

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 3160-4 or 3160-5 form.

Operator Signature Date: 10-15-13

Application Type:

☐ P&A ☒ Drilling/Casing Change ☐ Recomplete/DHC
☐ Location Change ☐ Other: _____

Well information:

API WELL #	Well Name	Well #	Operator Name	Type	Stat	County	Surf. Owner	UL	Sec	Twp	N/S	Rng	W/E	Feet	NS	Ft	EW
30-043-21152-00-00	LYBROOK E27 2306	001H	ENCANA OIL & GAS (USA) INC.	O	N	Sandoval	F	E	27	23	N	6	W	1569	N	199	W

Conditions of Approval:

Notify NMOCD 24hrs prior to beginning operations.
Hold C104 directional survey, and "As drilled" plat

NMOCD Approved by Signature

OCT 29 2013

Date

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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

CONFIDENTIAL
RECEIVED

SUNDRY NOTICES AND REPORTS ON WELLS
Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE – Other instructions on page 2 **OCT 18 2013**

1. Type of Well ☒ Oil Well ☐ Gas Well ☐ Other		7. If Unit of CA/Agreement, Name and/or No. N/A
2. Name of Operator Encana Oil & Gas (USA) Inc.		8. Well Name and No. Lybrook E27-2306 01H
3a. Address 370 17th Street, Suite 1700 Denver, CO 80202	3b. Phone No. (include area code) 720-876-3567	9. API Well No. 30-043-21152
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) SHL: 1569' FNL and 199' FWL Section 27, T23N, R6W BHL: 700' FNL and 660' FWL Section 28, T23N, R6W		10. Field and Pool or Exploratory Area Counselors Gallup-Dakota
		11. Country or Parish, State Sandoval County, New Mexico

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	☐ Fracture Treat	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other <u>revise BHL & POE</u>
	☒ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or 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 recomple 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.)

Encana Oil & Gas (USA) Inc. (Encana) would like to adjust the bottom hole location and point of entry for the Lybrook E27-2306 01H oil well.

The new point of entry will be 700' FNL, 660' FEL Section 28, T23N, R6W.

The new bottom hole location will be 700' FNL, 660' FWL Section 28, T23N, R6W.

Encana's casing program will contain the following changes: 7" Intermediate casing: 6,035' MD from 6,450' MD.

These revisions change the total depth (TD) of subject well to 5,570' TVD/10,506' MD from 5,560' TVD/11,171' MD

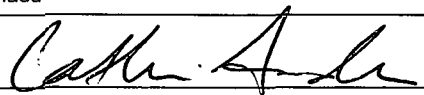
Please see attached C-102, drilling plan, directional plan and wellbore diagram for details.

Estimated spud date for the Lybrook E27-2306 01H well is December 14, 2013.

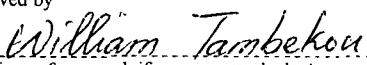
BLM'S APPROVAL OR ACCEPTANCE OF THIS ACTION DOES NOT RELIEVE THE LESSEE AND OPERATOR FROM OBTAINING ANY OTHER AUTHORIZATION REQUIRED FOR OPERATIONS ON FEDERAL AND INDIAN LANDS

CONDITIONS OF APPROVAL

Adhere to previously issued stipulations.

14. I hereby certify that the foregoing is true and correct. Name (Printed/Typed) Catherine Anadu		Title Regulatory Analyst
Signature 		Date 10/15/13

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

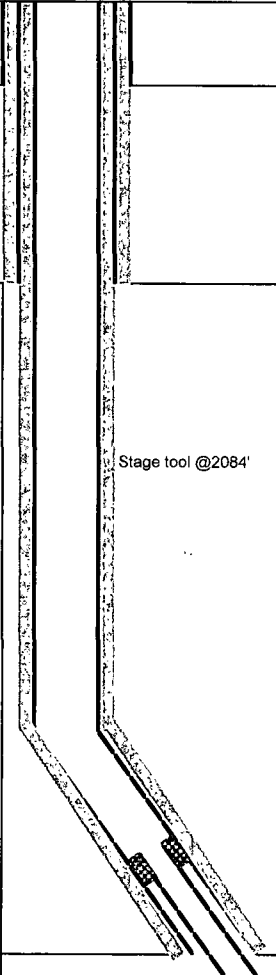
Approved by 	Title Petroleum Engineer	Date 10/21/2013
Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.		
Office FFO		

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)

NMOCDA

JASON C. EDWARDS
Certificate Number 15269

LÔC: Sec 27-T23N-R6W County: Sandoval WELL: Lybrook E27-2306 01H			Encana Natural Gas WELL SUMMARY					ENG: 10/17/13 RIG: GLE: 7054 RKBE: 7070	
MWD LWD	OPEN HOLE LOGGING	FORM	DEPTH			HOLE SIZE	CASING SPECS	MW MUD TYPE	DEVIATION INFORMATION
			TVD	MD					
			60	60'		30	20" 94# 100sx Type I Neat 16.0ppg cmt	Fresh wtr 8.3-9.2	
Surveys After csg is run	None					12 1/4	9 5/8" 36ppf J55 STC TOC @ surface 178 sks Type III Cmt	Fresh wtr 8.4-8.6	Vertical <1°
Surveys every 500'	No OH logs	Ojo Alamo Kirtland Fruitland Coal Pictured Cliffs Ss Lewis Shale Cliffhouse Ss Menefee Fn Point Lookout Ss Mancos Sh	1477 1633 1852 2034 2157 2896 3580 4280 4481	500 500		8 3/4	7" 26ppf J55 LTC TOC @ surface 30% OH excess: 590 sks Total. Stage 1 Lead : 254sks Premium Lite FM + 3% CaCl2 + 0.25/sk Cello Flake + 5#/sk LCM-1 + 8% Bentonite + 0.4% FL- 52A + 0.4% Sodium Metasilicate. Mixed at 12.1 ppg. Yield 2.13 cuft/sk. Stage 1 Tail: 174sks Type III Cement + 1% CaCl2 + 0.25#/sk Cello Flake + 0.2% FL-52A. Mixed at 14.6 ppg. Yield 1.38 cuft/sk. Stage 2: 184 sks Premium Lite FM + 3% CaCl2 + 0.25/sk Cello Flake + 5#/sk LCM-1 + 8% Bentonite + 0.4% FL-52A + 0.4% Sodium Metasilicate. Mixed at 12.1 ppg. Yield 2.13 cuft/sk.	Fresh Wtr 8.5-8.8	Vertical <1°
	Mud logger onsite	KICK OFF PT Mancos Silt Gallup Top 7" csg	5021 5098 5342 5594	6035		6 1/8	200' overlap at liner top 4582 Lateral	8.6-9.0 OBM	Switch to OBM 8.6-9.0
Surveys every 500' Gyro at CP MWD Gamma Directional	No OH Logs	horz target Base Gallup	5594 5639	5924		4 1/2" 11.6ppf SB80 LTC Running external swellable csg packers for isolation of prod string Plan on setting top packer within 100' of intermediate casing shoe			

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 KOP of 5021', 8 3/4" hole size,
- 5) PU directional tools and start curve at 10deg/100' build rate
- 6) Drill to casing point of 6035' MD
- 7) R&C 7" casing, circ cmt to surface, switch to OBM
- 8) Land at 90deg, drill 4582' lateral to 10506', run 4 1/2" liner with external swellable csg packers

Lybrook E27-2306 01H – API: 30-043-21152
 SHL: SWNW Section 27, T23N, R6W
 1569 FNL and 199 FWL
 BHL: NWNW Section 28, T23N, R6W
 700 FNL and 660 FWL
 Sandoval County, New Mexico
 Lease Number: NMNM 112953

Encana Oil & Gas (USA) Inc. Drilling Plan

1. ESTIMATED TOPS OF GEOLOGICAL MARKERS (TVD)

The estimated tops of important geologic markers are as follows:

Formation	Depth (TVD) units = feet
Ojo Alamo Ss.	1,477
Kirtland Shale	1,633
Fruitland Coal	1,852
Pictured Cliffs Ss.	2,034
Lewis Shale	2,157
Cliffhouse Ss.	2,896
Menefee Fn.	3,580
Point Lookout Ss.	4,280
Mancos Shale	4,481
Mancos Silt	5,098
Gallup Fn.	5,342

The referenced surface elevation is 7054', KB 7070'.

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

Substance	Formation	Depth (TVD) units = feet
Water/Gas	Fruitland Coal	1,852
Oil/Gas	Pictured Cliffs Ss.	2,034
Oil/Gas	Cliffhouse Ss.	2,896
Gas	Menefee Fn.	3,580
Oil/Gas	Point Lookout Ss.	4,280
Oil/Gas	Mancos Shale	4,481
Oil/Gas	Mancos Silt	5,098
Oil/Gas	Gallup Fn.	5,342

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

3. PRESSURE CONTROL

- a) Pressure control equipment and configuration will be designed to meet 2M standards.
- b) Working pressure on rams and BOPE will be 3,000 psi
- c) Function test and visual inspection of the BOP will be conducted daily and noted in the IADC Daily Drilling Report.

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- d) The Annular BOP will be pressure tested to a minimum of 50 percent of its rated working pressure.
- e) Blind and Pipe Rams/BOP will be tested against a test plug to 100 percent of rated working pressure.
- 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'	30"	20"	94#	H40, STC New
Surface	0'-500'	12 1/4"	9 5/8"	36#	J55, STC New
Intermediate	0'-6035'MD	8 3/4"	7"	26#	J55, LTC New
Production Liner	5835'-10506'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

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

Lybrook E27-2306 01H – API: 30-043-21152

SHL: SWNW Section 27, T23N, R6W
1569 FNL and 199 FWL

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700 FNL and 660 FWL

Sandoval County, New Mexico

Lease Number: NMNM 112953

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.

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 16.0 ppg	Surface	None
Surface	500'	178sk	Type III Cement + 1% CaCl + 0.25lb/sk Cello Flake + 0.2% FL, 16ppg, 1.38cuf/sk	Surface	1 per joint on bottom 3 joints
Intermediate	6035'MD	30% open hole excess Stage 1 Lead: 254sks Stage 1 Tail: 174sks Stage 2 Lead: 184sks	Lead (Stages 1 and 2): PremLite + 3% CaCl + 0.25lb/sk CelloFlake + 5lb/sk LCM, 12.1ppg 2.13cuf/sk Tail (Stage 1): 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*	5835'-10506'	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 a minimum of 8 hours or adequate to achieve a minimum of 500 psi compressive strength at the casing shoe prior to drilling out.

Lybrook E27-2306 01H – API: 30-043-21152

SHL: SWNW Section 27, T23N, R6W

1569 FNL and 199 FWL

BHL: NWNW Section 28, T23N, R6W

700 FNL and 660 FWL

Sandoval County, New Mexico

Lease Number: NMNM 112953

5. WELL PLAN & DIRECTIONAL DRILLING PROGRAM

The proposed horizontal well will have a kick off point of 5021'. Directional plans are attached.

Description	Proposed Depth (TVD/MD)	Formation
Horizontal Lateral TD	5570'/10506'	Gallup

6. DRILLING FLUIDS PROGRAM

a) Surface through Intermediate Casing Point:

Hole Size (in)	Depth (ft)	Mud Type	Density (lb/gal)	Viscosity (sec/qt)	Fluid Loss (cc)
30"	0-60' TVD	Fresh Water	8.3-9.2	38-100	4-28
12 1/4"	0-500' TVD	Fresh Water	8.4-8.6	60-70	NC
8 3/4"	500'TVD- 5594'TVD/6035'MD	Fresh Water LSND	8.5-8.8	40-50	8-10

b) Intermediate Casing Point to TD:

Hole Size (in)	MD (ft)	Mud Type	Density (lb/gal)	Viscosity (sec/qt)	Fluid Loss (cc)
6 1/8"	6035'-10506'	Synthetic Oil Based Mud	8.6-9.0	15-25	<15

- c) There will be sufficient mud on location to control a blowout should one occur. Mud flow and volume will be monitored both visually and with electronic pit volume totalizers. Mud tests shall be performed every 24 hours after mudding up to determine, as applicable: density, viscosity, gel strength, filtration, and pH.
- d) A closed-loop system will be used to recover drilling fluid and dry cuttings in both phases of the well and on all hole intervals, including fresh water and oil-based operations. Above-ground tanks will be utilized to hold cuttings and fluids for rig operations. A frac tank will be on location to store fresh water. Waste will be disposed of properly at an EPA-approved hazardous waste facility. Fresh water cuttings will be disposed of at Basin Disposal, Inc. and/or Industrial Ecosystems, Inc. The location will be lined in accordance with the Surface Use Plan of Operations.

7. TESTING, CORING and LOGGING

- a) Drill Stem Testing – None anticipated
- b) Coring – None anticipated.
- c) Mud Logging – Mud loggers will be on location from kick off point to TD.
- d) Logging – See Below

Cased Hole:

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

Lybrook E27-2306 01H – API: 30-043-21152

**SHL: SWNW Section 27, T23N, R6W
1569 FNL and 199 FWL**

**BHL: NWNW Section 28, T23N, R6W
700 FNL and 660 FWL**

Sandoval County, New Mexico

Lease Number: NMNM 112953

8. ABNORMAL PRESSURES & HYDROGEN SULFIDE

The anticipated bottom hole pressure is +/- 2618 psi based on a 9.0 ppg at 5594' TVD of the landing point of the horizontal lateral. 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.

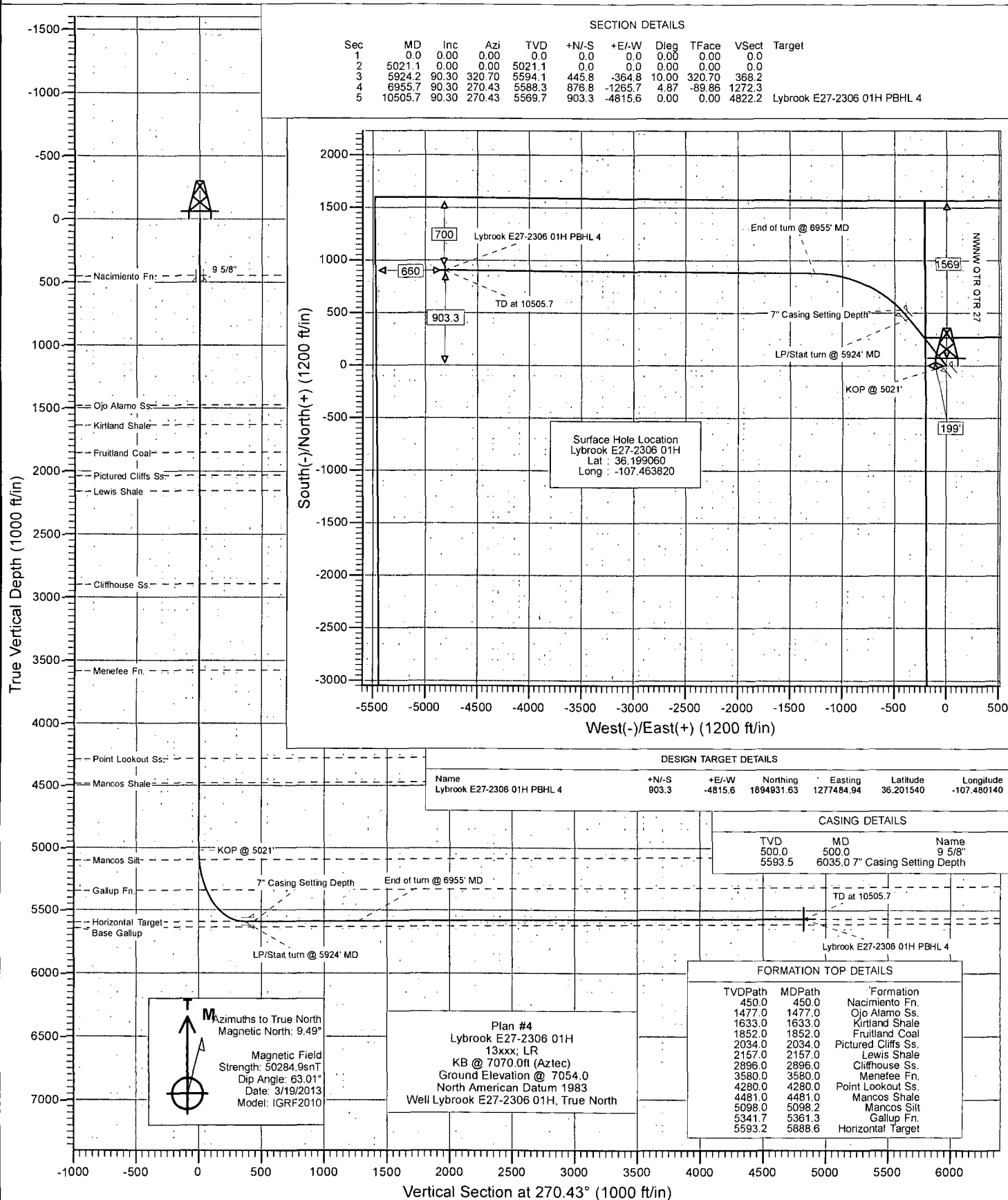
9. ANTICIPATED START DATE AND DURATION OF OPERATIONS

Drilling is estimated to commence on November 30, 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 20 days.

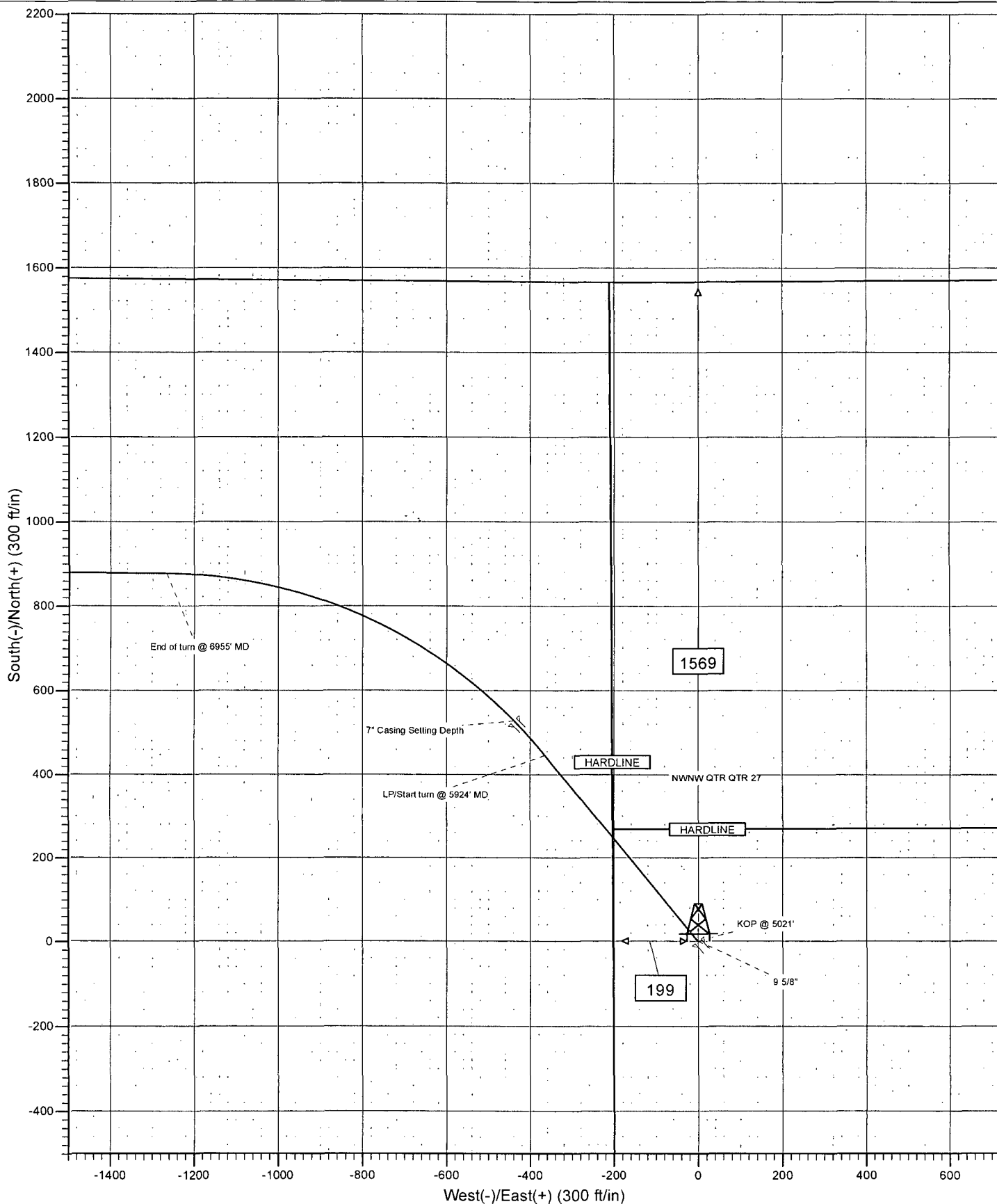


Project: Sandoval County, NM
 Site: Lybrook
 Well: Lybrook E27-2306 01H
 Wellbore: Hz
 Design: Plan #4





Project: Sandoval County, NM
Site: Lybrook
Well: Lybrook E27-2306 01H
Wellbore: Hz
Design: Plan #4



Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook E27-2306 01H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KB @ 7070.0ft (Aztec)
Project:	Sandoval County, NM	MD Reference:	KB @ 7070.0ft (Aztec)
Site:	Lybrook	North Reference:	True
Well:	Lybrook E27-2306 01H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #4		

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

Site	Lybrook				
Site Position:		Northing:	1,882,676.45 ft	Latitude:	36.168210
From:	Lat/Long	Easting:	1,287,068.90 ft	Longitude:	-107.447150
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-0.71 °

Well	Lybrook E27-2306 01H					
Well Position	+N/-S	0.0 ft	Northing:	1,893,968.14 ft	Latitude:	36.199060
	+E/-W	0.0 ft	Easting:	1,282,288.84 ft	Longitude:	-107.463820
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	7,054.0 ft

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	3/19/2013	9.49	63.01	50,285

Design	Plan #4			
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	270.43

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	
5,021.1	0.00	0.00	5,021.1	0.0	0.0	0.00	0.00	0.00	0.00	
5,924.2	90.30	320.70	5,594.1	445.8	-364.8	10.00	10.00	0.00	320.70	
6,955.7	90.30	270.43	5,588.3	876.8	-1,265.7	4.87	0.00	-4.87	-89.86	
10,505.7	90.30	270.43	5,569.7	903.3	-4,815.6	0.00	0.00	0.00	0.00	Lybrook E27-2306 01

$$Y \rightarrow (1569 - 903.3)_{ft} = 665.7 \approx 666 \text{ ft/N} \quad (\text{sec. 28})$$

$$X \rightarrow (199 + 2636.01 + 2636.60 - 4815.6)_{ft} = 656.01 \approx 656 \text{ ft/W} \quad (\text{sec 28})$$

William Tambekou
 10/21/2013

Planning Report

Database: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Site: Lybrook
Well: Lybrook E27-2306 01H
Wellbore: Hz
Design: Plan #4

Local Co-ordinate Reference: Well Lybrook E27-2306 01H
TVD Reference: KB @ 7070.0ft (Aztec)
MD Reference: KB @ 7070.0ft (Aztec)
North Reference: True
Survey Calculation Method: Minimum Curvature

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	
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	
450.0	0.00	0.00	450.0	0.0	0.0	0.0	0.00	0.00	Nacimiento Fn.
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	9 5/8"
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	
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	
1,300.0	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	
1,477.0	0.00	0.00	1,477.0	0.0	0.0	0.0	0.00	0.00	Ojo Alamo Ss.
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	
1,633.0	0.00	0.00	1,633.0	0.0	0.0	0.0	0.00	0.00	Kirtland Shale
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	
1,852.0	0.00	0.00	1,852.0	0.0	0.0	0.0	0.00	0.00	Fruitland Coal
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	
2,034.0	0.00	0.00	2,034.0	0.0	0.0	0.0	0.00	0.00	Pictured Cliffs Ss.
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	
2,157.0	0.00	0.00	2,157.0	0.0	0.0	0.0	0.00	0.00	Lewis Shale
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	
2,896.0	0.00	0.00	2,896.0	0.0	0.0	0.0	0.00	0.00	Cliffhouse Ss.
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	
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	
3,580.0	0.00	0.00	3,580.0	0.0	0.0	0.0	0.00	0.00	Menefee Fn.
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	
4,280.0	0.00	0.00	4,280.0	0.0	0.0	0.0	0.00	0.00	Point Lookout Ss.

Planning Report

Database: USA EDM 5000 Multi Users DB
 Company: EnCana Oil & Gas (USA) Inc
 Project: Sandoval County, NM
 Site: Lybrook
 Well: Lybrook E27-2306 01H
 Wellbore: Hz
 Design: Plan #4

Local Co-ordinate Reference: Well Lybrook E27-2306 01H
 TVD Reference: KB @ 7070.0ft (Aztec)
 MD Reference: KB @ 7070.0ft (Aztec)
 North Reference: True
 Survey Calculation Method: Minimum Curvature

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	
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	
4,481.0	0.00	0.00	4,481.0	0.0	0.0	0.0	0.00	0.00	Mancos Shale
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	
4,700.0	0.00	0.00	4,700.0	0.0	0.0	0.0	0.00	0.00	
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	
4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	0.00	
5,000.0	0.00	0.00	5,000.0	0.0	0.0	0.0	0.00	0.00	
5,021.1	0.00	0.00	5,021.1	0.0	0.0	0.0	0.00	0.00	KOP @ 5021'
5,098.2	7.71	320.70	5,098.0	4.0	-3.3	3.3	10.00	10.00	Mancos Silt
5,100.0	7.89	320.70	5,099.8	4.2	-3.4	3.5	10.00	10.00	
5,200.0	17.89	320.70	5,197.1	21.4	-17.5	17.7	10.00	10.00	
5,300.0	27.89	320.70	5,289.1	51.5	-42.1	42.5	10.00	10.00	
5,361.3	34.02	320.70	5,341.7	75.9	-62.1	62.7	10.00	10.00	Gallup Fn.
5,400.0	37.89	320.70	5,373.0	93.5	-76.5	77.2	10.00	10.00	
5,500.0	47.89	320.70	5,446.2	146.1	-119.5	120.6	10.00	10.00	
5,600.0	57.88	320.70	5,506.4	207.7	-170.0	171.5	10.00	10.00	
5,700.0	67.88	320.70	5,552.0	276.5	-226.3	228.3	10.00	10.00	
5,800.0	77.88	320.70	5,581.3	350.4	-286.7	289.3	10.00	10.00	
5,888.6	86.74	320.70	5,593.2	418.3	-342.3	345.4	10.00	10.00	Horizontal Target
5,900.0	87.88	320.70	5,593.7	427.0	-349.5	352.7	10.00	10.00	
5,924.2	90.30	320.70	5,594.1	445.8	-364.8	368.2	10.00	10.00	LP/Start turn @ 5924' MD
6,000.0	90.31	317.01	5,593.7	502.8	-414.7	418.4	4.87	0.01	
6,035.0	90.32	315.30	5,593.5	528.1	-438.9	442.9	4.87	0.01	7" Casing Setting Depth
6,100.0	90.32	312.14	5,593.1	573.0	-485.9	490.2	4.87	0.01	
6,200.0	90.33	307.26	5,592.6	636.9	-562.8	567.6	4.87	0.01	
6,300.0	90.33	302.39	5,592.0	694.0	-644.9	650.1	4.87	0.00	
6,400.0	90.33	297.51	5,591.4	743.9	-731.5	737.0	4.87	0.00	
6,500.0	90.33	292.64	5,590.8	786.2	-822.0	827.9	4.87	0.00	
6,600.0	90.33	287.77	5,590.3	820.8	-915.9	922.0	4.87	0.00	
6,700.0	90.32	282.89	5,589.7	847.2	-1,012.3	1,018.6	4.87	-0.01	
6,800.0	90.32	278.02	5,589.1	865.3	-1,110.6	1,117.0	4.87	-0.01	
6,900.0	90.31	273.14	5,588.6	875.0	-1,210.1	1,216.6	4.87	-0.01	
6,955.7	90.30	270.43	5,588.3	876.8	-1,265.7	1,272.3	4.87	-0.01	End of turn @ 6955' MD
7,000.0	90.30	270.43	5,588.1	877.1	-1,310.0	1,316.6	0.00	0.00	
7,100.0	90.30	270.43	5,587.5	877.9	-1,410.0	1,416.6	0.00	0.00	
7,200.0	90.30	270.43	5,587.0	878.6	-1,510.0	1,516.6	0.00	0.00	
7,300.0	90.30	270.43	5,586.5	879.3	-1,610.0	1,616.6	0.00	0.00	
7,400.0	90.30	270.43	5,586.0	880.1	-1,710.0	1,716.6	0.00	0.00	
7,500.0	90.30	270.43	5,585.5	880.8	-1,810.0	1,816.6	0.00	0.00	
7,600.0	90.30	270.43	5,584.9	881.6	-1,910.0	1,916.6	0.00	0.00	
7,700.0	90.30	270.43	5,584.4	882.3	-2,010.0	2,016.6	0.00	0.00	
7,800.0	90.30	270.43	5,583.9	883.1	-2,110.0	2,116.6	0.00	0.00	
7,900.0	90.30	270.43	5,583.4	883.8	-2,210.0	2,216.6	0.00	0.00	
8,000.0	90.30	270.43	5,582.8	884.6	-2,310.0	2,316.6	0.00	0.00	
8,100.0	90.30	270.43	5,582.3	885.3	-2,410.0	2,416.6	0.00	0.00	
8,200.0	90.30	270.43	5,581.8	886.1	-2,510.0	2,516.6	0.00	0.00	
8,300.0	90.30	270.43	5,581.3	886.8	-2,610.0	2,616.6	0.00	0.00	
8,400.0	90.30	270.43	5,580.8	887.6	-2,710.0	2,716.6	0.00	0.00	
8,500.0	90.30	270.43	5,580.2	888.3	-2,810.0	2,816.6	0.00	0.00	
8,600.0	90.30	270.43	5,579.7	889.1	-2,910.0	2,916.6	0.00	0.00	

Planning Report

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Wellbore: Hz
Design: Plan #4

Local Co-ordinate Reference: Well Lybrook E27-2306 01H
TVD Reference: KB @ 7070.0ft (Aztec)
MD Reference: KB @ 7070.0ft (Aztec)
North Reference: True
Survey Calculation Method: Minimum Curvature

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
8,700.0	90.30	270.43	5,579.2	889.8	-3,010.0	3,016.6	0.00	0.00	
8,800.0	90.30	270.43	5,578.7	890.6	-3,110.0	3,116.6	0.00	0.00	
8,900.0	90.30	270.43	5,578.1	891.3	-3,210.0	3,216.6	0.00	0.00	
9,000.0	90.30	270.43	5,577.6	892.0	-3,309.9	3,316.6	0.00	0.00	
9,100.0	90.30	270.43	5,577.1	892.8	-3,409.9	3,416.5	0.00	0.00	
9,200.0	90.30	270.43	5,576.6	893.5	-3,509.9	3,516.5	0.00	0.00	
9,300.0	90.30	270.43	5,576.1	894.3	-3,609.9	3,616.5	0.00	0.00	
9,400.0	90.30	270.43	5,575.5	895.0	-3,709.9	3,716.5	0.00	0.00	
9,500.0	90.30	270.43	5,575.0	895.8	-3,809.9	3,816.5	0.00	0.00	
9,600.0	90.30	270.43	5,574.5	896.5	-3,909.9	3,916.5	0.00	0.00	
9,700.0	90.30	270.43	5,574.0	897.3	-4,009.9	4,016.5	0.00	0.00	
9,800.0	90.30	270.43	5,573.4	898.0	-4,109.9	4,116.5	0.00	0.00	
9,900.0	90.30	270.43	5,572.9	898.8	-4,209.9	4,216.5	0.00	0.00	
10,000.0	90.30	270.43	5,572.4	899.5	-4,309.9	4,316.5	0.00	0.00	
10,100.0	90.30	270.43	5,571.9	900.3	-4,409.9	4,416.5	0.00	0.00	
10,200.0	90.30	270.43	5,571.3	901.0	-4,509.9	4,516.5	0.00	0.00	
10,300.0	90.30	270.43	5,570.8	901.8	-4,609.9	4,616.5	0.00	0.00	
10,400.0	90.30	270.43	5,570.3	902.5	-4,709.9	4,716.5	0.00	0.00	
10,500.0	90.30	270.43	5,569.8	903.3	-4,809.9	4,816.5	0.00	0.00	
10,505.7	90.30	270.43	5,569.7	903.3	-4,815.6	4,822.2	0.00	0.00	TD at 10505.7

Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Lybrook E27-2306 01H f	0.00	0.00	5,569.7	903.3	-4,815.6	1,894,931.63	1,277,484.94	36.201540	-107.480140
- hit/miss target									
- Shape									
- plan hits target center									
- Point									

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
6,035.0	5,593.5	7" Casing Setting Depth	0.000	0.000
500.0	500.0	9 5/8"	0.000	0.000

Planning Report

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Design: Plan #4

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MD Reference: KB @ 7070.0ft (Aztec)
North Reference: True
Survey Calculation Method: Minimum Curvature

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
450.0	450.0	Nacimiento Fn.		-0.30	270.43
1,477.0	1,477.0	Ojo Alamo Ss.		-0.30	270.43
1,633.0	1,633.0	Kirtland Shale		-0.30	270.43
1,852.0	1,852.0	Fruitland Coal		-0.30	270.43
2,034.0	2,034.0	Pictured Cliffs Ss.		-0.30	270.43
2,157.0	2,157.0	Lewis Shale		-0.30	270.43
2,896.0	2,896.0	Cliffhouse Ss.		-0.30	270.43
3,580.0	3,580.0	Menefee Fn.		-0.30	270.43
4,280.0	4,280.0	Point Lookout Ss.		-0.30	270.43
4,481.0	4,481.0	Mancos Shale		-0.30	270.43
5,098.2	5,098.0	Mancos Silt		-0.30	270.43
5,361.3	5,342.0	Gallup Fn.		-0.30	270.43
5,888.6	5,595.0	Horizontal Target		-0.30	270.43

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
5,021.1	5,021.1	0.0	0.0	KOP @ 5021'
5,924.2	5,594.1	445.8	-364.8	LP/Start turn @ 5924' MD
6,955.7	5,588.3	876.8	-1,265.7	End of turn @ 6955' MD
10,505.7	5,569.7	903.3	-4,815.6	TD at 10505.7