

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

CONFIDENTIAL

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

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. JUL 14 2014

1. Type of Well

☒ Oil Well ☐ Gas Well ☐ Other

2. Name of Operator
Encana Oil & Gas (USA) Inc.

3a. Address
370 17th Street, Suite 1700
Denver, CO 80202

3b. Phone No. (include area code)
720-876-5867

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
SHL: 320' FSL and 1289' FWL Sec 28, T23N, R6W
BHL: 330' FSL and 1225' FWL Sec 33, T23N, R6W

5. Lease Serial No.
NMNM 112953

6. If Indian, Allottee or Tribe Name
N/A

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

8. Well Name and No.
Lybrook M28-2306 02H

9. API Well No.
30-043-21175

10. Field and Pool or Exploratory Area
Lybrook Gallup

11. Country or Parish, State
Sandoval, 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
	☒ 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 recompleat 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.)

Encana Oil & Gas (USA) Inc. (Encana) would like to revise the Intermediate Casing/Cement plan for the Lybrook M28-2306 02H as follows:
No DV Tool will be run. TOC @ Surface (70% OH excess), Stage 1 Total 818 sks.

Attached is the updated Wellbore Diagram.

CONDITIONS OF APPROVAL

Adhere to previously issued stipulations.

OIL CONS. DIV DIST. 3

JUL 25 2014

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

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

Name (Printed/Typed)
Cristi Bauer

Title Operations Technologist

Signature

Cristi Bauer

Date

7/11/14

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

William Tambekou

Title

Petroleum Engineer

Date

7/24/2014

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

Escrito M30-2409 01H
SHL: SWSW 30 24N 9W
1074 FSL 636 FWL
BHL: NWSW 25 24N 10W
2180 FSL 330 FWL
San Juan, New Mexico

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	1,550
Kirtland Shale	1,731
Fruitland Coal	1,880
Pictured Cliffs Ss.	2,130
Lewis Shale	2,244
Cliffhouse Ss.	2,932
Menefee Fn.	3,690
Point Lookout Ss.	4,390
Mancos Shale	4,568
Mancos Silt	5,153
Gallup Fn.	5,413

The referenced surface elevation is 7220', KB 7236'

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

Substance	Formation	Depth (TVD) units = feet
Water/Gas	Fruitland Coal	1,880
Oil/Gas	Pictured Cliffs Ss.	2,130
Oil/Gas	Cliffhouse Ss.	2,932
Gas	Menefee Fn.	3,690
Oil/Gas	Point Lookout Ss.	4,390
Oil/Gas	Mancos Shale	4,568
Oil/Gas	Mancos Silt	5,153
Oil/Gas	Gallup Fn.	5,413

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.
- Pressure tests are required before drilling out from under all casing strings set and cemented in place.

Escrito M30-2409 01H
 SHL: SWSW 30 24N 9W
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 San Juan, New Mexico

- 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
- 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 (MD)	Hole Size	Csg Size	Weight	Grade
Conductor	0'-60'	30"	20"	94#	
Surface	0'-500'	12 1/4"	9 5/8"	36#	J55, STC New
Intermediate	0'-5900'	8 3/4"	7"	26#	J55, LTC New
Production Liner	5700'-10500'	6 1/8"	4 1/2"	11.6#	B80*, LTC New

Casing String				Casing Strength Properties			Minimum Design Factors		
Size	Weight (ppf)	Grade	Connection	Collapse (psi)	Burst (psi)	Tensile (1000lbs)	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
4.5"	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.

- b) The proposed cementing program is as follows

Escrito M30-2409 01H
 SHL: SWSW 30 24N 9W
 1074 FSL 636 FWL
 BHL: NWSW 26 24N 10W
 2180 FSL 330 FWL
 San Juan, New Mexico

Casing	Depth (MD)	Cement Volume (sacks)	Cement Type & Yield	Designed TOC	Centralizers
Conductor	0'-60'	100 sks	Type I Neat 16 ppg	Surface	None
Surface	0'-500'	314 sks	HALCEM™ SYSTEM + 2% CaCl ₂ + 0.125lbm/sk Poly-E-Flake. 15.8 ppg, 1.174 cuft/sk	Surface	1 per joint on bottom 3 joints
Intermediate	0'-5900'	70% open hole excess Stage 1 Lead: 451 sks Stage 1 Tail: 367 sks	Lead: PremLite + 3% CaCl + 0.25lb/sk CelloFlake + 5lb/sk LCM, 12.1ppg 2.13cuft/sk Tail: Type III Cmt + 1% CaCl + 0.25lb/sk Cello Flake 14.5ppg 1.38cuft/sk	Surface	1 every 3 joints through water bearing zones
Production Liner	5700'-10500'	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 minimum of 500 psi compressive strength at the casing shoe prior to drilling out.

5. WELL PLAN & DIRECTIONAL DRILLING PROGRAM

The proposed horizontal well will have a kick off point of 4937'. Directional plans are attached.

Description	Proposed Depth (TVD/MD)	Formation
Horizontal Lateral TD	5590'/10500'	Gallup

6. DRILLING FLUIDS PROGRAM

a) Surface through Intermediate Casing Point:

Hole Size (in)	Depth (TVD/MD)	Mud Type	Density (ppg)	Viscosity (sec/qt)	Fluid Loss (cc)
30"	0-60'/60'	Fresh Water	8.3-9.2	38-100	4-28
12 1/4"	0'-600'/500'	Fresh Water	8.3-10	60-70	NC

~~Escribo M30-2409 01H
SHL: SWSW 30 24N 9W
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San Juan, New Mexico~~

8 3/4"	500'/500'-5634'/5900'	Fresh Water LSND	8.3-10	40-50	8-10
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b) Intermediate Casing Point to TD:

Hole Size (In)	Depth (TVD/MD)	Mud Type	Density (ppg)	Viscosity (sec/qt)	Fluid Loss (cc)
6 1/8"	5634'/5900'- 5590'/10500'	Fresh Water LSND	8.3-10	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. 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, & LOGGING

- a) Drill Stem Testing - None anticipated.
- b) Coring - None anticipated.
- c) Mudd 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

8. ABNORMAL PRESSURES & HYDROGEN SULFIDE

The anticipated bottom hole pressure is +/- 2650 psi based on a 9.0 ppg at 5662' TVD of the horizontal lateral target. 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 January 1, 2015. It is anticipated that completion operations will begin within 30 days after the well has been drilled depending on fracture treatment schedules with various pumping service companies.

It is anticipated that the drilling of this well will take approximately 20 days.

LOC: 0 County: Sandoval WELL: Lybrook M28-2306 02H			Encana Natural Gas WELL SUMMARY			ENG: Sydney Kuyke 7/11/14 RIG: Aztec 860 QLE: 7220 RKBE: 7230			
MWD LWD	OPEN HOLE LOGGING	FORM	DEPTH			HOLE SIZE	CASING SPECS	MW MUD TYPE	DEVIATION INFORMATION
			TVD	MD					
			00	00'		30	20" 94# 100sx Type I Neat 16.0ppg cmt	Fresh wtr 8.3-9.2	
Multi-Well pad take survey every stand and run anti- collision report prior to spud	None	Nacimiento 9 5/8" Csg	0 600	500.00		12 1/4	9 5/8" 36ppf J55 STC TOC Surface with 100% OH Excess: 314 sks of HALCEM™ SYSTEM + 2% CaCl2 + 0.125lbm/sk Poly-E-Flake, Mixed at 15.8 ppg. Yield 1.174 cuft/sk.	Fresh wtr 8.3-10	Vertical ≤1"
Survey Every 60'-120', updating anti-collision report after surveys. Stop operations and contact drilling engineer if separation factor approaches 1.5	No OH logs	Op Alamo Kirtland Shale Fruitland Coal Pictured Cliffs Ss Lewis Shale Cliffhouse Ss. Manehee Fn. Point Lockout Ss. Manos Shale	1,550 1,731 1,880 2,130 2,244 2,932 3,690 4,390 4,508			8 3/4	7" 26ppf J55 LTC TOC @ surface (70% OH excess) Stage 1 Total 818/sks Stage 1 Lead: 451 sks Premium Life 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: 367 sks Type III Cement + 1% CaCl2 + 0.25#/sk Cello Flake + 0.2% FL-52A. Mixed at 14.6 ppg. Yield 1.38 cuft/sk.	Fresh Wtr 8.3-10	Vertical ≤1"
Surveys every 30' through the curve	Mud logger on site	KOP Manos Set Gallup Fn. 7" Csg	4,937 5,153 5,413 5,634	4,937					
Surveys every stand to TD unless directed otherwise by Geologist	No OH Logs	Horizontal Target TD Base Gallup	5,662 5,590 5,717	10,500		6 1/8	200' overlap at liner top 4800' Drilled Lateral		Horiz Inc/TVD 91.0 deg/95602R TD = 10459.5 MD
MWD Gamma Directional							4 1/2" 11.6ppf SB80 LTC Running external swellable csg packers for isolation of prod string	WBM 8.3-10	

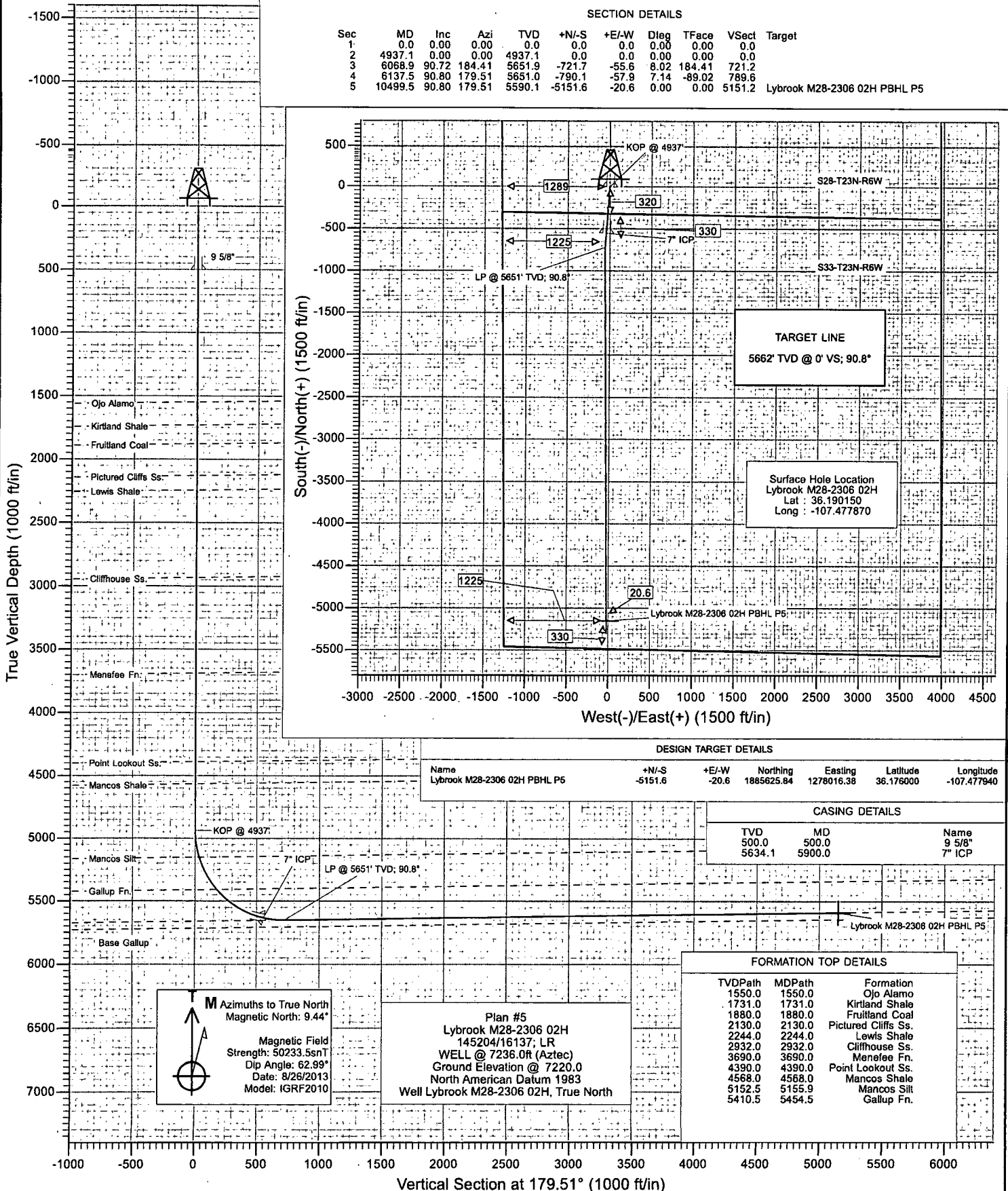
encana™

natural gas

Project: Sandoval County, NM
 Site: Lybrook
 Well: Lybrook M28-2306 02H
 Wellbore: Hz
 Design: Plan #5



SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	4937.1	0.00	0.00	4937.1	0.0	0.0	0.00	0.00	0.0	
3	6068.9	90.72	184.41	5651.9	-721.7	-55.6	8.02	184.41	721.2	
4	6137.5	90.80	179.51	5651.0	-790.1	-57.9	7.14	-89.02	789.6	
5	10499.5	90.80	179.51	5590.1	-5151.6	-20.6	0.00	0.00	5151.2	Lybrook M28-2306 02H PBHL P5



Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook M28-2306 02H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 7236.0ft (Aztec)
Project:	Sandoval County, NM	MD Reference:	WELL @ 7236.0ft (Aztec)
Site:	Lybrook	North Reference:	True
Well:	Lybrook M28-2306 02H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #5		

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:	13.200in	Grid Convergence:	-0.71 °

Well	Lybrook M28-2306 02H					
Well Position	+N/-S	0.0 ft	Northing:	1,890,776.73 ft	Latitude:	36.190150
	+E/-W	0.0 ft	Easting:	1,278,102.22 ft	Longitude:	-107.477870
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	7,220.0 ft

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	8/26/2013	9.44	62.99	50,233

Design	Plan #5			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(ft)	(ft)	(ft)	(°)
	0.0	0.0	0.0	179.51

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
4,937.1	0.00	0.00	4,937.1	0.0	0.0	0.00	0.00	0.00	0.00	
6,068.9	90.72	184.41	5,651.9	-721.7	-55.6	8.02	8.02	0.00	184.41	
6,137.5	90.80	179.51	5,651.0	-790.1	-57.9	7.14	0.12	-7.14	-89.02	
10,499.5	90.80	179.51	5,590.1	-5,151.6	-20.6	0.00	0.00	0.00	0.00	Lybrook M28-2306 02

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook M28-2306 02H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 7236.0ft (Aztec)
Project:	Sandoval County, NM	MD Reference:	WELL @ 7236.0ft (Aztec)
Site:	Lybrook	North Reference:	True
Well:	Lybrook M28-2306 02H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #5		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dipleg 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	
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	
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	
1,550.0	0.00	0.00	1,550.0	0.0	0.0	0.0	0.00	0.00	Ojo Alamo
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	
1,731.0	0.00	0.00	1,731.0	0.0	0.0	0.0	0.00	0.00	Kirtland Shale
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	
1,880.0	0.00	0.00	1,880.0	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	
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	
2,130.0	0.00	0.00	2,130.0	0.0	0.0	0.0	0.00	0.00	Pictured Cliffs Ss.
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	
2,244.0	0.00	0.00	2,244.0	0.0	0.0	0.0	0.00	0.00	Lewis Shale
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	
2,932.0	0.00	0.00	2,932.0	0.0	0.0	0.0	0.00	0.00	Cliffhouse Ss.
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	
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	
3,690.0	0.00	0.00	3,690.0	0.0	0.0	0.0	0.00	0.00	Menefee Fn.
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	
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	
4,390.0	0.00	0.00	4,390.0	0.0	0.0	0.0	0.00	0.00	Point Lookout Ss.

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook M28-2306 02H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 7236.0ft (Aztec)
Project:	Sandoval County, NM	MD Reference:	WELL @ 7236.0ft (Aztec)
Site:	Lybrook	North Reference:	True
Well:	Lybrook M28-2306 02H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #5		

Planned Survey

Measured			Vertical			Vertical	Depth	Build	Comments
Depth	Inclination	Azimuth	Depth	+N/-S	+E/-W	Section	Rate	Rate	Formations
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(°/100ft)	(°/100ft)	
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	
4,568.0	0.00	0.00	4,568.0	0.0	0.0	0.0	0.00	0.00	Mancos Shale
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	
4,937.1	0.00	0.00	4,937.1	0.0	0.0	0.0	0.00	0.00	KOP @ 4937'
5,000.0	5.04	184.41	4,999.9	-2.8	-0.2	2.8	8.02	8.02	
5,100.0	13.06	184.41	5,098.6	-18.4	-1.4	18.4	8.02	8.02	
5,155.9	17.54	184.41	5,152.5	-33.1	-2.6	33.1	8.02	8.02	Mancos Silt
5,200.0	21.07	184.41	5,194.1	-47.7	-3.7	47.6	8.02	8.02	
5,300.0	29.09	184.41	5,284.6	-89.9	-6.9	89.8	8.02	8.02	
5,400.0	37.10	184.41	5,368.3	-144.3	-11.1	144.2	8.02	8.02	
5,454.5	41.47	184.41	5,410.5	-178.7	-13.8	178.6	8.02	8.02	Gallup Fn.
5,500.0	45.12	184.41	5,443.6	-209.8	-16.2	209.6	8.02	8.02	
5,600.0	53.13	184.41	5,509.0	-285.1	-22.0	284.9	8.02	8.02	
5,700.0	61.15	184.41	5,563.2	-368.8	-28.4	368.5	8.02	8.02	
5,800.0	69.16	184.41	5,605.2	-459.2	-35.4	458.9	8.02	8.02	
5,900.0	77.18	184.41	5,634.1	-554.6	-42.7	554.2	8.02	8.02	7" ICP
6,000.0	85.19	184.41	5,649.4	-653.0	-50.3	652.6	8.02	8.02	
6,068.9	90.72	184.41	5,651.9	-721.7	-55.6	721.2	8.02	8.02	LP @ 5651' TVD; 90.8°
6,100.0	90.76	182.19	5,651.5	-752.7	-57.4	752.2	7.14	0.12	
6,137.5	90.80	179.51	5,651.0	-790.1	-57.9	789.6	7.14	0.12	
6,200.0	90.80	179.51	5,650.1	-852.7	-57.4	852.1	0.00	0.00	
6,300.0	90.80	179.51	5,648.7	-952.6	-56.6	952.1	0.00	0.00	
6,400.0	90.80	179.51	5,647.3	-1,052.6	-55.7	1,052.1	0.00	0.00	
6,500.0	90.80	179.51	5,645.9	-1,152.6	-54.8	1,152.1	0.00	0.00	
6,600.0	90.80	179.51	5,644.5	-1,252.6	-54.0	1,252.1	0.00	0.00	
6,700.0	90.80	179.51	5,643.1	-1,352.6	-53.1	1,352.1	0.00	0.00	
6,800.0	90.80	179.51	5,641.7	-1,452.6	-52.3	1,452.1	0.00	0.00	
6,900.0	90.80	179.51	5,640.3	-1,552.6	-51.4	1,552.1	0.00	0.00	
7,000.0	90.80	179.51	5,638.9	-1,652.6	-50.6	1,652.1	0.00	0.00	
7,100.0	90.80	179.51	5,637.5	-1,752.5	-49.7	1,752.0	0.00	0.00	
7,200.0	90.80	179.51	5,636.1	-1,852.5	-48.9	1,852.0	0.00	0.00	
7,300.0	90.80	179.51	5,634.7	-1,952.5	-48.0	1,952.0	0.00	0.00	
7,400.0	90.80	179.51	5,633.3	-2,052.5	-47.2	2,052.0	0.00	0.00	
7,500.0	90.80	179.51	5,631.9	-2,152.5	-46.3	2,152.0	0.00	0.00	
7,600.0	90.80	179.51	5,630.6	-2,252.5	-45.4	2,252.0	0.00	0.00	
7,700.0	90.80	179.51	5,629.2	-2,352.5	-44.6	2,352.0	0.00	0.00	
7,800.0	90.80	179.51	5,627.8	-2,452.4	-43.7	2,452.0	0.00	0.00	
7,900.0	90.80	179.51	5,626.4	-2,552.4	-42.9	2,552.0	0.00	0.00	
8,000.0	90.80	179.51	5,625.0	-2,652.4	-42.0	2,652.0	0.00	0.00	
8,100.0	90.80	179.51	5,623.6	-2,752.4	-41.2	2,752.0	0.00	0.00	
8,200.0	90.80	179.51	5,622.2	-2,852.4	-40.3	2,851.9	0.00	0.00	
8,300.0	90.80	179.51	5,620.8	-2,952.4	-39.5	2,951.9	0.00	0.00	
8,400.0	90.80	179.51	5,619.4	-3,052.4	-38.6	3,051.9	0.00	0.00	
8,500.0	90.80	179.51	5,618.0	-3,152.4	-37.7	3,151.9	0.00	0.00	
8,600.0	90.80	179.51	5,616.6	-3,252.3	-36.9	3,251.9	0.00	0.00	
8,700.0	90.80	179.51	5,615.2	-3,352.3	-36.0	3,351.9	0.00	0.00	
8,800.0	90.80	179.51	5,613.8	-3,452.3	-35.2	3,451.9	0.00	0.00	
8,900.0	90.80	179.51	5,612.4	-3,552.3	-34.3	3,551.9	0.00	0.00	

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook M28-2306 02H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 7236.0ft (Aztec)
Project:	Sandoval County, NM	MD Reference:	WELL @ 7236.0ft (Aztec)
Site:	Lybrook	North Reference:	True
Well:	Lybrook M28-2306 02H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #5		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Deglen Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
9,000.0	90.80	179.51	5,611.0	-3,652.3	-33.5	3,651.9	0.00	0.00	
9,100.0	90.80	179.51	5,609.6	-3,752.3	-32.6	3,751.9	0.00	0.00	
9,200.0	90.80	179.51	5,608.2	-3,852.3	-31.8	3,851.8	0.00	0.00	
9,300.0	90.80	179.51	5,606.8	-3,952.2	-30.9	3,951.8	0.00	0.00	
9,400.0	90.80	179.51	5,605.4	-4,052.2	-30.0	4,051.8	0.00	0.00	
9,500.0	90.80	179.51	5,604.0	-4,152.2	-29.2	4,151.8	0.00	0.00	
9,600.0	90.80	179.51	5,602.6	-4,252.2	-28.3	4,251.8	0.00	0.00	
9,700.0	90.80	179.51	5,601.2	-4,352.2	-27.5	4,351.8	0.00	0.00	
9,800.0	90.80	179.51	5,599.8	-4,452.2	-26.6	4,451.8	0.00	0.00	
9,900.0	90.80	179.51	5,598.4	-4,552.2	-25.8	4,551.8	0.00	0.00	
10,000.0	90.80	179.51	5,597.0	-4,652.1	-24.9	4,651.8	0.00	0.00	
10,100.0	90.80	179.51	5,595.6	-4,752.1	-24.1	4,751.8	0.00	0.00	
10,200.0	90.80	179.51	5,594.3	-4,852.1	-23.2	4,851.7	0.00	0.00	
10,300.0	90.80	179.51	5,592.9	-4,952.1	-22.4	4,951.7	0.00	0.00	
10,400.0	90.80	179.51	5,591.5	-5,052.1	-21.5	5,051.7	0.00	0.00	
10,499.5	90.80	179.51	5,590.1	-5,151.6	-20.6	5,151.2	0.00	0.00	TD at 10499.5

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Lybrook M28-2306 02H - hit/miss target - Shape	0.00	0.00	5,695.6	-659.0	590.2	1,890,110.35	1,278,684.08	36.188340	-107.475870
- plan misses target center by 641.1ft at 5964.3ft MD (5645.5 TVD, -617.6 N, -47.6 E)									
- Point									
Lybrook M28-2306 02H - plan hits target center - Point	0.00	0.00	5,590.1	-5,151.6	-20.6	1,885,625.84	1,278,016.38	36.176000	-107.477940
Lybrook M28-2306 02H - plan misses target center by 18.0ft at 10499.5ft MD (5590.1 TVD, -5151.6 N, -20.6 E)	0.00	0.00	5,572.1	-5,151.6	-20.6	1,885,625.84	1,278,016.38	36.176000	-107.477940
- Point									
Lybrook M28-2306 02H - plan misses target center by 9.2ft at 5996.0ft MD (5649.1 TVD, -649.0 N, -50.0 E)	0.00	0.00	5,650.7	-648.0	-59.0	1,890,129.48	1,278,035.00	36.188370	-107.478070
- Point									
Lybrook M28-2306 02H - plan misses target center by 651.4ft at 10499.5ft MD (5590.1 TVD, -5151.6 N, -20.6 E)	0.00	0.00	5,640.9	-5,162.5	628.7	1,885,606.71	1,278,665.56	36.175970	-107.475740
- Point									
Lybrook M28-2306 02H - plan misses target center by 655.6ft at 10499.5ft MD (5590.1 TVD, -5151.6 N, -20.6 E)	0.00	0.00	5,679.9	-5,162.5	628.7	1,885,606.71	1,278,665.56	36.175970	-107.475740
- Point									
Lybrook M28-2306 02H - plan misses target center by 639.2ft at 5958.3ft MD (5644.7 TVD, -611.7 N, -47.1 E)	0.00	0.00	5,656.6	-659.0	590.2	1,890,110.35	1,278,684.08	36.188340	-107.475870
- Point									

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook M28-2306 02H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 7236.0ft (Aztec)
Project:	Sandoval County, NM	MD Reference:	WELL @ 7236.0ft (Aztec)
Site:	Lybrook	North Reference:	True
Well:	Lybrook M28-2306 02H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #5		

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
500.0	500.0	9 5/8"	0.000	0.000	
5,900.0	5,634.1	7" ICP	0.000	0.000	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,550.0	1,550.0	Ojo Alamo		-0.80	179.51	
1,731.0	1,731.0	Kirtland Shale		-0.80	179.51	
1,880.0	1,880.0	Fruitland Coal		-0.80	179.51	
2,130.0	2,130.0	Pictured Cliffs Ss.		-0.80	179.51	
2,244.0	2,244.0	Lewis Shale		-0.80	179.51	
2,932.0	2,932.0	Cliffhouse Ss.		-0.80	179.51	
3,690.0	3,690.0	Menefee Fn.		-0.80	179.51	
4,390.0	4,390.0	Point Lookout Ss.		-0.80	179.51	
4,568.0	4,568.0	Mancos Shale		-0.80	179.51	
5,155.9	5,153.0	Mancos Silt		-0.80	179.51	
5,454.5	5,413.0	Gallup Fn.		-0.80	179.51	

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
4,937.1	4,937.1	0.0	0.0	KOP @ 4937'	
6,068.9	5,651.9	-721.7	-55.6	LP @ 5651' TVD; 90.8°	
10,499.5	5,590.1	-790.1	-57.9	TD at 10499.5	