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Farmington Field Office
Bureau of Land Management

Form 3160-5
(June 2015)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB No. 1004-0137
Expires: January 31, 2018

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE *- Other instructions on page 2*

5. Lease Serial No. NMNM18463

6. If Indian, Allottee or Tribe Name

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

1. Type of Well
☑ Oil Well ☐ Gas Well ☐ Other

8. Well Name and No. HEROS 2308 09L COM 1H

2. Name of Operator LOGOS Operating, LLC

9. API Well No. 30-045-35688

3a. Address 2010 Afton Place
Farmington, NM 87401

3b. Phone No. *(include area code)* (505) 324-4145

10. Field and Pool or Exploratory Area
Nageezi Gallup

4. Location of Well *(Footage, Sec., T.,R.,M., or Survey Description)*
1476 FSL & 210 FWL, NW/SW, L Sec 9 T23N R08W

11. Country or Parish, State
San Juan County, NM

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

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

OIL CONS. DIV DIST. 3

DEC 29 2016

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

LOGOS is requesting permission to change the well name from Chaco 23 08 9 #1H to HEROS 2308 09L COM 1H.
LOGOS is revising the bottom hole location from the approved APD footages of 2276' FSL & 380' FEL of Section 9 T23N R08W to 2274' FNL & 380' FWL of Section 16 T23N R08W. Changes to the horizontal leg are reflected in the attached revised C-102, Directional Drill Plan and Drilling Plan.

LOGOS proposes to make the following changes:
Change the drill depth of the 12-1/4" surface hole from 500' to 320' and will land the 9-5/8" casing @ 320'.
Change the 7" Intermediate casing from J-55 26# to J-55 23#.
Change the 4-1/2" Production casing from L-80 11.6# to P-110 11.6#.

Cement volumes will be adjusted accordingly.

BLM'S APPROVAL OR ACCEPTANCE OF THIS ACTION DOES NOT RELIEVE THE LESSEE AND OPERATOR FROM OBTAINING ANY OTHER AUTHORIZATION REQUIRED FOR OPERATIONS ON FEDERAL AND INDIAN LANDS

CONDITIONS OF APPROVAL

Adhere to previously issued stipulations

Original Sundry submittal 12/7 not found - resubmit 12/22 TS

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

Title Regulatory Specialist

Signature Tamra Sessions

Date 12/07/2016

THE SPACE FOR FEDERAL OR STATE OFICE USE

Approved by AG Elmadani

Title PE

Date 12/29/16

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

Office FFO

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

(Instructions on page 2)

NMOCD

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DISTRICT I
1625 N. French Dr., Hobbs, N.M. 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

DISTRICT II
811 S. First St., Artesia, N.M. 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

DISTRICT III
1000 Rio Brazos Rd., Aztec, N.M. 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

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

State of New Mexico
Energy, Minerals & Natural Resources Department

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

Form C-102
Revised August 1, 2011
Submit one copy to appropriate District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

[1] API Number	[2] Pool Code	[3] Pool Name
30-045-35688	47540	NAGEEZI GALLUP

[4] Property Code	[5] Property Name	[6] Well Number
317282	HEROS 2308 09L COM	#1H

[7] OGRID No.	[8] Operator Name	[9] Elevation
289408	LOGOS OPERATING, LLC	6916

[10] Surface Location

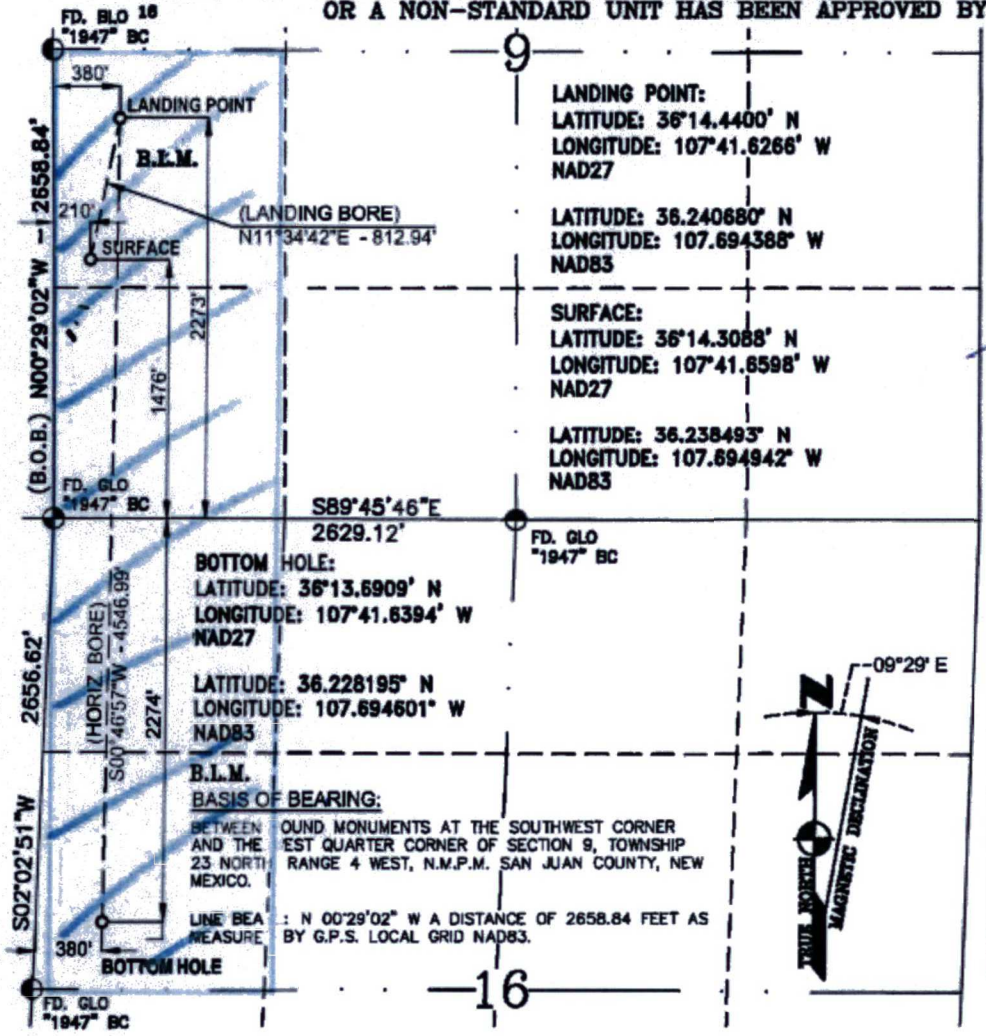
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
L	9	23-N	8-W		1476	SOUTH	210	WEST	SAN JUAN

[11] Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	16	23-N	8-W		2274	NORTH	380	WEST	SAN JUAN

[12] Dedicated Acres	[13] Joint or Infill	[14] Consolidation Code	[15] Order No.
160 Acres Sec 9 S2SW, Sec 16 W2NW			

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



[17] OPERATOR CERTIFICATION

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

Tamra Sessions 12/5/16

Signature Date

Tamra Sessions

Printed Name

tsessions@logosresourcesllc.com

E-mail Address

[18] SURVEYOR CERTIFICATION

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

DECEMBER 4, 20

Date of Survey

Signature and Seal of Professional Surveyor

GLEN W. RUSSELL NEW MEXICO 15703 LICENSED PROFESSIONAL SURVEYOR

GLEN W. RUSSELL

Certificate Number 15703

Directions from the Intersection of Highway 550 and Highway 64 in Bloomfield, NM
to
LOGOS OPERATING, LLC
HEROS 2308 09L COM #1H
1476' FSL 210' FWL,
Section 9, T23N, R8W, N.M.P.M., San Juan County, New Mexico
Latitude: 36° 14' 18.576" N
Longitude: 107° 41' 41.791" W
Nad 1983

From the Intersection of Highway 550 & Highway 64
Go South on Hwy 550 for 39.1 miles to Chaco Canyon road,
turn right (southerly) for 0.3 miles
turn left (easterly) for 0.6 miles thru 2 gates
to the beginning of new access on the left (north) side of the road and continues (northeasterly) for
262.07' to the new location.

HEROS 2308 09L COM 1H
API # 30-045-35688
Lease Serial # NMNM18463

Surface Location: 1476 FSL, 210 FWL
Legal Description: Sec 9, T23N, R8W (36.238493° N, 107.694942° W –NAD83)
Pay Zone Entry Point Location: 2373 FSL, 380 FWL
Legal Description: Sec 9, T23N, R8W (36.240680°N, 107.694388° W –NAD83)
Bottom Hole Location: 2274 FNL, 380 FWL
Legal Description: Sec 16, T23N, R8W (36.228195°N, 107.694601° W –NAD83)
San Juan County, NM

1. The elevation of the unprepared ground is 6,916 feet above sea level. Estimated KB Elev = 6931' (15'KB)
2. The geological name of the surface formation is the Nacimiento.
3. A rotary rig will be used to drill the well to a Proposed Total Depth of 5,156' TVD/10,390' MD.
4. Estimated top of important geological markers:

Formation	Depth TVD (ft)	Depth MD (ft)
Nacimiento	Surface	Surface
Ojo Alamo	1,063	1,080
Kirtland	1,213	1,232
Fruitland	1,328	1,350
Pictured Cliffs	1,763	1,809
Huerfanito Bentonite	2,038	2,106
Chacra	2,553	2,663
Cliff House	3,213	3,376
Menefee	3,263	3,430
Point Lookout	4,123	4,359
Mancos	4,573	4,841
Mancos/Niobrara "C"	**5,288**	**5,471**

5. Estimated depth at which anticipated water, oil, gas or other mineral bearing formations are expected to be encountered:

Formation	Depth TVD (ft)	Water/Hydrocarbon
Fruitland	1,328	Gas
Pictured Cliffs	1,763	Gas
Cliff House	3,213	Gas
Point Lookout	4,123	Gas
Mancos	4,573	Oil/Gas

6. All proposed casing is new and the program is as follows:

Casing	Size	Depth		Grade	Weight	Connection	PSI		x1000 lbs
		MD	TVD				Burst	Collapse	Tension
Surface	9-5/8"	0-320'	0-320'	J-55	36.00	STC	3520	2020	394
Intermediate	7"	0-5,843'	0-5,262'	J-55	23.00	LTC	4360	3270	313
Production	4-1/2 "	5,693'-10,390'	5,262'-5,156'	P-110	11.60	Premium	10690	7560	367

7. Cementing Program:

   a. **12-1/4"** hole x 9-5/8" casing at 320' will have cement circulated to surface with 270 sks (100% excess true hole) Class H Cement with 1.0% CaCl2, 1/2#/sk Poly-E-Flake 15.8 ppg, 1.17 ft^3/sk. Note: CEMENT MUST BE CIRCULATED TO SURFACE. STANDARD BOW SPRING CENTRALIZERS SHALL BE PLACED ON THE FIRST 3 (BOTTOM 3) JOINTS OF CASING (1 PER JOINT) AND 1 EVERY 3RD JOINT TO SURFACE. 20 BBLS OF WATER FOLLOWED BY 20 BBLS OF MUDFLUSH AHEAD OF CEMENT AS SPACER. Test Surface Casing to 750 psi.

   b. **8-3/4"** hole x 7" casing at 5,843' MD. Cement will be circulated to surface with 600 sks (50% excess true hole) of HLC with 1.0 % CaC2. ¼ #/sk Poly-E-Flake, 5 #/sk Kol-Seal (Gilsonite) – 12.3 ppg, 1.95 ft^3/sk followed by 115 sks (100% excess true hole) 50/50 Glass H/Poz with 0.15% Versaset, 0.30% HALAD-9, 1/4 #/sk Poly-E-Flake, 5 #/sk Kol-Seal – 13.5 ppg, 1.31 ft3/sk. ONE CENTRALIZER PER JOINT FOR THE FIRST 3 JOINTS, THEN EVERY 3RD JOINT TO SURFACE. 10 BBLS OF WATER FOLLOWED BY 30 BBLS OF MUDFLUSH AHEAD OF CEMENT AS SPACER Test Intermediate Casing to 1500 psi. Cement additives subject to change based on wellbore conditions and cement design criteria.

   c. **6-1/4"** hole x 4-1/2" liner at **10,390' MD.** A fluid caliper will be run to determine base slurry cement to have TOC at 5,700'. Base slurry to consist of 400 sks 50/50 Class H/Poz with 0.10% Versaset, 1.5 gal/sk CHEM-FOAMER 760, 0.10% sa-1015, 0.20% HALAD-766 -13.5 ppg, 1.27 fl3/sk, Foamed density 10.5 ppg. 50 sks of base slurry to be used as tail cement less foaming agent. CENTRALIZERS TO BE USED AT DISCRETION IN LATERAL TO ACHIEVE 70% STAND OFF. CENTRALIZERS TO BE USED TO TIE BACK DEPTH OF 6000' TO ACHIEVE 70% STAND OFF. PACKOFF SEAL ASSEMBLY TO BE USED FOR LINER TOP ISOLATION. Cement additives subject to change based on wellbore conditions and cement design criteria. Liner to be pressure tested during completion operations.

8. Pressure Control Equipment

BOP equipment and accessories will meet or exceed BLM requirements outlined in 43 CFR Part 3160.

A 2000 psig double ram hydraulic BOP will be used (see attached diagram). Since maximum anticipated formation pressure is 1915 psig (0.364 psi/ft @ 5262' TVD), accessories to the BOP will meet BLM requirements for a 2000 psig system. In accordance with Onshore Order #2 (111.A well requirements) the anticipated surface pressure assuming a partially evacuated hole with normal pressure gradient of 0.22 psi/ft will be 1158 psi (5262' TVD x 0.22 psi/ft).

The accumulator system capacity will be sufficient to close all BOPE with a 50% safety factor. Fill line, kill line and line to the choke manifold will be 2".

BOPs will be function tested every 24 hours and will be recorded on an IADC log. Accessories to the BOPE will include upper and lower Kelly cocks with handles with a stabbing valve to fit drill pipe on the floor at all times, string float at bit, 3000 psig choke manifold with 2" adjustable and 2"positive chokes, and pressure gauge.

All BOP equipment will be hydraulically operated with controls accessible both on the rig floor.

The wellhead BOP equipment will be nipped-up on the 9-5/8" x 11" 2,000 psi WP casing head prior to drilling out from under surface casing. All ram preventers and related equipment will be tested to 2,000 psi for 10 minutes. Annular preventers will be tested to 50% of rated working pressure for 10 minutes. Surface casing will be tested to 70% of internal yield pressure. All preventers and surface casing will be tested before drilling out of surface casing. BOP equipment will be tested every 14 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 rams will be activated daily and blind rams shall be activated each trip or at least weekly. The New Mexico Oil & Gas Conservation Commission and the BLM will be notified 24 hours in advance of testing of BOPE.

9. Mud Program:

0' - 320'	Fresh water/Spud Mud. Paper for losses and seepage. 8.5 to 9.0 ppg, 32 to 75 vis, PV 3 to 5, YP 5 to 7.WLNC
320' - 5850'	Fresh water/LSND. As needed LCM for losses and seepage. 8.5 to 9.5 ppg, pH 10, 28 to 60 vis, PY 1, YP 1, WL 8-15
5850' - 10,390'	WBM with shale and clay stabilizers. As needed LCM for losses and seepage. 8.3 to 9.3 ppg, 15 to 35 vis, PV 4-6, YP 4-6, WL < 20

**During drilling operations, all necessary products will be sufficiently stored on location for abnormal situations. The characteristics, use, testing of drilling mud and the implementation of related drilling procedures shall be designed to prevent the loss of well control. Sufficient quantities of mud materials shall be maintained or readily accessible for the purpose of assuring well control.
**A pH of 10 or above in the fresh water base mud system shall be maintained to control the effects corrosion has on metallurgy of equipment used.

Operating and Maintenance

LOGOS Operating will be using all above ground steel pits for fluid and cuttings while drilling. If any tank develops a leak we will have immediate visual discovery, we would then transfer the fluid to another tank then remove any contaminated soil and dispose of it in the cuttings bins for transportation. 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. A trip/surge tank will be used to monitor returns for any "kicks" of formation fluids.

Equipment:

2-Mongoose Shale Shakers

2-3400 High Speed Centrifuges with stands and pumps

2-Roll off bins with Tracks

2-200 bbl Open top Frac tanks

1-Mud/Gas Separator and Degasser

1-Trip/Surge Tank

Electronic or Visual monitoring system to indicate lost returns

10. Testing, Logging and Coring Program:

a. Testing Program: No drillstem tests are anticipated
b. Electric Logging Program: TBD
c. LWD Program: TBD
d. Coring Program: None anticipated.
e. CBL's and/or Temperature Surveys Will Be Performed as Needed or Required.
f. **MudLogging: Mudloggers will be on location from intermediate casing point to TD.**
g. **Gamma Ray from surface casing point to TD**
h. **Cased Hole: CBL/CCL/GRNDL will be run as needed for perforating control.**

11. Bottom Hole Pressure expected to be 2,500 +/- psi
12. Bottom Hole Temperature expected to be 160 deg F.

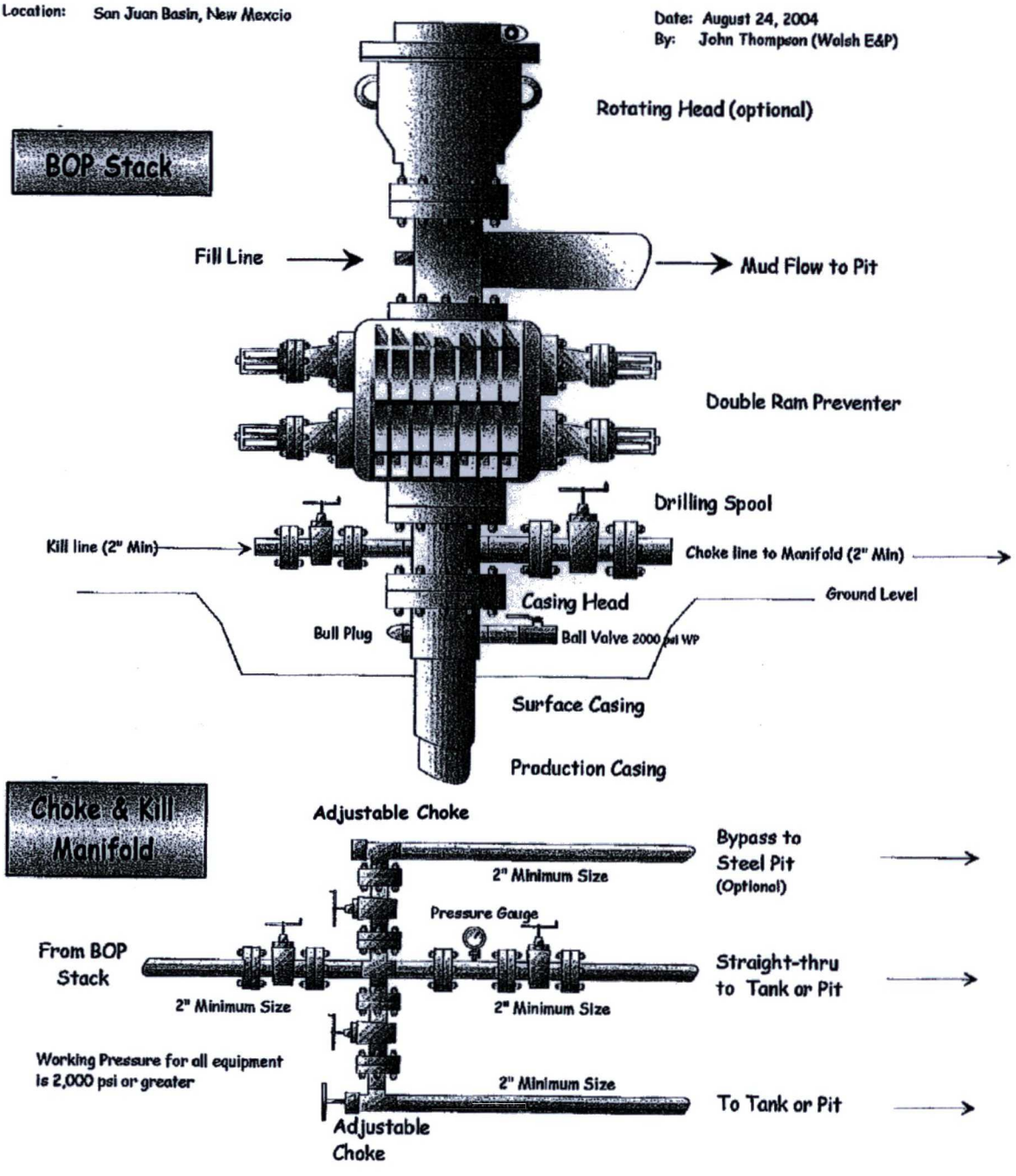
Well Control Equipment Schematic for 2M Service

Attachment to Drilling Technical Program

Exhibit #1
Typical BOP setup

Location: San Juan Basin, New Mexcio

Date: August 24, 2004
By: John Thompson (Walsh E&P)



Logos Resources II, LLC

Well: HEROS 2308 09L COM 1H Plan: Rev 0	Field: San Juan County, NM NAD83	Site: Sec. 09 Twn 23N Rng 8W	Rig: TBD
Borehole: Original Hole Plan Date: December 06 2016 VSec: 178.38deg Grid Conv: -0.89	System: US State Plane 1983 KB: 6931.00ft Zone: New Mexico Western Zone GL: 6916.00ft	Latitude: 36.238493°N Longitude: 107.694942°W Northing / Y: 1906138.82 Easting / X: 2763902.48	Model: IGRF200510 Date: 31-Dec-09 DEC: 9.97° DIP: 63.09° FS: 50626 North Ref: Grid

Critical Points

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	650.00	0.00	0.00	650.00	0.00	0.00	0.00	0.00	0.00	Build 2°/100 DLS
3	1761.03	22.22	5.26	1733.39	211.86	19.52	2.00	5.26	-211.22	Hold Inc
4	4721.77	22.22	5.26	4474.25	1326.81	122.26	0.00	0.00	-1322.82	KOP, Build 10°/100 DLS
5	5842.71	90.00	179.30	5262.00	796.37	162.23	10.00	173.56	-791.47	LP / 7" Csg
6	5942.71	90.00	179.30	5262.00	696.38	163.46	0.00	0.00	-691.48	Build 2°/100 DLS
7	6011.94	91.38	179.30	5261.16	627.16	164.31	2.00	0.00	-622.27	Hold Inc
8	8110.15	91.38	179.30	5210.47	-1470.28	190.04	0.00	0.00	1475.06	Turn 2°/100 DLS
9	8255.62	91.37	182.21	5206.97	-1615.68	188.13	2.00	90.29	1620.35	EOT, Hold to TD
10	10390.68	91.37	182.21	5156.00	-3748.55	105.92	0.00	0.00	3750.04	PBHL/TD

Target Details

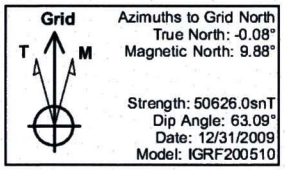
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Heros 2308 09L COM 1H LP	5262.00	796.37	162.23	1906935.19	2764064.71	36.240680°N	107.694388°W
HEROS 2308 09L COM 1H CT	5210.47	-1470.28	190.04	1904668.55	2764092.52	36.234453°N	107.694305°W
Heros 2308 09L COM 1H PBHL	5156.00	-3748.55	105.92	1902390.28	2764008.41	36.228195°N	107.694601°W

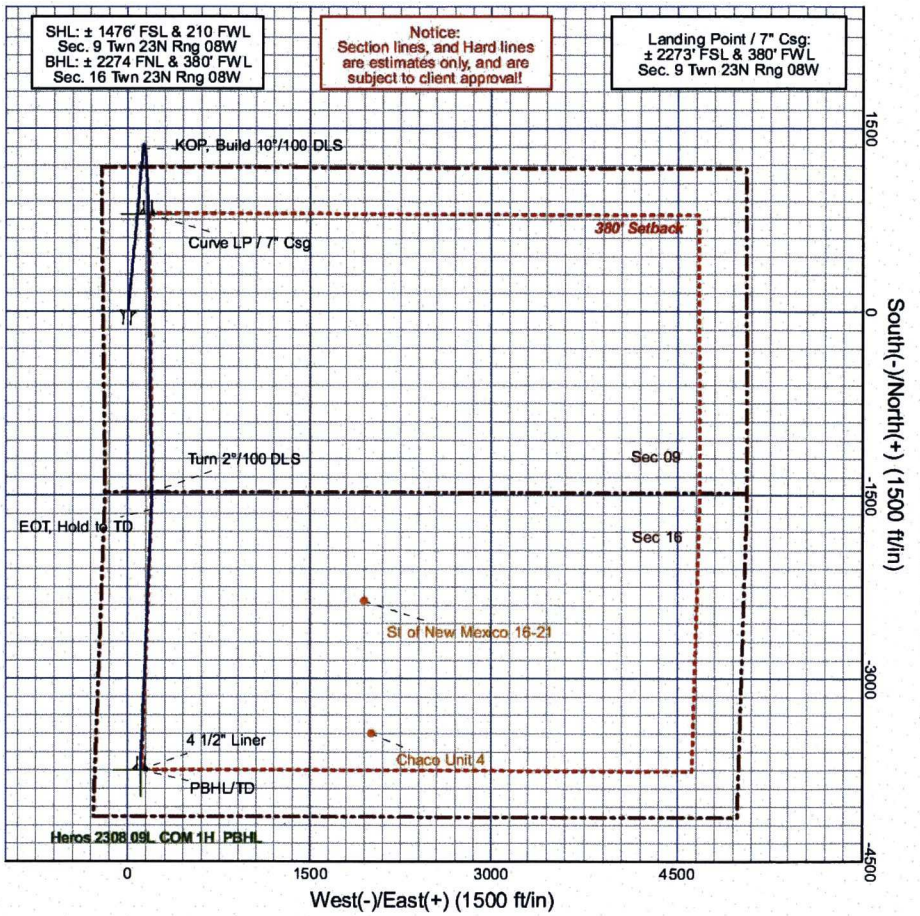
CASING DETAILS Option 1

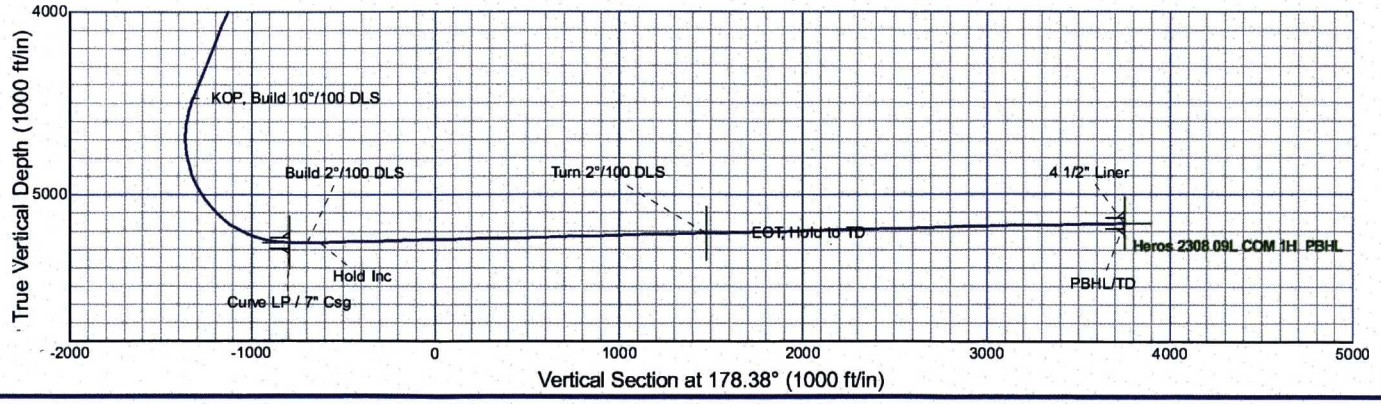
TVD	MD	Name	Size
320.00	320.00	9 5/8" Csg	9-5/8
5262.00	5842.71	Curve LP / 7" Csg	7
5156.00	10390.68	4 1/2" Liner	4-1/2

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
0.00	0.00	Nacimiento
1078.00	1079.61	Ojo Alamo
1228.00	1232.00	Kirtland
1343.00	1349.94	Fruitland
1778.00	1809.22	Pictured Cliffs
2053.00	2106.28	Huerfantio Bentonite
2568.00	2662.60	Chacra
3228.00	3375.54	Cliff House
3278.00	3429.56	Menefee
4138.00	4358.55	Point Lookout
4588.00	4840.52	Mancos







Logos Resources II, LLC

San Juan County, NM NAD83
Sec. 09 Twn 23N Rng 8W
HEROS 2308 09L COM 1H

Original Hole

Plan: Rev 0

Standard Planning Report - Geographic

06 December, 2016

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well HEROS 2308 09L COM 1H
Company:	Logos Resources II, LLC	**TVD Reference:**	Est KB @ 6931.00ft (TBD)
Project:	San Juan County, NM NAD83	**MD Reference:**	Est KB @ 6931.00ft (TBD)
Site:	Sec. 09 Twn 23N Rng 8W	**North Reference:**	Grid
Well:	HEROS 2308 09L COM 1H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Hole		
Design:	Rev 0		

Project San Juan County, 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 Sec. 09 Twn 23N Rng 8W

Site Position:		**Northing:**	1,909,035.47 usft	**Latitude:**	36.236996°N
From:	Map	**Easting:**	2,277,680.81 usft	**Longitude:**	109.343661°W
Position Uncertainty:	0.00 ft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	-0.89 °

Well HEROS 2308 09L COM 1H

Well Position	**+N/-S**	0.00 ft	**Northing:**	1,906,138.83 usft	**Latitude:**	36.238493°N
	+E/-W	0.00 ft	**Easting:**	2,763,902.48 usft	**Longitude:**	107.694942°W
Position Uncertainty		0.00 ft	**Wellhead Elevation:**		**Ground Level:**	6,916.00 ft

Wellbore Original Hole

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	12/31/2009	9.97	63.09	50,626

Design Rev 0

Audit Notes:

Version:		**Phase:**	PLAN	**Tie On Depth:**	0.00

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	178.38

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	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	
650.00	0.00	0.00	650.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,761.03	22.22	5.26	1,733.39	211.86	19.52	2.00	2.00	0.00	5.26	
4,721.77	22.22	5.26	4,474.25	1,326.81	122.26	0.00	0.00	0.00	0.00	
5,842.71	90.00	179.30	5,262.00	796.37	162.23	10.00	6.05	15.53	173.56	Heros 2308 09L COM
5,942.71	90.00	179.30	5,262.00	696.38	163.46	0.00	0.00	0.00	0.00	
6,011.94	91.38	179.30	5,261.16	627.16	164.31	2.00	2.00	0.00	0.00	
8,110.15	91.38	179.30	5,210.47	-1,470.28	190.04	0.00	0.00	0.00	0.00	HEROS 2308 09L CC
8,255.62	91.37	182.21	5,206.97	-1,615.68	188.13	2.00	-0.01	2.00	90.29	
10,390.68	91.37	182.21	5,156.00	-3,748.55	105.92	0.00	0.00	0.00	0.00	Heros 2308 09L COM

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well HEROS 2308 09L COM 1H
Company:	Logos Resources II, LLC	**TVD Reference:**	Est KB @ 6931.00ft (TBD)
Project:	San Juan County, NM NAD83	**MD Reference:**	Est KB @ 6931.00ft (TBD)
Site:	Sec. 09 Twn 23N Rng 8W	**North Reference:**	Grid
Well:	HEROS 2308 09L COM 1H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Hole		
Design:	Rev 0		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	1,906,138.83	2,763,902.48	36.238493°N	107.694942°W
Nacimiento									
100.00	0.00	0.00	100.00	0.00	0.00	1,906,138.83	2,763,902.48	36.238493°N	107.694942°W
200.00	0.00	0.00	200.00	0.00	0.00	1,906,138.83	2,763,902.48	36.238493°N	107.694942°W
300.00	0.00	0.00	300.00	0.00	0.00	1,906,138.83	2,763,902.48	36.238493°N	107.694942°W
320.00	0.00	0.00	320.00	0.00	0.00	1,906,138.83	2,763,902.48	36.238493°N	107.694942°W
9 5/8" Csg									
400.00	0.00	0.00	400.00	0.00	0.00	1,906,138.83	2,763,902.48	36.238493°N	107.694942°W
500.00	0.00	0.00	500.00	0.00	0.00	1,906,138.83	2,763,902.48	36.238493°N	107.694942°W
600.00	0.00	0.00	600.00	0.00	0.00	1,906,138.83	2,763,902.48	36.238493°N	107.694942°W
650.00	0.00	0.00	650.00	0.00	0.00	1,906,138.83	2,763,902.48	36.238493°N	107.694942°W
Build 2°/100 DLS									
700.00	1.00	5.26	700.00	0.43	0.04	1,906,139.26	2,763,902.52	36.238494°N	107.694942°W
800.00	3.00	5.26	799.93	3.91	0.36	1,906,142.74	2,763,902.84	36.238504°N	107.694941°W
900.00	5.00	5.26	899.68	10.86	1.00	1,906,149.68	2,763,903.48	36.238523°N	107.694939°W
1,000.00	7.00	5.26	999.13	21.26	1.96	1,906,160.09	2,763,904.44	36.238551°N	107.694936°W
1,079.61	8.59	5.26	1,078.00	32.02	2.95	1,906,170.84	2,763,905.43	36.238581°N	107.694932°W
Ojo Alamo									
1,100.00	9.00	5.26	1,098.15	35.12	3.24	1,906,173.95	2,763,905.72	36.238590°N	107.694931°W
1,200.00	11.00	5.26	1,196.63	52.41	4.83	1,906,191.24	2,763,907.31	36.238637°N	107.694926°W
1,232.00	11.64	5.26	1,228.00	58.67	5.41	1,906,197.49	2,763,907.89	36.238654°N	107.694924°W
Kirtland									
1,300.00	13.00	5.26	1,294.44	73.11	6.74	1,906,211.94	2,763,909.22	36.238694°N	107.694919°W
1,349.94	14.00	5.26	1,343.00	84.72	7.81	1,906,223.55	2,763,910.29	36.238726°N	107.694915°W
Fruitland									
1,400.00	15.00	5.26	1,391.46	97.20	8.96	1,906,236.03	2,763,911.44	36.238760°N	107.694911°W
1,500.00	17.00	5.26	1,487.58	124.65	11.49	1,906,263.48	2,763,913.97	36.238835°N	107.694903°W
1,600.00	19.00	5.26	1,582.68	155.42	14.32	1,906,294.25	2,763,916.81	36.238920°N	107.694893°W
1,700.00	21.00	5.26	1,676.65	189.47	17.46	1,906,328.30	2,763,919.94	36.239013°N	107.694882°W
1,761.03	22.22	5.26	1,733.39	211.86	19.52	1,906,350.68	2,763,922.01	36.239075°N	107.694875°W
Hold Inc									
1,800.00	22.22	5.26	1,769.46	226.53	20.87	1,906,365.36	2,763,923.36	36.239115°N	107.694870°W
1,809.22	22.22	5.26	1,778.00	230.00	21.19	1,906,368.83	2,763,923.68	36.239125°N	107.694869°W
Pictured Cliffs									
1,900.00	22.22	5.26	1,862.04	264.19	24.34	1,906,403.02	2,763,926.83	36.239219°N	107.694858°W
2,000.00	22.22	5.26	1,954.61	301.85	27.81	1,906,440.67	2,763,930.30	36.239322°N	107.694846°W
2,100.00	22.22	5.26	2,047.18	339.51	31.28	1,906,478.33	2,763,933.77	36.239426°N	107.694835°W
2,106.28	22.22	5.26	2,053.00	341.87	31.50	1,906,480.70	2,763,933.99	36.239432°N	107.694834°W
Huerfantio Bentonite									
2,200.00	22.22	5.26	2,139.76	377.16	34.75	1,906,515.99	2,763,937.24	36.239529°N	107.694823°W
2,300.00	22.22	5.26	2,232.33	414.82	38.22	1,906,553.65	2,763,940.71	36.239632°N	107.694811°W
2,400.00	22.22	5.26	2,324.90	452.48	41.69	1,906,591.30	2,763,944.18	36.239736°N	107.694799°W
2,500.00	22.22	5.26	2,417.48	490.14	45.17	1,906,628.96	2,763,947.65	36.239839°N	107.694787°W
2,600.00	22.22	5.26	2,510.05	527.79	48.64	1,906,666.62	2,763,951.12	36.239943°N	107.694775°W
2,662.60	22.22	5.26	2,568.00	551.37	50.81	1,906,690.19	2,763,953.29	36.240007°N	107.694767°W
Chacra									
2,700.00	22.22	5.26	2,602.63	565.45	52.11	1,906,704.28	2,763,954.59	36.240046°N	107.694763°W
2,800.00	22.22	5.26	2,695.20	603.11	55.58	1,906,741.94	2,763,958.06	36.240150°N	107.694751°W
2,900.00	22.22	5.26	2,787.77	640.77	59.05	1,906,779.59	2,763,961.53	36.240253°N	107.694739°W
3,000.00	22.22	5.26	2,880.35	678.43	62.52	1,906,817.25	2,763,965.00	36.240356°N	107.694727°W
3,100.00	22.22	5.26	2,972.92	716.08	65.99	1,906,854.91	2,763,968.47	36.240460°N	107.694715°W
3,200.00	22.22	5.26	3,065.49	753.74	69.46	1,906,892.57	2,763,971.94	36.240563°N	107.694703°W
3,300.00	22.22	5.26	3,158.07	791.40	72.93	1,906,930.22	2,763,975.41	36.240667°N	107.694691°W

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well HEROS 2308 09L COM 1H
Company:	Logos Resources II, LLC	**TVD Reference:**	Est KB @ 6931.00ft (TBD)
Project:	San Juan County, NM NAD83	**MD Reference:**	Est KB @ 6931.00ft (TBD)
Site:	Sec. 09 Twn 23N Rng 8W	**North Reference:**	Grid
Well:	HEROS 2308 09L COM 1H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Hole		
Design:	Rev 0		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
3,375.54	22.22	5.26	3,228.00	819.85	75.55	1,906,958.67	2,763,978.03	36.240745°N	107.694682°W
Cliff House									
3,400.00	22.22	5.26	3,250.64	829.06	76.40	1,906,967.88	2,763,978.88	36.240770°N	107.694679°W
3,429.56	22.22	5.26	3,278.00	840.19	77.42	1,906,979.01	2,763,979.91	36.240801°N	107.694676°W
Menefee									
3,500.00	22.22	5.26	3,343.21	866.71	79.87	1,907,005.54	2,763,982.35	36.240874°N	107.694667°W
3,600.00	22.22	5.26	3,435.79	904.37	83.34	1,907,043.20	2,763,985.82	36.240977°N	107.694655°W
3,700.00	22.22	5.26	3,528.36	942.03	86.81	1,907,080.85	2,763,989.29	36.241081°N	107.694643°W
3,800.00	22.22	5.26	3,620.93	979.69	90.28	1,907,118.51	2,763,992.76	36.241184°N	107.694631°W
3,900.00	22.22	5.26	3,713.51	1,017.35	93.75	1,907,156.17	2,763,996.23	36.241287°N	107.694619°W
4,000.00	22.22	5.26	3,806.08	1,055.00	97.22	1,907,193.83	2,763,999.70	36.241391°N	107.694607°W
4,100.00	22.22	5.26	3,898.65	1,092.66	100.69	1,907,231.49	2,764,003.17	36.241494°N	107.694596°W
4,200.00	22.22	5.26	3,991.23	1,130.32	104.16	1,907,269.14	2,764,006.64	36.241598°N	107.694584°W
4,300.00	22.22	5.26	4,083.80	1,167.98	107.63	1,907,306.80	2,764,010.11	36.241701°N	107.694572°W
4,358.55	22.22	5.26	4,138.00	1,190.02	109.66	1,907,328.85	2,764,012.14	36.241762°N	107.694565°W
Point Lookout									
4,400.00	22.22	5.26	4,176.37	1,205.63	111.10	1,907,344.46	2,764,013.58	36.241805°N	107.694560°W
4,500.00	22.22	5.26	4,268.95	1,243.29	114.57	1,907,382.12	2,764,017.05	36.241908°N	107.694548°W
4,600.00	22.22	5.26	4,361.52	1,280.95	118.04	1,907,419.77	2,764,020.52	36.242011°N	107.694536°W
4,700.00	22.22	5.26	4,454.09	1,318.61	121.51	1,907,457.43	2,764,023.99	36.242115°N	107.694524°W
4,721.77	22.22	5.26	4,474.25	1,326.81	122.26	1,907,465.63	2,764,024.75	36.242137°N	107.694521°W
KOP, Build 10°/100 DLS									
4,800.00	14.47	8.77	4,548.45	1,351.23	125.11	1,907,490.06	2,764,027.60	36.242204°N	107.694511°W
4,840.52	10.50	12.54	4,588.00	1,359.85	126.69	1,907,498.67	2,764,029.17	36.242228°N	107.694506°W
Mancos									
4,900.00	4.91	28.90	4,646.93	1,367.37	129.10	1,907,506.20	2,764,031.58	36.242249°N	107.694498°W
5,000.00	6.22	156.37	4,746.70	1,366.15	133.35	1,907,504.98	2,764,035.84	36.242245°N	107.694483°W
5,100.00	15.91	170.73	4,844.74	1,347.61	137.74	1,907,486.44	2,764,040.23	36.242194°N	107.694469°W
5,200.00	25.84	174.26	4,938.06	1,312.32	142.14	1,907,451.14	2,764,044.63	36.242098°N	107.694454°W
5,300.00	35.80	175.92	5,023.84	1,261.33	146.41	1,907,400.16	2,764,048.89	36.241957°N	107.694440°W
5,400.00	45.78	176.93	5,099.45	1,196.21	150.42	1,907,335.03	2,764,052.90	36.241779°N	107.694426°W
5,500.00	55.76	177.64	5,162.62	1,118.93	154.05	1,907,257.76	2,764,056.54	36.241566°N	107.694414°W
5,600.00	65.75	178.20	5,211.40	1,031.84	157.19	1,907,170.67	2,764,059.68	36.241327°N	107.694404°W
5,700.00	75.74	178.68	5,244.34	937.59	159.75	1,907,076.41	2,764,062.23	36.241068°N	107.694396°W
5,800.00	85.73	179.12	5,260.41	839.04	161.64	1,906,977.86	2,764,064.12	36.240797°N	107.694390°W
5,842.71	90.00	179.30	5,262.00	796.37	162.23	1,906,935.20	2,764,064.71	36.240680°N	107.694388°W
LP / 7" Csg - Curve LP / 7" Csg - Heros 2308 09L COM 1H LP									
5,900.00	90.00	179.30	5,262.00	739.08	162.93	1,906,877.91	2,764,065.42	36.240523°N	107.694386°W
5,942.71	90.00	179.30	5,262.00	696.38	163.46	1,906,835.20	2,764,065.94	36.240405°N	107.694385°W
Build 2°/100 DLS									
6,000.00	91.15	179.30	5,261.43	639.09	164.16	1,906,777.92	2,764,066.64	36.240248°N	107.694382°W
6,011.94	91.38	179.30	5,261.16	627.16	164.31	1,906,765.98	2,764,066.79	36.240215°N	107.694382°W
Hold Inc									
6,100.00	91.38	179.30	5,259.04	539.13	165.39	1,906,677.96	2,764,067.87	36.239973°N	107.694379°W
6,200.00	91.38	179.30	5,256.62	439.17	166.61	1,906,577.99	2,764,069.10	36.239699°N	107.694375°W
6,300.00	91.38	179.30	5,254.20	339.20	167.84	1,906,478.03	2,764,070.32	36.239424°N	107.694371°W
6,400.00	91.38	179.30	5,251.79	239.24	169.07	1,906,378.07	2,764,071.55	36.239150°N	107.694368°W
6,500.00	91.38	179.30	5,249.37	139.28	170.29	1,906,278.10	2,764,072.78	36.238875°N	107.694364°W
6,600.00	91.38	179.30	5,246.95	39.31	171.52	1,906,178.14	2,764,074.00	36.238600°N	107.694360°W
6,700.00	91.38	179.30	5,244.54	-60.65	172.75	1,906,078.18	2,764,075.23	36.238326°N	107.694357°W
6,800.00	91.38	179.30	5,242.12	-160.61	173.97	1,905,978.22	2,764,076.46	36.238051°N	107.694353°W
6,900.00	91.38	179.30	5,239.71	-260.58	175.20	1,905,878.25	2,764,077.68	36.237777°N	107.694349°W
7,000.00	91.38	179.30	5,237.29	-360.54	176.42	1,905,778.29	2,764,078.91	36.237502°N	107.694346°W
7,100.00	91.38	179.30	5,234.87	-460.50	177.65	1,905,678.33	2,764,080.13	36.237227°N	107.694342°W

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well HEROS 2308 09L COM 1H
Company:	Logos Resources II, LLC	**TVD Reference:**	Est KB @ 6931.00ft (TBD)
Project:	San Juan County, NM NAD83	**MD Reference:**	Est KB @ 6931.00ft (TBD)
Site:	Sec. 09 Twn 23N Rng 8W	**North Reference:**	Grid
Well:	HEROS 2308 09L COM 1H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Hole		
Design:	Rev 0		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
7,200.00	91.38	179.30	5,232.46	-560.47	178.88	1,905,578.36	2,764,081.36	36.236953°N	107.694338°W
7,300.00	91.38	179.30	5,230.04	-660.43	180.10	1,905,478.40	2,764,082.59	36.236678°N	107.694335°W
7,400.00	91.38	179.30	5,227.63	-760.39	181.33	1,905,378.44	2,764,083.81	36.236403°N	107.694331°W
7,500.00	91.38	179.30	5,225.21	-860.35	182.56	1,905,278.47	2,764,085.04	36.236129°N	107.694327°W
7,600.00	91.38	179.30	5,222.79	-960.32	183.78	1,905,178.51	2,764,086.27	36.235854°N	107.694324°W
7,700.00	91.38	179.30	5,220.38	-1,060.28	185.01	1,905,078.55	2,764,087.49	36.235580°N	107.694320°W
7,800.00	91.38	179.30	5,217.96	-1,160.24	186.24	1,904,978.58	2,764,088.72	36.235305°N	107.694316°W
7,900.00	91.38	179.30	5,215.54	-1,260.21	187.46	1,904,878.62	2,764,089.95	36.235030°N	107.694313°W
8,000.00	91.38	179.30	5,213.13	-1,360.17	188.69	1,904,778.66	2,764,091.17	36.234756°N	107.694309°W
8,100.00	91.38	179.30	5,210.71	-1,460.13	189.92	1,904,678.70	2,764,092.40	36.234481°N	107.694305°W
8,110.15	91.38	179.30	5,210.47	-1,470.28	190.04	1,904,668.55	2,764,092.52	36.234453°N	107.694305°W
Turn 2°/100 DLS - HEROS 2308 09L COM 1H Ctr Tgt									
8,200.00	91.37	181.09	5,208.30	-1,560.10	189.73	1,904,578.73	2,764,092.22	36.234207°N	107.694306°W
8,255.62	91.37	182.21	5,206.97	-1,615.68	188.13	1,904,523.15	2,764,090.61	36.234054°N	107.694312°W
EOT, Hold to TD									
8,300.00	91.37	182.21	5,205.91	-1,660.02	186.42	1,904,478.82	2,764,088.91	36.233932°N	107.694318°W
8,400.00	91.37	182.21	5,203.52	-1,759.91	182.57	1,904,378.92	2,764,085.06	36.233658°N	107.694332°W
8,500.00	91.37	182.21	5,201.14	-1,859.81	178.72	1,904,279.02	2,764,081.21	36.233383°N	107.694345°W
8,600.00	91.37	182.21	5,198.75	-1,959.71	174.87	1,904,179.12	2,764,077.36	36.233109°N	107.694359°W
8,700.00	91.37	182.21	5,196.36	-2,059.60	171.02	1,904,079.23	2,764,073.50	36.232834°N	107.694372°W
8,800.00	91.37	182.21	5,193.98	-2,159.50	167.17	1,903,979.33	2,764,069.65	36.232560°N	107.694386°W
8,900.00	91.37	182.21	5,191.59	-2,259.40	163.32	1,903,879.43	2,764,065.80	36.232286°N	107.694399°W
9,000.00	91.37	182.21	5,189.20	-2,359.30	159.47	1,903,779.54	2,764,061.95	36.232011°N	107.694413°W
9,100.00	91.37	182.21	5,186.81	-2,459.19	155.62	1,903,679.64	2,764,058.10	36.231737°N	107.694427°W
9,200.00	91.37	182.21	5,184.43	-2,559.09	151.77	1,903,579.74	2,764,054.25	36.231462°N	107.694440°W
9,300.00	91.37	182.21	5,182.04	-2,658.99	147.92	1,903,479.84	2,764,050.40	36.231188°N	107.694454°W
9,400.00	91.37	182.21	5,179.65	-2,758.89	144.07	1,903,379.95	2,764,046.55	36.230914°N	107.694467°W
9,500.00	91.37	182.21	5,177.26	-2,858.78	140.22	1,903,280.05	2,764,042.70	36.230639°N	107.694481°W
9,600.00	91.37	182.21	5,174.88	-2,958.68	136.37	1,903,180.15	2,764,038.85	36.230365°N	107.694494°W
9,700.00	91.37	182.21	5,172.49	-3,058.58	132.52	1,903,080.26	2,764,035.00	36.230090°N	107.694508°W
9,800.00	91.37	182.21	5,170.10	-3,158.48	128.67	1,902,980.36	2,764,031.15	36.229816°N	107.694521°W
9,900.00	91.37	182.21	5,167.71	-3,258.37	124.82	1,902,880.46	2,764,027.30	36.229542°N	107.694535°W
10,000.00	91.37	182.21	5,165.33	-3,358.27	120.97	1,902,780.56	2,764,023.45	36.229267°N	107.694548°W
10,100.00	91.37	182.21	5,162.94	-3,458.17	117.12	1,902,680.67	2,764,019.60	36.228993°N	107.694562°W
10,200.00	91.37	182.21	5,160.55	-3,558.06	113.27	1,902,580.77	2,764,015.75	36.228718°N	107.694575°W
10,300.00	91.37	182.21	5,158.16	-3,657.96	109.42	1,902,480.87	2,764,011.90	36.228444°N	107.694589°W
10,390.00	91.37	182.21	5,156.02	-3,747.87	105.95	1,902,390.97	2,764,008.43	36.228197°N	107.694601°W
PBHL/TD									
10,390.68	91.37	182.21	5,156.00	-3,748.55	105.92	1,902,390.29	2,764,008.41	36.228195°N	107.694601°W
Heros 2308 09L COM 1H PBHL									

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well HEROS 2308 09L COM 1H
Company:	Logos Resources II, LLC	**TVD Reference:**	Est KB @ 6931.00ft (TBD)
Project:	San Juan County, NM NAD83	**MD Reference:**	Est KB @ 6931.00ft (TBD)
Site:	Sec. 09 Twn 23N Rng 8W	**North Reference:**	Grid
Well:	HEROS 2308 09L COM 1H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Hole		
Design:	Rev 0		

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Heros 2308 09L COM 1H - plan hits target center - Point	0.00	1.35	5,156.00	-3,748.55	105.92	1,902,390.29	2,764,008.41	36.228195°N	107.694601°W
HEROS 2308 09L COM - plan hits target center - Point	0.00	0.00	5,210.47	-1,470.28	190.04	1,904,668.55	2,764,092.52	36.234453°N	107.694305°W
Heros 2308 09L COM 1H - plan hits target center - Point	0.00	1.35	5,262.00	796.37	162.23	1,906,935.20	2,764,064.71	36.240680°N	107.694388°W

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
320.00	320.00	9 5/8" Csg	9-5/8	12-1/4
5,842.71	5,262.00	Curve LP / 7" Csg	7	8-3/4
10,390.68	5,156.00	4 1/2" Liner	4-1/2	6-1/4

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
0.00	0.00	Nacimiento		0.00	
1,079.61	1,078.00	Ojo Alamo			
1,232.00	1,228.00	Kirtland			
1,349.94	1,343.00	Fruitland			
1,809.22	1,778.00	Pictured Cliffs			
2,106.28	2,053.00	Huerfantio Bentonite			
2,662.60	2,568.00	Chacra			
3,375.54	3,228.00	Cliff House			
3,429.56	3,278.00	Menefee			
4,358.55	4,138.00	Point Lookout			
4,840.52	4,588.00	Mancos			

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
650.00	650.00	0.00	0.00	Build 2°/100 DLS
1,761.03	1,733.39	211.86	19.52	Hold Inc
4,721.77	4,474.25	1,326.81	122.26	KOP, Build 10°/100 DLS
5,842.71	5,262.00	796.37	162.23	LP / 7" Csg
5,942.71	5,262.00	696.38	163.46	Build 2°/100 DLS
6,011.94	5,261.16	627.16	164.31	Hold Inc
8,110.15	5,210.47	-1,470.28	190.04	Turn 2°/100 DLS
8,255.62	5,206.97	-1,615.68	188.13	EOT, Hold to TD
10,390.00	5,156.02	-3,747.87	105.95	PBHL/TD