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

David R. Catanach 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: 2-5-15
Well information;
Operator Logos, Well Name and Number Brannon Federal #304H
API# 30-045-35644, Section 29, Township 25 (N/S), Range 9 (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
- 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
- ✓ Regarding Hydraulic Fracturing, review EPA Underground Injection Control Guidance 84
- ✓ 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.
- ✓ Well-bore communication is regulated under 19.15.29 NMAC. This requires well-bore Communication to be reported in accordance with 19.15.29.8.

Charles Perrin
NMOCD Approved by Signature

4-24-2015
Date KC

1220 South St. Francis Drive • Santa Fe, New Mexico 87505
Phone (505) 476-3460 • Fax (505) 476-3462 • www.emnrd.state.nm.us/ocd

Form 3160-3
(March 2012)

OIL CONS. DIV DIST. 3

APR 21 2015

RECEIVED

FEB 06 2015

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.
SF 078309

6. If Indian, Allotee or Tribe Name

1a. Type of work: ☑ DRILL ☐ REENTER

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

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

8. Lease Name and Well No.
Brannon Federal 304H

2. Name of Operator Logos Operating, LLC

9. API Well No.
30-045-35644

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

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

10. Field and Pool, or Exploratory
Basin Mancos

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*
At surface M 1150' FSL 899' FWL, SW/SW
At proposed prod. zone M 990' FSL 250' FWL, SW/SW

11. Sec., T. R. M. or Blk. and Survey or Area
SHL Sec 29, T25N R09W, UL M
BHL Sec 30, T25N R09W, UL M

KP

14. Distance in miles and direction from nearest town or post office*
8.2 miles northwest 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)	16. No. of acres in lease	17. Spacing Unit dedicated to this well
1150' from north line of section 32	2521.02 acres	L3, L4, W/2 SW, SE Sec 30 = 321.02 acres
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.	**19. Proposed Depth**	**20. BLM/BIA Bond No. on file**
800' from Federal 29 2E	11397' MD / 5615' TVD	BLM 1062415 NMB 000917
21. Elevations (Show whether DF, KDB, RT, GL, etc.)	**22. Approximate date work will start***	**23. Estimated duration**
6802' GL	05/15/2015	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	Name *(Printed/Typed)*	Date
Tamra Sessions	Tamra Sessions	02/05/2015

Title
Operations Technician

Approved by *(Signature)*	Name *(Printed/Typed)*	Date
Title AFM	Office FFO	4/16/15

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

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

(Continued on page 2)

*(Instructions on page 2)

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

CONFIDENTIAL

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

NMOCD

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

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
30-045-35614	97232	BASIN MANCOS

[4] Property Code	[5] Property Name	[6] Well Number
314773	BRANNON FEDERAL	304H

[7] OGRID No.	[8] Operator Name	[9] Elevation
289408	LOGOS OPERATING, LLC	6802'

[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
M	29	25-N	9-W		1150	SOUTH	899	WEST	SAN JUAN

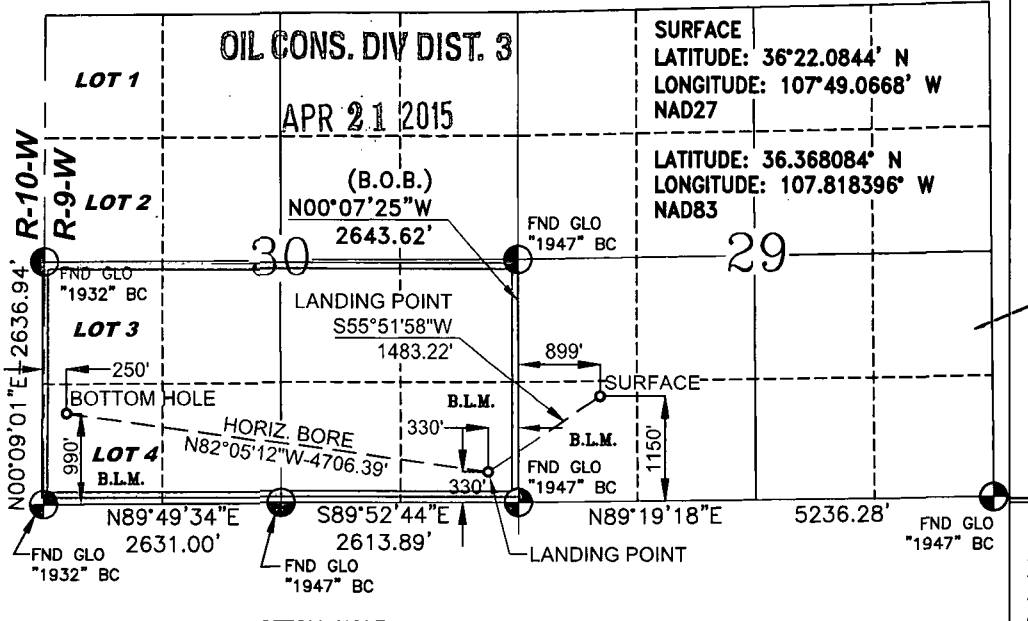
[11] Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	30	25-N	9-W	L	990	SOUTH	250	WEST	SAN JUAN

[12] Dedicated Acres	[13] Joint or Infill	[14] Consolidation Code	[15] Order No.
Lot 3,4, E/2 SW/4, SE/4 in Sec 30 - 321.02 acres			

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]



SURFACE
LATITUDE: 36°22.0844' N
LONGITUDE: 107°49.0668' W
NAD27

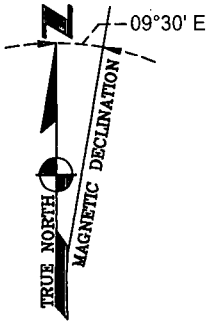
LATITUDE: 36.368084° N
LONGITUDE: 107.818396° W
NAD83

BOTTOM HOLE
LATITUDE: 36°22.0539' N
LONGITUDE: 107°50.2665' W
NAD27

LATITUDE: 36.367576° N
LONGITUDE: 107.838391° W
NAD83

LANDING POINT
LATITUDE: 36°21.9473' N
LONGITUDE: 107°49.3169' W
NAD27

LATITUDE: 36.365799° N
LONGITUDE: 107.822564° W
NAD83



BASIS OF BEARING:
BETWEEN FOUND MONUMENTS AT THE SOUTHEAST CORNER AND THE EAST QUARTER CORNER OF SECTION 30, TOWNSHIP 25 NORTH, RANGE 9 WEST, N.M.P.M. SAN JUAN COUNTY, NEW MEXICO.

LINE BEARS: N 00°07'25" W A DISTANCE OF 2643.62 FEET AS MEASURED BY G.P.S. LOCAL GRID NAD83.

[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 2/5/15
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.

SEPTEMBER 17, 2014
Date of Survey

Signature and Seal of Professional Surveyor:

GLEN W. RUSSELL NEW MEXICO 15703 LICENSED PROFESSIONAL SURVEYOR

GLEN W. RUSSELL
Certificate Number 15703

02/04/2015

Attachment To Application For Permit To Drill
Drilling Program

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

BRANNON FEDERAL 304H
Horizontal Gallup Oil and Gas Well
Surface Location: 1150' FSL – 899' FWL
Section 29, T25N, R9W
Ungraded GL Elev = 6802'
Estimate KB Elev = 6817' (15'KB)
Lat. = 36.368084 deg N
Long. = 107.818396 deg W
NAD83
San Juan County, New Mexico

Proposed Bottom Hole Location: 990' FSL – 250' FWL
Section 30, T25N, R9W
San Juan County, New Mexico

Drilling program written in compliance with Onshore Oil and Gas Order No. 1
(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	1042
Kirtland	1192
Fruitland	1496
Pictured Cliff's	1920
Chacra	2003
Cliff House	3451
Menefee	3482
Point Lookout	4324
Mancos	4574
Gallup	5196
Lower Gallup	5547
Landing Point	5629
Total Depth	5615

Drilling Plan

Drill 12 ¼" hole to 320' then set 9 5/8" casing. Drill 8 3/4" hole with fresh water mud from 320' MD to kick off point 4600' MD.

Trip out of hole and pick up 8 ¾" kick off assembly at 4600' MD. Build angle at 6.44 deg/100' to 85 degrees inclination and 277.91 degrees azimuth in the Gallup formation at 5253' MD/ 5196' TVD where 7" intermediate casing will be set at 6692' MD / 5625' TVD.
7" casing will be set in a legal position 330' FSL & 330' FEL in Section 30.

The 7" casing will be drilled out with a 6 1/8" drilling assembly building angle at 5 deg/100' to 90.17 degrees inclination and 277.91 degree azimuth to 6796' MD/ 5629' TVD. Hold 90.17 degrees, 277.91 degrees azimuth and drill to a total depth at 11397' MD/ 5615' TVD. Adjustments may be made to the directional program based on geology. Total depth will be 11397' MD/ 5615' TVD - 90.17 degrees, 277.91 degrees Azimuth.
The Bottom hole location will be in a legal location at 11397' MD at 990' FSL & 250' FWL of section 30.
A total of 4705' 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 5196' TVD 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 2049 psig (0.364 psi/ft @ 5629' 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 1238 psi (5629' 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, 2000 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 nippled-up on the 9-5/8" x 11" 2000 psi WP casing head prior to drilling out from under surface casing. All ram preventers and related equipment will be tested to 2000 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 320'
8-3/4" = 320' to 6692' = 7" Casing point @ 85 degrees
8-3/4" Landing point = 6796' @ 90.17 degrees
6-1/8" Lateral = 6692' MD to 11397' 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' - 320'	New casing. Cement to surface.
7" (8-3/4")	23 ppf	J or K-55	LT&C	0' – 6692' MD	New Casing. Cement to surface with one stage
4-1/2" (6-1/8")	11.6 ppf	P-110	LT&C	5500' – 11397' MD	New Casing - Horizontal Hole Cemented full length with foam cement - TOL at 60 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.

- 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 – (0-320'):
Excess – 100% over gauge hole – 12-1/4" hole and 9-5/8" casing (0.3132ft3/ft)
Top of Cement – Surface

Stage 1

Fluid 1: Water Spacer

Fresh Water	Fluid Density:	8.33 lbm/gal
	Volume:	10 bbl

Fluid 2: Lead Slurry

HALCEM (TM) SYSTEM	Fluid Weight:	15.8 lbm/gal
94 lbm Premium Cement	Volume:	55.8 bbl
0.1250 lbm Poly-E-Flake	Slurry Yield:	1.174 ft3/sack
5.13 Gal FRESH WATER	Total Mixing Fluid:	5.13 Gal/sack
	Top Of Fluid:	0 ft
	Calculated Fill:	500 ft
	Calculated sack:	266.77 sack
	Proposed sack:	270 sack

Fluid 3: Water Based Spacer

Displacement	Fluid Density:	8.33 lbm/gal
	Volume:	38.7 bbl

Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Estimated Avg Rate	Downhole Volume
1	SPACER	Fresh Water	8.33		10 bbl
2	CEMENT	HalCem Primary	15.8		270 sack
3	SPACER	Displacement	8.33		38.7 bbl

Intermediate Casing – One Stage Job (0- 6,692' MD):
Excess – 50% over gauge hole – 8-3/4" hole and 7" casing (0.1503 ft3/ft)
Top of Cement – Surface

Stage 1

Fluid 1: Water Spacer

Fresh Water	Fluid Density:	8.33 lbm/gal
	Liquid Volume:	10 bbl

Fluid 2: Reactive Spacer

Chemical Wash	Fluid Density:	8.4 lbm/gal
1000 gal/Mgal FRESH WATER	Liquid Volume:	40 bbl

Fluid 3: Lead Slurry

HALCEM (TM) SYSTEM	Fluid Weight:	11.5 lbm/gal
11.80 Gal FRESH WATER	Slurry Yield:	2.15 ft3/sack
	Total Mixing Fluid:	11.8 Gal/sack
	Top Of Fluid:	4539 ft
	Calculated Fill:	831 ft
	Liquid Volume:	32.5 bbl
	Calculated sack:	81.33 sack
	Proposed sack:	85 sack

Fluid 4: Foamed

ELASTISEAL (TM) SYSTEM	Fluid Weight:	13 lbm/gal
1.50 % CHEM - FOAMER 760, TOTETANK	Slurry Yield:	1.46 ft3/sack
6.73 Gal FRESH WATER	Total Mixing Fluid:	6.83 Gal/sack
	Top Of Fluid:	5370 ft
	Calculated Fill:	293 ft
	Liquid Volume:	152.1 bbl
	Calculated sack:	42.26 sack
	Proposed sack:	585 sack

Fluid 5: Tail Slurry

HALCEM (TM) SYSTEM	Fluid Weight:	13.5 lbm/gal
5.70 Gal FRESH WATER	Slurry Yield:	1.32 ft3/sack
	Total Mixing Fluid:	5.7 Gal/sack
	Top Of Fluid:	5663 ft
	Calculated Fill:	510 ft
	Liquid Volume:	25.9 bbl
	Calculated sack:	81.33 sack
	Proposed sack:	110 sack

Fluid 6: Water Based Spacer

Displacement	Fluid Density: Liquid Volume:	8.4 lbm/gal 230 bbl

Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Estimated Avg Rate	Downhole Volume
1	SPACER	Fresh Water	8.33		10 bbl
2	SPACER	Chemical Wash	8.4		40 bbl
3	CEMENT	Scavenger Cement	11.5		85 sack
4	CEMENT	Foamed Lead Cement	13		585 sack
5	CEMENT	Unfoamed Tail	13.5		110 sack
6	SPACER	Displacement	8.4		230 bbl

Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Estimated Avg Rate	Downhole Volume
1	SPACER	Fresh Water	8.33		10 bbl
2	SPACER	Chemical Wash	8.4		40 bbl
3	CEMENT	Scavenger Cement	11.5		85 sack
4	CEMENT	Foamed Lead Cement	13		585 sack
5	CEMENT	Unfoamed Tail	13.5		110 sack
6	SPACER	Displacement	8.4		230 bbl

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

Production Casing – Single Stage Job (5500' – 11397' 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.

Stage 1

Fluid 1: Water Spacer

Fresh Water	Fluid Density: Liquid Volume:	8.33 lbm/gal 10 bbl

Fluid 2: Rheologically Enhanced Spacer

10 lb/gal Tuned Spacer III 38.32 gal/bbl FRESH WATER 1 gal/bbl SEM-7 1 gal/bbl Musol(R) A 45 gal/bbl BAROID 41 - 50 LB BAG	Fluid Density: Liquid Volume:	10 lbm/gal 40 bbl

Fluid 3: Water Spacer

Fresh Water	Fluid Density: Liquid Volume:	8.33 lbm/gal 10 bbl

Fluid 4: Lead Slurry

ELASTISEAL (TM) SYSTEM 6.84 Gal FRESH WATER	Fluid Weight: Slurry Yield: Total Mixing Fluid: Top Of Fluid: Calculated Fill: Liquid Volume: Calculated sack: Proposed sack:	13 lbm/gal 1.46 ft3/sack 6.84 Gal/sack 6364 ft 598 ft 13 bbl 44.32 sack 50 sack

Fluid 5: Foamed

ELASTISEAL (TM) SYSTEM 2.50 % CHEM - FOAMER 760, TOTETANK 6.68 Gal FRESH WATER	Fluid Weight: Slurry Yield: Total Mixing Fluid: Top Of Fluid: Calculated Fill: Liquid Volume: Avg Foamed Yield: Foamed Volume: Calculated sack: Proposed sack:	13 lbm/gal 1.46 ft3/sack 6.85 Gal/sack 6962 ft 3031 ft 62.4 bbl ft3/sack 58.5 bbl 224.82 sack 240 sack

Fluid 6: Tail Slurry

ELASTISEAL (TM) SYSTEM 5.72 Gal FRESH WATER	Fluid Weight: Slurry Yield: Total Mixing Fluid: Top Of Fluid: Calculated Fill: Liquid Volume: Calculated sack: Proposed sack:	13.5 lbm/gal 1.3 ft3/sack 5.72 Gal/sack 9993 ft 1164 ft 25.5 bbl 97 sack 110 sack

Fluid 7: Water Based Spacer

MMCR Displacement 0.25 gal/bbl Micro Matrix Retarder	Fluid Density: Liquid Volume:	8.4 lbm/gal 20 bbl

Fluid 8: Water Spacer

Fresh Water Displacement	Fluid Density: Liquid Volume:	8.4 lbm/gal 130 bbl

Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Estimated Avg Rate	Downhole Volume
1	SPACER	Fresh Water	8.33		10 bbl
2	SPACER	10 lb/gal Tuned Spacer III	10		40 bbl
3	SPACER	Fresh Water	8.33		10 bbl
4	CEMENT	Unfoamed Lead	13		50 sack
5	CEMENT	Foamed Cement	13		240 sack
6	CEMENT	Unfoamed Tail	13.5		110 sack
7	SPACER	MMCR Displacement	8.4		20 bbl
8	SPACER	Fresh Water Displacement	8.4		130 bbl

Foam Output Parameter Summary:

Stage 1

Foam Calculation Method :	Constant Density	Calculated Gas :	21317.7 scf
Annulus Back Pressure :	20 psig	Additional Gas :	50000 scf
Bottom Hole Circulating Temp :	145degF	Total Gas :	71317.7 scf
Mud Outlet Temperature :	100degF		

Fluid #	Fluid Name	Unfoamed Liquid Volume (bbl)	Beginning Density (lbm/gal)	Ending Density (lbm/gal)	Beginning Rate (scf/bbl)	Ending Rate (scf/bbl)
2	10 lb/gal Tuned Spacer III	45	10		-42.58	-43.5
5	Foamed Cement	1.2	10		321.57	325.53

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"	0-320'	Fresh Water	8.4-8.6	60-70	NC
8-3/4"	320'-4600'	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"	4600' (KOP) – 5629' TVD / 6796'MD	Fresh Water LSND	8.5-8.8	40-50	8-10
6-1/8"	6796' MD – 11397' MD	Synthetic Oil Based Mud	7.0-9.0	15-25	<1

- 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.

✓ • 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

- Drill Stem Testing - None anticipated
- Coring - None anticipated.
- Mud Logging - Mud loggers will be on location from intermediate casing point to TD.
- Logging - See Below
- 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 +/- 2634 psi based on a 9.0 ppg at 5629' 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, 2015. 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:

- The closed-loop system will be signed in accordance with 19.15.17.11 NMAC.
- 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.
- Topsoil will be salvaged and stored for use in reclamation activities.
- The closed-loop system storage tanks will be placed in bermed secondary containment sized to contain a minimum of 110 percent 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:

- Fluid levels will be maintained to provide sufficient freeboard to prevent over-topping.
- 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.
- 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.
- The OCD District Office will be notified within 48 hours of discovery of a leak in the closed-loop drilling system. Ifa 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:

- Drilling fluids will be recycled and transferred to other permitted closed-loop systems or returned to the vendor for reuse, as practical.
- 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.
- 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.
- Storage tanks will be removed from the well location during the rig move.
- The well pad will be reclaimed and seeded in accordance with subsections G, Hand I of 19.15.17.13 NMAC.

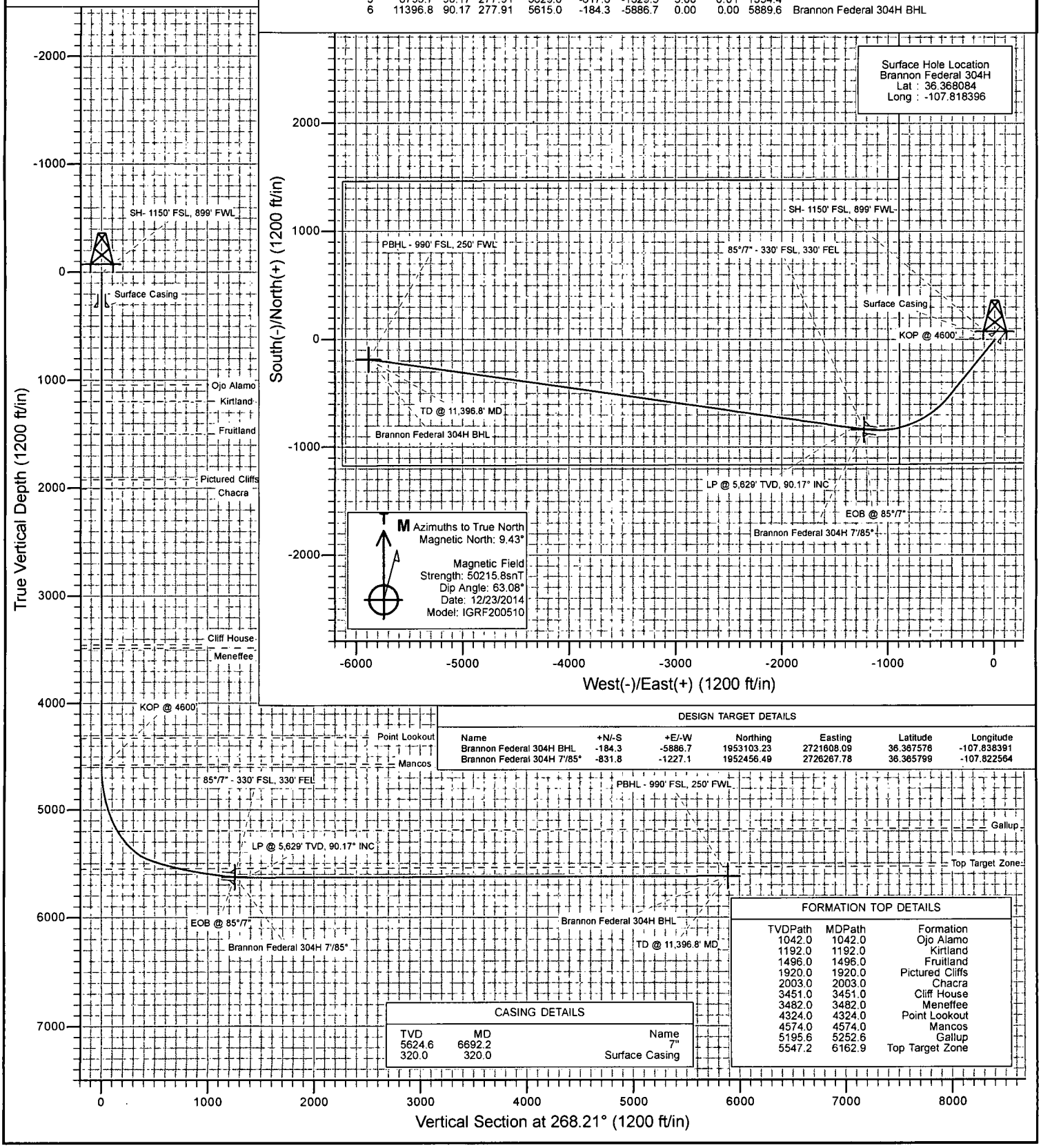
Project: San Juan County, NM
Site: S29-T25N-R9W (Brannon Pad)
Well: Brannon Federal 304H
Wellbore: HZ
Design: Plan #2

CATHEDRAL

Plan #2
Brannon Federal 304H
155XXX; SC
KB=15' @ 6817.0ft (aZTEC #222)
Ground Elevation @ 6802.0
North American Datum 1983
Well Brannon Federal 304H, 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	4600.0	0.00	0.00	4600.0	0.0	0.0	0.00	0.00	0.0	
3	5786.8	76.43	219.33	5464.9	-526.7	-431.6	6.44	219.33	447.9	
4	6692.2	85.00	277.91	5624.6	-831.8	-1227.1	6.44	87.50	1252.6	Brannon Federal 304H 7'/85°
5	6795.7	90.17	277.91	5629.0	-817.6	-1329.5	5.00	0.01	1354.4	
6	11396.8	90.17	277.91	5615.0	-184.3	-5886.7	0.00	0.00	5889.6	Brannon Federal 304H BHL



DESIGN TARGET DETAILS

Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Brannon Federal 304H BHL	-184.3	-5886.7	1953103.23	2721608.09	36.367576	-107.838391
Brannon Federal 304H 7'/85°	-831.8	-1227.1	1952456.49	2726267.78	36.365799	-107.822564

CASING DETAILS

TVD	MD	Name
5624.6	6692.2	7"
320.0	320.0	Surface Casing

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1042.0	1042.0	Ojo Alamo
1192.0	1192.0	Kirtland
1496.0	1496.0	Fruitland
1920.0	1920.0	Pictured Cliffs
2003.0	2003.0	Chacra
3451.0	3451.0	Cliff House
3482.0	3482.0	Meneffee
4324.0	4324.0	Point Lookout
4574.0	4574.0	Mancos
5195.6	5252.6	Gallup
5547.2	6162.9	Top Target Zone

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Brannon Federal 304H
Company:	LOGOS Operating LLC	**TVD Reference:**	KB=15' @ 6817.0ft (aZTEC #222)
Project:	San Juan County, NM	**MD Reference:**	KB=15' @ 6817.0ft (aZTEC #222)
Site:	S29-T25N-R9W (Brannon Pad)	**North Reference:**	True
Well:	Brannon Federal 304H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #2		

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 S29-T25N-R9W (Brannon Pad)

Site Position:		**Northing:**	1,953,288.46 ft	**Latitude:**	36.368084
From:	Lat/Long	**Easting:**	2,727,494.77 ft	**Longitude:**	-107.818396
Position Uncertainty:	0.0 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	0.01 °

Well Brannon Federal 304H

Well Position	**+N/-S**	0.0 ft	**Northing:**	1,953,288.46 ft	**Latitude:**	36.368084
	+E/-W	0.0 ft	**Easting:**	2,727,494.77 ft	**Longitude:**	-107.818396
Position Uncertainty		0.0 ft	**Wellhead Elevation:**	0.0 ft	**Ground Level:**	6,802.0 ft

Wellbore HZ

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	12/23/2014	9.43	63.08	50,216

Design Plan #2

Audit Notes:

Version:		**Phase:**	PLAN	**Tie On Depth:**	0.0

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	268.21

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.00	0.00	0.00	0.00	
5,786.8	76.43	219.33	5,464.9	-526.7	-431.6	6.44	6.44	0.00	219.33	
6,692.2	85.00	277.91	5,624.6	-831.8	-1,227.1	6.44	0.95	6.47	87.50	Brannon Federal 304I
6,795.7	90.17	277.91	5,629.0	-817.6	-1,329.5	5.00	5.00	0.00	0.01	
11,396.8	90.17	277.91	5,615.0	-184.3	-5,886.7	0.00	0.00	0.00	0.00	Brannon Federal 304I

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Brannon Federal 304H
Company:	LOGOS Operating LLC	**TVD Reference:**	KB=15' @ 6817.0ft (aZTEC #222)
Project:	San Juan County, NM	**MD Reference:**	KB=15' @ 6817.0ft (aZTEC #222)
Site:	S29-T25N-R9W (Brannon Pad)	**North Reference:**	True
Well:	Brannon Federal 304H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #2		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	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- 1150' FSL, 899' 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	
320.0	0.00	0.00	320.0	0.0	0.0	0.0	0.00	0.00	Surface Casing
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	
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	
1,042.0	0.00	0.00	1,042.0	0.0	0.0	0.0	0.00	0.00	Ojo Alamo
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	
1,192.0	0.00	0.00	1,192.0	0.0	0.0	0.0	0.00	0.00	Kirtland
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	
1,496.0	0.00	0.00	1,496.0	0.0	0.0	0.0	0.00	0.00	Fruitland
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	
1,920.0	0.00	0.00	1,920.0	0.0	0.0	0.0	0.00	0.00	Pictured Cliffs
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	
2,003.0	0.00	0.00	2,003.0	0.0	0.0	0.0	0.00	0.00	Chacra
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	
3,451.0	0.00	0.00	3,451.0	0.0	0.0	0.0	0.00	0.00	Cliff House
3,482.0	0.00	0.00	3,482.0	0.0	0.0	0.0	0.00	0.00	Meneffee
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Brannon Federal 304H
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Project:	San Juan County, NM	**MD Reference:**	KB=15' @ 6817.0ft (aZTEC #222)
Site:	S29-T25N-R9W (Brannon Pad)	**North Reference:**	True
Well:	Brannon Federal 304H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #2		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	
4,324.0	0.00	0.00	4,324.0	0.0	0.0	0.0	0.00	0.00	Point Lookout
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	
4,574.0	0.00	0.00	4,574.0	0.0	0.0	0.0	0.00	0.00	Mancos
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	KOP @ 4600'
4,650.0	3.22	219.33	4,650.0	-1.1	-0.9	0.9	6.44	6.44	
4,700.0	6.44	219.33	4,699.8	-4.3	-3.6	3.7	6.44	6.44	
4,750.0	9.66	219.33	4,749.3	-9.8	-8.0	8.3	6.44	6.44	
4,800.0	12.88	219.33	4,798.3	-17.3	-14.2	14.7	6.44	6.44	
4,850.0	16.10	219.33	4,846.7	-27.0	-22.1	23.0	6.44	6.44	
4,900.0	19.32	219.33	4,894.3	-38.8	-31.8	33.0	6.44	6.44	
4,950.0	22.54	219.33	4,941.0	-52.6	-43.1	44.7	6.44	6.44	
5,000.0	25.76	219.33	4,986.7	-68.4	-56.0	58.2	6.44	6.44	
5,050.0	28.98	219.33	5,031.1	-86.2	-70.6	73.3	6.44	6.44	
5,100.0	32.20	219.33	5,074.1	-105.8	-86.7	90.0	6.44	6.44	
5,150.0	35.42	219.33	5,115.6	-127.4	-104.4	108.3	6.44	6.44	
5,200.0	38.64	219.33	5,155.5	-150.6	-123.4	128.1	6.44	6.44	
5,250.0	41.86	219.33	5,193.7	-175.6	-143.9	149.3	6.44	6.44	
5,252.6	42.03	219.33	5,195.6	-177.0	-145.0	150.5	6.44	6.44	Gallup
5,300.0	45.08	219.33	5,230.0	-202.2	-165.7	172.0	6.44	6.44	
5,350.0	48.30	219.33	5,264.3	-230.4	-188.8	195.9	6.44	6.44	
5,400.0	51.52	219.33	5,296.5	-259.9	-213.0	221.1	6.44	6.44	
5,450.0	54.74	219.33	5,326.5	-290.9	-238.4	247.4	6.44	6.44	
5,500.0	57.96	219.33	5,354.2	-323.1	-264.7	274.7	6.44	6.44	
5,550.0	61.18	219.33	5,379.5	-356.4	-292.1	303.1	6.44	6.44	
5,600.0	64.40	219.33	5,402.4	-390.8	-320.3	332.3	6.44	6.44	
5,650.0	67.62	219.33	5,422.7	-426.1	-349.2	362.4	6.44	6.44	
5,700.0	70.84	219.33	5,440.4	-462.3	-378.8	393.1	6.44	6.44	
5,750.0	74.06	219.33	5,455.5	-499.1	-409.0	424.5	6.44	6.44	
5,786.8	76.43	219.33	5,464.9	-526.7	-431.6	447.9	6.44	6.44	
5,800.0	76.47	220.21	5,468.0	-536.5	-439.8	456.4	6.44	0.29	
5,850.0	76.64	223.51	5,479.6	-572.7	-472.3	489.9	6.44	0.35	
5,900.0	76.86	226.81	5,491.1	-607.0	-506.8	525.5	6.44	0.43	
5,950.0	77.11	230.11	5,502.3	-639.3	-543.2	563.0	6.44	0.52	
6,000.0	77.41	233.40	5,513.3	-669.5	-581.5	602.2	6.44	0.60	
6,050.0	77.75	236.67	5,524.1	-697.5	-621.5	643.1	6.44	0.68	
6,100.0	78.13	239.94	5,534.5	-723.2	-663.1	685.4	6.44	0.76	
6,150.0	78.55	243.20	5,544.7	-746.5	-706.2	729.2	6.44	0.83	
6,162.9	78.66	244.04	5,547.2	-752.1	-717.5	740.7	6.44	0.88	Top Target Zone
6,200.0	79.00	246.45	5,554.4	-767.4	-750.6	774.2	6.44	0.91	
6,250.0	79.49	249.69	5,563.7	-785.7	-796.1	820.3	6.44	0.97	
6,300.0	80.01	252.92	5,572.6	-801.5	-842.7	867.4	6.44	1.04	
6,350.0	80.56	256.14	5,581.1	-814.6	-890.2	915.3	6.44	1.10	
6,400.0	81.13	259.35	5,589.0	-825.1	-938.5	963.8	6.44	1.16	
6,450.0	81.74	262.55	5,596.5	-832.9	-987.3	1,012.9	6.44	1.21	
6,500.0	82.37	265.74	5,603.4	-837.9	-1,036.5	1,062.2	6.44	1.26	
6,550.0	83.03	268.91	5,609.7	-840.2	-1,086.1	1,111.8	6.44	1.31	
6,600.0	83.70	272.08	5,615.5	-839.8	-1,135.7	1,161.4	6.44	1.35	
6,650.0	84.40	275.25	5,620.7	-836.6	-1,185.3	1,210.9	6.44	1.39	
6,692.2	85.00	277.91	5,624.6	-831.8	-1,227.1	1,252.5	6.44	1.42	85°/7" - 330' FSL, 330' FEL - EOB @ 85°/7" - 7"
6,700.0	85.39	277.91	5,625.2	-830.7	-1,234.8	1,260.2	4.98	4.98	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Brannon Federal 304H
Company:	LOGOS Operating LLC	**TVD Reference:**	KB=15' @ 6817.0ft (aZTEC #222)
Project:	San Juan County, NM	**MD Reference:**	KB=15' @ 6817.0ft (aZTEC #222)
Site:	S29-T25N-R9W (Brannon Pad)	**North Reference:**	True
Well:	Brannon Federal 304H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #2		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
6,795.7	90.17	277.91	5,629.0	-817.6	-1,329.5	1,354.4	5.00	5.00	LP @ 5,629' TVD, 90.17° INC
6,800.0	90.17	277.91	5,628.9	-817.0	-1,333.7	1,358.6	0.03	0.03	
6,900.0	90.17	277.91	5,628.6	-803.2	-1,432.8	1,457.2	0.00	0.00	
7,000.0	90.17	277.91	5,628.3	-789.4	-1,531.8	1,555.8	0.00	0.00	
7,100.0	90.17	277.91	5,628.0	-775.7	-1,630.9	1,654.3	0.00	0.00	
7,200.0	90.17	277.91	5,627.7	-761.9	-1,729.9	1,752.9	0.00	0.00	
7,300.0	90.17	277.91	5,627.4	-748.2	-1,829.0	1,851.5	0.00	0.00	
7,400.0	90.17	277.91	5,627.1	-734.4	-1,928.0	1,950.1	0.00	0.00	
7,500.0	90.17	277.91	5,626.8	-720.6	-2,027.1	2,048.6	0.00	0.00	
7,600.0	90.17	277.91	5,626.5	-706.9	-2,126.1	2,147.2	0.00	0.00	
7,700.0	90.17	277.91	5,626.2	-693.1	-2,225.2	2,245.8	0.00	0.00	
7,800.0	90.17	277.91	5,625.9	-679.3	-2,324.2	2,344.3	0.00	0.00	
7,900.0	90.17	277.91	5,625.6	-665.6	-2,423.3	2,442.9	0.00	0.00	
8,000.0	90.17	277.91	5,625.3	-651.8	-2,522.3	2,541.5	0.00	0.00	
8,100.0	90.17	277.91	5,625.0	-638.1	-2,621.3	2,640.0	0.00	0.00	
8,200.0	90.17	277.91	5,624.7	-624.3	-2,720.4	2,738.6	0.00	0.00	
8,300.0	90.17	277.91	5,624.4	-610.5	-2,819.4	2,837.2	0.00	0.00	
8,400.0	90.17	277.91	5,624.1	-596.8	-2,918.5	2,935.7	0.00	0.00	
8,500.0	90.17	277.91	5,623.8	-583.0	-3,017.5	3,034.3	0.00	0.00	
8,600.0	90.17	277.91	5,623.5	-569.2	-3,116.6	3,132.9	0.00	0.00	
8,700.0	90.17	277.91	5,623.2	-555.5	-3,215.6	3,231.4	0.00	0.00	
8,800.0	90.17	277.91	5,622.9	-541.7	-3,314.7	3,330.0	0.00	0.00	
8,900.0	90.17	277.91	5,622.6	-527.9	-3,413.7	3,428.6	0.00	0.00	
9,000.0	90.17	277.91	5,622.3	-514.2	-3,512.8	3,527.2	0.00	0.00	
9,100.0	90.17	277.91	5,622.0	-500.4	-3,611.8	3,625.7	0.00	0.00	
9,200.0	90.17	277.91	5,621.7	-486.7	-3,710.9	3,724.3	0.00	0.00	
9,300.0	90.17	277.91	5,621.4	-472.9	-3,809.9	3,822.9	0.00	0.00	
9,400.0	90.17	277.91	5,621.1	-459.1	-3,909.0	3,921.4	0.00	0.00	
9,500.0	90.17	277.91	5,620.8	-445.4	-4,008.0	4,020.0	0.00	0.00	
9,600.0	90.17	277.91	5,620.4	-431.6	-4,107.1	4,118.6	0.00	0.00	
9,700.0	90.17	277.91	5,620.1	-417.8	-4,206.1	4,217.1	0.00	0.00	
9,800.0	90.17	277.91	5,619.8	-404.1	-4,305.2	4,315.7	0.00	0.00	
9,900.0	90.17	277.91	5,619.5	-390.3	-4,404.2	4,414.3	0.00	0.00	
10,000.0	90.17	277.91	5,619.2	-376.6	-4,503.3	4,512.8	0.00	0.00	
10,100.0	90.17	277.91	5,618.9	-362.8	-4,602.3	4,611.4	0.00	0.00	
10,200.0	90.17	277.91	5,618.6	-349.0	-4,701.4	4,710.0	0.00	0.00	
10,300.0	90.17	277.91	5,618.3	-335.3	-4,800.4	4,808.5	0.00	0.00	
10,400.0	90.17	277.91	5,618.0	-321.5	-4,899.5	4,907.1	0.00	0.00	
10,500.0	90.17	277.91	5,617.7	-307.7	-4,998.5	5,005.7	0.00	0.00	
10,600.0	90.17	277.91	5,617.4	-294.0	-5,097.5	5,104.2	0.00	0.00	
10,700.0	90.17	277.91	5,617.1	-280.2	-5,196.6	5,202.8	0.00	0.00	
10,800.0	90.17	277.91	5,616.8	-266.4	-5,295.6	5,301.4	0.00	0.00	
10,900.0	90.17	277.91	5,616.5	-252.7	-5,394.7	5,400.0	0.00	0.00	
11,000.0	90.17	277.91	5,616.2	-238.9	-5,493.7	5,498.5	0.00	0.00	
11,100.0	90.17	277.91	5,615.9	-225.2	-5,592.8	5,597.1	0.00	0.00	
11,200.0	90.17	277.91	5,615.6	-211.4	-5,691.8	5,695.7	0.00	0.00	
11,300.0	90.17	277.91	5,615.3	-197.6	-5,790.9	5,794.2	0.00	0.00	
11,396.8	90.17	277.91	5,615.0	-184.3	-5,886.7	5,889.6	0.00	0.00	TD @ 11,396.8' MD - PBHL - 990' FSL, 250' FW

Cathedral Energy Services

Planning Report

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Site:	S29-T25N-R9W (Brannon Pad)	**North Reference:**	True
Well:	Brannon Federal 304H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #2		

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Brannon Federal 304H E - plan hits target center - Point	0.00	0.00	5,615.0	-184.3	-5,886.7	1,953,103.23	2,721,608.09	36.367576	-107.838391
Brannon Federal 304H 7 - plan hits target center - Point	0.00	0.00	5,624.6	-831.8	-1,227.1	1,952,456.49	2,726,267.78	36.365799	-107.822564

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
6,692.2	5,624.6	7"	0.000	0.000
320.0	320.0	Surface Casing	0.000	0.000

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,042.0	1,042.0	Ojo Alamo		-0.17	277.91
1,192.0	1,192.0	Kirtland		-0.17	277.91
1,496.0	1,496.0	Fruitland		-0.17	277.91
1,920.0	1,920.0	Pictured Cliffs		-0.17	277.91
2,003.0	2,003.0	Chacra		-0.17	277.91
3,451.0	3,451.0	Cliff House		-0.17	277.91
3,482.0	3,482.0	Meneffee		-0.17	277.91
4,324.0	4,324.0	Point Lookout		-0.17	277.91
4,574.0	4,574.0	Mancos		-0.17	277.91
5,252.6	5,196.0	Gallup		-0.17	277.91
6,162.9	5,549.0	Top Target Zone		-0.17	277.91

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
0.5	0.5	0.0	0.0	SH- 1150' FSL, 899' FWL
4,600.0	4,600.0	0.0	0.0	KOP @ 4600'
6,692.2	5,624.6	-831.8	-1,227.1	85°/7" - 330' FSL, 330' FEL
6,692.2	5,624.6	-831.8	-1,227.1	EOB @ 85°/7"
6,795.7	5,629.0	-817.6	-1,329.5	LP @ 5,629' TVD, 90.17° INC
11,396.8	5,615.0	-184.3	-5,886.7	TD @ 11,396.8' MD
11,396.8	5,615.0	-184.3	-5,886.7	PBHL - 990' FSL, 250' FWL

f. Pipeline location warning signs will be installed along the tie-in pipeline corridor in the line-of-sight following construction. There markers will be placed within 90 days after construction is completed, to avoid creating safety hazards.

g. Construction of the pipeline will take approximately 3 to 5 days.

h. The pipeline ROW corridor will be conditioned in a manner to preclude vehicular travel upon said ROW, except for access to above-ground pipeline appurtenances.

4. Production Facilities

a. Access will be a teardrop-shaped road through the production area (as practical) so the center may be re-vegetated.

b. Production facilities will be painted Carlsbad Brown to blend with the natural color of the landscape and, to the extent possible, will be located to reasonably minimize the visual impact.

c. Berms will be constructed around all storage facilities sufficient in size to contain, at a minimum, the BLM BMP's recommendation of the storage capacity of the tanks. Berm walls will be compacted with appropriate equipment to assure containment.

d. After completion of the construction phases of the project, areas not used for operation will be reclaimed. When the well is plugged, the remainder of the project area will be reclaimed.

G. Methods for Handling Waste

1. Cuttings

a. All cuttings will be placed in a reserve pit lined with a 20-miligram string re-enforced material and constructed to meet the NMOCD pit guidelines. Cuttings will be hauled to a commercial disposal facility after drilling is completed. The reserve pit will be fenced prior to drilling.

b. After drilling, any free liquids in the cuttings pit will be disposed of at the appropriate waste disposal facilities. The solids in the reserve pit will be allowed to dry, be tested, and buried according to NMOCD pit rules.

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)