

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFORM 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.5. Lease Serial No.
NMNM120374

6. If Indian, Allottee or Tribe Name

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

SUBMIT IN TRIPLICATE - Other instructions on page 2

1. Type of Well

☐ Oil Well ☒ Gas Well ☐ Other8. Well Name and No.
ZEUS 2308 03 4H2. Name of Operator
LOGOS OPERATING LLCContact: MARIE E FLOREZ
E-Mail: mflorez@logosresourcesllc.com9. API Well No.
30-045-38179-00-X13a. Address
2010 AFTON PLACE
FARMINGTON, NM 874013b. Phone No. (include area code)
Ph: 505-787-221810. Field and Pool or Exploratory Area
BASIN MANCOS

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

Sec 3 T23N R8W SENE 1938FNL 224FEL
36.258232 N Lat, 107.660919 W Lon

11. County 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	Change to Original A
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	PD

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 recomple 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 recompletion in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

LOGOS Operating request a change in plans for the following:

Original surface location from 1938' FNL & 224' FEL to new surface location 1938' & 223' FEL.
Original bottom-hole location from 753' FNL & 0' FEL to new bottom-hole location 755' FNL & 1100' FWL.

Original TD @ 11437' MD 5483' TVD to new TD @ 12518' MD 5465' TVD.

Geology tops have been updated per changes.

Original KOP @ 4842' MD 4661' TVD to new KOP @ 4822' MD 4640' TVD.

NMOC

FEB 25 2020

DISTRICT III

ADHERE TO PREVIOUS NMOC
CONDITIONS OF APPROVAL

14. I hereby certify that the foregoing is true and correct.

Electronic Submission #502766 verified by the BLM Well Information System
For LOGOS OPERATING LLC, sent to the Farmington
Committed to AFMSS for processing by JOE KILLINS on 02/24/2020 (20JK0120SE)

Name (Printed/Typed) MARIE E FLOREZ

Title REGULATORY SPECIALIST

Signature (Electronic Submission)

Date 02/11/2020

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By JOE KILLINS

Title ENGINEER

Date 02/24/2020

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 Farmington

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)

** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED **

NMOC

Additional data for EC transaction #502766 that would not fit on the form

32. Additional remarks, continued

Original Landing point @ 6090' MD 5463' TVD to new Landing point @ 6071' MD 5443' TVD.

Original 7" Casing Intermediate @ 6090' MD to new 6070' MD.

Original 4.5" Casing Production @ 5990' - 11437' to new 5970' - 12518'.

Original 7" Intermediate & 4.5" production cementing bbls and sacks have been updated per casing depth changes.

Attached: New C102 package, Operation and Directional Drill plans.

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

Surface = Indian



LOGOS Operating, LLC Operations Plan

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

Date:	January 30, 2020	Pool:	Basin Mancos
Well Name:	Zeus 2308 03 4H	Elevation:	6,908
Surface Location:	Sec 3, T23N, R8W 1938' FNL, 223' FEL (36.258232° N, -107.660916° W – NAD83)	Measured Depth:	12,518
Bottom Hole Location:	Sec 1, T23N, R8W 755' FNL, 1100' FWL (36.261459° N, -107.638513° W – NAD83)	County:	San Juan

Lease Serial #NMNM 120374

I. GEOLOGY

A. Formation Tops (KB): Estimated top of important geological markers:
SURFACE FORMATION - NACIMIENTO

NAME	MD	TVD	NAME	MD	TVD
OJO ALAMO	1,080	1,080	MENEFEE	3,415	3,320
KIRTLAND	1,292	1,292	*POINT LOOKOUT	4,216	4,072
*FRUITLAND	1,457	1,457	*MANCOS	4,541	4,377
*PICTURED CLIFFS	1,793	1,789	GALLUP	5,436	5,190
CHACRA	2,658	2,610	KICKOFF POINT	4,822	4,640
*CLIFF HOUSE	3,352	3,261	LANDING POINT	6,071	5,443
			TD	12,518	5,465

* indicates depth at which anticipated water, oil, gas or other mineral bearing formations are expected to be encountered.

B. MUD LOGGING PROGRAM: Mudlogger on location from KOP to TD.

C. LOGGING PROGRAM: LWD GR from surface casing to TD.

D. NATURAL GAUGES: Gauge any noticeable increases in gas flow. Record all gauges in Tour book and on morning reports.

II. DRILLING

A. MUD PROGRAM: LSND mud (WBM) will be used to drill the 12-1/4" Surface hole, the 8 3/4" Directional Vertical hole, and the curve portion of the wellbore. A LSND (WBM) or (OBM) will be used to drill the lateral portion of well. Treat for lost circulation as necessary. Obtain 100% returns prior to cementing. Notify Engineering of any mud losses.

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

Zeus 2308 03 4H



- B. **BOP TESTING:** While drill pipe is in use, the pipe rams and the blindrams will be function tested once each trip. The BOPE will be tested to **250 psi (Low) for 5 minutes** and **1500 psi (High) for 10 minutes**. Pressure test surface casing to **600 psi for 30 minutes** and intermediate casing to **1500 psi for 30 minutes**. Utilize a BOPE Testing Unit with a recording chart and appropriate test plug for testing. The drum brakes will be inspected and tested each tour. **All tests and inspections will be recorded and logged with time and results.**

III. **MATERIALS**

A. **CASING EQUIPMENT:**

CASING TYPE	OH SIZE (IN)	DEPTH (MD)	CSG SIZE	WEIGHT	GRADE	CONN
SURFACE	12.25"	320' or greater	9.625"	36 LBS	J-55 or equiv	LTC or STC
INTERMEDIATE	8.75"	6,070'	7"	23 LBS	J-55 or equiv	LTC
PRODUCTION	6.125"	5,970' – 12,518'	4.5"	11.6 LBS	P-110 or equiv	LTC or BTC
TIE BACK	6.125"	Surf. – 5,970'	4.5"	11.6 LBS	P-110 or equiv	LTC or BTC

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

B. **FLOAT EQUIPMENT:**

1. **SURFACE CASING:** 9-5/8" notched regular pattern guide shoe. Run (1) standard centralizer on each of the bottom (4) joints of Surface Casing.
2. **INTERMEDIATE CASING:** 7" cement nose guide shoe with a self-fill insert float. Place float collar one joint above the shoe. Install (1) centralizer on each of the bottom (3) joints and one standard centralizer every (3) joints to 2,500 ft. Run (1) centralizer at 2,500 ft., 2,300ft., 2,000ft., 1,500 ft., and 1,000 ft. Optional use of DV Tool will be considered if losses while drilling are encountered. See note below.
3. **PRODUCTION LINER:** Run 4-1/2" Liner with cement nose guide Float Shoe+ 2jts. of 4-1/2" casing+ Landing Collar+ 4-1/2" pup joint+ 1 RSI (Sliding Sleeve). Centralizer program will be determined by wellbore condition. Set seals on Liner Hanger. Liner to be pressure tested during completion operations.

NOTE: Use of DV tool would be considered by operator as back up in case we experience heavy losses and are concerned with cement not reaching surface. If major losses are not encountered we will not run DV tool. Optional use of cancelation plugs for DV tools may be used if losses while cementing are not encountered.

C. **CEMENTING:**

(Note: Volumes may be adjusted onsite due to actual conditions)

1. **SURFACE:** 5 bbl Fresh Water Spacer, 100 sx (161 cu.ft.) of 14.5 ppg Type 1-11 (Neat G) + 20% Fly Ash cement w/ 7.41 gal/sack mix water ratio @ 1.61 cu ft/sx yield. Calculated @volume+ 30% excess. WOC 12 hours. Test csg to 600 psi. Total Volume: (160cu-ft/100 sx/ Bbls). TOC at Surface.
2. **INTERMEDIATE:** If deemed necessary, the intermediate casing will be cemented in 1 or 2 stages using DV/STAGE tools in order to reduce cement losses and maximize cement coverage. If losses are not observed a cancelation plug will be pumped and the remaining



cement will be pumped during stage 1.

Stage 1: Spacer #1: 20 bbl (112 cuft) Chemwash. Lead Cement: 230.7 bbls, 664 sks, 12.3 ppg@ 1.95 cuft/sk yield. Tail Cement: 58.5 bbls, 253 sks, 13.5 ppg@ 1.3 cu'ft/sk yield. Displacement: Displace w/ Drilling mud or water. Total Cement: 289.2 bbls, 917 sks.

3. PRODUCTION LINER: Spacer #1: 10 bbl (56 cu-ft) Water Spacer. Spacer #2: 40 bbl 9.5 ppg (224.6 cu-ft) Toned Spacer III. Spacer #3: 10 bbl Water Spacer. Lead Cement: Extencem TM System. Yield 1.36 cuft/sk 13.3 ppg (~612 sx / 148 bbls / 832 cuft). Tail Spacer: 40 BBL of MMCR. Displacement: Displace w/ drilling mud or water.

IV. COMPLETION

A. CBL

CBLs and/or Temperature Surveys Will Be Performed as Needed or Required

B. PRESSURE TEST

With frac stack installed on wellhead, pressure test 4-1/2" casing to 4000 psi max, hold at 1500 psi for 30 minutes. Increase pressure to Open RSI sleeves.

C. STIMULATION

Stimulate with sand, water and N2. Isolate stages with flow through frac plugs. Drill out frac plugs and flowback lateral.

D. PRODUCTION TUBING

Run 2-7/8", 6.5#, J-55, EUE tubing

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



Company: Logos Operating LLC
Project: San Juan, NM NAD83
Site: Chaco 2308-03 Pad
Well: Zeus 2308-03 4H
Wellbore: OH
Design: Plan #4

PROJECT DETAILS: San Juan, NM NAD83

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Western Zone
System Datum: Mean Sea Level
Local North: True



Azimuths to True North
Magnetic North: 8.73°

Magnetic Field
Strength: 49433.3nT
Dip Angle: 62.82°
Date: 8/29/2019
Model: HDGM

WELL DETAILS: Zeus 2308-03 4H

GL 6908' & RKB 25' @ 6933.00usft (Aztec 1000)
+N/-S +E/-W Northing Easting Latitude Longitude
0.00 0.00 1913340.39 2773923.78 36.2582320 -107.6609160

Plan: Plan #4 (Zeus 2308-03 4H/OH)

Created By: Janie Collins Date: 14:33, January 29 2020

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Zeus 4H POE	5443.00	1185.93	157.72	1914526.29	2774079.38	36.2614890	-107.6603810
Zeus 4H BHL	5465.00	1175.47	6604.60	1914527.61	2780526.28	36.2614590	-107.6385130
Zeus 4H FPerf	5465.00	1175.81	6504.66	1914527.77	2780426.34	36.2614600	-107.6388520
Zeus 4H LPerf	5443.00	1185.27	307.78	1914526.20	2774229.45	36.2614880	-107.6598720

SECTION DETAILS

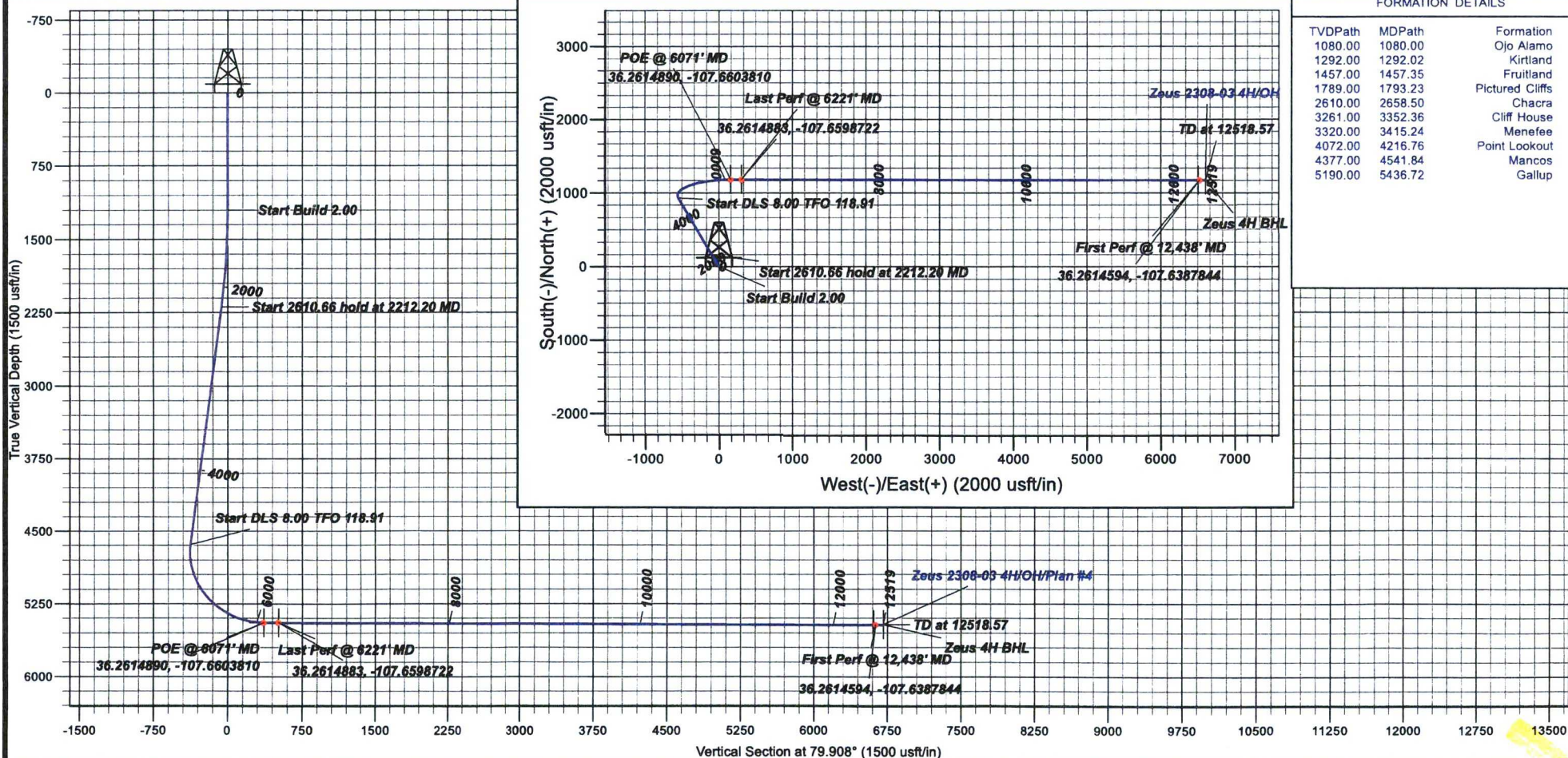
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	
1200.00	0.00	0.000	1200.00	0.00	0.00	0.00	0.00	0.00	
2212.20	20.24	329.674	2191.27	152.75	-89.35	2.00	329.67	-61.21	
4822.86	20.24	329.674	4640.66	932.48	-545.47	0.00	0.00	-373.64	
6071.65	89.80	90.090	5443.00	1185.63	157.72	8.00	118.91	363.03	Zeus 4H POE
12518.57	89.80	90.090	5465.00	1175.47	6604.60	0.00	0.00	6708.39	Zeus 4H BHL

CASING DETAILS

No casing data is available

FORMATION DETAILS

TVDPath	MDPath	Formation
1080.00	1080.00	Ojo Alamo
1292.00	1292.02	Kirtland
1457.00	1457.35	Fruitland
1789.00	1793.23	Pictured Cliffs
2610.00	2658.50	Chacra
3261.00	3352.36	Cliff House
3320.00	3415.24	Menefee
4072.00	4216.76	Point Lookout
4377.00	4541.84	Mancos
5190.00	5436.72	Gallup



Vertical Section at 79.908° (1500 usft/in)



Logos Operating LLC

San Juan, NM NAD83

Chaco 2308-03 Pad

Zeus 2308-03 4H

OH

Plan: Plan #4

Standard Planning Report

29 January, 2020



www.scientificdrilling.com



Scientific Drilling, Intl Planning Report



Database: Grand Junction
Company: Logos Operating LLC
Project: San Juan, NM NAD83
Site: Chaco 2308-03 Pad
Well: Zeus 2308-03 4H
Wellbore: OH
Design: Plan #4

Local Co-ordinate Reference: Well Zeus 2308-03 4H
TVD Reference: GL 6908' & RKB 25' @ 6933.00usft (Aztec 1000)
MD Reference: GL 6908' & RKB 25' @ 6933.00usft (Aztec 1000)
North Reference: True
Survey Calculation Method: Minimum Curvature

Project	San Juan, NM NAD83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Western Zone		

Site		Chaco 2308-03 Pad			
Site Position:		Northing:	1,913,296.34 usft	Latitude:	36.2581110
From:	Lat/Long	Easting:	2,773,925.33 usft	Longitude:	-107.6609110
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	0.10 °

Well	Zeus 2308-03 4H					
Well Position	+N/-S	44.05 usft	Northing:	1,913,340.39 usft	Latitude:	36.2582320
	+E/-W	-1.47 usft	Easting:	2,773,923.78 usft	Longitude:	-107.6609160
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	6,908.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	8/29/2019	8.73	62.82	49,433.30000000

Design	Plan #4			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	79.908

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,200.00	0.00	0.000	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,212.20	20.24	329.674	2,191.27	152.75	-89.35	2.00	2.00	0.00	329.67	
4,822.86	20.24	329.674	4,640.66	932.48	-545.47	0.00	0.00	0.00	0.00	
6,071.65	89.80	90.090	5,443.00	1,185.63	157.72	8.00	5.57	9.64	118.91	Zeus 4H POE
12,518.57	89.80	90.090	5,465.00	1,175.47	6,604.60	0.00	0.00	0.00	0.00	Zeus 4H BHL



Scientific Drilling, Intl
Planning Report



Database: Grand Junction
Company: Logos Operating LLC

Project: San Juan, NM NAD83

Site: Chaco 2308-03 Pad
Well: Zeus 2308-03 4H
Wellbore: OH
Design: Plan #4

Local Co-ordinate Reference: Well Zeus 2308-03 4H
TVD Reference: GL 6908' & RKB 25' @ 6933.00usft (Aztec 1000)
MD Reference: GL 6908' & RKB 25' @ 6933.00usft (Aztec 1000)
North Reference: True
Survey Calculation Method: 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 (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.000	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.000	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.000	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.000	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.000	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.000	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.000	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.000	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.000	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.000	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.000	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.000	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	2.00	329.674	1,299.98	1.51	-0.88	-0.60	2.00	2.00	0.00
1,400.00	4.00	329.674	1,399.84	6.02	-3.52	-2.41	2.00	2.00	0.00
1,500.00	6.00	329.674	1,499.45	13.55	-7.92	-5.43	2.00	2.00	0.00
1,600.00	8.00	329.674	1,598.70	24.06	-14.08	-9.64	2.00	2.00	0.00
1,700.00	10.00	329.674	1,697.47	37.57	-21.98	-15.05	2.00	2.00	0.00
1,800.00	12.00	329.674	1,795.62	54.04	-31.61	-21.65	2.00	2.00	0.00
1,900.00	14.00	329.674	1,893.06	73.45	-42.97	-29.43	2.00	2.00	0.00
2,000.00	16.00	329.674	1,989.64	95.79	-56.03	-38.38	2.00	2.00	0.00
2,100.00	18.00	329.674	2,085.27	121.03	-70.80	-48.49	2.00	2.00	0.00
2,200.00	20.00	329.674	2,179.82	149.13	-87.23	-59.75	2.00	2.00	0.00
2,212.20	20.24	329.674	2,191.27	152.75	-89.35	-61.21	2.00	2.00	0.00
2,300.00	20.24	329.674	2,273.65	178.97	-104.69	-71.71	0.00	0.00	0.00
2,400.00	20.24	329.674	2,367.47	208.84	-122.16	-83.68	0.00	0.00	0.00
2,500.00	20.24	329.674	2,461.29	238.71	-139.64	-95.65	0.00	0.00	0.00
2,600.00	20.24	329.674	2,555.12	268.58	-157.11	-107.62	0.00	0.00	0.00
2,700.00	20.24	329.674	2,648.94	298.44	-174.58	-119.58	0.00	0.00	0.00
2,800.00	20.24	329.674	2,742.76	328.31	-192.05	-131.55	0.00	0.00	0.00
2,900.00	20.24	329.674	2,836.58	358.18	-209.52	-143.52	0.00	0.00	0.00
3,000.00	20.24	329.674	2,930.41	388.04	-226.99	-155.49	0.00	0.00	0.00
3,100.00	20.24	329.674	3,024.23	417.91	-244.46	-167.45	0.00	0.00	0.00
3,200.00	20.24	329.674	3,118.05	447.78	-261.93	-179.42	0.00	0.00	0.00
3,300.00	20.24	329.674	3,211.87	477.65	-279.41	-191.39	0.00	0.00	0.00
3,400.00	20.24	329.674	3,305.70	507.51	-296.88	-203.36	0.00	0.00	0.00
3,500.00	20.24	329.674	3,399.52	537.38	-314.35	-215.32	0.00	0.00	0.00
3,600.00	20.24	329.674	3,493.34	567.25	-331.82	-227.29	0.00	0.00	0.00
3,700.00	20.24	329.674	3,587.17	597.12	-349.29	-239.26	0.00	0.00	0.00
3,800.00	20.24	329.674	3,680.99	626.98	-366.76	-251.23	0.00	0.00	0.00
3,900.00	20.24	329.674	3,774.81	656.85	-384.23	-263.19	0.00	0.00	0.00
4,000.00	20.24	329.674	3,868.63	686.72	-401.71	-275.16	0.00	0.00	0.00
4,100.00	20.24	329.674	3,962.46	716.58	-419.18	-287.13	0.00	0.00	0.00
4,200.00	20.24	329.674	4,056.28	746.45	-436.65	-299.10	0.00	0.00	0.00
4,300.00	20.24	329.674	4,150.10	776.32	-454.12	-311.06	0.00	0.00	0.00
4,400.00	20.24	329.674	4,243.92	806.19	-471.59	-323.03	0.00	0.00	0.00
4,500.00	20.24	329.674	4,337.75	836.05	-489.06	-335.00	0.00	0.00	0.00
4,600.00	20.24	329.674	4,431.57	865.92	-506.53	-346.97	0.00	0.00	0.00
4,700.00	20.24	329.674	4,525.39	895.79	-524.00	-358.93	0.00	0.00	0.00
4,800.00	20.24	329.674	4,619.22	925.66	-541.48	-370.90	0.00	0.00	0.00
4,822.86	20.24	329.674	4,640.66	932.48	-545.47	-373.64	0.00	0.00	0.00
4,900.00	18.05	347.352	4,713.59	955.69	-554.83	-378.79	8.00	-2.84	22.92



Scientific Drilling, Intl
Planning Report



Database: Grand Junction
Company: Logos Operating LLC
Project: San Juan, NM NAD83
Site: Chaco 2308-03 Pad
Well: Zeus 2308-03 4H
Wellbore: OH
Design: Plan #4

Local Co-ordinate Reference: Well Zeus 2308-03 4H
TVD Reference: GL 6908' & RKB 25' @ 6933.00usft (Aztec 1000)
MD Reference: GL 6908' & RKB 25' @ 6933.00usft (Aztec 1000)
North Reference: True
Survey Calculation Method: 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 (°/100usft)	Turn Rate (°/100usft)
5,000.00	18.08	13.350	4,808.82	985.95	-554.64	-373.30	8.00	0.03	26.00
5,100.00	21.26	35.356	4,903.10	1,015.88	-540.55	-354.18	8.00	3.18	22.01
5,200.00	26.47	50.480	4,994.61	1,044.89	-512.82	-321.80	8.00	5.21	15.12
5,300.00	32.76	60.548	5,081.56	1,072.42	-472.01	-276.79	8.00	6.29	10.07
5,400.00	39.61	67.567	5,162.26	1,097.93	-418.90	-220.04	8.00	6.85	7.02
5,500.00	46.78	72.773	5,235.13	1,120.92	-354.53	-152.63	8.00	7.17	5.21
5,600.00	54.13	76.867	5,298.77	1,140.95	-280.15	-75.89	8.00	7.35	4.09
5,700.00	61.60	80.257	5,351.94	1,157.63	-197.20	8.69	8.00	7.47	3.39
5,800.00	69.14	83.197	5,393.59	1,170.63	-107.31	99.47	8.00	7.54	2.94
5,900.00	76.73	85.854	5,422.91	1,179.70	-12.23	194.67	8.00	7.59	2.66
6,000.00	84.34	88.348	5,439.34	1,184.66	86.21	292.45	8.00	7.61	2.49
6,071.65	89.80	90.090	5,443.00	1,185.63	157.72	363.03	8.00	7.62	2.43
6,100.00	89.80	90.090	5,443.10	1,185.58	186.08	390.94	0.00	0.00	0.00
6,200.00	89.80	90.090	5,443.44	1,185.43	286.08	489.36	0.00	0.00	0.00
6,300.00	89.80	90.090	5,443.78	1,185.27	386.07	587.79	0.00	0.00	0.00
6,400.00	89.80	90.090	5,444.12	1,185.11	486.07	686.21	0.00	0.00	0.00
6,500.00	89.80	90.090	5,444.46	1,184.95	586.07	784.64	0.00	0.00	0.00
6,600.00	89.80	90.090	5,444.80	1,184.80	686.07	883.06	0.00	0.00	0.00
6,700.00	89.80	90.090	5,445.14	1,184.64	786.07	981.49	0.00	0.00	0.00
6,800.00	89.80	90.090	5,445.49	1,184.48	886.07	1,079.91	0.00	0.00	0.00
6,900.00	89.80	90.090	5,445.83	1,184.32	986.07	1,178.34	0.00	0.00	0.00
7,000.00	89.80	90.090	5,446.17	1,184.17	1,086.07	1,276.76	0.00	0.00	0.00
7,100.00	89.80	90.090	5,446.51	1,184.01	1,186.07	1,375.19	0.00	0.00	0.00
7,200.00	89.80	90.090	5,446.85	1,183.85	1,286.07	1,473.61	0.00	0.00	0.00
7,300.00	89.80	90.090	5,447.19	1,183.69	1,386.07	1,572.03	0.00	0.00	0.00
7,400.00	89.80	90.090	5,447.53	1,183.54	1,486.07	1,670.46	0.00	0.00	0.00
7,500.00	89.80	90.090	5,447.87	1,183.38	1,586.07	1,768.88	0.00	0.00	0.00
7,600.00	89.80	90.090	5,448.22	1,183.22	1,686.07	1,867.31	0.00	0.00	0.00
7,700.00	89.80	90.090	5,448.56	1,183.06	1,786.06	1,965.73	0.00	0.00	0.00
7,800.00	89.80	90.090	5,448.90	1,182.91	1,886.06	2,064.16	0.00	0.00	0.00
7,900.00	89.80	90.090	5,449.24	1,182.75	1,986.06	2,162.58	0.00	0.00	0.00
8,000.00	89.80	90.090	5,449.58	1,182.59	2,086.06	2,261.01	0.00	0.00	0.00
8,100.00	89.80	90.090	5,449.92	1,182.43	2,186.06	2,359.43	0.00	0.00	0.00
8,200.00	89.80	90.090	5,450.26	1,182.28	2,286.06	2,457.86	0.00	0.00	0.00
8,300.00	89.80	90.090	5,450.60	1,182.12	2,386.06	2,556.28	0.00	0.00	0.00
8,400.00	89.80	90.090	5,450.95	1,181.96	2,486.06	2,654.70	0.00	0.00	0.00
8,500.00	89.80	90.090	5,451.29	1,181.80	2,586.06	2,753.13	0.00	0.00	0.00
8,600.00	89.80	90.090	5,451.63	1,181.64	2,686.06	2,851.55	0.00	0.00	0.00
8,700.00	89.80	90.090	5,451.97	1,181.49	2,786.06	2,949.98	0.00	0.00	0.00
8,800.00	89.80	90.090	5,452.31	1,181.33	2,886.06	3,048.40	0.00	0.00	0.00
8,900.00	89.80	90.090	5,452.65	1,181.17	2,986.06	3,146.83	0.00	0.00	0.00
9,000.00	89.80	90.090	5,452.99	1,181.01	3,086.06	3,245.25	0.00	0.00	0.00
9,100.00	89.80	90.090	5,453.33	1,180.86	3,186.05	3,343.68	0.00	0.00	0.00
9,200.00	89.80	90.090	5,453.68	1,180.70	3,286.05	3,442.10	0.00	0.00	0.00
9,300.00	89.80	90.090	5,454.02	1,180.54	3,386.05	3,540.53	0.00	0.00	0.00
9,400.00	89.80	90.090	5,454.36	1,180.38	3,486.05	3,638.95	0.00	0.00	0.00
9,500.00	89.80	90.090	5,454.70	1,180.23	3,586.05	3,737.37	0.00	0.00	0.00
9,600.00	89.80	90.090	5,455.04	1,180.07	3,686.05	3,835.80	0.00	0.00	0.00
9,700.00	89.80	90.090	5,455.38	1,179.91	3,786.05	3,934.22	0.00	0.00	0.00
9,800.00	89.80	90.090	5,455.72	1,179.75	3,886.05	4,032.65	0.00	0.00	0.00
9,900.00	89.80	90.090	5,456.06	1,179.60	3,986.05	4,131.07	0.00	0.00	0.00
10,000.00	89.80	90.090	5,456.41	1,179.44	4,086.05	4,229.50	0.00	0.00	0.00



Scientific Drilling, Intl
Planning Report



Database: Grand Junction
Company: Logos Operating LLC
Project: San Juan, NM NAD83
Site: Chaco 2308-03 Pad
Well: Zeus 2308-03 4H
Wellbore: OH
Design: Plan #4

Local Co-ordinate Reference: Well Zeus 2308-03 4H
TVD Reference: GL 6908' & RKB 25' @ 6933.00usft (Aztec 1000)
MD Reference: GL 6908' & RKB 25' @ 6933.00usft (Aztec 1000)
North Reference: True
Survey Calculation Method: 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 (°/100usft)	Turn Rate (°/100usft)
10,100.00	89.80	90.090	5,456.75	1,179.28	4,186.05	4,327.92	0.00	0.00	0.00
10,200.00	89.80	90.090	5,457.09	1,179.12	4,286.05	4,426.35	0.00	0.00	0.00
10,300.00	89.80	90.090	5,457.43	1,178.97	4,386.05	4,524.77	0.00	0.00	0.00
10,400.00	89.80	90.090	5,457.77	1,178.81	4,486.05	4,623.20	0.00	0.00	0.00
10,500.00	89.80	90.090	5,458.11	1,178.65	4,586.04	4,721.62	0.00	0.00	0.00
10,600.00	89.80	90.090	5,458.45	1,178.49	4,686.04	4,820.04	0.00	0.00	0.00
10,700.00	89.80	90.090	5,458.79	1,178.34	4,786.04	4,918.47	0.00	0.00	0.00
10,800.00	89.80	90.090	5,459.14	1,178.18	4,886.04	5,016.89	0.00	0.00	0.00
10,900.00	89.80	90.090	5,459.48	1,178.02	4,986.04	5,115.32	0.00	0.00	0.00
11,000.00	89.80	90.090	5,459.82	1,177.86	5,086.04	5,213.74	0.00	0.00	0.00
11,100.00	89.80	90.090	5,460.16	1,177.71	5,186.04	5,312.17	0.00	0.00	0.00
11,200.00	89.80	90.090	5,460.50	1,177.55	5,286.04	5,410.59	0.00	0.00	0.00
11,300.00	89.80	90.090	5,460.84	1,177.39	5,386.04	5,509.02	0.00	0.00	0.00
11,400.00	89.80	90.090	5,461.18	1,177.23	5,486.04	5,607.44	0.00	0.00	0.00
11,500.00	89.80	90.090	5,461.52	1,177.08	5,586.04	5,705.87	0.00	0.00	0.00
11,600.00	89.80	90.090	5,461.87	1,176.92	5,686.04	5,804.29	0.00	0.00	0.00
11,700.00	89.80	90.090	5,462.21	1,176.76	5,786.04	5,902.71	0.00	0.00	0.00
11,800.00	89.80	90.090	5,462.55	1,176.60	5,886.04	6,001.14	0.00	0.00	0.00
11,900.00	89.80	90.090	5,462.89	1,176.45	5,986.03	6,099.56	0.00	0.00	0.00
12,000.00	89.80	90.090	5,463.23	1,176.29	6,086.03	6,197.99	0.00	0.00	0.00
12,100.00	89.80	90.090	5,463.57	1,176.13	6,186.03	6,296.41	0.00	0.00	0.00
12,200.00	89.80	90.090	5,463.91	1,175.97	6,286.03	6,394.84	0.00	0.00	0.00
12,300.00	89.80	90.090	5,464.25	1,175.82	6,386.03	6,493.26	0.00	0.00	0.00
12,400.00	89.80	90.090	5,464.60	1,175.66	6,486.03	6,591.69	0.00	0.00	0.00
12,500.00	89.80	90.090	5,464.94	1,175.50	6,586.03	6,690.11	0.00	0.00	0.00
12,518.57	89.80	90.090	5,465.00	1,175.47	6,604.60	6,708.39	0.00	0.00	0.00

Design 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
Zeus 4H LPerf - plan misses target center by 0.53usft at 6221.70usft MD (5443.51 TVD, 1185.39 N, 307.78 E) - Point	0.00	0.000	5,443.00	1,185.27	307.78	1,914,526.20	2,774,229.45	36.2614880	-107.6598720
Zeus 4H POE - plan hits target center - Point	0.00	0.000	5,443.00	1,185.63	157.72	1,914,526.30	2,774,079.39	36.2614890	-107.6603810
Zeus 4H FPerf - plan misses target center by 0.39usft at 12418.63usft MD (5464.66 TVD, 1175.63 N, 6504.66 E) - Point	0.00	0.000	5,465.00	1,175.81	6,504.66	1,914,527.78	2,780,426.34	36.2614600	-107.6388520
Zeus 4H BHL - plan hits target center - Point	0.00	0.000	5,465.00	1,175.47	6,604.60	1,914,527.61	2,780,526.28	36.2614590	-107.6385130



Scientific Drilling, Intl
Planning Report



Database: Grand Junction
Company: Logos Operating LLC
Project: San Juan, NM NAD83
Site: Chaco 2308-03 Pad
Well: Zeus 2308-03 4H
Wellbore: OH
Design: Plan #4

Local Co-ordinate Reference: Well Zeus 2308-03 4H
TVD Reference: GL 6908' & RKB 25' @ 6933.00usft (Aztec 1000)
MD Reference: GL 6908' & RKB 25' @ 6933.00usft (Aztec 1000)
North Reference: True
Survey Calculation Method: Minimum Curvature

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,080.00	1,080.00	Ojo Alamo		0.00	0.000
1,292.02	1,292.00	Kirtland		0.00	0.000
1,457.35	1,457.00	Fruitland		0.00	0.000
1,793.23	1,789.00	Pictured Cliffs		0.00	0.000
2,658.50	2,610.00	Chacra		0.00	0.000
3,352.36	3,261.00	Cliff House		0.00	0.000
3,415.24	3,320.00	Menefee		0.00	0.000
4,216.76	4,072.00	Point Lookout		0.00	0.000
4,541.84	4,377.00	Mancos		0.00	0.000
5,436.72	5,190.00	Gallup		0.00	0.000

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,200.00	1,200.00	0.00	0.00	Start Build 2.00
2,212.20	2,191.27	152.75	-89.35	Start 2610.66 hold at 2212.20 MD
4,822.86	4,640.66	932.48	-545.47	Start DLS 8.00 TFO 118.91
6,071.65	5,443.00	1,185.63	157.72	POE @ 6071' MD
6,071.65	5,443.00	1,185.63	157.73	36.2614890, -107.6603810
6,221.65	5,443.51	1,185.39	307.72	Last Perf @ 6221' MD
6,221.65	5,443.51	1,185.39	307.72	36.2614883, -107.6598722
12,438.57	5,464.73	1,175.60	6,524.60	First Perf @ 12,438' MD
12,438.57	5,464.73	1,175.60	6,524.60	36.2614594, -107.6387844
12,518.57	5,465.00	1,175.47	6,604.60	TD at 12518.57



Logos Operating LLC

San Juan, NM NAD83

Chaco 2308-03 Pad

Zeus 2308-03 4H

OH

Plan #4

Anticollision Report

29 January, 2020



Scientific Drilling

www.scientificdrilling.com



Scientific Drilling, Intl Anticollision Report



Company: Logos Operating LLC
Project: San Juan, NM NAD83
Reference Site: Chaco 2308-03 Pad
Site Error: 0.00 usft
Reference Well: Zeus 2308-03 4H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan #4

Local Co-ordinate Reference: Well Zeus 2308-03 4H
TVD Reference: GL 6908' & RKB 25' @ 6933.00usft (Aztec 1000)
MD Reference: GL 6908' & RKB 25' @ 6933.00usft (Aztec 1000)
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Grand Junction
Offset TVD Reference: Offset Datum

Reference	Plan #4		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum ellipse separation of 1,000.00 usft	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	1/29/2020		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	12,518.57	Plan #4 (OH)	MWD+HDGM	OWSG MWD + HDGM	

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Chaco 2308-03 Pad						
Chaco 2308-03 3H - OH - Plan #5	1,200.00	1,200.00	44.07	35.92	5.404	CC, ES
Chaco 2308-03 3H - OH - Plan #5	5,550.00	6,636.05	526.90	401.83	4.213	SF
Chaco 2308-03E 403H - OH - OH						Out of range
Chaco 23-08-3 #1H - OH - OH	1,054.76	1,053.37	54.69	48.93	9.496	CC, ES
Chaco 23-08-3 #1H - OH - OH	6,100.00	5,767.19	404.95	358.95	8.802	SF
Chaco 23-08-3 #1H - OH - Plan #2	1,174.48	1,173.90	50.61	43.87	7.506	CC, ES
Chaco 23-08-3 #1H - OH - Plan #2	1,200.00	1,198.77	50.93	44.01	7.360	SF
Chaco 23-08-3 #2H - OH - OH	100.00	95.79	126.45	126.21	532.516	CC
Chaco 23-08-3 #2H - OH - OH	466.50	462.30	126.51	124.50	63.013	ES
Chaco 23-08-3 #2H - OH - OH	1,400.00	1,383.78	195.78	188.41	26.582	SF
Chaco 23-08-3 #2H - OH - Plan #2	100.00	95.79	126.45	126.21	532.516	CC
Chaco 23-08-3 #2H - OH - Plan #2	466.50	462.30	126.51	124.50	63.013	ES
Chaco 23-08-3 #2H - OH - Plan #2	1,400.00	1,383.78	195.78	188.41	26.582	SF
Omega 2308-03 5H - OH - Plan #4	1,200.00	1,200.00	21.86	13.70	2.680	CC, ES
Omega 2308-03 5H - OH - Plan #4	1,300.00	1,300.06	23.23	14.36	2.621	SF

Offset Design Chaco 2308-03 Pad - Chaco 2308-03 3H - OH - Plan #5													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore +N/-S (usft)	Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
0.00	0.00	0.00	0.00	0.00	0.00	178.08	-44.05	1.47	44.07					
100.00	100.00	100.00	100.00	0.13	0.13	178.08	-44.05	1.47	44.07	43.80	0.27	163.924		
200.00	200.00	200.00	200.00	0.49	0.49	178.08	-44.05	1.47	44.07	43.09	0.99	44.707		
300.00	300.00	300.00	300.00	0.85	0.85	178.08	-44.05	1.47	44.07	42.37	1.70	25.883		
400.00	400.00	400.00	400.00	1.21	1.21	178.08	-44.05	1.47	44.07	41.65	2.42	18.214		
500.00	500.00	500.00	500.00	1.57	1.57	178.08	-44.05	1.47	44.07	40.93	3.14	14.051		
600.00	600.00	600.00	600.00	1.93	1.93	178.08	-44.05	1.47	44.07	40.22	3.85	11.437		
700.00	700.00	700.00	700.00	2.29	2.29	178.08	-44.05	1.47	44.07	39.50	4.57	9.643		
800.00	800.00	800.00	800.00	2.64	2.64	178.08	-44.05	1.47	44.07	38.78	5.29	8.335		
900.00	900.00	900.00	900.00	3.00	3.00	178.08	-44.05	1.47	44.07	38.07	6.00	7.340		
1,000.00	1,000.00	1,000.00	1,000.00	3.36	3.36	178.08	-44.05	1.47	44.07	37.35	6.72	6.557		

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

Well Control Equipment Schematic for 2M Service

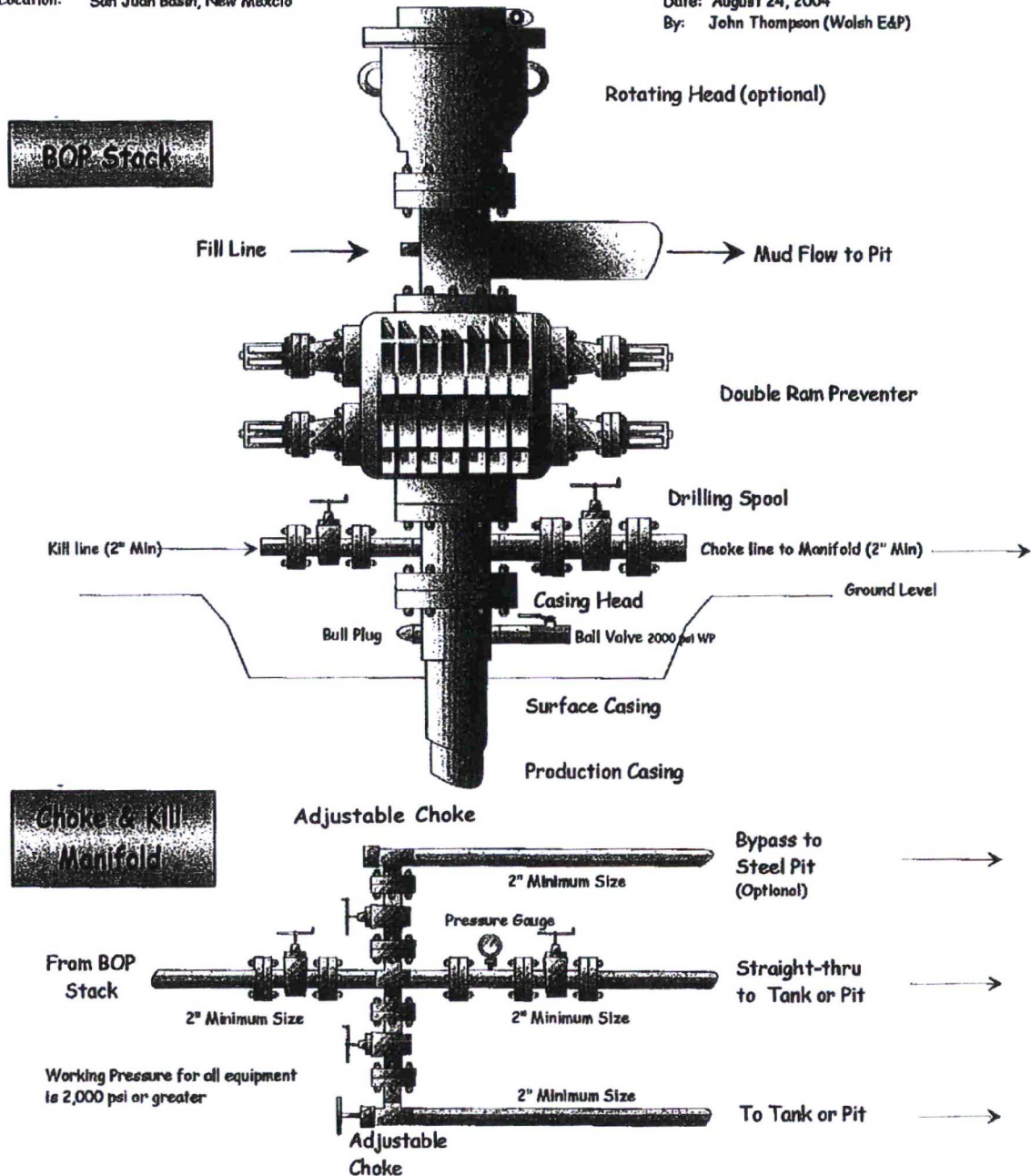
Attachment to Drilling Technical Program

Typical BOP setup

Location: San Juan Basin, New Mexico

Date: August 24, 2004

By: John Thompson (Walsh E&P)



Directions from the Intersection of US Hwy 550 & US Hwy 64

in Bloomfield, NM to Logos Operating, LLC Zeus 2308 03 #4H

1938' FNL & 223' FEL, Section 3, T23N, R8W, N.M.P.M., San Juan County, NM

Latitude: 36.258232°N Longitude: 107.660916°W Datum: NAD1983

From the intersection of US Hwy 550 & US Hwy 64 in Bloomfield, NM, @ Farmer's Market travel Southerly on US Hwy 550 for 41.1 miles to Mile Marker 110.6;

Go Left (Northerly) on existing roadway for 0.2 miles to fork in roadway;

Go Right (Easterly) on existing roadway for 0.4 miles to fork in roadway;

Go Left (Easterly) which is straight for 0.4 miles to staked Logos Zeus 2308 03 #4H wellpad twinned on Logos Chaco 23-08-3 #1H & #2H location.