State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

David Martin
Cabinet Secretary-Designate

Brett F. Woods, Ph.D.
Deputy Cabinet Secretary

Jami Bailey, Division Director
Oil Conservation Division

New Mexico Oil Conservation Division approval and conditions listed below are made in accordance with OCD Rule 19.15.7.11 and are in addition to the actions approved by BLM on the following 3160-3 APD form.

Operator Signature Date: 4/16/14
Well information;
Operator Logos, Well Name and Number Heros 3H
API# 30-045-35538, Section 3, Township 29 (N)S, Range 8 E(W)

Conditions of Approval:
(See the below checked and handwritten conditions)

- ✓ Notify Aztec OCD 24hrs prior to casing & cement.
- ✓ Hold C-104 for directional survey & "As Drilled" Plat
- ✓ Hold C-104 for (NSL) (NSP) DHC NSL 7084, NSP 1982
- o Spacing rule violation. Operator must follow up with change of status notification on other well to be shut in or abandoned
- o Regarding the use of a pit, closed loop system or below grade tank, the operator must comply with the following as applicable:
  - A pit requires a complete C-144 be submitted and approved prior to the construction or use of the pit, pursuant to 19.15.17.8.A
  - A closed loop system requires notification prior to use, pursuant to 19.15.17.9.A
  - A below grade tank requires a registration be filed prior to the construction or use of the below grade tank, pursuant to 19.15.17.8.C
- o 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
- ✓ 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.

NMOCD Approved by Signature

6-20-2014
Date

Form 3160-3
(March 2012)

RECEIVED
APR 17 2014
Farmington Field Office
Bureau of Land Management

FORM APPROVED
OMB No. 1004-0137
Expires October 31, 2014

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.	NM 109398
6. If Indian, Allotee or Tribe Name	
7. If Unit or CA Agreement, Name and No.	
8. Lease Name and Well No.	HEROS 003H
9. API Well No.	30-045-35538
10. Field and Pool, or Exploratory	Basin Mancos
11. Sec., T. R. M. or Blk. and Survey or Area	SHL: Sec 3, T23N R08W, UL L BHL: Sec 4, T23N R08W, UL L

1a. Type of work: ☑ DRILL ☐ REENTER

1b. Type of Well: ☑ Oil Well ☐ Gas Well ☐ Other ☑ Single Zone ☐ Multiple Zone

2. Name of Operator: Logos Operating, LLC

3a. Address: 4001 North Butler Ave, Building 7101, Farmington, NM 87401

3b. Phone No. (include area code): 505-330-9333

4. Location of Well (Report location clearly and in accordance with any State requirements.*)
At surface: 2216' FSL & 74' FWL
At proposed prod. zone: 2216' FSL & 330' FWL

14. Distance in miles and direction from nearest town or post office*: 5 miles southeast of Nageezi

12. County or Parish: San Juan

13. State: NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any): 74' from eastern edge of Sec 4

16. No. of acres in lease: ~~640.35~~ 639.60 acres

17. Spacing Unit dedicated to this well: N2/N2 = 160 acres

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.: 1750' from Logos 5 (UL P, Sec 4, T23N R08W)

19. Proposed Depth: 9703' MD, 5280' VD

20. BLM/BIA Bond No. on file: ~~BLM-1062415~~ NB000917

21. Elevations (Show whether DF, KDB, RT, GL, etc.): 6881' GL

22. Approximate date work will start*: 05/15/2014

23. Estimated duration: 45 days

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No.1, must be attached to this form:

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 required by the BLM.

25. Signature: Tamra Sessions — Name (Printed/Typed): Tamra Sessions — Date: 04/16/2014

Title: Operations Technician

Approved by (Signature): /s/ Monica Kuehling — Name (Printed/Typed): — Date: 6/17/14

Title: AFM — Office: FFO

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)

This action is subject to technical and procedural review pursuant to 43 CFR 3165.3 and appeal pursuant to 43 CFR 3165.4

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

*(Instructions on page 2)

DRILLING OPERATIONS AUTHORIZED ARE SUBJECT TO COMPLIANCE WITH ATTACHED "GENERAL REQUIREMENTS"

OIL CONS. DIV DIST. 3

JUN 17 2014

CONFIDENTIAL

NMOCD

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, N.M. 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department

RECEIVED

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

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

APR 17 2014

Farmington Field Office
Bureau of Land Management

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number	2 Pool Code	3 Pool Name
30-045-35538	97232	Basin Mancos

4 Property Code	5 Property Name	6 Well Number
313147	HEROS	003H

7 OGRID No.	8 Operator Name	9 Elevation
289408	LOGOS OPERATING, LLC	6881

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	3	23 N	8 W		2216	SOUTH	74	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
L	4	23 N	8 W		2216	SOUTH	330	WEST	SAN JUAN

12 Dedicated Acres	13 Joint or Infill	14 Consolidation Code	15 Order No.
160 acres N/2 S/2 Sec 4			

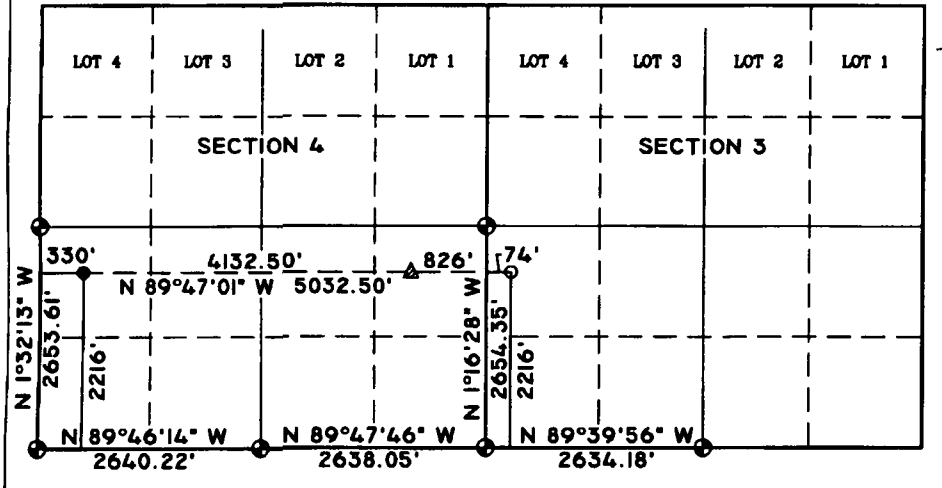
NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

16

BOTTOM HOLE
LAT: 36.2551197° N
LONG: 107.6948393° W
NAD 83
LAT: 36°15.30642' N
LONG: 107°41.65366' W
NAD 27

LANDING POINT
LAT: 36.2550597° N
LONG: 107.6808238° W
NAD 83
LAT: 36°15.30282' N
LONG: 107°40.81276' W
NAD 27

SURFACE
LAT: 36.2550465° N
LONG: 107.6777705° W
NAD 83
LAT: 36°15.30203' N
LONG: 107°40.62957' W
NAD 27



LEGEND:
○ = SURFACE LOCATION
● = BOTTOM HOLE LOCATION
⊕ = FOUND 1947 U.S.G.L.O. BRASS CAP
△ = LANDING POINT

BEARINGS & DISTANCES SHOWN ARE REFERENCED TO THE NEW MEXICO COORDINATE SYSTEM, WEST ZONE, NAD 83, UNLESS OTHERWISE NOTED.

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 working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Tam Sessions 4-16-14
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.

02/12/14
Date of Survey

Signature and Seal of Professional Surveyor:

GARY L. JONES
NEW MEXICO
2-25-14
17078
PROFESSIONAL SURVEYOR

17078
Certificate Number
United Field Services, Inc.

Attachment To Application For Permit To Drill.
Drilling program

LOGOS OPERATING, LLC
4001 N.Butler, Bldg 7101
Farmington, NM 87401
U.S.A

HEROS #3H
Horizontal Gallup Oil and Gas Well
Surface Location: 2216' FSL – 74' FWL
Section 3, T23N, R8W
Ungraded GL Elev = 6881'
Estimate KB Elev =6895.5' (14.5'KB)
Lat. = 36.2550465 deg N
Long. = 107.6777705 deg W
NAD83
San Juan County, New Mexico

Proposed Bottom Hole Location: 2216' FSL – 330' FWL
Section 4, T23N, R8W
San Juan County, New Mexico

Drilling program written in compliance with onshore Oil and Gas Order No. 1
(001 III.D.3, effective May 2007) and Onshore Order No. 2 Dated November 18,1988

1. ESTIMATED TOPS FOR IMPORTANT GEOLOGICAL FORMATIONS

Formation Tops	Surface (TVD)
Ojo Alamo	999
Kirtland	1145
Fruitland	1466
Pictured Cliff's	1673
Chacra	2075
Cliffs House	3151
Menefee	3190
Point Lookout	4060
Mancos	4208
Gallup	5110
Lower Gallup	5306
Landing Point	5316
Total Depth	5280

Drilling Plan

Drill 12 ¼" hole to 500' then set 9 5/8" casing. Drill 8 3/4" hole with fresh water mud from 500' MD to kick off point #1 600' MD and build 2 degrees per 100' to 6.46 degrees, 270.30 degrees azimuth and hold to approximately 4916'MD.

Trip out of hole and pick up 8 ¾" kick off assembly at 4916'MD. Build angle at 12 deg/100' to 85 degrees inclination and 270.31 degrees azimuth in the Gallup formation at 5570'MD/5312'TVD where 7" intermediate casing will be set. 7" casing will be set in a legal position 2216' FSL & 823' FEL in Section 4.
The 7" casing will be drilled out with a 6 1/8" drilling assembly building angle at 5 deg/100' to 90.51 degrees inclination and 270.31 degree azimuth to 5681'MD/5316'TVD. Hold 90.51 degrees, 270.31 degrees azimuth and drill to a total depth at 9703'MD/5280'TVD. Adjustments may be made to the directional program based on geology. Total depth will be 9703'MD/5280'TVD - 90.51 degrees, 270.31 degrees Azimuth.
The Bottom hole location will be in a legal location at 9703' MD at 2216' FSL & 330' FWL of section 4.
A total of 4133' of horizontal hole will be drilled.

2. ANTICIPATED DEPTHS OF PROSPECTIVE OIL GAS AND OTHER HYDROCARBONS

Primary objective is the Gallup formation encountered first at 5312' TVD at 7" casing point

See formation listings in #1 above for additional zones of interest.

3. MINIMUM SPECIFICATIONS FOR 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 1935 psig (0.364 psi/ft @ 5316' 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 1170 psi (5316' 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.

4. PROPOSED BIT AND CASING PROGRAM

A. Bit Program
12 1/4" Surface Hole = Surface to 500'
8 3/4" = 500' to 5596.2' = 7" Casing point @ 85 degrees – DV 100' below top of Mancos
8 ¾" Landing point = 5704.3' @ 90.41 degrees
6-1/8" Lateral = 5704.3' MD to 10502.1' MD = Gallup Pay Zone Horizontal

B. Casing Program – all casing stings are new casing

Casing & Hole Size	Weight	Grade	Coupling	Setting Depth (MD)	Comments
9-5/8" (12 1/4")	36 ppf	J or K-55	LT&C	0' - 500'	New casing. Cement to surface.
7" (8 ¾")	23 ppf	J or K-55	LT&C	0' - 5570' MD	New Casing. Cement to surface with two stages- DV Tool 100' below Mancos Top at 4330'
4 ½" (6 1/8")	11.6 ppf	P-110	LT&C	5000' - 9703' MD	New Casing - Horizontal Hole Cemented full length with foam cement - TOL at 15 degrees.

Casing strings below the conductor casing will be tested to .22 psi per foot of casing string length or 1500 psi, whichever is greater, but not to exceed 70% of the minimum internal yield.

Minimum casing design factors used:
Collapse - 1.125
Burst - 1.0
Jt. Strength - 1.60

Surface casing shall have a minimum of 1 centralizer per joint on the bottom three (3) joints, starting with the shoe joint for a total of (4) minimum centralizers. Centralizers will be placed 10' above the shoe on the shoe joint, on the 1st, 2nd and 3rd casing collars.

The intermediate casing will be centralized using 1 centralizer the first 6 jts and spaced appropriately through the curve section of the well-bore and then spaced +/- 1 centralizer / 4 jts through the remainder of

the cement column, using approximately 40 centralizers.

5. PROPOSED CEMENTING PROGRAM

The proposed cementing program has been designed to protect and/or isolate all usable water zones, potentially productive zones, lost circulation zones, abnormally pressured zones, and any prospectively valuable deposits of minerals. Any isolating medium other than cement shall receive approval prior to use. The casing setting depth shall be calculated to position the casing seat opposite a competent formation which will contain the maximum pressure to which it will be exposed during normal drilling operations. All indications of useable water shall be reported.

a) The proposed cementing program is as follows:

Top plugs shall be used to reduce contamination of cement by displacement fluid. A bottom plug or other acceptable technique, such as a pre-flush fluid, inner string cement method, etc. shall be utilized to help isolate the cement from contamination by the mud fluid being displaced ahead of the cement slurry.

Surface Casing Single Stage Job – (0-500'):
Excess – 100% over gauge hole – 12-1/4" hole and 9-5/8" casing (0.3132ft3/ft)
Top of Cement - Surface
Primary Cement
HALCEM (TM) SYSTEM
0.125 lbm/sk Poly-E-Flake (Lost Circulation Additive)

Fluid Weight	15.80 lbm/gal
Slurry Yield:	1.174 ft^3/sk
Total Mixing Fluid:	5.13 Gal/sk
Top of Fluid:	0 ft
Calculated Fill:	500 ft
Volume:	55.8 bbls
Calculated Sacks:	270 sks

Intermediate Casing – Two Stage Job – DV@ 4330' - (0-5570'MD):
Excess – 50% over gauge hole – 8-3/4" hole and 7" casing (0.1503 ft3/ft)
Top of Cement – Surface

Stage #1:
Lead - (5070' – 4330'): 86 sx - 12.3 ppg, lightweight conventional cement containing:
HALCEM ™ SYSTEM – Cement
HR-5 – Retarder – 0.30% BWOB
Kol - Seal – Lost Circulation Control Agent – 5 lbs/sx WBWOB
Poly - E – Flake – 0.125 lbs/sx WBWOB
Yield – 1.951 ft3/sx
Water requirement – 10.10 gal/sx.

Tail - (5570' – 5070'): 86 sx – 13.5. ppg, lightweight conventional cement containing:
HALCEM ™ SYSTEM – Cement
Kol - Seal – Lost Circulation Control Agent – 5 lbs/sx WBWOB
Poly - E – Flake – 0.125 lbs/sx WBWOB
Yield – 1.314 ft3/sx
Water requirement – 5.45 gal/sx.

Stage #2:
Lead - (3830' – 0'): 447 sx - 12.3 ppg, lightweight conventional cement containing:
HALCEM ™ SYSTEM – Cement
Kol - Seal – Lost Circulation Control Agent – 3 lbs/sx WBWOB
Poly - E – Flake – 0.125 lbs/sx WBWOB
Yield – 1.933 ft3/sx
Water requirement – 10.17 gal/sx.

Tail - (4330' – 3830'): 98 sx – 15.8. ppg, conventional cement containing:
HALCEM ™ SYSTEM – Cement
Yield – 1.148 ft3/sx
Water requirement – 4.97 gal/sx.
Total sacks of cement pumped = 1198

Cement volumes are minimums and may be adjusted based on caliper log results.

Production Casing – Single Stage Job (5000' - 9703'MD):
Excess – 50% over gauge hole – 6-1/8" hole and 4-1/2" casing (0.0942 ft3/ft)
Top of Cement – Top of Liner.

Lead Cement - Cap Cement
ELASTISEAL (TM) SYSTEM
0.2 % Versaset (Thixotropic Additive)
0.15 % HALAD-766 (Low Fluid Loss Control)
0.2 % Halad(R)-344 (Low Fluid Loss Control)

Fluid Weight	13 lbm/gal
Slurry Yield:	1.43 ft^3/sk
Total Mixing Fluid:	6.75 Gal/sk
Top of Fluid:	4700 ft
Calculated Fill:	300 ft
Volume:	7.15 bbl
Calculated Sacks:	30 sks

Foamed Lead Cement
ELASTISEAL (TM) SYSTEM
0.2 % Versaset (Thixotropic Additive)
0.15 % HALAD-766 (Low Fluid Loss Control)
2.5 % CHEM - FOAMER 760, TOTETANK (Foamer)
0.2 % Halad(R)-344 (Low Fluid Loss Control)

Fluid Weight	13 lbm/gal
Slurry Yield:	1.43 ft^3/sk
Total Mixing Fluid:	6.75 Gal/sk
Top of Fluid:	5000 ft
Calculated Fill:	3634 ft
Volume:	92 bbl
Calculated Sacks:	359 sks

Tail Cement
ELASTISEAL (TM) SYSTEM
0.2 % Versaset (Thixotropic Additive)
0.15 % HALAD-766 (Low Fluid Loss Control)
0.05 % SA-1015 (Suspension Agent)

Fluid Weight	13.50 lbm/gal
Slurry Yield:	1.28 ft^3/sk
Total Mixing Fluid:	5.64 Gal/sk
Top of Fluid:	8634 ft
Calculated Fill:	1069 ft
Volume:	20.85 bbl
Calculated Sacks:	100 sks

Detailed Pumping Schedule

Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Estimated Avg Rate bbl/min	Downhole Volume
1	Spacer	Fresh Water Spacer	8.3		10 bbl
2	Spacer	CHEMICAL WASH	8.4		40 bbl
3	Spacer	Fresh Water Spacer	8.3		10 bbl
4	Cement	Cap Cement	13.0		30 sks
5	Cement	Foamed Lead Cement	13.0		359 sks
6	Cement	Tail Cement	13.5		100 sks
7	Spacer	MMCR Spacer	8.3		20 bbl
8	Spacer	Fresh Water Displacement	8.3		

Foam Output Parameter Summary:

Fluid #	Fluid Name	Unfoamed Liquid Volume	Beginning Density lbm/gal	Ending Density lbm/gal	Beginning Rate scf/bbl	Ending Rate scf/bbl
Stage 1						
5	Foamed Lead Cement	50.98bbl	10.0	10.0	303.8	509.4

Foam Design Specifications:

Foam Calculation Method: Constant Density
Backpressure: 14 psig
Bottom Hole Circulating Temp: 158 degF
Mud Outlet Temperature: 100 degF

Calculated Gas = 20792.1 scf
Additional Gas = 50000 scf
Total Gas = 70792.1 scf

Production liner clarification: Utilizing foam cement for zonal isolation in the production liner.

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.

6. PROPOSED DRILLING FLUIDS PROGRAM

a) Vertical Portion

Hole Size (in)	TVD (ft)	Mud Type	Density (lb/gal)	Viscosity (sec/qt)	Fluid Loss (cc)
12 1/4"	0-500'	Fresh Water	8.4-8.6	60-70	NC
8 3/4"	500'-4916'	Fresh Water LSND	8.5-8.8	40-50	8-10

b) Kick off to Horizontal Lateral:

Hole Size (in)	TVD/MD (ft)	Mud Type	Density (lb/gal)	Viscosity (sec/qt)	Fluid Loss (CC)
8 3/4"	4916' (KOP)-5570'	Fresh Water LSND	8.5-8.8	40-50	8-10
6 1/8"	5570' - 9703'	Synthetic Oil Based Mud	7.0-9.0	15-25	<1

c) There will be sufficient mud on location to control a blowout should one occur. Mud flow and volume will be monitored both visually and with electronic pit volume totalizers. Mud tests shall be performed every 24 hours after mudding up to determine, as applicable: density, viscosity, gel strength, filtration, and pH.

d) A closed-loop system will be used to recover drilling fluid and dry cuttings in both phases of the well and on all hole intervals, including fresh water and oil-based operations. Above-ground tanks will be utilized to hold cuttings and fluids for rig operations. A frac tank will be on location to store fresh water. Waste will be disposed of properly at an EPA-approved hazardous waste facility. Fresh water cuttings will be disposed of at Basin Disposal, Inc. and/or Industrial Ecosystems, Inc. The location will be lined in accordance with the Surface Use Plan of Operations.

7. TESTING, CORING and LOGGING

a) Drill Stem Testing - None anticipated
b) Coring - None anticipated.
c) Mud Logging – Mud loggers will be on location from intermediate casing point to TD.
d) Logging - See Below
e) Gamma Ray from surface casing point to TD

Cased Hole:
CBL/CCL/GRNDL will be run as needed for perforating control

8. ABNORMAL PRESSURES & HYDROGEN SULFIDE

The anticipated bottom hole pressure is +/- 2537 psi based on a 9.0 ppg at 5420' TVD of the landing point of the horizontal. No abnormal pressure or temperatures are anticipated.

No hydrogen sulfide gas is anticipated, however, if H_2S is encountered, the guidelines in Onshore Order No. 6 will be followed.

9. ANTICIPATED START DATE AND DURATION OF OPERATIONS

Drilling is estimated to commence on May 15, 2014. It is anticipated that completion operations will begin within 30 days after the well has been drilled depending on fracture treatment schedules with various pumping service companies.

It is anticipated that the drilling of this well will take approximately 25 days.

CLOSED-LOOP SYSTEM DESIGN PLAN

The closed-loop system will consist of a series of temporary above-ground storage tanks and/or haul-off bins suitable for holding the cuttings and fluids from drilling operations. The closed- loop system will not entail temporary pits, below-grade storage tanks, below-grade sumps, or drying pads.

Design considerations include:

1. The closed-loop system will be signed in accordance with 19.15.17.11 NMAC.
2. The closed-loop system storage tanks will be of adequate volume to ensure confinement of all fluids and provide sufficient freeboard to prevent uncontrolled releases.
3. Topsoil will be salvaged and stored for use in reclamation activities.
4. The closed-loop system storage tanks will be placed in bermed secondary containment sized to contain a minimum of 110percent of the volume of the largest storage tank.

CLOSED-LOOP SYSTEM OPERATING & MAINTENANCE PLAN

The closed-loop system will be operated and maintained to contain liquids and solids; minimize the amount of drilling fluids and cuttings that require disposal; maximize the amount of drilling fluid recycled and reused in the drilling process; isolate drilling wastes from the environment; prevent contamination of fresh water; and protect public health and the environment.

Operation and maintenance considerations include:

1. Fluid levels will be maintained to provide sufficient freeboard to prevent over-topping.
2. Visual inspections will be conducted on a daily basis to identify any potential leaks and to ensure that the closed-loop system storage tanks have sufficient freeboard to prevent over-topping.
3. Only drilling fluids or cuttings intrinsic to, used by, or generated from, drilling operations will be stored in the closed-loop system storage tanks. Hazardous waste, miscellaneous solid waste, and/or debris will not be stored in the storage tanks.
4. The OCD District Office will be notified within 48 hours of discovery of a leak in the closed-loop drilling system. If a leak is discovered, all liquid will be removed within 48 hours and the damage repaired.

CLOSED-LOOP SYSTEM CLOSURE PLAN

The closed-loop system will be closed in accordance with 19.15.17.13 NMAC.

Closure considerations include:

1. Drilling fluids will be recycled and transferred to other permitted closed-loop systems or returned to the vendor for reuse, as practical.
2. Residual fluids will be pulled from the storage tanks, mixed with saw dust or similar absorbent material, and disposed of at Industrial Ecosystem, Inc. waste disposal facilities.
3. Remaining cuttings or sludges will be vacuumed from the storage tanks and disposed of at the Envirotech, Inc and/or Industrial Ecosystem, Inc. waste disposal facilities.
4. Storage tanks will be removed from the well location during the rig move.
5. The well pad will be reclaimed and seeded in accordance with subsections G, Hand I of 19.15.17.13NMAC.

LOGOS RESOURCES LLC

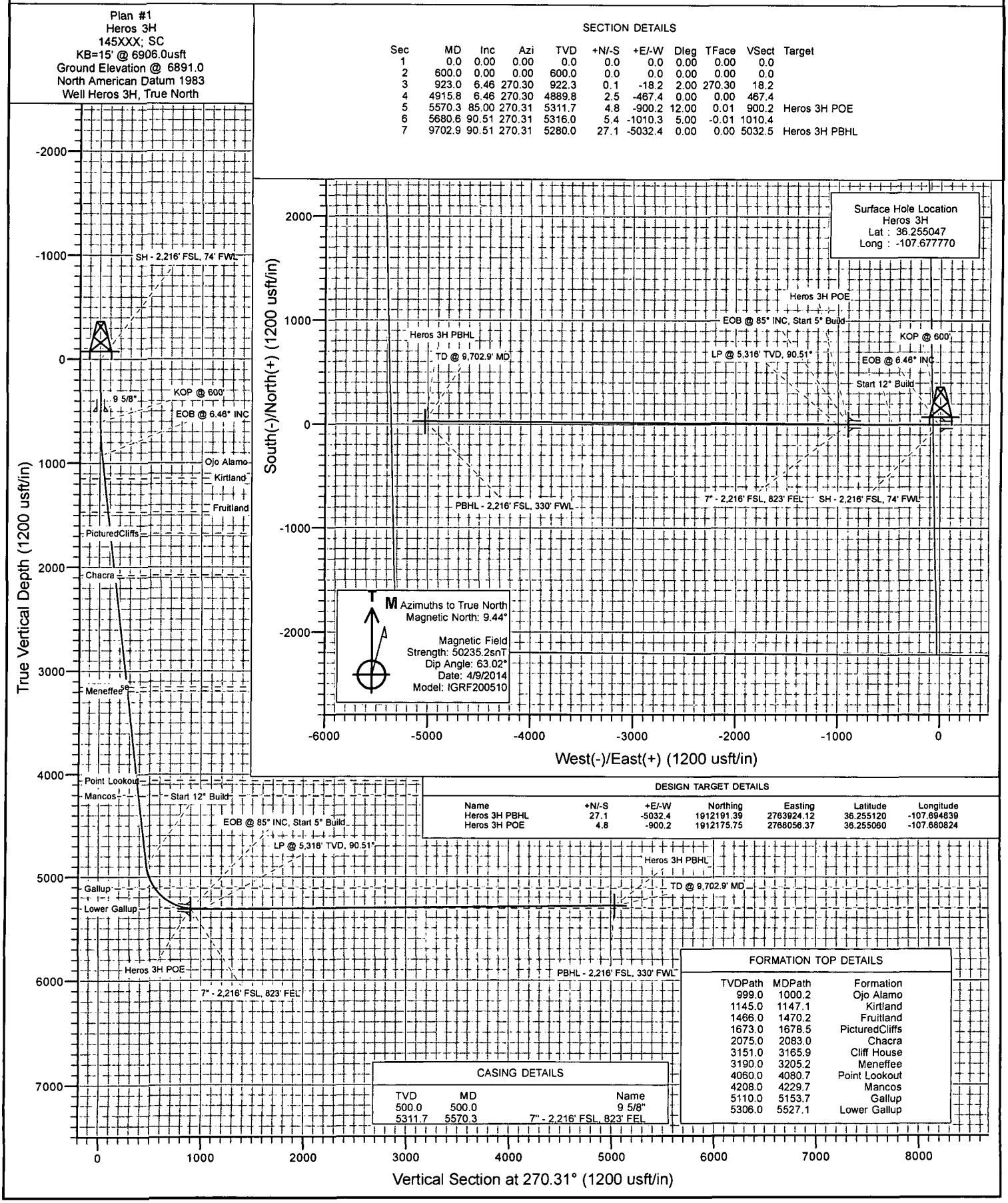
Project: San Juan County, NM
Site: S3-T23N-R8W (Heros Pad)
Well: Heros 3H
Wellbore: HZ
Design: Plan #1

CATHEDRAL

Plan #1
Heros 3H
145XXX; SC
KB=15' @ 6906.0usft
Ground Elevation @ 6891.0
North American Datum 1983
Well Heros 3H, True North

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	600.0	0.00	0.00	600.0	0.0	0.0	0.00	0.00	0.0	
3	923.0	6.46	270.30	922.3	0.1	-18.2	2.00	270.30	18.2	
4	4915.8	6.46	270.30	4889.8	2.5	-467.4	0.00	0.00	467.4	
5	5570.3	85.00	270.31	5311.7	4.8	-900.2	12.00	0.01	900.2	Heros 3H POE
6	5680.6	90.51	270.31	5316.0	5.4	-1010.3	5.00	-0.01	1010.4	
7	9702.9	90.51	270.31	5280.0	27.1	-5032.4	0.00	0.00	5032.5	Heros 3H PBHL



DESIGN TARGET DETAILS

Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Heros 3H PBHL	27.1	-5032.4	1912191.39	2763924.12	36.255120	-107.694839
Heros 3H POE	4.8	-900.2	1912175.75	2768056.37	36.255060	-107.680824

CASING DETAILS

TVD	MD	Name
500.0	500.0	9 5/8"
5311.7	5570.3	7" - 2,216' FSL, 823' FEL

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
999.0	1000.2	Ojo Alamo
1145.0	1147.1	Kirtland
1466.0	1470.2	Fruitland
1673.0	1678.5	PicturedCliffs
2075.0	2083.0	Chacra
3151.0	3165.9	Cliff House
3190.0	3205.2	Meneffee
4060.0	4080.7	Point Lookout
4208.0	4229.7	Mancos
5110.0	5153.7	Gallup
5306.0	5527.1	Lower Gallup

Planning Report

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Heros 3H
Company:	LOGOS Operating LLC	**TVD Reference:**	KB=15' @ 6906.0usft
Project:	San Juan County, NM	**MD Reference:**	KB=15' @ 6906.0usft
Site:	S3-T23N-R8W (Heros Pad)	**North Reference:**	True
Well:	Heros 3H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

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	S3-T23N-R8W (Heros Pad)				
Site Position:		**Northing:**	1,913,317.33 usft	**Latitude:**	36.258189
From:	Lat/Long	**Easting:**	2,769,670.19 usft	**Longitude:**	-107.675344
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16"	**Grid Convergence:**	0.09 °

Well	Heros 3H					
Well Position	**+N/-S**	0.0 usft	**Northing:**	1,912,172.38 usft	**Latitude:**	36.255047
	+E/-W	0.0 usft	**Easting:**	2,768,956.59 usft	**Longitude:**	-107.677770
Position Uncertainty		0.0 usft	**Wellhead Elevation:**	usft	**Ground Level:**	6,891.0 usft

Wellbore	HZ				
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF200510	4/9/2014	9.44	63.02	50,235

Design	Plan #1				
Audit Notes:					
Version:		**Phase:**	PLAN	**Tie On Depth:**	0.0
Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**	
	0.0	0.0	0.0	270.31	

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
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
600.0	0.00	0.00	600.0	0.0	0.0	0.00	0.00	0.00	0.00	
923.0	6.46	270.30	922.3	0.1	-18.2	2.00	2.00	0.00	270.30	
4,915.8	6.46	270.30	4,889.8	2.5	-467.4	0.00	0.00	0.00	0.00	
5,570.3	85.00	270.31	5,311.7	4.8	-900.2	12.00	12.00	0.00	0.01	Heros 3H POE
5,680.6	90.51	270.31	5,316.0	5.4	-1,010.3	5.00	5.00	0.00	-0.01	
9,702.9	90.51	270.31	5,280.0	27.1	-5,032.4	0.00	0.00	0.00	0.00	Heros 3H PBHL

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Well:	Heros 3H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft	Build Rate (°/100u	Comments / Formations
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
0.5	0.00	0.00	0.5	0.0	0.0	0.0	0.00	0.00	SH - 2,216' FSL, 74' FWL
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	9 5/8"
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	KOP @ 600'
700.0	2.00	270.30	700.0	0.0	-1.7	1.7	2.00	2.00	
800.0	4.00	270.30	799.8	0.0	-7.0	7.0	2.00	2.00	
900.0	6.00	270.30	899.5	0.1	-15.7	15.7	2.00	2.00	
923.0	6.46	270.30	922.3	0.1	-18.2	18.2	2.00	2.00	EOB @ 6.46° INC
1,000.0	6.46	270.30	998.8	0.1	-26.9	26.9	0.00	0.00	
1,000.2	6.46	270.30	999.0	0.1	-26.9	26.9	0.00	0.00	Ojo Alamo
1,100.0	6.46	270.30	1,098.2	0.2	-38.1	38.1	0.00	0.00	
1,147.1	6.46	270.30	1,145.0	0.2	-43.4	43.4	0.00	0.00	Kirtland
1,200.0	6.46	270.30	1,197.6	0.3	-49.4	49.4	0.00	0.00	
1,300.0	6.46	270.30	1,296.9	0.3	-60.6	60.6	0.00	0.00	
1,400.0	6.46	270.30	1,396.3	0.4	-71.9	71.9	0.00	0.00	
1,470.2	6.46	270.30	1,466.0	0.4	-79.7	79.7	0.00	0.00	Fruitland
1,500.0	6.46	270.30	1,495.7	0.4	-83.1	83.1	0.00	0.00	
1,600.0	6.46	270.30	1,595.0	0.5	-94.4	94.4	0.00	0.00	
1,678.5	6.46	270.30	1,673.0	0.5	-103.2	103.2	0.00	0.00	PicturedCliffs
1,700.0	6.46	270.30	1,694.4	0.6	-105.6	105.6	0.00	0.00	
1,800.0	6.46	270.30	1,793.7	0.6	-116.9	116.9	0.00	0.00	
1,900.0	6.46	270.30	1,893.1	0.7	-128.1	128.1	0.00	0.00	
2,000.0	6.46	270.30	1,992.5	0.7	-139.4	139.4	0.00	0.00	
2,083.0	6.46	270.30	2,075.0	0.8	-148.7	148.7	0.00	0.00	Chacra
2,100.0	6.46	270.30	2,091.8	0.8	-150.6	150.6	0.00	0.00	
2,200.0	6.46	270.30	2,191.2	0.9	-161.9	161.9	0.00	0.00	
2,300.0	6.46	270.30	2,290.6	0.9	-173.1	173.1	0.00	0.00	
2,400.0	6.46	270.30	2,389.9	1.0	-184.4	184.4	0.00	0.00	
2,500.0	6.46	270.30	2,489.3	1.0	-195.6	195.6	0.00	0.00	
2,600.0	6.46	270.30	2,588.7	1.1	-206.9	206.9	0.00	0.00	
2,700.0	6.46	270.30	2,688.0	1.2	-218.1	218.1	0.00	0.00	
2,800.0	6.46	270.30	2,787.4	1.2	-229.4	229.4	0.00	0.00	
2,900.0	6.46	270.30	2,886.8	1.3	-240.6	240.6	0.00	0.00	
3,000.0	6.46	270.30	2,986.1	1.3	-251.9	251.9	0.00	0.00	
3,100.0	6.46	270.30	3,085.5	1.4	-263.1	263.1	0.00	0.00	
3,165.9	6.46	270.30	3,151.0	1.4	-270.5	270.5	0.00	0.00	Cliff House
3,200.0	6.46	270.30	3,184.9	1.5	-274.4	274.4	0.00	0.00	
3,205.2	6.46	270.30	3,190.0	1.5	-274.9	274.9	0.00	0.00	Meneffee
3,300.0	6.46	270.30	3,284.2	1.5	-285.6	285.6	0.00	0.00	
3,400.0	6.46	270.30	3,383.6	1.6	-296.9	296.9	0.00	0.00	
3,500.0	6.46	270.30	3,483.0	1.6	-308.1	308.1	0.00	0.00	
3,600.0	6.46	270.30	3,582.3	1.7	-319.4	319.4	0.00	0.00	
3,700.0	6.46	270.30	3,681.7	1.8	-330.6	330.6	0.00	0.00	
3,800.0	6.46	270.30	3,781.0	1.8	-341.9	341.9	0.00	0.00	
3,900.0	6.46	270.30	3,880.4	1.9	-353.1	353.1	0.00	0.00	
4,000.0	6.46	270.30	3,979.8	1.9	-364.4	364.4	0.00	0.00	
4,080.7	6.46	270.30	4,060.0	2.0	-373.4	373.5	0.00	0.00	Point Lookout
4,100.0	6.46	270.30	4,079.1	2.0	-375.6	375.6	0.00	0.00	

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Well:	Heros 3H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft	Build Rate (°/100u	Comments / Formations
4,200.0	6.46	270.30	4,178.5	2.1	-386.9	386.9	0.00	0.00	
4,229.7	6.46	270.30	4,208.0	2.1	-390.2	390.2	0.00	0.00	Mancos
4,300.0	6.46	270.30	4,277.9	2.1	-398.1	398.1	0.00	0.00	
4,400.0	6.46	270.30	4,377.2	2.2	-409.4	409.4	0.00	0.00	
4,500.0	6.46	270.30	4,476.6	2.2	-420.6	420.6	0.00	0.00	
4,600.0	6.46	270.30	4,576.0	2.3	-431.9	431.9	0.00	0.00	
4,700.0	6.46	270.30	4,675.3	2.4	-443.1	443.1	0.00	0.00	
4,800.0	6.46	270.30	4,774.7	2.4	-454.4	454.4	0.00	0.00	
4,900.0	6.46	270.30	4,874.1	2.5	-465.6	465.6	0.00	0.00	
4,915.8	6.46	270.30	4,889.8	2.5	-467.4	467.4	0.00	0.00	Start 12° Build
4,925.0	7.56	270.31	4,898.9	2.5	-468.5	468.5	12.00	12.00	
4,950.0	10.56	270.31	4,923.6	2.5	-472.5	472.5	12.00	12.00	
4,975.0	13.56	270.31	4,948.0	2.5	-477.7	477.7	12.00	12.00	
5,000.0	16.56	270.31	4,972.2	2.6	-484.2	484.2	12.00	12.00	
5,025.0	19.56	270.31	4,995.9	2.6	-491.9	491.9	12.00	12.00	
5,050.0	22.56	270.31	5,019.3	2.7	-500.9	500.9	12.00	12.00	
5,075.0	25.56	270.31	5,042.1	2.7	-511.1	511.1	12.00	12.00	
5,100.0	28.56	270.31	5,064.3	2.8	-522.5	522.5	12.00	12.00	
5,125.0	31.56	270.31	5,086.0	2.8	-535.0	535.0	12.00	12.00	
5,150.0	34.56	270.31	5,106.9	2.9	-548.6	548.6	12.00	12.00	
5,153.7	35.01	270.31	5,110.0	2.9	-550.8	550.8	12.00	12.00	Gallup
5,175.0	37.56	270.31	5,127.1	3.0	-563.4	563.4	12.00	12.00	
5,200.0	40.56	270.31	5,146.5	3.1	-579.1	579.1	12.00	12.00	
5,225.0	43.56	270.31	5,165.1	3.2	-595.9	595.9	12.00	12.00	
5,250.0	46.56	270.31	5,182.8	3.3	-613.5	613.6	12.00	12.00	
5,275.0	49.56	270.31	5,199.5	3.4	-632.1	632.2	12.00	12.00	
5,300.0	52.56	270.31	5,215.2	3.5	-651.6	651.6	12.00	12.00	
5,325.0	55.56	270.31	5,229.8	3.6	-671.8	671.8	12.00	12.00	
5,350.0	58.56	270.31	5,243.4	3.7	-692.8	692.8	12.00	12.00	
5,375.0	61.56	270.31	5,255.9	3.8	-714.5	714.5	12.00	12.00	
5,400.0	64.56	270.31	5,267.2	3.9	-736.8	736.8	12.00	12.00	
5,425.0	67.56	270.31	5,277.4	4.1	-759.6	759.6	12.00	12.00	
5,450.0	70.56	270.31	5,286.3	4.2	-782.9	783.0	12.00	12.00	
5,475.0	73.56	270.31	5,294.0	4.3	-806.7	806.7	12.00	12.00	
5,500.0	76.56	270.31	5,300.4	4.4	-830.9	830.9	12.00	12.00	
5,525.0	79.56	270.31	5,305.6	4.6	-855.3	855.3	12.00	12.00	
5,527.1	79.82	270.31	5,306.0	4.6	-857.4	857.4	12.00	12.00	Lower Gallup
5,550.0	82.56	270.31	5,309.5	4.7	-880.0	880.0	12.00	12.00	
5,570.3	85.00	270.31	5,311.7	4.8	-900.2	900.2	12.00	12.00	EOB @ 85° INC, Start 5° Build - 7" - 2,216' FSL
5,600.0	86.48	270.31	5,313.9	5.0	-929.8	929.8	5.00	5.00	
5,680.6	90.51	270.31	5,316.0	5.4	-1,010.3	1,010.4	5.00	5.00	LP @ 5,316' TVD, 90.51°
5,700.0	90.51	270.31	5,315.8	5.5	-1,029.8	1,029.8	0.00	0.00	
5,800.0	90.51	270.31	5,314.9	6.1	-1,129.8	1,129.8	0.00	0.00	
5,900.0	90.51	270.31	5,314.0	6.6	-1,229.8	1,229.8	0.00	0.00	
6,000.0	90.51	270.31	5,313.2	7.1	-1,329.8	1,329.8	0.00	0.00	
6,100.0	90.51	270.31	5,312.3	7.7	-1,429.8	1,429.8	0.00	0.00	
6,200.0	90.51	270.31	5,311.4	8.2	-1,529.7	1,529.8	0.00	0.00	
6,300.0	90.51	270.31	5,310.5	8.8	-1,629.7	1,629.8	0.00	0.00	
6,400.0	90.51	270.31	5,309.6	9.3	-1,729.7	1,729.8	0.00	0.00	
6,500.0	90.51	270.31	5,308.7	9.8	-1,829.7	1,829.8	0.00	0.00	
6,600.0	90.51	270.31	5,307.8	10.4	-1,929.7	1,929.8	0.00	0.00	
6,700.0	90.51	270.31	5,306.9	10.9	-2,029.7	2,029.8	0.00	0.00	

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Design:	Plan #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft	Build Rate (°/100u	Comments / Formations
6,800.0	90.51	270.31	5,306.0	11.4	-2,129.7	2,129.7	0.00	0.00	
6,900.0	90.51	270.31	5,305.1	12.0	-2,229.7	2,229.7	0.00	0.00	
7,000.0	90.51	270.31	5,304.2	12.5	-2,329.7	2,329.7	0.00	0.00	
7,100.0	90.51	270.31	5,303.3	13.1	-2,429.7	2,429.7	0.00	0.00	
7,200.0	90.51	270.31	5,302.4	13.6	-2,529.7	2,529.7	0.00	0.00	
7,300.0	90.51	270.31	5,301.5	14.1	-2,629.7	2,629.7	0.00	0.00	
7,400.0	90.51	270.31	5,300.6	14.7	-2,729.7	2,729.7	0.00	0.00	
7,500.0	90.51	270.31	5,299.7	15.2	-2,829.7	2,829.7	0.00	0.00	
7,600.0	90.51	270.31	5,298.8	15.8	-2,929.7	2,929.7	0.00	0.00	
7,700.0	90.51	270.31	5,297.9	16.3	-3,029.7	3,029.7	0.00	0.00	
7,800.0	90.51	270.31	5,297.0	16.8	-3,129.7	3,129.7	0.00	0.00	
7,900.0	90.51	270.31	5,296.1	17.4	-3,229.7	3,229.7	0.00	0.00	
8,000.0	90.51	270.31	5,295.2	17.9	-3,329.7	3,329.7	0.00	0.00	
8,100.0	90.51	270.31	5,294.4	18.5	-3,429.6	3,429.7	0.00	0.00	
8,200.0	90.51	270.31	5,293.5	19.0	-3,529.6	3,529.7	0.00	0.00	
8,300.0	90.51	270.31	5,292.6	19.5	-3,629.6	3,629.7	0.00	0.00	
8,400.0	90.51	270.31	5,291.7	20.1	-3,729.6	3,729.7	0.00	0.00	
8,500.0	90.51	270.31	5,290.8	20.6	-3,829.6	3,829.7	0.00	0.00	
8,600.0	90.51	270.31	5,289.9	21.1	-3,929.6	3,929.7	0.00	0.00	
8,700.0	90.51	270.31	5,289.0	21.7	-4,029.6	4,029.7	0.00	0.00	
8,800.0	90.51	270.31	5,288.1	22.2	-4,129.6	4,129.7	0.00	0.00	
8,900.0	90.51	270.31	5,287.2	22.8	-4,229.6	4,229.7	0.00	0.00	
9,000.0	90.51	270.31	5,286.3	23.3	-4,329.6	4,329.7	0.00	0.00	
9,100.0	90.51	270.31	5,285.4	23.8	-4,429.6	4,429.7	0.00	0.00	
9,200.0	90.51	270.31	5,284.5	24.4	-4,529.6	4,529.7	0.00	0.00	
9,300.0	90.51	270.31	5,283.6	24.9	-4,629.6	4,629.6	0.00	0.00	
9,400.0	90.51	270.31	5,282.7	25.5	-4,729.6	4,729.6	0.00	0.00	
9,500.0	90.51	270.31	5,281.8	26.0	-4,829.6	4,829.6	0.00	0.00	
9,600.0	90.51	270.31	5,280.9	26.5	-4,929.6	4,929.6	0.00	0.00	
9,702.9	90.51	270.31	5,280.0	27.1	-5,032.4	5,032.5	0.00	0.00	TD @ 9,702.9' MD - PBHL - 2,216' FSL, 330' F\

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 3H PBHL - plan hits target center - Point	0.00	0.00	5,280.0	27.1	-5,032.4	1,912,191.39	2,763,924.12	36.255120	-107.694839
Heros 3H POE - plan hits target center - Point	0.00	0.00	5,311.7	4.8	-900.2	1,912,175.75	2,768,056.37	36.255060	-107.680824

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
500.0	500.0	9 5/8"	0	0
5,570.3	5,311.7	7" - 2,216' FSL, 823' FEL	0	0

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Heros 3H
Company:	LOGOS Operating LLC	**TVD Reference:**	KB=15' @ 6906.0usft
Project:	San Juan County, NM	**MD Reference:**	KB=15' @ 6906.0usft
Site:	S3-T23N-R8W (Heros Pad)	**North Reference:**	True
Well:	Heros 3H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,000.2	999.0	Ojo Alamo		0.00	
1,147.1	1,145.0	Kirtland		0.00	
1,470.2	1,466.0	Fruitland		0.00	
1,678.5	1,673.0	PicturedCliffs		0.00	
2,083.0	2,075.0	Chacra		0.00	
3,165.9	3,151.0	Cliff House		0.00	
3,205.2	3,190.0	Meneffee		0.00	
4,080.7	4,060.0	Point Lookout		0.00	
4,229.7	4,208.0	Mancos		0.00	
5,153.7	5,110.0	Gallup		0.00	
5,527.1	5,306.0	Lower Gallup		0.00	

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
0.5	0.5	0.0	0.0	SH - 2,216' FSL, 74' FWL
600.0	600.0	0.0	0.0	KOP @ 600'
923.0	922.3	0.1	-18.2	EOB @ 6.46° INC
4,915.8	4,889.8	2.5	-467.4	Start 12° Build
5,570.3	5,311.7	4.8	-900.2	EOB @ 85° INC, Start 5° Build
5,680.6	5,316.0	5.4	-1,010.3	LP @ 5,316' TVD, 90.51°
9,702.9	5,280.0	27.1	-5,032.4	TD @ 9,702.9' MD
9,702.9	5,280.0	27.1	-5,032.4	PBHL - 2,216' FSL, 330' FWL

Sheet C

LOGOS OPERATING, LLC

HEROS #003H

2216' FSL, 74' FWL (SURFACE) SECTION 3

2216' FSL, 330' FWL (BOTTOM HOLE) SECTION 4

LATITUDE: 36.2550465° N

LONGITUDE: 107.6777705° W

NAD 83

T-23-N, R-8-W, N.M.P.M

SAN JUAN COUNTY, NEW MEXICO

FROM THE INTERSECTION OF U.S. HIGHWAY 550
AND U.S. HIGHWAY 64 IN BLOOMFIELD, NEW MEXICO.
TRAVEL SOUTHERLY ON U.S. HIGHWAY 550 FOR 40.5 MILES.
TURN LEFT OFF THE HIGHWAY GOING THROUGH THE CATTLE GUARD ONTO THE SIDE ROAD; TRAVEL 0.08 MILE TO THE PROPOSED ACCESS ROAD LEADING TO THE PROPOSED HEROS #003H WELL LOCATION.

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)