674	
2,200.00	2,138.75	2,195.29	2,169.54	9.21	8.41	-164.21	255.19	-21.00	163.45	147.24	16.22	10.079	
2,300.00	2,232.85	2,294.25	2,266.48	9.74	8.83	-164.91	275.09	-21.83	177.70	160.69	17.01	10.446	
2,400.00	2,326.95	2,393.21	2,363.41	10.27	9.25	-165.50	294.99	-22.66	191.97	174.17	17.81	10.781	
2,500.00	2,421.05	2,492.17	2,460.34	10.81	9.68	-166.02	314.88	-23.49	206.26	187.66	18.60	11.087	
2,600.00	2,515.15	2,591.13	2,557.28	11.34	10.10	-166.47	334.78	-24.32	220.56	201.16	19.40	11.368	
2,700.00	2,609.25	2,690.08	2,654.21	11.88	10.53	-166.86	354.68	-25.15	234.88	214.67	20.20	11.626	
2,800.00	2,703.35	2,789.04	2,751.14	12.42	10.95	-167.21	374.58	-25.98	249.20	228.20	21.00	11.865	
2,900.00	2,797.45	2,888.00	2,848.08	12.96	11.38	-167.51	394.48	-26.80	263.53	241.73	21.80	12.086	
3,000.00	2,891.55	2,986.96	2,945.01	13.51	11.80	-167.79	414.37	-27.63	277.87	255.26	22.61	12.291	
3,100.00	2,985.65	3,085.92	3,041.95	14.05	12.23	-168.04	434.27	-28.46	292.21	268.80	23.41	12.482	
3,200.00	3,079.75	3,184.88	3,138.88	14.60	12.66	-168.27	454.17	-29.29	306.56	282.35	24.22	12.660	
3,300.00	3,173.85	3,283.83	3,235.81	15.14	13.08	-168.48	474.07	-30.12	320.91	295.89	25.02	12.826	
3,400.00	3,267.95	3,382.79	3,332.75	15.69	13.51	-168.67	493.97	-30.95	335.27	309.44	25.83	12.982	
3,500.00	3,362.05	3,481.75	3,429.68	16.23	13.94	-168.84	513.86	-31.78	349.63	323.00	26.63	13.128	
3,600.00	3,456.15	3,580.71	3,526.61	16.78	14.37	-169.00	533.76	-32.61	363.99	336.55	27.44	13.266	
3,700.00	3,550.25	3,679.67	3,623.55	17.33	14.80	-169.15	553.66	-33.43	378.36	350.11	28.25	13.395	
3,800.00	3,644.35	3,778.63	3,720.48	17.88	15.22	-169.28	573.56	-34.26	392.73	363.67	29.05	13.517	
3,900.00	3,738.45	3,877.58	3,817.41	18.42	15.65	-169.41	593.46	-35.09	407.10	377.23	29.86	13.633	
4,000.00	3,832.55	3,976.54	3,914.35	18.97	16.08	-169.53	613.35	-35.92	421.47	390.80	30.67	13.742	
4,100.00	3,926.65	4,075.50	4,011.28	19.52	16.51	-169.64	633.25	-36.75	435.84	404.36	31.48	13.846	
4,200.00	4,020.75	4,174.46	4,108.22	20.07	16.94	-169.74	653.15	-37.58	450.22	417.93	32.29	13.944	
4,300.00	4,114.85	4,273.42	4,205.15	20.62	17.37	-169.84	673.05	-38.41	464.59	431.50	33.10	14.038	
4,400.00	4,208.95	4,372.38	4,302.08	21.17	17.80	-169.93	692.95	-39.24	478.97	445.06	33.91	14.126	
4,500.00	4,303.05	4,471.33	4,399.02	21.72	18.23	-170.02	712.84	-40.06	493.35	458.63	34.72	14.211	
4,600.00	4,397.15	4,570.29	4,495.95	22.27	18.66	-170.10	732.74	-40.89	507.73	472.20	35.53	14.292	
4,700.00	4,491.25	4,669.25	4,592.88	22.82	19.09	-170.18	752.64	-41.72	522.11	485.77	36.34	14.369	
4,800.00	4,585.35	4,768.21	4,689.82	23.37	19.51	-170.25	772.54	-42.55	536.49	499.34	37.15	14.443	
4,900.00	4,679.45	4,867.17	4,786.75	23.93	19.94	-170.32	792.44	-43.38	550.87	512.91	37.96	14.513	
5,000.00	4,773.55	4,966.13	4,883.68	24.48	20.37	-170.38	812.33	-44.21	565.25	526.49	38.77	14.581	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #674H - OH - Prelim 5													Offset Site Error:	0.00 usft
Survey Program:		0-MWD+HRGM+MS						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	
5,100.00	4,867.65	5,065.08	4,980.62	25.03	20.80	-170.44	832.23	-45.04	579.64	540.06	39.58	14.646		
5,200.00	4,961.75	5,164.04	5,077.55	25.58	21.23	-170.50	852.13	-45.87	594.02	553.63	40.39	14.708		
5,300.00	5,055.85	5,263.00	5,174.49	26.13	21.66	-170.56	872.03	-46.69	608.41	567.21	41.20	14.767		
5,400.00	5,149.95	5,361.96	5,271.42	26.68	22.09	-170.61	891.93	-47.52	622.79	580.78	42.01	14.824		
5,500.00	5,244.05	5,460.92	5,368.35	27.24	22.52	-170.67	911.82	-48.35	637.18	594.35	42.82	14.879		
5,600.00	5,338.15	5,556.39	5,461.91	27.79	22.94	-170.72	930.85	-49.14	651.74	608.13	43.61	14.944		
5,665.73	5,400.00	5,617.94	5,522.29	28.15	23.20	-170.76	942.73	-49.64	661.71	617.59	44.12	14.998		
5,700.00	5,432.28	5,650.00	5,553.78	28.34	23.34	-170.79	948.79	-49.89	666.95	622.56	44.38	15.027		
5,800.00	5,526.87	5,743.58	5,645.76	28.88	23.73	-170.87	965.98	-50.61	681.60	636.46	45.15	15.097		
5,900.00	5,622.01	5,837.17	5,737.90	29.41	24.13	-170.94	982.42	-51.29	695.34	649.44	45.90	15.149		
6,000.00	5,717.67	5,930.78	5,830.18	29.92	24.51	-171.00	998.11	-51.95	708.15	661.51	46.64	15.182		
6,100.00	5,813.83	6,024.41	5,922.61	30.41	24.89	-171.05	1,013.04	-52.57	720.04	672.66	47.38	15.198		
6,200.00	5,910.44	6,118.05	6,015.16	30.89	25.27	-171.10	1,027.23	-53.16	731.00	682.90	48.10	15.197		
6,300.00	6,007.50	6,211.70	6,107.85	31.36	25.64	-171.13	1,040.66	-53.72	741.04	692.23	48.82	15.180		
6,400.00	6,104.96	6,305.37	6,200.65	31.80	26.01	-171.16	1,053.33	-54.25	750.15	700.64	49.52	15.149		
6,500.00	6,202.80	6,400.00	6,294.51	32.24	26.37	-171.18	1,065.36	-54.75	758.34	708.12	50.22	15.100		
6,600.00	6,300.98	6,492.73	6,386.58	32.66	26.73	-171.20	1,076.41	-55.21	765.60	714.70	50.89	15.043		
6,700.00	6,399.48	6,640.82	6,531.58	33.06	27.34	-170.06	1,100.74	-69.91	768.57	716.42	52.15	14.738		
6,722.82	6,422.00	6,673.94	6,562.98	33.15	27.49	-169.46	1,108.28	-77.28	768.14	715.70	52.44	14.648		
6,750.00	6,448.76	6,712.42	6,598.74	33.26	27.66	-158.94	1,117.95	-87.66	767.52	714.74	52.79	14.540		
6,800.00	6,497.51	6,780.90	6,660.09	33.48	27.99	-146.16	1,137.47	-110.88	767.00	713.56	53.44	14.352		
6,804.90	6,502.25	6,787.44	6,665.78	33.50	28.02	-145.21	1,139.49	-113.41	766.99	713.49	53.51	14.334		
6,850.00	6,545.40	6,846.36	6,715.45	33.72	28.32	-137.98	1,158.73	-138.53	767.39	713.26	54.13	14.177		
6,900.00	6,592.13	6,908.89	6,764.78	33.97	28.64	-132.06	1,181.19	-169.66	768.81	713.95	54.86	14.014		
6,950.00	6,637.40	6,968.63	6,808.22	34.25	28.97	-127.37	1,204.42	-203.41	771.36	715.73	55.63	13.865		
7,000.00	6,680.94	7,025.77	6,846.05	34.54	29.29	-123.39	1,228.07	-239.10	775.11	718.67	56.44	13.734		
7,050.00	6,722.48	7,080.52	6,878.58	34.85	29.62	-119.85	1,251.84	-276.13	780.09	722.83	57.26	13.624		
7,100.00	6,761.76	7,133.08	6,906.17	35.17	29.94	-116.60	1,275.55	-314.05	786.30	728.22	58.08	13.538		
7,150.00	6,798.55	7,183.67	6,929.19	35.51	30.26	-113.55	1,299.02	-352.49	793.71	734.82	58.89	13.479		
7,200.00	6,832.61	7,232.49	6,947.96	35.86	30.59	-110.65	1,322.14	-391.17	802.27	742.61	59.66	13.447		
7,250.00	6,863.74	7,279.73	6,962.80	36.22	30.92	-107.86	1,344.81	-429.84	811.90	751.50	60.40	13.443		
7,300.00	6,891.74	7,325.57	6,974.01	36.59	31.24	-105.17	1,366.98	-468.35	822.51	761.43	61.09	13.465		
7,350.00	6,916.44	7,370.15	6,981.83	36.98	31.57	-102.57	1,388.61	-506.54	834.00	772.27	61.72	13.512		
7,400.00	6,937.69	7,413.64	6,986.49	37.37	31.89	-100.05	1,409.64	-544.30	846.23	783.92	62.31	13.581		
7,450.00	6,955.36	7,456.15	6,988.20	37.78	32.22	-97.62	1,430.06	-581.55	859.09	796.24	62.84	13.670		
7,500.00	6,969.34	7,492.26	6,988.20	38.19	32.50	-95.45	1,447.14	-613.36	872.57	809.36	63.21	13.804		
7,550.00	6,979.53	7,528.07	6,988.17	38.62	32.78	-93.48	1,463.68	-645.11	886.68	823.09	63.59	13.943		
7,600.00	6,985.89	7,564.18	6,988.15	39.05	33.07	-91.72	1,479.97	-677.35	901.23	837.23	64.00	14.081		
7,650.00	6,988.37	7,600.00	6,988.12	39.48	33.37	-90.17	1,495.71	-709.52	916.06	851.63	64.43	14.217		
7,657.25	6,988.40	7,600.00	6,988.12	39.54	33.37	-89.97	1,495.71	-709.52	918.25	853.89	64.36	14.267		
7,700.00	6,988.37	7,636.40	6,988.10	39.92	33.67	-89.97	1,511.30	-742.41	931.22	866.30	64.92	14.344		
7,800.00	6,988.30	7,700.00	6,988.05	40.82	34.21	-89.97	1,537.53	-800.35	963.35	897.70	65.65	14.673		
7,900.00	6,988.23	7,777.53	6,988.00	41.77	34.89	-89.97	1,567.76	-871.74	997.73	930.91	66.82	14.931		
8,000.00	6,988.16	7,846.21	6,987.95	42.75	35.50	-89.97	1,592.91	-935.65	1,034.41	966.63	67.78	15.262		
8,100.00	6,988.09	7,900.00	6,987.91	43.76	35.99	-89.97	1,611.54	-986.11	1,073.40	1,005.10	68.29	15.717		
8,152.35	6,988.06	7,948.29	6,987.87	44.30	36.44	-89.97	1,627.45	-1,031.70	1,094.49	1,025.28	69.21	15.814		
8,200.00	6,988.02	7,979.81	6,987.85	44.79	36.73	-89.97	1,637.42	-1,061.60	1,113.57	1,043.91	69.65	15.987		
8,300.00	6,987.95	8,046.43	6,987.80	45.83	37.37	-89.98	1,657.41	-1,125.15	1,150.43	1,079.82	70.61	16.294		
8,400.00	6,987.88	8,100.00	6,987.76	46.85	37.88	-89.98	1,672.41	-1,176.58	1,183.05	1,111.93	71.11	16.636		
8,500.00	6,987.80	8,181.29	6,987.70	47.85	38.68	-89.98	1,693.33	-1,255.13	1,211.03	1,138.48	72.56	16.691		
8,600.00	6,987.73	8,249.37	6,987.65	48.83	39.35	-89.99	1,709.12	-1,321.35	1,234.68	1,161.12	73.55	16.786		
8,700.00	6,987.65	8,317.79	6,987.60	49.79	40.04	-89.99	1,723.41	-1,388.26	1,253.83	1,179.27	74.56	16.817		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #674H - OH - Prelim 5													Offset Site Error:	0.00 usft
Survey Program:		0-MWD+HRGM+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)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
8,800.00	6,987.57	8,400.00	6,987.53	50.72	40.87	-89.99	1,738.45	-1,469.08	1,268.56	1,192.49	76.07	16.677		
8,900.00	6,987.50	8,455.33	6,987.49	51.62	41.43	-90.00	1,747.27	-1,523.69	1,278.54	1,201.97	76.57	16.697		
9,000.00	6,987.42	8,524.30	6,987.44	52.48	42.15	-90.00	1,756.78	-1,592.01	1,284.07	1,206.49	77.58	16.552		
9,100.00	6,987.34	8,600.00	6,987.38	53.30	42.93	-90.00	1,765.32	-1,667.22	1,285.05	1,206.21	78.84	16.299		
9,200.00	6,987.27	8,662.34	6,987.34	54.08	43.58	-90.01	1,770.86	-1,729.31	1,281.41	1,201.85	79.56	16.107		
9,215.33	6,987.26	8,672.91	6,987.33	54.20	43.69	-90.01	1,771.67	-1,739.85	1,280.45	1,200.75	79.71	16.065		
9,300.00	6,987.20	8,731.37	6,987.29	54.85	44.30	-90.01	1,775.42	-1,798.19	1,275.73	1,195.20	80.53	15.843		
9,400.00	6,987.12	8,800.00	6,987.23	55.65	45.03	-90.01	1,778.30	-1,866.76	1,272.37	1,190.91	81.46	15.620		
9,487.39	6,987.06	8,861.06	6,987.19	56.37	45.67	-90.01	1,779.49	-1,927.81	1,271.42	1,189.10	82.32	15.446		
9,500.00	6,987.05	8,872.16	6,987.18	56.48	45.79	-90.01	1,779.56	-1,938.90	1,271.44	1,188.89	82.54	15.404		
9,600.00	6,986.98	8,968.75	6,987.11	57.35	46.82	-90.01	1,780.03	-2,035.50	1,271.78	1,187.01	84.77	15.003		
9,700.00	6,986.90	9,068.75	6,987.03	58.24	47.92	-90.01	1,780.52	-2,135.50	1,272.13	1,184.93	87.20	14.588		
9,800.00	6,986.83	9,168.75	6,986.96	59.17	49.05	-90.01	1,781.01	-2,235.50	1,272.49	1,182.80	89.69	14.188		
9,900.00	6,986.75	9,268.75	6,986.89	60.12	50.20	-90.01	1,781.50	-2,335.49	1,272.84	1,180.62	92.22	13.803		
10,000.00	6,986.68	9,368.75	6,986.81	61.10	51.37	-90.01	1,781.98	-2,435.49	1,273.19	1,178.40	94.79	13.432		
10,100.00	6,986.61	9,468.75	6,986.74	62.11	52.57	-90.01	1,782.47	-2,535.49	1,273.54	1,176.14	97.40	13.076		
10,200.00	6,986.53	9,568.75	6,986.66	63.14	53.79	-90.01	1,782.96	-2,635.49	1,273.89	1,173.85	100.04	12.734		
10,300.00	6,986.46	9,668.75	6,986.59	64.20	55.03	-90.01	1,783.45	-2,735.49	1,274.24	1,171.53	102.71	12.406		
10,400.00	6,986.39	9,768.75	6,986.51	65.28	56.29	-90.01	1,783.94	-2,835.48	1,274.59	1,169.17	105.42	12.091		
10,500.00	6,986.31	9,868.75	6,986.44	66.38	57.56	-90.01	1,784.42	-2,935.48	1,274.95	1,166.79	108.15	11.789		
10,600.00	6,986.24	9,968.75	6,986.36	67.50	58.86	-90.01	1,784.91	-3,035.48	1,275.30	1,164.39	110.91	11.499		
10,700.00	6,986.17	10,068.75	6,986.29	68.64	60.16	-90.01	1,785.40	-3,135.48	1,275.65	1,161.96	113.69	11.220		
10,800.00	6,986.09	10,168.75	6,986.21	69.80	61.48	-90.01	1,785.89	-3,235.48	1,276.00	1,159.50	116.49	10.953		
10,900.00	6,986.02	10,268.75	6,986.14	70.98	62.81	-90.01	1,786.37	-3,335.48	1,276.35	1,157.03	119.32	10.697		
11,000.00	6,985.95	10,368.74	6,986.07	72.17	64.16	-90.01	1,786.86	-3,435.47	1,276.70	1,154.54	122.16	10.451		
11,100.00	6,985.87	10,468.74	6,985.99	73.38	65.52	-90.01	1,787.35	-3,535.47	1,277.05	1,152.03	125.02	10.215		
11,200.00	6,985.80	10,568.74	6,985.92	74.61	66.89	-90.01	1,787.84	-3,635.47	1,277.40	1,149.50	127.90	9.987		
11,300.00	6,985.72	10,668.74	6,985.84	75.85	68.27	-90.01	1,788.33	-3,735.47	1,277.76	1,146.96	130.79	9.769		
11,400.00	6,985.65	10,768.74	6,985.77	77.10	69.65	-90.01	1,788.81	-3,835.47	1,278.11	1,144.41	133.70	9.559		
11,500.00	6,985.58	10,868.74	6,985.69	78.37	71.05	-90.01	1,789.30	-3,935.46	1,278.46	1,141.84	136.62	9.358		
11,600.00	6,985.50	10,968.74	6,985.62	79.65	72.46	-90.00	1,789.79	-4,035.46	1,278.81	1,139.26	139.55	9.164		
11,700.00	6,985.43	11,068.74	6,985.54	80.94	73.87	-90.00	1,790.28	-4,135.46	1,279.16	1,136.66	142.50	8.977		
11,800.00	6,985.36	11,168.74	6,985.47	82.24	75.29	-90.00	1,790.76	-4,235.46	1,279.51	1,134.06	145.46	8.797		
11,900.00	6,985.28	11,268.74	6,985.39	83.56	76.72	-90.00	1,791.25	-4,335.46	1,279.86	1,131.44	148.42	8.623		
12,000.00	6,985.21	11,368.74	6,985.32	84.88	78.16	-90.00	1,791.74	-4,435.46	1,280.22	1,128.82	151.40	8.456		
12,100.00	6,985.14	11,468.74	6,985.25	86.21	79.60	-90.00	1,792.23	-4,535.45	1,280.57	1,126.18	154.39	8.295		
12,200.00	6,985.06	11,568.74	6,985.17	87.56	81.05	-90.00	1,792.72	-4,635.45	1,280.92	1,123.54	157.38	8.139		
12,300.00	6,984.99	11,668.74	6,985.10	88.91	82.50	-90.00	1,793.20	-4,735.45	1,281.27	1,120.89	160.38	7.989		
12,400.00	6,984.92	11,768.74	6,985.02	90.27	83.96	-90.00	1,793.69	-4,835.45	1,281.62	1,118.23	163.40	7.844		
12,500.00	6,984.84	11,868.74	6,984.95	91.64	85.43	-90.00	1,794.18	-4,935.45	1,281.97	1,115.56	166.41	7.704		
12,600.00	6,984.77	11,968.73	6,984.87	93.01	86.90	-90.00	1,794.67	-5,035.44	1,282.32	1,112.89	169.44	7.568		
12,700.00	6,984.69	12,068.73	6,984.80	94.40	88.37	-90.00	1,795.15	-5,135.44	1,282.68	1,110.20	172.47	7.437		
12,800.00	6,984.62	12,168.73	6,984.72	95.79	89.85	-90.00	1,795.64	-5,235.44	1,283.03	1,107.52	175.51	7.310		
12,900.00	6,984.55	12,268.73	6,984.65	97.18	91.33	-90.00	1,796.13	-5,335.44	1,283.38	1,104.82	178.55	7.188		
13,000.00	6,984.47	12,368.73	6,984.57	98.59	92.82	-90.00	1,796.62	-5,435.44	1,283.73	1,102.13	181.60	7.069		
13,100.00	6,984.40	12,468.73	6,984.50	100.00	94.31	-90.00	1,797.11	-5,535.44	1,284.08	1,099.42	184.66	6.954		
13,200.00	6,984.33	12,568.73	6,984.43	101.41	95.81	-90.00	1,797.59	-5,635.43	1,284.43	1,096.71	187.72	6.842		
13,300.00	6,984.25	12,668.73	6,984.35	102.83	97.31	-90.00	1,798.08	-5,735.43	1,284.78	1,094.00	190.79	6.734		
13,400.00	6,984.18	12,768.73	6,984.28	104.26	98.81	-90.00	1,798.57	-5,835.43	1,285.14	1,091.28	193.86	6.629		
13,500.00	6,984.11	12,868.73	6,984.20	105.69	100.31	-90.00	1,799.06	-5,935.43	1,285.49	1,088.56	196.93	6.528		
13,600.00	6,984.03	12,968.73	6,984.13	107.13	101.82	-90.00	1,799.54	-6,035.43	1,285.84	1,085.83	200.01	6.429		
13,700.00	6,983.96	13,068.73	6,984.05	108.57	103.33	-90.00	1,800.03	-6,135.42	1,286.19	1,083.10	203.09	6.333		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #674H - OH - Prelim 5												Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HRGM+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)			
13,800.00	6,983.88	13,168.73	6,983.98	110.02	104.84	-90.00	1,800.52	-6,235.42	1,286.54	1,080.36	206.18	6.240	
13,900.00	6,983.81	13,268.73	6,983.90	111.47	106.36	-90.00	1,801.01	-6,335.42	1,286.89	1,077.62	209.27	6.149	
14,000.00	6,983.74	13,368.73	6,983.83	112.92	107.88	-90.00	1,801.49	-6,435.42	1,287.24	1,074.88	212.36	6.062	
14,100.00	6,983.66	13,468.73	6,983.75	114.38	109.40	-90.00	1,801.98	-6,535.42	1,287.60	1,072.14	215.46	5.976	
14,200.00	6,983.59	13,568.73	6,983.68	115.85	110.92	-90.00	1,802.47	-6,635.42	1,287.95	1,069.39	218.56	5.893	
14,300.00	6,983.52	13,668.72	6,983.61	117.31	112.45	-90.00	1,802.96	-6,735.41	1,288.30	1,066.63	221.66	5.812	
14,400.00	6,983.44	13,768.72	6,983.53	118.78	113.98	-90.00	1,803.45	-6,835.41	1,288.65	1,063.88	224.77	5.733	
14,500.00	6,983.37	13,868.72	6,983.46	120.26	115.51	-90.00	1,803.93	-6,935.41	1,289.00	1,061.12	227.88	5.656	
14,600.00	6,983.30	13,968.72	6,983.38	121.74	117.04	-90.00	1,804.42	-7,035.41	1,289.35	1,058.36	230.99	5.582	
14,700.00	6,983.22	14,068.72	6,983.31	123.22	118.58	-90.00	1,804.91	-7,135.41	1,289.70	1,055.60	234.11	5.509	
14,800.00	6,983.15	14,168.72	6,983.23	124.70	120.11	-90.00	1,805.40	-7,235.40	1,290.06	1,052.83	237.22	5.438	
14,900.00	6,983.08	14,268.72	6,983.16	126.19	121.65	-90.00	1,805.88	-7,335.40	1,290.41	1,050.06	240.34	5.369	
15,000.00	6,983.00	14,368.72	6,983.08	127.68	123.19	-90.00	1,806.37	-7,435.40	1,290.76	1,047.29	243.47	5.302	
15,100.00	6,982.93	14,468.72	6,983.01	129.17	124.73	-90.00	1,806.86	-7,535.40	1,291.11	1,044.52	246.59	5.236	
15,200.00	6,982.85	14,568.72	6,982.93	130.67	126.27	-90.00	1,807.35	-7,635.40	1,291.46	1,041.74	249.72	5.172	
15,300.00	6,982.78	14,668.72	6,982.86	132.16	127.82	-90.00	1,807.84	-7,735.40	1,291.81	1,038.97	252.84	5.109	
15,400.00	6,982.71	14,768.72	6,982.79	133.66	129.36	-90.00	1,808.32	-7,835.39	1,292.16	1,036.19	255.97	5.048	
15,500.00	6,982.63	14,868.72	6,982.71	135.17	130.91	-90.00	1,808.81	-7,935.39	1,292.52	1,033.41	259.11	4.988	
15,600.00	6,982.56	14,968.72	6,982.64	136.67	132.46	-90.00	1,809.30	-8,035.39	1,292.87	1,030.63	262.24	4.930	
15,700.00	6,982.49	15,068.72	6,982.56	138.18	134.01	-90.00	1,809.79	-8,135.39	1,293.22	1,027.84	265.38	4.873	
15,800.00	6,982.41	15,168.72	6,982.49	139.69	135.56	-90.00	1,810.27	-8,235.39	1,293.57	1,025.05	268.52	4.817	
15,900.00	6,982.34	15,268.71	6,982.41	141.20	137.11	-90.00	1,810.76	-8,335.38	1,293.92	1,022.27	271.65	4.763	
16,000.00	6,982.27	15,368.71	6,982.34	142.71	138.66	-90.00	1,811.25	-8,435.38	1,294.27	1,019.48	274.80	4.710	
16,100.00	6,982.19	15,468.71	6,982.26	144.23	140.22	-90.00	1,811.74	-8,535.38	1,294.62	1,016.69	277.94	4.658	
16,200.00	6,982.12	15,568.71	6,982.19	145.75	141.77	-90.00	1,812.23	-8,635.38	1,294.97	1,013.89	281.08	4.607	
16,300.00	6,982.05	15,668.71	6,982.11	147.27	143.33	-90.00	1,812.71	-8,735.38	1,295.33	1,011.10	284.23	4.557	
16,400.00	6,981.97	15,768.71	6,982.04	148.79	144.89	-90.00	1,813.20	-8,835.37	1,295.68	1,008.30	287.37	4.509	
16,500.00	6,981.90	15,868.71	6,981.97	150.31	146.45	-90.00	1,813.69	-8,935.37	1,296.03	1,005.51	290.52	4.461	
16,600.00	6,981.82	15,968.71	6,981.89	151.84	148.01	-90.00	1,814.18	-9,035.37	1,296.38	1,002.71	293.67	4.414	
16,700.00	6,981.75	16,068.71	6,981.82	153.36	149.57	-90.00	1,814.66	-9,135.37	1,296.73	999.91	296.82	4.369	
16,800.00	6,981.68	16,168.71	6,981.74	154.89	151.13	-90.00	1,815.15	-9,235.37	1,297.08	997.11	299.98	4.324	
16,900.00	6,981.60	16,268.71	6,981.67	156.42	152.69	-90.00	1,815.64	-9,335.37	1,297.43	994.31	303.13	4.280	
17,000.00	6,981.53	16,368.71	6,981.59	157.95	154.26	-90.00	1,816.13	-9,435.36	1,297.79	991.50	306.28	4.237	
17,100.00	6,981.46	16,468.71	6,981.52	159.49	155.82	-90.00	1,816.61	-9,535.36	1,298.14	988.70	309.44	4.195	
17,200.00	6,981.38	16,568.71	6,981.44	161.02	157.38	-90.00	1,817.10	-9,635.36	1,298.49	985.89	312.60	4.154	
17,300.00	6,981.31	16,668.71	6,981.37	162.56	158.95	-90.00	1,817.59	-9,735.36	1,298.84	983.09	315.75	4.113	
17,400.00	6,981.24	16,768.71	6,981.29	164.09	160.52	-90.00	1,818.08	-9,835.36	1,299.19	980.28	318.91	4.074	
17,500.00	6,981.16	16,868.70	6,981.22	165.63	162.08	-90.00	1,818.57	-9,935.35	1,299.54	977.47	322.07	4.035	
17,600.00	6,981.09	16,968.70	6,981.15	167.17	163.65	-90.00	1,819.05	-10,035.35	1,299.89	974.66	325.23	3.997	
17,700.00	6,981.01	17,068.70	6,981.07	168.71	165.22	-90.00	1,819.54	-10,135.35	1,300.25	971.85	328.39	3.959	
17,800.00	6,980.94	17,168.70	6,981.00	170.25	166.79	-90.00	1,820.03	-10,235.35	1,300.60	969.04	331.56	3.923	
17,900.00	6,980.87	17,268.70	6,980.92	171.80	168.36	-90.00	1,820.52	-10,335.35	1,300.95	966.23	334.72	3.887	
18,000.00	6,980.79	17,368.70	6,980.85	173.34	169.93	-90.00	1,821.00	-10,435.35	1,301.30	963.41	337.89	3.851	
18,100.00	6,980.72	17,468.70	6,980.77	174.89	171.50	-90.00	1,821.49	-10,535.34	1,301.65	960.60	341.05	3.817	
18,200.00	6,980.65	17,568.70	6,980.70	176.43	173.08	-90.00	1,821.98	-10,635.34	1,302.00	957.79	344.22	3.783	
18,300.00	6,980.57	17,668.70	6,980.62	177.98	174.65	-90.00	1,822.47	-10,735.34	1,302.35	954.97	347.38	3.749	
18,400.00	6,980.50	17,768.70	6,980.55	179.53	176.22	-90.00	1,822.96	-10,835.34	1,302.71	952.15	350.55	3.716	
18,500.00	6,980.43	17,868.70	6,980.47	181.08	177.79	-90.00	1,823.44	-10,935.34	1,303.06	949.34	353.72	3.684	
18,600.00	6,980.35	17,968.70	6,980.40	182.63	179.37	-90.00	1,823.93	-11,035.33	1,303.41	946.52	356.89	3.652	
18,700.00	6,980.28	18,068.70	6,980.33	184.18	180.94	-90.00	1,824.42	-11,135.33	1,303.76	943.70	360.06	3.621	
18,800.00	6,980.21	18,168.70	6,980.25	185.73	182.52	-90.00	1,824.91	-11,235.33	1,304.11	940.88	363.23	3.590	
18,900.00	6,980.13	18,268.70	6,980.18	187.28	184.09	-90.00	1,825.39	-11,335.33	1,304.46	938.06	366.40	3.560	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #674H - OH - Prelim 5													Offset Site Error:	0.00 usft
Survey Program:		0-MWD+HRGM+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 (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
19,000.00	6,980.06	18,368.70	6,980.10	188.84	185.67	-90.00	1,825.88	-11,435.33	1,304.81	935.24	369.57	3.531		
19,100.00	6,979.98	18,468.69	6,980.03	190.39	187.25	-90.00	1,826.37	-11,535.33	1,305.17	932.42	372.74	3.502		
19,200.00	6,979.91	18,568.69	6,979.95	191.95	188.83	-90.00	1,826.86	-11,635.32	1,305.52	929.60	375.92	3.473		
19,300.00	6,979.84	18,668.69	6,979.88	193.51	190.40	-90.00	1,827.35	-11,735.32	1,305.87	926.78	379.09	3.445		
19,400.00	6,979.76	18,768.69	6,979.80	195.06	191.98	-90.00	1,827.83	-11,835.32	1,306.22	923.95	382.27	3.417		
19,500.00	6,979.69	18,868.69	6,979.73	196.62	193.56	-90.00	1,828.32	-11,935.32	1,306.57	921.13	385.44	3.390		
19,600.00	6,979.62	18,968.69	6,979.65	198.18	195.14	-90.00	1,828.81	-12,035.32	1,306.92	918.31	388.62	3.363		
19,700.00	6,979.54	19,068.69	6,979.58	199.74	196.72	-90.00	1,829.30	-12,135.31	1,307.27	915.48	391.79	3.337		
19,800.00	6,979.47	19,168.69	6,979.51	201.30	198.30	-90.00	1,829.78	-12,235.31	1,307.63	912.66	394.97	3.311		
19,900.00	6,979.40	19,268.69	6,979.43	202.86	199.88	-90.00	1,830.27	-12,335.31	1,307.98	909.83	398.14	3.285		
20,000.00	6,979.32	19,368.69	6,979.36	204.42	201.46	-90.00	1,830.76	-12,435.31	1,308.33	907.01	401.32	3.260		
20,100.00	6,979.25	19,468.69	6,979.28	205.98	203.04	-90.00	1,831.25	-12,535.31	1,308.68	904.18	404.50	3.235		
20,200.00	6,979.18	19,568.69	6,979.21	207.55	204.62	-90.00	1,831.74	-12,635.31	1,309.03	901.35	407.68	3.211		
20,300.00	6,979.10	19,668.69	6,979.13	209.11	206.20	-90.00	1,832.22	-12,735.30	1,309.38	898.52	410.86	3.187		
20,400.00	6,979.03	19,768.69	6,979.06	210.68	207.79	-90.00	1,832.71	-12,835.30	1,309.73	895.70	414.04	3.163		
20,500.00	6,978.95	19,868.69	6,978.98	212.24	209.37	-90.00	1,833.20	-12,935.30	1,310.09	892.87	417.22	3.140		
20,600.00	6,978.88	19,968.69	6,978.91	213.81	210.95	-90.00	1,833.69	-13,035.30	1,310.44	890.04	420.40	3.117		
20,700.00	6,978.81	20,068.69	6,978.83	215.37	212.53	-90.00	1,834.17	-13,135.30	1,310.79	887.21	423.58	3.095		
20,800.00	6,978.73	20,168.68	6,978.76	216.94	214.12	-90.00	1,834.66	-13,235.29	1,311.14	884.38	426.76	3.072		
20,900.00	6,978.66	20,268.68	6,978.69	218.51	215.70	-90.00	1,835.15	-13,335.29	1,311.49	881.55	429.94	3.050		
21,000.00	6,978.59	20,368.68	6,978.61	220.07	217.28	-90.00	1,835.64	-13,435.29	1,311.84	878.72	433.12	3.029		
21,100.00	6,978.51	20,468.68	6,978.54	221.64	218.87	-90.00	1,836.12	-13,535.29	1,312.19	875.89	436.31	3.008		
21,200.00	6,978.44	20,568.68	6,978.46	223.21	220.45	-90.00	1,836.61	-13,635.29	1,312.54	873.06	439.49	2.987		
21,300.00	6,978.37	20,668.68	6,978.39	224.78	222.04	-90.00	1,837.10	-13,735.29	1,312.90	870.22	442.67	2.966		
21,400.00	6,978.29	20,768.68	6,978.31	226.35	223.62	-90.00	1,837.59	-13,835.28	1,313.25	867.39	445.86	2.945		
21,500.00	6,978.22	20,868.68	6,978.24	227.92	225.21	-90.00	1,838.08	-13,935.28	1,313.60	864.56	449.04	2.925		
21,600.00	6,978.14	20,968.68	6,978.16	229.49	226.79	-90.00	1,838.56	-14,035.28	1,313.95	861.73	452.22	2.906		
21,700.00	6,978.07	21,068.68	6,978.09	231.06	228.38	-90.00	1,839.05	-14,135.28	1,314.30	858.89	455.41	2.886		
21,800.00	6,978.00	21,168.68	6,978.01	232.63	229.97	-90.00	1,839.54	-14,235.28	1,314.65	856.06	458.59	2.867		
21,900.00	6,977.92	21,268.68	6,977.94	234.21	231.55	-90.00	1,840.03	-14,335.27	1,315.00	853.23	461.78	2.848		
22,000.00	6,977.85	21,368.68	6,977.87	235.78	233.14	-90.00	1,840.51	-14,435.27	1,315.36	850.39	464.96	2.829		
22,100.00	6,977.78	21,468.68	6,977.79	237.35	234.73	-90.00	1,841.00	-14,535.27	1,315.71	847.56	468.15	2.810		
22,200.00	6,977.70	21,568.68	6,977.72	238.92	236.31	-90.00	1,841.49	-14,635.27	1,316.06	844.72	471.34	2.792		
22,300.00	6,977.63	21,668.68	6,977.64	240.50	237.90	-90.00	1,841.98	-14,735.27	1,316.41	841.89	474.52	2.774		
22,400.00	6,977.56	21,768.67	6,977.57	242.07	239.49	-90.00	1,842.47	-14,835.26	1,316.76	839.05	477.71	2.756		
22,500.00	6,977.48	21,868.67	6,977.49	243.65	241.08	-90.00	1,842.95	-14,935.26	1,317.11	836.22	480.90	2.739		
22,600.00	6,977.41	21,968.67	6,977.42	245.22	242.67	-90.00	1,843.44	-15,035.26	1,317.46	833.38	484.09	2.722		
22,700.00	6,977.34	22,068.67	6,977.34	246.80	244.25	-90.00	1,843.93	-15,135.26	1,317.82	830.54	487.27	2.704		
22,800.00	6,977.26	22,168.67	6,977.27	248.37	245.84	-90.00	1,844.42	-15,235.26	1,318.17	827.71	490.46	2.688		
22,900.00	6,977.19	22,268.67	6,977.19	249.95	247.43	-90.00	1,844.90	-15,335.26	1,318.52	824.87	493.65	2.671		
23,000.00	6,977.11	22,368.67	6,977.12	251.53	249.02	-90.00	1,845.39	-15,435.25	1,318.87	822.03	496.84	2.655		
23,100.00	6,977.04	22,468.67	6,977.05	253.10	250.61	-90.00	1,845.88	-15,535.25	1,319.22	819.19	500.03	2.638		
23,155.65	6,977.00	22,524.32	6,977.00	253.98	251.49	-90.00	1,846.15	-15,590.90	1,319.42	817.62	501.80	2.629		
23,156.15	6,977.00	22,524.82	6,977.00	254.06	251.50	-90.00	1,846.15	-15,591.40	1,319.42	817.60	501.81	2.629 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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #690H - OH - Prelim 5													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HRGM+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)			
0.00	0.00	0.00	0.00	0.00	0.00	-150.73	-34.95	-19.59	40.06				
100.00	100.00	100.00	100.00	0.25	0.25	-150.73	-34.95	-19.59	40.06	39.56	0.50	79.832	
200.00	200.00	200.00	200.00	0.61	0.61	-150.73	-34.95	-19.59	40.06	38.85	1.22	32.872	
300.00	300.00	300.00	300.00	0.97	0.97	-150.73	-34.95	-19.59	40.06	38.13	1.94	20.697	
400.00	400.00	400.00	400.00	1.33	1.33	-150.73	-34.95	-19.59	40.06	37.41	2.65	15.103	
500.00	500.00	500.00	500.00	1.68	1.68	-150.73	-34.95	-19.59	40.06	36.69	3.37	11.890 CC, ES	
600.00	599.98	599.98	599.98	2.04	2.04	-161.52	-34.95	-19.59	41.72	37.63	4.09	10.207	
700.00	699.84	701.12	701.10	2.41	2.41	-162.21	-33.19	-19.90	45.30	40.50	4.81	9.423	
800.00	799.45	802.35	802.18	2.77	2.77	-161.51	-27.92	-20.83	49.43	43.90	5.53	8.944	
900.00	898.70	903.65	903.08	3.13	3.14	-159.74	-19.12	-22.38	54.12	47.88	6.25	8.665	
1,000.00	997.47	1,004.98	1,003.63	3.50	3.51	-157.21	-6.81	-24.55	59.46	52.49	6.97	8.530	
1,100.00	1,095.63	1,106.36	1,103.73	3.89	3.88	-152.13	9.00	-27.34	65.31	57.61	7.71	8.475	
1,200.00	1,193.09	1,207.80	1,203.25	4.29	4.27	-147.93	28.31	-30.74	71.47	63.01	8.46	8.448	
1,300.00	1,289.73	1,309.29	1,302.07	4.72	4.68	-144.36	51.08	-34.76	77.93	68.69	9.24	8.436	
1,400.00	1,385.42	1,410.85	1,400.07	5.16	5.11	-141.24	77.30	-39.38	84.68	74.63	10.05	8.427	
1,496.97	1,477.20	1,509.38	1,494.18	5.62	5.55	-138.55	106.00	-44.44	91.50	80.63	10.87	8.417	
1,500.00	1,480.05	1,512.46	1,497.11	5.63	5.56	-138.50	106.95	-44.61	91.71	80.82	10.90	8.416	
1,600.00	1,574.15	1,612.21	1,591.82	6.12	6.02	-136.77	137.79	-50.04	98.81	87.02	11.79	8.378	
1,700.00	1,668.25	1,711.92	1,686.48	6.62	6.49	-135.27	168.62	-55.48	105.99	93.27	12.71	8.336	
1,800.00	1,762.35	1,811.63	1,781.15	7.12	6.97	-133.97	199.46	-60.92	113.22	99.57	13.65	8.293	
1,900.00	1,856.45	1,911.33	1,875.81	7.64	7.46	-132.82	230.29	-66.35	120.51	105.91	14.61	8.251	
2,000.00	1,950.55	2,011.04	1,970.47	8.16	7.95	-131.81	261.12	-71.79	127.85	112.27	15.57	8.209	
2,100.00	2,044.65	2,110.75	2,065.14	8.68	8.45	-130.90	291.95	-77.23	135.21	118.66	16.55	8.169	
2,200.00	2,138.75	2,210.45	2,159.80	9.21	8.95	-130.09	322.78	-82.66	142.61	125.07	17.54	8.132	
2,300.00	2,232.85	2,310.16	2,254.47	9.74	9.46	-129.36	353.61	-88.10	150.03	131.50	18.53	8.096	
2,400.00	2,326.95	2,409.87	2,349.13	10.27	9.97	-128.69	384.45	-93.54	157.48	137.95	19.53	8.062	
2,500.00	2,421.05	2,509.57	2,443.79	10.81	10.48	-128.09	415.28	-98.97	164.94	144.40	20.54	8.030	
2,600.00	2,515.15	2,609.28	2,538.46	11.34	10.99	-127.54	446.11	-104.41	172.43	150.87	21.55	8.000	
2,700.00	2,609.25	2,708.99	2,633.12	11.88	11.50	-127.04	476.94	-109.85	179.92	157.35	22.57	7.972	
2,800.00	2,703.35	2,808.69	2,727.79	12.42	12.02	-126.57	507.77	-115.28	187.43	163.84	23.59	7.945	
2,900.00	2,797.45	2,908.40	2,822.45	12.96	12.53	-126.14	538.60	-120.72	194.95	170.34	24.61	7.921	
3,000.00	2,891.55	3,008.11	2,917.11	13.51	13.05	-125.75	569.43	-126.15	202.48	176.84	25.64	7.897	
3,100.00	2,985.65	3,107.81	3,011.78	14.05	13.57	-125.38	600.27	-131.59	210.02	183.35	26.67	7.875	
3,200.00	3,079.75	3,207.52	3,106.44	14.60	14.09	-125.04	631.10	-137.03	217.56	189.86	27.70	7.854	
3,300.00	3,173.85	3,307.23	3,201.11	15.14	14.61	-124.72	661.93	-142.46	225.12	196.39	28.73	7.835	
3,400.00	3,267.95	3,406.93	3,295.77	15.69	15.13	-124.42	692.76	-147.90	232.68	202.91	29.77	7.816	
3,500.00	3,362.05	3,506.64	3,390.43	16.23	15.65	-124.14	723.59	-153.34	240.25	209.44	30.81	7.799	
3,600.00	3,456.15	3,606.35	3,485.10	16.78	16.18	-123.87	754.42	-158.77	247.82	215.97	31.84	7.782	
3,700.00	3,550.25	3,706.05	3,579.76	17.33	16.70	-123.63	785.26	-164.21	255.39	222.51	32.88	7.767	
3,800.00	3,644.35	3,805.76	3,674.43	17.88	17.22	-123.39	816.09	-169.65	262.97	229.05	33.92	7.752	
3,900.00	3,738.45	3,905.47	3,769.09	18.42	17.75	-123.17	846.92	-175.08	270.56	235.59	34.97	7.738	
4,000.00	3,832.55	4,005.17	3,863.75	18.97	18.27	-122.97	877.75	-180.52	278.15	242.14	36.01	7.724	
4,100.00	3,926.65	4,104.88	3,958.42	19.52	18.80	-122.77	908.58	-185.96	285.74	248.69	37.05	7.711	
4,200.00	4,020.75	4,204.59	4,053.08	20.07	19.32	-122.58	939.41	-191.39	293.34	255.24	38.10	7.699	
4,300.00	4,114.85	4,304.29	4,147.75	20.62	19.85	-122.40	970.24	-196.83	300.94	261.79	39.15	7.688	
4,400.00	4,208.95	4,404.00	4,242.41	21.17	20.37	-122.24	1,001.08	-202.26	308.54	268.34	40.19	7.677	
4,500.00	4,303.05	4,503.71	4,337.08	21.72	20.90	-122.08	1,031.91	-207.70	316.14	274.90	41.24	7.666	
4,600.00	4,397.15	4,603.41	4,431.74	22.27	21.42	-121.92	1,062.74	-213.14	323.75	281.46	42.29	7.656	
4,700.00	4,491.25	4,703.12	4,526.40	22.82	21.95	-121.78	1,093.57	-218.57	331.35	288.02	43.34	7.646	
4,800.00	4,585.35	4,802.83	4,621.07	23.37	22.48	-121.64	1,124.40	-224.01	338.96	294.58	44.38	7.637	
4,900.00	4,679.45	4,902.53	4,715.73	23.93	23.01	-121.50	1,155.23	-229.45	346.58	301.14	45.43	7.628	
5,000.00	4,773.55	5,002.24	4,810.40	24.48	23.53	-121.38	1,186.07	-234.88	354.19	307.71	46.48	7.620	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #690H - OH - Prelim 5													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HRGM+MS													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)			
5,100.00	4,867.65	5,101.95	4,905.06	25.03	24.06	-121.25	1,216.90	-240.32	361.81	314.27	47.53	7.611	
5,200.00	4,961.75	5,201.65	4,999.72	25.58	24.59	-121.14	1,247.73	-245.76	369.42	320.84	48.59	7.604	
5,300.00	5,055.85	5,301.36	5,094.39	26.13	25.11	-121.02	1,278.56	-251.19	377.04	327.41	49.64	7.596	
5,400.00	5,149.95	5,401.07	5,189.05	26.68	25.64	-120.92	1,309.39	-256.63	384.66	333.97	50.69	7.589	
5,500.00	5,244.05	5,500.77	5,283.72	27.24	26.17	-120.81	1,340.22	-262.06	392.28	340.54	51.74	7.582	
5,600.00	5,338.15	5,600.48	5,378.38	27.79	26.70	-120.71	1,371.05	-267.50	399.91	347.11	52.79	7.575	
5,665.73	5,400.00	5,665.07	5,439.75	28.15	27.04	-120.67	1,390.88	-271.00	404.97	351.50	53.47	7.574	
5,700.00	5,432.28	5,698.48	5,471.58	28.34	27.21	-120.69	1,400.90	-272.76	407.64	353.82	53.82	7.574	
5,800.00	5,526.87	5,795.95	5,564.76	28.88	27.71	-120.77	1,429.06	-277.73	415.20	360.39	54.81	7.575	
5,900.00	5,622.01	5,893.41	5,658.40	29.41	28.20	-120.86	1,455.65	-282.42	422.42	366.65	55.78	7.574	
6,000.00	5,717.67	5,990.85	5,752.47	29.92	28.67	-120.96	1,480.67	-286.83	429.29	372.58	56.71	7.570	
6,100.00	5,813.83	6,088.27	5,846.94	30.41	29.13	-121.07	1,504.10	-290.96	435.81	378.19	57.62	7.564	
6,200.00	5,910.44	6,185.68	5,941.78	30.89	29.57	-121.19	1,525.94	-294.81	441.97	383.48	58.49	7.556	
6,300.00	6,007.50	6,283.06	6,036.97	31.36	30.00	-121.32	1,546.19	-298.38	447.78	388.44	59.34	7.546	
6,400.00	6,104.96	6,380.41	6,132.47	31.80	30.41	-121.46	1,564.84	-301.67	453.24	393.08	60.16	7.534	
6,500.00	6,202.80	6,477.75	6,228.25	32.24	30.81	-121.61	1,581.88	-304.68	458.34	397.40	60.94	7.521	
6,600.00	6,300.98	6,575.06	6,324.29	32.66	31.20	-121.76	1,597.31	-307.40	463.09	401.39	61.70	7.505	
6,700.00	6,399.48	6,704.16	6,451.90	33.06	31.70	-121.91	1,616.56	-309.49	467.03	404.37	62.66	7.453	
6,722.82	6,422.00	6,781.41	6,526.93	33.15	32.04	-121.63	1,633.99	-304.18	465.08	402.40	62.68	7.420	
6,750.00	6,448.76	6,838.62	6,580.83	33.26	32.31	-112.00	1,651.11	-295.76	459.17	396.66	62.51	7.346	
6,800.00	6,497.51	6,987.62	6,711.94	33.48	33.10	-101.82	1,709.98	-258.08	438.94	379.12	59.82	7.338	
6,850.00	6,545.40	7,125.33	6,816.37	33.72	33.90	-98.26	1,780.99	-203.94	409.58	354.99	54.59	7.503	
6,900.00	6,592.13	7,190.60	6,858.34	33.97	34.31	-99.18	1,819.52	-172.18	373.70	321.14	52.56	7.110	
6,950.00	6,637.40	7,275.28	6,905.43	34.25	34.86	-105.72	1,872.88	-126.44	333.93	286.63	47.30	7.060	
7,000.00	6,680.94	7,324.08	6,928.09	34.54	35.19	-116.20	1,905.21	-97.78	291.92	247.65	44.27	6.594	
7,050.00	6,722.48	7,361.54	6,943.22	34.85	35.45	-129.82	1,930.62	-74.81	249.30	207.87	41.43	6.018	
7,100.00	6,761.76	7,390.67	6,953.58	35.17	35.65	-143.72	1,950.69	-56.42	207.88	169.12	38.76	5.363	
7,150.00	6,798.55	7,413.56	6,960.86	35.51	35.81	-155.37	1,966.62	-41.67	170.40	133.28	37.12	4.591	
7,200.00	6,832.61	7,431.70	6,966.07	35.86	35.94	-164.06	1,979.32	-29.81	141.58	102.01	39.57	3.578	
7,250.00	6,863.74	7,446.13	6,969.86	36.22	36.05	-170.24	1,989.46	-20.28	128.58	79.71	48.87	2.631	
7,256.15	6,867.36	7,447.69	6,970.25	36.26	36.06	-170.86	1,990.56	-19.25	128.42	78.14	50.28	2.554	
7,300.00	6,891.74	7,457.60	6,972.65	36.59	36.13	-174.61	1,997.55	-12.64	136.73	77.62	59.11	2.313 SF	
7,350.00	6,916.44	7,466.65	6,974.72	36.98	36.19	-177.75	2,003.95	-6.58	163.21	98.93	64.29	2.539	
7,400.00	6,937.69	7,473.70	6,976.23	37.37	36.25	-179.99	2,008.93	-1.84	200.99	135.16	65.83	3.053	
7,450.00	6,955.36	7,479.03	6,977.33	37.78	36.29	-178.36	2,012.71	1.76	244.86	178.81	66.05	3.707	
7,500.00	6,969.34	7,482.87	6,978.10	38.19	36.31	-177.27	2,015.44	4.36	291.94	226.01	65.93	4.428	
7,550.00	6,979.53	7,485.38	6,978.58	38.62	36.33	-176.85	2,017.21	6.06	340.74	274.95	65.79	5.179	
7,600.00	6,985.89	7,486.66	6,978.83	39.05	36.34	-178.47	2,018.13	6.93	390.39	324.67	65.71	5.941	
7,650.00	6,988.37	7,486.81	6,978.86	39.48	36.34	-32.97	2,018.23	7.03	440.35	374.65	65.70	6.703	
7,657.25	6,988.40	7,486.73	6,978.84	39.54	36.34	-21.21	2,018.18	6.98	447.60	381.90	65.70	6.813	
7,700.00	6,988.37	7,486.25	6,978.75	39.92	36.34	-23.39	2,017.83	6.65	490.34	424.63	65.71	7.462	
7,800.00	6,988.30	7,485.13	6,978.54	40.82	36.33	-27.96	2,017.04	5.89	590.32	524.58	65.74	8.980	
7,900.00	6,988.23	7,484.05	6,978.33	41.77	36.32	-31.88	2,016.27	5.16	690.30	624.54	65.76	10.498	
8,000.00	6,988.16	7,483.01	6,978.13	42.75	36.31	-35.25	2,015.53	4.45	790.29	724.52	65.77	12.016	
8,100.00	6,988.09	7,482.00	6,977.93	43.76	36.31	-38.15	2,014.82	3.77	890.27	824.49	65.78	13.533	
8,152.35	6,988.06	7,481.48	6,977.82	44.30	36.30	-39.51	2,014.45	3.42	942.62	876.83	65.79	14.328	
8,200.00	6,988.02	7,480.37	6,977.60	44.79	36.29	-75.24	2,013.66	2.67	990.25	924.46	65.79	15.053	
8,300.00	6,987.95	7,473.95	6,976.29	45.83	36.25	-84.12	2,009.11	-1.67	1,089.92	1,024.21	65.72	16.585	
8,400.00	6,987.88	7,462.29	6,973.74	46.85	36.16	-85.93	2,000.86	-9.51	1,188.85	1,123.27	65.58	18.129	
8,500.00	6,987.80	7,450.00	6,970.83	47.85	36.07	-86.66	1,992.19	-17.71	1,286.61	1,221.11	65.50	19.644	
8,600.00	6,987.73	7,424.95	6,964.19	48.83	35.89	-86.65	1,974.58	-34.24	1,382.78	1,317.71	65.07	21.252	
8,700.00	6,987.65	7,400.00	6,956.64	49.79	35.72	-86.58	1,957.17	-50.44	1,477.01	1,412.22	64.79	22.797	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #690H - OH - Prelim 5												Offset Site Error:	0.00 usft
Survey Program:		0-MWD+HRGM+MS						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)			
8,800.00	6,987.57	7,372.43	6,947.24	50.72	35.52	-86.40	1,938.10	-67.98	1,568.99	1,504.52	64.47	24.335	
8,900.00	6,987.50	7,342.03	6,935.59	51.62	35.31	-86.13	1,917.33	-86.87	1,658.43	1,594.33	64.10	25.872	
9,000.00	6,987.42	7,309.80	6,921.80	52.48	35.09	-85.81	1,895.65	-106.32	1,745.08	1,681.34	63.74	27.379	
9,100.00	6,987.34	7,276.43	6,906.00	53.30	34.87	-85.47	1,873.63	-125.78	1,828.75	1,765.36	63.39	28.850	
9,200.00	6,987.27	7,250.00	6,892.42	54.08	34.69	-85.28	1,856.54	-140.68	1,909.31	1,846.08	63.23	30.194	
9,215.33	6,987.26	7,237.40	6,885.62	54.20	34.61	-85.05	1,848.51	-147.61	1,921.35	1,858.34	63.01	30.491	
9,300.00	6,987.20	7,200.00	6,864.22	54.85	34.37	-84.15	1,825.16	-167.50	1,988.18	1,925.62	62.56	31.780	
9,400.00	6,987.12	7,179.82	6,851.95	55.65	34.24	-83.64	1,812.88	-177.79	2,067.98	2,005.40	62.57	33.049	
9,500.00	6,987.05	7,150.00	6,832.91	56.48	34.06	-82.86	1,795.19	-192.40	2,148.84	2,086.48	62.36	34.460	
9,600.00	6,986.98	7,127.39	6,817.78	57.35	33.92	-82.26	1,782.16	-202.99	2,230.69	2,168.40	62.30	35.808	
9,700.00	6,986.90	7,100.00	6,798.67	58.24	33.75	-81.50	1,766.82	-215.24	2,313.51	2,251.39	62.13	37.239	
9,800.00	6,986.83	7,083.53	6,786.78	59.17	33.65	-81.04	1,757.86	-222.29	2,397.23	2,335.06	62.17	38.557	
9,900.00	6,986.75	7,064.29	6,772.53	60.12	33.54	-80.50	1,747.64	-230.20	2,481.82	2,419.67	62.16	39.929	
10,000.00	6,986.68	7,050.00	6,761.71	61.10	33.45	-80.09	1,740.23	-235.87	2,567.24	2,505.02	62.22	41.259	
10,100.00	6,986.61	7,030.33	6,746.48	62.11	33.34	-79.51	1,730.29	-243.35	2,653.42	2,591.24	62.19	42.669	
10,200.00	6,986.53	7,015.31	6,734.59	63.14	33.25	-79.07	1,722.90	-248.81	2,740.34	2,678.12	62.23	44.039	
10,300.00	6,986.46	7,000.00	6,722.26	64.20	33.17	-78.62	1,715.57	-254.15	2,827.94	2,765.69	62.25	45.428	
10,400.00	6,986.39	7,000.00	6,722.26	65.28	33.17	-78.62	1,715.57	-254.15	2,916.24	2,853.72	62.52	46.644	
10,500.00	6,986.31	6,976.62	6,703.03	66.38	33.04	-77.91	1,704.74	-261.87	3,005.03	2,942.62	62.41	48.152	
10,600.00	6,986.24	6,950.00	6,680.57	67.50	32.89	-77.10	1,692.99	-269.99	3,094.55	3,032.30	62.25	49.715	
10,700.00	6,986.17	6,950.00	6,680.57	68.64	32.89	-77.10	1,692.99	-269.99	3,184.39	3,121.90	62.48	50.964	
10,800.00	6,986.09	6,950.00	6,680.57	69.80	32.89	-77.10	1,692.99	-269.99	3,274.81	3,212.10	62.71	52.223	
10,900.00	6,986.02	6,950.00	6,680.57	70.98	32.89	-77.10	1,692.99	-269.99	3,365.78	3,302.86	62.92	53.493	
11,000.00	6,985.95	6,927.98	6,661.56	72.17	32.77	-76.43	1,683.75	-276.17	3,457.02	3,394.20	62.82	55.032	
11,100.00	6,985.87	6,920.03	6,654.61	73.38	32.73	-76.18	1,680.52	-278.27	3,548.75	3,485.84	62.91	56.412	
11,200.00	6,985.80	6,900.00	6,636.89	74.61	32.62	-75.56	1,672.64	-283.29	3,640.94	3,578.11	62.83	57.946	
11,300.00	6,985.72	6,900.00	6,636.89	75.85	32.62	-75.56	1,672.64	-283.29	3,733.35	3,670.33	63.02	59.245	
11,400.00	6,985.65	6,900.00	6,636.89	77.10	32.62	-75.56	1,672.64	-283.29	3,826.14	3,762.95	63.19	60.550	
11,500.00	6,985.58	6,900.00	6,636.89	78.37	32.62	-75.56	1,672.64	-283.29	3,919.28	3,855.93	63.36	61.862	
11,600.00	6,985.50	6,900.00	6,636.89	79.65	32.62	-75.56	1,672.64	-283.29	4,012.76	3,949.25	63.51	63.179	
11,700.00	6,985.43	6,881.04	6,619.86	80.94	32.53	-74.97	1,665.54	-287.64	4,106.37	4,042.92	63.45	64.722	
11,800.00	6,985.36	6,875.71	6,615.04	82.24	32.50	-74.80	1,663.60	-288.80	4,200.33	4,136.79	63.53	66.111	
11,900.00	6,985.28	6,870.66	6,610.44	83.56	32.47	-74.64	1,661.79	-289.87	4,294.53	4,230.91	63.62	67.500	
12,000.00	6,985.21	6,850.00	6,591.49	84.88	32.37	-73.99	1,654.65	-293.95	4,389.09	4,325.56	63.54	69.079	
12,100.00	6,985.14	6,850.00	6,591.49	86.21	32.37	-73.99	1,654.65	-293.95	4,483.69	4,420.02	63.67	70.416	
12,200.00	6,985.06	6,850.00	6,591.49	87.56	32.37	-73.99	1,654.65	-293.95	4,578.52	4,514.71	63.81	71.756	
12,300.00	6,984.99	6,850.00	6,591.49	88.91	32.37	-73.99	1,654.65	-293.95	4,673.56	4,609.63	63.93	73.099	
12,400.00	6,984.92	6,850.00	6,591.49	90.27	32.37	-73.99	1,654.65	-293.95	4,768.81	4,704.75	64.06	74.444	
12,500.00	6,984.84	6,850.00	6,591.49	91.64	32.37	-73.99	1,654.65	-293.95	4,864.24	4,800.06	64.18	75.792	
12,600.00	6,984.77	6,850.00	6,591.49	93.01	32.37	-73.99	1,654.65	-293.95	4,959.86	4,895.56	64.30	77.141	
12,700.00	6,984.69	6,850.00	6,591.49	94.40	32.37	-73.99	1,654.65	-293.95	5,055.64	4,991.23	64.41	78.492	
12,800.00	6,984.62	6,850.00	6,591.49	95.79	32.37	-73.99	1,654.65	-293.95	5,151.59	5,087.07	64.52	79.844	
12,900.00	6,984.55	6,850.00	6,591.49	97.18	32.37	-73.99	1,654.65	-293.95	5,247.69	5,183.06	64.63	81.197	
13,000.00	6,984.47	6,828.29	6,571.32	98.59	32.26	-73.30	1,647.59	-297.74	5,343.69	5,279.16	64.53	82.804	
13,100.00	6,984.40	6,825.35	6,568.56	100.00	32.25	-73.21	1,646.67	-298.22	5,440.00	5,375.39	64.61	84.193	
13,200.00	6,984.33	6,822.52	6,565.91	101.41	32.23	-73.11	1,645.80	-298.67	5,536.43	5,471.74	64.69	85.583	
13,300.00	6,984.25	6,800.00	6,544.65	102.83	32.13	-72.40	1,639.11	-301.92	5,633.17	5,568.58	64.60	87.206	
13,400.00	6,984.18	6,800.00	6,544.65	104.26	32.13	-72.40	1,639.11	-301.92	5,729.78	5,665.09	64.70	88.563	
13,500.00	6,984.11	6,800.00	6,544.65	105.69	32.13	-72.40	1,639.11	-301.92	5,826.51	5,761.71	64.80	89.921	
13,600.00	6,984.03	6,800.00	6,544.65	107.13	32.13	-72.40	1,639.11	-301.92	5,923.34	5,858.45	64.89	91.278	
13,700.00	6,983.96	6,800.00	6,544.65	108.57	32.13	-72.40	1,639.11	-301.92	6,020.28	5,955.29	64.99	92.635	
13,800.00	6,983.88	6,800.00	6,544.65	110.02	32.13	-72.40	1,639.11	-301.92	6,117.31	6,052.23	65.08	93.991	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #690H - OH - Prelim 5													Offset Site Error:	0.00 usft
Survey Program:		0-MWD+HRGM+MS						Rule Assigned:					Offset Well Error:	0.00 usft
Reference		Offset		Semi Maior 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)				
13,900.00	6,983.81	6,800.00	6,544.65	111.47	32.13	-72.40	1,639.11	-301.92	6,214.44	6,149.26	65.18	95.347		
14,000.00	6,983.74	6,800.00	6,544.65	112.92	32.13	-72.40	1,639.11	-301.92	6,311.66	6,246.39	65.27	96.703		
14,100.00	6,983.66	6,800.00	6,544.65	114.38	32.13	-72.40	1,639.11	-301.92	6,408.96	6,343.60	65.36	98.057		
14,200.00	6,983.59	6,800.00	6,544.65	115.85	32.13	-72.40	1,639.11	-301.92	6,506.35	6,440.90	65.45	99.411		
14,300.00	6,983.52	6,800.00	6,544.65	117.31	32.13	-72.40	1,639.11	-301.92	6,603.81	6,538.27	65.54	100.764		
14,400.00	6,983.44	6,800.00	6,544.65	118.78	32.13	-72.40	1,639.11	-301.92	6,701.35	6,635.73	65.63	102.116		
14,500.00	6,983.37	6,800.00	6,544.65	120.26	32.13	-72.40	1,639.11	-301.92	6,798.96	6,733.25	65.71	103.466		
14,600.00	6,983.30	6,800.00	6,544.65	121.74	32.13	-72.40	1,639.11	-301.92	6,896.64	6,830.84	65.80	104.815		
14,700.00	6,983.22	6,800.00	6,544.65	123.22	32.13	-72.40	1,639.11	-301.92	6,994.38	6,928.50	65.88	106.163		
14,800.00	6,983.15	6,800.00	6,544.65	124.70	32.13	-72.40	1,639.11	-301.92	7,092.19	7,026.22	65.97	107.509		
14,900.00	6,983.08	6,800.00	6,544.65	126.19	32.13	-72.40	1,639.11	-301.92	7,190.06	7,124.01	66.05	108.854		
15,000.00	6,983.00	6,800.00	6,544.65	127.68	32.13	-72.40	1,639.11	-301.92	7,287.98	7,221.85	66.14	110.197		
15,100.00	6,982.93	6,800.00	6,544.65	129.17	32.13	-72.40	1,639.11	-301.92	7,385.97	7,319.75	66.22	111.538		
15,200.00	6,982.85	6,800.00	6,544.65	130.67	32.13	-72.40	1,639.11	-301.92	7,484.00	7,417.70	66.30	112.878		
15,300.00	6,982.78	6,800.00	6,544.65	132.16	32.13	-72.40	1,639.11	-301.92	7,582.09	7,515.70	66.38	114.216		
15,400.00	6,982.71	6,800.00	6,544.65	133.66	32.13	-72.40	1,639.11	-301.92	7,680.22	7,613.76	66.47	115.551		
15,500.00	6,982.63	6,800.00	6,544.65	135.17	32.13	-72.40	1,639.11	-301.92	7,778.40	7,711.86	66.55	116.885		
15,600.00	6,982.56	6,777.14	6,522.83	136.67	32.02	-71.67	1,632.86	-304.65	7,876.36	7,809.89	66.47	118.497		
15,700.00	6,982.49	6,775.87	6,521.62	138.18	32.02	-71.62	1,632.53	-304.78	7,974.60	7,908.06	66.54	119.843		
15,800.00	6,982.41	6,774.63	6,520.43	139.69	32.01	-71.58	1,632.20	-304.91	8,072.88	8,006.27	66.62	121.187		
15,900.00	6,982.34	6,773.43	6,519.27	141.20	32.00	-71.55	1,631.89	-305.04	8,171.21	8,104.52	66.69	122.528		
16,000.00	6,982.27	6,772.26	6,518.14	142.71	32.00	-71.51	1,631.59	-305.16	8,269.57	8,202.81	66.76	123.867		
16,100.00	6,982.19	6,750.00	6,496.66	144.23	31.90	-70.79	1,626.14	-307.14	8,368.20	8,301.50	66.70	125.467		
16,200.00	6,982.12	6,750.00	6,496.66	145.75	31.90	-70.79	1,626.14	-307.14	8,466.61	8,399.83	66.78	126.788		
16,300.00	6,982.05	6,750.00	6,496.66	147.27	31.90	-70.79	1,626.14	-307.14	8,565.06	8,498.20	66.86	128.106		
16,400.00	6,981.97	6,750.00	6,496.66	148.79	31.90	-70.79	1,626.14	-307.14	8,663.54	8,596.60	66.94	129.421		
16,500.00	6,981.90	6,750.00	6,496.66	150.31	31.90	-70.79	1,626.14	-307.14	8,762.06	8,695.04	67.02	130.734		
16,600.00	6,981.82	6,750.00	6,496.66	151.84	31.90	-70.79	1,626.14	-307.14	8,860.61	8,793.51	67.10	132.045		
16,700.00	6,981.75	6,750.00	6,496.66	153.36	31.90	-70.79	1,626.14	-307.14	8,959.20	8,892.01	67.18	133.353		
16,800.00	6,981.68	6,750.00	6,496.66	154.89	31.90	-70.79	1,626.14	-307.14	9,057.81	8,990.55	67.27	134.658		
16,900.00	6,981.60	6,750.00	6,496.66	156.42	31.90	-70.79	1,626.14	-307.14	9,156.46	9,089.11	67.35	135.960		
17,000.00	6,981.53	6,750.00	6,496.66	157.95	31.90	-70.79	1,626.14	-307.14	9,255.13	9,187.70	67.43	137.260		
17,100.00	6,981.46	6,750.00	6,496.66	159.49	31.90	-70.79	1,626.14	-307.14	9,353.83	9,286.32	67.51	138.557		
17,200.00	6,981.38	6,750.00	6,496.66	161.02	31.90	-70.79	1,626.14	-307.14	9,452.56	9,384.97	67.59	139.851		
17,300.00	6,981.31	6,750.00	6,496.66	162.56	31.90	-70.79	1,626.14	-307.14	9,551.32	9,483.65	67.67	141.143		
17,400.00	6,981.24	6,750.00	6,496.66	164.09	31.90	-70.79	1,626.14	-307.14	9,650.10	9,582.35	67.75	142.431		
17,500.00	6,981.16	6,750.00	6,496.66	165.63	31.90	-70.79	1,626.14	-307.14	9,748.90	9,681.07	67.83	143.716		
17,600.00	6,981.09	6,750.00	6,496.66	167.17	31.90	-70.79	1,626.14	-307.14	9,847.73	9,779.82	67.92	144.999		
17,700.00	6,981.01	6,750.00	6,496.66	168.71	31.90	-70.79	1,626.14	-307.14	9,946.59	9,878.59	68.00	146.279		
17,800.00	6,980.94	6,750.00	6,496.66	170.25	31.90	-70.79	1,626.14	-307.14	10,045.46	9,977.38	68.08	147.555		
17,900.00	6,980.87	6,750.00	6,496.66	171.80	31.90	-70.79	1,626.14	-307.14	10,144.36	10,076.20	68.16	148.828		
18,000.00	6,980.79	6,750.00	6,496.66	173.34	31.90	-70.79	1,626.14	-307.14	10,243.28	10,175.04	68.24	150.099		
18,100.00	6,980.72	6,750.00	6,496.66	174.89	31.90	-70.79	1,626.14	-307.14	10,342.22	10,273.90	68.33	151.366		
18,200.00	6,980.65	6,750.00	6,496.66	176.43	31.90	-70.79	1,626.14	-307.14	10,441.18	10,372.77	68.41	152.630		
18,300.00	6,980.57	6,750.00	6,496.66	177.98	31.90	-70.79	1,626.14	-307.14	10,540.16	10,471.67	68.49	153.891		
18,400.00	6,980.50	6,750.00	6,496.66	179.53	31.90	-70.79	1,626.14	-307.14	10,639.16	10,570.59	68.57	155.149		
18,500.00	6,980.43	6,750.00	6,496.66	181.08	31.90	-70.79	1,626.14	-307.14	10,738.18	10,669.52	68.66	156.404		
18,600.00	6,980.35	6,750.00	6,496.66	182.63	31.90	-70.79	1,626.14	-307.14	10,837.22	10,768.48	68.74	157.655		
18,700.00	6,980.28	6,750.00	6,496.66	184.18	31.90	-70.79	1,626.14	-307.14	10,936.27	10,867.45	68.82	158.903		
18,800.00	6,980.21	6,750.00	6,496.66	185.73	31.90	-70.79	1,626.14	-307.14	11,035.34	10,966.43	68.91	160.148		
18,900.00	6,980.13	6,750.00	6,496.66	187.28	31.90	-70.79	1,626.14	-307.14	11,134.43	11,065.44	68.99	161.390		
19,000.00	6,980.06	6,750.00	6,496.66	188.84	31.90	-70.79	1,626.14	-307.14	11,233.53	11,164.46	69.07	162.628		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #690H - OH - Prelim 5												Offset Site Error: 0.00 usft	
Survey Program: 0-MWD+HRGM+MS								Rule Assigned:				Offset Well Error: 0.00 usft	
Measured Depth (usft)	Reference Vertical Depth (usft)	Measured Depth (usft)	Offset Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
19,100.00	6,979.98	6,750.00	6,496.66	190.39	31.90	-70.79	1,626.14	-307.14	11,332.65	11,263.49	69.16	163.863	
19,200.00	6,979.91	6,750.00	6,496.66	191.95	31.90	-70.79	1,626.14	-307.14	11,431.78	11,362.54	69.24	165.095	
19,300.00	6,979.84	6,750.00	6,496.66	193.51	31.90	-70.79	1,626.14	-307.14	11,530.93	11,461.61	69.33	166.323	
19,400.00	6,979.76	6,750.00	6,496.66	195.06	31.90	-70.79	1,626.14	-307.14	11,630.10	11,560.68	69.41	167.548	
19,500.00	6,979.69	6,750.00	6,496.66	196.62	31.90	-70.79	1,626.14	-307.14	11,729.28	11,659.78	69.50	168.770	
19,600.00	6,979.62	6,750.00	6,496.66	198.18	31.90	-70.79	1,626.14	-307.14	11,828.47	11,758.88	69.58	169.988	
19,700.00	6,979.54	6,750.00	6,496.66	199.74	31.90	-70.79	1,626.14	-307.14	11,927.67	11,858.00	69.67	171.203	
19,800.00	6,979.47	6,750.00	6,496.66	201.30	31.90	-70.79	1,626.14	-307.14	12,026.89	11,957.14	69.76	172.414	
19,900.00	6,979.40	6,750.00	6,496.66	202.86	31.90	-70.79	1,626.14	-307.14	12,126.12	12,056.28	69.84	173.622	
20,000.00	6,979.32	6,750.00	6,496.66	204.42	31.90	-70.79	1,626.14	-307.14	12,225.37	12,155.44	69.93	174.827	
20,100.00	6,979.25	6,750.00	6,496.66	205.98	31.90	-70.79	1,626.14	-307.14	12,324.62	12,254.61	70.02	176.028	
20,200.00	6,979.18	6,750.00	6,496.66	207.55	31.90	-70.79	1,626.14	-307.14	12,423.89	12,353.79	70.10	177.225	
20,300.00	6,979.10	6,750.00	6,496.66	209.11	31.90	-70.79	1,626.14	-307.14	12,523.17	12,452.98	70.19	178.419	
20,400.00	6,979.03	6,750.00	6,496.66	210.68	31.90	-70.79	1,626.14	-307.14	12,622.46	12,552.19	70.28	179.610	
20,500.00	6,978.95	6,750.00	6,496.66	212.24	31.90	-70.79	1,626.14	-307.14	12,721.77	12,651.40	70.36	180.797	
20,600.00	6,978.88	6,750.00	6,496.66	213.81	31.90	-70.79	1,626.14	-307.14	12,821.08	12,750.63	70.45	181.980	
20,700.00	6,978.81	6,750.00	6,496.66	215.37	31.90	-70.79	1,626.14	-307.14	12,920.40	12,849.86	70.54	183.160	
20,800.00	6,978.73	6,750.00	6,496.66	216.94	31.90	-70.79	1,626.14	-307.14	13,019.74	12,949.11	70.63	184.337	
20,900.00	6,978.66	6,750.00	6,496.66	218.51	31.90	-70.79	1,626.14	-307.14	13,119.08	13,048.36	70.72	185.510	
21,000.00	6,978.59	6,750.00	6,496.66	220.07	31.90	-70.79	1,626.14	-307.14	13,218.43	13,147.63	70.81	186.679	
21,100.00	6,978.51	6,750.00	6,496.66	221.64	31.90	-70.79	1,626.14	-307.14	13,317.80	13,246.90	70.90	187.845	
21,200.00	6,978.44	6,750.00	6,496.66	223.21	31.90	-70.79	1,626.14	-307.14	13,417.17	13,346.18	70.99	189.007	
21,300.00	6,978.37	6,750.00	6,496.66	224.78	31.90	-70.79	1,626.14	-307.14	13,516.55	13,445.48	71.08	190.166	
21,400.00	6,978.29	6,750.00	6,496.66	226.35	31.90	-70.79	1,626.14	-307.14	13,615.95	13,544.78	71.17	191.321	
21,500.00	6,978.22	6,750.00	6,496.66	227.92	31.90	-70.79	1,626.14	-307.14	13,715.35	13,644.09	71.26	192.473	
21,600.00	6,978.14	6,750.00	6,496.66	229.49	31.90	-70.79	1,626.14	-307.14	13,814.75	13,743.40	71.35	193.621	
21,700.00	6,978.07	6,750.00	6,496.66	231.06	31.90	-70.79	1,626.14	-307.14	13,914.17	13,842.73	71.44	194.765	
21,800.00	6,978.00	6,750.00	6,496.66	232.63	31.90	-70.79	1,626.14	-307.14	14,013.60	13,942.07	71.53	195.906	
21,900.00	6,977.92	6,750.00	6,496.66	234.21	31.90	-70.79	1,626.14	-307.14	14,113.03	14,041.41	71.62	197.043	
22,000.00	6,977.85	6,750.00	6,496.66	235.78	31.90	-70.79	1,626.14	-307.14	14,212.47	14,140.76	71.72	198.177	
22,100.00	6,977.78	6,750.00	6,496.66	237.35	31.90	-70.79	1,626.14	-307.14	14,311.92	14,240.11	71.81	199.307	
22,200.00	6,977.70	6,750.00	6,496.66	238.92	31.90	-70.79	1,626.14	-307.14	14,411.38	14,339.48	71.90	200.433	
22,300.00	6,977.63	6,750.00	6,496.66	240.50	31.90	-70.79	1,626.14	-307.14	14,510.84	14,438.85	71.99	201.556	
22,400.00	6,977.56	6,750.00	6,496.66	242.07	31.90	-70.79	1,626.14	-307.14	14,610.32	14,538.23	72.09	202.675	
22,500.00	6,977.48	6,750.00	6,496.66	243.65	31.90	-70.79	1,626.14	-307.14	14,709.80	14,637.61	72.18	203.791	
22,600.00	6,977.41	6,750.00	6,496.66	245.22	31.90	-70.79	1,626.14	-307.14	14,809.28	14,737.01	72.27	204.903	
22,700.00	6,977.34	6,750.00	6,496.66	246.80	31.90	-70.79	1,626.14	-307.14	14,908.77	14,836.41	72.37	206.011	
22,800.00	6,977.26	6,750.00	6,496.66	248.37	31.90	-70.79	1,626.14	-307.14	15,008.27	14,935.81	72.46	207.116	
22,900.00	6,977.19	6,750.00	6,496.66	249.95	31.90	-70.79	1,626.14	-307.14	15,107.78	15,035.22	72.56	208.217	
23,000.00	6,977.11	6,750.00	6,496.66	251.53	31.90	-70.79	1,626.14	-307.14	15,207.29	15,134.64	72.65	209.315	
23,100.00	6,977.04	6,750.00	6,496.66	253.10	31.90	-70.79	1,626.14	-307.14	15,306.81	15,234.07	72.75	210.409	
23,155.65	6,977.00	6,750.00	6,496.66	253.98	31.90	-70.79	1,626.14	-307.14	15,362.20	15,289.40	72.80	211.016	
23,156.15	6,977.00	6,750.00	6,496.66	254.06	31.90	-70.79	1,626.14	-307.14	15,362.70	15,285.26	77.44	198.386	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #692H - OH - Prelim 5													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HRGM+MS													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis			Offset Wellbore Centre		Distance		Rule Assigned:		Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.00	0.00	0.00	0.00	0.00	0.00	-150.86	-52.43	-29.23	60.03				
100.00	100.00	100.00	100.00	0.25	0.25	-150.86	-52.43	-29.23	60.03	59.52	0.50	119.605	
200.00	200.00	200.00	200.00	0.61	0.61	-150.86	-52.43	-29.23	60.03	58.81	1.22	49.249	
300.00	300.00	300.00	300.00	0.97	0.97	-150.86	-52.43	-29.23	60.03	58.09	1.94	31.009	
400.00	400.00	400.00	400.00	1.33	1.33	-150.86	-52.43	-29.23	60.03	57.37	2.65	22.628	
500.00	500.00	500.00	500.00	1.68	1.68	-150.86	-52.43	-29.23	60.03	56.66	3.37	17.814 CC, ES	
600.00	599.98	599.98	599.98	2.04	2.04	-161.38	-52.43	-29.23	61.68	57.59	4.09	15.092	
700.00	699.84	699.84	699.84	2.41	2.40	-162.78	-52.43	-29.23	66.66	61.85	4.81	13.869	
800.00	799.45	801.68	801.66	2.77	2.77	-164.02	-50.63	-29.43	73.53	68.00	5.53	13.298	
900.00	898.70	903.74	903.57	3.13	3.13	-164.35	-45.23	-30.04	80.77	74.52	6.25	12.920	
1,000.00	997.47	1,006.01	1,005.43	3.50	3.50	-163.99	-36.20	-31.05	88.34	81.37	6.97	12.668	
1,100.00	1,095.63	1,108.49	1,107.10	3.89	3.88	-160.95	-23.53	-32.47	96.08	88.39	7.70	12.480	
1,200.00	1,193.09	1,209.44	1,206.85	4.29	4.25	-158.77	-8.06	-34.20	104.28	95.85	8.44	12.361 SF	
1,300.00	1,289.73	1,308.84	1,305.00	4.72	4.62	-157.87	7.52	-35.95	115.15	105.97	9.18	12.539	
1,400.00	1,385.42	1,407.84	1,402.76	5.16	5.00	-157.94	23.04	-37.68	129.02	119.08	9.94	12.981	
1,496.97	1,477.20	1,503.34	1,497.06	5.62	5.37	-158.60	38.01	-39.36	145.39	134.72	10.67	13.620	
1,500.00	1,480.05	1,506.31	1,500.00	5.63	5.38	-158.66	38.48	-39.41	145.95	135.25	10.70	13.640	
1,600.00	1,574.15	1,604.51	1,596.97	6.12	5.76	-160.23	53.87	-41.14	164.41	152.95	11.46	14.348	
1,700.00	1,668.25	1,702.70	1,693.93	6.62	6.15	-161.48	69.27	-42.86	182.96	170.74	12.22	14.970	
1,800.00	1,762.35	1,800.89	1,790.89	7.12	6.53	-162.50	84.66	-44.58	201.58	188.59	12.99	15.519	
1,900.00	1,856.45	1,899.08	1,887.86	7.64	6.92	-163.35	100.05	-46.31	220.26	206.50	13.76	16.006	
2,000.00	1,950.55	1,997.28	1,984.82	8.16	7.31	-164.07	115.45	-48.03	238.97	224.44	14.54	16.441	
2,100.00	2,044.65	2,095.47	2,081.78	8.68	7.70	-164.68	130.84	-49.76	257.72	242.41	15.31	16.831	
2,200.00	2,138.75	2,193.66	2,178.75	9.21	8.09	-165.21	146.23	-51.48	276.49	260.40	16.09	17.183	
2,300.00	2,232.85	2,291.86	2,275.71	9.74	8.48	-165.67	161.62	-53.20	295.28	278.40	16.87	17.502	
2,400.00	2,326.95	2,390.05	2,372.68	10.27	8.87	-166.08	177.02	-54.93	314.08	296.43	17.65	17.791	
2,500.00	2,421.05	2,488.24	2,469.64	10.81	9.27	-166.44	192.41	-56.65	332.90	314.46	18.44	18.056	
2,600.00	2,515.15	2,586.43	2,566.60	11.34	9.66	-166.76	207.80	-58.38	351.73	332.51	19.22	18.298	
2,700.00	2,609.25	2,684.63	2,663.57	11.88	10.05	-167.05	223.20	-60.10	370.57	350.56	20.01	18.521	
2,800.00	2,703.35	2,782.82	2,760.53	12.42	10.45	-167.31	238.59	-61.82	389.42	368.62	20.80	18.726	
2,900.00	2,797.45	2,881.01	2,857.49	12.96	10.84	-167.55	253.98	-63.55	408.27	386.69	21.58	18.916	
3,000.00	2,891.55	2,979.21	2,954.46	13.51	11.24	-167.76	269.38	-65.27	427.13	404.76	22.37	19.093	
3,100.00	2,985.65	3,077.40	3,051.42	14.05	11.63	-167.96	284.77	-66.99	446.00	422.84	23.16	19.256	
3,200.00	3,079.75	3,175.59	3,148.38	14.60	12.03	-168.14	300.16	-68.72	464.87	440.92	23.95	19.409	
3,300.00	3,173.85	3,273.79	3,245.35	15.14	12.42	-168.31	315.56	-70.44	483.75	459.01	24.74	19.552	
3,400.00	3,267.95	3,371.98	3,342.31	15.69	12.82	-168.46	330.95	-72.17	502.63	477.09	25.53	19.686	
3,500.00	3,362.05	3,470.17	3,439.27	16.23	13.22	-168.61	346.34	-73.89	521.51	495.19	26.32	19.811	
3,600.00	3,456.15	3,568.36	3,536.24	16.78	13.61	-168.74	361.74	-75.61	540.40	513.28	27.12	19.929	
3,700.00	3,550.25	3,666.56	3,633.20	17.33	14.01	-168.87	377.13	-77.34	559.28	531.37	27.91	20.040	
3,800.00	3,644.35	3,764.75	3,730.17	17.88	14.41	-168.98	392.52	-79.06	578.17	549.47	28.70	20.144	
3,900.00	3,738.45	3,862.94	3,827.13	18.42	14.80	-169.09	407.92	-80.79	597.07	567.57	29.49	20.243	
4,000.00	3,832.55	3,961.14	3,924.09	18.97	15.20	-169.20	423.31	-82.51	615.96	585.67	30.29	20.337	
4,100.00	3,926.65	4,059.33	4,021.06	19.52	15.60	-169.29	438.70	-84.23	634.86	603.78	31.08	20.425	
4,200.00	4,020.75	4,157.52	4,118.02	20.07	15.99	-169.38	454.10	-85.96	653.76	621.88	31.88	20.509	
4,300.00	4,114.85	4,255.71	4,214.98	20.62	16.39	-169.47	469.49	-87.68	672.66	639.99	32.67	20.589	
4,400.00	4,208.95	4,353.91	4,311.95	21.17	16.79	-169.55	484.88	-89.41	691.56	658.09	33.46	20.665	
4,500.00	4,303.05	4,452.10	4,408.91	21.72	17.19	-169.63	500.27	-91.13	710.46	676.20	34.26	20.737	
4,600.00	4,397.15	4,550.29	4,505.87	22.27	17.58	-169.70	515.67	-92.85	729.36	694.31	35.05	20.806	
4,700.00	4,491.25	4,648.49	4,602.84	22.82	17.98	-169.77	531.06	-94.58	748.27	712.42	35.85	20.872	
4,800.00	4,585.35	4,746.68	4,699.80	23.37	18.38	-169.83	546.45	-96.30	767.17	730.53	36.65	20.935	
4,900.00	4,679.45	4,844.87	4,796.76	23.93	18.78	-169.90	561.85	-98.02	786.08	748.64	37.44	20.995	
5,000.00	4,773.55	4,943.07	4,893.73	24.48	19.18	-169.96	577.24	-99.75	804.99	766.75	38.24	21.053	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #692H - OH - Prelim 5													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HRGM+MS													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis			Offset Wellbore Centre		Distance		Rule Assigned:		Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
5,100.00	4,867.65	5,041.26	4,990.69	25.03	19.57	-170.01	592.63	-101.47	823.89	784.86	39.03	21.108	
5,200.00	4,961.75	5,139.45	5,087.66	25.58	19.97	-170.07	608.03	-103.20	842.80	802.97	39.83	21.161	
5,300.00	5,055.85	5,237.64	5,184.62	26.13	20.37	-170.12	623.42	-104.92	861.71	821.09	40.62	21.212	
5,400.00	5,149.95	5,335.84	5,281.58	26.68	20.77	-170.17	638.81	-106.64	880.62	839.20	41.42	21.260	
5,500.00	5,244.05	5,434.03	5,378.55	27.24	21.17	-170.22	654.21	-108.37	899.53	857.32	42.22	21.307	
5,600.00	5,338.15	5,522.13	5,465.60	27.79	21.52	-170.27	667.64	-109.87	918.86	875.92	42.95	21.396	
5,665.73	5,400.00	5,577.92	5,520.83	28.15	21.74	-170.31	675.48	-110.75	932.30	888.90	43.40	21.479	
5,700.00	5,432.28	5,606.94	5,549.59	28.34	21.86	-170.35	679.35	-111.18	939.44	895.80	43.64	21.527	
5,800.00	5,526.87	5,691.48	5,633.47	28.88	22.18	-170.46	689.80	-112.35	960.08	915.76	44.32	21.663	
5,900.00	5,622.01	5,775.82	5,717.31	29.41	22.50	-170.58	698.99	-113.38	980.39	935.41	44.98	21.796	
6,000.00	5,717.67	5,859.97	5,801.07	29.92	22.82	-170.70	706.94	-114.27	1,000.40	954.77	45.62	21.928	
6,100.00	5,813.83	5,943.93	5,884.76	30.41	23.12	-170.82	713.65	-115.03	1,020.08	973.83	46.25	22.057	
6,200.00	5,910.44	6,027.70	5,968.34	30.89	23.42	-170.95	719.13	-115.64	1,039.44	992.59	46.85	22.184	
6,300.00	6,007.50	6,111.28	6,051.82	31.36	23.72	-171.08	723.39	-116.12	1,058.48	1,011.04	47.44	22.310	
6,400.00	6,104.96	6,200.00	6,140.48	31.80	24.02	-171.23	726.59	-116.47	1,077.21	1,029.13	48.07	22.409	
6,500.00	6,202.80	6,277.91	6,218.37	32.24	24.28	-171.36	728.27	-116.66	1,095.57	1,047.00	48.57	22.557	
6,600.00	6,300.98	7,504.96	6,987.00	32.66	29.89	151.00	1,090.57	519.15	1,087.94	1,036.49	51.45	21.146	
6,700.00	6,399.48	7,514.28	6,987.00	33.06	29.96	150.17	1,095.23	527.22	1,040.63	986.98	53.65	19.397	
6,722.82	6,422.00	7,516.28	6,987.00	33.15	29.97	150.00	1,096.23	528.95	1,030.68	976.55	54.13	19.041	
6,750.00	6,448.76	7,518.45	6,987.00	33.26	29.99	159.28	1,097.32	530.83	1,019.83	965.13	54.70	18.645	
6,800.00	6,497.51	7,521.52	6,987.00	33.48	30.01	169.89	1,098.85	533.49	1,004.19	948.48	55.71	18.025	
6,850.00	6,545.40	7,523.37	6,987.00	33.72	30.03	176.02	1,099.77	535.09	994.45	937.79	56.66	17.551	
6,900.00	6,592.13	7,523.98	6,987.00	33.97	30.03	-179.99	1,100.08	535.62	990.86	933.35	57.52	17.228	
6,903.80	6,595.62	7,523.98	6,987.00	33.99	30.03	-179.74	1,100.08	535.62	990.84	933.27	57.58	17.209	
6,950.00	6,637.40	7,523.36	6,987.00	34.25	30.03	-177.08	1,099.77	535.08	993.51	935.26	58.25	17.057	
7,000.00	6,680.94	7,521.51	6,987.00	34.54	30.01	-174.70	1,098.84	533.48	1,002.32	943.49	58.84	17.036	
7,050.00	6,722.48	7,518.43	6,987.00	34.85	29.99	-172.58	1,097.31	530.81	1,017.08	957.80	59.28	17.158	
7,100.00	6,761.76	7,514.15	6,987.00	35.17	29.96	-170.49	1,095.17	527.11	1,037.44	977.86	59.58	17.412	
7,150.00	6,798.55	7,508.70	6,987.00	35.51	29.92	-168.30	1,092.44	522.39	1,062.94	1,003.18	59.76	17.787	
7,200.00	6,832.61	7,502.11	6,987.00	35.86	29.87	-165.85	1,089.14	516.67	1,093.04	1,033.21	59.83	18.269	
7,250.00	6,863.74	7,494.41	6,987.00	36.22	29.81	-163.00	1,085.30	510.01	1,127.19	1,067.37	59.82	18.843	
7,300.00	6,891.74	7,485.66	6,987.00	36.59	29.75	-159.55	1,080.92	502.43	1,164.81	1,105.06	59.75	19.496	
7,350.00	6,916.44	7,475.91	6,987.00	36.98	29.68	-155.24	1,076.05	493.99	1,205.32	1,145.70	59.63	20.215	
7,400.00	6,937.69	7,465.22	6,987.00	37.37	29.61	-149.73	1,070.70	484.73	1,248.19	1,188.72	59.48	20.986	
7,450.00	6,955.36	7,453.65	6,987.00	37.78	29.53	-142.55	1,064.92	474.71	1,292.91	1,233.60	59.31	21.799	
7,500.00	6,969.34	7,441.29	6,987.00	38.19	29.44	-133.16	1,058.74	464.00	1,339.02	1,279.88	59.14	22.642	
7,550.00	6,979.53	7,428.20	6,987.00	38.62	29.35	-121.17	1,052.19	452.67	1,386.07	1,327.11	58.96	23.507	
7,600.00	6,985.89	7,414.46	6,987.00	39.05	29.26	-106.90	1,045.32	440.77	1,433.69	1,374.90	58.79	24.386	
7,650.00	6,988.37	7,400.01	6,986.92	39.48	29.16	-91.80	1,038.10	428.26	1,481.53	1,422.90	58.63	25.271	
7,657.25	6,988.40	7,397.87	6,986.89	39.54	29.15	-89.67	1,037.03	426.40	1,488.46	1,429.86	58.60	25.399	
7,700.00	6,988.37	7,385.18	6,986.52	39.92	29.06	-89.63	1,030.69	415.42	1,529.34	1,470.88	58.46	26.159	
7,800.00	6,988.30	7,355.56	6,984.68	40.82	28.87	-89.43	1,015.92	389.81	1,624.96	1,566.82	58.14	27.949	
7,900.00	6,988.23	7,326.09	6,981.49	41.77	28.68	-89.10	1,001.29	364.43	1,720.58	1,662.76	57.82	29.758	
8,000.00	6,988.16	7,296.91	6,977.00	42.75	28.50	-88.67	986.91	339.45	1,816.20	1,758.69	57.51	31.583	
8,100.00	6,988.09	7,268.14	6,971.28	43.76	28.32	-88.14	972.84	315.01	1,911.83	1,854.63	57.20	33.424	
8,152.35	6,988.06	7,253.27	6,967.83	44.30	28.23	-87.84	965.63	302.47	1,961.90	1,904.85	57.04	34.393	
8,200.00	6,988.02	7,239.16	6,964.24	44.79	28.15	-87.78	958.83	290.64	2,007.24	1,950.34	56.89	35.280	
8,300.00	6,987.95	7,205.57	6,954.49	45.83	27.95	-87.54	942.82	262.77	2,100.70	2,044.15	56.54	37.152	
8,400.00	6,987.88	7,167.36	6,941.35	46.85	27.74	-87.20	924.97	231.66	2,191.54	2,135.39	56.15	39.032	
8,500.00	6,987.80	7,125.62	6,924.57	47.85	27.51	-86.78	905.97	198.51	2,279.40	2,223.67	55.73	40.904	
8,600.00	6,987.73	7,081.60	6,904.20	48.83	27.29	-86.32	886.58	164.65	2,363.98	2,308.69	55.29	42.755	
8,700.00	6,987.65	7,036.60	6,880.65	49.79	27.07	-85.83	867.57	131.37	2,445.05	2,390.19	54.86	44.567	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #692H - OH - Prelim 5													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HRGM+MS				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)			
8,800.00	6,987.57	6,991.89	6,854.61	50.72	26.87	-85.34	849.56	99.80	2,522.43	2,467.97	54.45	46.324		
8,900.00	6,987.50	6,950.00	6,827.97	51.62	26.69	-84.90	833.57	71.73	2,596.00	2,541.91	54.09	47.996		
9,000.00	6,987.42	6,907.31	6,798.69	52.48	26.51	-84.44	818.22	44.73	2,665.69	2,611.97	53.72	49.617		
9,100.00	6,987.34	6,868.84	6,770.57	53.30	26.35	-84.05	805.27	21.89	2,731.49	2,678.07	53.42	51.133		
9,200.00	6,987.27	6,833.40	6,743.31	54.08	26.21	-83.70	794.12	2.20	2,793.37	2,740.23	53.14	52.563		
9,215.33	6,987.26	6,828.24	6,739.24	54.20	26.19	-83.66	792.56	-0.56	2,802.51	2,749.41	53.10	52.776		
9,300.00	6,987.20	6,800.00	6,716.50	54.85	26.08	-83.11	784.33	-15.15	2,853.35	2,800.43	52.93	53.911		
9,400.00	6,987.12	6,773.54	6,694.55	55.65	25.98	-82.58	777.09	-28.01	2,914.95	2,862.16	52.79	55.215		
9,500.00	6,987.05	6,750.00	6,674.51	56.48	25.89	-82.11	771.03	-38.78	2,978.23	2,925.55	52.68	56.538		
9,600.00	6,986.98	6,727.09	6,654.58	57.35	25.81	-81.63	765.50	-48.64	3,043.13	2,990.54	52.59	57.870		
9,700.00	6,986.90	6,700.00	6,630.52	58.24	25.71	-81.06	759.44	-59.49	3,109.64	3,057.19	52.45	59.283		
9,800.00	6,986.83	6,700.00	6,630.52	59.17	25.71	-81.06	759.44	-59.49	3,177.67	3,125.07	52.60	60.411		
9,900.00	6,986.75	6,674.80	6,607.68	60.12	25.61	-80.52	754.26	-68.79	3,247.13	3,194.62	52.50	61.846		
10,000.00	6,986.68	6,650.00	6,584.80	61.10	25.52	-79.99	749.61	-77.16	3,318.06	3,265.64	52.41	63.304		
10,100.00	6,986.61	6,650.00	6,584.80	62.11	25.52	-79.99	749.61	-77.16	3,390.24	3,337.68	52.56	64.498		
10,200.00	6,986.53	6,650.00	6,584.80	63.14	25.52	-79.99	749.61	-77.16	3,463.81	3,411.10	52.71	65.714		
10,300.00	6,986.46	6,626.00	6,562.33	64.20	25.43	-79.46	745.55	-84.53	3,538.43	3,485.79	52.64	67.217		
10,400.00	6,986.39	6,600.00	6,537.64	65.28	25.34	-78.88	741.62	-91.67	3,614.38	3,561.82	52.56	68.766		
10,500.00	6,986.31	6,600.00	6,537.64	66.38	25.34	-78.88	741.62	-91.67	3,691.22	3,638.51	52.71	70.033		
10,600.00	6,986.24	6,600.00	6,537.64	67.50	25.34	-78.88	741.62	-91.67	3,769.14	3,716.29	52.85	71.318		
10,700.00	6,986.17	6,600.00	6,537.64	68.64	25.34	-78.88	741.62	-91.67	3,848.08	3,795.09	52.99	72.619		
10,800.00	6,986.09	6,600.00	6,537.64	69.80	25.34	-78.88	741.62	-91.67	3,927.98	3,874.86	53.13	73.937		
10,900.00	6,986.02	6,578.33	6,516.82	70.98	25.26	-78.40	738.74	-96.96	4,008.57	3,955.48	53.09	75.502		
11,000.00	6,985.95	6,572.28	6,510.98	72.17	25.24	-78.26	738.00	-98.33	4,090.08	4,036.90	53.18	76.910		
11,100.00	6,985.87	6,550.00	6,489.32	73.38	25.16	-77.76	735.52	-102.94	4,172.50	4,119.35	53.15	78.511		
11,200.00	6,985.80	6,550.00	6,489.32	74.61	25.16	-77.76	735.52	-102.94	4,255.45	4,202.17	53.28	79.875		
11,300.00	6,985.72	6,550.00	6,489.32	75.85	25.16	-77.76	735.52	-102.94	4,339.11	4,285.71	53.40	81.251		
11,400.00	6,985.65	6,550.00	6,489.32	77.10	25.16	-77.76	735.52	-102.94	4,423.46	4,369.93	53.53	82.637		
11,500.00	6,985.58	6,550.00	6,489.32	78.37	25.16	-77.76	735.52	-102.94	4,508.44	4,454.79	53.65	84.033		
11,600.00	6,985.50	6,550.00	6,489.32	79.65	25.16	-77.76	735.52	-102.94	4,594.03	4,540.26	53.77	85.439		
11,700.00	6,985.43	6,550.00	6,489.32	80.94	25.16	-77.76	735.52	-102.94	4,680.19	4,626.30	53.89	86.853		
11,800.00	6,985.36	6,550.00	6,489.32	82.24	25.16	-77.76	735.52	-102.94	4,766.89	4,712.89	54.00	88.276		
11,900.00	6,985.28	6,550.00	6,489.32	83.56	25.16	-77.76	735.52	-102.94	4,854.10	4,799.99	54.11	89.705		
12,000.00	6,985.21	6,528.95	6,468.71	84.88	25.09	-77.28	733.52	-106.70	4,941.57	4,887.48	54.09	91.354		
12,100.00	6,985.14	6,525.82	6,465.63	86.21	25.08	-77.21	733.25	-107.20	5,029.65	4,975.47	54.18	92.827		
12,200.00	6,985.06	6,522.84	6,462.70	87.56	25.07	-77.14	733.00	-107.67	5,118.16	5,063.89	54.27	94.304		
12,300.00	6,984.99	6,500.00	6,440.15	88.91	24.99	-76.62	731.33	-110.89	5,207.29	5,153.04	54.25	95.993		
12,400.00	6,984.92	6,500.00	6,440.15	90.27	24.99	-76.62	731.33	-110.89	5,296.54	5,242.19	54.35	97.448		
12,500.00	6,984.84	6,500.00	6,440.15	91.64	24.99	-76.62	731.33	-110.89	5,386.17	5,331.71	54.46	98.908		
12,600.00	6,984.77	6,500.00	6,440.15	93.01	24.99	-76.62	731.33	-110.89	5,476.16	5,421.60	54.56	100.372		
12,700.00	6,984.69	6,500.00	6,440.15	94.40	24.99	-76.62	731.33	-110.89	5,566.49	5,511.83	54.66	101.839		
12,800.00	6,984.62	6,500.00	6,440.15	95.79	24.99	-76.62	731.33	-110.89	5,657.14	5,602.38	54.76	103.310		
12,900.00	6,984.55	6,500.00	6,440.15	97.18	24.99	-76.62	731.33	-110.89	5,748.11	5,693.25	54.86	104.785		
13,000.00	6,984.47	6,500.00	6,440.15	98.59	24.99	-76.62	731.33	-110.89	5,839.37	5,784.42	54.95	106.262		
13,100.00	6,984.40	6,500.00	6,440.15	100.00	24.99	-76.62	731.33	-110.89	5,930.91	5,875.86	55.05	107.741		
13,200.00	6,984.33	6,500.00	6,440.15	101.41	24.99	-76.62	731.33	-110.89	6,022.72	5,967.58	55.14	109.222		
13,300.00	6,984.25	6,500.00	6,440.15	102.83	24.99	-76.62	731.33	-110.89	6,114.79	6,059.56	55.23	110.706		
13,400.00	6,984.18	6,500.00	6,440.15	104.26	24.99	-76.62	731.33	-110.89	6,207.10	6,151.78	55.33	112.191		
13,500.00	6,984.11	6,500.00	6,440.15	105.69	24.99	-76.62	731.33	-110.89	6,299.65	6,244.24	55.42	113.677		
13,600.00	6,984.03	6,500.00	6,440.15	107.13	24.99	-76.62	731.33	-110.89	6,392.43	6,336.92	55.51	115.164		
13,700.00	6,983.96	6,500.00	6,440.15	108.57	24.99	-76.62	731.33	-110.89	6,485.41	6,429.82	55.60	116.652		
13,800.00	6,983.88	6,500.00	6,440.15	110.02	24.99	-76.62	731.33	-110.89	6,578.61	6,522.92	55.68	118.140		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #692H - OH - Prelim 5													Offset Site Error:	0.00 usft
Survey Program:		0-MWD+HRGM+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)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
13,900.00	6,983.81	6,500.00	6,440.15	111.47	24.99	-76.62	731.33	-110.89	6,672.00	6,616.23	55.77	119.629		
14,000.00	6,983.74	6,500.00	6,440.15	112.92	24.99	-76.62	731.33	-110.89	6,765.58	6,709.72	55.86	121.118		
14,100.00	6,983.66	6,500.00	6,440.15	114.38	24.99	-76.62	731.33	-110.89	6,859.34	6,803.39	55.95	122.607		
14,200.00	6,983.59	6,500.00	6,440.15	115.85	24.99	-76.62	731.33	-110.89	6,953.27	6,897.24	56.03	124.096		
14,300.00	6,983.52	6,500.00	6,440.15	117.31	24.99	-76.62	731.33	-110.89	7,047.37	6,991.26	56.12	125.584		
14,400.00	6,983.44	6,500.00	6,440.15	118.78	24.99	-76.62	731.33	-110.89	7,141.64	7,085.43	56.20	127.071		
14,500.00	6,983.37	6,500.00	6,440.15	120.26	24.99	-76.62	731.33	-110.89	7,236.05	7,179.77	56.29	128.558		
14,600.00	6,983.30	6,500.00	6,440.15	121.74	24.99	-76.62	731.33	-110.89	7,330.62	7,274.25	56.37	130.044		
14,700.00	6,983.22	6,500.00	6,440.15	123.22	24.99	-76.62	731.33	-110.89	7,425.32	7,368.87	56.45	131.529		
14,800.00	6,983.15	6,476.99	6,417.32	124.70	24.91	-76.09	730.06	-113.42	7,519.85	7,463.41	56.44	133.227		
14,900.00	6,983.08	6,475.94	6,416.27	126.19	24.91	-76.06	730.01	-113.52	7,614.80	7,558.27	56.52	134.718		
15,000.00	6,983.00	6,474.92	6,415.25	127.68	24.91	-76.04	729.96	-113.62	7,709.87	7,653.27	56.60	136.208		
15,100.00	6,982.93	6,473.92	6,414.27	129.17	24.90	-76.02	729.92	-113.71	7,805.06	7,748.38	56.68	137.696		
15,200.00	6,982.85	6,472.96	6,413.31	130.67	24.90	-76.00	729.88	-113.79	7,900.38	7,843.61	56.76	139.182		
15,300.00	6,982.78	6,450.00	6,390.43	132.16	24.82	-75.47	729.09	-115.48	7,996.09	7,939.33	56.76	140.881		
15,400.00	6,982.71	6,450.00	6,390.43	133.66	24.82	-75.47	729.09	-115.48	8,091.60	8,034.76	56.84	142.353		
15,500.00	6,982.63	6,450.00	6,390.43	135.17	24.82	-75.47	729.09	-115.48	8,187.22	8,130.29	56.93	143.824		
15,600.00	6,982.56	6,450.00	6,390.43	136.67	24.82	-75.47	729.09	-115.48	8,282.94	8,225.93	57.01	145.292		
15,700.00	6,982.49	6,450.00	6,390.43	138.18	24.82	-75.47	729.09	-115.48	8,378.76	8,321.67	57.09	146.758		
15,800.00	6,982.41	6,450.00	6,390.43	139.69	24.82	-75.47	729.09	-115.48	8,474.68	8,417.51	57.18	148.222		
15,900.00	6,982.34	6,450.00	6,390.43	141.20	24.82	-75.47	729.09	-115.48	8,570.69	8,513.44	57.26	149.683		
16,000.00	6,982.27	6,450.00	6,390.43	142.71	24.82	-75.47	729.09	-115.48	8,666.80	8,609.45	57.34	151.141		
16,100.00	6,982.19	6,450.00	6,390.43	144.23	24.82	-75.47	729.09	-115.48	8,762.99	8,705.56	57.43	152.597		
16,200.00	6,982.12	6,450.00	6,390.43	145.75	24.82	-75.47	729.09	-115.48	8,859.26	8,801.75	57.51	154.050		
16,300.00	6,982.05	6,450.00	6,390.43	147.27	24.82	-75.47	729.09	-115.48	8,955.62	8,898.02	57.59	155.501		
16,400.00	6,981.97	6,450.00	6,390.43	148.79	24.82	-75.47	729.09	-115.48	9,052.05	8,994.37	57.68	156.948		
16,500.00	6,981.90	6,450.00	6,390.43	150.31	24.82	-75.47	729.09	-115.48	9,148.56	9,090.80	57.76	158.392		
16,600.00	6,981.82	6,450.00	6,390.43	151.84	24.82	-75.47	729.09	-115.48	9,245.15	9,187.30	57.84	159.834		
16,700.00	6,981.75	6,450.00	6,390.43	153.36	24.82	-75.47	729.09	-115.48	9,341.80	9,283.88	57.93	161.272		
16,800.00	6,981.68	6,450.00	6,390.43	154.89	24.82	-75.47	729.09	-115.48	9,438.53	9,380.52	58.01	162.707		
16,900.00	6,981.60	6,450.00	6,390.43	156.42	24.82	-75.47	729.09	-115.48	9,535.32	9,477.23	58.09	164.138		
17,000.00	6,981.53	6,450.00	6,390.43	157.95	24.82	-75.47	729.09	-115.48	9,632.18	9,574.01	58.18	165.566		
17,100.00	6,981.46	6,450.00	6,390.43	159.49	24.82	-75.47	729.09	-115.48	9,729.11	9,670.85	58.26	166.991		
17,200.00	6,981.38	6,450.00	6,390.43	161.02	24.82	-75.47	729.09	-115.48	9,826.09	9,767.75	58.35	168.413		
17,300.00	6,981.31	6,450.00	6,390.43	162.56	24.82	-75.47	729.09	-115.48	9,923.14	9,864.71	58.43	169.831		
17,400.00	6,981.24	6,450.00	6,390.43	164.09	24.82	-75.47	729.09	-115.48	10,020.24	9,961.73	58.51	171.245		
17,500.00	6,981.16	6,450.00	6,390.43	165.63	24.82	-75.47	729.09	-115.48	10,117.40	10,058.80	58.60	172.656		
17,600.00	6,981.09	6,450.00	6,390.43	167.17	24.82	-75.47	729.09	-115.48	10,214.61	10,155.93	58.68	174.063		
17,700.00	6,981.01	6,450.00	6,390.43	168.71	24.82	-75.47	729.09	-115.48	10,311.88	10,253.11	58.77	175.466		
17,800.00	6,980.94	6,450.00	6,390.43	170.25	24.82	-75.47	729.09	-115.48	10,409.20	10,350.35	58.85	176.866		
17,900.00	6,980.87	6,450.00	6,390.43	171.80	24.82	-75.47	729.09	-115.48	10,506.57	10,447.63	58.94	178.261		
18,000.00	6,980.79	6,450.00	6,390.43	173.34	24.82	-75.47	729.09	-115.48	10,603.99	10,544.96	59.02	179.653		
18,100.00	6,980.72	6,450.00	6,390.43	174.89	24.82	-75.47	729.09	-115.48	10,701.45	10,642.34	59.11	181.041		
18,200.00	6,980.65	6,450.00	6,390.43	176.43	24.82	-75.47	729.09	-115.48	10,798.97	10,739.77	59.20	182.425		
18,300.00	6,980.57	6,450.00	6,390.43	177.98	24.82	-75.47	729.09	-115.48	10,896.52	10,837.24	59.28	183.806		
18,400.00	6,980.50	6,450.00	6,390.43	179.53	24.82	-75.47	729.09	-115.48	10,994.13	10,934.76	59.37	185.182		
18,500.00	6,980.43	6,450.00	6,390.43	181.08	24.82	-75.47	729.09	-115.48	11,091.77	11,032.31	59.46	186.554		
18,600.00	6,980.35	6,450.00	6,390.43	182.63	24.82	-75.47	729.09	-115.48	11,189.46	11,129.91	59.54	187.922		
18,700.00	6,980.28	6,450.00	6,390.43	184.18	24.82	-75.47	729.09	-115.48	11,287.18	11,227.55	59.63	189.286		
18,800.00	6,980.21	6,450.00	6,390.43	185.73	24.82	-75.47	729.09	-115.48	11,384.95	11,325.23	59.72	190.645		
18,900.00	6,980.13	6,450.00	6,390.43	187.28	24.82	-75.47	729.09	-115.48	11,482.75	11,422.95	59.81	192.001		
19,000.00	6,980.06	6,450.00	6,390.43	188.84	24.82	-75.47	729.09	-115.48	11,580.59	11,520.70	59.89	193.353		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #692H - OH - Prelim 5													Offset Site Error:	0.00 usft
Survey Program:		0-MWD+HRGM+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 (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
19,100.00	6,979.98	6,450.00	6,390.43	190.39	24.82	-75.47	729.09	-115.48	11,678.47	11,618.49	59.98	194.700		
19,200.00	6,979.91	6,450.00	6,390.43	191.95	24.82	-75.47	729.09	-115.48	11,776.39	11,716.32	60.07	196.043		
19,300.00	6,979.84	6,450.00	6,390.43	193.51	24.82	-75.47	729.09	-115.48	11,874.34	11,814.18	60.16	197.381		
19,400.00	6,979.76	6,450.00	6,390.43	195.06	24.82	-75.47	729.09	-115.48	11,972.32	11,912.07	60.25	198.716		
19,500.00	6,979.69	6,450.00	6,390.43	196.62	24.82	-75.47	729.09	-115.48	12,070.33	12,010.00	60.34	200.046		
19,600.00	6,979.62	6,450.00	6,390.43	198.18	24.82	-75.47	729.09	-115.48	12,168.38	12,107.95	60.43	201.372		
19,700.00	6,979.54	6,450.00	6,390.43	199.74	24.82	-75.47	729.09	-115.48	12,266.46	12,205.94	60.52	202.693		
19,800.00	6,979.47	6,450.00	6,390.43	201.30	24.82	-75.47	729.09	-115.48	12,364.57	12,303.96	60.61	204.010		
19,900.00	6,979.40	6,450.00	6,390.43	202.86	24.82	-75.47	729.09	-115.48	12,462.71	12,402.01	60.70	205.323		
20,000.00	6,979.32	6,450.00	6,390.43	204.42	24.82	-75.47	729.09	-115.48	12,560.88	12,500.09	60.79	206.631		
20,100.00	6,979.25	6,450.00	6,390.43	205.98	24.82	-75.47	729.09	-115.48	12,659.08	12,598.20	60.88	207.935		
20,200.00	6,979.18	6,450.00	6,390.43	207.55	24.82	-75.47	729.09	-115.48	12,757.31	12,696.34	60.97	209.235		
20,300.00	6,979.10	6,450.00	6,390.43	209.11	24.82	-75.47	729.09	-115.48	12,855.56	12,794.50	61.06	210.530		
20,400.00	6,979.03	6,450.00	6,390.43	210.68	24.82	-75.47	729.09	-115.48	12,953.84	12,892.69	61.15	211.821		
20,500.00	6,978.95	6,450.00	6,390.43	212.24	24.82	-75.47	729.09	-115.48	13,052.15	12,990.90	61.25	213.107		
20,600.00	6,978.88	6,450.00	6,390.43	213.81	24.82	-75.47	729.09	-115.48	13,150.48	13,089.14	61.34	214.388		
20,700.00	6,978.81	6,450.00	6,390.43	215.37	24.82	-75.47	729.09	-115.48	13,248.84	13,187.40	61.43	215.665		
20,800.00	6,978.73	6,450.00	6,390.43	216.94	24.82	-75.47	729.09	-115.48	13,347.22	13,285.69	61.53	216.938		
20,900.00	6,978.66	6,450.00	6,390.43	218.51	24.82	-75.47	729.09	-115.48	13,445.62	13,384.01	61.62	218.206		
21,000.00	6,978.59	6,450.00	6,390.43	220.07	24.82	-75.47	729.09	-115.48	13,544.05	13,482.34	61.71	219.470		
21,100.00	6,978.51	6,450.00	6,390.43	221.64	24.82	-75.47	729.09	-115.48	13,642.50	13,580.70	61.81	220.729		
21,200.00	6,978.44	6,450.00	6,390.43	223.21	24.82	-75.47	729.09	-115.48	13,740.98	13,679.08	61.90	221.984		
21,300.00	6,978.37	6,450.00	6,390.43	224.78	24.82	-75.47	729.09	-115.48	13,839.47	13,777.48	62.00	223.234		
21,400.00	6,978.29	6,450.00	6,390.43	226.35	24.82	-75.47	729.09	-115.48	13,937.99	13,875.90	62.09	224.479		
21,500.00	6,978.22	6,450.00	6,390.43	227.92	24.82	-75.47	729.09	-115.48	14,036.53	13,974.34	62.19	225.720		
21,600.00	6,978.14	6,450.00	6,390.43	229.49	24.82	-75.47	729.09	-115.48	14,135.09	14,072.81	62.28	226.957		
21,700.00	6,978.07	6,450.00	6,390.43	231.06	24.82	-75.47	729.09	-115.48	14,233.67	14,171.29	62.38	228.189		
21,800.00	6,978.00	6,450.00	6,390.43	232.63	24.82	-75.47	729.09	-115.48	14,332.27	14,269.79	62.47	229.416		
21,900.00	6,977.92	6,450.00	6,390.43	234.21	24.82	-75.47	729.09	-115.48	14,430.88	14,368.31	62.57	230.639		
22,000.00	6,977.85	6,450.00	6,390.43	235.78	24.82	-75.47	729.09	-115.48	14,529.52	14,466.85	62.67	231.857		
22,100.00	6,977.78	6,450.00	6,390.43	237.35	24.82	-75.47	729.09	-115.48	14,628.18	14,565.41	62.76	233.071		
22,200.00	6,977.70	6,450.00	6,390.43	238.92	24.82	-75.47	729.09	-115.48	14,726.85	14,663.99	62.86	234.280		
22,300.00	6,977.63	6,450.00	6,390.43	240.50	24.82	-75.47	729.09	-115.48	14,825.54	14,762.58	62.96	235.484		
22,400.00	6,977.56	6,450.00	6,390.43	242.07	24.82	-75.47	729.09	-115.48	14,924.25	14,861.19	63.06	236.684		
22,500.00	6,977.48	6,450.00	6,390.43	243.65	24.82	-75.47	729.09	-115.48	15,022.97	14,959.82	63.15	237.880		
22,600.00	6,977.41	6,450.00	6,390.43	245.22	24.82	-75.47	729.09	-115.48	15,121.72	15,058.47	63.25	239.071		
22,700.00	6,977.34	6,450.00	6,390.43	246.80	24.82	-75.47	729.09	-115.48	15,220.48	15,157.13	63.35	240.257		
22,800.00	6,977.26	6,450.00	6,390.43	248.37	24.82	-75.47	729.09	-115.48	15,319.25	15,255.80	63.45	241.439		
22,900.00	6,977.19	6,450.00	6,390.43	249.95	24.82	-75.47	729.09	-115.48	15,418.04	15,354.49	63.55	242.616		
23,000.00	6,977.11	6,450.00	6,390.43	251.53	24.82	-75.47	729.09	-115.48	15,516.85	15,453.20	63.65	243.789		
23,100.00	6,977.04	6,450.00	6,390.43	253.10	24.82	-75.47	729.09	-115.48	15,615.67	15,551.92	63.75	244.957		
23,155.65	6,977.00	6,450.00	6,390.43	253.98	24.82	-75.47	729.09	-115.48	15,670.67	15,606.87	63.80	245.605		
23,156.15	6,977.00	6,450.00	6,390.43	254.06	24.82	-75.47	729.09	-115.48	15,671.17	15,602.69	68.48	228.851		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #694H - OH - Prelim 5													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HRGM+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)			
0.00	0.00	0.00	0.00	0.00	0.00	-150.92	-69.90	-38.88	79.99				
100.00	100.00	100.00	100.00	0.25	0.25	-150.92	-69.90	-38.88	79.99	79.48	0.50	159.379	
200.00	200.00	200.00	200.00	0.61	0.61	-150.92	-69.90	-38.88	79.99	78.77	1.22	65.627	
300.00	300.00	300.00	300.00	0.97	0.97	-150.92	-69.90	-38.88	79.99	78.05	1.94	41.321	
400.00	400.00	400.00	400.00	1.33	1.33	-150.92	-69.90	-38.88	79.99	77.33	2.65	30.153	
500.00	500.00	500.00	500.00	1.68	1.68	-150.92	-69.90	-38.88	79.99	76.62	3.37	23.737	CC, ES
600.00	599.98	599.98	599.98	2.04	2.04	-161.31	-69.90	-38.88	81.64	77.55	4.09	19.976	
700.00	699.84	699.84	699.84	2.41	2.40	-162.39	-69.90	-38.88	86.61	81.81	4.81	18.021	
800.00	799.45	802.12	802.10	2.77	2.77	-163.31	-68.11	-39.22	93.54	88.01	5.53	16.912	
900.00	898.70	903.07	902.93	3.13	3.13	-163.59	-63.32	-40.13	101.39	95.14	6.25	16.213	
1,000.00	997.47	1,002.47	1,002.19	3.50	3.49	-164.18	-58.21	-41.10	112.27	105.30	6.98	16.092	
1,100.00	1,095.63	1,101.44	1,101.03	3.89	3.84	-162.82	-53.13	-42.07	126.35	118.65	7.70	16.405	
1,200.00	1,193.09	1,199.88	1,199.33	4.29	4.20	-162.54	-48.07	-43.03	143.51	135.08	8.43	17.026	
1,300.00	1,289.73	1,297.68	1,297.00	4.72	4.55	-162.88	-43.04	-43.98	163.82	154.66	9.16	17.890	
1,400.00	1,385.42	1,394.71	1,393.89	5.16	4.90	-163.54	-38.06	-44.93	187.35	177.47	9.89	18.949	
1,496.97	1,477.20	1,487.95	1,487.01	5.62	5.23	-164.33	-33.27	-45.84	213.28	202.68	10.60	20.129	
1,500.00	1,480.05	1,490.85	1,489.91	5.63	5.25	-164.38	-33.12	-45.87	214.14	203.52	10.62	20.161	
1,600.00	1,574.15	1,586.54	1,585.47	6.12	5.59	-165.95	-28.20	-46.80	242.55	231.20	11.35	21.377	
1,700.00	1,668.25	1,682.24	1,681.03	6.62	5.94	-167.19	-23.28	-47.73	271.09	259.02	12.07	22.451	
1,800.00	1,762.35	1,777.93	1,776.59	7.12	6.28	-168.19	-18.37	-48.67	299.73	286.92	12.81	23.404	
1,900.00	1,856.45	1,873.62	1,872.15	7.64	6.63	-169.02	-13.45	-49.60	328.44	314.90	13.54	24.253	
2,000.00	1,950.55	1,969.31	1,967.71	8.16	6.98	-169.71	-8.53	-50.54	357.20	342.92	14.28	25.014	
2,100.00	2,044.65	2,065.01	2,063.27	8.68	7.32	-170.30	-3.62	-51.47	386.00	370.98	15.02	25.699	
2,200.00	2,138.75	2,160.70	2,158.84	9.21	7.67	-170.81	1.30	-52.40	414.83	399.07	15.76	26.318	
2,300.00	2,232.85	2,256.39	2,254.40	9.74	8.01	-171.25	6.22	-53.34	443.69	427.19	16.51	26.881	
2,400.00	2,326.95	2,352.08	2,349.96	10.27	8.36	-171.64	11.13	-54.27	472.57	455.32	17.25	27.394	
2,500.00	2,421.05	2,447.77	2,445.52	10.81	8.71	-171.99	16.05	-55.20	501.47	483.47	18.00	27.864	
2,600.00	2,515.15	2,543.47	2,541.08	11.34	9.05	-172.29	20.97	-56.14	530.38	511.64	18.74	28.295	
2,700.00	2,609.25	2,639.16	2,636.64	11.88	9.40	-172.57	25.88	-57.07	559.31	539.82	19.49	28.692	
2,800.00	2,703.35	2,734.85	2,732.20	12.42	9.75	-172.82	30.80	-58.01	588.25	568.00	20.24	29.060	
2,900.00	2,797.45	2,830.54	2,827.77	12.96	10.09	-173.04	35.72	-58.94	617.19	596.20	20.99	29.400	
3,000.00	2,891.55	2,926.24	2,923.33	13.51	10.44	-173.24	40.63	-59.87	646.15	624.40	21.74	29.716	
3,100.00	2,985.65	3,021.93	3,018.89	14.05	10.79	-173.43	45.55	-60.81	675.11	652.61	22.50	30.010	
3,200.00	3,079.75	3,117.62	3,114.45	14.60	11.14	-173.60	50.47	-61.74	704.07	680.83	23.25	30.285	
3,300.00	3,173.85	3,213.31	3,210.01	15.14	11.48	-173.76	55.38	-62.68	733.05	709.04	24.00	30.542	
3,400.00	3,267.95	3,309.01	3,305.57	15.69	11.83	-173.91	60.30	-63.61	762.02	737.27	24.75	30.783	
3,500.00	3,362.05	3,404.70	3,401.13	16.23	12.18	-174.04	65.22	-64.54	791.00	765.49	25.51	31.010	
3,600.00	3,456.15	3,500.39	3,496.70	16.78	12.52	-174.17	70.13	-65.48	819.99	793.72	26.26	31.223	
3,700.00	3,550.25	3,596.08	3,592.26	17.33	12.87	-174.29	75.05	-66.41	848.98	821.96	27.02	31.424	
3,800.00	3,644.35	3,691.78	3,687.82	17.88	13.22	-174.40	79.97	-67.34	877.97	850.19	27.77	31.613	
3,900.00	3,738.45	3,787.47	3,783.38	18.42	13.56	-174.50	84.88	-68.28	906.96	878.43	28.53	31.793	
4,000.00	3,832.55	3,883.16	3,878.94	18.97	13.91	-174.59	89.80	-69.21	935.96	906.67	29.28	31.962	
4,100.00	3,926.65	3,978.85	3,974.50	19.52	14.26	-174.68	94.72	-70.15	964.95	934.92	30.04	32.123	
4,200.00	4,020.75	4,074.55	4,070.06	20.07	14.61	-174.77	99.63	-71.08	993.96	963.16	30.80	32.276	
4,300.00	4,114.85	4,170.24	4,165.63	20.62	14.95	-174.85	104.55	-72.01	1,022.96	991.41	31.55	32.422	
4,400.00	4,208.95	4,265.93	4,261.19	21.17	15.30	-174.93	109.46	-72.95	1,051.96	1,019.65	32.31	32.560	
4,500.00	4,303.05	4,361.62	4,356.75	21.72	15.65	-175.00	114.38	-73.88	1,080.97	1,047.90	33.07	32.692	
4,600.00	4,397.15	4,457.31	4,452.31	22.27	15.99	-175.07	119.30	-74.82	1,109.98	1,076.15	33.82	32.817	
4,700.00	4,491.25	4,553.01	4,547.87	22.82	16.34	-175.13	124.21	-75.75	1,138.98	1,104.40	34.58	32.937	
4,800.00	4,585.35	4,648.70	4,643.43	23.37	16.69	-175.19	129.13	-76.68	1,167.99	1,132.66	35.34	33.052	
4,900.00	4,679.45	4,744.39	4,738.99	23.93	17.04	-175.25	134.05	-77.62	1,197.00	1,160.91	36.10	33.162	
5,000.00	4,773.55	4,840.08	4,834.56	24.48	17.38	-175.30	138.96	-78.55	1,226.02	1,189.16	36.85	33.267	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #694H - OH - Prelim 5												Offset Site Error:	0.00 usft
Survey Program:		0-MWD+HRGM+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)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
5,100.00	4,867.65	4,935.78	4,930.12	25.03	17.73	-175.36	143.88	-79.49	1,255.03	1,217.42	37.61	33.367	
5,200.00	4,961.75	5,031.47	5,025.68	25.58	18.08	-175.41	148.80	-80.42	1,284.04	1,245.67	38.37	33.464	
5,300.00	5,055.85	5,127.16	5,121.24	26.13	18.42	-175.46	153.71	-81.35	1,313.06	1,273.93	39.13	33.557	
5,400.00	5,149.95	5,222.85	5,216.80	26.68	18.77	-175.50	158.63	-82.29	1,342.07	1,302.19	39.89	33.646	
5,500.00	5,244.05	5,318.55	5,312.36	27.24	19.12	-175.55	163.55	-83.22	1,371.09	1,330.44	40.65	33.731	
5,600.00	5,338.15	5,406.17	5,399.88	27.79	19.44	-175.59	167.84	-84.04	1,400.33	1,358.98	41.35	33.866	
5,665.73	5,400.00	5,462.33	5,455.98	28.15	19.64	-175.62	170.26	-84.50	1,419.91	1,378.11	41.80	33.969	
5,700.00	5,432.28	5,491.57	5,485.20	28.34	19.74	-175.64	171.41	-84.71	1,430.14	1,388.11	42.03	34.024	
5,800.00	5,526.87	5,576.94	5,570.52	28.88	20.05	-175.72	174.36	-85.27	1,459.33	1,416.62	42.71	34.168	
5,900.00	5,622.01	5,662.40	5,655.94	29.41	20.36	-175.79	176.68	-85.71	1,487.53	1,444.15	43.38	34.290	
6,000.00	5,717.67	5,747.92	5,741.45	29.92	20.66	-175.86	178.37	-86.04	1,514.74	1,470.70	44.04	34.392	
6,100.00	5,813.83	5,833.52	5,827.04	30.41	20.97	-175.93	179.44	-86.24	1,540.97	1,496.27	44.70	34.475	
6,200.00	5,910.44	5,919.18	5,912.70	30.89	21.27	-176.00	179.89	-86.32	1,566.20	1,520.85	45.35	34.539	
6,300.00	6,007.50	6,013.98	6,007.50	31.36	21.61	-176.08	179.90	-86.33	1,590.22	1,544.16	46.06	34.525	
6,400.00	6,104.96	6,111.44	6,104.96	31.80	21.95	-176.15	179.90	-86.33	1,612.55	1,565.77	46.79	34.465	
6,500.00	6,202.80	6,209.28	6,202.80	32.24	22.30	-176.21	179.90	-86.33	1,633.19	1,585.68	47.51	34.373	
6,600.00	6,300.98	6,307.46	6,300.98	32.66	22.65	-176.27	179.90	-86.33	1,652.13	1,603.89	48.24	34.251	
6,700.00	6,399.48	6,438.97	6,432.28	33.06	23.11	-176.16	181.25	-91.23	1,668.88	1,619.67	49.21	33.914	
6,722.82	6,422.00	6,476.68	6,469.52	33.15	23.25	-175.97	182.80	-96.87	1,672.02	1,622.54	49.49	33.787	
6,750.00	6,448.76	6,520.81	6,512.57	33.26	23.41	-165.63	185.36	-106.17	1,675.80	1,625.99	49.81	33.643	
6,800.00	6,497.51	6,599.49	6,587.29	33.48	23.69	-153.12	191.87	-129.79	1,683.82	1,633.43	50.39	33.413	
6,850.00	6,545.40	6,674.55	6,655.24	33.72	23.97	-145.14	200.31	-160.43	1,693.28	1,642.32	50.96	33.227	
6,900.00	6,592.13	6,745.75	6,715.82	33.97	24.24	-139.37	210.23	-196.43	1,704.21	1,652.70	51.51	33.083	
6,950.00	6,637.40	6,813.11	6,768.96	34.25	24.51	-134.74	221.21	-236.29	1,716.63	1,664.58	52.06	32.975	
7,000.00	6,680.94	6,876.79	6,814.92	34.54	24.78	-130.74	232.90	-278.75	1,730.55	1,677.95	52.60	32.900	
7,050.00	6,722.48	6,937.06	6,854.15	34.85	25.05	-127.12	245.04	-322.82	1,745.93	1,692.79	53.14	32.855	
7,100.00	6,761.76	6,994.22	6,887.22	35.17	25.31	-123.70	257.42	-367.76	1,762.70	1,709.03	53.68	32.838	
7,150.00	6,798.55	7,048.64	6,914.70	35.51	25.58	-120.40	269.89	-413.03	1,780.80	1,726.59	54.21	32.847	
7,200.00	6,832.61	7,100.65	6,937.12	35.86	25.85	-117.17	282.34	-458.25	1,800.11	1,745.37	54.75	32.880	
7,250.00	6,863.74	7,150.57	6,954.97	36.22	26.12	-113.98	294.72	-503.19	1,820.51	1,765.24	55.28	32.935	
7,300.00	6,891.74	7,198.72	6,968.68	36.59	26.39	-110.80	306.97	-547.67	1,841.87	1,786.07	55.80	33.008	
7,350.00	6,916.44	7,245.36	6,978.60	36.98	26.67	-107.64	319.07	-591.60	1,864.02	1,807.70	56.32	33.098	
7,400.00	6,937.69	7,290.74	6,985.02	37.37	26.94	-104.51	331.00	-634.90	1,886.81	1,829.98	56.83	33.201	
7,450.00	6,955.36	7,335.09	6,988.19	37.78	27.21	-101.41	342.75	-677.54	1,910.07	1,852.73	57.33	33.315	
7,500.00	6,969.34	7,378.02	6,988.61	38.19	27.49	-98.38	354.15	-718.92	1,933.64	1,875.81	57.83	33.439	
7,550.00	6,979.53	7,420.78	6,988.58	38.62	27.77	-95.50	365.50	-760.15	1,957.35	1,899.01	58.34	33.550	
7,600.00	6,985.89	7,464.34	6,988.55	39.05	28.08	-92.81	377.07	-802.15	1,981.00	1,922.11	58.89	33.639	
7,650.00	6,988.37	7,508.44	6,988.52	39.48	28.40	-90.32	388.78	-844.66	2,004.40	1,944.94	59.46	33.708	
7,657.25	6,988.40	7,514.86	6,988.51	39.54	28.45	-89.98	390.49	-850.85	2,007.76	1,948.21	59.55	33.715	
7,700.00	6,988.37	7,552.75	6,988.48	39.92	28.74	-89.98	400.55	-887.38	2,027.57	1,967.49	60.08	33.749	
7,800.00	6,988.30	7,641.37	6,988.42	40.82	29.45	-89.98	424.08	-972.82	2,073.90	2,012.53	61.37	33.794	
7,900.00	6,988.23	7,700.00	6,988.38	41.77	29.94	-89.98	439.37	-1,029.42	2,120.73	2,058.42	62.31	34.035	
8,000.00	6,988.16	7,749.82	6,988.35	42.75	30.39	-89.98	451.49	-1,077.74	2,169.09	2,105.93	63.16	34.342	
8,100.00	6,988.09	7,800.00	6,988.31	43.76	30.84	-89.98	462.84	-1,126.62	2,218.95	2,154.92	64.03	34.655	
8,152.35	6,988.06	7,824.22	6,988.29	44.30	31.07	-89.98	468.02	-1,150.28	2,245.64	2,181.18	64.47	34.835	
8,200.00	6,988.02	7,847.25	6,988.28	44.79	31.29	-89.98	472.75	-1,172.82	2,269.60	2,204.72	64.88	34.981	
8,300.00	6,987.95	7,900.00	6,988.24	45.83	31.79	-89.99	482.91	-1,224.58	2,316.47	2,250.63	65.84	35.185	
8,400.00	6,987.88	7,946.23	6,988.20	46.85	32.25	-89.99	491.03	-1,270.09	2,358.62	2,291.91	66.72	35.354	
8,500.00	6,987.80	8,000.00	6,988.16	47.85	32.78	-89.99	499.55	-1,323.18	2,396.00	2,328.25	67.74	35.370	
8,600.00	6,987.73	8,048.24	6,988.13	48.83	33.28	-90.00	506.35	-1,370.94	2,428.49	2,359.79	68.70	35.351	
8,700.00	6,987.65	8,100.00	6,988.09	49.79	33.82	-90.00	512.74	-1,422.30	2,456.05	2,386.32	69.73	35.224	
8,800.00	6,987.57	8,152.45	6,988.05	50.72	34.38	-90.00	518.27	-1,474.46	2,478.61	2,407.81	70.80	35.010	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design:		Rosa Unit 34 - Rosa Unit #694H - OH - Prelim 5										Offset Site Error:		0.00 usft	
Survey Program:		0-MWD+HRGM+MS						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)					
8,900.00	6,987.50	8,200.00	6,988.01	51.62	34.88	-90.01	522.46	-1,521.82	2,496.14	2,424.37	71.77	34.781			
9,000.00	6,987.42	8,258.09	6,987.97	52.48	35.52	-90.01	526.51	-1,579.77	2,508.57	2,435.58	72.99	34.371			
9,100.00	6,987.34	8,300.00	6,987.94	53.30	35.98	-90.01	528.70	-1,621.62	2,515.95	2,442.11	73.84	34.073			
9,200.00	6,987.27	8,364.42	6,987.89	54.08	36.71	-90.01	530.88	-1,686.01	2,518.12	2,442.90	75.22	33.476			
9,215.33	6,987.26	8,372.58	6,987.88	54.20	36.80	-90.01	531.05	-1,694.17	2,518.01	2,442.62	75.39	33.398			
9,276.02	6,987.21	8,404.88	6,987.86	54.66	37.16	-90.01	531.50	-1,726.46	2,517.67	2,441.59	76.08	33.094			
9,300.00	6,987.20	8,418.78	6,987.84	54.85	37.32	-90.01	531.59	-1,740.36	2,517.72	2,441.35	76.37	32.967			
9,400.00	6,987.12	8,518.78	6,987.77	55.65	38.48	-90.01	532.02	-1,840.36	2,518.12	2,439.46	78.66	32.013			
9,500.00	6,987.05	8,618.78	6,987.69	56.48	39.66	-90.01	532.46	-1,940.36	2,518.52	2,437.51	81.01	31.089			
9,600.00	6,986.98	8,718.78	6,987.61	57.35	40.87	-90.01	532.90	-2,040.36	2,518.92	2,435.50	83.42	30.196			
9,700.00	6,986.90	8,818.78	6,987.53	58.24	42.11	-90.01	533.34	-2,140.35	2,519.32	2,433.44	85.88	29.336			
9,800.00	6,986.83	8,918.78	6,987.45	59.17	43.38	-90.01	533.78	-2,240.35	2,519.72	2,431.34	88.39	28.508			
9,900.00	6,986.75	9,018.78	6,987.37	60.12	44.66	-90.01	534.22	-2,340.35	2,520.12	2,429.18	90.94	27.712			
10,000.00	6,986.68	9,118.78	6,987.30	61.10	45.97	-90.01	534.66	-2,440.35	2,520.52	2,426.99	93.53	26.948			
10,100.00	6,986.61	9,218.78	6,987.22	62.11	47.29	-90.01	535.10	-2,540.35	2,520.92	2,424.76	96.16	26.216			
10,200.00	6,986.53	9,318.77	6,987.14	63.14	48.63	-90.01	535.54	-2,640.35	2,521.32	2,422.50	98.82	25.513			
10,300.00	6,986.46	9,418.77	6,987.06	64.20	49.99	-90.01	535.98	-2,740.34	2,521.72	2,420.20	101.52	24.840			
10,400.00	6,986.39	9,518.77	6,986.98	65.28	51.36	-90.01	536.42	-2,840.34	2,522.12	2,417.88	104.24	24.194			
10,500.00	6,986.31	9,618.77	6,986.90	66.38	52.74	-90.01	536.85	-2,940.34	2,522.52	2,415.53	107.00	23.576			
10,600.00	6,986.24	9,718.77	6,986.83	67.50	54.14	-90.01	537.29	-3,040.34	2,522.92	2,413.15	109.77	22.984			
10,700.00	6,986.17	9,818.77	6,986.75	68.64	55.54	-90.01	537.73	-3,140.34	2,523.32	2,410.75	112.57	22.416			
10,800.00	6,986.09	9,918.77	6,986.67	69.80	56.96	-90.01	538.17	-3,240.33	2,523.72	2,408.33	115.39	21.871			
10,900.00	6,986.02	10,018.77	6,986.59	70.98	58.39	-90.01	538.61	-3,340.33	2,524.12	2,405.89	118.23	21.349			
11,000.00	6,985.95	10,118.77	6,986.51	72.17	59.82	-90.01	539.05	-3,440.33	2,524.52	2,403.44	121.09	20.849			
11,100.00	6,985.87	10,218.77	6,986.44	73.38	61.27	-90.01	539.49	-3,540.33	2,524.92	2,400.96	123.96	20.368			
11,200.00	6,985.80	10,318.77	6,986.36	74.61	62.72	-90.01	539.93	-3,640.33	2,525.32	2,398.47	126.86	19.907			
11,300.00	6,985.72	10,418.77	6,986.28	75.85	64.18	-90.01	540.37	-3,740.33	2,525.72	2,395.96	129.76	19.464			
11,400.00	6,985.65	10,518.76	6,986.20	77.10	65.65	-90.01	540.81	-3,840.32	2,526.12	2,393.44	132.68	19.039			
11,500.00	6,985.58	10,618.76	6,986.12	78.37	67.12	-90.01	541.24	-3,940.32	2,526.52	2,390.91	135.62	18.630			
11,600.00	6,985.50	10,718.76	6,986.04	79.65	68.60	-90.01	541.68	-4,040.32	2,526.92	2,388.36	138.56	18.237			
11,700.00	6,985.43	10,818.76	6,985.97	80.94	70.08	-90.01	542.12	-4,140.32	2,527.32	2,385.81	141.52	17.859			
11,800.00	6,985.36	10,918.76	6,985.89	82.24	71.57	-90.01	542.56	-4,240.32	2,527.72	2,383.24	144.49	17.495			
11,900.00	6,985.28	11,018.76	6,985.81	83.56	73.06	-90.01	543.00	-4,340.31	2,528.12	2,380.66	147.46	17.144			
12,000.00	6,985.21	11,118.76	6,985.73	84.88	74.56	-90.01	543.44	-4,440.31	2,528.53	2,378.07	150.45	16.806			
12,100.00	6,985.14	11,218.76	6,985.65	86.21	76.06	-90.01	543.88	-4,540.31	2,528.93	2,375.48	153.45	16.481			
12,200.00	6,985.06	11,318.76	6,985.57	87.56	77.57	-90.01	544.32	-4,640.31	2,529.33	2,372.87	156.45	16.167			
12,300.00	6,984.99	11,418.76	6,985.50	88.91	79.08	-90.01	544.76	-4,740.31	2,529.73	2,370.26	159.46	15.864			
12,400.00	6,984.92	11,518.76	6,985.42	90.27	80.60	-90.01	545.20	-4,840.31	2,530.13	2,367.64	162.48	15.571			
12,500.00	6,984.84	11,618.76	6,985.34	91.64	82.11	-90.01	545.64	-4,940.30	2,530.53	2,365.01	165.51	15.289			
12,600.00	6,984.77	11,718.76	6,985.26	93.01	83.63	-90.01	546.07	-5,040.30	2,530.93	2,362.38	168.55	15.016			
12,700.00	6,984.69	11,818.75	6,985.18	94.40	85.16	-90.01	546.51	-5,140.30	2,531.33	2,359.74	171.59	14.752			
12,800.00	6,984.62	11,918.75	6,985.10	95.79	86.69	-90.01	546.95	-5,240.30	2,531.73	2,357.09	174.63	14.497			
12,900.00	6,984.55	12,018.75	6,985.03	97.18	88.22	-90.01	547.39	-5,340.30	2,532.13	2,354.44	177.68	14.251			
13,000.00	6,984.47	12,118.75	6,984.95	98.59	89.75	-90.01	547.83	-5,440.30	2,532.53	2,351.78	180.74	14.012			
13,100.00	6,984.40	12,218.75	6,984.87	100.00	91.28	-90.01	548.27	-5,540.29	2,532.93	2,349.12	183.81	13.781			
13,200.00	6,984.33	12,318.75	6,984.79	101.41	92.82	-90.01	548.71	-5,640.29	2,533.33	2,346.45	186.87	13.556			
13,300.00	6,984.25	12,418.75	6,984.71	102.83	94.36	-90.01	549.15	-5,740.29	2,533.73	2,343.78	189.94	13.339			
13,400.00	6,984.18	12,518.75	6,984.63	104.26	95.90	-90.01	549.59	-5,840.29	2,534.13	2,341.10	193.02	13.129			
13,500.00	6,984.11	12,618.75	6,984.56	105.69	97.44	-90.01	550.03	-5,940.29	2,534.53	2,338.42	196.10	12.924			
13,600.00	6,984.03	12,718.75	6,984.48	107.13	98.99	-90.01	550.46	-6,040.28	2,534.93	2,335.74	199.19	12.726			
13,700.00	6,983.96	12,818.75	6,984.40	108.57	100.54	-90.01	550.90	-6,140.28	2,535.33	2,333.05	202.28	12.534			
13,800.00	6,983.88	12,918.75	6,984.32	110.02	102.09	-90.01	551.34	-6,240.28	2,535.73	2,330.36	205.37	12.347			

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #694H - OH - Prelim 5												Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HRGM+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)			
13,900.00	6,983.81	13,018.74	6,984.24	111.47	103.64	-90.01	551.78	-6,340.28	2,536.13	2,327.66	208.47	12.166	
14,000.00	6,983.74	13,118.74	6,984.16	112.92	105.19	-90.01	552.22	-6,440.28	2,536.53	2,324.96	211.56	11.989	
14,100.00	6,983.66	13,218.74	6,984.09	114.38	106.74	-90.01	552.66	-6,540.28	2,536.93	2,322.26	214.67	11.818	
14,200.00	6,983.59	13,318.74	6,984.01	115.85	108.30	-90.01	553.10	-6,640.27	2,537.33	2,319.55	217.77	11.651	
14,300.00	6,983.52	13,418.74	6,983.93	117.31	109.86	-90.01	553.54	-6,740.27	2,537.73	2,316.85	220.88	11.489	
14,400.00	6,983.44	13,518.74	6,983.85	118.78	111.41	-90.01	553.98	-6,840.27	2,538.13	2,314.13	223.99	11.331	
14,500.00	6,983.37	13,618.74	6,983.77	120.26	112.97	-90.01	554.42	-6,940.27	2,538.53	2,311.42	227.11	11.178	
14,600.00	6,983.30	13,718.74	6,983.69	121.74	114.53	-90.01	554.86	-7,040.27	2,538.93	2,308.70	230.22	11.028	
14,700.00	6,983.22	13,818.74	6,983.62	123.22	116.10	-90.01	555.29	-7,140.26	2,539.33	2,305.98	233.34	10.882	
14,800.00	6,983.15	13,918.74	6,983.54	124.70	117.66	-90.01	555.73	-7,240.26	2,539.73	2,303.26	236.47	10.740	
14,900.00	6,983.08	14,018.74	6,983.46	126.19	119.22	-90.01	556.17	-7,340.26	2,540.13	2,300.54	239.59	10.602	
15,000.00	6,983.00	14,118.74	6,983.38	127.68	120.79	-90.01	556.61	-7,440.26	2,540.53	2,297.81	242.72	10.467	
15,100.00	6,982.93	14,218.74	6,983.30	129.17	122.35	-90.01	557.05	-7,540.26	2,540.93	2,295.08	245.84	10.336	
15,200.00	6,982.85	14,318.73	6,983.23	130.67	123.92	-90.01	557.49	-7,640.26	2,541.33	2,292.35	248.97	10.207	
15,300.00	6,982.78	14,418.73	6,983.15	132.16	125.49	-90.01	557.93	-7,740.25	2,541.73	2,289.62	252.11	10.082	
15,400.00	6,982.71	14,518.73	6,983.07	133.66	127.06	-90.01	558.37	-7,840.25	2,542.13	2,286.89	255.24	9.960	
15,500.00	6,982.63	14,618.73	6,982.99	135.17	128.63	-90.01	558.81	-7,940.25	2,542.53	2,284.15	258.38	9.840	
15,600.00	6,982.56	14,718.73	6,982.91	136.67	130.20	-90.01	559.25	-8,040.25	2,542.93	2,281.41	261.52	9.724	
15,700.00	6,982.49	14,818.73	6,982.83	138.18	131.77	-90.01	559.68	-8,140.25	2,543.33	2,278.67	264.65	9.610	
15,800.00	6,982.41	14,918.73	6,982.76	139.69	133.34	-90.01	560.12	-8,240.24	2,543.73	2,275.93	267.80	9.499	
15,900.00	6,982.34	15,018.73	6,982.68	141.20	134.92	-90.01	560.56	-8,340.24	2,544.13	2,273.19	270.94	9.390	
16,000.00	6,982.27	15,118.73	6,982.60	142.71	136.49	-90.01	561.00	-8,440.24	2,544.53	2,270.45	274.08	9.284	
16,100.00	6,982.19	15,218.73	6,982.52	144.23	138.07	-90.01	561.44	-8,540.24	2,544.93	2,267.70	277.23	9.180	
16,200.00	6,982.12	15,318.73	6,982.44	145.75	139.64	-90.01	561.88	-8,640.24	2,545.33	2,264.95	280.38	9.078	
16,300.00	6,982.05	15,418.73	6,982.36	147.27	141.22	-90.01	562.32	-8,740.24	2,545.73	2,262.20	283.53	8.979	
16,400.00	6,981.97	15,518.72	6,982.29	148.79	142.79	-90.01	562.76	-8,840.23	2,546.13	2,259.45	286.68	8.882	
16,500.00	6,981.90	15,618.72	6,982.21	150.31	144.37	-90.01	563.20	-8,940.23	2,546.53	2,256.70	289.83	8.786	
16,600.00	6,981.82	15,718.72	6,982.13	151.84	145.95	-90.01	563.64	-9,040.23	2,546.93	2,253.95	292.98	8.693	
16,700.00	6,981.75	15,818.72	6,982.05	153.36	147.53	-90.01	564.08	-9,140.23	2,547.33	2,251.20	296.13	8.602	
16,800.00	6,981.68	15,918.72	6,981.97	154.89	149.11	-90.01	564.51	-9,240.23	2,547.73	2,248.44	299.29	8.513	
16,900.00	6,981.60	16,018.72	6,981.89	156.42	150.68	-90.01	564.95	-9,340.23	2,548.13	2,245.69	302.44	8.425	
17,000.00	6,981.53	16,118.72	6,981.82	157.95	152.26	-90.01	565.39	-9,440.22	2,548.53	2,242.93	305.60	8.339	
17,100.00	6,981.46	16,218.72	6,981.74	159.49	153.84	-90.01	565.83	-9,540.22	2,548.93	2,240.17	308.76	8.255	
17,200.00	6,981.38	16,318.72	6,981.66	161.02	155.43	-90.01	566.27	-9,640.22	2,549.33	2,237.41	311.92	8.173	
17,300.00	6,981.31	16,418.72	6,981.58	162.56	157.01	-90.01	566.71	-9,740.22	2,549.73	2,234.65	315.08	8.092	
17,400.00	6,981.24	16,518.72	6,981.50	164.09	158.59	-90.01	567.15	-9,840.22	2,550.13	2,231.89	318.24	8.013	
17,500.00	6,981.16	16,618.72	6,981.42	165.63	160.17	-90.01	567.59	-9,940.21	2,550.53	2,229.13	321.40	7.936	
17,600.00	6,981.09	16,718.72	6,981.35	167.17	161.75	-90.01	568.03	-10,040.21	2,550.93	2,226.36	324.57	7.860	
17,700.00	6,981.01	16,818.71	6,981.27	168.71	163.34	-90.01	568.47	-10,140.21	2,551.33	2,223.60	327.73	7.785	
17,800.00	6,980.94	16,918.71	6,981.19	170.25	164.92	-90.01	568.90	-10,240.21	2,551.73	2,220.84	330.90	7.712	
17,900.00	6,980.87	17,018.71	6,981.11	171.80	166.51	-90.01	569.34	-10,340.21	2,552.13	2,218.07	334.06	7.640	
18,000.00	6,980.79	17,118.71	6,981.03	173.34	168.09	-90.01	569.78	-10,440.21	2,552.53	2,215.30	337.23	7.569	
18,100.00	6,980.72	17,218.71	6,980.95	174.89	169.67	-90.01	570.22	-10,540.20	2,552.93	2,212.54	340.40	7.500	
18,200.00	6,980.65	17,318.71	6,980.88	176.43	171.26	-90.00	570.66	-10,640.20	2,553.33	2,209.77	343.56	7.432	
18,300.00	6,980.57	17,418.71	6,980.80	177.98	172.84	-90.00	571.10	-10,740.20	2,553.73	2,207.00	346.73	7.365	
18,400.00	6,980.50	17,518.71	6,980.72	179.53	174.43	-90.00	571.54	-10,840.20	2,554.13	2,204.23	349.90	7.300	
18,500.00	6,980.43	17,618.71	6,980.64	181.08	176.02	-90.00	571.98	-10,940.20	2,554.53	2,201.46	353.07	7.235	
18,600.00	6,980.35	17,718.71	6,980.56	182.63	177.60	-90.00	572.42	-11,040.19	2,554.93	2,198.69	356.24	7.172	
18,700.00	6,980.28	17,818.71	6,980.48	184.18	179.19	-90.00	572.86	-11,140.19	2,555.33	2,195.92	359.42	7.110	
18,800.00	6,980.21	17,918.71	6,980.41	185.73	180.78	-90.00	573.30	-11,240.19	2,555.73	2,193.14	362.59	7.049	
18,900.00	6,980.13	18,018.70	6,980.33	187.28	182.36	-90.00	573.73	-11,340.19	2,556.13	2,190.37	365.76	6.989	
19,000.00	6,980.06	18,118.70	6,980.25	188.84	183.95	-90.00	574.17	-11,440.19	2,556.53	2,187.60	368.93	6.930	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #694H - OH - Prelim 5													Offset Site Error:	0.00 usft			
Survey Program:		0-MWD+HRGM+MS					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				
19,100.00	6,979.98	18,218.70	6,980.17	190.39	185.54	-90.00	574.61	-11,540.19	2,556.93	2,184.82	372.11	6.871					
19,200.00	6,979.91	18,318.70	6,980.09	191.95	187.13	-90.00	575.05	-11,640.18	2,557.33	2,182.05	375.28	6.814					
19,300.00	6,979.84	18,418.70	6,980.02	193.51	188.72	-90.00	575.49	-11,740.18	2,557.73	2,179.27	378.46	6.758					
19,400.00	6,979.76	18,518.70	6,979.94	195.06	190.31	-90.00	575.93	-11,840.18	2,558.13	2,176.50	381.64	6.703					
19,500.00	6,979.69	18,618.70	6,979.86	196.62	191.90	-90.00	576.37	-11,940.18	2,558.53	2,173.72	384.81	6.649					
19,600.00	6,979.62	18,718.70	6,979.78	198.18	193.48	-90.00	576.81	-12,040.18	2,558.93	2,170.94	387.99	6.595					
19,700.00	6,979.54	18,818.70	6,979.70	199.74	195.07	-90.00	577.25	-12,140.17	2,559.33	2,168.17	391.17	6.543					
19,800.00	6,979.47	18,918.70	6,979.62	201.30	196.66	-90.00	577.69	-12,240.17	2,559.73	2,165.39	394.34	6.491					
19,900.00	6,979.40	19,018.70	6,979.55	202.86	198.25	-90.00	578.12	-12,340.17	2,560.13	2,162.61	397.52	6.440					
20,000.00	6,979.32	19,118.70	6,979.47	204.42	199.84	-90.00	578.56	-12,440.17	2,560.53	2,159.83	400.70	6.390					
20,100.00	6,979.25	19,218.70	6,979.39	205.98	201.44	-90.00	579.00	-12,540.17	2,560.93	2,157.05	403.88	6.341					
20,200.00	6,979.18	19,318.69	6,979.31	207.55	203.03	-90.00	579.44	-12,640.17	2,561.33	2,154.27	407.06	6.292					
20,300.00	6,979.10	19,418.69	6,979.23	209.11	204.62	-90.00	579.88	-12,740.16	2,561.73	2,151.49	410.24	6.244					
20,400.00	6,979.03	19,518.69	6,979.15	210.68	206.21	-90.00	580.32	-12,840.16	2,562.13	2,148.71	413.42	6.197					
20,500.00	6,978.95	19,618.69	6,979.08	212.24	207.80	-90.00	580.76	-12,940.16	2,562.53	2,145.93	416.60	6.151					
20,600.00	6,978.88	19,718.69	6,979.00	213.81	209.39	-90.00	581.20	-13,040.16	2,562.93	2,143.15	419.79	6.105					
20,700.00	6,978.81	19,818.69	6,978.92	215.37	210.98	-90.00	581.64	-13,140.16	2,563.33	2,140.36	422.97	6.060					
20,800.00	6,978.73	19,918.69	6,978.84	216.94	212.57	-90.00	582.08	-13,240.16	2,563.73	2,137.58	426.15	6.016					
20,900.00	6,978.66	20,018.69	6,978.76	218.51	214.17	-90.00	582.52	-13,340.15	2,564.13	2,134.80	429.33	5.972					
21,000.00	6,978.59	20,118.69	6,978.68	220.07	215.76	-90.00	582.95	-13,440.15	2,564.53	2,132.02	432.52	5.929					
21,100.00	6,978.51	20,218.69	6,978.61	221.64	217.35	-90.00	583.39	-13,540.15	2,564.93	2,129.23	435.70	5.887					
21,200.00	6,978.44	20,318.69	6,978.53	223.21	218.94	-90.00	583.83	-13,640.15	2,565.33	2,126.45	438.89	5.845					
21,300.00	6,978.37	20,418.69	6,978.45	224.78	220.54	-90.00	584.27	-13,740.15	2,565.73	2,123.66	442.07	5.804					
21,400.00	6,978.29	20,518.68	6,978.37	226.35	222.13	-90.00	584.71	-13,840.14	2,566.13	2,120.88	445.26	5.763					
21,500.00	6,978.22	20,618.68	6,978.29	227.92	223.72	-90.00	585.15	-13,940.14	2,566.53	2,118.09	448.44	5.723					
21,600.00	6,978.14	20,718.68	6,978.21	229.49	225.32	-90.00	585.59	-14,040.14	2,566.93	2,115.31	451.63	5.684					
21,700.00	6,978.07	20,818.68	6,978.14	231.06	226.91	-90.00	586.03	-14,140.14	2,567.33	2,112.52	454.81	5.645					
21,800.00	6,978.00	20,918.68	6,978.06	232.63	228.50	-90.00	586.47	-14,240.14	2,567.74	2,109.74	458.00	5.606					
21,900.00	6,977.92	21,018.68	6,977.98	234.21	230.10	-90.00	586.91	-14,340.14	2,568.14	2,106.95	461.18	5.569					
22,000.00	6,977.85	21,118.68	6,977.90	235.78	231.69	-90.00	587.34	-14,440.13	2,568.54	2,104.16	464.37	5.531					
22,100.00	6,977.78	21,218.68	6,977.82	237.35	233.29	-90.00	587.78	-14,540.13	2,568.94	2,101.38	467.56	5.494					
22,200.00	6,977.70	21,318.68	6,977.74	238.92	234.88	-90.00	588.22	-14,640.13	2,569.34	2,098.59	470.75	5.458					
22,300.00	6,977.63	21,418.68	6,977.67	240.50	236.47	-90.00	588.66	-14,740.13	2,569.74	2,095.80	473.93	5.422					
22,400.00	6,977.56	21,518.68	6,977.59	242.07	238.07	-90.00	589.10	-14,840.13	2,570.14	2,093.01	477.12	5.387					
22,500.00	6,977.48	21,618.68	6,977.51	243.65	239.66	-90.00	589.54	-14,940.12	2,570.54	2,090.23	480.31	5.352					
22,600.00	6,977.41	21,718.68	6,977.43	245.22	241.26	-90.00	589.98	-15,040.12	2,570.94	2,087.44	483.50	5.317					
22,700.00	6,977.34	21,818.67	6,977.35	246.80	242.85	-90.00	590.42	-15,140.12	2,571.34	2,084.65	486.69	5.283					
22,800.00	6,977.26	21,918.67	6,977.27	248.37	244.45	-90.00	590.86	-15,240.12	2,571.74	2,081.86	489.88	5.250					
22,900.00	6,977.19	22,018.67	6,977.20	249.95	246.04	-90.00	591.30	-15,340.12	2,572.14	2,079.07	493.07	5.217					
23,000.00	6,977.11	22,118.67	6,977.12	251.53	247.64	-90.00	591.74	-15,440.12	2,572.54	2,076.28	496.26	5.184					
23,100.00	6,977.04	22,218.67	6,977.04	253.10	249.23	-90.00	592.17	-15,540.11	2,572.94	2,073.49	499.45	5.152					
23,155.65	6,977.00	22,269.73	6,977.00	253.98	250.05	-90.00	592.40	-15,591.17	2,573.16	2,072.10	501.07	5.135 SF					
23,156.15	6,977.00	22,269.73	6,977.00	254.06	250.05	-90.00	592.40	-15,591.17	2,573.17	2,072.10	501.06	5.135					

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #696H - OH - Prelim 5													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HRGM+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)			
0.00	0.00	0.00	0.00	0.00	0.00	-150.81	-87.38	-48.82	100.09				
100.00	100.00	100.00	100.00	0.25	0.25	-150.81	-87.38	-48.82	100.09	99.59	0.50	199.437	
200.00	200.00	200.00	200.00	0.61	0.61	-150.81	-87.38	-48.82	100.09	98.87	1.22	82.121	
300.00	300.00	300.00	300.00	0.97	0.97	-150.81	-87.38	-48.82	100.09	98.15	1.94	51.706	
400.00	400.00	400.00	400.00	1.33	1.33	-150.81	-87.38	-48.82	100.09	97.44	2.65	37.731	
500.00	500.00	500.00	500.00	1.68	1.68	-150.81	-87.38	-48.82	100.09	96.72	3.37	29.703 CC, ES	
600.00	599.98	599.98	599.98	2.04	2.04	-161.12	-87.38	-48.82	101.74	97.65	4.09	24.894	
700.00	699.84	699.84	699.84	2.41	2.40	-162.00	-87.38	-48.82	106.70	101.90	4.81	22.202	
800.00	799.45	801.62	801.60	2.77	2.77	-162.57	-85.82	-49.72	114.07	108.54	5.53	20.627	
900.00	898.70	901.14	901.05	3.13	3.12	-162.84	-82.81	-51.46	123.83	117.58	6.25	19.815	
1,000.00	997.47	1,000.26	1,000.11	3.50	3.48	-163.47	-79.81	-53.18	136.91	129.94	6.97	19.643 SF	
1,100.00	1,095.63	1,098.88	1,098.68	3.89	3.83	-162.05	-76.83	-54.91	153.17	145.48	7.69	19.913	
1,200.00	1,193.09	1,196.91	1,196.65	4.29	4.18	-161.62	-73.87	-56.62	172.49	164.07	8.42	20.496	
1,300.00	1,289.73	1,294.22	1,293.90	4.72	4.53	-161.79	-70.93	-58.31	194.92	185.78	9.14	21.324	
1,400.00	1,385.42	1,390.69	1,390.31	5.16	4.88	-162.28	-68.01	-60.00	220.52	210.65	9.87	22.350	
1,496.97	1,477.20	1,483.33	1,482.90	5.62	5.21	-162.93	-65.21	-61.61	248.41	237.84	10.57	23.499	
1,500.00	1,480.05	1,486.21	1,485.78	5.63	5.22	-162.98	-65.13	-61.66	249.33	238.73	10.60	23.528	
1,600.00	1,574.15	1,581.25	1,580.75	6.12	5.56	-164.47	-62.25	-63.32	279.74	268.43	11.32	24.720	
1,700.00	1,668.25	1,676.29	1,675.73	6.62	5.90	-165.67	-59.38	-64.98	310.30	298.26	12.04	25.772	
1,800.00	1,762.35	1,771.32	1,770.71	7.12	6.24	-166.65	-56.51	-66.64	340.95	328.18	12.77	26.705	
1,900.00	1,856.45	1,866.36	1,865.69	7.64	6.58	-167.47	-53.64	-68.30	371.68	358.19	13.50	27.538	
2,000.00	1,950.55	1,961.40	1,960.67	8.16	6.93	-168.17	-50.76	-69.96	402.47	388.24	14.23	28.284	
2,100.00	2,044.65	2,056.43	2,055.65	8.68	7.27	-168.76	-47.89	-71.61	433.31	418.34	14.96	28.955	
2,200.00	2,138.75	2,151.47	2,150.63	9.21	7.61	-169.28	-45.02	-73.27	464.18	448.48	15.70	29.563	
2,300.00	2,232.85	2,246.51	2,245.60	9.74	7.95	-169.74	-42.15	-74.93	495.09	478.65	16.44	30.115	
2,400.00	2,326.95	2,341.54	2,340.58	10.27	8.29	-170.14	-39.27	-76.59	526.01	508.83	17.18	30.619	
2,500.00	2,421.05	2,436.58	2,435.56	10.81	8.64	-170.49	-36.40	-78.25	556.96	539.04	17.92	31.079	
2,600.00	2,515.15	2,531.62	2,530.54	11.34	8.98	-170.81	-33.53	-79.91	587.93	569.27	18.66	31.503	
2,700.00	2,609.25	2,626.65	2,625.52	11.88	9.32	-171.10	-30.66	-81.57	618.91	599.51	19.41	31.892	
2,800.00	2,703.35	2,721.69	2,720.50	12.42	9.66	-171.36	-27.78	-83.22	649.91	629.75	20.15	32.253	
2,900.00	2,797.45	2,816.72	2,815.48	12.96	10.00	-171.59	-24.91	-84.88	680.91	660.01	20.90	32.587	
3,000.00	2,891.55	2,911.76	2,910.45	13.51	10.35	-171.81	-22.04	-86.54	711.92	690.28	21.64	32.897	
3,100.00	2,985.65	3,006.80	3,005.43	14.05	10.69	-172.01	-19.17	-88.20	742.95	720.56	22.39	33.186	
3,200.00	3,079.75	3,101.83	3,100.41	14.60	11.03	-172.19	-16.30	-89.86	773.98	750.84	23.13	33.456	
3,300.00	3,173.85	3,196.87	3,195.39	15.14	11.37	-172.35	-13.42	-91.52	805.01	781.13	23.88	33.708	
3,400.00	3,267.95	3,291.91	3,290.37	15.69	11.72	-172.51	-10.55	-93.17	836.06	811.43	24.63	33.945	
3,500.00	3,362.05	3,386.94	3,385.35	16.23	12.06	-172.65	-7.68	-94.83	867.10	841.72	25.38	34.167	
3,600.00	3,456.15	3,481.98	3,480.33	16.78	12.40	-172.79	-4.81	-96.49	898.16	872.03	26.13	34.376	
3,700.00	3,550.25	3,577.02	3,575.30	17.33	12.74	-172.91	-1.93	-98.15	929.21	902.33	26.88	34.573	
3,800.00	3,644.35	3,672.05	3,670.28	17.88	13.09	-173.03	0.94	-99.81	960.27	932.64	27.63	34.759	
3,900.00	3,738.45	3,767.09	3,765.26	18.42	13.43	-173.14	3.81	-101.47	991.33	962.96	28.38	34.935	
4,000.00	3,832.55	3,862.13	3,860.24	18.97	13.77	-173.24	6.68	-103.12	1,022.40	993.27	29.13	35.102	
4,100.00	3,926.65	3,957.16	3,955.22	19.52	14.11	-173.34	9.56	-104.78	1,053.47	1,023.59	29.88	35.260	
4,200.00	4,020.75	4,052.20	4,050.20	20.07	14.45	-173.43	12.43	-106.44	1,084.54	1,053.91	30.63	35.409	
4,300.00	4,114.85	4,147.23	4,145.18	20.62	14.80	-173.52	15.30	-108.10	1,115.62	1,084.24	31.38	35.552	
4,400.00	4,208.95	4,242.27	4,240.15	21.17	15.14	-173.60	18.17	-109.76	1,146.69	1,114.56	32.13	35.688	
4,500.00	4,303.05	4,337.31	4,335.13	21.72	15.48	-173.68	21.05	-111.42	1,177.77	1,144.89	32.88	35.817	
4,600.00	4,397.15	4,432.34	4,430.11	22.27	15.82	-173.75	23.92	-113.07	1,208.85	1,175.22	33.64	35.940	
4,700.00	4,491.25	4,527.38	4,525.09	22.82	16.17	-173.82	26.79	-114.73	1,239.93	1,205.54	34.39	36.057	
4,800.00	4,585.35	4,622.42	4,620.07	23.37	16.51	-173.89	29.66	-116.39	1,271.02	1,235.88	35.14	36.170	
4,900.00	4,679.45	4,717.45	4,715.05	23.93	16.85	-173.95	32.53	-118.05	1,302.10	1,266.21	35.89	36.277	
5,000.00	4,773.55	4,812.49	4,810.02	24.48	17.19	-174.01	35.41	-119.71	1,333.19	1,296.54	36.65	36.380	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #696H - OH - Prelim 5												Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HRGM+MS				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
5,100.00	4,867.65	4,907.53	4,905.00	25.03	17.54	-174.07	38.28	-121.37	1,364.27	1,326.88	37.40	36.479	
5,200.00	4,961.75	5,002.56	4,999.98	25.58	17.88	-174.12	41.15	-123.02	1,395.36	1,357.21	38.15	36.574	
5,300.00	5,055.85	5,097.60	5,094.96	26.13	18.22	-174.17	44.02	-124.68	1,426.45	1,387.55	38.91	36.664	
5,400.00	5,149.95	5,192.64	5,189.94	26.68	18.56	-174.22	46.90	-126.34	1,457.54	1,417.88	39.66	36.751	
5,500.00	5,244.05	5,287.67	5,284.92	27.24	18.91	-174.27	49.77	-128.00	1,488.63	1,448.22	40.41	36.835	
5,600.00	5,338.15	5,382.71	5,379.90	27.79	19.25	-174.32	52.64	-129.66	1,519.73	1,478.56	41.17	36.916	
5,665.73	5,400.00	5,441.12	5,438.28	28.15	19.46	-174.35	54.35	-130.64	1,540.22	1,498.59	41.63	36.994	
5,700.00	5,432.28	5,470.56	5,467.70	28.34	19.56	-174.37	55.12	-131.09	1,550.90	1,509.03	41.87	37.041	
5,800.00	5,526.87	5,556.54	5,553.66	28.88	19.87	-174.46	57.00	-132.18	1,581.32	1,538.77	42.55	37.161	
5,900.00	5,622.01	5,642.67	5,639.77	29.41	20.18	-174.55	58.33	-132.94	1,610.66	1,567.43	43.23	37.257	
6,000.00	5,717.67	5,728.92	5,726.02	29.92	20.49	-174.64	59.09	-133.38	1,638.90	1,595.00	43.90	37.332	
6,100.00	5,813.83	5,816.73	5,813.83	30.41	20.80	-174.74	59.29	-133.50	1,666.04	1,621.46	44.57	37.376	
6,200.00	5,910.44	5,913.35	5,910.44	30.89	21.15	-174.85	59.29	-133.50	1,691.72	1,646.41	45.31	37.338	
6,300.00	6,007.50	6,010.41	6,007.50	31.36	21.49	-174.94	59.29	-133.50	1,715.71	1,669.67	46.04	37.266	
6,400.00	6,104.96	6,107.87	6,104.96	31.80	21.84	-175.03	59.29	-133.50	1,738.02	1,691.25	46.77	37.163	
6,500.00	6,202.80	6,205.70	6,202.80	32.24	22.18	-175.10	59.29	-133.50	1,758.63	1,711.14	47.49	37.030	
6,600.00	6,300.98	6,303.88	6,300.98	32.66	22.53	-175.17	59.29	-133.50	1,777.54	1,729.32	48.21	36.868	
6,700.00	6,399.48	6,734.27	6,709.31	33.06	23.94	-178.70	80.23	-25.79	1,790.18	1,739.63	50.55	35.414	
6,722.82	6,422.00	6,858.87	6,804.95	33.15	24.36	178.82	95.41	52.30	1,789.40	1,738.41	51.00	35.087	
6,750.00	6,448.76	6,932.06	6,852.93	33.26	24.62	-173.24	105.94	106.48	1,787.85	1,736.51	51.34	34.821	
6,792.10	6,489.86	7,033.56	6,908.85	33.44	25.01	-166.13	122.06	189.42	1,786.62	1,734.71	51.92	34.413	
6,800.00	6,497.51	7,037.14	6,910.62	33.48	25.03	-164.85	122.66	192.47	1,786.68	1,734.71	51.97	34.376	
6,850.00	6,545.40	7,128.38	6,948.74	33.72	25.42	-160.93	138.45	273.72	1,788.80	1,736.14	52.66	33.969	
6,900.00	6,592.13	7,157.18	6,958.16	33.97	25.55	-157.34	143.64	300.43	1,794.91	1,741.83	53.08	33.816	
6,950.00	6,637.40	7,171.53	6,962.39	34.25	25.61	-154.38	146.26	313.89	1,805.20	1,751.79	53.41	33.802	
7,000.00	6,680.94	7,177.19	6,963.98	34.54	25.64	-151.66	147.30	319.23	1,819.62	1,765.96	53.65	33.914	
7,050.00	6,722.48	7,177.20	6,963.98	34.85	25.64	-148.97	147.30	319.24	1,838.01	1,784.17	53.84	34.139	
7,100.00	6,761.76	7,173.26	6,962.88	35.17	25.62	-146.15	146.57	315.52	1,860.16	1,806.19	53.97	34.467	
7,150.00	6,798.55	7,166.40	6,960.91	35.51	25.59	-143.09	145.32	309.07	1,885.78	1,831.73	54.05	34.888	
7,200.00	6,832.61	7,157.28	6,958.19	35.86	25.55	-139.69	143.66	300.53	1,914.55	1,860.46	54.09	35.394	
7,250.00	6,863.74	7,146.31	6,954.75	36.22	25.50	-135.85	141.67	290.31	1,946.13	1,892.03	54.10	35.975	
7,300.00	6,891.74	7,133.78	6,950.60	36.59	25.44	-131.51	139.42	278.70	1,980.16	1,926.09	54.07	36.622	
7,350.00	6,916.44	7,119.87	6,945.72	36.98	25.38	-126.57	136.93	265.91	2,016.29	1,962.27	54.02	37.326	
7,400.00	6,937.69	7,104.70	6,940.08	37.37	25.31	-121.02	134.25	252.09	2,054.13	2,000.19	53.94	38.080	
7,450.00	6,955.36	7,088.35	6,933.63	37.78	25.24	-114.85	131.38	237.35	2,093.34	2,039.49	53.85	38.874	
7,500.00	6,969.34	7,070.86	6,926.30	38.19	25.17	-108.15	128.35	221.76	2,133.56	2,079.82	53.74	39.701	
7,550.00	6,979.53	7,050.00	6,916.99	38.62	25.08	-101.02	124.79	203.43	2,174.45	2,120.84	53.60	40.566	
7,600.00	6,985.89	7,032.56	6,908.74	39.05	25.01	-93.90	121.86	188.35	2,215.67	2,162.18	53.49	41.423	
7,650.00	6,988.37	7,011.75	6,898.35	39.48	24.92	-86.85	118.41	170.65	2,256.93	2,203.58	53.35	42.303	
7,657.25	6,988.40	7,008.63	6,896.75	39.54	24.91	-85.86	117.91	168.03	2,262.90	2,209.56	53.33	42.432	
7,700.00	6,988.37	6,990.54	6,887.16	39.92	24.84	-85.48	114.98	152.96	2,298.10	2,244.89	53.21	43.187	
7,800.00	6,988.30	6,950.00	6,864.14	40.82	24.69	-84.58	108.61	120.22	2,380.81	2,327.86	52.96	44.958	
7,900.00	6,988.23	6,914.18	6,842.06	41.77	24.55	-83.74	103.23	92.53	2,464.07	2,411.34	52.74	46.723	
8,000.00	6,988.16	6,880.84	6,820.12	42.75	24.43	-82.93	98.44	67.90	2,547.92	2,495.38	52.54	48.494	
8,100.00	6,988.09	6,850.00	6,798.68	43.76	24.33	-82.14	94.21	46.15	2,632.37	2,580.00	52.36	50.270	
8,152.35	6,988.06	6,835.58	6,788.29	44.30	24.28	-81.77	92.31	36.33	2,676.82	2,624.54	52.29	51.196	
8,200.00	6,988.02	6,822.40	6,778.60	44.79	24.23	-81.86	90.60	27.56	2,717.01	2,664.80	52.21	52.038	
8,300.00	6,987.95	6,800.00	6,761.71	45.83	24.16	-82.11	87.79	13.12	2,799.06	2,746.96	52.10	53.728	
8,400.00	6,987.88	6,768.14	6,736.82	46.85	24.05	-82.07	84.00	-6.40	2,877.83	2,825.91	51.92	55.429	
8,500.00	6,987.80	6,750.00	6,722.22	47.85	23.99	-82.30	81.95	-16.96	2,953.24	2,901.40	51.84	56.965	
8,600.00	6,987.73	6,718.05	6,695.77	48.83	23.88	-82.18	78.53	-34.55	3,025.12	2,973.44	51.67	58.542	
8,700.00	6,987.65	6,700.00	6,680.44	49.79	23.82	-82.31	76.71	-43.91	3,093.42	3,041.82	51.61	59.939	

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #696H - OH - Prelim 5													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HRGM+MS				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	
8,800.00	6,987.57	6,673.96	6,657.87	50.72	23.74	-82.26	74.23	-56.65	3,158.05	3,106.56	51.49	61.332		
8,900.00	6,987.50	6,650.00	6,636.64	51.62	23.66	-82.21	72.11	-67.56	3,218.94	3,167.55	51.40	62.631		
9,000.00	6,987.42	6,650.00	6,636.64	52.48	23.66	-82.58	72.11	-67.56	3,276.09	3,224.62	51.48	63.642		
9,100.00	6,987.34	6,619.82	6,609.33	53.30	23.57	-82.37	69.66	-80.17	3,329.25	3,277.91	51.34	64.841		
9,200.00	6,987.27	6,600.00	6,591.08	54.08	23.51	-82.33	68.19	-87.75	3,378.58	3,327.29	51.29	65.872		
9,215.33	6,987.26	6,600.00	6,591.08	54.20	23.51	-82.37	68.19	-87.75	3,385.79	3,334.49	51.30	65.998		
9,300.00	6,987.20	6,600.00	6,591.08	54.85	23.51	-82.37	68.19	-87.75	3,426.15	3,374.77	51.39	66.675		
9,400.00	6,987.12	6,578.83	6,571.33	55.65	23.44	-82.00	66.73	-95.24	3,475.70	3,424.36	51.34	67.702		
9,500.00	6,987.05	6,567.70	6,560.85	56.48	23.41	-81.81	66.02	-98.91	3,527.30	3,475.93	51.37	68.665		
9,600.00	6,986.98	6,550.00	6,544.06	57.35	23.36	-81.49	64.95	-104.38	3,580.88	3,529.52	51.36	69.724		
9,700.00	6,986.90	6,550.00	6,544.06	58.24	23.36	-81.49	64.95	-104.38	3,636.29	3,584.81	51.48	70.635		
9,800.00	6,986.83	6,550.00	6,544.06	59.17	23.36	-81.49	64.95	-104.38	3,693.58	3,641.98	51.60	71.575		
9,900.00	6,986.75	6,550.00	6,544.06	60.12	23.36	-81.49	64.95	-104.38	3,752.66	3,700.93	51.73	72.542		
10,000.00	6,986.68	6,525.00	6,520.08	61.10	23.28	-81.05	63.61	-111.32	3,813.14	3,761.46	51.68	73.778		
10,100.00	6,986.61	6,500.00	6,495.84	62.11	23.20	-80.59	62.44	-117.34	3,875.53	3,823.89	51.64	75.050		
10,200.00	6,986.53	6,500.00	6,495.84	63.14	23.20	-80.59	62.44	-117.34	3,939.17	3,887.39	51.77	76.085		
10,300.00	6,986.46	6,500.00	6,495.84	64.20	23.20	-80.59	62.44	-117.34	4,004.29	3,952.39	51.91	77.144		
10,400.00	6,986.39	6,500.00	6,495.84	65.28	23.20	-80.59	62.44	-117.34	4,070.83	4,018.79	52.04	78.226		
10,500.00	6,986.31	6,500.00	6,495.84	66.38	23.20	-80.59	62.44	-117.34	4,138.72	4,086.55	52.17	79.329		
10,600.00	6,986.24	6,500.00	6,495.84	67.50	23.20	-80.59	62.44	-117.34	4,207.89	4,155.59	52.30	80.453		
10,700.00	6,986.17	6,500.00	6,495.84	68.64	23.20	-80.59	62.44	-117.34	4,278.28	4,225.84	52.43	81.597		
10,800.00	6,986.09	6,500.00	6,495.84	69.80	23.20	-80.59	62.44	-117.34	4,349.82	4,297.26	52.56	82.759		
10,900.00	6,986.02	6,479.40	6,475.71	70.98	23.13	-80.22	61.61	-121.59	4,422.23	4,369.67	52.56	84.140		
11,000.00	6,985.95	6,475.78	6,472.15	72.17	23.12	-80.15	61.48	-122.27	4,495.83	4,443.17	52.66	85.370		
11,100.00	6,985.87	6,472.36	6,468.79	73.38	23.11	-80.09	61.36	-122.89	4,570.43	4,517.66	52.77	86.615		
11,200.00	6,985.80	6,450.00	6,446.74	74.61	23.04	-79.68	60.65	-126.54	4,646.18	4,593.42	52.76	88.070		
11,300.00	6,985.72	6,450.00	6,446.74	75.85	23.04	-79.68	60.65	-126.54	4,722.55	4,669.67	52.88	89.307		
11,400.00	6,985.65	6,450.00	6,446.74	77.10	23.04	-79.68	60.65	-126.54	4,799.79	4,746.78	53.00	90.558		
11,500.00	6,985.58	6,450.00	6,446.74	78.37	23.04	-79.68	60.65	-126.54	4,877.85	4,824.73	53.12	91.823		
11,600.00	6,985.50	6,450.00	6,446.74	79.65	23.04	-79.68	60.65	-126.54	4,956.70	4,903.46	53.24	93.100		
11,700.00	6,985.43	6,450.00	6,446.74	80.94	23.04	-79.68	60.65	-126.54	5,036.31	4,982.95	53.36	94.389		
11,800.00	6,985.36	6,450.00	6,446.74	82.24	23.04	-79.68	60.65	-126.54	5,116.63	5,063.15	53.47	95.689		
11,900.00	6,985.28	6,450.00	6,446.74	83.56	23.04	-79.68	60.65	-126.54	5,197.63	5,144.04	53.58	97.000		
12,000.00	6,985.21	6,450.00	6,446.74	84.88	23.04	-79.68	60.65	-126.54	5,279.28	5,225.59	53.69	98.321		
12,100.00	6,985.14	6,450.00	6,446.74	86.21	23.04	-79.68	60.65	-126.54	5,361.56	5,307.75	53.80	99.651		
12,200.00	6,985.06	6,450.00	6,446.74	87.56	23.04	-79.68	60.65	-126.54	5,444.43	5,390.52	53.91	100.990		
12,300.00	6,984.99	6,450.00	6,446.74	88.91	23.04	-79.68	60.65	-126.54	5,527.86	5,473.84	54.02	102.337		
12,400.00	6,984.92	6,450.00	6,446.74	90.27	23.04	-79.68	60.65	-126.54	5,611.84	5,557.72	54.12	103.692		
12,500.00	6,984.84	6,450.00	6,446.74	91.64	23.04	-79.68	60.65	-126.54	5,696.33	5,642.11	54.22	105.054		
12,600.00	6,984.77	6,450.00	6,446.74	93.01	23.04	-79.68	60.65	-126.54	5,781.32	5,727.00	54.32	106.424		
12,700.00	6,984.69	6,450.00	6,446.74	94.40	23.04	-79.68	60.65	-126.54	5,866.78	5,812.36	54.42	107.799		
12,800.00	6,984.62	6,450.00	6,446.74	95.79	23.04	-79.68	60.65	-126.54	5,952.70	5,898.18	54.52	109.180		
12,900.00	6,984.55	6,450.00	6,446.74	97.18	23.04	-79.68	60.65	-126.54	6,039.05	5,984.43	54.62	110.567		
13,000.00	6,984.47	6,450.00	6,446.74	98.59	23.04	-79.68	60.65	-126.54	6,125.81	6,071.10	54.71	111.959		
13,100.00	6,984.40	6,450.00	6,446.74	100.00	23.04	-79.68	60.65	-126.54	6,212.98	6,158.17	54.81	113.356		
13,200.00	6,984.33	6,450.00	6,446.74	101.41	23.04	-79.68	60.65	-126.54	6,300.52	6,245.62	54.90	114.757		
13,300.00	6,984.25	6,427.08	6,424.02	102.83	22.96	-79.26	60.07	-129.49	6,388.07	6,333.18	54.89	116.376		
13,400.00	6,984.18	6,425.84	6,422.78	104.26	22.96	-79.24	60.05	-129.62	6,476.29	6,421.31	54.98	117.796		
13,500.00	6,984.11	6,424.63	6,421.58	105.69	22.95	-79.22	60.02	-129.75	6,564.84	6,509.78	55.07	119.218		
13,600.00	6,984.03	6,423.46	6,420.42	107.13	22.95	-79.19	60.00	-129.88	6,653.72	6,598.57	55.15	120.644		
13,700.00	6,983.96	6,400.00	6,397.06	108.57	22.87	-78.76	59.60	-131.93	6,743.25	6,688.11	55.14	122.298		
13,800.00	6,983.88	6,400.00	6,397.06	110.02	22.87	-78.76	59.60	-131.93	6,832.70	6,777.47	55.23	123.716		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #696H - OH - Prelim 5													Offset Site Error:	0.00 usft
Survey Program:		0-MWD+HRGM+MS						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)			
13,900.00	6,983.81	6,400.00	6,397.06	111.47	22.87	-78.76	59.60	-131.93	6,922.44	6,867.12	55.32	125.137		
14,000.00	6,983.74	6,400.00	6,397.06	112.92	22.87	-78.76	59.60	-131.93	7,012.46	6,957.05	55.41	126.560		
14,100.00	6,983.66	6,400.00	6,397.06	114.38	22.87	-78.76	59.60	-131.93	7,102.75	7,047.25	55.50	127.985		
14,200.00	6,983.59	6,400.00	6,397.06	115.85	22.87	-78.76	59.60	-131.93	7,193.29	7,137.70	55.58	129.411		
14,300.00	6,983.52	6,400.00	6,397.06	117.31	22.87	-78.76	59.60	-131.93	7,284.08	7,228.41	55.67	130.839		
14,400.00	6,983.44	6,400.00	6,397.06	118.78	22.87	-78.76	59.60	-131.93	7,375.11	7,319.35	55.76	132.268		
14,500.00	6,983.37	6,400.00	6,397.06	120.26	22.87	-78.76	59.60	-131.93	7,466.36	7,410.52	55.85	133.698		
14,600.00	6,983.30	6,400.00	6,397.06	121.74	22.87	-78.76	59.60	-131.93	7,557.84	7,501.91	55.93	135.128		
14,700.00	6,983.22	6,400.00	6,397.06	123.22	22.87	-78.76	59.60	-131.93	7,649.53	7,593.52	56.02	136.559		
14,800.00	6,983.15	6,400.00	6,397.06	124.70	22.87	-78.76	59.60	-131.93	7,741.43	7,685.33	56.10	137.990		
14,900.00	6,983.08	6,400.00	6,397.06	126.19	22.87	-78.76	59.60	-131.93	7,833.53	7,777.34	56.19	139.421		
15,000.00	6,983.00	6,400.00	6,397.06	127.68	22.87	-78.76	59.60	-131.93	7,925.82	7,869.55	56.27	140.853		
15,100.00	6,982.93	6,400.00	6,397.06	129.17	22.87	-78.76	59.60	-131.93	8,018.29	7,961.93	56.35	142.284		
15,200.00	6,982.85	6,400.00	6,397.06	130.67	22.87	-78.76	59.60	-131.93	8,110.94	8,054.50	56.44	143.714		
15,300.00	6,982.78	6,400.00	6,397.06	132.16	22.87	-78.76	59.60	-131.93	8,203.76	8,147.24	56.52	145.145		
15,400.00	6,982.71	6,400.00	6,397.06	133.66	22.87	-78.76	59.60	-131.93	8,296.76	8,240.15	56.60	146.574		
15,500.00	6,982.63	6,400.00	6,397.06	135.17	22.87	-78.76	59.60	-131.93	8,389.91	8,333.22	56.69	148.003		
15,600.00	6,982.56	6,400.00	6,397.06	136.67	22.87	-78.76	59.60	-131.93	8,483.21	8,426.44	56.77	149.430		
15,700.00	6,982.49	6,400.00	6,397.06	138.18	22.87	-78.76	59.60	-131.93	8,576.67	8,519.82	56.85	150.857		
15,800.00	6,982.41	6,400.00	6,397.06	139.69	22.87	-78.76	59.60	-131.93	8,670.28	8,613.34	56.94	152.282		
15,900.00	6,982.34	6,400.00	6,397.06	141.20	22.87	-78.76	59.60	-131.93	8,764.02	8,707.01	57.02	153.706		
16,000.00	6,982.27	6,400.00	6,397.06	142.71	22.87	-78.76	59.60	-131.93	8,857.91	8,800.81	57.10	155.129		
16,100.00	6,982.19	6,400.00	6,397.06	144.23	22.87	-78.76	59.60	-131.93	8,951.92	8,894.74	57.18	156.549		
16,200.00	6,982.12	6,400.00	6,397.06	145.75	22.87	-78.76	59.60	-131.93	9,046.07	8,988.80	57.26	157.969		
16,300.00	6,982.05	6,400.00	6,397.06	147.27	22.87	-78.76	59.60	-131.93	9,140.33	9,082.99	57.35	159.386		
16,400.00	6,981.97	6,400.00	6,397.06	148.79	22.87	-78.76	59.60	-131.93	9,234.72	9,177.29	57.43	160.801		
16,500.00	6,981.90	6,400.00	6,397.06	150.31	22.87	-78.76	59.60	-131.93	9,329.23	9,271.72	57.51	162.215		
16,600.00	6,981.82	6,400.00	6,397.06	151.84	22.87	-78.76	59.60	-131.93	9,423.85	9,366.25	57.59	163.626		
16,700.00	6,981.75	6,400.00	6,397.06	153.36	22.87	-78.76	59.60	-131.93	9,518.58	9,460.90	57.68	165.035		
16,800.00	6,981.68	6,400.00	6,397.06	154.89	22.87	-78.76	59.60	-131.93	9,613.41	9,555.65	57.76	166.442		
16,900.00	6,981.60	6,400.00	6,397.06	156.42	22.87	-78.76	59.60	-131.93	9,708.35	9,650.51	57.84	167.847		
17,000.00	6,981.53	6,400.00	6,397.06	157.95	22.87	-78.76	59.60	-131.93	9,803.39	9,745.47	57.92	169.249		
17,100.00	6,981.46	6,400.00	6,397.06	159.49	22.87	-78.76	59.60	-131.93	9,898.53	9,840.52	58.01	170.648		
17,200.00	6,981.38	6,400.00	6,397.06	161.02	22.87	-78.76	59.60	-131.93	9,993.76	9,935.67	58.09	172.045		
17,300.00	6,981.31	6,400.00	6,397.06	162.56	22.87	-78.76	59.60	-131.93	10,089.09	10,030.91	58.17	173.439		
17,400.00	6,981.24	6,400.00	6,397.06	164.09	22.87	-78.76	59.60	-131.93	10,184.50	10,126.25	58.25	174.830		
17,500.00	6,981.16	6,400.00	6,397.06	165.63	22.87	-78.76	59.60	-131.93	10,280.00	10,221.66	58.34	176.219		
17,600.00	6,981.09	6,400.00	6,397.06	167.17	22.87	-78.76	59.60	-131.93	10,375.59	10,317.17	58.42	177.604		
17,700.00	6,981.01	6,400.00	6,397.06	168.71	22.87	-78.76	59.60	-131.93	10,471.26	10,412.75	58.50	178.987		
17,800.00	6,980.94	6,400.00	6,397.06	170.25	22.87	-78.76	59.60	-131.93	10,567.01	10,508.42	58.59	180.367		
17,900.00	6,980.87	6,400.00	6,397.06	171.80	22.87	-78.76	59.60	-131.93	10,662.83	10,604.16	58.67	181.743		
18,000.00	6,980.79	6,400.00	6,397.06	173.34	22.87	-78.76	59.60	-131.93	10,758.74	10,699.98	58.75	183.117		
18,100.00	6,980.72	6,400.00	6,397.06	174.89	22.87	-78.76	59.60	-131.93	10,854.71	10,795.88	58.84	184.487		
18,200.00	6,980.65	6,400.00	6,397.06	176.43	22.87	-78.76	59.60	-131.93	10,950.76	10,891.84	58.92	185.854		
18,300.00	6,980.57	6,400.00	6,397.06	177.98	22.87	-78.76	59.60	-131.93	11,046.88	10,987.88	59.01	187.217		
18,400.00	6,980.50	6,400.00	6,397.06	179.53	22.87	-78.76	59.60	-131.93	11,143.07	11,083.98	59.09	188.578		
18,500.00	6,980.43	6,400.00	6,397.06	181.08	22.87	-78.76	59.60	-131.93	11,239.32	11,180.15	59.17	189.935		
18,600.00	6,980.35	6,400.00	6,397.06	182.63	22.87	-78.76	59.60	-131.93	11,335.64	11,276.38	59.26	191.288		
18,700.00	6,980.28	6,400.00	6,397.06	184.18	22.87	-78.76	59.60	-131.93	11,432.02	11,372.68	59.34	192.638		
18,800.00	6,980.21	6,400.00	6,397.06	185.73	22.87	-78.76	59.60	-131.93	11,528.47	11,469.04	59.43	193.984		
18,900.00	6,980.13	6,400.00	6,397.06	187.28	22.87	-78.76	59.60	-131.93	11,624.97	11,565.46	59.52	195.327		
19,000.00	6,980.06	6,400.00	6,397.06	188.84	22.87	-78.76	59.60	-131.93	11,721.53	11,661.93	59.60	196.666		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #696H - OH - Prelim 5													Offset Site Error:	0.00 usft
Survey Program:		0-MWD+HRGM+MS						Rule Assigned:					Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
19,100.00	6,979.98	6,400.00	6,397.06	190.39	22.87	-78.76	59.60	-131.93	11,818.15	11,758.47	59.69	198.002		
19,200.00	6,979.91	6,400.00	6,397.06	191.95	22.87	-78.76	59.60	-131.93	11,914.83	11,855.06	59.77	199.334		
19,300.00	6,979.84	6,400.00	6,397.06	193.51	22.87	-78.76	59.60	-131.93	12,011.56	11,951.70	59.86	200.662		
19,400.00	6,979.76	6,400.00	6,397.06	195.06	22.87	-78.76	59.60	-131.93	12,108.34	12,048.39	59.95	201.986		
19,500.00	6,979.69	6,400.00	6,397.06	196.62	22.87	-78.76	59.60	-131.93	12,205.18	12,145.14	60.03	203.307		
19,600.00	6,979.62	6,400.00	6,397.06	198.18	22.87	-78.76	59.60	-131.93	12,302.06	12,241.94	60.12	204.624		
19,700.00	6,979.54	6,400.00	6,397.06	199.74	22.87	-78.76	59.60	-131.93	12,399.00	12,338.79	60.21	205.936		
19,800.00	6,979.47	6,400.00	6,397.06	201.30	22.87	-78.76	59.60	-131.93	12,495.98	12,435.68	60.30	207.246		
19,900.00	6,979.40	6,400.00	6,397.06	202.86	22.87	-78.76	59.60	-131.93	12,593.01	12,532.63	60.38	208.551		
20,000.00	6,979.32	6,400.00	6,397.06	204.42	22.87	-78.76	59.60	-131.93	12,690.09	12,629.61	60.47	209.852		
20,100.00	6,979.25	6,400.00	6,397.06	205.98	22.87	-78.76	59.60	-131.93	12,787.21	12,726.65	60.56	211.149		
20,200.00	6,979.18	6,400.00	6,397.06	207.55	22.87	-78.76	59.60	-131.93	12,884.37	12,823.72	60.65	212.442		
20,300.00	6,979.10	6,400.00	6,397.06	209.11	22.87	-78.76	59.60	-131.93	12,981.58	12,920.84	60.74	213.731		
20,400.00	6,979.03	6,400.00	6,397.06	210.68	22.87	-78.76	59.60	-131.93	13,078.83	13,018.01	60.83	215.017		
20,500.00	6,978.95	6,400.00	6,397.06	212.24	22.87	-78.76	59.60	-131.93	13,176.12	13,115.21	60.92	216.298		
20,600.00	6,978.88	6,400.00	6,397.06	213.81	22.87	-78.76	59.60	-131.93	13,273.46	13,212.45	61.01	217.575		
20,700.00	6,978.81	6,400.00	6,397.06	215.37	22.87	-78.76	59.60	-131.93	13,370.83	13,309.73	61.10	218.848		
20,800.00	6,978.73	6,400.00	6,397.06	216.94	22.87	-78.76	59.60	-131.93	13,468.24	13,407.05	61.19	220.117		
20,900.00	6,978.66	6,400.00	6,397.06	218.51	22.87	-78.76	59.60	-131.93	13,565.69	13,504.41	61.28	221.381		
21,000.00	6,978.59	6,400.00	6,397.06	220.07	22.87	-78.76	59.60	-131.93	13,663.17	13,601.80	61.37	222.642		
21,100.00	6,978.51	6,400.00	6,397.06	221.64	22.87	-78.76	59.60	-131.93	13,760.69	13,699.23	61.46	223.898		
21,200.00	6,978.44	6,400.00	6,397.06	223.21	22.87	-78.76	59.60	-131.93	13,858.25	13,796.70	61.55	225.151		
21,300.00	6,978.37	6,400.00	6,397.06	224.78	22.87	-78.76	59.60	-131.93	13,955.84	13,894.20	61.64	226.399		
21,400.00	6,978.29	6,400.00	6,397.06	226.35	22.87	-78.76	59.60	-131.93	14,053.46	13,991.73	61.73	227.643		
21,500.00	6,978.22	6,400.00	6,397.06	227.92	22.87	-78.76	59.60	-131.93	14,151.12	14,089.29	61.83	228.882		
21,600.00	6,978.14	6,400.00	6,397.06	229.49	22.87	-78.76	59.60	-131.93	14,248.81	14,186.89	61.92	230.118		
21,700.00	6,978.07	6,400.00	6,397.06	231.06	22.87	-78.76	59.60	-131.93	14,346.53	14,284.52	62.01	231.349		
21,800.00	6,978.00	6,400.00	6,397.06	232.63	22.87	-78.76	59.60	-131.93	14,444.29	14,382.18	62.11	232.576		
21,900.00	6,977.92	6,400.00	6,397.06	234.21	22.87	-78.76	59.60	-131.93	14,542.07	14,479.87	62.20	233.799		
22,000.00	6,977.85	6,400.00	6,397.06	235.78	22.87	-78.76	59.60	-131.93	14,639.88	14,577.59	62.29	235.017		
22,100.00	6,977.78	6,400.00	6,397.06	237.35	22.87	-78.76	59.60	-131.93	14,737.73	14,675.34	62.39	236.232		
22,200.00	6,977.70	6,400.00	6,397.06	238.92	22.87	-78.76	59.60	-131.93	14,835.60	14,773.12	62.48	237.442		
22,300.00	6,977.63	6,400.00	6,397.06	240.50	22.87	-78.76	59.60	-131.93	14,933.50	14,870.92	62.58	238.647		
22,400.00	6,977.56	6,400.00	6,397.06	242.07	22.87	-78.76	59.60	-131.93	15,031.43	14,968.76	62.67	239.849		
22,500.00	6,977.48	6,400.00	6,397.06	243.65	22.87	-78.76	59.60	-131.93	15,129.38	15,066.61	62.77	241.046		
22,600.00	6,977.41	6,400.00	6,397.06	245.22	22.87	-78.76	59.60	-131.93	15,227.36	15,164.50	62.86	242.239		
22,700.00	6,977.34	6,400.00	6,397.06	246.80	22.87	-78.76	59.60	-131.93	15,325.37	15,262.41	62.96	243.427		
22,800.00	6,977.26	6,400.00	6,397.06	248.37	22.87	-78.76	59.60	-131.93	15,423.40	15,360.35	63.05	244.611		
22,900.00	6,977.19	6,400.00	6,397.06	249.95	22.87	-78.76	59.60	-131.93	15,521.46	15,458.31	63.15	245.791		
23,000.00	6,977.11	6,400.00	6,397.06	251.53	22.87	-78.76	59.60	-131.93	15,619.54	15,556.30	63.25	246.967		
23,100.00	6,977.04	6,400.00	6,397.06	253.10	22.87	-78.76	59.60	-131.93	15,717.65	15,654.31	63.34	248.138		
23,155.65	6,977.00	6,400.00	6,397.06	253.98	22.87	-78.76	59.60	-131.93	15,772.26	15,708.86	63.40	248.789		
23,156.15	6,977.00	6,400.00	6,397.06	254.06	22.87	-78.76	59.60	-131.93	15,772.75	15,704.97	67.78	232.716		

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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Reference Depths are relative to 6347+30 @ 6377.00usft (H&P 530)

Coordinates are relative to: Rosa Unit #672H

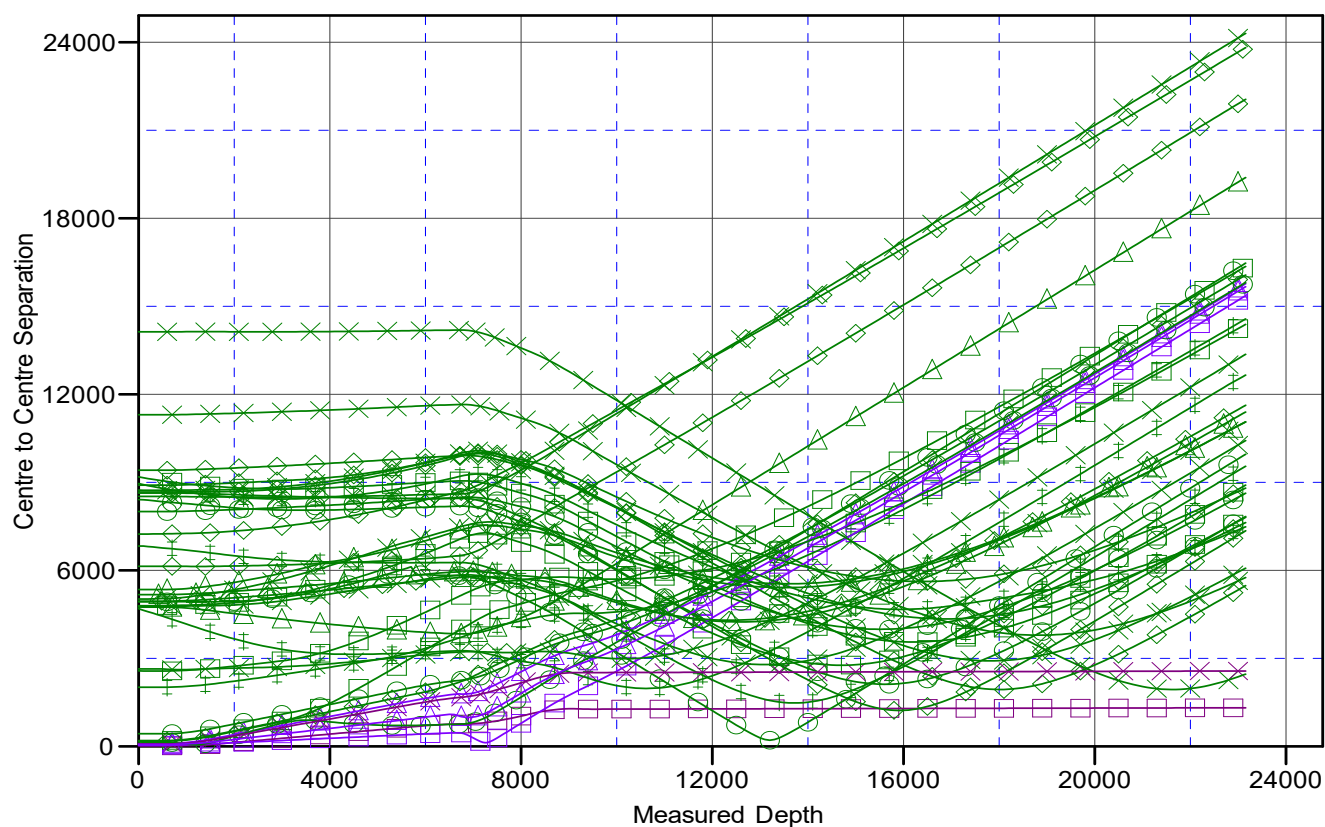
Offset Depths are relative to Offset Datum

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

Central Meridian is -107.833334

Grid Convergence at Surface is: 0.27°

Ladder Plot



LEGEND

(C) Rosa Unit #674H, OH, Prelim 5 V0	(C) Rosa Unit #171B, OH, OH-SVY V0	(C) Rosa Unit #228A, OH, OH-SVY V0
(C) Rosa Unit #65, OH, OH-INC V0	(C) Rosa Unit 148 COM, OH, OH-INC V0	(C) Rosa Unit #46, OH, OH-INC V0
(C) Rosa Unit #149B, OH, OH-INC V0	(C) Rosa Unit #336, OH, OH-INC V0	Rosa Unit #694H, OH, Prelim 5 V0
(C) Rosa Unit #108, OH, OH-SVY V0	(C) Rosa Unit #041C, OH, OH-SVY V0	Rosa Unit #692H, OH, Prelim 5 V0
(C) Rosa Unit #160C, OH, OH-SVY V0	(C) Rosa Unit #164B, OH, OH-SVY V0	(C) Rosa Unit #149A, OH, OH-INC V0
(C) Rosa Unit #149C, OH, OH-SVY V0	(C) Rosa Unit #164, OH, OH-SVY V0	(C) Rosa Unit #171A, OH, OH-SVY V0
Rosa Unit #696H, OH, Prelim 5 V0	(C) Rosa Unit #107, OH, OH-INC V0	(C) Rosa Unit #149, OH, OH-INC V0
(C) Rosa Unit #080A, OH, OH-INC V0	(C) Rosa Unit #164A, OH, OH-INC V0	(C) Rosa Unit #171C, OH, OH-SVY V0
(C) Carson #1, OH, OH-INC V0	(C) Rosa Unit #041B, OH, OH-SVY V0	(C) Rosa Unit #171, OH, OH-INC V0
Rosa Unit #690H, OH, Prelim 5 V0	(C) Rosa Unit #336A, OH, OH-INC V0	(C) Rosa Unit #053, OH, OH-INC V0
(C) Rosa Unit #072C, OH, OH-SVY V0	(C) Rosa Unit #072B, OH, OH-SVY V0	(C) Rosa Unit #80B, OH, OH-SVY V0
(C) Rosa Unit #228A, OH, OH-SVY V0	(C) Rosa Unit #550A, OH, OH-SVY V0	(C) Rosa Unit #228, OH, OH-INC 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 #672H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #672H	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:	Prelim 5	Offset TVD Reference:	Offset Datum

Reference Depths are relative to 6347+30 @ 6377.00usft (H&P 530)

Offset Depths are relative to Offset Datum

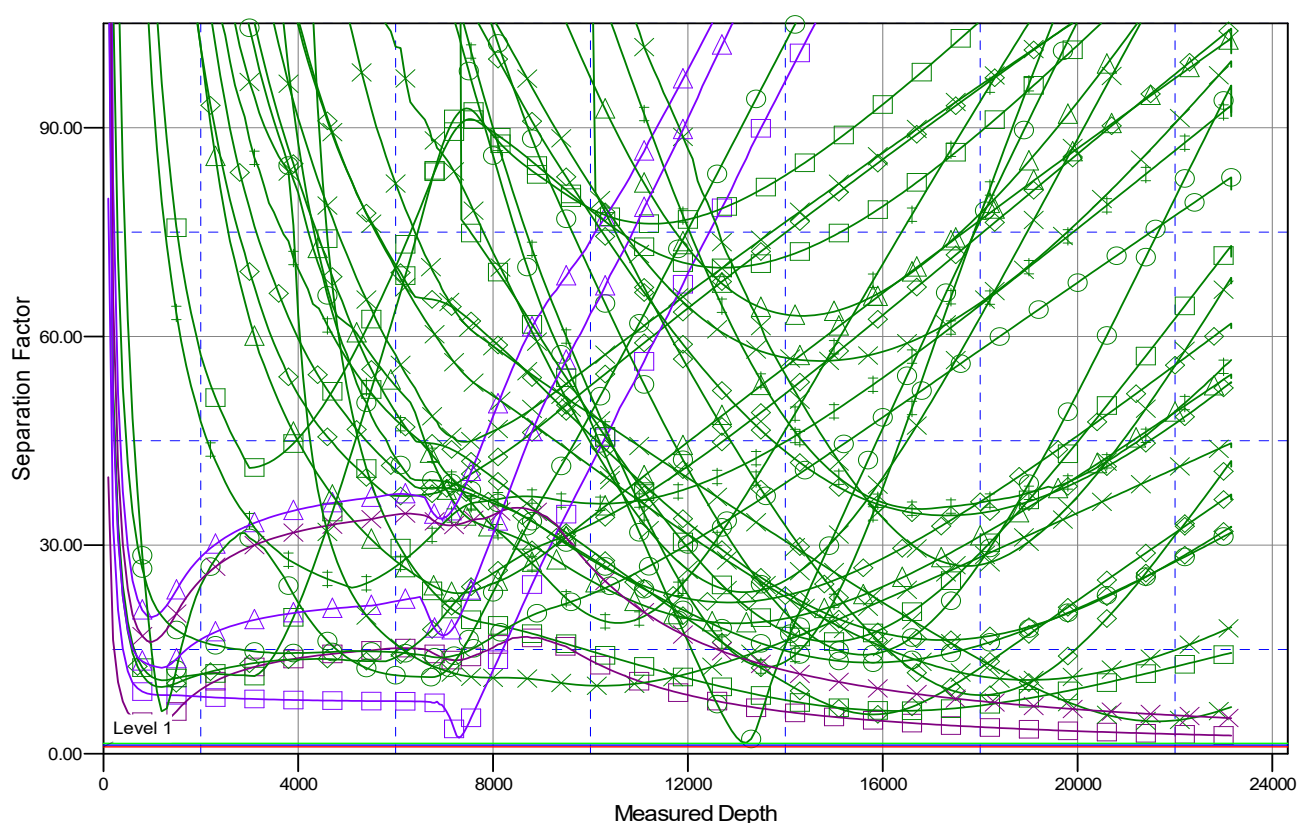
Central Meridian is -107.833334

Coordinates are relative to: Rosa Unit #672H

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

Grid Convergence at Surface is: 0.27°

Separation Factor Plot



LEGEND

(C) Rosa Unit #674H, OH, Prelim 5 V0	(C) Rosa Unit #171B, OH, OH-SVY V0	(C) Rosa Unit #228A, OH, OH-SVY V0
(C) Rosa Unit #65, OH, OH-INC V0	(C) Rosa Unit 148 COM, OH, OH-INC V0	(C) Rosa Unit #46, OH, OH-INC V0
(C) Rosa Unit #140B, OH, OH-INC V0	(C) Rosa Unit #336, OH, OH-INC V0	Rosa Unit #694H, OH, Prelim 5 V0
(C) Rosa Unit #108, OH, OH-SVY V0	(C) Rosa Unit #641C, OH, OH-SVY V0	Rosa Unit #692H, OH, Prelim 5 V0
(C) Rosa Unit #164C, OH, OH-SVY V0	(C) Rosa Unit #168C, OH, OH-SVY V0	(C) Rosa Unit #149A, OH, OH-INC V0
(C) Rosa Unit #149C, OH, OH-SVY V0	(C) Rosa Unit #164, OH, OH-SVY V0	(C) Rosa Unit #171A, OH, OH-SVY V0
Rosa Unit #696H, OH, Prelim 5 V0	(C) Rosa Unit #107, OH, OH-INC V0	(C) Rosa Unit #149, OH, OH-INC V0
(C) Rosa Unit #680A, OH, OH-INC V0	(C) Rosa Unit #164A, OH, OH-INC V0	(C) Rosa Unit #171C, OH, OH-SVY V0
(C) Carson #1, OH, OH-INC V0	(C) Rosa Unit #041B, OH, OH-SVY V0	(C) Rosa Unit #171, OH, OH-INC V0
Rosa Unit #690H, OH, Prelim 5 V0	(C) Rosa Unit #336A, OH, OH-INC V0	(C) Rosa Unit #053, OH, OH-INC V0
(C) Rosa Unit #072C, OH, OH-SVY V0	(C) Rosa Unit 072B, OH, OH-SVY V0	(C) Rosa Unit #68B, OH, OH-SVY V0
(C) Rosa Unit #228A, OH, OH-SVY V0	(C) Rosa Unit #850A, OH, OH-SVY V0	(C) Rosa Unit #228, OH, OH-INC V0

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

Logos Operating LLC

Rio Arriba, NM (NAD83)

Rosa Unit 34

Rosa Unit #672H

OH

Plan: Prelim 5

Standard Planning Report

22 November, 2024

SDT
Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit #672H
Company:	Logos Operating LLC	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site:	Rosa Unit 34	North Reference:	True
Well:	Rosa Unit #672H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Prelim 5		

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 34				
Site Position:		Northing:	2,154,213.35 usft	Latitude:	36.919164
From:	Lat/Long	Easting:	2,854,601.45 usft	Longitude:	-107.383447
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "		

Well	Rosa Unit #672H					
Well Position	+N/-S	0.00 usft	Northing:	2,154,261.53 usft	Latitude:	36.919296
	+E/-W	0.00 usft	Easting:	2,854,628.12 usft	Longitude:	-107.383355
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	6,347.00 usft
Grid Convergence:		0.27 °				

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	7/16/2024	8.40	63.46	49,423.26522222

Design	Prelim 5				
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	270.48

Plan Survey Tool Program	Date	11/22/2024			
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	23,155.63 Prelim 5 (OH)	MWD+HRGM+MS		
			MWD + HRGM + Multi-Station		

SDT
Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit #672H
Company:	Logos Operating LLC	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site:	Rosa Unit 34	North Reference:	True
Well:	Rosa Unit #672H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Prelim 5		

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	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,000.00	10.00	10.00	997.47	42.86	7.56	2.00	2.00	0.00	10.00	
1,496.97	19.78	2.70	1,477.20	169.67	19.04	2.00	1.97	-1.47	-14.43	
5,665.73	19.78	2.70	5,400.00	1,578.85	85.50	0.00	0.00	0.00	0.00	
6,722.82	9.21	2.70	6,422.00	1,842.76	97.94	1.00	-1.00	0.00	-180.00	
7,657.25	90.04	313.00	6,988.40	2,326.16	-317.68	9.00	8.65	-5.32	-50.06	
8,152.35	90.04	313.00	6,988.06	2,663.82	-679.77	0.00	0.00	0.00	0.00	
9,215.33	90.04	270.48	6,987.26	3,048.57	-1,644.64	4.00	0.00	-4.00	-89.98	
23,155.65	90.04	270.48	6,977.00	3,165.55	-15,584.47	0.00	0.00	0.00	0.00	RU 672H PBHL

SDT

Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit #672H
Company:	Logos Operating LLC	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site:	Rosa Unit 34	North Reference:	True
Well:	Rosa Unit #672H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Prelim 5		

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
Start Build 2.00									
600.00	2.00	10.00	599.98	1.72	0.30	-0.29	2.00	2.00	0.00
700.00	4.00	10.00	699.84	6.87	1.21	-1.15	2.00	2.00	0.00
800.00	6.00	10.00	799.45	15.46	2.73	-2.60	2.00	2.00	0.00
900.00	8.00	10.00	898.70	27.46	4.84	-4.61	2.00	2.00	0.00
1,000.00	10.00	10.00	997.47	42.86	7.56	-7.20	2.00	2.00	0.00
Start DLS 2.00 TFO -14.43									
1,100.00	11.95	7.59	1,095.63	61.67	10.43	-9.92	2.00	1.95	-2.41
1,200.00	13.91	5.85	1,193.09	83.89	13.03	-12.32	2.00	1.96	-1.74
1,300.00	15.88	4.54	1,289.73	109.49	15.34	-14.42	2.00	1.97	-1.32
1,400.00	17.86	3.51	1,385.42	138.44	17.36	-16.20	2.00	1.98	-1.03
1,496.97	19.78	2.70	1,477.20	169.67	19.04	-17.62	2.00	1.98	-0.83
Start 4168.76 hold at 1496.97 MD									
1,500.00	19.78	2.70	1,480.05	170.69	19.09	-17.66	0.00	0.00	0.00
1,600.00	19.78	2.70	1,574.15	204.50	20.68	-18.97	0.00	0.00	0.00
1,700.00	19.78	2.70	1,668.25	238.30	22.28	-20.28	0.00	0.00	0.00
1,800.00	19.78	2.70	1,762.35	272.10	23.87	-21.59	0.00	0.00	0.00
1,900.00	19.78	2.70	1,856.45	305.91	25.47	-22.90	0.00	0.00	0.00
2,000.00	19.78	2.70	1,950.55	339.71	27.06	-24.21	0.00	0.00	0.00
2,100.00	19.78	2.70	2,044.65	373.51	28.65	-25.52	0.00	0.00	0.00
2,200.00	19.78	2.70	2,138.75	407.32	30.25	-26.83	0.00	0.00	0.00
2,300.00	19.78	2.70	2,232.85	441.12	31.84	-28.15	0.00	0.00	0.00
2,400.00	19.78	2.70	2,326.95	474.92	33.44	-29.46	0.00	0.00	0.00
2,500.00	19.78	2.70	2,421.05	508.73	35.03	-30.77	0.00	0.00	0.00
2,519.07	19.78	2.70	2,439.00	515.17	35.33	-31.02	0.00	0.00	0.00
Ojo Alamo									
2,600.00	19.78	2.70	2,515.15	542.53	36.62	-32.08	0.00	0.00	0.00
2,646.60	19.78	2.70	2,559.00	558.28	37.37	-32.69	0.00	0.00	0.00
Kirtland									
2,700.00	19.78	2.70	2,609.25	576.33	38.22	-33.39	0.00	0.00	0.00
2,800.00	19.78	2.70	2,703.35	610.14	39.81	-34.70	0.00	0.00	0.00
2,900.00	19.78	2.70	2,797.45	643.94	41.41	-36.01	0.00	0.00	0.00
2,964.34	19.78	2.70	2,858.00	665.69	42.43	-36.85	0.00	0.00	0.00
Fruitland									
3,000.00	19.78	2.70	2,891.55	677.74	43.00	-37.32	0.00	0.00	0.00
3,100.00	19.78	2.70	2,985.65	711.55	44.59	-38.63	0.00	0.00	0.00
3,116.31	19.78	2.70	3,001.00	717.06	44.85	-38.85	0.00	0.00	0.00
T/Coals									
3,200.00	19.78	2.70	3,079.75	745.35	46.19	-39.94	0.00	0.00	0.00
3,292.72	19.78	2.70	3,167.00	776.69	47.67	-41.16	0.00	0.00	0.00
B/Coals									
3,300.00	19.78	2.70	3,173.85	779.15	47.78	-41.25	0.00	0.00	0.00
3,400.00	19.78	2.70	3,267.95	812.96	49.38	-42.56	0.00	0.00	0.00
3,500.00	19.78	2.70	3,362.05	846.76	50.97	-43.88	0.00	0.00	0.00
3,506.32	19.78	2.70	3,368.00	848.90	51.07	-43.96	0.00	0.00	0.00
Pictured Cliffs									
3,600.00	19.78	2.70	3,456.15	880.56	52.57	-45.19	0.00	0.00	0.00

SDT

Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit #672H
Company:	Logos Operating LLC	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site:	Rosa Unit 34	North Reference:	True
Well:	Rosa Unit #672H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Prelim 5		

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)	
3,615.78	19.78	2.70	3,471.00	885.90	52.82	-45.39	0.00	0.00	0.00	
Lewis										
3,700.00	19.78	2.70	3,550.25	914.37	54.16	-46.50	0.00	0.00	0.00	
3,800.00	19.78	2.70	3,644.35	948.17	55.75	-47.81	0.00	0.00	0.00	
3,900.00	19.78	2.70	3,738.45	981.97	57.35	-49.12	0.00	0.00	0.00	
4,000.00	19.78	2.70	3,832.55	1,015.78	58.94	-50.43	0.00	0.00	0.00	
4,100.00	19.78	2.70	3,926.65	1,049.58	60.54	-51.74	0.00	0.00	0.00	
4,200.00	19.78	2.70	4,020.75	1,083.38	62.13	-53.05	0.00	0.00	0.00	
4,300.00	19.78	2.70	4,114.85	1,117.19	63.72	-54.36	0.00	0.00	0.00	
4,400.00	19.78	2.70	4,208.95	1,150.99	65.32	-55.67	0.00	0.00	0.00	
4,500.00	19.78	2.70	4,303.05	1,184.80	66.91	-56.98	0.00	0.00	0.00	
4,600.00	19.78	2.70	4,397.15	1,218.60	68.51	-58.30	0.00	0.00	0.00	
4,700.00	19.78	2.70	4,491.25	1,252.40	70.10	-59.61	0.00	0.00	0.00	
4,800.00	19.78	2.70	4,585.35	1,286.21	71.69	-60.92	0.00	0.00	0.00	
4,867.64	19.78	2.70	4,649.00	1,309.07	72.77	-61.80	0.00	0.00	0.00	
Chacra										
4,900.00	19.78	2.70	4,679.45	1,320.01	73.29	-62.23	0.00	0.00	0.00	
5,000.00	19.78	2.70	4,773.55	1,353.81	74.88	-63.54	0.00	0.00	0.00	
5,100.00	19.78	2.70	4,867.65	1,387.62	76.48	-64.85	0.00	0.00	0.00	
5,200.00	19.78	2.70	4,961.75	1,421.42	78.07	-66.16	0.00	0.00	0.00	
5,300.00	19.78	2.70	5,055.85	1,455.22	79.67	-67.47	0.00	0.00	0.00	
5,358.61	19.78	2.70	5,111.00	1,475.03	80.60	-68.24	0.00	0.00	0.00	
U/Cliff House										
5,400.00	19.78	2.70	5,149.95	1,489.03	81.26	-68.78	0.00	0.00	0.00	
5,500.00	19.78	2.70	5,244.05	1,522.83	82.85	-70.09	0.00	0.00	0.00	
5,600.00	19.78	2.70	5,338.15	1,556.63	84.45	-71.40	0.00	0.00	0.00	
5,665.73	19.78	2.70	5,400.00	1,578.85	85.50	-72.27	0.00	0.00	0.00	
Start DLS 1.00 TFO -180.00										
5,693.33	19.50	2.70	5,426.00	1,588.12	85.93	-72.63	1.00	-1.00	0.00	
Cliff House										
5,700.00	19.44	2.70	5,432.28	1,590.34	86.04	-72.71	1.00	-1.00	0.00	
5,730.42	19.13	2.70	5,461.00	1,600.38	86.51	-73.10	1.00	-1.00	0.00	
Menefee										
5,800.00	18.44	2.70	5,526.87	1,622.76	87.57	-73.97	1.00	-1.00	0.00	
5,900.00	17.44	2.70	5,622.01	1,653.52	89.02	-75.16	1.00	-1.00	0.00	
5,913.61	17.30	2.70	5,635.00	1,657.58	89.21	-75.32	1.00	-1.00	0.00	
Point Lookout										
6,000.00	16.44	2.70	5,717.67	1,682.62	90.39	-76.29	1.00	-1.00	0.00	
6,100.00	15.44	2.70	5,813.83	1,710.05	91.68	-77.35	1.00	-1.00	0.00	
6,200.00	14.44	2.70	5,910.44	1,735.79	92.90	-78.35	1.00	-1.00	0.00	
6,300.00	13.44	2.70	6,007.50	1,759.85	94.03	-79.29	1.00	-1.00	0.00	
6,400.00	12.44	2.70	6,104.96	1,782.22	95.09	-80.15	1.00	-1.00	0.00	
6,500.00	11.44	2.70	6,202.80	1,802.88	96.06	-80.95	1.00	-1.00	0.00	
6,535.89	11.08	2.70	6,238.00	1,809.88	96.39	-81.22	1.00	-1.00	0.00	
Mancos										
6,600.00	10.44	2.70	6,300.98	1,821.83	96.95	-81.69	1.00	-1.00	0.00	
6,700.00	9.44	2.70	6,399.48	1,839.07	97.77	-82.36	1.00	-1.00	0.00	
6,722.82	9.21	2.70	6,422.00	1,842.76	97.94	-82.50	1.00	-1.00	0.00	
Start DLS 9.00 TFO -50.06										
6,750.00	10.94	352.77	6,448.76	1,847.49	97.72	-82.24	9.00	6.37	-36.53	
6,800.00	14.66	341.21	6,497.51	1,858.19	95.08	-79.51	9.00	7.44	-23.13	
6,850.00	18.72	334.40	6,545.40	1,871.43	89.58	-73.89	9.00	8.12	-13.61	
6,900.00	22.94	329.99	6,592.13	1,887.11	81.23	-65.42	9.00	8.44	-8.83	

SDT

Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit #672H
Company:	Logos Operating LLC	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site:	Rosa Unit 34	North Reference:	True
Well:	Rosa Unit #672H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Prelim 5		

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)
6,950.00	27.25	326.90	6,637.40	1,905.14	70.10	-54.14	9.00	8.61	-6.18
7,000.00	31.60	324.60	6,680.94	1,925.42	56.25	-40.12	9.00	8.71	-4.60
7,050.00	35.99	322.81	6,722.48	1,947.82	39.77	-23.45	9.00	8.78	-3.58
7,100.00	40.40	321.36	6,761.76	1,972.19	20.76	-4.24	9.00	8.82	-2.90
7,150.00	44.83	320.15	6,798.55	1,998.39	-0.66	17.40	9.00	8.85	-2.41
7,176.56	47.18	319.58	6,817.00	2,013.00	-12.98	29.84	9.00	8.87	-2.13
Black Top									
7,200.00	49.26	319.12	6,832.61	2,026.26	-24.37	41.34	9.00	8.88	-1.99
7,250.00	53.71	318.21	6,863.74	2,055.62	-50.21	67.42	9.00	8.89	-1.81
7,300.00	58.16	317.41	6,891.74	2,086.29	-78.02	95.50	9.00	8.90	-1.61
7,350.00	62.61	316.68	6,916.44	2,118.10	-107.64	125.38	9.00	8.91	-1.46
7,400.00	67.07	316.00	6,937.69	2,150.82	-138.88	156.89	9.00	8.92	-1.35
7,450.00	71.53	315.37	6,955.36	2,184.28	-171.55	189.84	9.00	8.92	-1.26
7,500.00	76.00	314.77	6,969.34	2,218.26	-205.44	224.02	9.00	8.93	-1.20
7,550.00	80.46	314.20	6,979.53	2,252.55	-240.36	259.22	9.00	8.93	-1.15
7,600.00	84.93	313.63	6,985.89	2,286.93	-276.08	295.23	9.00	8.93	-1.12
7,650.00	89.39	313.08	6,988.37	2,321.21	-312.38	331.81	9.00	8.93	-1.11
7,657.25	90.04	313.00	6,988.40	2,326.16	-317.68	337.15	9.00	8.93	-1.10
Start 495.10 hold at 7657.25 MD									
7,700.00	90.04	313.00	6,988.37	2,355.31	-348.94	368.66	0.00	0.00	0.00
7,800.00	90.04	313.00	6,988.30	2,423.51	-422.08	442.37	0.00	0.00	0.00
7,900.00	90.04	313.00	6,988.23	2,491.71	-495.21	516.07	0.00	0.00	0.00
8,000.00	90.04	313.00	6,988.16	2,559.91	-568.35	589.77	0.00	0.00	0.00
8,100.00	90.04	313.00	6,988.09	2,628.11	-641.48	663.48	0.00	0.00	0.00
8,152.35	90.04	313.00	6,988.06	2,663.82	-679.77	702.06	0.00	0.00	0.00
Start DLS 4.00 TFO -89.98									
8,200.00	90.04	311.09	6,988.02	2,695.73	-715.15	737.71	4.00	0.00	-4.00
8,300.00	90.04	307.09	6,987.95	2,758.77	-792.75	815.83	4.00	0.00	-4.00
8,400.00	90.04	303.09	6,987.88	2,816.25	-874.55	898.11	4.00	0.00	-4.00
8,500.00	90.04	299.09	6,987.80	2,867.89	-960.17	984.16	4.00	0.00	-4.00
8,600.00	90.04	295.09	6,987.73	2,913.42	-1,049.17	1,073.55	4.00	0.00	-4.00
8,700.00	90.04	291.09	6,987.65	2,952.64	-1,141.14	1,165.84	4.00	0.00	-4.00
8,800.00	90.04	287.09	6,987.57	2,985.35	-1,235.62	1,260.59	4.00	0.00	-4.00
8,900.00	90.04	283.09	6,987.50	3,011.38	-1,332.15	1,357.33	4.00	0.00	-4.00
9,000.00	90.04	279.09	6,987.42	3,030.62	-1,430.26	1,455.60	4.00	0.00	-4.00
9,100.00	90.04	275.09	6,987.34	3,042.97	-1,529.48	1,554.92	4.00	0.00	-4.00
9,200.00	90.04	271.09	6,987.27	3,048.36	-1,629.31	1,654.79	4.00	0.00	-4.00
9,215.33	90.04	270.48	6,987.26	3,048.57	-1,644.64	1,670.12	4.00	0.00	-4.00
Start 13940.32 hold at 9215.33 MD									
9,300.00	90.04	270.48	6,987.20	3,049.28	-1,729.31	1,754.79	0.00	0.00	0.00
9,400.00	90.04	270.48	6,987.12	3,050.12	-1,829.30	1,854.79	0.00	0.00	0.00
9,500.00	90.04	270.48	6,987.05	3,050.96	-1,929.30	1,954.79	0.00	0.00	0.00
9,600.00	90.04	270.48	6,986.98	3,051.80	-2,029.30	2,054.79	0.00	0.00	0.00
9,700.00	90.04	270.48	6,986.90	3,052.64	-2,129.29	2,154.79	0.00	0.00	0.00
9,800.00	90.04	270.48	6,986.83	3,053.48	-2,229.29	2,254.79	0.00	0.00	0.00
9,900.00	90.04	270.48	6,986.75	3,054.32	-2,329.29	2,354.79	0.00	0.00	0.00
10,000.00	90.04	270.48	6,986.68	3,055.16	-2,429.28	2,454.79	0.00	0.00	0.00
10,100.00	90.04	270.48	6,986.61	3,056.00	-2,529.28	2,554.79	0.00	0.00	0.00
10,200.00	90.04	270.48	6,986.53	3,056.84	-2,629.27	2,654.79	0.00	0.00	0.00
10,300.00	90.04	270.48	6,986.46	3,057.68	-2,729.27	2,754.79	0.00	0.00	0.00
10,400.00	90.04	270.48	6,986.39	3,058.51	-2,829.27	2,854.79	0.00	0.00	0.00
10,500.00	90.04	270.48	6,986.31	3,059.35	-2,929.26	2,954.79	0.00	0.00	0.00
10,600.00	90.04	270.48	6,986.24	3,060.19	-3,029.26	3,054.79	0.00	0.00	0.00

SDT

Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit #672H
Company:	Logos Operating LLC	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site:	Rosa Unit 34	North Reference:	True
Well:	Rosa Unit #672H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Prelim 5		

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)	
10,700.00	90.04	270.48	6,986.17	3,061.03	-3,129.26	3,154.79	0.00	0.00	0.00	
10,800.00	90.04	270.48	6,986.09	3,061.87	-3,229.25	3,254.79	0.00	0.00	0.00	
10,900.00	90.04	270.48	6,986.02	3,062.71	-3,329.25	3,354.79	0.00	0.00	0.00	
11,000.00	90.04	270.48	6,985.95	3,063.55	-3,429.25	3,454.79	0.00	0.00	0.00	
11,100.00	90.04	270.48	6,985.87	3,064.39	-3,529.24	3,554.79	0.00	0.00	0.00	
11,200.00	90.04	270.48	6,985.80	3,065.23	-3,629.24	3,654.79	0.00	0.00	0.00	
11,300.00	90.04	270.48	6,985.72	3,066.07	-3,729.24	3,754.79	0.00	0.00	0.00	
11,400.00	90.04	270.48	6,985.65	3,066.91	-3,829.23	3,854.79	0.00	0.00	0.00	
11,500.00	90.04	270.48	6,985.58	3,067.74	-3,929.23	3,954.79	0.00	0.00	0.00	
11,600.00	90.04	270.48	6,985.50	3,068.58	-4,029.23	4,054.79	0.00	0.00	0.00	
11,700.00	90.04	270.48	6,985.43	3,069.42	-4,129.22	4,154.79	0.00	0.00	0.00	
11,800.00	90.04	270.48	6,985.36	3,070.26	-4,229.22	4,254.79	0.00	0.00	0.00	
11,900.00	90.04	270.48	6,985.28	3,071.10	-4,329.21	4,354.79	0.00	0.00	0.00	
12,000.00	90.04	270.48	6,985.21	3,071.94	-4,429.21	4,454.79	0.00	0.00	0.00	
12,100.00	90.04	270.48	6,985.14	3,072.78	-4,529.21	4,554.79	0.00	0.00	0.00	
12,200.00	90.04	270.48	6,985.06	3,073.62	-4,629.20	4,654.79	0.00	0.00	0.00	
12,300.00	90.04	270.48	6,984.99	3,074.46	-4,729.20	4,754.79	0.00	0.00	0.00	
12,400.00	90.04	270.48	6,984.92	3,075.30	-4,829.20	4,854.79	0.00	0.00	0.00	
12,500.00	90.04	270.48	6,984.84	3,076.14	-4,929.19	4,954.79	0.00	0.00	0.00	
12,600.00	90.04	270.48	6,984.77	3,076.98	-5,029.19	5,054.79	0.00	0.00	0.00	
12,700.00	90.04	270.48	6,984.69	3,077.81	-5,129.19	5,154.79	0.00	0.00	0.00	
12,800.00	90.04	270.48	6,984.62	3,078.65	-5,229.18	5,254.79	0.00	0.00	0.00	
12,900.00	90.04	270.48	6,984.55	3,079.49	-5,329.18	5,354.79	0.00	0.00	0.00	
13,000.00	90.04	270.48	6,984.47	3,080.33	-5,429.18	5,454.79	0.00	0.00	0.00	
13,100.00	90.04	270.48	6,984.40	3,081.17	-5,529.17	5,554.79	0.00	0.00	0.00	
13,200.00	90.04	270.48	6,984.33	3,082.01	-5,629.17	5,654.79	0.00	0.00	0.00	
13,300.00	90.04	270.48	6,984.25	3,082.85	-5,729.17	5,754.79	0.00	0.00	0.00	
13,400.00	90.04	270.48	6,984.18	3,083.69	-5,829.16	5,854.79	0.00	0.00	0.00	
13,500.00	90.04	270.48	6,984.11	3,084.53	-5,929.16	5,954.79	0.00	0.00	0.00	
13,600.00	90.04	270.48	6,984.03	3,085.37	-6,029.15	6,054.79	0.00	0.00	0.00	
13,700.00	90.04	270.48	6,983.96	3,086.21	-6,129.15	6,154.79	0.00	0.00	0.00	
13,800.00	90.04	270.48	6,983.88	3,087.05	-6,229.15	6,254.79	0.00	0.00	0.00	
13,900.00	90.04	270.48	6,983.81	3,087.88	-6,329.14	6,354.79	0.00	0.00	0.00	
14,000.00	90.04	270.48	6,983.74	3,088.72	-6,429.14	6,454.79	0.00	0.00	0.00	
14,100.00	90.04	270.48	6,983.66	3,089.56	-6,529.14	6,554.79	0.00	0.00	0.00	
14,200.00	90.04	270.48	6,983.59	3,090.40	-6,629.13	6,654.79	0.00	0.00	0.00	
14,300.00	90.04	270.48	6,983.52	3,091.24	-6,729.13	6,754.79	0.00	0.00	0.00	
14,400.00	90.04	270.48	6,983.44	3,092.08	-6,829.13	6,854.79	0.00	0.00	0.00	
14,500.00	90.04	270.48	6,983.37	3,092.92	-6,929.12	6,954.79	0.00	0.00	0.00	
14,600.00	90.04	270.48	6,983.30	3,093.76	-7,029.12	7,054.79	0.00	0.00	0.00	
14,700.00	90.04	270.48	6,983.22	3,094.60	-7,129.12	7,154.79	0.00	0.00	0.00	
14,800.00	90.04	270.48	6,983.15	3,095.44	-7,229.11	7,254.79	0.00	0.00	0.00	
14,900.00	90.04	270.48	6,983.08	3,096.28	-7,329.11	7,354.79	0.00	0.00	0.00	
15,000.00	90.04	270.48	6,983.00	3,097.11	-7,429.10	7,454.79	0.00	0.00	0.00	
15,100.00	90.04	270.48	6,982.93	3,097.95	-7,529.10	7,554.79	0.00	0.00	0.00	
15,200.00	90.04	270.48	6,982.85	3,098.79	-7,629.10	7,654.79	0.00	0.00	0.00	
15,300.00	90.04	270.48	6,982.78	3,099.63	-7,729.09	7,754.79	0.00	0.00	0.00	
15,400.00	90.04	270.48	6,982.71	3,100.47	-7,829.09	7,854.79	0.00	0.00	0.00	
15,500.00	90.04	270.48	6,982.63	3,101.31	-7,929.09	7,954.79	0.00	0.00	0.00	
15,600.00	90.04	270.48	6,982.56	3,102.15	-8,029.08	8,054.79	0.00	0.00	0.00	
15,700.00	90.04	270.48	6,982.49	3,102.99	-8,129.08	8,154.79	0.00	0.00	0.00	
15,800.00	90.04	270.48	6,982.41	3,103.83	-8,229.08	8,254.79	0.00	0.00	0.00	
15,900.00	90.04	270.48	6,982.34	3,104.67	-8,329.07	8,354.79	0.00	0.00	0.00	
16,000.00	90.04	270.48	6,982.27	3,105.51	-8,429.07	8,454.79	0.00	0.00	0.00	

SDT

Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit #672H
Company:	Logos Operating LLC	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site:	Rosa Unit 34	North Reference:	True
Well:	Rosa Unit #672H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Prelim 5		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
16,100.00	90.04	270.48	6,982.19	3,106.35	-8,529.07	8,554.79	0.00	0.00	0.00
16,200.00	90.04	270.48	6,982.12	3,107.18	-8,629.06	8,654.79	0.00	0.00	0.00
16,300.00	90.04	270.48	6,982.05	3,108.02	-8,729.06	8,754.79	0.00	0.00	0.00
16,400.00	90.04	270.48	6,981.97	3,108.86	-8,829.06	8,854.79	0.00	0.00	0.00
16,500.00	90.04	270.48	6,981.90	3,109.70	-8,929.05	8,954.79	0.00	0.00	0.00
16,600.00	90.04	270.48	6,981.82	3,110.54	-9,029.05	9,054.79	0.00	0.00	0.00
16,700.00	90.04	270.48	6,981.75	3,111.38	-9,129.04	9,154.79	0.00	0.00	0.00
16,800.00	90.04	270.48	6,981.68	3,112.22	-9,229.04	9,254.79	0.00	0.00	0.00
16,900.00	90.04	270.48	6,981.60	3,113.06	-9,329.04	9,354.79	0.00	0.00	0.00
17,000.00	90.04	270.48	6,981.53	3,113.90	-9,429.03	9,454.79	0.00	0.00	0.00
17,100.00	90.04	270.48	6,981.46	3,114.74	-9,529.03	9,554.79	0.00	0.00	0.00
17,200.00	90.04	270.48	6,981.38	3,115.58	-9,629.03	9,654.79	0.00	0.00	0.00
17,300.00	90.04	270.48	6,981.31	3,116.42	-9,729.02	9,754.79	0.00	0.00	0.00
17,400.00	90.04	270.48	6,981.24	3,117.25	-9,829.02	9,854.79	0.00	0.00	0.00
17,500.00	90.04	270.48	6,981.16	3,118.09	-9,929.02	9,954.79	0.00	0.00	0.00
17,600.00	90.04	270.48	6,981.09	3,118.93	-10,029.01	10,054.79	0.00	0.00	0.00
17,700.00	90.04	270.48	6,981.01	3,119.77	-10,129.01	10,154.79	0.00	0.00	0.00
17,800.00	90.04	270.48	6,980.94	3,120.61	-10,229.01	10,254.79	0.00	0.00	0.00
17,900.00	90.04	270.48	6,980.87	3,121.45	-10,329.00	10,354.79	0.00	0.00	0.00
18,000.00	90.04	270.48	6,980.79	3,122.29	-10,429.00	10,454.79	0.00	0.00	0.00
18,100.00	90.04	270.48	6,980.72	3,123.13	-10,528.99	10,554.79	0.00	0.00	0.00
18,200.00	90.04	270.48	6,980.65	3,123.97	-10,628.99	10,654.79	0.00	0.00	0.00
18,300.00	90.04	270.48	6,980.57	3,124.81	-10,728.99	10,754.79	0.00	0.00	0.00
18,400.00	90.04	270.48	6,980.50	3,125.65	-10,828.98	10,854.79	0.00	0.00	0.00
18,500.00	90.04	270.48	6,980.43	3,126.49	-10,928.98	10,954.79	0.00	0.00	0.00
18,600.00	90.04	270.48	6,980.35	3,127.32	-11,028.98	11,054.79	0.00	0.00	0.00
18,700.00	90.04	270.48	6,980.28	3,128.16	-11,128.97	11,154.79	0.00	0.00	0.00
18,800.00	90.04	270.48	6,980.21	3,129.00	-11,228.97	11,254.79	0.00	0.00	0.00
18,900.00	90.04	270.48	6,980.13	3,129.84	-11,328.97	11,354.79	0.00	0.00	0.00
19,000.00	90.04	270.48	6,980.06	3,130.68	-11,428.96	11,454.79	0.00	0.00	0.00
19,100.00	90.04	270.48	6,979.98	3,131.52	-11,528.96	11,554.79	0.00	0.00	0.00
19,200.00	90.04	270.48	6,979.91	3,132.36	-11,628.96	11,654.79	0.00	0.00	0.00
19,300.00	90.04	270.48	6,979.84	3,133.20	-11,728.95	11,754.79	0.00	0.00	0.00
19,400.00	90.04	270.48	6,979.76	3,134.04	-11,828.95	11,854.79	0.00	0.00	0.00
19,500.00	90.04	270.48	6,979.69	3,134.88	-11,928.95	11,954.79	0.00	0.00	0.00
19,600.00	90.04	270.48	6,979.62	3,135.72	-12,028.94	12,054.79	0.00	0.00	0.00
19,700.00	90.04	270.48	6,979.54	3,136.55	-12,128.94	12,154.79	0.00	0.00	0.00
19,800.00	90.04	270.48	6,979.47	3,137.39	-12,228.93	12,254.79	0.00	0.00	0.00
19,900.00	90.04	270.48	6,979.40	3,138.23	-12,328.93	12,354.79	0.00	0.00	0.00
20,000.00	90.04	270.48	6,979.32	3,139.07	-12,428.93	12,454.79	0.00	0.00	0.00
20,100.00	90.04	270.48	6,979.25	3,139.91	-12,528.92	12,554.79	0.00	0.00	0.00
20,200.00	90.04	270.48	6,979.18	3,140.75	-12,628.92	12,654.79	0.00	0.00	0.00
20,300.00	90.04	270.48	6,979.10	3,141.59	-12,728.92	12,754.79	0.00	0.00	0.00
20,400.00	90.04	270.48	6,979.03	3,142.43	-12,828.91	12,854.79	0.00	0.00	0.00
20,500.00	90.04	270.48	6,978.95	3,143.27	-12,928.91	12,954.79	0.00	0.00	0.00
20,600.00	90.04	270.48	6,978.88	3,144.11	-13,028.91	13,054.79	0.00	0.00	0.00
20,700.00	90.04	270.48	6,978.81	3,144.95	-13,128.90	13,154.79	0.00	0.00	0.00
20,800.00	90.04	270.48	6,978.73	3,145.79	-13,228.90	13,254.79	0.00	0.00	0.00
20,900.00	90.04	270.48	6,978.66	3,146.62	-13,328.90	13,354.79	0.00	0.00	0.00
21,000.00	90.04	270.48	6,978.59	3,147.46	-13,428.89	13,454.79	0.00	0.00	0.00
21,100.00	90.04	270.48	6,978.51	3,148.30	-13,528.89	13,554.79	0.00	0.00	0.00
21,200.00	90.04	270.48	6,978.44	3,149.14	-13,628.88	13,654.79	0.00	0.00	0.00
21,300.00	90.04	270.48	6,978.37	3,149.98	-13,728.88	13,754.79	0.00	0.00	0.00
21,400.00	90.04	270.48	6,978.29	3,150.82	-13,828.88	13,854.79	0.00	0.00	0.00

SDT
Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit #672H
Company:	Logos Operating LLC	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site:	Rosa Unit 34	North Reference:	True
Well:	Rosa Unit #672H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Prelim 5		

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)
21,500.00	90.04	270.48	6,978.22	3,151.66	-13,928.87	13,954.79	0.00	0.00	0.00
21,600.00	90.04	270.48	6,978.14	3,152.50	-14,028.87	14,054.79	0.00	0.00	0.00
21,700.00	90.04	270.48	6,978.07	3,153.34	-14,128.87	14,154.79	0.00	0.00	0.00
21,800.00	90.04	270.48	6,978.00	3,154.18	-14,228.86	14,254.79	0.00	0.00	0.00
21,900.00	90.04	270.48	6,977.92	3,155.02	-14,328.86	14,354.79	0.00	0.00	0.00
22,000.00	90.04	270.48	6,977.85	3,155.86	-14,428.86	14,454.79	0.00	0.00	0.00
22,100.00	90.04	270.48	6,977.78	3,156.69	-14,528.85	14,554.79	0.00	0.00	0.00
22,200.00	90.04	270.48	6,977.70	3,157.53	-14,628.85	14,654.79	0.00	0.00	0.00
22,300.00	90.04	270.48	6,977.63	3,158.37	-14,728.85	14,754.79	0.00	0.00	0.00
22,400.00	90.04	270.48	6,977.56	3,159.21	-14,828.84	14,854.79	0.00	0.00	0.00
22,500.00	90.04	270.48	6,977.48	3,160.05	-14,928.84	14,954.79	0.00	0.00	0.00
22,600.00	90.04	270.48	6,977.41	3,160.89	-15,028.84	15,054.79	0.00	0.00	0.00
22,700.00	90.04	270.48	6,977.34	3,161.73	-15,128.83	15,154.79	0.00	0.00	0.00
22,800.00	90.04	270.48	6,977.26	3,162.57	-15,228.83	15,254.79	0.00	0.00	0.00
22,900.00	90.04	270.48	6,977.19	3,163.41	-15,328.82	15,354.79	0.00	0.00	0.00
23,000.00	90.04	270.48	6,977.11	3,164.25	-15,428.82	15,454.79	0.00	0.00	0.00
23,100.00	90.04	270.48	6,977.04	3,165.09	-15,528.82	15,554.79	0.00	0.00	0.00
23,155.65	90.04	270.48	6,977.00	3,165.55	-15,584.47	15,610.44	0.00	0.00	0.00
TD at 23155.65									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
RU 672H SHL	0.00	0.00	0.00	0.00	0.00	2,154,261.53	2,854,628.12	36.919296	-107.383355
- plan hits target center									
- Point									
RU 672H KOP	0.00	0.00	6,422.00	1,842.76	97.94	2,156,104.73	2,854,717.37	36.924358	-107.383020
- plan hits target center									
- Point									
RU 672H PBHL	0.00	0.00	6,977.00	3,165.55	-15,584.47	2,157,353.52	2,839,028.89	36.927979	-107.436674
- plan hits target center									
- Point									
RU 672H IP2	0.00	0.00	6,987.26	3,048.57	-1,644.64	2,157,302.31	2,852,969.11	36.927670	-107.388982
- plan hits target center									
- Point									
RU 672H IP1	0.00	0.00	6,988.06	2,663.82	-679.77	2,156,922.11	2,853,935.79	36.926613	-107.385681
- plan hits target center									
- Point									
RU 672H POE	0.00	0.00	6,988.40	2,326.16	-317.68	2,156,586.16	2,854,299.47	36.925685	-107.384442
- plan hits target center									
- Point									

SDT
Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit #672H
Company:	Logos Operating LLC	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site:	Rosa Unit 34	North Reference:	True
Well:	Rosa Unit #672H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Prelim 5		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,519.07	2,439.00	Ojo Alamo				
2,646.60	2,559.00	Kirtland				
2,964.34	2,858.00	Fruitland				
3,116.31	3,001.00	T/Coals				
3,292.72	3,167.00	B/Coals				
3,506.32	3,368.00	Pictured Cliffs				
3,615.78	3,471.00	Lewis				
4,867.64	4,649.00	Chacra				
5,358.61	5,111.00	U/Cliff House				
5,693.33	5,426.00	Cliff House				
5,730.42	5,461.00	Menefee				
5,913.61	5,635.00	Point Lookout				
6,535.89	6,238.00	Mancos				
7,176.56	6,817.00	Black Top				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
500.00	500.00	0.00	0.00	Start Build 2.00	
1,000.00	997.47	42.86	7.56	Start DLS 2.00 TFO -14.43	
1,496.97	1,477.20	169.67	19.04	Start 4168.76 hold at 1496.97 MD	
5,665.73	5,400.00	1,578.85	85.50	Start DLS 1.00 TFO -180.00	
6,722.82	6,422.00	1,842.76	97.94	Start DLS 9.00 TFO -50.06	
7,657.25	6,988.40	2,326.16	-317.68	Start 495.10 hold at 7657.25 MD	
8,152.35	6,988.06	2,663.82	-679.77	Start DLS 4.00 TFO -89.98	
9,215.33	6,987.26	3,048.57	-1,644.64	Start 13940.32 hold at 9215.33 MD	
23,155.65	6,977.00	3,165.55	-15,584.47	TD at 23155.65	

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

General Information
Phone: (505) 629-6116

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

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

CONDITIONS

Action 471311

CONDITIONS

Operator: LOGOS OPERATING, LLC 2010 Afton Place Farmington, NM 87401	OGRID: 289408
	Action Number: 471311
	Action Type: [C-101] BLM - Federal/Indian Land Lease (Form 3160-3)

CONDITIONS

Created By	Condition	Condition Date
etta trujillo	Cement is required to circulate on both surface and intermediate1 strings of casing.	6/5/2025
etta trujillo	If cement does not circulate on any string, a Cement Bond Log (CBL) is required for that string of casing.	6/5/2025
ward.rikala	Notify the OCD 24 hours prior to casing & cement.	7/15/2025
ward.rikala	File As Drilled C-102 and a directional Survey with C-104 completion packet.	7/15/2025
ward.rikala	Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string.	7/15/2025
ward.rikala	Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system.	7/15/2025