

DEC 01 2014

Form 3160-5
(March 2012)UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

NOV 19 2014

FORM APPROVED
OMB No. 1004-0137
Expires: October 31, 2014

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.5. Lease Serial No.
NMNM 81638, NM 36943, NOG 1403-1912

6. If Indian, Allottee or Tribe Name

SUBMIT IN TRIPLICATE - Other instructions on page 2.

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: 1391' FNL and 2114' FEL Sec 30, T23N, R7W
BHL: 2221' FNL and 330' FWL Sec 25, T23N, R8W7. If Unit of CA/Agreement, Name and/or No.
N/A8. Well Name and No.
Lybrook G30-2307 03H9. API Well No.
30-043-2123710. Field and Pool or Exploratory Area
Basin Mancos Pool11. County or Parish, State
Sandoval, NM

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 recompleat 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) wishes to modify the drilling plan for the Lybrook G30-2307 03H well to cement the 4 1/2" production liner, instead of running open hole swell packers, as previously planned. Attached is an updated Directional Drilling Plan, 10-Point Drilling Plan and Wellbore Diagram that reflect this change. Please note, the 7" ICP was also moved from approximately 72 degrees to approximately 55 degrees.

CONDITIONS OF APPROVAL

Adhere to previously issued stipulations

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

ADHERE TO PREVIOUS NMOCD
CONDITIONS OF APPROVAL

14. I hereby certify that the foregoing is true and correct. Name (Printed/Typed)

Cristi Bauer

Title Operations Technician

Signature

Cristi Bauer

Date

11/18/14

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

William Tambekou

Title

Petroleum Engineer

Date

11/20/2014

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

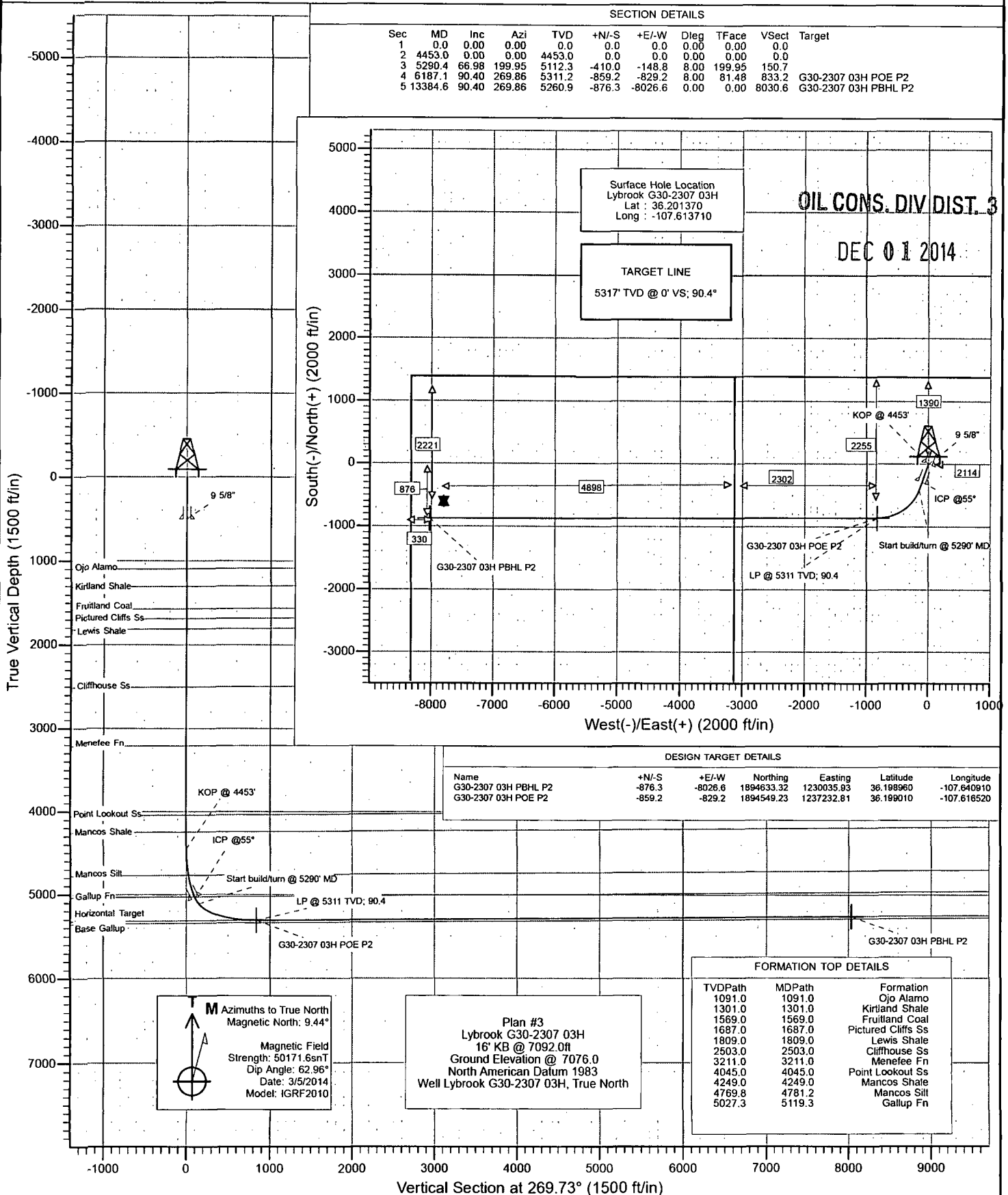
FFO

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)

NMOCD

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Lybrook G30-2307 03H

SHL: SW/4 NE/4 Sec 30 T23N R7W, 1391' FNL, 2114' FEL

BHL: SW/4 NW/4 Sec 25 T23N R8W, 2221' FNL, 330' FWL

Sandoval, 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
Nacimiento	0
Ojo Alamo	1,091
Kirtland Shale	1,301
Fruitland Coal	1,569
Pictured Cliffs Ss.	1,687
Lewis Shale	1,809
Cliffhouse Ss.	2,503
Menefee Fn.	3,211
Point Lookout Ss.	4,045
Mancos Shale	4,249
Mancos Silt	4,770
Gallup Fn.	5,028
Horizontal Target	5,317

The referenced surface elevation is 7076', KB 7092'

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

Substance	Formation	Depth (TVD) units = feet
Water/Gas	Fruitland Coal	1,569
Oil/Gas	Pictured Cliffs Ss.	1,687
Oil/Gas	Cliffhouse Ss.	2,503
Gas	Menefee Fn.	3,211
Oil/Gas	Point Lookout Ss.	4,045
Oil/Gas	Mancos Shale	4,249
Oil/Gas	Mancos Silt	4,770
Oil/Gas	Gallup Fn.	5,028

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

Lybrook G30-2307 03H

SHL: SW/4 NE/4 Sec 30 T23N R7W, 1391' FNL, 2114' FEL

BHL: SW/4 NW/4 Sec 25 T23N R8W, 2221' FNL, 330' FWL

Sandoval, New Mexico

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.
- 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 (MD)	Hole Size	Csg Size	Weight	Grade
Conductor	0'-60'	26"	16"	42.09#	
Surface	0'-500'	12 1/4"	9 5/8"	36#	J55, STC New
Intermediate	0'-5141'	8 3/4"	7"	26#	J55, LTC New
Production Liner	5041'-13385'	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

Lybrook G30-2307 03H

SHL: SW/4 NE/4 Sec 30 T23N R7W, 1391' FNL, 2114' FEL

BHL: SW/4 NW/4 Sec 25 T23N R8W, 2221' FNL, 330' FWL

Sandoval, New Mexico

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

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'	228 sks	Type III Cement + 1% bwoc Calcium Chloride + 0.25 lbs/sack Cello Flake + 0.2% bwoc FL-52A + 58.9% Fresh Water	Surface	1 per joint on bottom 3 joints
Intermediate	0'-5141'	100% open hole excess Stage 1 Lead: 477 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	5041'-13385'	50% OH excess Stage 1 Blend Total: 463sks	Blend: Premium Lite High Strength FM + 0.7% bwoc R-3 + 3% bwow Potassium Chloride + 0.25lbs/sack Cello Flake + 0.5% bwoc CD-32 + 1.15% bwoc FL- 52A + 60 lbs/sack Calcium Carbonate + 124.4% Fresh Water. Yield 2.63 cuft/sk	Liner Hanger	N/A

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 2900'. Directional plans are attached.

Description	Proposed Depth (TVD/MD)	Formation
Horizontal Lateral TD	5261'/13385'	Gallup

Lybrook G30-2307 03H

SHL: SW/4 NE/4 Sec 30 T23N R7W, 1391' FNL, 2114' FEL

BHL: SW/4 NW/4 Sec 25 T23N R8W, 2221' FNL, 330' FWL

Sandoval, New Mexico

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'-500'/500'	Fresh Water	8.3-10	60-70	NC
8 3/4"	500'/500'-5040'/5141'	Fresh Water LSND	8.3-10	40-50	8-10

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"	5040'/5141'- 5261'/13385'	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 +/- 2488 psi based on a 9.0 ppg at 5317' 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 November 5, 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: Lybrook G30-2307 03H County: Sandoval WELL: Lybrook G30-2307 03H			Encana Natural Gas WELL SUMMARY				ENG: Jeff Villalobos 11/18/14 RIG: Unassigned GLE: 7076 RKBE: 7092		
MWD LWD	OPEN HOLE LOGGING	FORM	DEPTH TVDMD			HOLE SIZE	CASING SPECS	MW MUD TYPE	DEVIATION INFORMATION
			60 0	60' 500		26	16" 42.09# 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	San Jose Fn.	0			12 1/4	9 5/8" 36ppf J55 STC	Fresh wtr	Vertical <1°
		Nacimiento 9 5/8" Csg	0 500	500.00			TOC Surface with 100% OH Excess: 228 sks Type III Cement + 1% bwoc Calcium Chloride + 0.25 lbs/sack Cello Flake + 0.2% bwoc FL-52A + 58.9% Fresh Water.	8.3-10	
Survey Every 60'-120', updating anticollision report after surveys. Stop operations and contact drilling engineer if separation factor approaches 1.5	No OH logs	Ojo Alamo Kirtland Shale	1,091 1,301			8 3/4	7" 26ppf J55 LTC	Fresh Wtr	Vertical <1°
		Fruitland Coal	1,569				TOC @ surface (100% OH excess - 70% Lead 30% Tail) Stage 1 Total: 844sks	8.3-10	
		Pictured Cliffs Ss. Lewis Shale	1,687 1,809				Stage 1 Lead: 477 sks Premium Lite FM + 3% CaCl2 + 0.25/sk Cello Flake + 5#/sk LCM-1 + 8% Bentonite + 0.4% FL-52A + 0.4% Sodium Metasilicate. Mixed at 12.1 ppg. Yield 2.13 cuft/sk.		
		Cliffhouse Ss. Menefee Fn.	2,503 3,211				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.		
		Point Lookout Ss. Mancos Shale	4,045 4,249						
		KOP	2,900				2,900		
Surveys every 30' through the curve	Mud logger onsite	Mancos Silt	4,770						
		Gallup Fn.	5,028						
		7" Csg	5,040	5,141'					
Surveys every stand to TD unless directed otherwise by Geologist	No OH Logs	Horizontal Target TD	5,317 5,261	13,385		6 1/8	100' overlap at liner top		Horz Inc/TVD 90.4 degdeg/5317ft
		Base Gallup	5,346			8244' Drilled Lateral		TD = 13384.6 MD	
MWD Gamma Directional							4 1/2" 11.6ppf SB80 LTC	WBM 8.3-10	
							TOC @ hanger (50% OH excess) Stage 1 Total: 463sks Stage 1 Blend: 463 sks Premium Lite High Strength FM + 0.7% bwoc R-3 + 3% bwow Potassium Chloride + 0.25lbs/sack Cello Flake + 0.5% bwoc CD-32 + 1.15% bwoc FL-52A + 60 lbs/sack Calcium Carbonate + 124.4% Fresh Water. Yield 2.63 cuft/sk.		

NOTES:

- 1) Drill with 26" bit to 60', set 16" 42.09ppf 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 2900', 8 3/4 inch holesize
- 5) Start curve at 10deg/100' build rate
- 6) Drill to csg point of 5141' MD
- 7) R&C 7" csg, circ cmt to surface
- 8) Land at ~90 deg, drill lateral to 13385' run 4 1/2 inch cemented liner

OIL CONS. DIV DIST. 3
DEC 01 2014

Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
 Company: EnCana Oil & Gas (USA) Inc
 Project: Sandoval County, NM
 Site: S30-T23N-R7W
 Well: Lybrook G30-2307 03H
 Wellbore: HZ
 Design: Plan #3

Local Co-ordinate Reference: Well Lybrook G30-2307 03H
 TVD Reference: 16' KB @ 7092.0ft
 MD Reference: 16' KB @ 7092.0ft
 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	S30-T23N-R7W				
Site Position:		Northing:	1,891,883.94 ft	Latitude:	36.191750
From:	Lat/Long	Easting:	1,238,783.16 ft	Longitude:	-107.611140
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-0.80 °

Well	Lybrook G30-2307 03H					
Well Position	+N/-S	0.0 ft	Northing:	1,895,396.71 ft	Latitude:	36.201370
	+E/-W	0.0 ft	Easting:	1,238,074.01 ft	Longitude:	-107.613710
Position Uncertainty	0.0 ft	Wellhead Elevation:	ft	Ground Level:	7,076.0 ft	

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	3/5/2014	9.44	62.96	50,172

Design	Plan #3			
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	
4,453.0	0.00	0.00	4,453.0	0.0	0.0	0.00	0.00	0.00	0.00	
5,290.4	66.98	199.95	5,112.3	-410.0	-148.8	8.00	8.00	0.00	199.95	
6,187.1	90.40	269.86	5,311.2	-859.2	-829.2	8.00	2.61	7.80	81.48	G30-2307 03H POE F
13,384.6	90.40	269.86	5,260.9	-876.3	-8,026.6	0.00	0.00	0.00	0.00	G30-2307 03H PBHL

Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
 Company: EnCana Oil & Gas (USA) Inc
 Project: Sandoval County, NM
 Site: S30-T23N-R7W
 Well: Lybrook G30-2307 03H
 Wellbore: HZ
 Design: Plan #3

Local Co-ordinate Reference: Well Lybrook G30-2307 03H
 TVD Reference: 16' KB @ 7092.0ft
 MD Reference: 16' KB @ 7092.0ft
 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	
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	
1,091.0	0.00	0.00	1,091.0	0.0	0.0	0.0	0.00	0.00	Ojo Alamo
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	
1,301.0	0.00	0.00	1,301.0	0.0	0.0	0.0	0.00	0.00	Kirtland Shale
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	
1,569.0	0.00	0.00	1,569.0	0.0	0.0	0.0	0.00	0.00	Fruitland Coal
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	
1,687.0	0.00	0.00	1,687.0	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	
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	
1,809.0	0.00	0.00	1,809.0	0.0	0.0	0.0	0.00	0.00	Lewis Shale
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	
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	
2,503.0	0.00	0.00	2,503.0	0.0	0.0	0.0	0.00	0.00	Cliffhouse Ss
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	KOP @ 2900'
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	
3,211.0	0.00	0.00	3,211.0	0.0	0.0	0.0	0.00	0.00	Menefee Fn
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	
4,045.0	0.00	0.00	4,045.0	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	
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	
4,249.0	0.00	0.00	4,249.0	0.0	0.0	0.0	0.00	0.00	Mancos Shale

Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Site: S30-T23N-R7W
Well: Lybrook G30-2307 03H
Wellbore: HZ
Design: Plan #3

Local Co-ordinate Reference: Well Lybrook G30-2307 03H
TVD Reference: 16' KB @ 7092.0ft
MD Reference: 16' KB @ 7092.0ft
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
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	
4,348.4	0.00	0.00	4,348.4	0.0	0.0	0.0	0.00	0.00	EOB; Inc=28.97°
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	
4,453.0	0.00	0.00	4,453.0	0.0	0.0	0.0	0.00	0.00	
4,500.0	3.76	199.95	4,500.0	-1.4	-0.5	0.5	8.00	8.00	
4,600.0	11.76	199.95	4,599.0	-14.1	-5.1	5.2	8.00	8.00	
4,700.0	19.76	199.95	4,695.1	-39.6	-14.4	14.6	8.00	8.00	
4,781.2	26.25	199.95	4,769.8	-69.4	-25.2	25.5	8.00	8.00	Mancos Silt
4,800.0	27.75	199.95	4,786.6	-77.5	-28.1	28.5	7.99	7.99	
4,900.0	35.75	199.95	4,871.6	-126.9	-46.1	46.7	8.00	8.00	
5,000.0	43.75	199.95	4,948.4	-187.0	-67.9	68.7	8.00	8.00	
5,043.8	47.25	199.95	4,979.1	-216.3	-78.5	79.5	8.00	8.00	Start build/turn @ 5043' MD
5,100.0	51.75	199.95	5,015.6	-256.5	-93.1	94.3	8.00	8.00	
5,119.3	53.29	199.95	5,027.3	-270.9	-98.3	99.6	8.00	8.00	Gallup Fn
5,140.7	55.00	199.95	5,039.8	-287.2	-104.2	105.6	8.00	8.00	ICP @55°
5,200.0	59.75	199.95	5,071.8	-334.1	-121.3	122.8	8.00	8.00	
5,290.4	66.98	199.95	5,112.3	-410.0	-148.8	150.7	8.00	8.00	
5,300.0	67.09	200.77	5,116.1	-418.3	-151.9	153.9	7.99	1.21	
5,400.0	68.55	209.27	5,153.9	-502.1	-191.0	193.4	8.00	1.45	
5,500.0	70.42	217.58	5,189.0	-580.2	-242.6	245.3	8.00	1.87	
5,600.0	72.66	225.68	5,220.7	-651.0	-305.6	308.7	8.00	2.24	
5,700.0	75.23	233.56	5,248.4	-713.1	-378.8	382.1	8.00	2.56	
5,800.0	78.05	241.26	5,271.5	-765.4	-460.7	464.3	8.00	2.82	
5,841.2	79.27	244.38	5,279.6	-783.9	-496.6	500.2	8.00	2.97	LP @ 5311' TVD; 90.4°
5,900.0	81.07	248.79	5,289.6	-806.9	-549.8	553.6	8.00	3.06	
6,000.0	84.25	256.20	5,302.4	-836.7	-644.3	648.2	8.00	3.18	
6,100.0	87.52	263.52	5,309.6	-854.2	-742.4	746.4	8.00	3.27	
6,151.5	89.22	267.28	5,311.1	-858.3	-793.7	797.7	8.00	3.31	G30-2307 03H POE
6,187.1	90.40	269.86	5,311.2	-859.2	-829.2	833.2	8.00	3.31	G30-2307 03H POE P2
6,200.0	90.40	269.86	5,311.1	-859.3	-842.2	846.2	0.00	0.00	
6,300.0	90.40	269.86	5,310.4	-859.5	-942.2	946.2	0.00	0.00	
6,400.0	90.40	269.86	5,309.7	-859.7	-1,042.2	1,046.2	0.00	0.00	
6,500.0	90.40	269.86	5,309.0	-860.0	-1,142.2	1,146.2	0.00	0.00	
6,600.0	90.40	269.86	5,308.3	-860.2	-1,242.2	1,246.2	0.00	0.00	
6,700.0	90.40	269.86	5,307.6	-860.4	-1,342.2	1,346.2	0.00	0.00	
6,800.0	90.40	269.86	5,306.9	-860.7	-1,442.2	1,446.2	0.00	0.00	
6,900.0	90.40	269.86	5,306.2	-860.9	-1,542.2	1,546.2	0.00	0.00	
7,000.0	90.40	269.86	5,305.5	-861.2	-1,642.1	1,646.2	0.00	0.00	
7,100.0	90.40	269.86	5,304.8	-861.4	-1,742.1	1,746.2	0.00	0.00	
7,200.0	90.40	269.86	5,304.1	-861.6	-1,842.1	1,846.2	0.00	0.00	
7,300.0	90.40	269.86	5,303.4	-861.9	-1,942.1	1,946.2	0.00	0.00	
7,400.0	90.40	269.86	5,302.7	-862.1	-2,042.1	2,046.2	0.00	0.00	
7,500.0	90.40	269.86	5,302.0	-862.3	-2,142.1	2,146.2	0.00	0.00	
7,600.0	90.40	269.86	5,301.3	-862.6	-2,242.1	2,246.2	0.00	0.00	
7,700.0	90.40	269.86	5,300.6	-862.8	-2,342.1	2,346.2	0.00	0.00	
7,800.0	90.40	269.86	5,299.9	-863.1	-2,442.1	2,446.2	0.00	0.00	
7,900.0	90.40	269.86	5,299.2	-863.3	-2,542.1	2,546.2	0.00	0.00	
8,000.0	90.40	269.86	5,298.5	-863.5	-2,642.1	2,646.2	0.00	0.00	
8,100.0	90.40	269.86	5,297.8	-863.8	-2,742.1	2,746.2	0.00	0.00	
8,200.0	90.40	269.86	5,297.1	-864.0	-2,842.1	2,846.2	0.00	0.00	
8,300.0	90.40	269.86	5,296.4	-864.2	-2,942.1	2,946.2	0.00	0.00	
8,400.0	90.40	269.86	5,295.7	-864.5	-3,042.1	3,046.2	0.00	0.00	

Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Site: S30-T23N-R7W
Well: Lybrook G30-2307 03H
Wellbore: HZ
Design: Plan #3

Local Co-ordinate Reference: Well Lybrook G30-2307 03H
TVD Reference: 16' KB @ 7092.0ft
MD Reference: 16' KB @ 7092.0ft
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
8,500.0	90.40	269.86	5,295.0	-864.7	-3,142.1	3,146.2	0.00	0.00	
8,600.0	90.40	269.86	5,294.3	-865.0	-3,242.1	3,246.1	0.00	0.00	
8,700.0	90.40	269.86	5,293.6	-865.2	-3,342.1	3,346.1	0.00	0.00	
8,800.0	90.40	269.86	5,292.9	-865.4	-3,442.1	3,446.1	0.00	0.00	
8,900.0	90.40	269.86	5,292.2	-865.7	-3,542.1	3,546.1	0.00	0.00	
9,000.0	90.40	269.86	5,291.5	-865.9	-3,642.1	3,646.1	0.00	0.00	
9,100.0	90.40	269.86	5,290.8	-866.1	-3,742.1	3,746.1	0.00	0.00	
9,200.0	90.40	269.86	5,290.1	-866.4	-3,842.1	3,846.1	0.00	0.00	
9,300.0	90.40	269.86	5,289.4	-866.6	-3,942.1	3,946.1	0.00	0.00	
9,400.0	90.40	269.86	5,288.7	-866.9	-4,042.1	4,046.1	0.00	0.00	
9,500.0	90.40	269.86	5,288.0	-867.1	-4,142.1	4,146.1	0.00	0.00	
9,600.0	90.40	269.86	5,287.3	-867.3	-4,242.1	4,246.1	0.00	0.00	
9,700.0	90.40	269.86	5,286.6	-867.6	-4,342.1	4,346.1	0.00	0.00	
9,800.0	90.40	269.86	5,286.0	-867.8	-4,442.1	4,446.1	0.00	0.00	
9,900.0	90.40	269.86	5,285.3	-868.0	-4,542.1	4,546.1	0.00	0.00	
10,000.0	90.40	269.86	5,284.6	-868.3	-4,642.1	4,646.1	0.00	0.00	
10,100.0	90.40	269.86	5,283.9	-868.5	-4,742.1	4,746.1	0.00	0.00	
10,200.0	90.40	269.86	5,283.2	-868.8	-4,842.1	4,846.1	0.00	0.00	
10,300.0	90.40	269.86	5,282.5	-869.0	-4,942.1	4,946.1	0.00	0.00	
10,400.0	90.40	269.86	5,281.8	-869.2	-5,042.1	5,046.1	0.00	0.00	
10,500.0	90.40	269.86	5,281.1	-869.5	-5,142.1	5,146.1	0.00	0.00	
10,600.0	90.40	269.86	5,280.4	-869.7	-5,242.1	5,246.1	0.00	0.00	
10,700.0	90.40	269.86	5,279.7	-869.9	-5,342.1	5,346.1	0.00	0.00	
10,780.2	90.40	269.86	5,279.1	-870.1	-5,422.3	5,426.3	0.00	0.00	G30-2307 03H PBHL
10,800.0	90.40	269.86	5,279.0	-870.2	-5,442.1	5,446.1	0.00	0.00	
10,900.0	90.40	269.86	5,278.3	-870.4	-5,542.1	5,546.1	0.00	0.00	
11,000.0	90.40	269.86	5,277.6	-870.7	-5,642.0	5,646.1	0.00	0.00	
11,100.0	90.40	269.86	5,276.9	-870.9	-5,742.0	5,746.1	0.00	0.00	
11,200.0	90.40	269.86	5,276.2	-871.1	-5,842.0	5,846.1	0.00	0.00	
11,300.0	90.40	269.86	5,275.5	-871.4	-5,942.0	5,946.1	0.00	0.00	
11,400.0	90.40	269.86	5,274.8	-871.6	-6,042.0	6,046.1	0.00	0.00	
11,500.0	90.40	269.86	5,274.1	-871.8	-6,142.0	6,146.1	0.00	0.00	
11,600.0	90.40	269.86	5,273.4	-872.1	-6,242.0	6,246.1	0.00	0.00	
11,700.0	90.40	269.86	5,272.7	-872.3	-6,342.0	6,346.1	0.00	0.00	
11,800.0	90.40	269.86	5,272.0	-872.6	-6,442.0	6,446.1	0.00	0.00	
11,900.0	90.40	269.86	5,271.3	-872.8	-6,542.0	6,546.1	0.00	0.00	
12,000.0	90.40	269.86	5,270.6	-873.0	-6,642.0	6,646.1	0.00	0.00	
12,100.0	90.40	269.86	5,269.9	-873.3	-6,742.0	6,746.1	0.00	0.00	
12,200.0	90.40	269.86	5,269.2	-873.5	-6,842.0	6,846.1	0.00	0.00	
12,300.0	90.40	269.86	5,268.5	-873.7	-6,942.0	6,946.1	0.00	0.00	
12,400.0	90.40	269.86	5,267.8	-874.0	-7,042.0	7,046.1	0.00	0.00	
12,500.0	90.40	269.86	5,267.1	-874.2	-7,142.0	7,146.1	0.00	0.00	
12,600.0	90.40	269.86	5,266.4	-874.5	-7,242.0	7,246.0	0.00	0.00	
12,700.0	90.40	269.86	5,265.7	-874.7	-7,342.0	7,346.0	0.00	0.00	
12,800.0	90.40	269.86	5,265.0	-874.9	-7,442.0	7,446.0	0.00	0.00	
12,900.0	90.40	269.86	5,264.3	-875.2	-7,542.0	7,546.0	0.00	0.00	
13,000.0	90.40	269.86	5,263.6	-875.4	-7,642.0	7,646.0	0.00	0.00	
13,038.7	90.40	269.86	5,263.3	-875.5	-7,680.7	7,684.7	0.00	0.00	TD at 13038.7
13,100.0	90.40	269.86	5,262.9	-875.6	-7,742.0	7,746.0	0.00	0.00	
13,200.0	90.40	269.86	5,262.2	-875.9	-7,842.0	7,846.0	0.00	0.00	
13,300.0	90.40	269.86	5,261.5	-876.1	-7,942.0	7,946.0	0.00	0.00	
13,384.6	90.40	269.86	5,260.9	-876.3	-8,026.6	8,030.6	0.00	0.00	G30-2307 03H PBHL P2

Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Site: S30-T23N-R7W
Well: Lybrook G30-2307 03H
Wellbore: HZ
Design: Plan #3

Local Co-ordinate Reference: Well Lybrook G30-2307 03H
TVD Reference: 16" KB @ 7092.0ft
MD Reference: 16" KB @ 7092.0ft
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
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Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
G30-2307 03H PBHL P2 - hit/miss target - Shape - Point	0.00	0.00	5,260.9	-876.3	-8,026.6	1,894,633.32	1,230,035.93	36.198960	-107.640910
G30-2307 03H POE P2 - plan hits target center - Point	0.00	0.00	5,311.2	-859.2	-829.2	1,894,549.23	1,237,232.81	36.199010	-107.616520
G30-2307 03H POE - plan misses target center by 615.3ft at 6171.7ft MD (5311.2 TVD, -859.0 N, -813.9 E) - Point	0.00	0.00	5,311.3	-243.9	-829.2	1,895,164.47	1,237,241.47	36.200700	-107.616520
G30-2307 03H PBHL - plan misses target center by 604.9ft at 10780.2ft MD (5279.1 TVD, -870.1 N, -5422.3 E) - Point	0.00	0.00	5,279.2	-265.3	-5,423.7	1,895,207.72	1,232,647.12	36.200640	-107.632090

500.0	500.0	9 5/8"	0.000	0.000
5,140.7	5,039.8	ICP @55°	0.000	0.000

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,091.0	1,091.0	Ojo Alamo		-0.40	270.00
1,301.0	1,301.0	Kirtland Shale		-0.40	270.00
1,569.0	1,569.0	Fruitland Coal		-0.40	270.00
1,687.0	1,687.0	Pictured Cliffs Ss		-0.40	270.00
1,809.0	1,809.0	Lewis Shale		-0.40	270.00
2,503.0	2,503.0	Cliffhouse Ss		-0.40	270.00
3,211.0	3,211.0	Menefee Fn		-0.40	270.00
4,045.0	4,045.0	Point Lookout Ss		-0.40	270.00
4,249.0	4,249.0	Mancos Shale		-0.40	270.00
4,781.2	4,770.0	Mancos Silt		-0.40	270.00
5,119.3	5,028.0	Gallup Fn		-0.40	270.00

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates	Comment	
		+N/-S (ft)	+E/-W (ft)	
2,900.0	2,900.0	0.0	0.0	KOP @ 2900'
4,348.4	4,287.5	-331.8	-135.6	EOB; Inc=28.97°
5,043.8	4,895.9	-643.5	-263.0	Start build/turn @ 5043' MD
5,841.2	5,311.2	-859.2	-829.2	LP @ 5311' TVD; 90.4°
13,038.7	5,260.9	-876.3	-8,026.5	TD at 13038.7

Cathedral Energy Services

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Reference Site: S30-T23N-R7W
Site Error: 0.0ft
Reference Well: Lybrook G30-2307 03H
Well Error: 0.0ft
Reference Wellbore: HZ
Reference Design: Plan #3

Local Co-ordinate Reference: Well Lybrook G30-2307 03H
TVD Reference: 16' KB @ 7092.0ft
MD Reference: 16' KB @ 7092.0ft
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	Plan #3		
Filter type:	GLOBAL FILTER APPLIED: All wellpaths within 200'+ 100/1000 of reference		
Interpolation Method:	MD Interval 100.0ft	Error Model:	Systematic Ellipse
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,538.5ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program		Date 10/31/2014		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	13,384.2	Plan #3 (HZ)	Geolink 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						
S29-T23N-R7W						
Lybrook L29-2307 01H - Hz - Plan #1	8,156.5	10,667.4	825.7	617.7	3.970	CC
Lybrook L29-2307 01H - Hz - Plan #1	8,200.0	10,667.5	826.7	617.6	3.954	ES, SF
S30-T23N-R7W						
Lybrook G30-2307 01H - HZ - Plan #4	4,400.0	4,400.0	61.9	46.6	4.045	CC, ES
Lybrook G30-2307 01H - HZ - Plan #4	4,438.1	4,438.1	62.3	46.9	4.039	SF
Lybrook G30-2307 02H - HZ - Plan #3	4,400.0	4,400.0	32.8	17.5	2.141	CC, ES, SF
Lybrook G30-2307 04H - HZ - Plan #1	3,181.0	3,184.3	12.3	1.3	1.115	Level 2, CC
Lybrook G30-2307 04H - HZ - Plan #1	10,762.5	10,424.1	26.3	-225.2	0.105	Level 1, ES, SF

EnCana Oil & Gas (USA) Inc

Sandoval County, NM

S30-T23N-R7W

Lybrook G30-2307 03H

HZ

Plan #3

Anticollision Report

31 October, 2014

Cathedral Energy Services

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference: Well Lybrook G30-2307 03H
Project: Sandoval County, NM	TVD Reference: 16' KB @ 7092.0ft
Reference Site: S30-T23N-R7W	MD Reference: 16' KB @ 7092.0ft
Site Error: 0.0ft	North Reference: True
Reference Well: Lybrook G30-2307 03H	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 #3	Offset TVD Reference: Offset Datum

Reference Plan #3		
Filter type: NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method: MD Interval 100.0ft	Error Model: Systematic Ellipse	
Depth Range: Unlimited	Scan Method: Closest Approach 3D	
Results Limited by: Maximum center-center distance of 1,538.5ft	Error Surface: Elliptical Conic	
Warning Levels Evaluated at: 2.00 Sigma		

Survey Tool Program	Date 10/31/2014	
From (ft)	To (ft)	Survey (Wellbore)
0.0	13,384.2	Plan #3 (HZ)
	Tool Name	Description
	Geolink MWD	Geolink MWD

Summary						
Site Name	Reference	Offset	Distance		Separation	Warning
	Measured	Measured	Between	Between		
Offset Well - Wellbore - Design	Depth	Depth	Centres	Ellipses	Factor	
	(ft)	(ft)	(ft)	(ft)		
S29-T23N-R7W						
Lybrook L29-2307 01H - Hz - Plan #1	8,156.5	10,667.4	825.7	617.7	3.970	CC
Lybrook L29-2307 01H - Hz - Plan #1	8,200.0	10,667.5	826.7	617.6	3.954	ES, SF
S30-T23N-R7W						
Lybrook G30-2307 01H - HZ - Plan #4	4,400.0	4,400.0	61.9	46.6	4.045	CC, ES
Lybrook G30-2307 01H - HZ - Plan #4	4,438.1	4,438.1	62.3	46.9	4.039	SF
Lybrook G30-2307 02H - HZ - Plan #3	4,400.0	4,400.0	32.8	17.5	2.141	CC, ES, SF

Cathedral Energy Services

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
 Project: Sandoval County, NM
 Reference Site: S30-T23N-R7W
 Site Error: 0.0ft
 Reference Well: Lybrook G30-2307 03H
 Well Error: 0.0ft
 Reference Wellbore: HZ
 Reference Design: Plan #3

Local Co-ordinate Reference: Well Lybrook G30-2307 03H
 TVD Reference: 16' KB @ 7092.0ft
 MD Reference: 16' KB @ 7092.0ft
 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

Offset Design S29-T23N-R7W - Lybrook L29-2307 01H - 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	5,015.6	7,965.9	5,087.7	10.3	74.0	-38.08	-1,695.7	-99.0	1,466.0	1,412.3	53.73	27.287	
5,200.0	5,071.8	7,993.4	5,087.4	11.3	74.7	-45.39	-1,695.6	-126.5	1,379.6	1,332.4	47.15	29.258	
5,300.0	5,116.0	8,023.4	5,087.2	12.5	75.4	-56.11	-1,695.5	-156.5	1,289.6	1,247.3	42.32	30.473	
5,400.0	5,153.9	8,062.0	5,086.8	13.8	76.4	-66.58	-1,695.5	-195.1	1,201.5	1,151.7	49.84	24.110	
5,500.0	5,189.0	8,113.1	5,086.4	15.3	77.6	-73.66	-1,695.3	-246.2	1,120.1	1,061.5	58.55	19.130	
5,600.0	5,220.7	8,175.6	5,085.8	16.8	79.1	-78.68	-1,695.2	-308.7	1,046.7	979.0	67.78	15.444	
5,700.0	5,248.4	8,248.4	5,085.2	18.4	80.9	-82.28	-1,695.0	-381.5	982.9	905.8	77.06	12.755	
5,800.0	5,271.5	8,330.0	5,084.5	20.1	82.9	-84.84	-1,694.8	-463.1	929.6	843.6	86.04	10.804	
5,900.0	5,289.6	8,418.8	5,083.7	21.8	85.1	-86.60	-1,694.6	-551.9	887.7	793.3	94.40	9.404	
6,000.0	5,302.4	8,513.2	5,082.9	23.6	87.4	-87.72	-1,694.4	-646.2	857.8	755.9	101.86	8.422	
6,100.0	5,309.6	8,611.1	5,082.1	25.3	89.8	-88.30	-1,694.1	-744.2	840.2	732.0	108.14	7.770	
6,200.0	5,311.1	8,710.9	5,081.2	27.0	92.2	-88.43	-1,693.9	-844.0	835.0	721.9	113.06	7.385	
6,300.0	5,310.4	8,810.9	5,080.3	28.8	94.6	-88.42	-1,693.7	-944.0	834.5	716.7	117.74	7.087	
6,400.0	5,309.7	8,910.9	5,079.5	30.7	97.1	-88.40	-1,693.4	-1,043.9	834.0	711.5	122.47	6.810	
6,500.0	5,309.0	9,010.9	5,078.6	32.6	99.5	-88.39	-1,693.2	-1,143.9	833.5	706.3	127.24	6.551	
6,600.0	5,308.3	9,110.9	5,077.7	34.6	102.0	-88.38	-1,692.9	-1,243.9	833.1	701.0	132.03	6.310	
6,700.0	5,307.6	9,210.9	5,076.8	36.7	104.4	-88.37	-1,692.7	-1,343.9	832.6	695.8	136.85	6.084	
6,800.0	5,306.9	9,310.9	5,076.0	38.9	106.9	-88.35	-1,692.5	-1,443.9	832.1	690.4	141.68	5.873	
6,900.0	5,306.2	9,410.9	5,075.1	41.0	109.3	-88.34	-1,692.2	-1,543.9	831.7	685.1	146.52	5.676	
7,000.0	5,305.5	9,510.9	5,074.2	43.2	111.8	-88.33	-1,692.0	-1,643.9	831.2	679.8	151.38	5.491	
7,100.0	5,304.8	9,610.9	5,073.4	45.5	114.3	-88.32	-1,691.7	-1,743.9	830.7	674.5	156.25	5.317	
7,200.0	5,304.1	9,710.9	5,072.5	47.7	116.7	-88.30	-1,691.5	-1,843.9	830.2	669.1	161.12	5.153	
7,300.0	5,303.4	9,810.9	5,071.6	50.0	119.2	-88.29	-1,691.3	-1,943.9	829.8	663.8	166.00	4.999	
7,400.0	5,302.7	9,910.9	5,070.8	52.3	121.6	-88.28	-1,691.0	-2,043.9	829.3	658.4	170.89	4.853	
7,500.0	5,302.0	10,010.9	5,069.9	54.6	124.1	-88.26	-1,690.8	-2,143.9	828.8	653.0	175.78	4.715	
7,600.0	5,301.3	10,110.9	5,069.0	56.9	126.5	-88.25	-1,690.5	-2,243.9	828.4	647.7	180.68	4.585	
7,700.0	5,300.6	10,210.9	5,068.2	59.3	129.0	-88.24	-1,690.3	-2,343.9	827.9	642.3	185.58	4.461	
7,800.0	5,299.9	10,310.9	5,067.3	61.6	131.5	-88.23	-1,690.1	-2,443.9	827.4	636.9	190.48	4.344	
7,900.0	5,299.2	10,410.9	5,066.4	64.0	133.9	-88.21	-1,689.8	-2,543.9	826.9	631.6	195.39	4.232	
8,000.0	5,298.5	10,510.9	5,065.5	66.4	136.4	-88.20	-1,689.6	-2,643.9	826.5	626.2	200.29	4.126	
8,100.0	5,297.8	10,610.9	5,064.7	68.7	138.8	-88.19	-1,689.3	-2,743.9	826.0	620.8	205.21	4.025	
8,156.5	5,297.4	10,667.4	5,064.2	70.1	140.2	-88.18	-1,689.2	-2,800.3	825.7	617.7	207.98	3.970 CC	
8,200.0	5,297.1	10,667.5	5,064.2	71.1	140.2	-88.18	-1,689.2	-2,800.5	826.7	617.6	209.05	3.954 ES, SF	
8,300.0	5,296.4	10,667.5	5,064.2	73.5	140.2	-88.18	-1,689.2	-2,800.5	837.4	625.9	211.50	3.959	
8,400.0	5,295.7	10,667.5	5,064.2	75.9	140.2	-88.18	-1,689.2	-2,800.5	859.7	645.8	213.95	4.018	
8,500.0	5,295.0	10,667.5	5,064.2	78.3	140.2	-88.18	-1,689.2	-2,800.5	892.8	676.4	216.40	4.126	
8,600.0	5,294.3	10,667.5	5,064.2	80.7	140.2	-88.18	-1,689.2	-2,800.5	935.4	716.5	218.85	4.274	
8,700.0	5,293.6	10,667.5	5,064.2	83.1	140.2	-88.18	-1,689.2	-2,800.5	986.3	765.0	221.31	4.457	
8,800.0	5,292.9	10,667.5	5,064.2	85.5	140.2	-88.18	-1,689.2	-2,800.5	1,044.4	820.6	223.76	4.667	
8,900.0	5,292.2	10,667.5	5,064.2	87.9	140.2	-88.18	-1,689.2	-2,800.5	1,108.4	882.2	226.22	4.900	
9,000.0	5,291.5	10,667.5	5,064.2	90.4	140.2	-88.18	-1,689.2	-2,800.5	1,177.5	948.8	228.68	5.149	
9,100.0	5,290.8	10,667.5	5,064.2	92.8	140.2	-88.18	-1,689.2	-2,800.5	1,250.7	1,019.6	231.14	5.411	
9,200.0	5,290.1	10,667.5	5,064.2	95.2	140.2	-88.18	-1,689.2	-2,800.5	1,327.5	1,093.9	233.59	5.683	
9,300.0	5,289.4	10,667.5	5,064.2	97.6	140.2	-88.18	-1,689.2	-2,800.5	1,407.2	1,171.1	236.05	5.961	
9,400.0	5,288.7	10,667.5	5,064.2	100.1	140.2	-88.18	-1,689.2	-2,800.5	1,489.3	1,250.8	238.52	6.244	

Cathedral Energy Services

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Reference Site: S30-T23N-R7W
Site Error: 0.0ft
Reference Well: Lybrook G30-2307 03H
Well Error: 0.0ft
Reference Wellbore: HZ
Reference Design: Plan #3

Local Co-ordinate Reference: Well Lybrook G30-2307 03H
TVD Reference: 16' KB @ 7092.0ft
MD Reference: 16' KB @ 7092.0ft
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

Offset Design S30-T23N-R7W - Lybrook G30-2307 01H - HZ - Plan #4												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
0.0	0.0	0.0	0.0	0.0	0.0	0.00	61.9	0.0	61.9				
100.0	100.0	100.0	100.0	0.1	0.1	0.00	61.9	0.0	61.9	61.6	0.29	211.087	
200.0	200.0	200.0	200.0	0.3	0.3	0.00	61.9	0.0	61.9	61.3	0.64	96.366	
300.0	300.0	300.0	300.0	0.5	0.5	0.00	61.9	0.0	61.9	60.9	0.99	62.434	
400.0	400.0	400.0	400.0	0.7	0.7	0.00	61.9	0.0	61.9	60.6	1.34	46.175	
500.0	500.0	500.0	500.0	0.8	0.8	0.00	61.9	0.0	61.9	60.2	1.69	36.635	
600.0	600.0	600.0	600.0	1.0	1.0	0.00	61.9	0.0	61.9	59.9	2.04	30.362	
700.0	700.0	700.0	700.0	1.2	1.2	0.00	61.9	0.0	61.9	59.5	2.39	25.923	
800.0	800.0	800.0	800.0	1.4	1.4	0.00	61.9	0.0	61.9	59.2	2.74	22.616	
900.0	900.0	900.0	900.0	1.5	1.5	0.00	61.9	0.0	61.9	58.8	3.09	20.058	
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	0.00	61.9	0.0	61.9	58.5	3.43	18.020	
1,100.0	1,100.0	1,100.0	1,100.0	1.9	1.9	0.00	61.9	0.0	61.9	58.1	3.78	16.357	
1,200.0	1,200.0	1,200.0	1,200.0	2.1	2.1	0.00	61.9	0.0	61.9	57.8	4.13	14.976	
1,300.0	1,300.0	1,300.0	1,300.0	2.2	2.2	0.00	61.9	0.0	61.9	57.4	4.48	13.809	
1,400.0	1,400.0	1,400.0	1,400.0	2.4	2.4	0.00	61.9	0.0	61.9	57.1	4.83	12.812	
1,500.0	1,500.0	1,500.0	1,500.0	2.6	2.6	0.00	61.9	0.0	61.9	56.7	5.18	11.948	
1,600.0	1,600.0	1,600.0	1,600.0	2.8	2.8	0.00	61.9	0.0	61.9	56.4	5.53	11.194	
1,700.0	1,700.0	1,700.0	1,700.0	2.9	2.9	0.00	61.9	0.0	61.9	56.0	5.88	10.529	
1,800.0	1,800.0	1,800.0	1,800.0	3.1	3.1	0.00	61.9	0.0	61.9	55.7	6.23	9.939	
1,900.0	1,900.0	1,900.0	1,900.0	3.3	3.3	0.00	61.9	0.0	61.9	55.3	6.58	9.412	
2,000.0	2,000.0	2,000.0	2,000.0	3.5	3.5	0.00	61.9	0.0	61.9	55.0	6.93	8.937	
2,100.0	2,100.0	2,100.0	2,100.0	3.6	3.6	0.00	61.9	0.0	61.9	54.6	7.27	8.508	
2,200.0	2,200.0	2,200.0	2,200.0	3.8	3.8	0.00	61.9	0.0	61.9	54.3	7.62	8.119	
2,300.0	2,300.0	2,300.0	2,300.0	4.0	4.0	0.00	61.9	0.0	61.9	53.9	7.97	7.763	
2,400.0	2,400.0	2,400.0	2,400.0	4.2	4.2	0.00	61.9	0.0	61.9	53.6	8.32	7.438	
2,500.0	2,500.0	2,500.0	2,500.0	4.3	4.3	0.00	61.9	0.0	61.9	53.2	8.67	7.138	
2,600.0	2,600.0	2,600.0	2,600.0	4.5	4.5	0.00	61.9	0.0	61.9	52.9	9.02	6.862	
2,700.0	2,700.0	2,700.0	2,700.0	4.7	4.7	0.00	61.9	0.0	61.9	52.5	9.37	6.606	
2,800.0	2,800.0	2,800.0	2,800.0	4.9	4.9	0.00	61.9	0.0	61.9	52.2	9.72	6.369	
2,900.0	2,900.0	2,900.0	2,900.0	5.0	5.0	0.00	61.9	0.0	61.9	51.8	10.07	6.148	
3,000.0	3,000.0	3,000.0	3,000.0	5.2	5.2	0.00	61.9	0.0	61.9	51.5	10.42	5.942	
3,100.0	3,100.0	3,100.0	3,100.0	5.4	5.4	0.00	61.9	0.0	61.9	51.1	10.77	5.749	
3,200.0	3,200.0	3,200.0	3,200.0	5.6	5.6	0.00	61.9	0.0	61.9	50.8	11.11	5.569	
3,300.0	3,300.0	3,300.0	3,300.0	5.7	5.7	0.00	61.9	0.0	61.9	50.4	11.46	5.399	
3,400.0	3,400.0	3,400.0	3,400.0	5.9	5.9	0.00	61.9	0.0	61.9	50.1	11.81	5.240	
3,500.0	3,500.0	3,500.0	3,500.0	6.1	6.1	0.00	61.9	0.0	61.9	49.7	12.16	5.089	
3,600.0	3,600.0	3,600.0	3,600.0	6.3	6.3	0.00	61.9	0.0	61.9	49.4	12.51	4.947	
3,700.0	3,700.0	3,700.0	3,700.0	6.4	6.4	0.00	61.9	0.0	61.9	49.0	12.86	4.813	
3,800.0	3,800.0	3,800.0	3,800.0	6.6	6.6	0.00	61.9	0.0	61.9	48.7	13.21	4.686	
3,900.0	3,900.0	3,900.0	3,900.0	6.8	6.8	0.00	61.9	0.0	61.9	48.3	13.56	4.565	
4,000.0	4,000.0	4,000.0	4,000.0	7.0	7.0	0.00	61.9	0.0	61.9	48.0	13.91	4.451	
4,100.0	4,100.0	4,100.0	4,100.0	7.1	7.1	0.00	61.9	0.0	61.9	47.6	14.26	4.342	
4,200.0	4,200.0	4,200.0	4,200.0	7.3	7.3	0.00	61.9	0.0	61.9	47.3	14.60	4.238	
4,300.0	4,300.0	4,300.0	4,300.0	7.5	7.5	0.00	61.9	0.0	61.9	46.9	14.95	4.139	
4,400.0	4,400.0	4,400.0	4,400.0	7.7	7.7	0.00	61.9	0.0	61.9	46.6	15.30	4.045 CC, ES	
4,438.1	4,438.1	4,438.1	4,438.1	7.7	7.7	160.19	61.9	0.0	62.3	46.9	15.43	4.039 SF	
4,500.0	4,500.0	4,497.5	4,497.5	7.8	7.8	160.29	62.4	-0.2	63.9	48.3	15.63	4.091	
4,600.0	4,599.0	4,586.1	4,585.6	8.0	8.0	160.72	71.1	-2.7	86.3	70.5	15.78	5.467	
4,700.0	4,695.1	4,664.1	4,661.7	8.2	8.1	160.41	87.2	-7.4	131.4	115.7	15.74	8.350	
4,800.0	4,786.6	4,727.3	4,721.7	8.5	8.3	159.17	106.1	-12.9	195.3	179.8	15.52	12.580	
4,900.0	4,871.6	4,774.9	4,765.7	8.9	8.4	156.66	123.6	-18.0	273.4	258.2	15.23	17.952	
5,000.0	4,948.4	4,808.0	4,795.5	9.5	8.5	151.74	137.5	-22.1	361.6	346.5	15.07	23.985	

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

Cathedral Energy Services

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
 Project: Sandoval County, NM
 Reference Site: S30-T23N-R7W
 Site Error: 0.0ft
 Reference Well: Lybrook G30-2307 03H
 Well Error: 0.0ft
 Reference Wellbore: HZ
 Reference Design: Plan #3

Local Co-ordinate Reference: Well Lybrook G30-2307 03H
 TVD Reference: 16' KB @ 7092.0ft
 MD Reference: 16' KB @ 7092.0ft
 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

Offset Design S30-T23N-R7W - Lybrook G30-2307 01H - HZ - Plan #4														Offset Site Error:	0.0 ft
Survey Program: 0-Geolink MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Total Uncertainty Axis	Separation Factor	Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)					
5,100.0	5,015.6	4,828.5	4,813.6	10.3	8.6	140.98	146.7	-24.8	456.1	440.4	15.72	29.010			
5,200.0	5,071.8	4,838.7	4,822.5	11.3	8.6	112.08	151.4	-26.2	554.1	535.1	18.93	29.269			
5,300.0	5,116.0	4,850.0	4,832.3	12.5	8.7	68.34	156.9	-27.7	653.3	633.2	20.12	32.485			
5,400.0	5,153.9	4,850.0	4,832.3	13.8	8.7	71.59	156.9	-27.7	751.2	729.6	21.63	34.724			
5,500.0	5,189.0	4,850.0	4,832.3	15.3	8.7	70.95	156.9	-27.7	846.5	823.7	22.83	37.088			
5,600.0	5,220.7	4,850.0	4,832.3	16.8	8.7	69.52	156.9	-27.7	938.4	914.5	23.88	39.296			
5,700.0	5,248.4	4,850.0	4,832.3	18.4	8.7	68.00	156.9	-27.7	1,026.3	1,001.5	24.81	41.360			
5,800.0	5,271.5	4,850.0	4,832.3	20.1	8.7	66.65	156.9	-27.7	1,109.5	1,083.9	25.61	43.319			
5,900.0	5,289.6	4,850.0	4,832.3	21.8	8.7	65.58	156.9	-27.7	1,187.7	1,161.4	26.27	45.217			
6,000.0	5,302.4	4,850.0	4,832.3	23.6	8.7	64.85	156.9	-27.7	1,260.3	1,233.5	26.76	47.097			
6,100.0	5,309.6	4,850.0	4,832.3	25.3	8.7	64.48	156.9	-27.7	1,327.0	1,299.9	27.08	49.006			
6,200.0	5,311.1	4,865.1	4,845.2	27.0	8.7	65.22	164.4	-29.9	1,387.3	1,359.7	27.63	50.209			
6,300.0	5,310.4	4,871.4	4,850.6	28.8	8.7	65.54	167.6	-30.9	1,448.0	1,418.3	29.74	48.695			
6,400.0	5,309.7	4,878.0	4,856.1	30.7	8.8	65.87	171.0	-31.9	1,512.9	1,481.0	31.89	47.434			

Cathedral Energy Services

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
 Project: Sandoval County, NM
 Reference Site: S30-T23N-R7W
 Site Error: 0.0ft
 Reference Well: Lybrook G30-2307 03H
 Well Error: 0.0ft
 Reference Wellbore: HZ
 Reference Design: Plan #3

Local Co-ordinate Reference: Well Lybrook G30-2307 03H
 TVD Reference: 16' KB @ 7092.0ft
 MD Reference: 16' KB @ 7092.0ft
 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

Offset Design S30-T23N-R7W - Lybrook G30-2307 02H - HZ - Plan #3														Offset Site Error: 0.0 ft	
Survey Program: D-Geolink 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		Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning		
							+N/-S (ft)	+E/-W (ft)							
0.0	0.0	0.0	0.0	0.0	0.0	0.00	32.8	0.0	32.8						
100.0	100.0	100.0	100.0	0.1	0.1	0.00	32.8	0.0	32.8	32.5	0.29	111.752			
200.0	200.0	200.0	200.0	0.3	0.3	0.00	32.8	0.0	32.8	32.1	0.64	51.017			
300.0	300.0	300.0	300.0	0.5	0.5	0.00	32.8	0.0	32.8	31.8	0.99	33.053			
400.0	400.0	400.0	400.0	0.7	0.7	0.00	32.8	0.0	32.8	31.4	1.34	24.446			
500.0	500.0	500.0	500.0	0.8	0.8	0.00	32.8	0.0	32.8	31.1	1.69	19.395			
600.0	600.0	600.0	600.0	1.0	1.0	0.00	32.8	0.0	32.8	30.7	2.04	16.074			
700.0	700.0	700.0	700.0	1.2	1.2	0.00	32.8	0.0	32.8	30.4	2.39	13.724			
800.0	800.0	800.0	800.0	1.4	1.4	0.00	32.8	0.0	32.8	30.0	2.74	11.973			
900.0	900.0	900.0	900.0	1.5	1.5	0.00	32.8	0.0	32.8	29.7	3.09	10.619			
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	0.00	32.8	0.0	32.8	29.3	3.43	9.540			
1,100.0	1,100.0	1,100.0	1,100.0	1.9	1.9	0.00	32.8	0.0	32.8	29.0	3.78	8.660			
1,200.0	1,200.0	1,200.0	1,200.0	2.1	2.1	0.00	32.8	0.0	32.8	28.6	4.13	7.928			
1,300.0	1,300.0	1,300.0	1,300.0	2.2	2.2	0.00	32.8	0.0	32.8	28.3	4.48	7.311			
1,400.0	1,400.0	1,400.0	1,400.0	2.4	2.4	0.00	32.8	0.0	32.8	27.9	4.83	6.783			
1,500.0	1,500.0	1,500.0	1,500.0	2.6	2.6	0.00	32.8	0.0	32.8	27.6	5.18	6.326			
1,600.0	1,600.0	1,600.0	1,600.0	2.8	2.8	0.00	32.8	0.0	32.8	27.2	5.53	5.926			
1,700.0	1,700.0	1,700.0	1,700.0	2.9	2.9	0.00	32.8	0.0	32.8	26.9	5.88	5.574			
1,800.0	1,800.0	1,800.0	1,800.0	3.1	3.1	0.00	32.8	0.0	32.8	26.5	6.23	5.262			
1,900.0	1,900.0	1,900.0	1,900.0	3.3	3.3	0.00	32.8	0.0	32.8	26.2	6.58	4.983			
2,000.0	2,000.0	2,000.0	2,000.0	3.5	3.5	0.00	32.8	0.0	32.8	25.8	6.93	4.731			
2,100.0	2,100.0	2,100.0	2,100.0	3.6	3.6	0.00	32.8	0.0	32.8	25.5	7.27	4.504			
2,200.0	2,200.0	2,200.0	2,200.0	3.8	3.8	0.00	32.8	0.0	32.8	25.1	7.62	4.298			
2,300.0	2,300.0	2,300.0	2,300.0	4.0	4.0	0.00	32.8	0.0	32.8	24.8	7.97	4.110			
2,400.0	2,400.0	2,400.0	2,400.0	4.2	4.2	0.00	32.8	0.0	32.8	24.4	8.32	3.938			
2,500.0	2,500.0	2,500.0	2,500.0	4.3	4.3	0.00	32.8	0.0	32.8	24.1	8.67	3.779			
2,600.0	2,600.0	2,600.0	2,600.0	4.5	4.5	0.00	32.8	0.0	32.8	23.7	9.02	3.633			
2,700.0	2,700.0	2,700.0	2,700.0	4.7	4.7	0.00	32.8	0.0	32.8	23.4	9.37	3.497			
2,800.0	2,800.0	2,800.0	2,800.0	4.9	4.9	0.00	32.8	0.0	32.8	23.0	9.72	3.372			
2,900.0	2,900.0	2,900.0	2,900.0	5.0	5.0	0.00	32.8	0.0	32.8	22.7	10.07	3.255			
3,000.0	3,000.0	3,000.0	3,000.0	5.2	5.2	0.00	32.8	0.0	32.8	22.4	10.42	3.146			
3,100.0	3,100.0	3,100.0	3,100.0	5.4	5.4	0.00	32.8	0.0	32.8	22.0	10.77	3.044			
3,200.0	3,200.0	3,200.0	3,200.0	5.6	5.6	0.00	32.8	0.0	32.8	21.7	11.11	2.948			
3,300.0	3,300.0	3,300.0	3,300.0	5.7	5.7	0.00	32.8	0.0	32.8	21.3	11.46	2.858			
3,400.0	3,400.0	3,400.0	3,400.0	5.9	5.9	0.00	32.8	0.0	32.8	21.0	11.81	2.774			
3,500.0	3,500.0	3,500.0	3,500.0	6.1	6.1	0.00	32.8	0.0	32.8	20.6	12.16	2.694			
3,600.0	3,600.0	3,600.0	3,600.0	6.3	6.3	0.00	32.8	0.0	32.8	20.3	12.51	2.619			
3,700.0	3,700.0	3,700.0	3,700.0	6.4	6.4	0.00	32.8	0.0	32.8	19.9	12.86	2.548			
3,800.0	3,800.0	3,800.0	3,800.0	6.6	6.6	0.00	32.8	0.0	32.8	19.6	13.21	2.481			
3,900.0	3,900.0	3,900.0	3,900.0	6.8	6.8	0.00	32.8	0.0	32.8	19.2	13.56	2.417			
4,000.0	4,000.0	4,000.0	4,000.0	7.0	7.0	0.00	32.8	0.0	32.8	18.9	13.91	2.356			
4,100.0	4,100.0	4,100.0	4,100.0	7.1	7.1	0.00	32.8	0.0	32.8	18.5	14.26	2.299			
4,200.0	4,200.0	4,200.0	4,200.0	7.3	7.3	0.00	32.8	0.0	32.8	18.2	14.60	2.244			
4,300.0	4,300.0	4,300.0	4,300.0	7.5	7.5	0.00	32.8	0.0	32.8	17.8	14.95	2.191			
4,400.0	4,400.0	4,400.0	4,400.0	7.7	7.7	0.00	32.8	0.0	32.8	17.5	15.30	2.141 CC, ES, SF			
4,431.7	4,431.7	4,431.7	4,431.7	7.7	7.7	160.24	32.8	0.0	33.1	17.7	15.41	2.146			
4,500.0	4,500.0	4,500.0	4,500.0	7.8	7.8	160.89	32.8	0.0	34.2	18.6	15.63	2.189			
4,600.0	4,599.0	4,598.0	4,597.9	8.0	8.0	159.77	33.8	-5.0	47.9	32.1	15.80	3.034			
4,700.0	4,695.1	4,691.5	4,689.8	8.2	8.2	153.14	37.2	-21.0	77.3	61.4	15.86	4.872			
4,800.0	4,786.6	4,778.3	4,772.9	8.5	8.4	146.91	42.1	-45.6	121.6	105.7	15.90	7.649			
4,900.0	4,871.6	4,858.3	4,846.7	8.9	8.6	141.47	46.7	-76.0	177.9	161.9	16.03	11.100			
5,000.0	4,948.4	4,929.8	4,909.9	9.5	8.9	136.14	50.6	-109.0	244.2	227.8	16.38	14.912			

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

Cathedral Energy Services

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Reference Site: S30-T23N-R7W
Site Error: 0.0ft
Reference Well: Lybrook G30-2307 03H
Well Error: 0.0ft
Reference Wellbore: HZ
Reference Design: Plan #3

Local Co-ordinate Reference: Well Lybrook G30-2307 03H
TVD Reference: 16' KB @ 7092.0ft
MD Reference: 16' KB @ 7092.0ft
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

Offset Design S30-T23N-R7W - Lybrook G30-2307 02H - HZ - Plan #3														Offset Site Error:	0.0 ft
Survey Program: 0-Geolink MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Tooface (")	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)		
5,100.0	5,015.6	4,992.5	4,962.8	10.3	9.2	130.23	53.9	-142.4	318.6	301.6	17.09	18.643			
5,200.0	5,071.8	5,046.6	5,006.4	11.3	9.5	123.08	56.5	-174.5	399.6	381.3	18.34	21.788			
5,300.0	5,116.0	5,092.7	5,041.8	12.5	9.8	114.22	58.6	-203.9	485.5	465.3	20.17	24.064			
5,400.0	5,153.9	5,139.9	5,076.2	13.8	10.2	107.51	60.7	-236.1	569.9	547.8	22.11	25.777			
5,500.0	5,189.0	5,194.9	5,113.9	15.3	10.8	102.56	62.9	-276.0	648.3	624.2	24.03	26.975			
5,600.0	5,220.7	5,258.4	5,154.2	16.8	11.5	98.80	65.2	-325.2	719.5	693.4	26.07	27.599			
5,700.0	5,248.4	5,331.2	5,195.4	18.4	12.5	95.94	67.5	-385.1	782.4	754.1	28.33	27.621			
5,800.0	5,271.5	5,413.6	5,235.5	20.1	13.8	93.81	69.6	-456.9	835.9	805.0	30.89	27.063			
5,900.0	5,289.6	5,505.3	5,271.5	21.8	15.4	92.29	71.4	-541.2	878.6	844.8	33.78	26.008			
6,000.0	5,302.4	5,605.3	5,299.9	23.6	17.3	91.30	72.7	-637.0	909.4	872.4	36.96	24.605			
6,100.0	5,309.6	5,711.4	5,317.2	25.3	19.6	90.75	73.1	-741.8	927.4	887.1	40.24	23.043			
6,200.0	5,311.1	5,818.6	5,321.1	27.0	22.0	90.61	72.7	-848.7	932.0	888.5	43.54	21.406			
6,300.0	5,310.4	5,918.6	5,320.4	28.8	24.3	90.61	72.0	-948.7	931.6	883.5	48.04	19.390			
6,400.0	5,309.7	6,018.6	5,319.7	30.7	26.6	90.61	71.3	-1,048.7	931.1	878.5	52.63	17.692			
6,500.0	5,309.0	6,118.6	5,319.0	32.6	28.9	90.61	70.6	-1,148.7	930.7	873.4	57.27	16.249			
6,600.0	5,308.3	6,218.6	5,318.3	34.6	31.3	90.62	69.9	-1,248.6	930.2	868.2	61.97	15.011			
6,700.0	5,307.6	6,318.6	5,317.6	36.7	33.7	90.62	69.2	-1,348.6	929.8	863.1	66.70	13.940			
6,800.0	5,306.9	6,418.6	5,316.9	38.9	36.0	90.62	68.5	-1,448.6	929.3	857.8	71.46	13.005			
6,900.0	5,306.2	6,518.6	5,316.2	41.0	38.4	90.62	67.9	-1,548.6	928.8	852.6	76.24	12.183			
7,000.0	5,305.5	6,618.6	5,315.5	43.2	40.8	90.62	67.2	-1,648.6	928.4	847.4	81.04	11.456			
7,100.0	5,304.8	6,718.6	5,314.8	45.5	43.3	90.62	66.5	-1,748.6	927.9	842.1	85.86	10.807			
7,200.0	5,304.1	6,818.6	5,314.1	47.7	45.7	90.62	65.8	-1,848.6	927.5	836.8	90.70	10.226			
7,300.0	5,303.4	6,918.6	5,313.4	50.0	48.1	90.62	65.1	-1,948.6	927.0	831.5	95.54	9.703			
7,400.0	5,302.7	7,018.6	5,312.7	52.3	50.5	90.62	64.4	-2,048.6	926.6	826.2	100.40	9.229			
7,500.0	5,302.0	7,118.6	5,312.0	54.6	53.0	90.62	63.7	-2,148.6	926.1	820.9	105.26	8.798			
7,600.0	5,301.3	7,218.6	5,311.3	56.9	55.4	90.62	63.0	-2,248.6	925.7	815.5	110.13	8.405			
7,700.0	5,300.6	7,318.6	5,310.6	59.3	57.9	90.62	62.3	-2,348.6	925.2	810.2	115.01	8.045			
7,800.0	5,299.9	7,418.6	5,309.9	61.8	60.3	90.62	61.6	-2,448.6	924.8	804.9	119.89	7.713			
7,900.0	5,299.2	7,518.6	5,309.2	64.0	62.8	90.62	60.9	-2,548.6	924.3	799.5	124.78	7.407			
8,000.0	5,298.5	7,618.6	5,308.5	66.4	65.2	90.62	60.2	-2,648.6	923.9	794.2	129.68	7.124			
8,100.0	5,297.8	7,718.6	5,307.8	68.7	67.7	90.62	59.6	-2,748.6	923.4	788.8	134.57	6.862			
8,200.0	5,297.1	7,818.6	5,307.1	71.1	70.1	90.62	58.9	-2,848.6	922.9	783.5	139.47	6.617			
8,300.0	5,296.4	7,918.6	5,306.4	73.5	72.6	90.62	58.2	-2,948.5	922.5	778.1	144.38	6.389			
8,400.0	5,295.7	8,018.6	5,305.7	75.9	75.0	90.62	57.5	-3,048.5	922.0	772.8	149.29	6.176			
8,500.0	5,295.0	8,118.6	5,305.0	78.3	77.5	90.62	56.8	-3,148.5	921.6	767.4	154.20	5.977			
8,600.0	5,294.3	8,218.6	5,304.3	80.7	79.9	90.62	56.1	-3,248.5	921.1	762.0	159.11	5.789			
8,700.0	5,293.6	8,318.6	5,303.6	83.1	82.4	90.62	55.4	-3,348.5	920.7	756.7	164.02	5.613			
8,800.0	5,292.9	8,418.6	5,302.9	85.5	84.9	90.62	54.7	-3,448.5	920.2	751.3	168.94	5.447			
8,900.0	5,292.2	8,518.6	5,302.2	87.9	87.3	90.62	54.0	-3,548.5	919.8	745.9	173.86	5.290			
9,000.0	5,291.5	8,618.6	5,301.5	90.4	89.8	90.62	53.3	-3,648.5	919.3	740.5	178.78	5.142			
9,100.0	5,290.8	8,718.6	5,300.8	92.8	92.2	90.62	52.6	-3,748.5	918.9	735.2	183.70	5.002			
9,200.0	5,290.1	8,818.6	5,300.1	95.2	94.7	90.62	52.0	-3,848.5	918.4	729.8	188.62	4.869			
9,300.0	5,289.4	8,918.6	5,299.4	97.6	97.2	90.62	51.3	-3,948.5	918.0	724.4	193.54	4.743			
9,400.0	5,288.7	9,018.6	5,298.7	100.1	99.6	90.63	50.6	-4,048.5	917.5	719.0	198.47	4.623			
9,500.0	5,288.0	9,118.6	5,298.0	102.5	102.1	90.63	49.9	-4,148.5	917.1	713.7	203.40	4.509			
9,600.0	5,287.3	9,218.6	5,297.3	104.9	104.6	90.63	49.2	-4,248.5	916.6	708.3	208.32	4.400			
9,700.0	5,286.6	9,318.6	5,296.6	107.4	107.0	90.63	48.5	-4,348.5	916.1	702.9	213.25	4.296			
9,800.0	5,286.0	9,418.6	5,295.9	109.8	109.5	90.63	47.8	-4,448.5	915.7	697.5	218.18	4.197			
9,900.0	5,285.3	9,518.6	5,295.2	112.3	112.0	90.63	47.1	-4,548.5	915.2	692.1	223.11	4.102			
10,000.0	5,284.6	9,618.6	5,294.5	114.7	114.4	90.63	46.4	-4,648.4	914.8	686.7	228.04	4.011			
10,100.0	5,283.9	9,718.6	5,293.8	117.1	116.9	90.63	45.7	-4,748.4	914.3	681.4	232.97	3.925			
10,200.0	5,283.2	9,818.6	5,293.1	119.6	119.4	90.63	45.0	-4,848.4	913.9	676.0	237.91	3.841			

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

Cathedral Energy Services

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
 Project: Sandoval County, NM
 Reference Site: S30-T23N-R7W
 Site Error: 0.0ft
 Reference Well: Lybrook G30-2307 03H
 Well Error: 0.0ft
 Reference Wellbore: HZ
 Reference Design: Plan #3

Local Co-ordinate Reference: Well Lybrook G30-2307 03H
 TVD Reference: 16' KB @ 7092.0ft
 MD Reference: 16' KB @ 7092.0ft
 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

Offset Design S30-T23N-R7W - Lybrook G30-2307 02H - HZ - Plan #3

Survey Program: 0-Geolink MWD

Offset Site Error: 0.0 ft

Offset Well Error: 0.0 ft

Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Total Uncertainty Axis	Separation Factor	Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N-S (ft)	+E-W (ft)	Between Centres (ft)	Between Ellipses (ft)			
10,300.0	5,282.5	9,918.5	5,292.4	122.0	121.8	90.63	44.3	-4,948.4	913.4	670.6	242.84	3.781	
10,400.0	5,281.8	10,018.5	5,291.7	124.5	124.3	90.63	43.7	-5,048.4	913.0	665.2	247.77	3.685	
10,500.0	5,281.1	10,118.5	5,291.1	126.9	126.8	90.63	43.0	-5,148.4	912.5	659.8	252.71	3.611	
10,600.0	5,280.4	10,218.5	5,290.4	129.4	129.2	90.63	42.3	-5,248.4	912.1	654.4	257.64	3.540	
10,700.0	5,279.7	10,318.5	5,289.7	131.8	131.7	90.63	41.6	-5,348.4	911.6	649.0	262.58	3.472	
10,800.0	5,279.0	10,418.5	5,289.0	134.3	134.2	90.63	40.9	-5,448.4	911.2	643.6	267.51	3.406	
10,900.0	5,278.3	10,518.5	5,288.3	136.7	136.6	90.63	40.2	-5,548.4	910.7	638.3	272.45	3.343	
11,000.0	5,277.6	10,618.5	5,287.6	139.2	139.1	90.63	39.5	-5,648.4	910.2	632.9	277.39	3.282	
11,100.0	5,276.9	10,718.5	5,286.9	141.6	141.6	90.63	38.8	-5,748.4	909.8	627.5	282.32	3.223	
11,200.0	5,276.2	10,818.5	5,286.2	144.1	144.0	90.63	38.1	-5,848.4	909.3	622.1	287.26	3.166	
11,300.0	5,275.5	10,918.5	5,285.5	146.5	146.5	90.63	37.4	-5,948.4	908.9	616.7	292.20	3.111	
11,400.0	5,274.8	11,018.5	5,284.8	149.0	149.0	90.63	36.7	-6,048.4	908.4	611.3	297.14	3.057	
11,500.0	5,274.1	11,118.5	5,284.1	151.4	151.4	90.63	36.1	-6,148.4	908.0	605.9	302.07	3.006	
11,600.0	5,273.4	11,218.5	5,283.4	153.9	153.9	90.63	35.4	-6,248.4	907.5	600.5	307.01	2.956	
11,700.0	5,272.7	11,318.5	5,282.7	156.4	156.4	90.63	34.7	-6,348.3	907.1	595.1	311.95	2.908	
11,800.0	5,272.0	11,418.5	5,282.0	158.8	158.9	90.63	34.0	-6,448.3	906.6	589.7	316.89	2.861	
11,900.0	5,271.3	11,518.5	5,281.3	161.3	161.3	90.63	33.3	-6,548.3	906.2	584.3	321.83	2.816	
12,000.0	5,270.6	11,618.5	5,280.6	163.7	163.8	90.63	32.6	-6,648.3	905.7	578.9	326.77	2.772	
12,100.0	5,269.9	11,718.5	5,279.9	166.2	166.3	90.64	31.9	-6,748.3	905.3	573.5	331.71	2.729	
12,200.0	5,269.2	11,818.5	5,279.2	168.6	168.7	90.64	31.2	-6,848.3	904.8	568.2	336.65	2.688	
12,300.0	5,268.5	11,918.5	5,278.5	171.1	171.2	90.64	30.5	-6,948.3	904.3	562.8	341.59	2.647	
12,400.0	5,267.8	12,018.5	5,277.8	173.6	173.7	90.64	29.8	-7,048.3	903.9	557.4	346.53	2.608	
12,500.0	5,267.1	12,118.5	5,277.1	176.0	176.2	90.64	29.1	-7,148.3	903.4	552.0	351.47	2.570	
12,600.0	5,266.4	12,218.5	5,276.4	178.5	178.6	90.64	28.4	-7,248.3	903.0	546.6	356.41	2.534	
12,700.0	5,265.7	12,318.5	5,275.7	180.9	181.1	90.64	27.8	-7,348.3	902.5	541.2	361.36	2.498	
12,800.0	5,265.0	12,418.5	5,275.0	183.4	183.6	90.64	27.1	-7,448.3	902.1	535.8	366.30	2.463	
12,900.0	5,264.3	12,518.5	5,274.3	185.9	186.0	90.64	26.4	-7,548.3	901.6	530.4	371.24	2.429	
13,000.0	5,263.6	12,618.5	5,273.6	188.3	188.5	90.64	25.7	-7,648.3	901.2	525.0	376.18	2.396	
13,100.0	5,262.9	12,718.5	5,272.9	190.8	191.0	90.64	25.0	-7,748.3	900.7	519.6	381.12	2.363	
13,200.0	5,262.2	12,818.5	5,272.2	193.3	193.5	90.64	24.3	-7,848.3	900.3	514.2	386.07	2.332	
13,300.0	5,261.5	12,918.5	5,271.5	195.7	195.9	90.64	23.6	-7,948.3	899.8	508.8	391.01	2.301	
13,384.6	5,260.9	13,003.1	5,270.9	197.8	198.0	90.64	23.0	-8,032.8	899.4	504.2	395.19	2.276	

Cathedral Energy Services

Anticollision Report

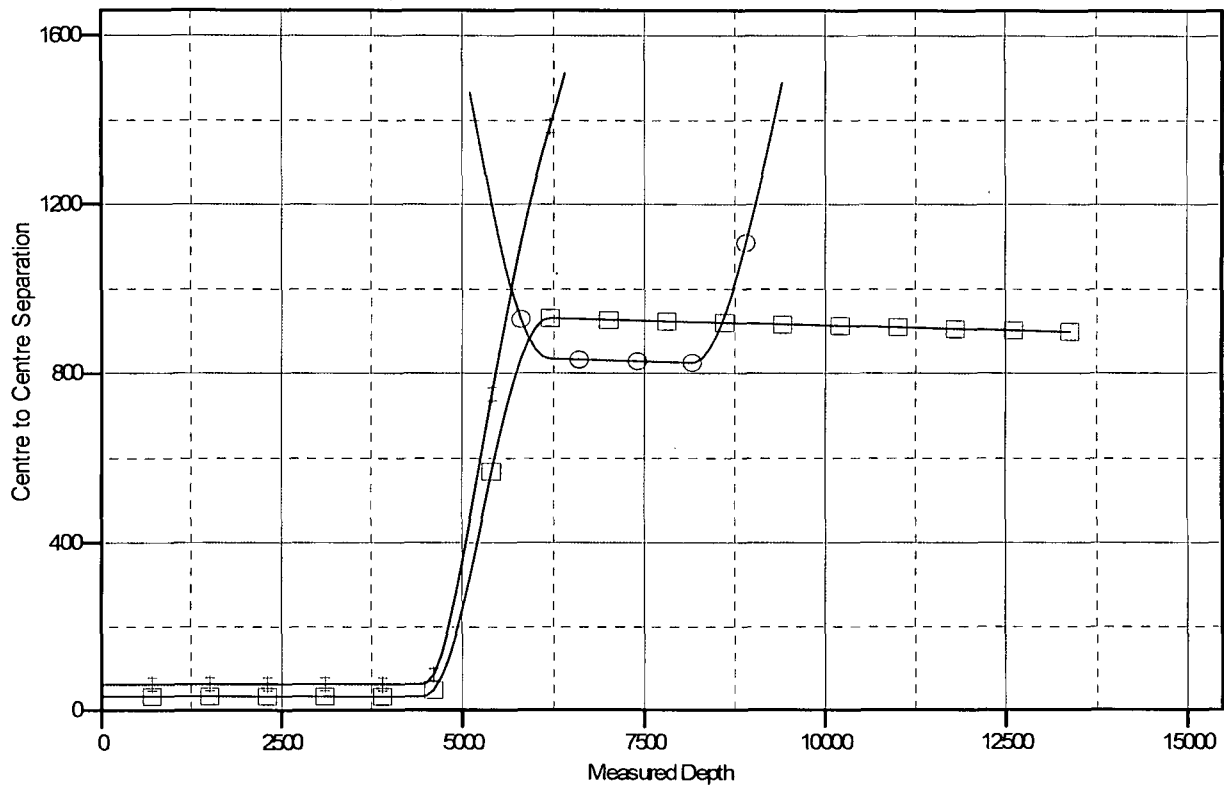
Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Reference Site: S30-T23N-R7W
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Well Error: 0.0ft
Reference Wellbore: HZ
Reference Design: Plan #3

Local Co-ordinate Reference: Well Lybrook G30-2307 03H
TVD Reference: 16' KB @ 7092.0ft
MD Reference: 16' KB @ 7092.0ft
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 16' KB @ 7092.0ft
Offset Depths are relative to Offset Datum
Central Meridian is -106.250000 °

Coordinates are relative to: Lybrook G30-2307 03H
Coordinate System is US State Plane 1983, New Mexico Central Zone
Grid Convergence at Surface is: -0.81°

Ladder Plot



LEGEND

○ Lybrook L29-2307 01H, HZ, Plan #1 V0 □ Lybrook G30-2307 01H, HZ, Plan #4 V0 △ Lybrook G30-2307 02H, HZ, Plan #3 V0