

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: 1-16-14

Well information;

Operator Encana, Well Name and Number Lybrook P28-2307 #01H

API# 30-043-21199, Section 28, Township 23 N/S, Range 7 E/W

Conditions of Approval:

(See the below checked and handwritten conditions)

- ☒ Notify Aztec OCD 24hrs prior to casing & cement.
- ☒ Hold C-104 for directional survey & "As Drilled" Plat
- ☒ Hold C-104 for NSL, NSP DHC
- ☐ Spacing rule violation. Operator must follow up with change of status notification on other well to be shut in or abandoned
- ☐ Regarding the use of a pit, closed loop system or below grade tank, the operator must comply with the following as applicable:
 - A pit requires a complete C-144 be submitted and approved prior to the construction or use of the pit, pursuant to 19.15.17.8.A
 - A closed loop system requires notification prior to use, pursuant to 19.15.17.9.A
 - A below grade tank requires a registration be filed prior to the construction or use of the below grade tank, pursuant to 19.15.17.8.C
- ☐ Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string
- ☒ Regarding Hydraulic Fracturing, review EPA Underground Injection Control Guidance 84
- ☒ Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system.
- ☒ Well-bore communication is regulated under 19.15.29 NMAC. This requires well-bore Communication to be reported in accordance with 19.15.29.8.



NMOCD Approved by Signature

10-2-2014

Date JB

RECEIVED

CONFIDENTIAL

FEB 06 2014

Form 3160-3
(August 2007)

UNITED STATES **Farmington Field Office**
DEPARTMENT OF THE INTERIOR **Bureau of Land Management**
BUREAU OF LAND MANAGEMENT

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

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: ☒ DRILL ☐ REENTER		6. If Indian, Allottee or Tribe Name N/A	
1b. Type of Well: ☐ Oil Well ☒ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone		7. If Unit or CA Agreement, Name and No. N/A	
2. Name of Operator Encana Oil & Gas (USA) Inc.		8. Lease Name and Well No. Lybrook P28-2307 01H	
3a. Address 370 17th Street, Suite 1700 Denver, CO 80202		9. API Well No. 3004321199	
3b. Phone No. (include area code) 720-876-3926		10. Field and Pool, or Exploratory Basin Mancos DIST. 3	
4. Location of Well (Report location clearly and in accordance with any State requirements.) At surface 1,348' FSL and 43' FEL Section 28, T23N, R7W At proposed prod. zone 1,175' FSL and 330' FWL Section 28, T23N, R7W		11. Sec., T, R, M. or Blk. and Survey or Area Section 28, T23N, R7W NMPM	
14. Distance in miles and direction from nearest town or post office* +/- 49.5 miles southeast of the intersection of US Hwy 550 & US Hwy 64 in Bloomfield, NM		12. County or Parish Sandoval	13. State 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 Section 28, T23N, R7W	16. No. of acres in lease NMNM 58878 - 400 acres	17. Spacing Unit dedicated to this well 160 acres - N2S2 Section 28, T23N, R7W	
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 30' north of the Lybrook P28-2307 02H	19. Proposed Depth 5,251' TVD/10,032' MD	20. BLM/BIA Bond No. on file COB-000235	
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 6,940' GL, 6,956' KB	22. Approximate date work will start* 09/26/2014	23. Estimated duration 12 days	
24. Attachments			

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No.1, must be attached to this form:

- | | |
|--|---|
| 1. Well plat certified by a registered surveyor. | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). |
| 2. A Drilling Plan. | 5. Operator certification |
| 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office). | 6. Such other site specific information and/or plans as may be required by the BLM. |

25. Signature <i>Jessica Gregg</i>	Name (Printed Typed) Jessica Gregg	Date 1/16/14
Title Regulatory Analyst		
Approved by (Signature) <i>[Signature]</i>	Name (Printed Typed) AFM	Date 9/23/14
Title AFM	Office FFO	

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)

**DRILLING OPERATIONS
AUTHORIZED ARE SUBJECT TO
CHANGE WITH ATTACHED
FEDERAL REQUIREMENTS**

**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**

*(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**

NMOCDAV

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
RECEIVED

FEB 06 2014

WELL LOCATION AND ACREAGE DEDICATION PLAT

Farmington Field Office
Bureau of Land Management

API Number 30-043-21199	Pool Code 97232	Pool Name BASIN MANCOS
Property Code 313726	Property Name LYBROOK P28-2307	Well Number 01H
OGRIID No. 282327	Operator Name ENCANA OIL & GAS (USA) INC.	Elevation 6940'

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
I	28	23N	7W		1348	SOUTH	43	EAST	SANDOVAL

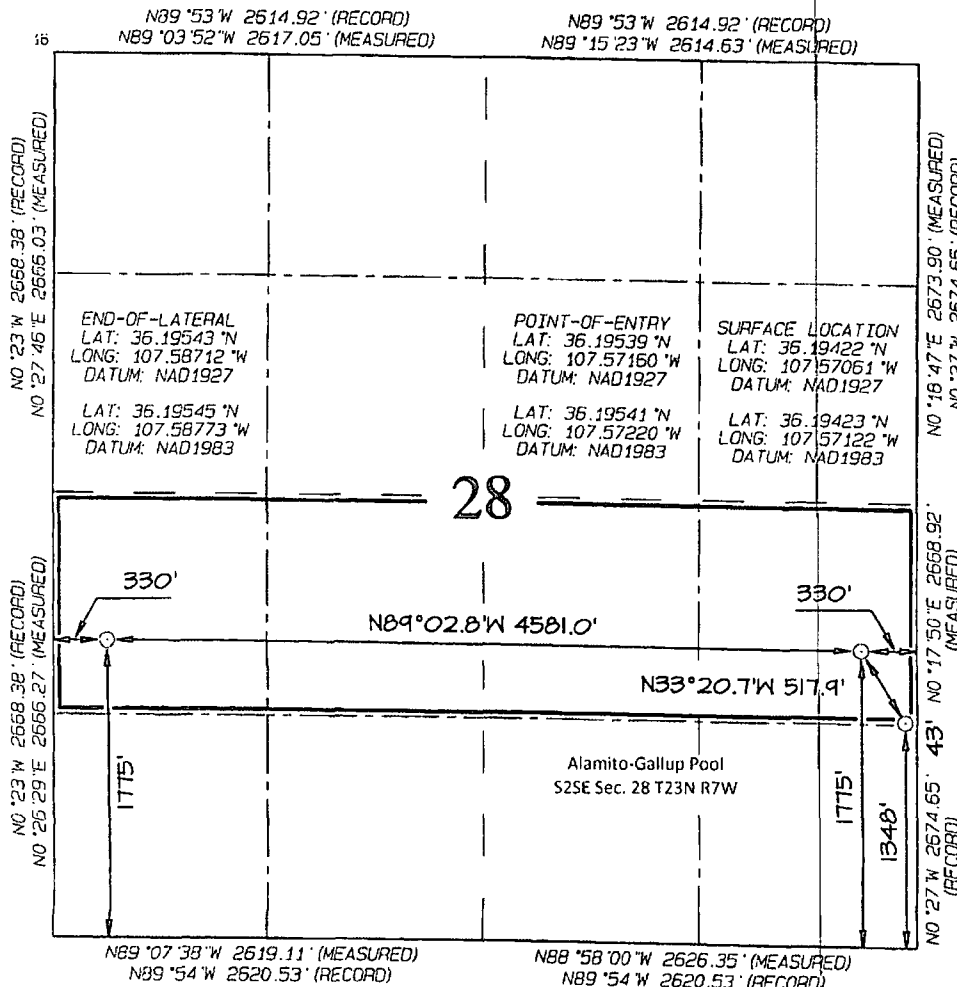
11 Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
L	28	23N	7W		1775	SOUTH	330	WEST	SANDOVAL

12 Dedicated Acres 160.00 Acres N/2 S/2 - Section 28	13 Joint or Infill	14 Consolidation Code	15 Order No. RCVD SEP 24 '14
--	--------------------	-----------------------	--

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

OIL CONS. DIV.
DIST. 3



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
Holly Hill

Date
1/7/14

Printed Name
holly.hill @encana.com

E-mail Address

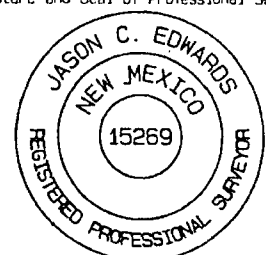
18 SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

Date Revised: DECEMBER 12, 2013

Date Survey: OCTOBER 10, 2013

Signature and Seal of Professional Surveyor



Certificate Number

15269

Lybrook P28-2307 01H
 SHL: NESE Section 28, T23N, R7W
 1,348' FSL and 43' FEL
 BHL: NWSW Section 28, T23N, R7W
 1,775' FSL and 330' FWL
 Sandoval County, New Mexico
 Lease Number: NMNM 58878

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.	1065
Kirtland Sh.	1216
Fruitland Coal	1350
Pictured Cliffs Ss.	1640
Lewis Sh.	1746
Cliffhouse Ss.	2452
Menefee Fn.	3150
Point Lookout Ss.	4014
Mancos Sh.	4193
Gallup Fn.	4989

The referenced surface elevation is 6,940', KB 6,956'

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

Substance	Formation	Depth (TVD) units = feet
Water/Gas	Fruitland Coal	1350
Oil/Gas	Pictured Cliffs Ss.	1640
Oil/Gas	Cliffhouse Ss.	2452
Gas	Menefee Fn.	3150
Oil/Gas	Point Lookout Ss.	4014
Oil/Gas	Mancos Sh.	4193
Oil/Gas	Gallup Fn.	4989

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.
- d) The Annular BOP will be pressure tested to a minimum of 50 percent of its rated working pressure.

Lybrook P28-2307 01H

SHL: NESE Section 28, T23N, R7W
1,348' FSL and 43' FEL

BHL: NWSW Section 28, T23N, R7W
1,775' FSL and 330' FWL

Sandoval County, New Mexico

Lease Number: NMNM 58878

- 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'-5501'MD	8 3/4"	7"	26#	J55, LTC New
Production Liner	5301'-10032'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 P28-2307 01H
SHL: NESE Section 28, T23N, R7W
1,348' FSL and 43' FEL
BHL: NWSW Section 28, T23N, R7W
1,775' FSL and 330' FWL
Sandoval County, New Mexico
Lease Number: NMNM 58878

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 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	5501'MD	30% open hole excess Stage 1 Lead: 245sks Stage 1 Tail: 168sks Stage 2 Lead: 148sks	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*	5301'-10032'	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.

5. WELL PLAN & DIRECTIONAL DRILLING PROGRAM

The proposed horizontal well will have a kick off point of 4449'. Directional plans are attached.

Description	Proposed Depth (TVD/MD)	Formation
Horizontal Lateral TD	5251'/10032'	Gallup

Lybrook P28-2307 01H

SHL: NESE Section 28, T23N, R7W
1,348' FSL and 43' FEL

BHL: NWSW Section 28, T23N, R7W
1,775' FSL and 330' FWL

Sandoval County, New Mexico

Lease Number: NMNM 58878

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- 5239'TVD/5501'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"	5501'-10032'	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

8. ABNORMAL PRESSURES & HYDROGEN SULFIDE

The anticipated bottom hole pressure is +/- 2468 psi based on a 9.0 ppg at 5273' 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.

Lybrook P28-2307 01H

**SHL: NESE Section 28, T23N, R7W
1,348' FSL and 43' FEL**

**BHL: NWSW Section 28, T23N, R7W
1,775' FSL and 330' FWL**

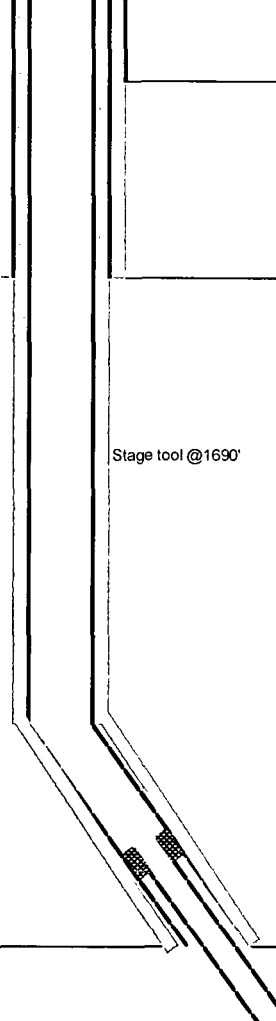
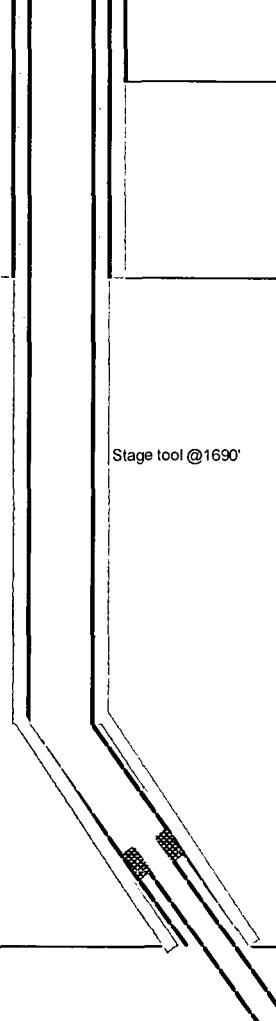
Sandoval County, New Mexico

Lease Number: NMNM 58878

9. ANTICIPATED START DATE AND DURATION OF OPERATIONS

Drilling is estimated to commence on September 26, 2014. 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 12 days.

LOC: Sec 28-T23N-R7W County: Sandoval WELL: Lybrook P28-2307 01H			Encana Natural Gas WELL SUMMARY						ENG: 2/3/14 RIG: GLE: 6940 RKBE: 6956	
MWD LWD	OPEN HOLE LOGGING	FORM	DEPTH TVDMD			HOLE SIZE	CASING SPECS	MW MUD TYPE	DEVIATION INFORMATION	
			60	60'		30	20" 94# 100sx Type I Neat 16ppg 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 KICK OFF PT Gallup Top 7" csg	1065 1,216 1350 1640 1746 2452 3150 4014 4193 4449 4989 5239	5501	Stage tool @1690'	8 3/4	7" 26ppf J55 LTC TOC @ surface 30% OH excess: 561 sksTotal. Stage 1 Lead: 245sks Stage 1 Tail: 168sks. Stage 2 Lead: 148sks	Fresh Wtr 8.5-8.8	Vertical <1° KOP 4449 10 deg/100'	
Surveys every 500' Gyro at CP MWD Gamma Directional	No OH Logs	horz target	5273	5722		6 1/8	200' overlap at liner top		.25deg updip 5251'TVD TD = 10032' MD	
		Base Gallup	5344				4310' Lateral	8.6-9.0 OBM	Switch to OBM 8.6-9.0	
							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 4449', 8 3/4" hole size,
- 5) PU directional tools and start curve at 10deg/100' build rate
- 6) Drill to casing point of 5501' MD
- 7) R&C 7" casing, circ cmt to surface, switch to OBM
- 8) Land at 90deg, drill 4310' lateral to 10032', 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

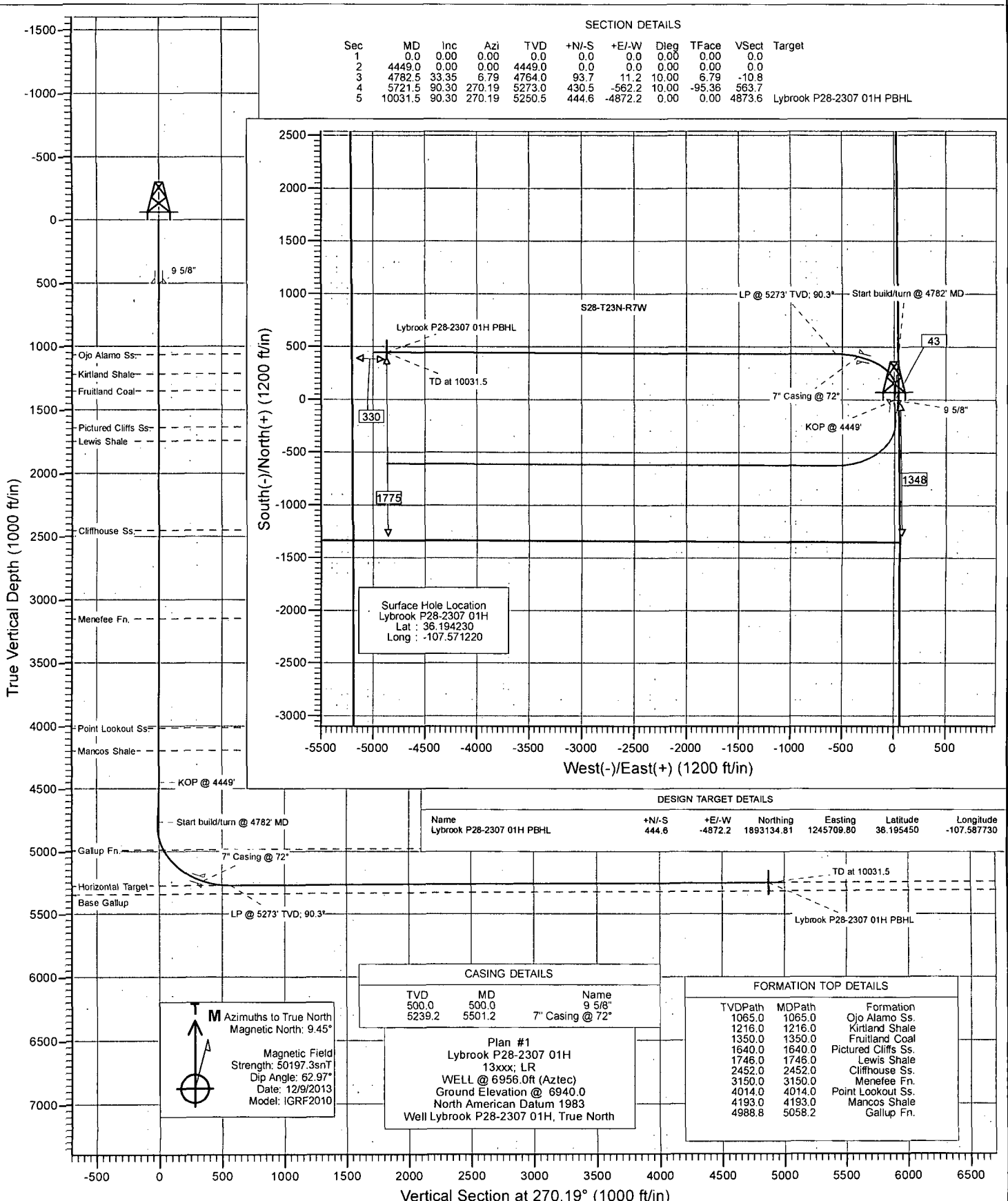
Drilling Mud Weight (ppg)	_____	9.625
Tension Safety Factor	_____	1.80
Maximum Tension Length (ft)	_____	9,630
Internal Yield Safety Factor	_____	1.10
Maximum Depth for Internal Yield (ft)	_____	14,150
Collapse Safety Factor	_____	1.125
Maximum Collapse Depth (ft)	_____	11,290

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 P28-2307 01H
 Wellbore: Hz
 Design: Plan #1



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	4449.0	0.00	0.00	4449.0	0.0	0.0	0.00	0.00	0.0	
3	4782.5	33.35	6.79	4764.0	93.7	11.2	10.00	6.79	-10.8	
4	5721.5	90.30	270.19	5273.0	430.5	-562.2	10.00	-95.36	563.7	
5	10031.5	90.30	270.19	5250.5	444.6	-4872.2	0.00	0.00	4873.6	Lybrook P28-2307 01H PBHL

DESIGN TARGET DETAILS					
Name	+N/-S	+E/-W	Northing	Easting	Latitude
Lybrook P28-2307 01H PBHL	444.6	-4872.2	1893134.81	1245709.80	38.195450
Longitude					
-107.587730					

CASING DETAILS		
TVD	MD	Name
500.0	500.0	9 5/8"
5239.2	5501.2	7" Casing @ 72°

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
1065.0	1065.0	Ojo Alamo Ss.
1216.0	1216.0	Kirtland Shale
1350.0	1350.0	Fruitland Coal
1640.0	1640.0	Pictured Cliffs Ss.
1746.0	1746.0	Lewis Shale
2452.0	2452.0	Cliffhouse Ss.
3150.0	3150.0	Menefee Fn.
4014.0	4014.0	Point Lookout Ss.
4193.0	4193.0	Mancos Shale
4988.8	5058.2	Gallup Fn.

M Azimuths to True North
 Magnetic North: 9.45°
 Magnetic Field
 Strength: 50197.3snT
 Dip Angle: 62.97°
 Date: 12/9/2013
 Model: IGRF2010

Plan #1
 Lybrook P28-2307 01H
 13xxx; LR
 WELL @ 6956.0ft (Aztec)
 Ground Elevation @ 6940.0
 North American Datum 1983
 Well Lybrook P28-2307 01H, True North

Planning Report

Database: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Site: Lybrook
Well: Lybrook P28-2307 01H
Wellbore: Hz
Design: Plan #1

Local Co-ordinate Reference: Well Lybrook P28-2307 01H
TVD Reference: WELL @ 6956.0ft (Aztec)
MD Reference: WELL @ 6956.0ft (Aztec)
North Reference: True
Survey Calculation Method: Minimum Curvature

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

Well	Lybrook P28-2307 01H		
Well Position	+N/-S	0.0 ft	Northing: 1,892,623.91 ft
	+E/-W	0.0 ft	Easting: 1,250,575.45 ft
Position Uncertainty	0.0 ft	Wellhead Elevation:	ft
		Latitude:	36.194230
		Longitude:	-107.571220
		Ground Level:	6,940.0 ft

Wellbore	Hz		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF2010	12/9/2013	9.45
			Dip Angle (°)
			62.97
			Field Strength (nT)
			50,197

Design	Plan #1		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)
	0.0	0.0	0.0
			Direction (°)
			270.19

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	
4,449.0	0.00	0.00	4,449.0	0.0	0.0	0.00	0.00	0.00	0.00	
4,782.5	33.35	6.79	4,764.0	93.7	11.2	10.00	10.00	0.00	6.79	
5,721.5	90.30	270.19	5,273.0	430.5	-562.2	10.00	6.06	-10.29	-95.36	
10,031.5	90.30	270.19	5,250.5	444.6	-4,872.2	0.00	0.00	0.00	0.00	Lybrook P28-2307 01

Planning Report

Database: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Site: Lybrook
Well: Lybrook P28-2307 01H
Wellbore: Hz
Design: Plan #1

Local Co-ordinate Reference: Well Lybrook P28-2307 01H
TVD Reference: WELL @ 6956.0ft (Aztec)
MD Reference: WELL @ 6956.0ft (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	
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	
1,065.0	0.00	0.00	1,065.0	0.0	0.0	0.0	0.00	0.00	Ojo Alamo Ss.
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	
1,216.0	0.00	0.00	1,216.0	0.0	0.0	0.0	0.00	0.00	Kirtland Shale
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	
1,350.0	0.00	0.00	1,350.0	0.0	0.0	0.0	0.00	0.00	Fruitland Coal
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	
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	
1,640.0	0.00	0.00	1,640.0	0.0	0.0	0.0	0.00	0.00	Pictured Cliffs Ss.
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	
1,746.0	0.00	0.00	1,746.0	0.0	0.0	0.0	0.00	0.00	Lewis Shale
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	
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	
2,452.0	0.00	0.00	2,452.0	0.0	0.0	0.0	0.00	0.00	Cliffhouse Ss.
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	
3,150.0	0.00	0.00	3,150.0	0.0	0.0	0.0	0.00	0.00	Menefee Fn.
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	
3,700.0	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	
4,014.0	0.00	0.00	4,014.0	0.0	0.0	0.0	0.00	0.00	Point Lookout Ss.
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	
4,193.0	0.00	0.00	4,193.0	0.0	0.0	0.0	0.00	0.00	Mancos Shale
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 P28-2307 01H
Wellbore: Hz
Design: Plan #1

Local Co-ordinate Reference: Well Lybrook P28-2307 01H
TVD Reference: WELL @ 6956.0ft (Aztec)
MD Reference: WELL @ 6956.0ft (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	
4,449.0	0.00	0.00	4,449.0	0.0	0.0	0.0	0.00	0.00	KOP @ 4449'
4,500.0	5.10	6.79	4,499.9	2.3	0.3	-0.3	10.00	10.00	
4,600.0	15.10	6.79	4,598.3	19.6	2.3	-2.3	10.00	10.00	
4,700.0	25.10	6.79	4,692.0	53.7	6.4	-6.2	10.00	10.00	
4,782.5	33.35	6.79	4,764.0	93.7	11.2	-10.8	10.00	10.00	Start build/turn @ 4782' MD
4,800.0	33.23	3.61	4,778.6	103.3	12.0	-11.7	10.00	-0.70	
4,900.0	34.08	345.58	4,862.1	157.9	6.8	-6.2	10.00	0.85	
5,000.0	37.36	329.35	4,943.4	211.2	-15.7	16.4	10.00	3.28	
5,058.2	40.16	321.21	4,988.8	241.1	-36.5	37.3	10.00	4.82	Gallup Fn.
5,100.0	42.49	315.95	5,020.2	261.7	-54.8	55.6	10.00	5.58	
5,200.0	48.89	305.19	5,090.2	307.8	-109.2	110.2	10.00	6.40	
5,300.0	56.11	296.45	5,151.1	348.1	-177.3	178.5	10.00	7.22	
5,400.0	63.84	289.12	5,201.1	381.4	-257.1	258.3	10.00	7.73	
5,500.0	71.90	282.73	5,238.8	406.7	-346.1	347.4	10.00	8.06	
5,501.2	72.00	282.65	5,239.2	406.9	-347.2	348.5	10.00	8.17	7" Casing @ 72"
5,600.0	80.15	276.90	5,262.9	423.1	-441.6	443.0	10.00	8.25	
5,700.0	88.50	271.37	5,272.8	430.2	-540.7	542.1	10.00	8.35	
5,721.5	90.30	270.19	5,273.0	430.5	-562.2	563.7	10.00	8.37	LP @ 5273' TVD; 90.3°
5,800.0	90.30	270.19	5,272.6	430.8	-640.7	642.1	0.00	0.00	
5,900.0	90.30	270.19	5,272.1	431.1	-740.7	742.1	0.00	0.00	
6,000.0	90.30	270.19	5,271.6	431.4	-840.7	842.1	0.00	0.00	
6,100.0	90.30	270.19	5,271.1	431.7	-940.7	942.1	0.00	0.00	
6,200.0	90.30	270.19	5,270.5	432.1	-1,040.7	1,042.1	0.00	0.00	
6,300.0	90.30	270.19	5,270.0	432.4	-1,140.7	1,142.1	0.00	0.00	
6,400.0	90.30	270.19	5,269.5	432.7	-1,240.7	1,242.1	0.00	0.00	
6,500.0	90.30	270.19	5,269.0	433.0	-1,340.7	1,342.1	0.00	0.00	
6,600.0	90.30	270.19	5,268.4	433.4	-1,440.7	1,442.1	0.00	0.00	
6,700.0	90.30	270.19	5,267.9	433.7	-1,540.7	1,542.1	0.00	0.00	
6,800.0	90.30	270.19	5,267.4	434.0	-1,640.7	1,642.1	0.00	0.00	
6,900.0	90.30	270.19	5,266.9	434.4	-1,740.7	1,742.1	0.00	0.00	
7,000.0	90.30	270.19	5,266.3	434.7	-1,840.7	1,842.1	0.00	0.00	
7,100.0	90.30	270.19	5,265.8	435.0	-1,940.7	1,942.1	0.00	0.00	
7,200.0	90.30	270.19	5,265.3	435.3	-2,040.7	2,042.1	0.00	0.00	
7,300.0	90.30	270.19	5,264.8	435.7	-2,140.7	2,142.1	0.00	0.00	
7,400.0	90.30	270.19	5,264.3	436.0	-2,240.7	2,242.1	0.00	0.00	
7,500.0	90.30	270.19	5,263.7	436.3	-2,340.7	2,342.1	0.00	0.00	
7,600.0	90.30	270.19	5,263.2	436.6	-2,440.7	2,442.1	0.00	0.00	
7,700.0	90.30	270.19	5,262.7	437.0	-2,540.7	2,542.1	0.00	0.00	
7,800.0	90.30	270.19	5,262.2	437.3	-2,640.7	2,642.1	0.00	0.00	
7,900.0	90.30	270.19	5,261.6	437.6	-2,740.7	2,742.1	0.00	0.00	
8,000.0	90.30	270.19	5,261.1	437.9	-2,840.7	2,842.1	0.00	0.00	
8,100.0	90.30	270.19	5,260.6	438.3	-2,940.7	2,942.1	0.00	0.00	
8,200.0	90.30	270.19	5,260.1	438.6	-3,040.7	3,042.1	0.00	0.00	
8,300.0	90.30	270.19	5,259.5	438.9	-3,140.7	3,142.1	0.00	0.00	
8,400.0	90.30	270.19	5,259.0	439.3	-3,240.6	3,242.1	0.00	0.00	
8,500.0	90.30	270.19	5,258.5	439.6	-3,340.6	3,342.1	0.00	0.00	
8,600.0	90.30	270.19	5,258.0	439.9	-3,440.6	3,442.1	0.00	0.00	
8,700.0	90.30	270.19	5,257.4	440.2	-3,540.6	3,542.1	0.00	0.00	
8,800.0	90.30	270.19	5,256.9	440.6	-3,640.6	3,642.1	0.00	0.00	
8,900.0	90.30	270.19	5,256.4	440.9	-3,740.6	3,742.1	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 P28-2307 01H
Wellbore: Hz
Design: Plan #1

Local Co-ordinate Reference: Well Lybrook P28-2307 01H
TVD Reference: WELL @ 6956.0ft (Aztec)
MD Reference: WELL @ 6956.0ft (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
9,000.0	90.30	270.19	5,255.9	441.2	-3,840.6	3,842.1	0.00	0.00	
9,100.0	90.30	270.19	5,255.4	441.5	-3,940.6	3,942.1	0.00	0.00	
9,200.0	90.30	270.19	5,254.8	441.9	-4,040.6	4,042.1	0.00	0.00	
9,300.0	90.30	270.19	5,254.3	442.2	-4,140.6	4,142.1	0.00	0.00	
9,400.0	90.30	270.19	5,253.8	442.5	-4,240.6	4,242.1	0.00	0.00	
9,500.0	90.30	270.19	5,253.3	442.8	-4,340.6	4,342.1	0.00	0.00	
9,600.0	90.30	270.19	5,252.7	443.2	-4,440.6	4,442.1	0.00	0.00	
9,700.0	90.30	270.19	5,252.2	443.5	-4,540.6	4,542.1	0.00	0.00	
9,800.0	90.30	270.19	5,251.7	443.8	-4,640.6	4,642.1	0.00	0.00	
9,900.0	90.30	270.19	5,251.2	444.2	-4,740.6	4,742.1	0.00	0.00	
10,000.0	90.30	270.19	5,250.6	444.5	-4,840.6	4,842.1	0.00	0.00	
10,031.5	90.30	270.19	5,250.5	444.6	-4,872.2	4,873.6	0.00	0.00	TD at 10031.5

Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Lybrook P28-2307 01H F - hit/miss target - Shape - Point	0.00	0.00	5,274.5	429.6	-289.2	1,893,057.42	1,250,292.13	36.195410	-107.572200
- plan misses target center by 61.7ft at 5468.5ft MD (5228.3 TVD, 399.6 N, -317.2 E)									
Lybrook P28-2307 01H F - plan hits target center - Point	0.00	0.00	5,250.5	444.6	-4,872.2	1,893,134.81	1,245,709.80	36.195450	-107.587730

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
5,501.2	5,239.2	7" Casing @ 72°	0.000	0.000

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,065.0	1,065.0	Ojo Alamo Ss.		-0.30	270.19
1,216.0	1,216.0	Kirtland Shale		-0.30	270.19
1,350.0	1,350.0	Fruitland Coal		-0.30	270.19
1,640.0	1,640.0	Pictured Cliffs Ss.		-0.30	270.19
1,746.0	1,746.0	Lewis Shale		-0.30	270.19
2,452.0	2,452.0	Cliffhouse Ss.		-0.30	270.19
3,150.0	3,150.0	Menefee Fn.		-0.30	270.19
4,014.0	4,014.0	Point Lookout Ss.		-0.30	270.19
4,193.0	4,193.0	Mancos Shale		-0.30	270.19
5,058.2	4,989.0	Gallup Fn.		-0.30	270.19

Planning Report

Database: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Site: Lybrook
Well: Lybrook P28-2307 01H
Wellbore: Hz
Design: Plan #1

Local Co-ordinate Reference: Well Lybrook P28-2307 01H
TVD Reference: WELL @ 6956.0ft (Aztec)
MD Reference: WELL @ 6956.0ft (Aztec)
North Reference: True
Survey Calculation Method: Minimum Curvature

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
4,449.0	4,449.0	0.0	0.0	KOP @ 4449'
4,782.5	4,764.0	93.7	11.2	Start build/turn @ 4782' MD
5,721.5	5,273.0	430.5	-562.2	LP @ 5273' TVD; 90.3°
10,031.5	5,250.5	444.6	-4,872.2	TD at 10031.5

EnCana Oil & Gas (USA) Inc

Sandoval County, NM

Lybrook

Lybrook P28-2307 01H

Hz

Plan #1

Anticollision Report

10 December, 2013

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Reference Site: Lybrook
Site Error: 0.0ft
Reference Well: Lybrook P28-2307 01H
Well Error: 0.0ft
Reference Wellbore: Hz
Reference Design: Plan #1

Local Co-ordinate Reference: Well Lybrook P28-2307 01H
TVD Reference: WELL @ 6956.0ft (Aztec)
MD Reference: WELL @ 6956.0ft (Aztec)
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA EDM 5000 Multi Users DB
Offset TVD Reference: Offset Datum

Reference	Plan #1
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria
Interpolation Method:	MD Interval 100.0ft
Depth Range:	Unlimited
Results Limited by:	Maximum center-center distance of 1,211.4ft
Warning Levels Evaluated at:	2.00 Sigma
Error Model:	Systematic Ellipse
Scan Method:	Closest Approach 3D
Error Surface:	Elliptical Conic

Survey Tool Program	Date	12/10/2013
From (ft)	To (ft)	Survey (Wellbore)
0.0	10,031.5	Plan #1 (Hz)
		Tool Name
		Geolink MWD
		Description
		Geolink MWD

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Lybrook						
Lybrook P28-2307 02H - Hz - Plan #1	4,400.0	4,400.0	29.1	13.8	1.903	CC, ES
Lybrook P28-2307 02H - Hz - Plan #1	4,413.8	4,413.8	29.2	13.9	1.903	SF

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
 Project: Sandoval County, NM
 Reference Site: Lybrook
 Site Error: 0.0ft
 Reference Well: Lybrook P28-2307 01H
 Well Error: 0.0ft
 Reference Wellbore: Hz
 Reference Design: Plan #1

Local Co-ordinate Reference: Well Lybrook P28-2307 01H
 TVD Reference: WELL @ 6956.0ft (Aztec)
 MD Reference: WELL @ 6956.0ft (Aztec)
 North Reference: True
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: USA EDM 5000 Multi Users DB
 Offset TVD Reference: Offset Datum

Offset Design Lybrook - Lybrook P28-2307 02H - Hz - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-Geolink MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface Toolface (")	Distance		Total Uncertainty Axis	Separation Factor	Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)					Between Centres (ft)	Between Ellipses (ft)
0.0	0.0	0.0	0.0	0.0	0.0	180.00	-29.1	0.0	29.1					
100.0	100.0	100.0	100.0	0.1	0.1	180.00	-29.1	0.0	29.1	28.8	0.29	99.334		
200.0	200.0	200.0	200.0	0.3	0.3	180.00	-29.1	0.0	29.1	28.5	0.64	45.348		
300.0	300.0	300.0	300.0	0.5	0.5	180.00	-29.1	0.0	29.1	28.1	0.99	29.380		
400.0	400.0	400.0	400.0	0.7	0.7	180.00	-29.1	0.0	29.1	27.8	1.34	21.729		
500.0	500.0	500.0	500.0	0.8	0.8	180.00	-29.1	0.0	29.1	27.4	1.69	17.240		
600.0	600.0	600.0	600.0	1.0	1.0	180.00	-29.1	0.0	29.1	27.1	2.04	14.288		
700.0	700.0	700.0	700.0	1.2	1.2	180.00	-29.1	0.0	29.1	26.7	2.39	12.199		
800.0	800.0	800.0	800.0	1.4	1.4	180.00	-29.1	0.0	29.1	26.4	2.74	10.643		
900.0	900.0	900.0	900.0	1.5	1.5	180.00	-29.1	0.0	29.1	26.0	3.09	9.439		
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	180.00	-29.1	0.0	29.1	25.7	3.43	8.480		
1,100.0	1,100.0	1,100.0	1,100.0	1.9	1.9	180.00	-29.1	0.0	29.1	25.3	3.78	7.697		
1,200.0	1,200.0	1,200.0	1,200.0	2.1	2.1	180.00	-29.1	0.0	29.1	25.0	4.13	7.047		
1,300.0	1,300.0	1,300.0	1,300.0	2.2	2.2	180.00	-29.1	0.0	29.1	24.6	4.48	6.498		
1,400.0	1,400.0	1,400.0	1,400.0	2.4	2.4	180.00	-29.1	0.0	29.1	24.3	4.83	6.029		
1,500.0	1,500.0	1,500.0	1,500.0	2.6	2.6	180.00	-29.1	0.0	29.1	23.9	5.18	5.623		
1,600.0	1,600.0	1,600.0	1,600.0	2.8	2.8	180.00	-29.1	0.0	29.1	23.6	5.53	5.268		
1,700.0	1,700.0	1,700.0	1,700.0	2.9	2.9	180.00	-29.1	0.0	29.1	23.2	5.88	4.955		
1,800.0	1,800.0	1,800.0	1,800.0	3.1	3.1	180.00	-29.1	0.0	29.1	22.9	6.23	4.677		
1,900.0	1,900.0	1,900.0	1,900.0	3.3	3.3	180.00	-29.1	0.0	29.1	22.5	6.58	4.429		
2,000.0	2,000.0	2,000.0	2,000.0	3.5	3.5	180.00	-29.1	0.0	29.1	22.2	6.93	4.206		
2,100.0	2,100.0	2,100.0	2,100.0	3.6	3.6	180.00	-29.1	0.0	29.1	21.9	7.27	4.004		
2,200.0	2,200.0	2,200.0	2,200.0	3.8	3.8	180.00	-29.1	0.0	29.1	21.5	7.62	3.821		
2,300.0	2,300.0	2,300.0	2,300.0	4.0	4.0	180.00	-29.1	0.0	29.1	21.2	7.97	3.653		
2,400.0	2,400.0	2,400.0	2,400.0	4.2	4.2	180.00	-29.1	0.0	29.1	20.8	8.32	3.500		
2,500.0	2,500.0	2,500.0	2,500.0	4.3	4.3	180.00	-29.1	0.0	29.1	20.5	8.67	3.359		
2,600.0	2,600.0	2,600.0	2,600.0	4.5	4.5	180.00	-29.1	0.0	29.1	20.1	9.02	3.229		
2,700.0	2,700.0	2,700.0	2,700.0	4.7	4.7	180.00	-29.1	0.0	29.1	19.8	9.37	3.109		
2,800.0	2,800.0	2,800.0	2,800.0	4.9	4.9	180.00	-29.1	0.0	29.1	19.4	9.72	2.997		
2,900.0	2,900.0	2,900.0	2,900.0	5.0	5.0	180.00	-29.1	0.0	29.1	19.1	10.07	2.893		
3,000.0	3,000.0	3,000.0	3,000.0	5.2	5.2	180.00	-29.1	0.0	29.1	18.7	10.42	2.796		
3,100.0	3,100.0	3,100.0	3,100.0	5.4	5.4	180.00	-29.1	0.0	29.1	18.4	10.77	2.706		
3,200.0	3,200.0	3,200.0	3,200.0	5.6	5.6	180.00	-29.1	0.0	29.1	18.0	11.11	2.621		
3,300.0	3,300.0	3,300.0	3,300.0	5.7	5.7	180.00	-29.1	0.0	29.1	17.7	11.46	2.541		
3,400.0	3,400.0	3,400.0	3,400.0	5.9	5.9	180.00	-29.1	0.0	29.1	17.3	11.81	2.466		
3,500.0	3,500.0	3,500.0	3,500.0	6.1	6.1	180.00	-29.1	0.0	29.1	17.0	12.16	2.395		
3,600.0	3,600.0	3,600.0	3,600.0	6.3	6.3	180.00	-29.1	0.0	29.1	16.6	12.51	2.328		
3,700.0	3,700.0	3,700.0	3,700.0	6.4	6.4	180.00	-29.1	0.0	29.1	16.3	12.86	2.265		
3,800.0	3,800.0	3,800.0	3,800.0	6.6	6.6	180.00	-29.1	0.0	29.1	15.9	13.21	2.205		
3,900.0	3,900.0	3,900.0	3,900.0	6.8	6.8	180.00	-29.1	0.0	29.1	15.6	13.56	2.148		
4,000.0	4,000.0	4,000.0	4,000.0	7.0	7.0	180.00	-29.1	0.0	29.1	15.2	13.91	2.094		
4,100.0	4,100.0	4,100.0	4,100.0	7.1	7.1	180.00	-29.1	0.0	29.1	14.9	14.26	2.043		
4,200.0	4,200.0	4,200.0	4,200.0	7.3	7.3	180.00	-29.1	0.0	29.1	14.5	14.60	1.994		
4,300.0	4,300.0	4,300.0	4,300.0	7.5	7.5	180.00	-29.1	0.0	29.1	14.2	14.95	1.948		
4,400.0	4,400.0	4,400.0	4,400.0	7.7	7.7	180.00	-29.1	0.0	29.1	13.8	15.30	1.903 CC, ES		
4,413.8	4,413.8	4,413.8	4,413.8	7.7	7.7	173.23	-29.1	0.0	29.2	13.9	15.35	1.903 SF		
4,500.0	4,499.9	4,496.3	4,496.2	7.8	7.8	173.26	-32.4	0.2	34.9	19.2	15.60	2.233		
4,600.0	4,598.3	4,582.2	4,580.6	8.0	8.0	173.66	-47.9	1.0	69.8	54.2	15.61	4.474		
4,700.0	4,692.0	4,650.0	4,645.0	8.3	8.1	173.49	-68.9	2.2	131.4	116.2	15.27	8.607		
4,800.0	4,778.6	4,700.0	4,690.7	8.6	8.3	178.24	-89.2	3.4	211.8	197.0	14.80	14.308		
4,900.0	4,862.1	4,728.6	4,715.9	9.0	8.4	-151.94	-102.6	4.1	298.7	283.3	15.42	19.366		
5,000.0	4,943.4	4,750.0	4,734.4	9.6	8.4	-124.98	-113.4	4.7	386.7	370.1	16.64	23.244		

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

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
 Project: Sandoval County, NM
 Reference Site: Lybrook
 Site Error: 0.0ft
 Reference Well: Lybrook P28-2307 01H
 Well Error: 0.0ft
 Reference Wellbore: Hz
 Reference Design: Plan #1

Local Co-ordinate Reference: Well Lybrook P28-2307 01H
 TVD Reference: WELL @ 6956.0ft (Aztec)
 MD Reference: WELL @ 6956.0ft (Aztec)
 North Reference: True
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: USA EDM 5000 Multi Users DB
 Offset TVD Reference: Offset Datum

Offset Design Lybrook - Lybrook P28-2307 02H - Hz - Plan #1														Offset Site Error:	0.0 ft
Survey Program: 0-Geolink MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor			
5,100.0	5,020.2	4,775.4	4,755.7	10.2	8.5	-104.40	-127.1	5.5	474.2	456.3	17.88	26.515			
5,200.0	5,090.2	4,800.0	4,775.8	10.9	8.6	-89.12	-141.3	6.3	560.3	541.4	18.92	29.614			
5,300.0	5,151.1	4,800.0	4,775.8	11.9	8.6	-74.59	-141.3	6.3	643.5	623.9	19.59	32.847			
5,400.0	5,201.1	4,800.0	4,775.8	13.1	8.6	-64.25	-141.3	6.3	723.5	703.7	19.88	36.396			
5,500.0	5,238.8	4,815.4	4,788.1	14.5	8.7	-58.69	-150.6	6.8	798.9	778.7	20.19	39.562			
5,600.0	5,262.9	4,817.8	4,789.9	16.1	8.7	-53.83	-152.1	6.9	869.3	849.0	20.29	42.847			
5,700.0	5,272.8	4,817.8	4,789.9	17.9	8.7	-50.57	-152.1	6.9	933.9	913.5	20.35	45.882			
5,800.0	5,272.6	4,816.1	4,788.6	19.7	8.7	-49.94	-151.1	6.8	996.0	974.4	21.61	46.102			
5,900.0	5,272.1	5,991.2	5,260.1	21.7	23.0	-89.34	-621.1	-744.1	1,052.2	1,011.4	40.81	25.786			
6,000.0	5,271.6	6,091.2	5,259.6	23.8	25.0	-89.34	-620.7	-844.1	1,052.2	1,006.9	45.28	23.238			
6,100.0	5,271.1	6,191.2	5,259.0	26.0	27.0	-89.34	-620.4	-944.1	1,052.2	1,002.4	49.84	21.110			
6,200.0	5,270.5	6,291.2	5,258.5	28.2	29.2	-89.34	-620.1	-1,044.1	1,052.2	997.7	54.48	19.315			
6,300.0	5,270.0	6,391.2	5,258.0	30.5	31.3	-89.34	-619.8	-1,144.1	1,052.2	993.1	59.16	17.786			
6,400.0	5,269.5	6,491.2	5,257.5	32.8	33.6	-89.35	-619.4	-1,244.1	1,052.2	988.3	63.88	16.471			
6,500.0	5,269.0	6,591.2	5,256.9	35.1	35.8	-89.35	-619.1	-1,344.1	1,052.2	983.6	68.64	15.330			
6,600.0	5,268.4	6,691.2	5,256.4	37.4	38.1	-89.35	-618.8	-1,444.1	1,052.2	978.8	73.42	14.332			
6,700.0	5,267.9	6,791.2	5,255.9	39.8	40.4	-89.35	-618.4	-1,544.1	1,052.2	974.0	78.22	13.452			
6,800.0	5,267.4	6,891.2	5,255.4	42.2	42.8	-89.35	-618.1	-1,644.1	1,052.2	969.2	83.04	12.672			
6,900.0	5,266.9	6,991.2	5,254.8	44.5	45.1	-89.35	-617.8	-1,744.0	1,052.2	964.4	87.87	11.975			
7,000.0	5,266.3	7,091.2	5,254.3	46.9	47.5	-89.35	-617.5	-1,844.0	1,052.2	959.5	92.72	11.349			
7,100.0	5,265.8	7,191.2	5,253.8	49.3	49.8	-89.35	-617.1	-1,944.0	1,052.2	954.7	97.57	10.784			
7,200.0	5,265.3	7,291.2	5,253.3	51.7	52.2	-89.35	-616.8	-2,044.0	1,052.2	949.8	102.44	10.272			
7,300.0	5,264.8	7,391.2	5,252.8	54.1	54.6	-89.35	-616.5	-2,144.0	1,052.2	944.9	107.31	9.806			
7,400.0	5,264.3	7,491.2	5,252.2	56.6	57.0	-89.35	-616.2	-2,244.0	1,052.2	940.0	112.19	9.379			
7,500.0	5,263.7	7,591.2	5,251.7	59.0	59.4	-89.35	-615.8	-2,344.0	1,052.2	935.2	117.07	8.988			
7,600.0	5,263.2	7,691.2	5,251.2	61.4	61.8	-89.35	-615.5	-2,444.0	1,052.2	930.3	121.96	8.627			
7,700.0	5,262.7	7,791.2	5,250.7	63.8	64.2	-89.35	-615.2	-2,544.0	1,052.2	925.4	126.86	8.295			
7,800.0	5,262.2	7,891.2	5,250.1	66.3	66.7	-89.35	-614.9	-2,644.0	1,052.2	920.5	131.76	7.986			
7,900.0	5,261.6	7,991.2	5,249.6	68.7	69.1	-89.35	-614.5	-2,744.0	1,052.2	915.6	136.66	7.700			
8,000.0	5,261.1	8,091.2	5,249.1	71.2	71.5	-89.35	-614.2	-2,844.0	1,052.2	910.7	141.56	7.433			
8,100.0	5,260.6	8,191.2	5,248.6	73.6	73.9	-89.35	-613.9	-2,944.0	1,052.2	905.8	146.47	7.184			
8,200.0	5,260.1	8,291.2	5,248.0	76.0	76.4	-89.35	-613.6	-3,044.0	1,052.2	900.8	151.38	6.951			
8,300.0	5,259.5	8,391.2	5,247.5	78.5	78.8	-89.35	-613.2	-3,144.0	1,052.2	895.9	156.29	6.732			
8,400.0	5,259.0	8,491.2	5,247.0	80.9	81.2	-89.35	-612.9	-3,244.0	1,052.2	891.0	161.21	6.527			
8,500.0	5,258.5	8,591.2	5,246.5	83.4	83.7	-89.35	-612.6	-3,344.0	1,052.2	886.1	166.13	6.334			
8,600.0	5,258.0	8,691.2	5,246.0	85.8	86.1	-89.35	-612.2	-3,444.0	1,052.2	881.2	171.05	6.152			
8,700.0	5,257.4	8,791.2	5,245.4	88.3	88.6	-89.35	-611.9	-3,544.0	1,052.2	876.3	175.97	5.980			
8,800.0	5,256.9	8,891.2	5,244.9	90.7	91.0	-89.35	-611.6	-3,644.0	1,052.2	871.3	180.89	5.817			
8,900.0	5,256.4	8,991.2	5,244.4	93.2	93.5	-89.35	-611.3	-3,744.0	1,052.2	866.4	185.81	5.663			
9,000.0	5,255.9	9,091.2	5,243.9	95.6	95.9	-89.35	-610.9	-3,844.0	1,052.2	861.5	190.74	5.517			
9,100.0	5,255.4	9,191.2	5,243.3	98.1	98.4	-89.35	-610.6	-3,944.0	1,052.2	856.6	195.66	5.378			
9,200.0	5,254.8	9,291.2	5,242.8	100.6	100.8	-89.35	-610.3	-4,044.0	1,052.2	851.6	200.59	5.246			
9,300.0	5,254.3	9,391.2	5,242.3	103.0	103.3	-89.35	-610.0	-4,144.0	1,052.2	846.7	205.52	5.120			
9,400.0	5,253.8	9,491.2	5,241.8	105.5	105.7	-89.35	-609.6	-4,244.0	1,052.2	841.8	210.45	5.000			
9,500.0	5,253.3	9,591.2	5,241.3	107.9	108.2	-89.35	-609.3	-4,344.0	1,052.2	836.9	215.38	4.886			
9,600.0	5,252.7	9,691.2	5,240.7	110.4	110.6	-89.35	-609.0	-4,444.0	1,052.2	831.9	220.31	4.776			
9,700.0	5,252.2	9,791.2	5,240.2	112.9	113.1	-89.35	-608.7	-4,544.0	1,052.2	827.0	225.24	4.672			
9,800.0	5,251.7	9,891.2	5,239.7	115.3	115.5	-89.35	-608.3	-4,644.0	1,052.2	822.1	230.17	4.571			
9,900.0	5,251.2	9,991.2	5,239.2	117.8	118.0	-89.35	-608.0	-4,744.0	1,052.2	817.1	235.11	4.476			
10,000.0	5,250.6	10,091.2	5,238.6	120.2	120.5	-89.35	-607.7	-4,844.0	1,052.2	812.2	240.04	4.384			
10,011.2	5,250.6	10,102.4	5,238.6	120.5	120.7	-89.35	-607.6	-4,855.2	1,052.2	811.6	240.59	4.374			
10,031.5	5,250.5	10,113.6	5,238.5	121.0	121.0	-89.35	-607.6	-4,866.4	1,052.3	810.9	241.37	4.360			

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

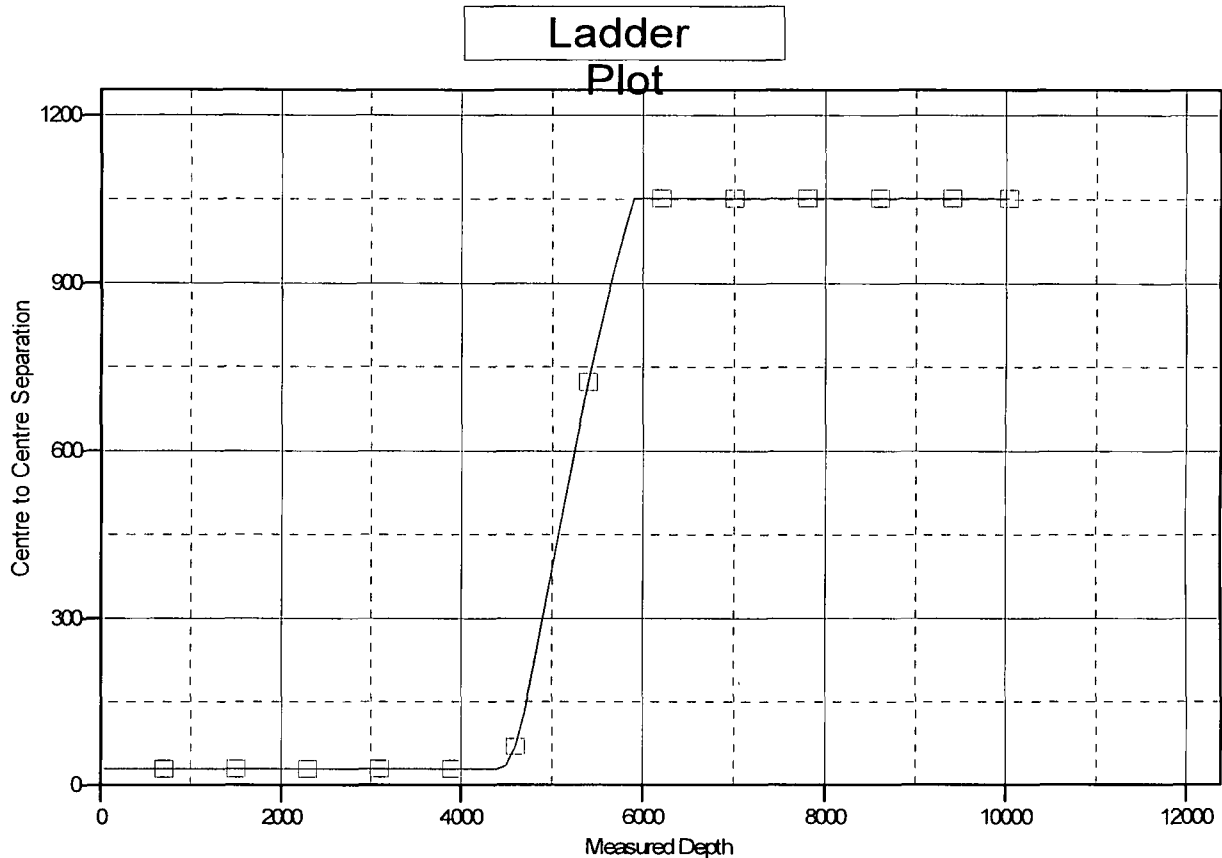
Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Reference Site: Lybrook
Site Error: 0.0ft
Reference Well: Lybrook P28-2307 01H
Well Error: 0.0ft
Reference Wellbore: Hz
Reference Design: Plan #1

Local Co-ordinate Reference: Well Lybrook P28-2307 01H
TVD Reference: WELL @ 6956.0ft (Aztec)
MD Reference: WELL @ 6956.0ft (Aztec)
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA EDM 5000 Multi Users DB
Offset TVD Reference: Offset Datum

Reference Depths are relative to WELL @ 6956.0ft (Aztec)
Offset Depths are relative to Offset Datum
Central Meridian is -106.250000 °

Coordinates are relative to: Lybrook P28-2307 01H
Coordinate System is US State Plane 1983, New Mexico Central Zone
Grid Convergence at Surface is: -0.78°



LEGEND

—□— Lybrook P28-2307 02H, Hz, Plan #1 V0

Directions from the Intersection of US Hwy 550 & US Hwy 64
in Bloomfield, NM to Encana Oil & Gas (USA) Inc. Lybrook P28-2307 01H
1348' FSL & 43' FEL, Section 28, T23N, R7W, N.M.P.M., Sandoval County, NM

Latitude: 36.19423°N Longitude: 107.57122°W Datum: NAD1983

From the intersection of US Hwy 550 & US Hwy 64 in Bloomfield, NM, travel Southerly on US Hwy 550 for 38.7 miles to Mile Marker 112.7;

Go right (Southerly) on County Road #7900 for 4.9 miles to fork in road;

Go straight (South-easterly) remaining on County Road #7900 for 0.2 miles to fork in road;

Go left (North-easterly) exiting County Road #7900 for 2.8 miles to three-way intersection;

Go straight (Easterly) for 0.2 miles to fork in road at gate;

Go straight (Easterly) for 1.0 miles to fork in road;

Go right which is straight (Easterly) for 1.7 miles to fork in road;

Go left (Northerly) for 0.9 miles to new access on right-hand side of existing roadway which continues for 1553' to staked Encana Lybrook P28-2307 01H location.

WELLHEAD BLOWOUT CONTROL SYSTEM

encana

Well name and number:

Lybrook P28-2307 01H

