

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: 10/4/12

Well information;

Operator Encana, Well Name and Number Lybrook P24-2206 1H

API# 30-043-21124, Section 24, Township 22 NS, Range 6 EW

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
- ☐ Spacing rule violation. Operator must follow up with change of status notification on other well to be shut in or abandoned
- ☒ A complete C-144 must be submitted to and approved by the NMOCD for: a pit, closed loop system, below grade tank, or proposed alternative method, pursuant to NMOCD PART 19.15.17 prior to the use or construction of the above applications
- ☐ 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

Cheli Kern
NMOCD Approved by Signature

6-20-2013
Date

JUN 21 2013 *ca*

RECEIVED

FORM APPROVED
OMB No. 1004-0137
Expires July 31, 2010

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OCT 05 2012

APPLICATION FOR PERMIT TO DRILL OR REENTER

Farmington Field Office

1a. Type of work: ☒ DRILL ☐ REENTER		5. Lease Serial No. NMNM 109390	
1b. Type of Well: ☒ Oil Well ☐ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone		6. If Indian, Allottee or Tribe Name N/A	
2. Name of Operator Encana Oil & Gas (USA) Inc.		7. If Unit or CA Agreement, Name and No. N/A	
3a. Address 370 17th Street, Suite 1700 Denver, CO 80202		8. Lease Name and Well No. Lybrook P24-2206 01H	
3b. Phone No. (include area code) 720-876-5331		9. API Well No. 30-043-21124	
4. Location of Well (Report location clearly and in accordance with any State requirements.) At surface 1059' FSL and 449' FEL Section 24, T22N, R6W At proposed prod. zone 800' FSL and 330' FWL Section 24, T22N, R6W		10. Field and Pool, or Exploratory Wildcat (Gallup)	
11. Sec., T. R. M. or Blk. and Survey or Area Section 24, T22N, R6W NMPM		12. County or Parish Sandoval	
13. State NM		14. Distance in miles and direction from nearest town or post office* 61.3 +/- miles SE of Bloomfield, NM	
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) BHL is 330' from west lease line		16. No. of acres in lease 800 acres	
17. Spacing Unit dedicated to this well 160 acres		RCVD JUN 17 '13	
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. SHL is +/- 7,994.62' north of TALL PINE 1		19. Proposed Depth 5331' TVD/9557' MD	
20. BLM/BIA Bond No. on file COB-000235		OIL CONS. DIV. DIST. 3	
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 7178' GL, 7192' KB		22. Approximate date work will start* 02/16/2013	
23. Estimated duration 25 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:

- Well plat certified by a registered surveyor.
- A Drilling Plan.
- A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office).
- Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
- Operator certification
- Such other site specific information and/or plans as may be required by the BLM.

25. Signature <i>Holly Hill</i>	Name (Printed/Typed) Holly Hill	Date 10/04/12
Title Regulatory Analyst		
Approved by (Signature) <i>[Signature]</i>	Name (Printed/Typed) AFM	Date 6/10/13
Title AFM	Office EFU	

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)

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

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

NMOC
A

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

District I
1625 N. French Drive, Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

District II
811 S. First Street, Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

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

State of New Mexico
Energy, Minerals & Natural Resources Department

Form C-102
Revised August 1, 2011

Submit one copy to
Appropriate District Office

OIL CONSERVATION DIVISION

1220 South St. Francis Drive
Santa Fe, NM 87505

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

*API Number 30-043-21124	*Pool Code 98032	*Pool Name WC 22N6W24; Gallup (S)
*Property Code 39970	*Property Name LYBROOK P24-2206	*Well Number 01H
*DGRID No. 28327	*Operator Name ENCANA OIL & GAS (USA) INC.	*Elevation 7178'

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
P	24	22N	6W		1059	SOUTH	449	EAST	SANDOVAL

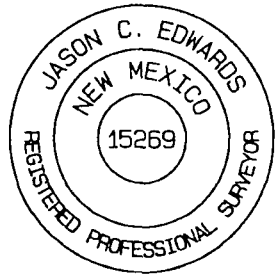
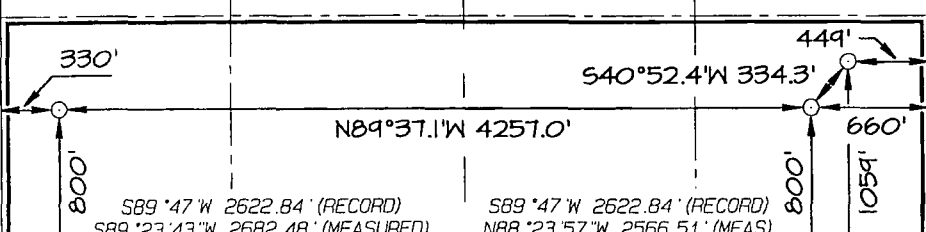
¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	24	22N	6W		800	SOUTH	330	WEST	SANDOVAL

¹² Dedicated Acres 160.0 Acres - (S/2 S/2)	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

¹⁶

N89°11'29"W 2616.88' (MEASURED) N89°52'W 2620.86' (RECORD)	N89°21'07"W 2620.73' (MEASURED) N89°52'W 2620.86' (RECORD)	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. Signature: <i>Brenda R. Linster</i> Date: 10/4/12 Printed Name: Brenda R. Linster E-mail Address: brenda.linster@encana.com
END OF LATERAL LAT: 36.11751°N LONG: 107.42827°W DATUM: NAD1927 LAT: 36.11752°N LONG: 107.42887°W DATUM: NAD1983	POINT OF ENTRY LAT: 36.11757°N LONG: 107.41386°W DATUM: NAD1927 LAT: 36.11759°N LONG: 107.41446°W DATUM: NAD1983	SURFACE LOCATION LAT: 36.11827°N LONG: 107.41313°W DATUM: NAD1927 LAT: 36.11829°N LONG: 107.41373°W DATUM: NAD1983
24		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. Date of Survey: AUGUST 24, 2012 Signature and Seal of Professional Surveyor  JASON C. EDWARDS Certificate Number 15269
		

Directions from the Intersection of US Hwy 550 & US Hwy 64
in Bloomfield, NM to Encana Oil & Gas (USA) Inc. Lybrook P24-2206 01H
1059' FSL & 449' FEL, Section 24, T22N, R6W, N.M.P.M., Sandoval County, NM

Latitude: 36.11829°N Longitude: 107.41373°W Datum: NAD1983

From the intersection of US Hwy 550 & US Hwy 64 in Bloomfield, NM, travel Southerly on US Hwy 550 for 53.6 miles to Mile Marker 97.7;

Go right (South-easterly) for 3.3 miles to an unimproved roadway;

Go left (South-easterly) along unimproved roadway for Encana Lybrook H01-2206 01H location for 12,155' to " T " intersection in proposed roadway;

Go right (Southerly) for an additional 11,125' along an unimproved roadway to staked Encana Lybrook P24-2206 01H location.

Lybrook P24-2206 01H
SHL: SESE Section 24, T22N, R6W
1059 FSL and 449 FEL
BHL: SWSW Section 24, T22N, R6W
800 FSL and 330 FWL
Sandoval County, New Mexico
Lease Number: NMNM 109390

Encana Oil & Gas (USA) Inc. Drilling Plan

1. ESTIMATED TOPS OF GEOLOGICAL MARKERS (TVD)

The estimated tops of important geologic markers are as follows:

<u>Formation</u>	<u>Depth (TVD)</u>
Ojo Alamo	1229'
Kirtland	1345'
Fruitland Coal	1427'
Pictured Cliffs	1813'
Lewis	1922'
Cliffhouse	2574'
Menefee	3322'
Point Lookout	4104'
Mancos	4288'
Gallup	5102'
Juana Lopez	5719'
Lower Carlile	5841'
Greenhorn	6070'
Graneros	6137'
Dakota	6167'
Morrison	6474'

The referenced surface elevation is 7178', KB 7192'

2. ESTIMATED DEPTH OF POTENTIAL WATER, OIL, GAS, & OTHER MINERAL BEARING FORMATIONS

<u>Substance</u>	<u>Formation</u>	<u>Depth (TVD)</u>
Water	Ojo Alamo	1229'
Gas	Fruitland Coal	1427'
Gas	Pictured Cliffs	1813'
Gas	Cliffhouse	2574'
Gas	Point Lookout	4104'
Oil/Gas	Mancos	4288'
Oil/Gas	Dakota	6167'

All shows of fresh water and minerals will be reported and protected.

3. PRESSURE CONTROL

- Pressure control equipment and configuration will be designed to meet 2M standards.
- Working pressure on rams and BOPE will be 3,000 psi
- Function test and visual inspection of the BOP will be conducted daily and noted in the IADC Daily Drilling Report.
- The Annular BOP will be pressure tested to a minimum of 50 percent of its rated working pressure.
- Blind and Pipe Rams/BOP will be tested against a test plug to 100 percent of rated working pressure.

Lybrook P24-2206 01H

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1059 FSL and 449 FEL

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800 FSL and 330 FWL

Sandoval County, New Mexico

Lease Number: NMNM 109390

- f) Pressure tests are required before drilling out from under all casing strings set and cemented in place.
- g) BOP controls must be installed prior to drilling the surface casing plug and will remain in use until the well is completed or abandoned.
- h) BOP testing procedures and testing frequency will conform to Onshore Order No. 2.
- i) BOP remote controls shall be located on the rig floor at a location readily accessible to the driller. Master controls shall be on the ground at the accumulator and shall have the capability to function all preventers.
- j) The kill line shall be 2-inch minimum and contain two kill line valves, one of which shall be a check valve.
- k) The choke line shall be a 2-inch minimum and contain two choke line valves (2-inch minimum).
- l) The choke and manifold shall contain two adjustable chokes.
- m) Hand wheels shall be installed on all ram preventers.
- n) Safety valves and wrenches (with subs for drill string connections) shall be available on the rig floor at all times.
- o) Inside BOP or float sub shall also be available on the rig floor at all times.

Proposed BOP and choke manifold arrangements are attached.

4. CASING & CEMENTING PROGRAM

The proposed casing and 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 casing design is as follows:

Casing	Depth	Hole Size	Csg Size	Weight	Grade
Conductor	0-60'	26"	20"	94#	H40, STC New
Surface	0'-500'	12 1/4"	9 5/8"	36#	J55, STC New
Intermediate	0'-5550'MD	8 1/2"	7"	26#	J55, LTC New
Production Liner	5350'-9557'MD	6 1/8"	4 1/2"	11.6#	B80*, LTC New

Casing String				Casing Strength Properties			Minimum Design Factors		
Size	Weight (lb/ft)	Grade	Connection	Collapse (psi)	Burst (psi)	Tensile (1000lb)	Collapse	Burst	Tension
9 5/8"	36	J55	STC	2020	3520	394	1.125	1.1	1.5
7"	26	J55	LTC	4320	4980	367	1.125	1.1	1.5
4 1/2"	11.6	B80	LTC	6350	7780	201	1.125	1.1	1.5

*B80 pipe specifications are attached

Casing design is subject to revision based on geologic conditions encountered.

All casing strings below the conductor shall be pressure tested to 0.22 psi per foot of casing string length or 1,500 psi, whichever is greater, but not to exceed 70 percent of the minimum internal yield. If pressure declines more than 10 percent in 30 minutes, corrective action shall be taken.

Lybrook P24-2206 01H

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800 FSL and 330 FWL

Sandoval County, New Mexico

Lease Number: NMNM 109390

b) 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.

Casing	Depth	Cement Volume (sacks)	Cement Type&Yield	Designed TOC	Centralizers
Conductor	60'	100sk	Type I Neat 14.8 ppg	Surface	None
Surface	500'	178sk	Type III Cement + 1% CaCl + 0.25lb/sk Cello Flake + 0.2% FL, 14.6ppg, 1.38cuf/sk	Surface	1 turbolizer per joint on bottom 3 joints
Intermediate	5550'	30% open hole excess Lead: 155sk Tail: 460sk	Lead: PremLite + 3% CaCl + 0.25lb/sk CelloFlake + 5lb/sk LCM, 12.1ppg 2.13cuf/sk Tail: Type III Cmt + 1% CaCl + 0.25lb/sk Cello Flake 14.5ppg 1.38cuf/sk	Surface	1 per joint for bottom 3 joints, 1 every 3 joints for remaining joints
Production Liner*	5350'-9557'	None – External casing packers	N/A	N/A	N/A

*Production liner clarification: Utilizing external swell casing packer system for zonal isolation will not use cement 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 adequate to achieve a minimum of 500 psi compressive strength at the casing shoe prior to drilling out.

5. WELL PLAN & DIRECTIONAL DRILLING PROGRAM

The proposed well will be drilled in two phases. A pilot hole will be drilled in the first phase, followed by kicking off a horizontal lateral in the existing wellbore in the second phase. The intent of drilling a pilot hole is to obtain open hole log and core data. The intent of the second phase of the well is to plug back the pilot hole with cement to the kick off point. After plugging back, the plan is to drill a horizontal lateral from the kick off point in the existing wellbore to the proposed bottom hole location.

Directional plans are attached.

Lybrook P24-2206 01H

SHL: SESE Section 24, T22N, R6W
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800 FSL and 330 FWL

Sandoval County, New Mexico

Lease Number: NMNM 109390

Well Phase	Description	Proposed Depth (TVD/MD)	Formation
1	Vertical Pilot Hole	6574'/6574'	Morrison
2	Horizontal Lateral	5331'/9557'	Gallup

Proposed Plug Back Procedure:

TOPS: TVD
KOP 4500'
Graneros Shale 6137'
Dakota 6167'

Set 2 cement plugs in 8 1/2" hole

Plug A: Bottom plug over Graneros

Plug B: Kick plug at KOP

Plug A

1. TIH to TD of vertical pilot hole at 6574'
2. Spot 270' cement plug from 6304' - 6574'
 - a. 77sx of Class C cement with 1% CaCl + 0.25#/sk celloflake + 0.2% FL (1.38ft³/sk yield, 14.6 ppg)
 - b. Pump displacement and 10 bbl spacer
3. Pull uphole 270' and reverse out
4. Spot 270' cement plug from 6034' - 6304'
 - a. 77 sx of Class C cement with 1% CaCl + 0.25#/sk celloflake + 0.2% FL (1.38ft³/sk yield, 14.6 ppg)
 - b. Pump displacement
5. Pull uphole and reverse out
6. Pump bottoms up 2 times, pull uphole
7. TIH and tag plug, proceed when cement is solid
8. Fill hole and move uphole to spot kick plug

Plug B

1. Spot 300' kick plug from 4400' - 4700'
 - a. 91sx of Class A cement with salt (1.3ft³/sk yield)
 - b. Spot tuned spacer
2. Pull uphole and reverse out
3. Pump bottoms up 2 times, pull uphole
4. Tag plug, drill ahead to KOP when cement is solid

6. DRILLING FLUIDS PROGRAM

a) Vertical Pilot Hole:

Hole Size (in)	TVD (ft)	Mud Type	Density (lb/gal)	Viscosity (sec/qt)	Fluid Loss (cc)
30"	0-60'	Fresh Water	8.3-9.2	38-100	4-28
12 1/4"	0-500'	Fresh Water	8.4-8.6	60-70	NC
8 1/2"	500-6574'	Fresh Water LSND	8.5-8.8	40-50	8-10

Lybrook P24-2206 01H

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Sandoval County, New Mexico

Lease Number: NMNM 109390

b) Kick off to Intermediate Casing:

Hole Size (in)	Depth (ft)	Mud Type	Density (lb/gal)	Viscosity (sec/qt)	Fluid Loss (cc)
8 1/2"	4500-5550'MD/5306'TVD	Fresh Water LSND	8.5-8.8	40-50	8-10

c) Intermediate Casing to TD of Horizontal Lateral

Hole Size (in)	Measured Depth (ft)	Mud Type	Density (lb/gal)	Viscosity (sec/qt)	Fluid Loss (cc)
6 1/8"	5550'-9557'	Synthetic Oil Based Mud	8.6-9.0	15-25	<15

- d) 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.
- e) 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 – Obtain core starting in the Mancos formation. Specific cored intervals will be determined real time by onsite geologists.
- c) Mud Logging – Mud loggers will be on location from Intermediate Casing to TD.
- d) Logging – See Below

Open Hole:

Triple combo with Spectral Gamma TD to surface casing

Specialty logs will be decided real time by onsite geologists

Cased Hole:

CBL/CCL/GR/VDL will be run as needed for perforating control

8. ABNORMAL PRESSURES & HYDROGEN SULFIDE

The anticipated bottom hole pressure is +/- 3077 psi based on a 9.0 ppg at 6574' TVD of the vertical pilot hole. No abnormal pressure or temperatures are anticipated.

No hydrogen sulfide gas is anticipated, however, if H₂S is encountered, the guidelines in Onshore Order No. 6 will be followed.

Lybrook P24-2206 01H

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Sandoval County, New Mexico

Lease Number: NMNM 109390

9. ANTICIPATED START DATE AND DURATION OF OPERATIONS

Drilling is estimated to commence on February 16, 2013. 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.

LOC: Sec 24-T22N-R6W County: Sandoval WELL: Lybrook P24-2206 01H			Encana Natural Gas WELL SUMMARY			encana™ natural gas		ENG: J. Fox/ A. 10/23/12 RIG: GLE: 7179 RKBE: 7192	
MWD LWD	OPEN HOLE LOGGING	FORM	DEPTH			HOLE SIZE	CASING SPECS	MW MUD TYPE	DEVIATION INFORMATION
			TVD	MD					
			60	60'					

NOTES:

- 1) Drill with 30" bit to 60', set 20" 94# conductor pipe
- 2) Drill surface to 500', R&C 9 5/8" casing
- 3) N/U BOP and surface equipment
- 4) Drill to pilot hole TD of 6574' and run OH logs.
- 5) Spot cement plug over Graneros and pull up to spot cement kick plug
- 6) Kick off at 4500' and start curve at 10deg/100' build rate
- 7) Drill to casing point of 5550' MD
- 8) R&C 7" casing, circ cmt to surface, switch to OBM
- 9) Land at 90deg, drill 3770' lateral to 9557', run 4 1/2" liner with external swellable csg packers



Boomerang Tube LLC

CASING (OR) TUBING DESCRIPTION AND PERFORMANCE PROPERTIES

Pipe Outside Diameter (ins)	_____	4.500
Pipe Wall Thickness (ins)	_____	0.250
Nominal Weight Per Foot (lbs)	_____	11.60
Thread Name	_____	Long Thread CSG
Grade Name	_____	SB-80
Pipe Minimum Yield (psi)	_____	80,000
Pipe Minimum Ultimate (psi)	_____	90,000
Coupling Minimum Yield (psi)	_____	80,000
Coupling Minimum Ultimate (psi)	_____	100,000
Coupling or Joint Outside Diameter (ins)	_____	5.000
Drift Diameter (ins)	_____	3.875
Plain End Weight per Foot (lbs)	_____	11.36
Joint Strength (lbs)	_____	201,000
Internal Yield (psi)	_____	7,780
Collapse Rating (psi)	_____	6,350

MAXIMUM DEPTH/LENGTH BASED ON MUD WTS & SAFETY FACTORS

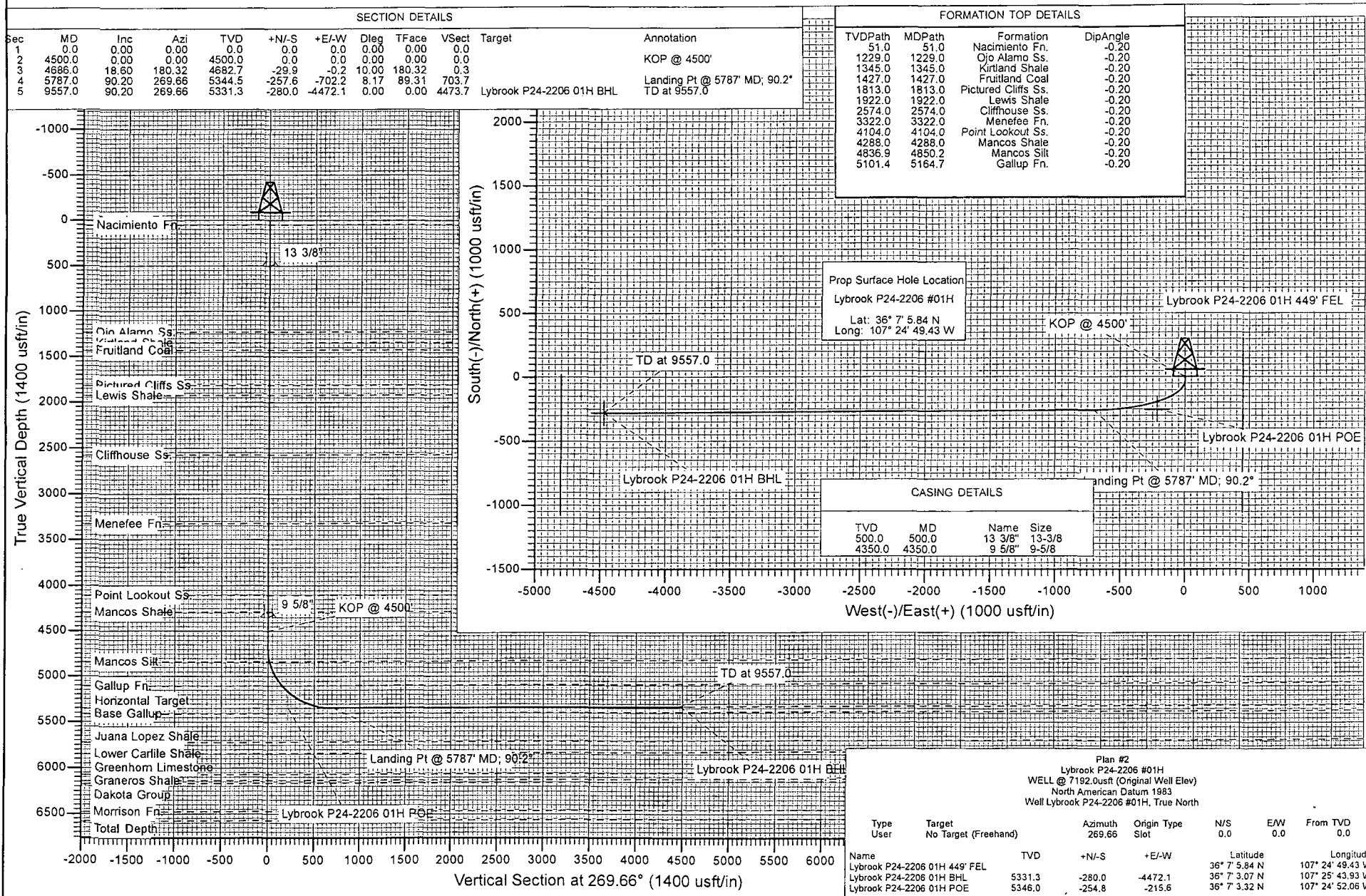
Drilling Mud Weight (ppg)	_____	9.625
Tension Safety Factor	_____	1.80
Maximum Tension Length (ft)	_____	9,630
Internal Yield Safety Factor	_____	1.10
Maximum Depth for Internal Yield (ft)	_____	14,150
Collapse Safety Factor	_____	1.125
Maximum Collapse Depth (ft)	_____	11,290

API RELATED VALUES and INTERMEDIATE CALCULATION RESULTS

Coupling Thread Fracture Strength	_____	464,000
Pipe Thread Fracture Strength (lbs)	_____	201,000
Pipe Body Plain End Yield (lbs)	_____	267,000
Round Thread Pull-Out (lbs)	_____	219,000
Minimum Make-up Torque (ft-lbs)	_____	1,640
Nominal Make-up Torque (ft-lbs)	_____	2,190
Maximum Make-up Torque (ft-lbs)	_____	2,740
Coupling Internal Yield (psi)	_____	10,660
Pipe Body Internal Yield (psi)	_____	7,780
Leak @ E1 or E7 plane (psi)	_____	17,920
Pipe Hydrostatic Test Pressure @ 80 % SMYS	_____	7,100



Project: Sandoval County, NM
Site: Lybrook
Well: Lybrook P24-2206 #01H
Wellbore: HZ
Design: Plan #2



Planning Report

Database: USA EDM 5000 Multi Users DB
 Company: EnCana Oil & Gas (USA) Inc
 Project: Sandoval County, NM
 Site: Lybrook
 Well: Lybrook P24-2206 #01H
 Wellbore: HZ
 Design: Plan #2

Local Co-ordinate Reference: Well Lybrook P24-2206 #01H
 TVD Reference: WELL @ 7192.0usft (Original Well Elev)
 MD Reference: WELL @ 7192.0usft (Original Well Elev)
 North Reference: True
 Survey Calculation Method: Minimum Curvature

Project: Sandoval County, NM
 Map System: US State Plane 1983
 Geo Datum: North American Datum 1983
 Map Zone: New Mexico Central Zone

System Datum: Mean Sea Level

Site: Lybrook

Site Position: Northing: 1,882,672.69 usft Latitude: 36° 10' 5.56 N
 From: Lat/Long Easting: 1,287,066.33 usft Longitude: 107° 26' 49.74 W
 Position Uncertainty: 0.0 usft Slot Radius: 13-3/16" Grid Convergence: -0.71 °

Well: Lybrook P24-2206 #01H

Well Position: +N/-S 0.0 usft Northing: 1,864,380.18 usft Latitude: 36° 7' 5.84 N
 +E/-W 0.0 usft Easting: 1,296,713.26 usft Longitude: 107° 24' 49.43 W
 Position Uncertainty: 0.0 usft Wellhead Elevation: usft Ground Level: 7,179.0 usft

Wellbore: HZ

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/14/2012	9.56	62.97	50,327

Design: Plan #2

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	269.66

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	
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.00	0.00	0.00	0.00	
4,686.0	18.60	180.32	4,682.7	-29.9	-0.2	10.00	10.00	0.00	180.32	
5,787.0	90.20	269.66	5,344.5	-257.6	-702.2	8.17	6.50	8.11	89.31	
9,557.0	90.20	269.66	5,331.3	-280.0	-4,472.1	0.00	0.00	0.00	0.00	Lybrook P24-2206 01

Planning Report

Database: USA EDM 5000 Multi Users DB
 Company: EnCana Oil & Gas (USA) Inc
 Project: Sandoval County, NM
 Site: Lybrook
 Well: Lybrook P24-2206 #01H
 Wellbore: HZ
 Design: Plan #2

Local Co-ordinate Reference: Well Lybrook P24-2206 #01H
 TVD Reference: WELL @ 7192.0usft (Original Well Elev)
 MD Reference: WELL @ 7192.0usft (Original Well Elev)
 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 (°/100u	Comments / Formations
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	Lybrook P24-2206 01H 449' FEL
51.0	0.00	0.00	51.0	0.0	0.0	0.0	0.00	0.00	Nacimiento Fn.
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	13 3/8"
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	
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	
1,229.0	0.00	0.00	1,229.0	0.0	0.0	0.0	0.00	0.00	Ojo Alamo Ss.
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	
1,345.0	0.00	0.00	1,345.0	0.0	0.0	0.0	0.00	0.00	Kirtland Shale
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	
1,427.0	0.00	0.00	1,427.0	0.0	0.0	0.0	0.00	0.00	Fruitland Coal
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	
1,813.0	0.00	0.00	1,813.0	0.0	0.0	0.0	0.00	0.00	Pictured Cliffs Ss.
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	
1,922.0	0.00	0.00	1,922.0	0.0	0.0	0.0	0.00	0.00	Lewis Shale
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	
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	
2,574.0	0.00	0.00	2,574.0	0.0	0.0	0.0	0.00	0.00	Cliffhouse Ss.
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	
3,322.0	0.00	0.00	3,322.0	0.0	0.0	0.0	0.00	0.00	Menefee Fn.
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	
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	
4,104.0	0.00	0.00	4,104.0	0.0	0.0	0.0	0.00	0.00	Point Lookout Ss.
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	

Planning Report

Database: USA EDM 5000 Multi Users DB
 Company: EnCana Oil & Gas (USA) Inc
 Project: Sandoval County, NM
 Site: Lybrook
 Well: Lybrook P24-2206 #01H
 Wellbore: HZ
 Design: Plan #2

Local Co-ordinate Reference: Well Lybrook P24-2206 #01H
 TVD Reference: WELL @ 7192.0usft (Original Well Elev)
 MD Reference: WELL @ 7192.0usft (Original Well Elev)
 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 (°/100u)	Comments / Formations
4,288.0	0.00	0.00	4,288.0	0.0	0.0	0.0	0.00	0.00	Mancos Shale
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	
4,350.0	0.00	0.00	4,350.0	0.0	0.0	0.0	0.00	0.00	9 5/8"
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	KOP @ 4500'
4,600.0	10.00	180.32	4,599.5	-8.7	0.0	0.1	10.00	10.00	
4,686.0	18.60	180.32	4,682.7	-29.9	-0.2	0.3	10.00	10.00	
4,700.0	18.65	183.90	4,696.0	-34.4	-0.3	0.5	8.17	0.34	
4,800.0	20.83	207.40	4,790.3	-66.2	-9.6	10.0	8.17	2.18	
4,850.2	22.92	216.85	4,836.9	-81.9	-19.6	20.1	8.13	4.16	Mancos Silt
4,900.0	25.47	224.65	4,882.3	-97.3	-32.9	33.5	8.21	5.13	
5,000.0	31.50	236.29	4,970.2	-127.2	-69.9	70.6	8.17	6.03	
5,100.0	38.27	244.34	5,052.3	-155.1	-119.6	120.5	8.17	6.77	
5,164.7	42.88	248.34	5,101.4	-171.9	-158.2	159.2	8.17	7.12	Gallup Fn.
5,200.0	45.44	250.24	5,126.7	-180.6	-181.1	182.2	8.17	7.27	
5,300.0	52.84	254.82	5,192.1	-203.1	-253.2	254.4	8.17	7.41	
5,364.1	57.67	257.30	5,228.6	-215.8	-304.3	305.6	8.17	7.53	Lybrook P24-2206 01H POE
5,400.0	60.39	258.57	5,247.1	-222.2	-334.4	335.8	8.17	7.59	
5,500.0	68.04	261.79	5,290.6	-237.5	-423.1	424.5	8.17	7.64	
5,600.0	75.73	264.68	5,321.7	-248.6	-517.4	518.9	8.17	7.70	
5,700.0	83.46	267.38	5,339.7	-255.4	-615.4	616.9	8.17	7.73	
5,787.0	90.20	269.66	5,344.5	-257.6	-702.2	703.7	8.17	7.74	Landing Pt @ 5787' MD; 90.2°
5,800.0	90.20	269.66	5,344.5	-257.7	-715.2	716.7	0.00	0.00	
5,900.0	90.20	269.66	5,344.1	-258.3	-815.2	816.7	0.00	0.00	
6,000.0	90.20	269.66	5,343.8	-258.9	-915.2	916.7	0.00	0.00	
6,100.0	90.20	269.66	5,343.4	-259.5	-1,015.2	1,016.7	0.00	0.00	
6,200.0	90.20	269.66	5,343.1	-260.1	-1,115.2	1,116.7	0.00	0.00	
6,300.0	90.20	269.66	5,342.7	-260.7	-1,215.2	1,216.7	0.00	0.00	
6,400.0	90.20	269.66	5,342.4	-261.2	-1,315.2	1,316.7	0.00	0.00	
6,500.0	90.20	269.66	5,342.0	-261.8	-1,415.2	1,416.7	0.00	0.00	
6,600.0	90.20	269.66	5,341.7	-262.4	-1,515.2	1,516.7	0.00	0.00	
6,700.0	90.20	269.66	5,341.3	-263.0	-1,615.2	1,616.7	0.00	0.00	
6,800.0	90.20	269.66	5,341.0	-263.6	-1,715.2	1,716.7	0.00	0.00	
6,900.0	90.20	269.66	5,340.6	-264.2	-1,815.2	1,816.7	0.00	0.00	
7,000.0	90.20	269.66	5,340.3	-264.8	-1,915.2	1,916.7	0.00	0.00	
7,100.0	90.20	269.66	5,339.9	-265.4	-2,015.2	2,016.7	0.00	0.00	
7,200.0	90.20	269.66	5,339.6	-266.0	-2,115.2	2,116.7	0.00	0.00	
7,300.0	90.20	269.66	5,339.2	-266.6	-2,215.2	2,216.7	0.00	0.00	
7,400.0	90.20	269.66	5,338.9	-267.2	-2,315.2	2,316.7	0.00	0.00	
7,500.0	90.20	269.66	5,338.5	-267.8	-2,415.2	2,416.7	0.00	0.00	
7,600.0	90.20	269.66	5,338.2	-268.4	-2,515.2	2,516.7	0.00	0.00	
7,700.0	90.20	269.66	5,337.8	-269.0	-2,615.2	2,616.7	0.00	0.00	
7,800.0	90.20	269.66	5,337.5	-269.6	-2,715.2	2,716.7	0.00	0.00	
7,900.0	90.20	269.66	5,337.1	-270.1	-2,815.2	2,816.7	0.00	0.00	
8,000.0	90.20	269.66	5,336.8	-270.7	-2,915.2	2,916.7	0.00	0.00	
8,100.0	90.20	269.66	5,336.4	-271.3	-3,015.2	3,016.7	0.00	0.00	
8,200.0	90.20	269.66	5,336.1	-271.9	-3,115.2	3,116.7	0.00	0.00	
8,300.0	90.20	269.66	5,335.7	-272.5	-3,215.2	3,216.7	0.00	0.00	
8,400.0	90.20	269.66	5,335.4	-273.1	-3,315.2	3,316.7	0.00	0.00	
8,500.0	90.20	269.66	5,335.0	-273.7	-3,415.2	3,416.7	0.00	0.00	
8,600.0	90.20	269.66	5,334.7	-274.3	-3,515.1	3,516.7	0.00	0.00	
8,700.0	90.20	269.66	5,334.3	-274.9	-3,615.1	3,616.7	0.00	0.00	

Planning Report

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 Project: Sandoval County, NM
 Site: Lybrook
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 Wellbore: HZ
 Design: Plan #2

Local Co-ordinate Reference: Well Lybrook P24-2206 #01H
 TVD Reference: WELL @ 7192.0usft (Original Well Elev)
 MD Reference: WELL @ 7192.0usft (Original Well Elev)
 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 (°/100u)	Comments / Formations
8,800.0	90.20	269.66	5,334.0	-275.5	-3,715.1	3,716.7	0.00	0.00	
8,900.0	90.20	269.66	5,333.6	-276.1	-3,815.1	3,816.7	0.00	0.00	
9,000.0	90.20	269.66	5,333.3	-276.7	-3,915.1	3,916.7	0.00	0.00	
9,100.0	90.20	269.66	5,332.9	-277.3	-4,015.1	4,016.7	0.00	0.00	
9,200.0	90.20	269.66	5,332.6	-277.9	-4,115.1	4,116.7	0.00	0.00	
9,300.0	90.20	269.66	5,332.2	-278.5	-4,215.1	4,216.7	0.00	0.00	
9,400.0	90.20	269.66	5,331.9	-279.0	-4,315.1	4,316.7	0.00	0.00	
9,500.0	90.20	269.66	5,331.5	-279.6	-4,415.1	4,416.7	0.00	0.00	
9,557.0	90.20	269.66	5,331.3	-280.0	-4,472.1	4,473.7	0.00	0.00	TD at 9557.0 - Lybrook P24-2206 01H BHL

Targets

Target Name	hit/miss target	Dip Angle (°)	Dip Dir (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Lybrook P24-2206 01H A	- plan misses target center by 5331.4usft at 0.0usft MD (0.0 TVD, 0.0 N, 0.0 E)	0.00	0.00	-5,331.4	0.0	0.0	1,864,380.18	1,296,713.26	36° 7' 5.84 N	107° 24' 49.43 W
- Polygon										
Point 1				-5,331.4	300.0	449.0	1,864,674.78	1,297,165.82		
Point 2				-5,331.4	-1,059.0	449.0	1,863,315.88	1,297,149.54		
Lybrook P24-2206 01H F	- plan misses target center by 152.2usft at 5364.1usft MD (5228.6 TVD, -215.8 N, -304.3 E)	0.00	0.00	5,346.0	-254.8	-215.6	1,864,127.94	1,296,494.59	36° 7' 3.32 N	107° 24' 52.06 W
- Point										
Lybrook P24-2206 01H I	- plan hits target center	0.00	0.00	5,331.3	-280.0	-4,472.1	1,864,153.77	1,292,238.12	36° 7' 3.07 N	107° 25' 43.93 W
- Polygon										
Point 1				5,331.3	300.0	-330.0	1,864,457.70	1,291,911.74		
Point 2				5,331.3	-800.0	-330.0	1,863,357.78	1,291,898.56		

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
500.0	500.0	13 3/8"	13-3/8	13-3/8
4,350.0	4,350.0	9 5/8"	9-5/8	9-5/8

Planning Report

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Wellbore: HZ
Design: Plan #2

Local Co-ordinate Reference: Well Lybrook P24-2206 #01H
TVD Reference: WELL @ 7192.0usft (Original Well Elev)
MD Reference: WELL @ 7192.0usft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
51.0	51.0	Nacimiento Fn.		-0.20	269.66
1,229.0	1,229.0	Ojo Alamo Ss.		-0.20	269.66
1,345.0	1,345.0	Kirtland Shale		-0.20	269.66
1,427.0	1,427.0	Fruitland Coal		-0.20	269.66
1,813.0	1,813.0	Pictured Cliffs Ss.		-0.20	269.66
1,922.0	1,922.0	Lewis Shale		-0.20	269.66
2,574.0	2,574.0	Cliffhouse Ss.		-0.20	269.66
3,322.0	3,322.0	Menefee Fn.		-0.20	269.66
4,104.0	4,104.0	Point Lookout Ss.		-0.20	269.66
4,288.0	4,288.0	Mancos Shale		-0.20	269.66
4,850.2	4,837.0	Mancos Silt		-0.20	269.66
5,164.7	5,102.0	Gallup Fn.		-0.20	269.66

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
4,500.0	4,500.0	0.0	0.0	KOP @ 4500'
5,787.0	5,344.5	-257.6	-702.2	Landing Pt @ 5787' MD; 90.2°
9,557.0	5,331.3	-280.0	-4,472.1	TD at 9557.0

WELLHEAD BLOWOUT CONTROL SYSTEM



Well name and number:

Lybrook P24-2206 01H

