

AUG 17 2012

Form 3160-3
(August 2007)FORM APPROVED
OMB No. 1004-0137
Expires July 31, 2010UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: ☒ DRILL ☐ REENTER		5. Lease Serial No. NM NM 109391
1b. Type of Well: ☒ Oil Well ☐ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone		6. If Indian, Allottee or Tribe Name N/A
2. Name of Operator Encana Oil & Gas (USA) Inc.		7. If Unit or CA Agreement, Name and No. N/A
3a. Address 370 17th Street, Suite 1700 Denver, CO 80202		8. Lease Name and Well No. Lybrook P01-2207 01H
3b. Phone No. (include area code) 720-876-3989		9. API Well No. 30-043-21134
4. Location of Well (Report location clearly and in accordance with any State requirements.) At surface 816' FSL and 412' FEL Section 1, T22N, R7W At proposed prod. zone 816' FSL and 330' FWL Section 1, T22N, R7W		10. Field and Pool, or Exploratory Lybrook Gallup
11. Sec., T, R, M, or Blk. and Survey or Area Section 1, T22N, R7W NMPM		12. County or Parish Sandoval
13. State NM		14. Distance in miles and direction from nearest town or post office* 62.4 miles S of Bloomfield, NM
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drg. unit line, if any) BHL is 330' from west lease line	16. No. of acres in lease 880 acres	17. Spacing Unit dedicated to this well 160 acres
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. BHL is 205' north of Pettigrew 1	19. Proposed Depth 5372' TVD/ 9667' MD	20. BLM/BIA Bond No. on file COB-000235
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 7153' GL, 7166' KB	22. Approximate date work will start* 11/08/2012	23. Estimated duration 25 days

24. Attachments

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

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

25. Signature <i>Brenda R. Linster</i>	Name (Printed/Typed) Brenda R. Linster	Date 08 07 12
Title Regulatory Advisor		

Approved by (Signature) <i>[Signature]</i>	Name (Printed/Typed) AFM	Date 11/21/12
Title 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)

*(Instructions on page 2)

Hold C104

for Directional Survey
and "As Drilled" platNWOC
OPERATORThis action is subject to technical and
procedural review pursuant to 43 CFR 3160.3
and appeal pursuant to 43 CFR 3165.4DRILLING OPERATIONS AUTHORIZED ARE
SUBJECT TO COMPLIANCE WITH ATTACHED
"GENERAL REQUIREMENTS".

JAN 17 2013 ca

CONFIDENTIAL

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 LANDSHold C104
for Directional Survey
and "As Drilled" platNOTIFY AZTEC OCD 24 HRS.
PRIOR TO CASING & CEMENT

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

AUG 17 2012

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 36-043-21134	Pool Code 42289	Pool Name LYBROOK GALLUP
Property Code 39640	Property Name LYBROOK P01-2207	Well Number 01H
GRID No. 282327	Operator Name ENCANA OIL & GAS (USA) INC.	Elevation 7153'

10 Surface Location

U. or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	1	22N	7W		816	SOUTH	412	EAST	SANDOVAL

11 Bottom Hole Location If Different From Surface

U. or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	1	22N	7W		816	SOUTH	330	WEST	SANDOVAL

Dedicated Acres 150.0 Acres - (S/2 S/2)	Joint or Infill	Consolidation Code	Order No.
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

16 N89°23'08"W 2638.15' (MEASURED) N89°33'22"W 2629.51' (MEASURED)

S89°46'W 2634.72' (RECORD)		S89°46'W 2634.72' (RECORD)	
LOT 4	LOT 3	LOT 2	LOT 1
END OF LATERAL LAT: 36.16330°N LONG: 107.53381°W DATUM: NAD1927		SURFACE LOCATION LAT: 36.16336°N LONG: 107.51850°W DATUM: NAD1927	
LAT: 36.16331°N LONG: 107.53441°W DATUM: NAD1983		LAT: 36.16337°N LONG: 107.51910°W DATUM: NAD1983	
330'		412'	
N89°29.6'W 4521.3'			
PETTIGREW #1 (PSA) LAT: 36.16287°N LONG: 107.53336°W DATUM: NAD1983			
N89°29'36"W 2625.83' (MEASURED) S89°43'W 2625.81' (RECORD)		N89°30'21"W 2627.19' (MEASURED) S89°43'W 2625.81' (RECORD)	

17 OPERATOR CERTIFICATION
I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom-hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or of compulsory pooling order heretofore entered by the Division.
Signature: *Brenda R. Linster*
Printed Name: Brenda R. Linster
E-mail Address: brenda.linster@encana.com

18 SURVEYOR CERTIFICATION
I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.
Date of Survey: JULY 26, 2012
Signature and Seal of Professional Surveyor

JASON C. EDWARDS
Certificate Number 15269

Directions from the Intersection of US Hwy 550 & US Hwy 64
in Bloomfield, NM to Encana Oil & Gas (USA) Inc. Lybrook P01-2207 01H
816' ESL & 412' FEL, Section 1, T22N, R7W, N.M.P.M., Sandoval County, NM

Latitude: 36.16337°N Longitude: 107.51910°W Datum: NAD1983

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

Go right (South-easterly) for 4.3 miles to fork in road;

Go left (South-westerly) for 0.2 miles to 4-way intersection;

Go right (North-westerly) for 0.6 miles to 4-way intersection;

Go straight (Westerly) for 0.2 miles to 4-way intersection;

Go straight (Westerly) for 0.6 miles to fork in road;

Go right (North-westerly) for 1.4 miles to fork in road;

Go right (North-westerly) for 0.9 miles to fork in road;

Go left (South-easterly) for 0.6 miles to fork in road;

Go right (South-westerly) for 100' to new access on left-hand side which continues for 1305' to Encana Lybrook P01-2207 01H staked location.

Lybrook P01-2207 02H
SHL: SESE Section 1, T22N, R7W
816 FSL and 412 FEL
BHL: SWSW Section 1, T22N, R7W
816 FSL and 330 FWL
Sandoval County, New Mexico
Lease Number: NIM NM 109391

**Encana Oil & Gas (USA) Inc.
Drilling Plan**

1. ESTIMATED TOPS OF GEOLOGICAL MARKERS (TVD)

The estimated tops of important geologic markers are as follows:

<u>Formation</u>	<u>Depth (TVD)</u>
Ojo Alamo Ss.	1241'
Kirtland	1461'
Fruitland Coal	1674'
Pictured Cliffs	1893'
Lewis	2024'
Cliffhouse	2660'
Menefee	3346'
Point Lookout	4144'
Mancos	4341'
Mancos Silt	4870'
Gallup	5133'

The referenced surface elevation is 7153', KB 7166'

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

<u>Substance</u>	<u>Formation</u>	<u>Depth (TVD)</u>
Gas	Fruitland Coal	1674'
Gas	Pictured Cliffs	1893'
Gas	Cliffhouse	2660'
Gas	Point Lookout	4144'
Oil/Gas	Mancos	4341'

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 either 70 percent of the casings internal yield pressure or 100 percent of rated working pressure.
- Pressure tests are required before drilling out from under all casing strings set and cemented in place.
- BOP controls must be installed prior to drilling the surface casing plug and will remain in use until the well is completed or abandoned.
- BOP testing procedures and testing frequency will conform to Onshore Order No. 2.

Lybrook P01-2207 02H

SHL: SESE Section 1, T22N, R7W
816 FSL and 412 FEL

BHL: SWSW Section 1, T22N, R7W
816 FSL and 330 FWL

Sandoval County, New Mexico

Lease Number: NM NM 109391

- 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'-5700'MD	8 1/2"	7"	26#	J55, LTC New
Production Liner	5500'-9667'	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.

- 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.

Lybrook P01-2207 02H
 SHL: SESE Section 1, T22N, R7W
 816 FSL and 412 FEL
 BHL: SWSW Section 1, T22N, R7W
 816 FSL and 330 FWL
 Sandoval County, New Mexico
 Lease Number: NMA NMA 109391

Casing	Depth	Cement Volume (sacks)	Cement Type&Yield	Designed TOC	Centralizers
Conductor	60'	100sk	Redi-mix Construction Grade Cement	Surface	None
Surface	500'	178sk	Type III Cement + 1% CaCl + 0.25lb/sk Cello Flake + 0.2% FL, 14.6ppg, 1.38cuf/sk	Surface	1 per joint on bottom 3 joints
Intermediate	5700'	30% open hole excess Lead: 155sk Tail: 448sk	Lead: PremLite + 3% CaCl + 0.25lb/sk Cello Flake + 5lb/sk LCM, 12.1ppg 2.13cuf/sk Tail: Type III Cmt + 1% CaCl + 0.25lb/sk Cello Flake 14.5ppg 1.38cuf/sk	Surface	1 per joint for bottom 3 joints, 1 every 3 joints for remaining joints, turbolizers at base of Ojo Alamo
Production Liner*	5500'-9667'	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 4820'. Directional plans are attached.

Description	Proposed Depth (TVD/MD)	Formation
Horizontal Lateral TD	5372'/9667'	Gallup

Lybrook P01-2207 02H
 SHL: SESE Section 1, T22N, R7W
 816 FSL and 412 FEL
 BHL: SWSW Section 1, T22N, R7W
 816 FSL and 330 FWL
 Sandoval County, New Mexico
 Lease Number: NM NM 109391

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 1/2"	500'TVD-5393'TVD/5700'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"	5700'-9667'	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.
- e) The lateral of this well is approximately 156' North of the Pettigrew 1, which was plugged and abandoned in 1957. The Pettigrew 1 penetrated the Gallup, however, it was neither cased nor completed in this interval. Plugging records indicate 7 cement plugs are in place with cement coverage over the Gallup formation to surface. Given the proximity to the plugged well, extra precautions will be taken during completion operations of this well.
- In the event of any abnormal pressure response, the completion operation will be shut down immediately until the cause of the change in pressure can be identified. Any abnormal events will be reported immediately and operations will cease until further activity is approved.
 - Visual inspection of the surface location of the plugged well will be performed. Any abnormal observations will immediately be reported and operations will cease until further activity is approved.

Lybrook P01-2207 02H

SHL: SESE Section 1, T22N, R7W
816 FSL and 412 FEL

BHL: SWSW Section 1, T22N, R7W
816 FSL and 330 FWL

Sandoval County, New Mexico

Lease Number: NM NM 109391

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

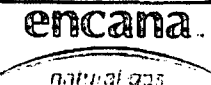
The anticipated bottom hole pressure is +/- 2524 psi based on a 9.0 ppg at 5393' TVD of the landing point of the horizontal lateral. No abnormal pressure or temperatures are anticipated.

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 8, 2012. It is anticipated that completion operations will begin within 30 days after the well has been drilled depending on fracture treatment schedules with various pumping service companies.

It is anticipated that the drilling of this well will take approximately 25 days.

LOC: Sec 01-T22N-R7W County: Sandoval WELL: Lybrook P01-2207 01H			Encana Natural Gas WELL SUMMARY					ENG: J. Fox/ A. RIG: GLE: 7163 RKBE: 7166	8/2/12
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 48 8ppg cmt	Fresh wtr 8.3-9.2	
Surveys After csg is run	None		500	500		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 Mud logger onsite	Ojo Alamo Kirtland Shale Fruitland Coal Pictured Cliffs Ss Lewis Shale Cliffhouse Ss Morefee Fm Point Lookout Ss Mancos Sh KICK OFF PT Mancos Sil Gallup Top	1,241 1,461 1674 1893 2024 2660 3346 4144 4341 4820 4870 5133 5383			8 1/2	7" 26ppf J55 LTC TOC @ surface 30% OH excess: 603sks Lead 155 sks Tail 448sks	Fresh Wtr 8.5-8.8	Vertical <1° KOP 4820 10 deg/100'
Surveys every 500' Gyro at CP MWD Gamma Directional	No OH Logs	horz target Base Gallup	5393 5454	5723		6 1/8	200' overlap at liner top 3950' Lateral	OBM 8.6-9.0	25deg wtd to 5372' TVD TD = 9667' MD
							4 1/2" 11.6ppf SB80 LTC Running external swellable csg packers for isolation of prod string	OBM 8.6-9.0	

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 4820', 8 1/2" hole size
- 5) PU directional tools and start curve at 10deg/100' build rate
- 6) Drill to casing point of 5700' MD (88deg).
- 7) R&C 7" casing, circ cmt to surface. Switch to OBM.
- 8) Land at 90deg, drill 3950' lateral to 9667', run 4 1/2" liner with external swellable csg packers



Project: Sandoval County, NM
 Site: Lybrook
 Well: Lybrook P01-2207 #01H
 Wellbore: HZ
 Design: Plan #2

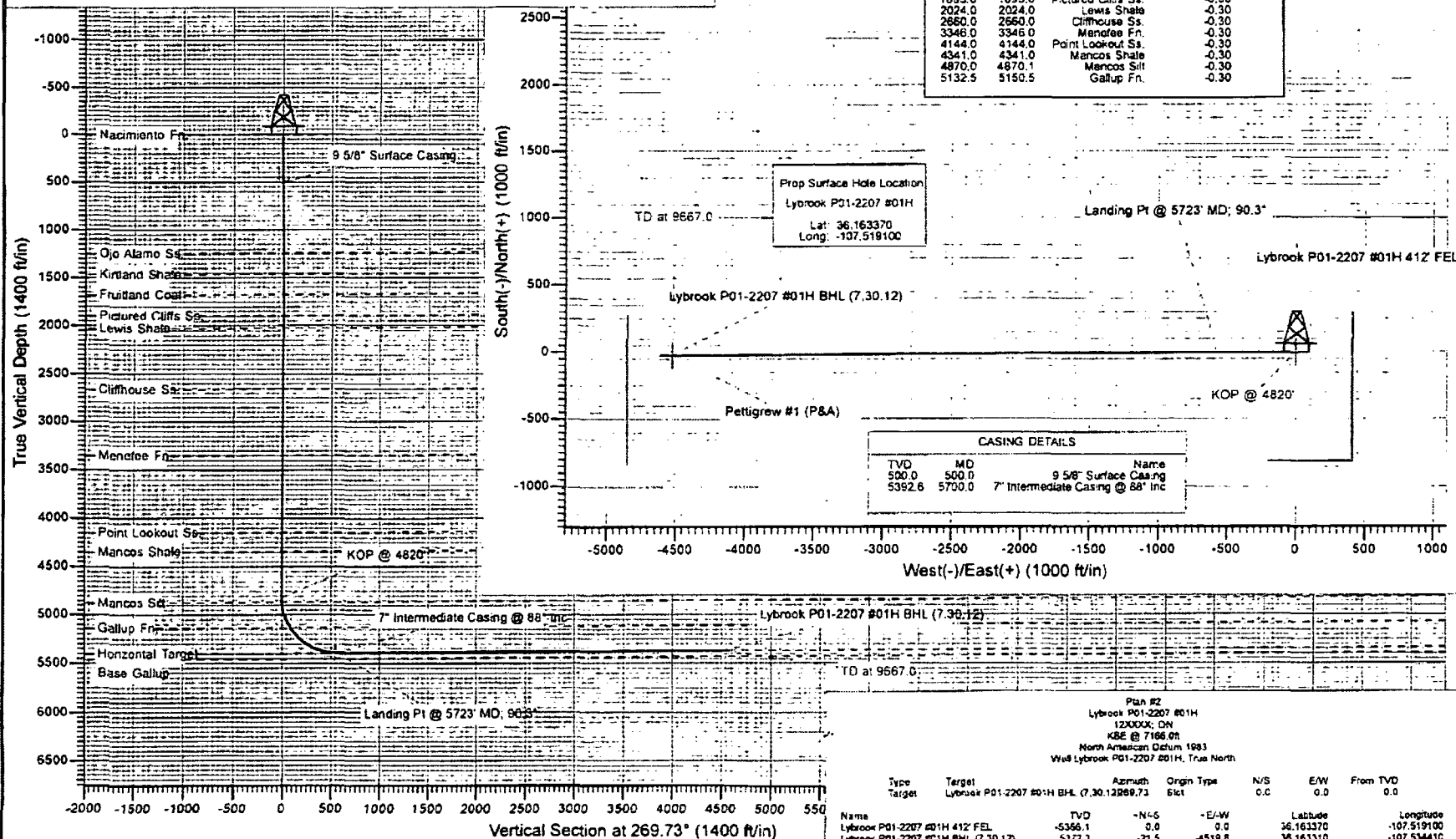


SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSecl	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	4820.0	0.00	0.00	4820.0	0.0	0.0	0.00	0.00	0.0	
3	5723.0	90.30	269.73	5393.0	-2.7	-576.0	10.00	269.73	576.6	
4	9667.0	90.30	269.73	5372.3	-21.5	-4519.8	0.00	0.00	4519.9	Lybrook P01-2207 #01H BHL (7.30.12)

FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle
1241.0	1241.0	Ojo Alamo Ss.	-0.30
1461.0	1461.0	Kirtland Shale	-0.30
1674.0	1674.0	Fruitland Coal	-0.30
1893.0	1893.0	Pictured Cliffs Ss.	-0.30
2024.0	2024.0	Lewis Shale	-0.30
2660.0	2660.0	Climhouse Ss.	-0.30
3346.0	3346.0	Menofee Fr.	-0.30
4144.0	4144.0	Point Lookout Ss.	-0.30
4341.0	4341.0	Mancos Shale	-0.30
4870.0	4870.1	Mancos Silt	-0.30
5132.5	5150.5	Gallup Fr.	-0.30



CASING DETAILS

TVD	MD	Name
500.0	500.0	9 5/8" Surface Casing
5392.6	5700.0	7" Intermediate Casing @ 88" inc

Plan #2

Lybrook P01-2207 #01H
 12XXXX, CH
 K&E @ 7166 ft
 North American Datum 1983
 Well Lybrook P01-2207 #01H, True North

Type	Target	Azimuth	Origin	Type	N/S	E/W	From TVD
Target	Lybrook P01-2207 #01H BHL (7.30.12) 269.73	5150.5	5150.5	5150.5	0.0	0.0	0.0
Name	Lybrook P01-2207 #01H 412' FEL	TVD	-N/-S	-E/-W	Latitude	Longitude	
	Lybrook P01-2207 #01H BHL (7.30.12)	5372.3	-21.5	-4519.8	36.163370	-107.519100	
					36.163310	-107.534410	

Planning Report

Databaso: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Site: Lybrook
Well: Lybrook P01-2207 #01H
Wellbore: HZ
Design: Plan #2

Local Co-ordinate Reference: Well Lybrook P01-2207 #01H
TVD Reference: KBE @ 7166.0ft
MD Reference: KBE @ 7166.0ft
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	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 P01-2207 #01H					
Well Position	+N/-S	0.0 ft	Northing:	1,881,184.29 ft	Latitude:	36.163370
	+E/-W	0.0 ft	Easting:	1,285,808.06 ft	Longitude:	-107.519100
Position Uncertainty	0.0 ft	Wellhead Elevation:	ft	Ground Level:	7,153.0 ft	

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/14/2012	9.61	62.99	50,340

Design	Plan #2				
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	269.73	

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	
4,820.0	0.00	0.00	4,820.0	0.0	0.0	0.00	0.00	0.00	0.00	
5,723.0	90.30	269.73	5,393.0	-2.7	-576.0	10.00	10.00	0.00	269.73	
9,667.0	90.30	269.73	5,372.3	-21.5	-4,519.8	0.00	0.00	0.00	0.00	Lybrook P01-2207 #0

Planning Report

Database: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Site: Lybrook
Well: Lybrook P01-2207 #01H
Wellbore: HZ
Design: Plan #2

Local Co-ordinate Reference: Well Lybrook P01-2207 #01H
TVD Reference: KBE @ 7166.0ft
MD Reference: KBE @ 7166.0ft
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	Lybrook P01-2207 #01H 412' FEL
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" Surface Casing
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	
1,241.0	0.00	0.00	1,241.0	0.0	0.0	0.0	0.00	0.00	Ojo Alamo Ss.
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	
1,461.0	0.00	0.00	1,461.0	0.0	0.0	0.0	0.00	0.00	Kirtland Shale
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	
1,674.0	0.00	0.00	1,674.0	0.0	0.0	0.0	0.00	0.00	Fruitland Coal
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	
1,893.0	0.00	0.00	1,893.0	0.0	0.0	0.0	0.00	0.00	Pictured Cliffs Ss
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	
2,024.0	0.00	0.00	2,024.0	0.0	0.0	0.0	0.00	0.00	Lewis Shale
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	
2,660.0	0.00	0.00	2,660.0	0.0	0.0	0.0	0.00	0.00	Cliffhouse Ss.
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	
3,346.0	0.00	0.00	3,346.0	0.0	0.0	0.0	0.00	0.00	Menafce Fm
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	
4,144.0	0.00	0.00	4,144.0	0.0	0.0	0.0	0.00	0.00	Point Lookout Ss.
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	
4,300.0	0.00	0.00	4,300.0	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 P01-2207 #01H
 Wellbore: HZ
 Design: Plan #2

Local Co-ordinate Reference: Well Lybrook P01-2207 #01H
 TVD Reference: KBE @ 7166.0ft
 MD Reference: KBE @ 7166.0ft
 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
4,341.0	0.00	0.00	4,341.0	0.0	0.0	0.0	0.00	0.00	Mancos Shale
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	
4,600.0	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	
4,820.0	0.00	0.00	4,820.0	0.0	0.0	0.0	0.00	0.00	KOP @ 4820'
4,870.1	5.01	269.73	4,870.0	0.0	-2.2	2.2	10.00	10.00	Mancos Silt
4,900.0	8.00	269.73	4,889.7	0.0	-5.6	5.6	10.00	10.00	
5,000.0	18.00	269.73	4,997.1	-0.1	-28.0	28.0	10.00	10.00	
5,100.0	28.00	269.73	5,089.0	-0.3	-67.1	67.1	10.00	10.00	
5,150.5	33.05	269.73	5,132.5	-0.4	-92.7	92.7	10.00	10.00	Gallup Fr.
5,200.0	38.00	269.73	5,172.7	-0.6	-121.5	121.5	10.00	10.00	
5,300.0	48.00	269.73	5,245.8	-0.9	-189.6	189.6	10.00	10.00	
5,400.0	58.00	269.73	5,305.9	-1.3	-269.3	269.3	10.00	10.00	
5,500.0	68.00	269.73	5,351.2	-1.7	-358.3	358.3	10.00	10.00	
5,600.0	78.00	269.73	5,380.4	-2.2	-453.8	453.8	10.00	10.00	
5,700.0	88.00	269.73	5,392.6	-2.6	-553.0	553.0	10.00	10.00	7" Intermediate Casing @ 88° Inc
5,723.0	90.30	269.73	5,393.0	-2.7	-576.0	576.0	10.00	10.00	Landing Pt @ 5/23' MD: 90.3°
5,800.0	90.30	269.73	5,392.5	-3.1	-652.9	653.0	0.00	0.00	
5,900.0	90.30	269.73	5,392.0	-3.6	-752.9	753.0	0.00	0.00	
6,000.0	90.30	269.73	5,391.5	-4.1	-852.9	853.0	0.00	0.00	
6,100.0	90.30	269.73	5,391.0	-4.5	-952.9	953.0	0.00	0.00	
6,200.0	90.30	269.73	5,390.5	-5.0	-1,052.9	1,053.0	0.00	0.00	
6,300.0	90.30	269.73	5,389.9	-5.5	-1,152.9	1,152.9	0.00	0.00	
6,400.0	90.30	269.73	5,389.4	-6.0	-1,252.9	1,252.9	0.00	0.00	
6,500.0	90.30	269.73	5,388.9	-6.4	-1,352.9	1,352.9	0.00	0.00	
6,600.0	90.30	269.73	5,388.4	-6.9	-1,452.9	1,452.9	0.00	0.00	
6,700.0	90.30	269.73	5,387.8	-7.4	-1,552.9	1,552.9	0.00	0.00	
6,800.0	90.30	269.73	5,387.3	-7.9	-1,652.9	1,652.9	0.00	0.00	
6,900.0	90.30	269.73	5,386.8	-8.3	-1,752.9	1,752.9	0.00	0.00	
7,000.0	90.30	269.73	5,386.3	-8.8	-1,852.9	1,852.9	0.00	0.00	
7,100.0	90.30	269.73	5,385.7	-9.3	-1,952.9	1,952.9	0.00	0.00	
7,200.0	90.30	269.73	5,385.2	-9.8	-2,052.9	2,052.9	0.00	0.00	
7,300.0	90.30	269.73	5,384.7	-10.2	-2,152.9	2,152.9	0.00	0.00	
7,400.0	90.30	269.73	5,384.2	-10.7	-2,252.9	2,252.9	0.00	0.00	
7,500.0	90.30	269.73	5,383.6	-11.2	-2,352.9	2,352.9	0.00	0.00	
7,600.0	90.30	269.73	5,383.1	-11.7	-2,452.9	2,452.9	0.00	0.00	
7,700.0	90.30	269.73	5,382.6	-12.1	-2,552.9	2,552.9	0.00	0.00	
7,800.0	90.30	269.73	5,382.1	-12.6	-2,652.9	2,652.9	0.00	0.00	
7,900.0	90.30	269.73	5,381.6	-13.1	-2,752.9	2,752.9	0.00	0.00	
8,000.0	90.30	269.73	5,381.0	-13.6	-2,852.9	2,852.9	0.00	0.00	
8,100.0	90.30	269.73	5,380.5	-14.0	-2,952.9	2,952.9	0.00	0.00	
8,200.0	90.30	269.73	5,380.0	-14.5	-3,052.9	3,052.9	0.00	0.00	
8,300.0	90.30	269.73	5,379.5	-15.0	-3,152.9	3,152.9	0.00	0.00	
8,400.0	90.30	269.73	5,378.9	-15.5	-3,252.9	3,252.9	0.00	0.00	
8,500.0	90.30	269.73	5,378.4	-15.9	-3,352.9	3,352.9	0.00	0.00	
8,600.0	90.30	269.73	5,377.9	-16.4	-3,452.9	3,452.9	0.00	0.00	
8,700.0	90.30	269.73	5,377.4	-16.9	-3,552.9	3,552.9	0.00	0.00	
8,800.0	90.30	269.73	5,376.8	-17.4	-3,652.9	3,652.9	0.00	0.00	
8,900.0	90.30	269.73	5,376.3	-17.8	-3,752.9	3,752.9	0.00	0.00	
9,000.0	90.30	269.73	5,375.8	-18.3	-3,852.9	3,852.9	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 P01-2207 #01H
Wellbore: HZ
Design: Plan #2

Local Co-ordinate Reference: Well Lybrook P01-2207 #01H
TVD Reference: KBE @ 7166.0ft
MD Reference: KBE @ 7166.0ft
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
9,100.0	90.30	269.73	5,375.3	-18.8	-3,952.9	3,952.9	0.00	0.00	
9,200.0	90.30	269.73	5,374.7	-19.3	-4,052.9	4,052.9	0.00	0.00	
9,300.0	90.30	269.73	5,374.2	-19.7	-4,152.9	4,152.9	0.00	0.00	
9,400.0	90.30	269.73	5,373.7	-20.2	-4,252.9	4,252.9	0.00	0.00	
9,500.0	90.30	269.73	5,373.2	-20.7	-4,352.9	4,352.9	0.00	0.00	
9,600.0	90.30	269.73	5,372.7	-21.2	-4,452.9	4,452.9	0.00	0.00	
9,667.0	90.30	269.73	5,372.3	-21.5	-4,519.8	4,519.9	0.00	0.00	TD at 9667.0 - Lybrook P01-2207 #01H BHL (7

Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N-S (ft)	+E-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
Lybrook P01-2207 #01H	0.00	0.00	-5,366.1	0.0	0.0	1,881,184.29	1,265,808.06	36.163370	-107.519100
- plan misses target center by 5366.1ft at 0.0ft MD (0.0 TVD, 0.0 N, 0.0 E)									
- Polygon									
Point 1			-5,366.1	300.0	412.0	1,881,478.88	1,268,223.94		
Point 2			-5,366.1	-816.0	412.0	1,880,362.98	1,266,209.36		
Point 3			-5,366.1	-816.0	-200.0	1,880,370.98	1,265,597.41		
Point 4			-5,366.1	-816.0	412.0	1,880,362.98	1,266,209.36		
Lybrook P01-2207 #01H	0.00	0.00	5,372.3	-21.5	-4,519.8	1,881,221.89	1,261,288.35	36.163310	-107.534410
- plan hits target center									
- Polygon									
Point 1			5,372.3	300.0	-330.0	1,881,526.17	1,260,962.30		
Point 2			5,372.3	-816.0	-330.0	1,880,410.27	1,260,947.71		

5,700.0	5,392.6	7" Intermediate Casing @ 88° Inc	0.000	0.000
500.0	500.0	9 5/8" Surface Casing	0.000	0.000

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,241.0	1,241.0	Ojo Alamo Ss.		-0.30	269.73
1,461.0	1,461.0	Kirtland Shale		-0.30	269.73
1,674.0	1,674.0	Fruitland Coal		-0.30	269.73
1,893.0	1,893.0	Pictured Cliffs Ss.		-0.30	269.73
2,024.0	2,024.0	Lewis Shale		-0.30	269.73
2,660.0	2,660.0	Cliffhouse Ss.		-0.30	269.73
3,346.0	3,346.0	Menefee Fn.		-0.30	269.73
4,144.0	4,144.0	Point Lookout Ss.		-0.30	269.73
4,341.0	4,341.0	Mancos Shale		-0.30	269.73
4,870.1	4,870.0	Mancos Silt		-0.30	269.73
5,150.5	5,133.0	Gallup Fn.		-0.30	269.73

Planning Report

Databaso: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Site: Lybrook
Well: Lybrook P01-2207 #01H
Wellbore: HZ
Design: Plan #2

Local Co-ordinate Reference: Well Lybrook P01-2207 #01H
TVD Reference: KBE @ 7166.0ft
MD Reference: KBE @ 7166.0ft
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)	
4,820.0	4,820.0	0.0	0.0	KOP @ 4820'
5,723.0	5,393.0	-2.7	-576.0	Landing Pt @ 5723' MD; 90.3°
9,667.0	5,372.3	-21.5	-4,519.8	TD at 9667.0

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lybrook P01-2207 #01H
Project:	Sandoval County, NM	TVD Reference:	KBE @ 7166.0ft
Reference Site:	Lybrook	MD Reference:	KBE @ 7166.0ft
Site Error:	0.0ft	North Reference:	True
Reference Well:	Lybrook P01-2207 #01H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #2	Offset TVD Reference:	Offset Datum

Reference	Plan #2
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 500.0ft
Warning Levels Evaluated at:	2.00 Sigma
Error Model:	Systematic Ellipse
Scan Method:	Closest Approach 3D
Error Surface:	Elliptical Conic

Survey Tool Program		Date	7/30/2012	
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	9,667.0	Plan #2 (HZ)	MWD	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							
Pettigrew #1 (P&A) - Existing - Existing	9,357.8	5,441.9	161.7	47.9	1.421	Level 3, CC, ES, SF	

Lybrook - Pettigrew #1 (P&A) - Existing - Existing													Offset Site Error: 0.0 ft	
Survey Program: 6000-MWD													Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							
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	Warning	
8,000.0	5,376.3	5,444.3	5,444.3	93.0	9.5	-90.85	-181.7	-4,209.9	485.5	363.0	102.52	4.735		
9,000.0	5,375.8	5,443.8	5,443.8	95.5	9.5	-90.66	-181.7	-4,209.9	392.8	287.6	104.99	3.740		
9,100.0	5,375.3	5,443.3	5,443.3	98.0	9.5	-90.48	-181.7	-4,209.9	304.3	198.8	107.46	2.832		
9,200.0	5,374.7	5,442.7	5,442.7	100.4	9.5	-90.29	-181.7	-4,209.9	225.9	116.0	109.92	2.055		
9,300.0	5,374.2	5,442.2	5,442.2	102.9	9.5	-90.11	-181.7	-4,209.9	171.7	59.3	112.39	1.528		
9,357.8	5,373.9	5,441.9	5,441.9	104.3	9.5	-90.00	-181.7	-4,209.9	161.7	47.9	113.81	1.421	Level 3, CC, ES, SF	
9,400.0	5,373.7	5,441.7	5,441.7	105.4	9.5	-89.92	-181.7	-4,209.9	167.1	52.3	114.85	1.455	Level 3	
9,500.0	5,373.2	5,441.2	5,441.2	107.8	9.5	-89.74	-181.7	-4,209.9	215.4	98.0	117.31	1.836		
9,600.0	5,372.7	5,440.7	5,440.7	110.3	9.5	-89.55	-181.7	-4,209.9	291.2	171.5	119.78	2.432		
9,667.0	5,372.3	5,440.3	5,440.3	111.9	9.5	-89.43	-181.7	-4,209.9	348.9	227.5	121.42	2.874		

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

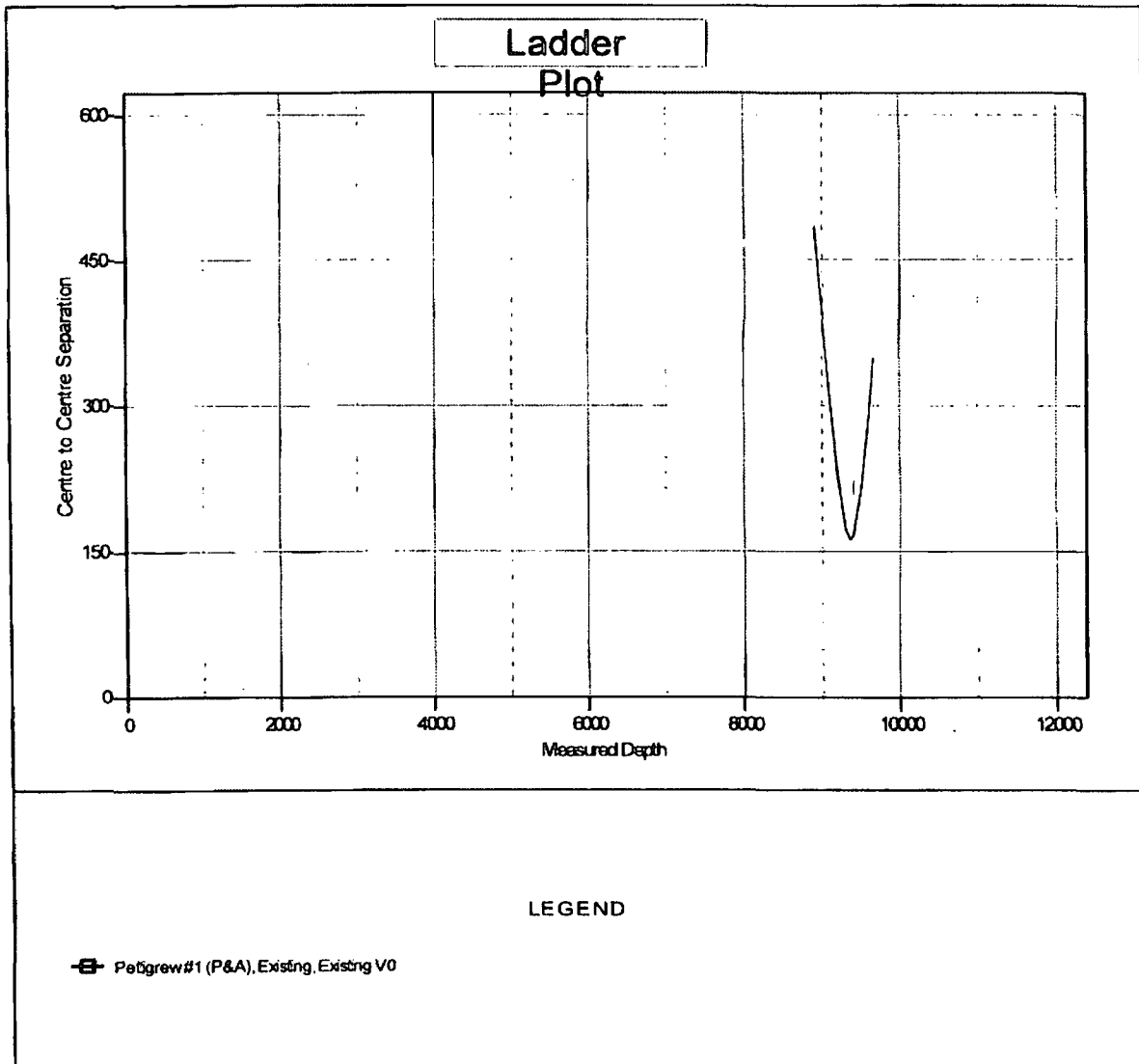
Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
 Project: Sandoval County, NM
 Reference Site: Lybrook
 Site Error: 0.0ft
 Reference Well: Lybrook P01-2207 #01H
 Well Error: 0.0ft
 Reference Wellbore: HZ
 Reference Design: Plan #2

Local Co-ordinate Reference: Well Lybrook P01-2207 #01H
 TVD Reference: KBE @ 7166.0ft
 MD Reference: KBE @ 7166.0ft
 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 KBE @ 7166.0ft
 Offset: Depths are relative to Offset Datum
 Central Meridian is -106.250000°

Coordinates are relative to: Lybrook P01-2207 #01H
 Coordinate System is US State Plane 1983, New Mexico Central Zone
 Grid Convergence at Surface is: -0.75°



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



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	_____	S8-80
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

WELLHEAD BLOWOUT CONTROL SYSTEM



Well name and number:

Lybrook P01-2207 01H

