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MAY 04 2017

Form 3160-5
(June 2015)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
*Farmington Field Office
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
1. Type of Well ☒ Oil Well ☐ Gas Well ☐ Other		6. If Indian, Allottee or Tribe Name
2. Name of Operator LOGOS Operating, LLC		7. If Unit of CA/Agreement, Name and/or No. NMNM136868
3a. Address 2010 Afton Place Farmington, NM 87401	3b. Phone No. (include area code) (505) 324-4145	8. Well Name and No. HEROS 2308 09L COM 1H
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) 1476 FSL & 210 FWL, NW/SW, L. Sec 9 T23N R08W		9. API Well No. 30-045-35688
		10. Field and Pool or Exploratory Area Nageezi Gallup
		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
☐ Subsequent Report	☐ Alter Casing	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☐ Other
	☒ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

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

LOGOS is revising the directional drill plan to maximize the producing interval as per attached Plat, Drilling Plan & Directional Drill Plan. Plug back depth of this well be the RSI(or similar) tool assembly, which will put the first perf within the legal setbacks as noted on the C-102.

LOGOS proposes to make the following changes:

Revise BHL f/2325' FNL & 381' FWL to 2372' FNL & 1314' FWL, of E-16-T23N-R08W.

Change the 4-1/2" Production casing depth from 10507'MD/5154'TVD to 10539'MD/5240'-5151'TVD.

Cement volumes will be adjusted accordingly.

5/3/17 BLM was notified and verbal approval received from William Tambekou. OCD is being notified 5/4/17.

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

OIL CONS. DIV DIST. 3

MAY 04 2017

CONDITIONS OF APPROVAL

Adhere to previously issued stipulations

14. I hereby certify that the foregoing is true and correct. Name (Printed/Typed) Tamra Sessions		Regulatory Specialist	
Signature <i>Tamra Sessions</i>		Date 05/03/2017	

THE SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by <i>Jack Sawaya</i>		Title PE	Date 5/4/2017
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 FFU	

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)

NMOCDAY

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 Branco 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) 476-3480 Fax: (505) 476-3482

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

*API Number 30-045-35688		*Pool Code 47540	*Pool Name NAGEEZI GALLUP
*Property Code 317282	*Property Name HEROS 2308 09L COM		*Well Number #1H
*GRID No. 289408	*Operator Name LOGOS OPERATING, LLC		*Elevation 6916

¹⁰ Surface Location

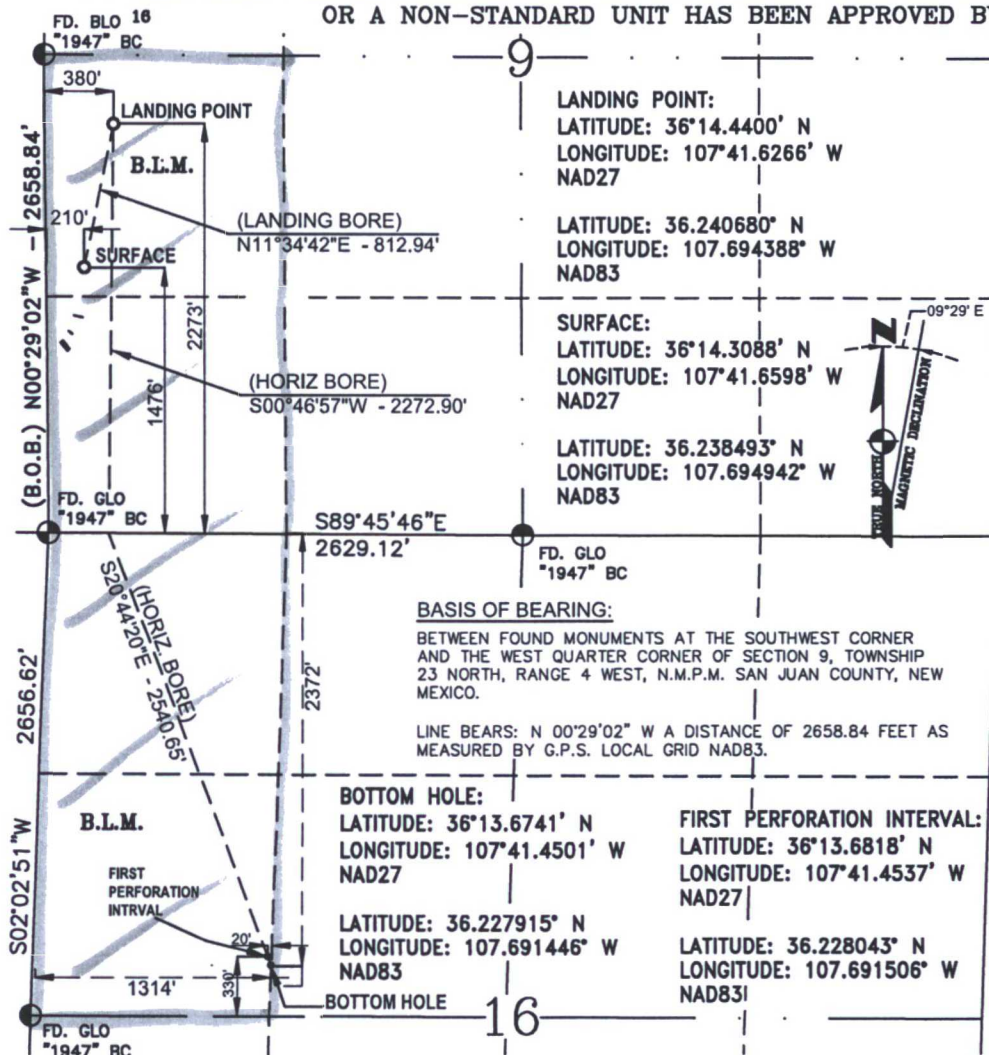
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
L	9	23-N	8-W		1476	SOUTH	210	WEST	SAN JUAN

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		2372	NORTH	1314	WEST	SAN JUAN

*Dedicated Acres 160ACRE= W/2SW/4 SEC 9 W/2NW/4 SEC 16	*Joint or Infill	*Consolidation Code	*Order No.
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



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.

Tam Sessions 5/2/17
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.

MAY 1, 2017
Date of Survey
Signature and Seal of Professional Surveyor
GLEN W. RUSSELL
15703
Certificate Number 15703

**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: 2273 FSL, 380 FWL

Legal Description: Sec 9, T23N, R8W (36.240680° N, 107.694388° W –NAD83)

Permitted Bottom Hole Location (PBHL): 2327' FNL, 1295' FWL

Legal Description: Sec 16, T23N, R8W (36.228058° N, 107.691512° W –NAD83)

San Juan County, NM

1. The elevation of the unprepared ground is 6,916 feet above sea level. Estimated KB Elev = 6930' (14'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 measured Depth of 5,150' TVD/10,592' MD with the first perforation at the PBHL 10539'MD/5,151'TVD, 2327' FNL, 1295' FWL.
4. Estimated top of important geological markers:

<u>Formation</u>	<u>Depth TVD (ft)</u>	<u>Depth MD (ft)</u>
Nacimiento	Surface	Surface
Ojo Alamo	850	850
Kirtland	1,056	1,057
Fruitland	1,186	1,189
Pictured Cliffs	1,538	1,553
Huerfanito Bentonite		
Chacra	1,647	1,668
Cliff House	3,019	3,168
Menefee	3,056	3,208
Point Lookout	3,878	4,108
Mancos	4,180	4,438
Gallup	4,888	5,180

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

<u>Formation</u>	<u>Depth TVD (ft)</u>	<u>Water/Hydrocarbon</u>
Fruitland	1,186	Gas
Pictured Cliffs	1,538	Gas
Cliff House	3,019	Gas
Point Lookout	3,878	Gas
Mancos	4,180	Oil/Gas

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

Casing	Size	Depth		Grade	Weight	Connection	PSI x1000lbs		
		MD	TVD				Burst	Collapse	Tension
Surface	9-5/8"	0-320'	0-320'	J-55	36.00	STC	3520	2020	394
Intermediate	7"	0-5,909'	0-5,261'	J-55	23.00	LTC	4360	3270	313
Production	4-1/2 "	5,759'-10,539'	5,240'-5,151'	P-110	11.60	LTC	10690	7560	278

7. Cementing Program:

- a. **12-1/4" hole x 9-5/8" casing at 320'** will have cement circulated to surface with 190 sks (100% excess true hole) Class H Cement with 1/4pps seal, 2% CaCL 15.8 ppg, 1.15 ft³/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 1500 psi.
- b. **8-3/4" hole x 7" casing at 5,909' MD.** Cement will be circulated to surface in a single stage with 594 sks (70% excess true hole) of HALCEM with 1.0 % CaC2. 1/4 #/sk Poly-E-Flake, 5 #/sk Kol-Seal (Gilsonite) – 12.3 ppg, 1.95 ft³/sk followed by 256 sks (70% excess true hole) VARICEM with 0.15% Versaset, 0.30% HALAD-9, 1/4 #/sk Poly-E-Flake, 5 #/sk Kol-Seal – 13.5 ppg, 1.3 ft³/sk. ONE CENTRALIZER PER JOINT FOR THE FIRST 3 JOINTS, THEN EVERY OTHER JOINT TO KOP, THEN ONE EVERY 3RD JOINT TO SURFACE. 20 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. **6-1/8" hole x 4-1/2" liner at 10,539' MD.** It will be a conventional liner job using 30% excess for TOC at 5759' MD liner top. Cement slurry consist of 432 sks EXTENDACEM cement, -13.3 ppg, 1.36 ft³/sk. 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 1918 psig (0.364 psi/ft @ 5268' 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 1159 psi (5268' 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. 8.4 to 9.0 ppg, 27 to 35 vis, PV <10, YP 1 to 10, FLNC, LGS < 4%
320' - 5909'	LSND WBM. As needed LCM for losses and seepage. 8.5 to 9.4 ppg, pH 8-9, 50 to 65 vis, PV 10-15. YP 15-25. FL < 5mls, LGS < 3%
5909' - 10,592'	LSND WBM. As needed LCM for losses and seepage. 8.5 to 9.5 ppg, PH 8-9, 40 to 45 vis, PV 10-15. YP 10-15, FL < 4mls, LGS < 3%

**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 8.0-9.0 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- three- high sided cuttings catch tank

2-Roll off bins with track

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 and gas detection sensors

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: On location from 4000'TVD 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

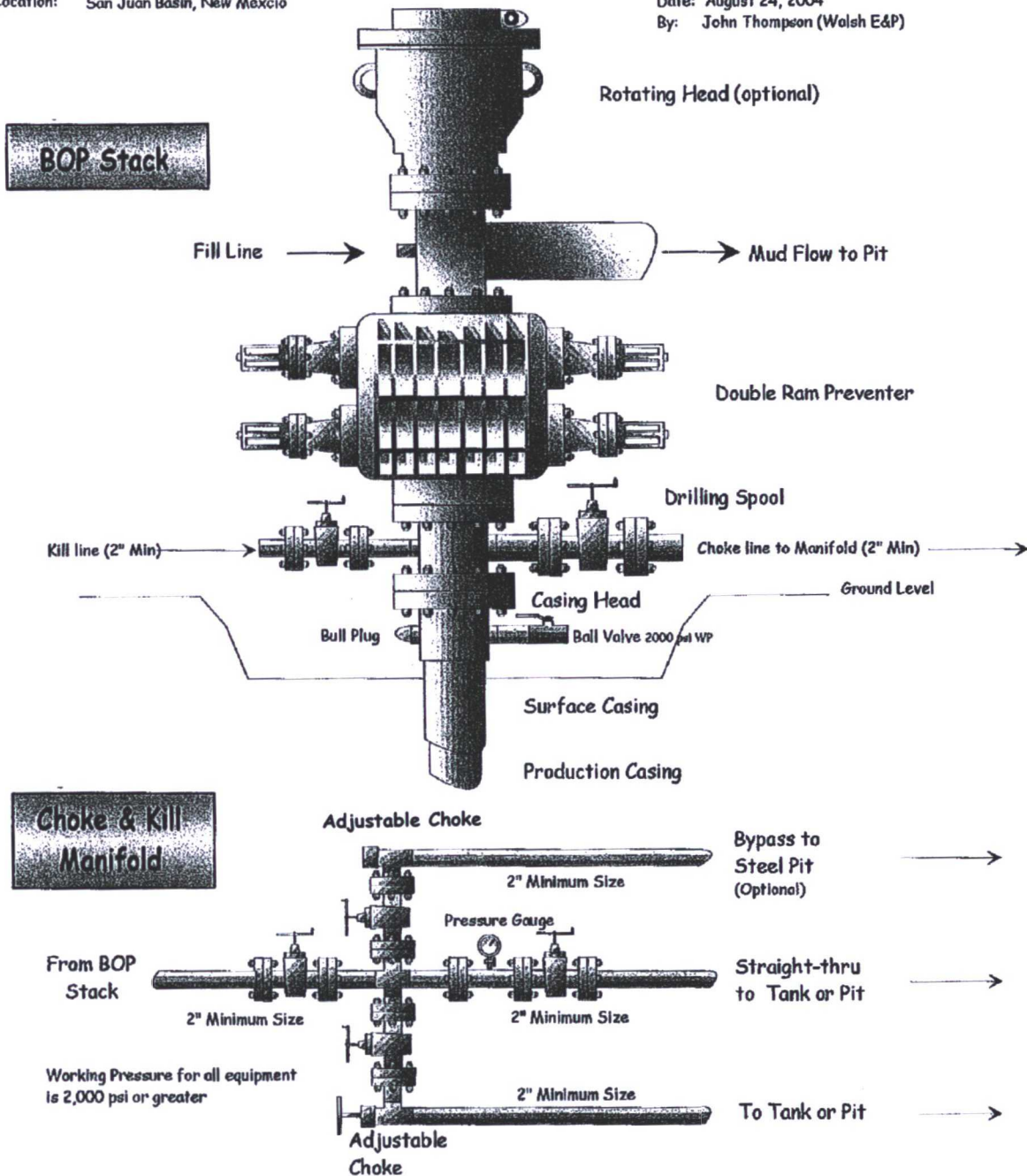
Attachment to Drilling Technical Program

Exhibit #1 Typical BOP setup

Location: San Juan Basin, New Mexico

Date: August 24, 2004

By: John Thompson (Walsh E&P)





Project: San Juan County, NM
Site: S9-T23N-R8W
Well: HEROS 2308 09L COM #1H
Wellbore: OH
Design: PLAN #9

PROJECT DETAILS: San Juan County, NM

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Western Zone

SITE DETAILS: S9-T23N-R8W

Well Centre Northing: 1906138.82
Easting: 2763902.48
Positional Uncertainty: 0.00
Convergence: 0.08
Local North: True

SHL: 1476' FSL & 210' FWL
SEC 9 T2N 23N R8W
BHL: 2372' FNL & 1314' FWL
SEC 16 T2N 23N R8W

LANDING PT / 7" CSG:
2273' FSL & 380' FWL
SEC 9 T2N 23N R8W

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VFace	Annotation
1	5843.00	82.88	175.11	5246.99	729.02	157.87	0.00	0.00	-724.52	TIE IN SURVEY @ 5843' MD
2	5908.00	85.00	178.00	5253.86	664.51	161.75	5.49	53.74	-659.93	PTB @ 5908' MD
3	5990.00	85.00	178.00	5261.00	582.88	164.61	0.00	0.00	-578.25	START BUILD
4	6156.67	90.00	178.00	5268.27	416.52	170.42	3.00	0.00	-411.80	EOB: INC=90°
5	6280.20	91.96	179.51	5266.16	293.05	173.10	2.00	37.61	-288.30	START BUILD
6	7844.32	91.96	179.51	5212.75	-1270.10	186.51	0.00	0.00	1274.65	EOB: INC=91.96°
7	7874.23	91.38	179.35	5211.88	-1300.00	186.81	2.00	-164.65	1304.55	START TURN
8	7874.23	91.38	179.35	5211.88	-1300.00	186.81	0.00	0.00	1304.55	START TURN
9	9595.22	91.25	153.53	5171.72	-2958.44	586.84	1.50	-89.99	2973.12	END OF TURN
10	10592.10	91.25	153.53	5150.00	-3850.59	1031.09	0.00	0.00	3876.88	TD at 10592.10

HEROS 2308 09L PBHL P8 (1314' FWL, 2372' FNL) DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
FIRST PERF (330' FSL, 20' FEL)	5150.00	-3850.59	1031.09	1902289.71	2764939.07	36.227915	-107.691446
HEROS 2308 09L TGT	5209.47	-3804.00	1013.39	1902336.27	2764921.31	36.228043	-107.691506
HEROS 2308 09L LP	5261.00	-1470.54	187.94	1904668.55	2764092.52	36.234453	-107.694305
HEROS 2308 09L LP	5261.00	796.14	163.37	1906935.19	2764064.71	36.240680	-107.694388

CASING DETAILS

TVD	MD	Name	Size
320.00	320.00	9 5/8"	9-5/8
5253.92	5908.68	7" (2273' FSL, 380' FWL)	7
5151.14	10539.71	4 1/2" (330' FSL, 20' FEL)	5-1/2

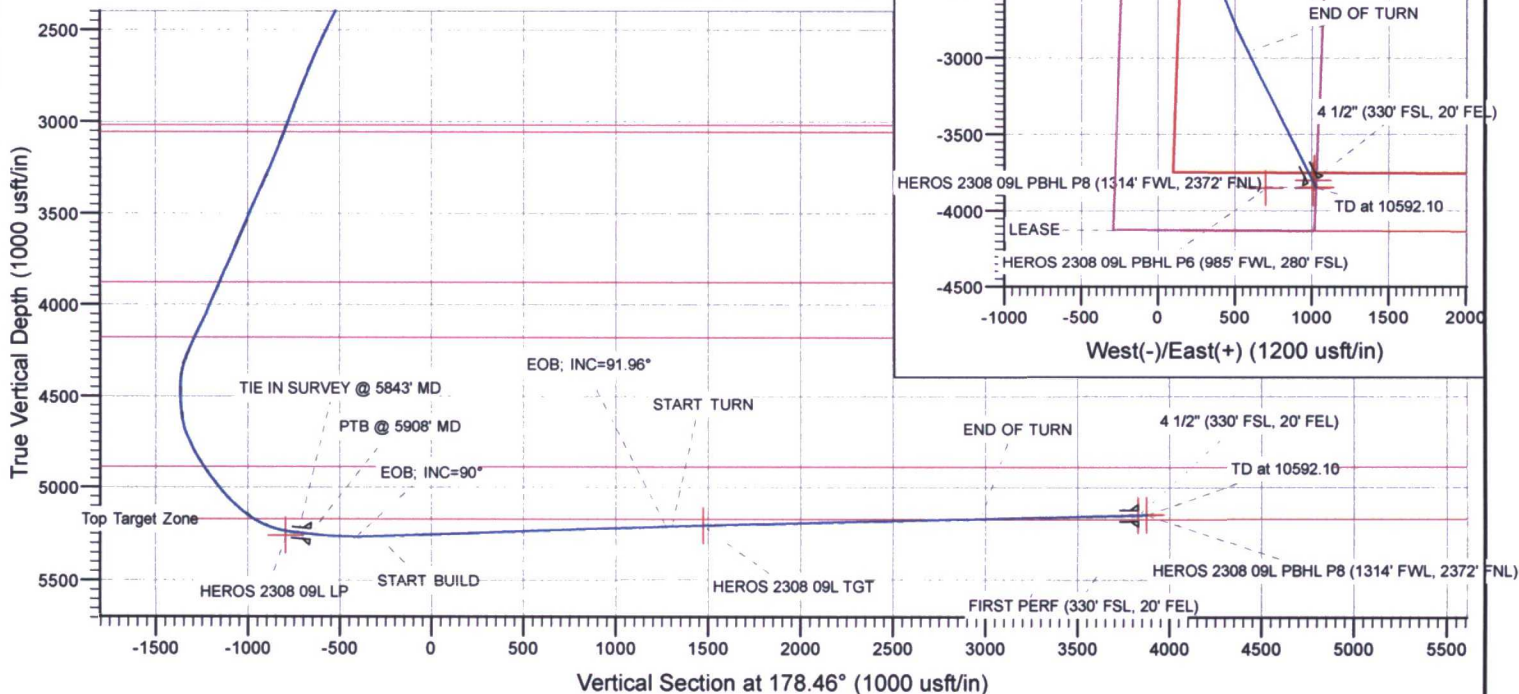
FORMATION TOP DETAILS

TVDPath	MDPath	Formation
850.00	850.41	Ojo Alamo
1056.00	1057.59	Kirkland
1186.00	1188.93	Fruitland
1538.00	1551.07	Pictured Cliffs
1647.00	1665.72	Chacra
3019.00	3172.35	Cliff House
3056.00	3211.79	Meneffee
3878.00	4107.13	Point Lookout
4180.00	4438.98	Mancos
4888.00	5189.66	Gallup
5173.00	5587.15	Top Target Zone



Azimuths to True North
Magnetic North: 9.00°

Magnetic Field
Strength: 49687.7 nT
Dip Angle: 62.90°
Date: 4/7/2017
Model: HDGM



WELL DETAILS: HEROS 2308 09L COM #1H

+N/-S: 0.00 +E/-W: 0.00 Northing: 1906138.82 Ground Level: 6916.00 Easting: 2763902.48 Latitude: 36.238493 Longitude: -107.694942



Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well HEROS 2308 09L COM #1H
Company:	LOGOS Operating LLC	TVD Reference:	14' KB @ 6930.00usft (AZTEC 920)
Project:	San Juan County, NM	MD Reference:	14' KB @ 6930.00usft (AZTEC 920)
Site:	S9-T23N-R8W	North Reference:	True
Well:	HEROS 2308 09L COM #1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #9		

Project	San Juan County, NM		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Western Zone		

Site		S9-T23N-R8W			
Site Position:		Northing:	1,906,138.83 usft	Latitude:	36.238493
From:	Map	Easting:	2,763,902.48 usft	Longitude:	-107.694942
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16"	Grid Convergence:	0.08 °

Well	HEROS 2308 09L COM #1H					
Well Position	+N/-S	0.00 usft	Northing:	1,906,138.82 usft	Latitude:	36.238493
	+E/-W	0.00 usft	Easting:	2,763,902.48 usft	Longitude:	-107.694942
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	6,916.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	4/7/2017	9.00	62.90	49,688

Design	PLAN #9			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	5,843.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	178.46

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
5,843.00	82.88	175.11	5,246.99	729.02	157.87	0.00	0.00	0.00	0.00	
5,908.00	85.00	178.00	5,253.86	664.51	161.75	5.49	3.26	4.45	53.74	
5,990.00	85.00	178.00	5,261.00	582.88	164.61	0.00	0.00	0.00	0.00	
6,156.67	90.00	178.00	5,268.27	416.52	170.42	3.00	3.00	0.00	0.00	
6,280.20	91.96	179.51	5,266.16	293.05	173.10	2.00	1.58	1.22	37.61	
7,844.32	91.96	179.51	5,212.75	-1,270.10	186.51	0.00	0.00	0.00	0.00	
7,874.23	91.38	179.35	5,211.88	-1,300.00	186.81	2.00	-1.93	-0.53	-164.65	
7,874.23	91.38	179.35	5,211.88	-1,300.00	186.81	0.00	0.00	0.00	0.00	
9,595.22	91.25	153.53	5,171.72	-2,958.44	586.84	1.50	-0.01	-1.50	-89.99	
10,592.10	91.25	153.53	5,150.00	-3,850.59	1,031.09	0.00	0.00	0.00	0.00	HEROS 2308 09L PB

Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
Company: LOGOS Operating LLC
Project: San Juan County, NM
Site: S9-T23N-R8W
Well: HEROS 2308 09L COM #1H
Wellbore: OH
Design: PLAN #9

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:

Well HEROS 2308 09L COM #1H
 14' KB @ 6930.00usft (AZTEC 920)
 14' KB @ 6930.00usft (AZTEC 920)
 True
 Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Comments / Formations
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
320.00	0.17	120.36	320.00	-0.25	0.42	0.26	0.05	0.05	9 5/8"
404.00	0.22	120.36	404.00	-0.39	0.67	0.41	0.05	0.05	
465.00	0.13	330.06	465.00	-0.39	0.74	0.41	0.56	-0.15	
526.00	0.09	191.20	526.00	-0.38	0.69	0.40	0.34	-0.07	
587.00	0.22	35.19	587.00	-0.33	0.75	0.35	0.50	0.21	
649.00	1.23	11.64	648.99	0.42	0.95	-0.39	1.66	1.63	
710.00	3.34	5.48	709.94	2.83	1.25	-2.80	3.48	3.46	
772.00	3.74	0.04	771.82	6.65	1.43	-6.61	0.84	0.65	
833.00	4.83	2.32	832.65	11.21	1.53	-11.16	1.81	1.79	
894.00	5.89	1.97	893.38	16.90	1.75	-16.85	1.74	1.74	
956.00	6.11	1.00	955.04	23.38	1.91	-23.32	0.39	0.35	
1,017.00	6.28	358.45	1,015.69	29.96	1.88	-29.90	0.53	0.28	
1,078.00	7.43	358.81	1,076.25	37.24	1.71	-37.18	1.89	1.89	
1,139.00	8.31	1.62	1,136.68	45.59	1.75	-45.52	1.57	1.44	
1,200.00	9.84	359.42	1,196.91	55.21	1.82	-55.14	2.57	2.51	
1,262.00	11.38	1.09	1,257.85	66.62	1.88	-66.55	2.53	2.48	
1,323.00	12.35	4.69	1,317.55	79.14	2.53	-79.04	2.00	1.59	
1,383.00	13.76	6.80	1,375.99	92.62	3.90	-92.48	2.48	2.35	
1,444.00	14.81	9.00	1,435.11	107.52	5.98	-107.33	1.94	1.72	
1,504.00	16.48	8.74	1,492.88	123.51	8.47	-123.24	2.79	2.78	
1,565.00	16.74	6.01	1,551.34	140.80	10.71	-140.46	1.35	0.43	
1,626.00	18.46	4.69	1,609.48	159.16	12.42	-158.77	2.89	2.82	
1,687.00	20.65	3.81	1,666.96	179.52	13.92	-179.09	3.62	3.59	
1,748.00	22.02	4.87	1,723.78	201.65	15.61	-201.16	2.33	2.25	
1,809.00	23.03	4.08	1,780.12	224.95	17.43	-224.40	1.73	1.66	
1,870.00	22.94	3.29	1,836.28	248.72	18.96	-248.12	0.53	-0.15	
1,932.00	22.72	1.88	1,893.42	272.75	20.04	-272.11	0.95	-0.35	
1,993.00	23.64	0.30	1,949.50	296.75	20.50	-296.09	1.82	1.51	
2,054.00	24.92	359.60	2,005.10	321.83	20.47	-321.17	2.15	2.10	
2,116.00	26.41	1.00	2,060.98	348.68	20.62	-348.00	2.59	2.40	
2,177.00	27.25	0.91	2,115.42	376.21	21.08	-375.51	1.38	1.38	
2,238.00	27.69	0.04	2,169.54	404.35	21.31	-403.63	0.98	0.72	
2,299.00	28.30	0.12	2,223.40	432.98	21.35	-432.25	1.00	1.00	
2,359.00	26.94	3.02	2,276.57	460.78	22.10	-460.02	3.19	-2.27	
2,420.00	26.46	4.78	2,331.06	488.12	23.96	-487.30	1.52	-0.79	
2,482.00	27.55	6.10	2,386.30	516.14	26.63	-515.24	2.01	1.76	
2,544.00	27.60	7.07	2,441.26	544.65	29.92	-543.66	0.73	0.08	
2,607.00	26.32	9.18	2,497.41	572.93	33.95	-571.81	2.54	-2.03	
2,670.00	24.96	10.93	2,554.21	599.77	38.70	-598.51	2.47	-2.16	
2,734.00	24.21	10.32	2,612.41	625.94	43.61	-624.54	1.24	-1.17	
2,798.00	22.32	8.39	2,671.20	650.87	47.73	-649.36	3.18	-2.95	
2,862.00	21.97	6.89	2,730.48	674.78	50.94	-673.17	1.04	-0.55	
2,926.00	23.07	5.66	2,789.60	699.15	53.61	-697.46	1.87	1.72	
2,989.00	22.46	4.61	2,847.69	723.43	55.80	-721.67	1.16	-0.97	
3,053.00	20.92	3.81	2,907.16	747.01	57.54	-745.20	2.45	-2.41	
3,117.00	20.39	2.94	2,967.04	769.55	58.87	-767.69	0.96	-0.83	
3,180.00	19.91	1.62	3,026.19	791.23	59.74	-789.34	1.05	-0.76	
3,244.00	21.49	1.71	3,086.06	813.84	60.40	-811.93	2.47	2.47	
3,307.00	22.06	2.15	3,144.56	837.20	61.18	-835.26	0.94	0.90	
3,371.00	22.54	2.06	3,203.77	861.47	62.08	-859.49	0.75	0.75	
3,435.00	23.56	2.76	3,262.66	886.50	63.13	-884.49	1.65	1.59	

Cathedral Energy Services

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Design: PLAN #9

Local Co-ordinate Reference:
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Survey Calculation Method:

Well HEROS 2308 09L COM #1H
 14' KB @ 6930.00usft (AZTEC 920)
 14' KB @ 6930.00usft (AZTEC 920)
 True
 Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Comments / Formations
3,498.00	25.05	4.78	3,320.08	912.37	64.85	-910.30	2.71	2.37	
3,561.00	24.65	5.05	3,377.25	938.75	67.12	-936.61	0.66	-0.63	
3,624.00	24.43	4.43	3,434.55	964.83	69.28	-962.62	0.54	-0.35	
3,688.00	22.94	3.46	3,493.16	990.47	71.06	-988.21	2.41	-2.33	
3,752.00	22.76	3.99	3,552.14	1,015.27	72.67	-1,012.96	0.43	-0.28	
3,816.00	23.12	4.52	3,611.08	1,040.15	74.52	-1,037.77	0.65	0.56	
3,879.00	23.69	4.87	3,668.89	1,065.09	76.57	-1,062.65	0.93	0.90	
3,943.00	23.25	4.43	3,727.60	1,090.50	78.64	-1,087.99	0.74	-0.69	
4,006.00	24.04	3.55	3,785.31	1,115.70	80.39	-1,113.14	1.37	1.25	
4,070.00	23.42	2.76	3,843.90	1,141.42	81.81	-1,138.81	1.09	-0.97	
4,107.13	23.22	2.15	3,878.00	1,156.10	82.44	-1,153.47	0.85	-0.55	Point Lookout
4,134.00	23.07	1.71	3,902.70	1,166.66	82.80	-1,164.01	0.85	-0.54	
4,198.00	23.07	2.67	3,961.59	1,191.71	83.76	-1,189.04	0.59	0.00	
4,262.00	24.21	3.81	4,020.21	1,217.34	85.21	-1,214.61	1.92	1.78	
4,326.00	25.44	6.63	4,078.30	1,244.09	87.67	-1,241.28	2.67	1.92	
4,389.00	26.24	9.09	4,135.00	1,271.28	91.44	-1,268.37	2.12	1.27	
4,438.98	25.37	8.74	4,180.00	1,292.77	94.81	-1,289.76	1.77	-1.75	Mancos
4,452.00	25.14	8.65	4,191.78	1,298.26	95.65	-1,295.23	1.77	-1.75	
4,516.00	22.90	7.77	4,250.23	1,324.04	99.38	-1,320.90	3.54	-3.50	
4,539.00	22.90	6.72	4,271.42	1,332.92	100.51	-1,329.74	1.78	0.00	
4,571.00	20.57	7.33	4,301.14	1,344.68	101.95	-1,341.46	7.32	-7.28	
4,603.00	15.73	11.64	4,331.54	1,354.51	103.55	-1,351.24	15.69	-15.12	
4,635.00	10.11	18.76	4,362.72	1,361.43	105.33	-1,358.11	18.22	-17.56	
4,666.00	9.60	30.97	4,393.27	1,366.22	107.53	-1,362.84	6.92	-1.65	
4,699.00	5.05	46.00	4,425.99	1,369.59	109.99	-1,366.14	14.85	-13.79	
4,731.00	1.01	102.08	4,457.94	1,370.51	111.28	-1,367.03	14.26	-12.62	
4,763.00	3.91	251.58	4,489.92	1,370.11	110.52	-1,366.65	15.02	9.06	
4,795.00	8.26	240.94	4,521.73	1,368.64	107.48	-1,365.27	13.99	13.59	
4,826.00	6.60	229.70	4,552.48	1,366.41	104.17	-1,363.12	7.09	-5.35	
4,858.00	4.75	198.32	4,584.32	1,363.96	102.35	-1,360.72	11.08	-5.78	
4,890.00	9.14	198.40	4,616.08	1,360.29	101.13	-1,357.09	13.72	13.72	
4,922.00	12.92	192.52	4,647.49	1,354.38	99.55	-1,351.22	12.31	11.81	
4,954.00	16.04	180.39	4,678.47	1,346.47	98.75	-1,343.33	13.55	9.75	
4,986.00	21.09	174.76	4,708.80	1,336.31	99.24	-1,333.16	16.73	15.78	
5,018.00	24.52	172.21	4,738.29	1,323.99	100.67	-1,320.81	11.15	10.72	
5,050.00	25.40	172.39	4,767.31	1,310.61	102.48	-1,307.38	2.76	2.75	
5,082.00	26.81	171.07	4,796.04	1,296.68	104.51	-1,293.40	4.77	4.41	
5,114.00	29.71	169.49	4,824.22	1,281.75	107.08	-1,278.41	9.36	9.06	
5,145.00	32.34	166.94	4,850.79	1,266.11	110.35	-1,262.69	9.48	8.48	
5,176.00	34.10	166.15	4,876.72	1,249.60	114.31	-1,246.08	5.85	5.68	
5,189.66	34.62	166.99	4,888.00	1,242.10	116.10	-1,238.53	5.15	3.82	Gallup
5,208.00	35.33	168.08	4,903.03	1,231.83	118.36	-1,228.21	5.15	3.86	
5,239.00	36.96	168.87	4,928.06	1,213.92	122.02	-1,210.20	5.47	5.26	
5,271.00	37.44	171.07	4,953.55	1,194.87	125.38	-1,191.07	4.42	1.50	
5,303.00	38.54	173.80	4,978.77	1,175.35	127.97	-1,171.49	6.28	3.44	
5,334.00	38.58	175.64	5,003.01	1,156.11	129.75	-1,152.21	3.70	0.13	
5,366.00	39.38	174.59	5,027.89	1,136.05	131.46	-1,132.11	3.24	2.50	
5,398.00	42.32	175.20	5,052.09	1,115.21	133.32	-1,111.23	9.27	9.19	
5,430.00	45.57	175.38	5,075.13	1,093.08	135.14	-1,089.06	10.16	10.16	
5,462.00	47.99	175.64	5,097.04	1,069.83	136.97	-1,065.77	7.59	7.56	
5,494.00	49.48	171.86	5,118.15	1,045.93	139.59	-1,041.81	10.02	4.66	
5,526.00	52.38	171.07	5,138.31	1,021.37	143.29	-1,017.15	9.26	9.06	

Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
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Project: San Juan County, NM
Site: S9-T23N-R8W
Well: HEROS 2308 09L COM #1H
Wellbore: OH
Design: PLAN #9

Local Co-ordinate Reference:
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MD Reference:
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Survey Calculation Method:

Well HEROS 2308 09L COM #1H
14' KB @ 6930.00usft (AZTEC 920)
14' KB @ 6930.00usft (AZTEC 920)
True
Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Comments / Formations
5,558.00	55.55	173.80	5,157.14	995.72	146.68	-991.42	12.07	9.91	
5,589.00	58.71	176.17	5,173.96	969.79	148.94	-965.44	12.05	10.19	
5,622.00	63.24	178.37	5,189.97	940.97	150.31	-936.60	14.91	13.73	
5,653.00	67.15	179.95	5,202.98	912.84	150.71	-908.47	13.43	12.61	
5,685.00	70.53	180.48	5,214.53	883.01	150.60	-878.64	10.67	10.56	
5,716.00	73.30	179.16	5,224.15	853.54	150.69	-849.19	9.81	8.94	
5,748.00	77.30	177.93	5,232.27	822.61	151.48	-818.24	13.04	12.50	
5,779.00	80.64	176.52	5,238.20	792.22	152.96	-787.83	11.66	10.77	
5,811.00	82.44	175.29	5,242.91	760.65	155.22	-756.21	6.79	5.62	
5,843.00	82.88	175.11	5,246.99	729.02	157.87	-724.52	1.48	1.37	TIE IN SURVEY @ 5843' MD
5,908.00	85.00	178.00	5,253.86	664.51	161.75	-659.93	5.49	3.26	PTB @ 5908' MD
5,908.68	85.00	178.00	5,253.92	663.84	161.78	-659.26	0.00	0.00	7" (2273' FSL, 380' FWL)
5,990.00	85.00	178.00	5,261.00	582.88	164.61	-578.25	0.00	0.00	START BUILD
6,000.00	85.30	178.00	5,261.85	572.92	164.95	-568.28	3.00	3.00	
6,100.00	88.30	178.00	5,267.43	473.15	168.44	-468.45	3.00	3.00	
6,156.67	90.00	178.00	5,268.27	416.52	170.42	-411.79	3.00	3.00	EOB; INC=90°
6,200.00	90.69	178.53	5,268.01	373.21	171.73	-368.47	2.00	1.58	
6,280.20	91.96	179.51	5,266.16	293.05	173.10	-288.30	2.00	1.58	START BUILD
6,300.00	91.96	179.51	5,265.49	273.26	173.27	-268.51	0.00	0.00	
6,400.00	91.96	179.51	5,262.07	173.32	174.13	-168.58	0.00	0.00	
6,500.00	91.96	179.51	5,258.66	73.38	174.99	-68.66	0.00	0.00	
6,600.00	91.96	179.51	5,255.24	-26.56	175.84	31.27	0.00	0.00	
6,700.00	91.96	179.51	5,251.83	-126.49	176.70	131.19	0.00	0.00	
6,800.00	91.96	179.51	5,248.41	-226.43	177.56	231.12	0.00	0.00	
6,900.00	91.96	179.51	5,245.00	-326.37	178.42	331.04	0.00	0.00	
7,000.00	91.96	179.51	5,241.58	-426.31	179.27	430.97	0.00	0.00	
7,100.00	91.96	179.51	5,238.17	-526.25	180.13	530.89	0.00	0.00	
7,200.00	91.96	179.51	5,234.75	-626.18	180.99	630.82	0.00	0.00	
7,300.00	91.96	179.51	5,231.34	-726.12	181.84	730.74	0.00	0.00	
7,400.00	91.96	179.51	5,227.92	-826.06	182.70	830.67	0.00	0.00	
7,500.00	91.96	179.51	5,224.51	-926.00	183.56	930.59	0.00	0.00	
7,600.00	91.96	179.51	5,221.09	-1,025.94	184.42	1,030.52	0.00	0.00	
7,700.00	91.96	179.51	5,217.68	-1,125.87	185.27	1,130.44	0.00	0.00	
7,800.00	91.96	179.51	5,214.26	-1,225.81	186.13	1,230.37	0.00	0.00	
7,844.32	91.96	179.51	5,212.75	-1,270.10	186.51	1,274.65	0.00	0.00	EOB; INC=91.96°
7,874.23	91.38	179.35	5,211.88	-1,300.00	186.81	1,304.55	2.00	-1.93	START TURN
7,900.00	91.38	178.96	5,211.26	-1,325.76	187.19	1,330.31	1.50	0.00	
8,000.00	91.38	177.46	5,208.85	-1,425.68	190.31	1,430.27	1.50	0.00	
8,100.00	91.38	175.96	5,206.44	-1,525.48	196.04	1,530.20	1.50	0.00	
8,200.00	91.38	174.46	5,204.04	-1,625.10	204.38	1,630.00	1.50	0.00	
8,300.00	91.37	172.96	5,201.64	-1,724.47	215.33	1,729.63	1.50	0.00	
8,400.00	91.37	171.46	5,199.25	-1,823.52	228.88	1,829.00	1.50	0.00	
8,500.00	91.36	169.96	5,196.86	-1,922.17	245.02	1,928.06	1.50	-0.01	
8,600.00	91.36	168.46	5,194.49	-2,020.38	263.73	2,026.73	1.50	-0.01	
8,700.00	91.35	166.96	5,192.12	-2,118.05	285.01	2,124.94	1.50	-0.01	
8,800.00	91.34	165.46	5,189.77	-2,215.14	308.84	2,222.63	1.50	-0.01	
8,900.00	91.33	163.96	5,187.44	-2,311.57	335.20	2,319.74	1.50	-0.01	
9,000.00	91.32	162.46	5,185.12	-2,407.28	364.08	2,416.19	1.50	-0.01	
9,100.00	91.31	160.96	5,182.81	-2,502.20	395.46	2,511.91	1.50	-0.01	
9,200.00	91.30	159.46	5,180.53	-2,596.27	429.31	2,606.85	1.50	-0.01	
9,300.00	91.29	157.96	5,178.27	-2,689.41	465.61	2,700.94	1.50	-0.01	
9,400.00	91.28	156.46	5,176.03	-2,781.58	504.34	2,794.11	1.50	-0.01	

Cathedral Energy Services

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Well HEROS 2308 09L COM #1H
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True
Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Comments / Formations
9,500.00	91.26	154.96	5,173.81	-2,872.70	545.47	2,886.31	1.50	-0.01	
9,536.84	91.26	154.40	5,173.00	-2,906.00	561.22	2,920.01	1.50	-0.01	Top Target Zone
9,595.22	91.25	153.53	5,171.72	-2,958.44	586.84	2,973.12	1.50	-0.02	END OF TURN
9,600.00	91.25	153.53	5,171.62	-2,962.71	588.97	2,977.46	0.00	0.00	
9,700.00	91.25	153.53	5,169.44	-3,052.21	633.53	3,068.11	0.00	0.00	
9,800.00	91.25	153.53	5,167.26	-3,141.70	678.09	3,158.77	0.00	0.00	
9,900.00	91.25	153.53	5,165.08	-3,231.20	722.66	3,249.43	0.00	0.00	
10,000.00	91.25	153.53	5,162.90	-3,320.69	767.22	3,340.09	0.00	0.00	
10,100.00	91.25	153.53	5,160.72	-3,410.19	811.79	3,430.75	0.00	0.00	
10,200.00	91.25	153.53	5,158.54	-3,499.68	856.35	3,521.41	0.00	0.00	
10,300.00	91.25	153.53	5,156.37	-3,589.17	900.92	3,612.06	0.00	0.00	
10,400.00	91.25	153.53	5,154.19	-3,678.67	945.48	3,702.72	0.00	0.00	
10,500.00	91.25	153.53	5,152.01	-3,768.16	990.05	3,793.38	0.00	0.00	
10,539.71	91.25	153.53	5,151.14	-3,803.70	1,007.74	3,829.38	0.00	0.00	4 1/2" (330' FSL, 20' FEL)
10,592.10	91.25	153.53	5,150.00	-3,850.59	1,031.09	3,876.88	0.00	0.00	TD at 10592.10

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
HEROS 2308 09L TGT - plan misses target center by 4.91usft at 8044.62usft MD (5207.78 TVD, -1470.23 N, 192.54 E) - Point	0.00	0.08	5,209.47	-1,470.54	187.94	1,904,668.55	2,764,092.52	36.234453	-107.694305
HEROS 2308 09L PBHL - plan misses target center by 296.38usft at 10448.23usft MD (5153.13 TVD, -3721.83 N, 966.98 E) - Point	0.00	0.08	5,150.00	-3,853.88	701.65	1,902,285.95	2,764,609.63	36.227906	-107.692563
FIRST PERF (330' FSL, - plan misses target center by 5.66usft at 10539.71usft MD (5151.14 TVD, -3803.70 N, 1007.74 E) - Point	0.00	0.00	5,151.18	-3,804.00	1,013.39	1,902,336.27	2,764,921.31	36.228043	-107.691506
HEROS 2308 09L LP - plan misses target center by 25.37usft at 5779.22usft MD (5238.23 TVD, 792.00 N, 152.97 E) - Point	0.00	0.08	5,261.00	796.14	163.37	1,906,935.19	2,764,064.71	36.240680	-107.694388
HEROS 2308 09L PBHL - plan misses target center by 18.89usft at 10586.36usft MD (5150.12 TVD, -3845.45 N, 1028.53 E) - Point	0.00	0.08	5,150.00	-3,853.87	1,011.63	1,902,286.40	2,764,919.61	36.227906	-107.691512
HEROS 2308 09L PBHL - plan misses target center by 787.56usft at 10086.12usft MD (5161.03 TVD, -3397.76 N, 805.60 E) - Point	0.00	0.08	5,155.00	-3,748.69	100.58	1,902,390.28	2,764,008.41	36.228195	-107.694601
HEROS 2308 09L PBHL - plan hits target center - Point	0.00	0.08	5,150.00	-3,850.59	1,031.09	1,902,289.71	2,764,939.07	36.227915	-107.691446
HEROS 2308 09L PBHL - plan misses target center by 34.57usft at 10501.08usft MD (5151.98 TVD, -3769.13 N, 990.53 E) - Point	0.00	0.08	5,150.00	-3,753.71	1,021.40	1,902,386.58	2,764,929.24	36.228181	-107.691479

320.00	320.00	9 5/8"	9-5/8	12-1/4
5,908.68	5,253.92	7" (2273' FSL, 380' FWL)	7	7
10,539.71	5,151.14	4 1/2" (330' FSL, 20' FEL)	5-1/2	6

Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
Company: LOGOS Operating LLC
Project: San Juan County, NM
Site: S9-T23N-R8W
Well: HEROS 2308 09L COM #1H
Wellbore: OH
Design: PLAN #9

Local Co-ordinate Reference: Well HEROS 2308 09L COM #1H
TVD Reference: 14' KB @ 6930.00usft (AZTEC 920)
MD Reference: 14' KB @ 6930.00usft (AZTEC 920)
North Reference: True
Survey Calculation Method: Minimum Curvature

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,107.13	3,878.00	Point Lookout		0.00	180.08
4,438.98	4,180.00	Mancos		0.00	180.08
5,189.66	4,888.00	Gallup		0.00	180.08
9,536.84	5,173.00	Top Target Zone		0.00	180.08

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
5,843.00	5,246.99	729.02	157.87	TIE IN SURVEY @ 5843' MD
5,908.00	5,253.86	664.51	161.75	PTB @ 5908' MD
5,990.00	5,261.00	582.88	164.61	START BUILD
6,156.67	5,268.27	416.52	170.42	EOB; INC=90°
6,280.20	5,266.16	293.05	173.10	START BUILD
7,844.32	5,212.75	-1,270.10	186.51	EOB; INC=91.96°
7,874.23	5,211.88	-1,300.00	186.81	START TURN
9,595.22	5,171.72	-2,958.44	586.84	END OF TURN
10,592.10	5,150.00	-3,850.59	1,031.09	TD at 10592.10