

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

David Martin
Cabinet Secretary

Brett F. Woods, Ph.D.
Deputy Cabinet Secretary

David R. Catanach Division Director
Oil Conservation Division



New Mexico Oil Conservation Division approval and conditions listed below are made in accordance with OCD Rule 19.15.7.11 and are in addition to the actions approved by BLM on the following 3160-3 APD form.

Operator Signature Date: 2-5-15

Well information;

Operator Encana, Well Name and Number Lybrook D22 2306 #2H

API# 30043-21253, Section 22, Township 23 N/S, Range 6 E/W

Conditions of Approval:

(See the below checked and handwritten conditions)

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


NMOCD Approved by Signature

6-22-2015
Date KC

JUN 12 2015

Form 3160-3
(March 2012)

RECEIVED

FORM APPROVED
OMB No. 1004-0137
Expires October 31, 2014UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FEB 06 2015

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: ☒ DRILL ☐ REENTER		5. Lease Serial No. NMNM112953, Fee Mineral Tract
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	3b. Phone No. (include area code) 720-876-3740	8. Lease Name and Well No. Lybrook D22-2306 02H
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface 1015' FNL and 649' FWL Section 22, T23N, R6W At proposed prod. zone 2020' FNL and 330' FWL Section 21, T23N, R6W		9. API Well No. 30-043-21253
14. Distance in miles and direction from nearest town or post office* +/- 50 miles South from the intersection of HWY 64 & US HWY 550 from Bloomfield, NM		10. Field and Pool, or Exploratory Counselors Gallup-Dakota
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) BHL is 330' FWL Section 21, T23N, R6W	16. No. of acres in lease NMNM112953- 1760 acres Fee- 80 acres	11. Sec., T. R. M. or Blk. and Survey or Area Section 22, T23N, R6W NMPM
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. SHL is +/-30' N from Lybrook D22-2306 01H	19. Proposed Depth 5,554' TVD/ 10,860' MD	12. County or Parish Sandoval
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 6,986' GL; 7,002' KB	22. Approximate date work will start* 07/01/2015	13. State NM
17. Spacing Unit dedicated to this well 320.0 acres - N/2 Section 21, T23N, R6W		20. BLM/BIA Bond No. on file COB-000235
23. Estimated duration 20 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>Rosalie Thim</i>	Name (Printed/Typed) Rosalie Thim	Date 02/05/2015
Title Regulatory Analyst		
Approved by (Signature) <i>DJ Mantecor</i>	Name (Printed/Typed) AFN	Date 2/10/15
Title AFN	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)

DRILLING OPERATIONS
AUTHORIZED ARE SUBJECT TO
COMPLIANCE WITH ATTACHED
"GENERAL REQUIREMENTS"

NMOCDA

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

This action is subject to technical
and procedural review pursuant to
43 CFR 3165.3 and appeal
pursuant to 43 CFR 3165.4

DISTRICT I

1625 N. French Dr., Hobbs, N.M. 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

DISTRICT II

811 S. First St., Artesia, N.M. 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

DISTRICT III

1000 Rio Brazos Rd., Axtco, N.M. 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

DISTRICT IV

1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 478-3460 Fax: (505) 478-3462

State of New Mexico
Energy, Minerals & Natural Resources Department

Form C-102
Revised August 1, 2011

OIL CONSERVATION DIVISION **FEB 06 2015**

1220 South St. Francis Dr.
Santa Fe, NM 87505

Submit one copy to appropriate
District Office

Farmington Field Office ☐ AMENDED REPORT
Bureau of Land Management

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-043-21253	² Pool Code 13379	³ Pool Name COUNSELORS GALLUP-DAKOTA
⁴ Property Code 314990	⁵ Property Name LYBROOK D22-2306	⁶ Well Number 02H
⁷ OGRID No. 282327	⁸ Operator Name ENCANA OIL & GAS (USA) INC.	⁹ Elevation 6985.9'

¹⁰ Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	22	23N	6W		1015'	NORTH	649'	WEST	SANDOVAL

¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	21	23N	6W		2020'	NORTH	330'	WEST	SANDOVAL

¹² Dedicated Acres 320.00 ACRES N/2 SEC. 21	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ 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

BOTTOM HOLE
LAT. 36.212054° N (NAD83)
LONG. 107.481411° W (NAD83)
LAT. 36.212040° N (NAD27)
LONG. 107.480806° W (NAD27)

ENTRY POINT
LAT. 36.212074° N (NAD83)
LONG. 107.465745° W (NAD83)
LAT. 36.212060° N (NAD27)
LONG. 107.465141° W (NAD27)

WELL FLAG
LAT. 36.214866° N (NAD83)
LONG. 107.462460° W (NAD83)
LAT. 36.214852° N (NAD27)
LONG. 107.461856° W (NAD27)

ALL CORNERS
FND 3/4" BC
BLM 1964

**1. LAT. 36.217598° N (NAD83)
LONG. 107.482616° W (NAD83)
LAT. 36.217584° N (NAD27)
LONG. 107.482011° W (NAD27)**

**2. LAT. 36.210537° N (NAD83)
LONG. 107.482506° W (NAD83)
LAT. 36.210523° N (NAD27)
LONG. 107.481901° W (NAD27)**

**3. LAT. 36.217621° N (NAD83)
LONG. 107.464690° W (NAD83)
LAT. 36.217607° N (NAD27)
LONG. 107.464086° W (NAD27)**

**4. LAT. 36.210488° N (NAD83)
LONG. 107.464609° W (NAD83)
LAT. 36.210474° N (NAD27)
LONG. 107.464005° W (NAD27)**

17 OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Rosalie Thim 02/05/15
Signature Date

Rosalie Thim
Printed Name

rosalie.thim@encana.com
E-mail Address

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.

MARCH 24, 2014
Date of Survey

David Russell
Signature and Seal of Professional Surveyor:

DAVID RUSSELL
REGISTERED PROFESSIONAL LAND SURVEYOR
10201

DAVID RUSSELL
Certificate Number 10201

Lybrook D22-2306 02H

SHL: 1015' FNL, 649' FWL Sec 22 T23N R06W

BHL: 2020' FNL, 330' FWL Sec 21 T23N R06W

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
San Jose Fn.	n/a
Nacimiento Fn.	surface
Ojo Alamo Ss.	1,487
Kirtland Shale	1,668
Fruitland Coal	1,831
Pictured Cliffs Ss.	2,054
Lewis Shale	2,183
Cliffhouse Ss.	2,875
Menefee Fn.	3,596
Point Lookout Ss.	4,311
Mancos Shale	4,520
Mancos Silt	5,113
Gallup Fn.	5,345
Base Gallup	5,667

The referenced surface elevation is 6986', KB 7002'

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

Substance	Formation	Depth (TVD) units = feet
Water/Gas	Fruitland Coal	1,831
Oil/Gas	Pictured Cliffs Ss.	2,054
Oil/Gas	Cliffhouse Ss.	2,875
Gas	Menefee Fn.	3,596
Oil/Gas	Point Lookout Ss.	4,311
Oil/Gas	Mancos Shale	4,520
Oil/Gas	Mancos Silt	5,113
Oil/Gas	Gallup Fn.	5,345

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

Lybrook D22-2306 02H

SHL: 1015' FNL, 649' FWL Sec 22 T23N R06W

BHL: 2020' FNL, 330' FWL Sec 21 T23N R06W

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'-5743'	8 3/4"	7"	26#	J55, LTC New
Production Liner	5643'-10860'	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 D22-2306 02H**SHL: 1015' FNL, 649' FWL Sec 22 T23N R06W****BHL: 2020' FNL, 330' FWL Sec 21 T23N R06W****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'	276 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'-5743'	100% open hole excess Stage 1 Lead: 765 sks Stage 1 Tail: 576 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	5643'-10860'	50% OH excess Stage 1 Blend Total: 295sks	Blend: Premium Lite High Strength FM + 0.7% bwoc R-3 + 3% bwoc 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 2700'. Directional plans are attached.

Description	Proposed Depth (TVD/MD)	Formation
Horizontal Lateral TD	5554'/10860'	Gallup

Lybrook D22-2306 02H**SHL: 1015' FNL, 649' FWL Sec 22 T23N R06W****BHL: 2020' FNL, 330' FWL Sec 21 T23N R06W****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'-5470'/5743'	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"	5470'/5743'- 5554'/10860'	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 +/- 2618 psi based on a 9.0 ppg at 5593' 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 July 1, 2015. It is anticipated that completion operations will begin within 30 days after the well has been drilled depending on fracture treatment schedules with various pumping service companies.

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

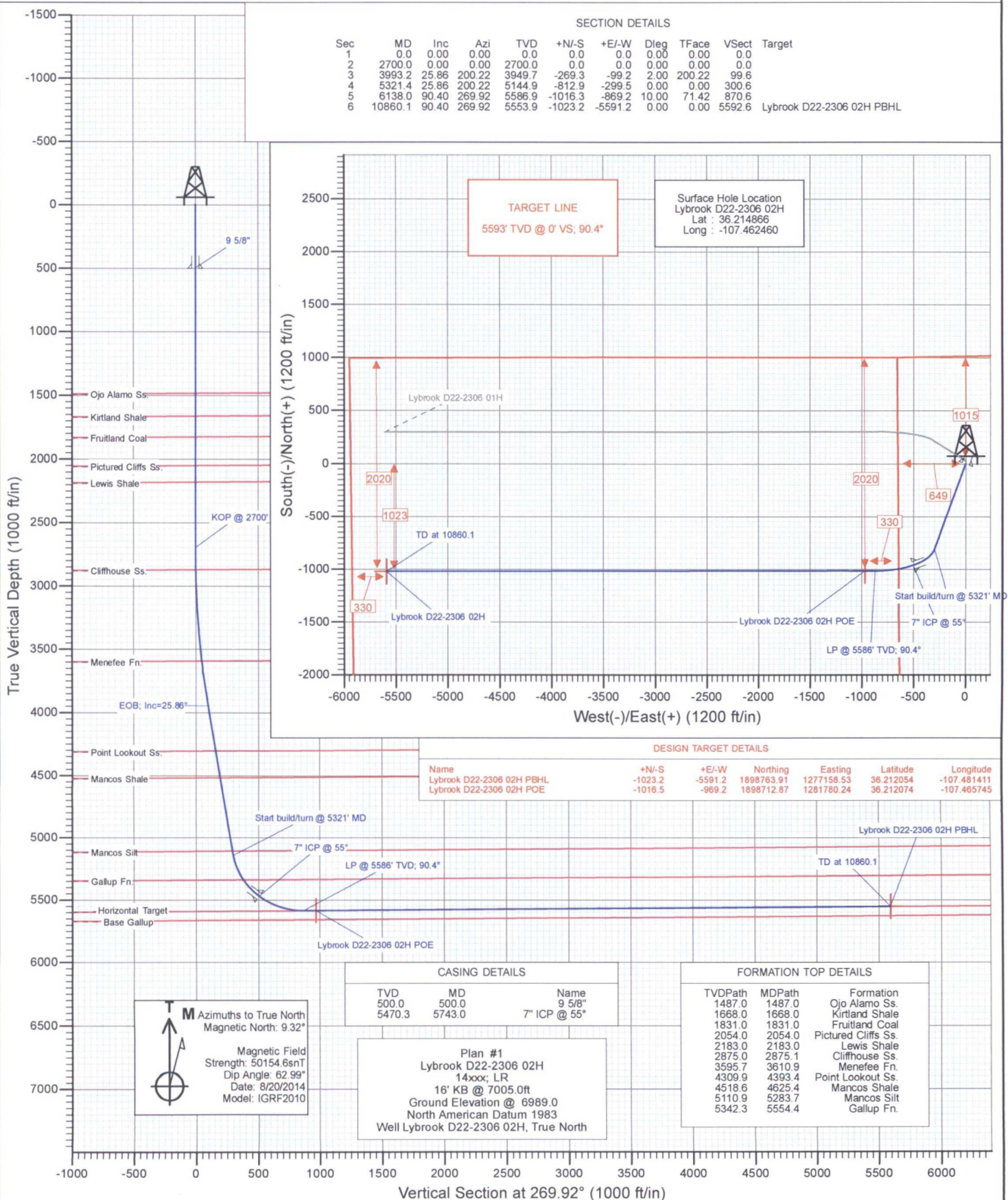
LOC: 1015' FNL, 649' FWL Sec 22 T23N R06 County: Sandoval WELL: Lybrook D22-2306 02H			Encana Natural Gas WELL SUMMARY				ENG: Michael Sanch RIG: Unassigned GLE: 6986 RKBE: 7002			2-4-15
MWD LWD	OPEN HOLE LOGGING	FORM	DEPTH				HOLE SIZE	CASING SPECS	MW MUD TYPE	DEVIATION INFORMATION
			TVD	MD						
			60	60'			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 TOC Surface with 100% OH Excess: 276 sks Type III Cement + 1% bwoc Calcium Chloride + 0.25 lbs/sack Cello Flake + 0.2% bwoc FL-52A + 58.9% Fresh Water.	Fresh wtr 8.3-10	Vertical <1°
		Nacimiento Fn. 9 5/8" Csg	surface 500	500.00						
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 Ss. Kirtland Shale	1,487 1,668				8 3/4	7" 26ppf J55 LTC TOC @ surface (100% OH excess - 70% Lead 30% Tail) Stage 1 Total: 1341sks Stage 1 Lead: 765 sks Premium Lite FM + 3% CaCl2 + 0.25/sk Cello Flake + 5#/sk LCM-1 + 8% Bentonite + 0.4% FL-52A + 0.4% Sodium Metasilicate. Mixed at 12.1 ppg. Yield 2.13 cuft/sk.	Fresh Wtr 8.3-10	Vertical <1°
		Fruitland Coal	1,831							
		Pictured Cliffs Ss. Lewis Shale	2,054 2,183							
		Cliffhouse Ss. Menefee Fn.	2,875 3,596							
		Point Lookout Ss. Mancos Shale	4,311 4,520							
		KOP	2,700		2,700					
Surveys every 30' through the curve	Mud logger onsite	Mancos Silt	5,113				Stage 1 Tail: 576 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.			
		Gallup Fn.	5,345							
		7" Csg	5,470	5,743'						
Surveys every stand to TD unless directed otherwise by Geologist	No OH Logs	Horizontal Target TD	5,593 5,554	10,860			6 1/8	100' overlap at liner top 5117' Drilled Lateral		Horz Inc/TVD 90.4deg/5593ft
		Base Gallup	5,667					4 1/2" 11.6ppf SB80 LTC TOC @ hanger (50% OH excess) Stage 1 Total: 295sks Stage 1 Blend: 295 sks Premium Lite High Strength FM + 0.7% bwoc R-3 + 3% bwoc 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.	WBM 8.3-10	TD = 10860.1 MD
MWD Gamma Directional										

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 2700', 8 3/4 inch holesize
- 5) Start curve at 10deg/100' build rate
- 6) Drill to csg point of 5743' MD
- 7) R&C 7" csg, circ cmt to surface
- 8) Land at ~90 deg, drill lateral to 10860' run 4 1/2 inch cemented liner



Project: Sandoval County, NM
Site: S22-T23N-R6W
Well: Lybrook D22-2306 02H
Wellbore: HZ
Design: Plan #1



Planning Report

Database: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Site: S22-T23N-R6W
Well: Lybrook D22-2306 02H
Wellbore: HZ
Design: Plan #1

Local Co-ordinate Reference: Well Lybrook D22-2306 02H
TVD Reference: 16' KB @ 7005.0ft
MD Reference: 16' KB @ 7005.0ft
North Reference: True
Survey Calculation Method: Minimum Curvature

Project Sandoval County, NM

Map System: US State Plane 1983
Geo Datum: North American Datum 1983
Map Zone: New Mexico Central Zone
System Datum: Mean Sea Level

Site S22-T23N-R6W

Site Position:
From: Lat/Long
Position Uncertainty: 0.0 ft
Northing: 1,899,747.00 ft
Easting: 1,282,761.84 ft
Slot Radius: 13.200 in
Latitude: 36.214948
Longitude: -107.462462
Grid Convergence: -0.72 °

Well Lybrook D22-2306 02H

Well Position +N/-S 0.0 ft
Well Position +E/-W 0.0 ft
Position Uncertainty 0.0 ft
Northing: 1,899,717.14 ft
Easting: 1,282,762.06 ft
Wellhead Elevation: 0.0 ft
Latitude: 36.214866
Longitude: -107.462460
Ground Level: 6,989.0 ft

Wellbore HZ

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	8/20/2014	9.32	62.99	50,155

Design Plan #1

Audit Notes:

Version: Phase: PLAN
Tie On Depth: 0.0

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	269.92

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	
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.00	0.00	0.00	0.00	
3,993.2	25.86	200.22	3,949.7	-269.3	-99.2	2.00	2.00	0.00	200.22	
5,321.4	25.86	200.22	5,144.9	-812.9	-299.5	0.00	0.00	0.00	0.00	
6,138.0	90.40	269.92	5,586.9	-1,016.3	-869.2	10.00	7.90	8.53	71.42	
10,860.1	90.40	269.92	5,553.9	-1,023.2	-5,591.2	0.00	0.00	0.00	0.00	Lybrook D22-2306 02

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook D22-2306 02H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	16' KB @ 7005.0ft
Project:	Sandoval County, NM	MD Reference:	16' KB @ 7005.0ft
Site:	S22-T23N-R6W	North Reference:	True
Well:	Lybrook D22-2306 02H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

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	
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	
1,487.0	0.00	0.00	1,487.0	0.0	0.0	0.0	0.00	0.00	Ojo Alamo Ss.
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	
1,668.0	0.00	0.00	1,668.0	0.0	0.0	0.0	0.00	0.00	Kirtland Shale
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	
1,831.0	0.00	0.00	1,831.0	0.0	0.0	0.0	0.00	0.00	Fruitland Coal
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	
2,054.0	0.00	0.00	2,054.0	0.0	0.0	0.0	0.00	0.00	Pictured Cliffs Ss.
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	
2,183.0	0.00	0.00	2,183.0	0.0	0.0	0.0	0.00	0.00	Lewis Shale
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	KOP @ 2700'
2,800.0	2.00	200.22	2,800.0	-1.6	-0.6	0.6	2.00	2.00	
2,875.1	3.50	200.22	2,875.0	-5.0	-1.8	1.9	2.00	2.00	Cliffhouse Ss.
2,900.0	4.00	200.22	2,899.8	-6.5	-2.4	2.4	2.00	2.00	
3,000.0	6.00	200.22	2,999.5	-14.7	-5.4	5.4	2.00	2.00	
3,100.0	8.00	200.22	3,098.7	-26.2	-9.6	9.7	2.00	2.00	
3,200.0	10.00	200.22	3,197.5	-40.8	-15.0	15.1	2.00	2.00	
3,300.0	12.00	200.22	3,295.6	-58.7	-21.6	21.7	2.00	2.00	
3,400.0	14.00	200.22	3,393.1	-79.9	-29.4	29.5	2.00	2.00	
3,500.0	16.00	200.22	3,489.6	-104.1	-38.4	38.5	2.00	2.00	
3,600.0	18.00	200.22	3,585.3	-131.6	-48.5	48.7	2.00	2.00	
3,610.9	18.22	200.22	3,595.7	-134.8	-49.6	49.8	2.00	2.00	Menefee Fn.
3,700.0	20.00	200.22	3,679.8	-162.1	-59.7	60.0	2.00	2.00	
3,800.0	22.00	200.22	3,773.2	-195.7	-72.1	72.4	2.00	2.00	
3,900.0	24.00	200.22	3,865.2	-232.4	-85.6	85.9	2.00	2.00	
3,993.2	25.86	200.22	3,949.7	-269.3	-99.2	99.6	2.00	2.00	EOB; Inc=25.86°
4,000.0	25.86	200.22	3,955.8	-272.1	-100.2	100.6	0.00	0.00	
4,100.0	25.86	200.22	4,045.8	-313.0	-115.3	115.7	0.00	0.00	
4,200.0	25.86	200.22	4,135.8	-353.9	-130.4	130.9	0.00	0.00	
4,300.0	25.86	200.22	4,225.8	-394.9	-145.5	146.0	0.00	0.00	

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook D22-2306 02H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	16' KB @ 7005.0ft
Project:	Sandoval County, NM	MD Reference:	16' KB @ 7005.0ft
Site:	S22-T23N-R6W	North Reference:	True
Well:	Lybrook D22-2306 02H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

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
4,393.4	25.86	200.22	4,309.9	-433.1	-159.6	160.2	0.00	0.00	Point Lookout Ss.
4,400.0	25.86	200.22	4,315.8	-435.8	-160.5	161.2	0.00	0.00	
4,500.0	25.86	200.22	4,405.8	-476.7	-175.6	176.3	0.00	0.00	
4,600.0	25.86	200.22	4,495.7	-517.7	-190.7	191.4	0.00	0.00	
4,625.4	25.86	200.22	4,518.6	-528.1	-194.5	195.3	0.00	0.00	Mancos Shale
4,700.0	25.86	200.22	4,585.7	-558.6	-205.8	206.6	0.00	0.00	
4,800.0	25.86	200.22	4,675.7	-599.5	-220.9	221.7	0.00	0.00	
4,900.0	25.86	200.22	4,765.7	-640.5	-235.9	236.8	0.00	0.00	
5,000.0	25.86	200.22	4,855.7	-681.4	-251.0	252.0	0.00	0.00	
5,100.0	25.86	200.22	4,945.7	-722.3	-266.1	267.1	0.00	0.00	
5,200.0	25.86	200.22	5,035.6	-763.3	-281.2	282.2	0.00	0.00	
5,283.7	25.86	200.22	5,110.9	-797.5	-293.8	294.9	0.00	0.00	Mancos Silt
5,300.0	25.86	200.22	5,125.6	-804.2	-296.3	297.4	0.00	0.00	
5,321.4	25.86	200.22	5,144.9	-812.9	-299.5	300.6	0.00	0.00	Start build/turn @ 5321' MD
5,400.0	29.26	215.60	5,214.6	-844.7	-316.6	317.8	10.00	4.33	
5,500.0	35.53	230.24	5,299.2	-883.3	-353.3	354.5	10.00	6.26	
5,554.4	39.52	236.33	5,342.3	-903.0	-379.9	381.1	10.00	7.33	Gallup Fn.
5,600.0	43.07	240.67	5,376.6	-918.7	-405.5	406.8	10.00	7.79	
5,700.0	51.31	248.41	5,444.5	-949.8	-471.7	473.1	10.00	8.24	
5,743.0	54.99	251.19	5,470.3	-961.7	-504.0	505.4	10.00	8.56	7" ICP @ 55°
5,800.0	59.96	254.51	5,501.0	-975.8	-549.9	551.3	10.00	8.71	
5,900.0	68.84	259.61	5,544.2	-995.8	-637.7	639.1	10.00	8.88	
6,000.0	77.86	264.13	5,572.8	-1,009.3	-732.5	733.9	10.00	9.02	
6,100.0	86.94	268.35	5,586.0	-1,015.7	-831.2	832.7	10.00	9.09	
6,138.0	90.40	269.92	5,586.9	-1,016.3	-869.2	870.6	10.00	9.10	LP @ 5586' TVD; 90.4°
6,200.0	90.40	269.92	5,586.5	-1,016.4	-931.2	932.6	0.00	0.00	
6,238.0	90.40	269.92	5,586.2	-1,016.5	-969.2	970.6	0.00	0.00	Lybrook D22-2306 02H POE
6,300.0	90.40	269.92	5,585.8	-1,016.6	-1,031.2	1,032.6	0.00	0.00	
6,400.0	90.40	269.92	5,585.1	-1,016.7	-1,131.2	1,132.6	0.00	0.00	
6,500.0	90.40	269.92	5,584.4	-1,016.8	-1,231.2	1,232.6	0.00	0.00	
6,600.0	90.40	269.92	5,583.7	-1,017.0	-1,331.2	1,332.6	0.00	0.00	
6,700.0	90.40	269.92	5,583.0	-1,017.1	-1,431.2	1,432.6	0.00	0.00	
6,800.0	90.40	269.92	5,582.3	-1,017.3	-1,531.2	1,532.6	0.00	0.00	
6,900.0	90.40	269.92	5,581.6	-1,017.4	-1,631.2	1,632.6	0.00	0.00	
7,000.0	90.40	269.92	5,580.9	-1,017.6	-1,731.2	1,732.6	0.00	0.00	
7,100.0	90.40	269.92	5,580.2	-1,017.7	-1,831.2	1,832.6	0.00	0.00	
7,200.0	90.40	269.92	5,579.5	-1,017.9	-1,931.2	1,932.6	0.00	0.00	
7,300.0	90.40	269.92	5,578.8	-1,018.0	-2,031.2	2,032.6	0.00	0.00	
7,400.0	90.40	269.92	5,578.1	-1,018.2	-2,131.2	2,132.6	0.00	0.00	
7,500.0	90.40	269.92	5,577.4	-1,018.3	-2,231.2	2,232.6	0.00	0.00	
7,600.0	90.40	269.92	5,576.7	-1,018.5	-2,331.2	2,332.6	0.00	0.00	
7,700.0	90.40	269.92	5,576.0	-1,018.6	-2,431.2	2,432.6	0.00	0.00	
7,800.0	90.40	269.92	5,575.3	-1,018.7	-2,531.2	2,532.6	0.00	0.00	
7,900.0	90.40	269.92	5,574.6	-1,018.9	-2,631.2	2,632.6	0.00	0.00	
8,000.0	90.40	269.92	5,573.9	-1,019.0	-2,731.2	2,732.6	0.00	0.00	
8,100.0	90.40	269.92	5,573.2	-1,019.2	-2,831.2	2,832.6	0.00	0.00	
8,200.0	90.40	269.92	5,572.5	-1,019.3	-2,931.2	2,932.6	0.00	0.00	
8,300.0	90.40	269.92	5,571.8	-1,019.5	-3,031.2	3,032.6	0.00	0.00	
8,400.0	90.40	269.92	5,571.1	-1,019.6	-3,131.2	3,132.6	0.00	0.00	
8,500.0	90.40	269.92	5,570.4	-1,019.8	-3,231.2	3,232.6	0.00	0.00	
8,600.0	90.40	269.92	5,569.7	-1,019.9	-3,331.2	3,332.6	0.00	0.00	
8,700.0	90.40	269.92	5,569.0	-1,020.1	-3,431.2	3,432.6	0.00	0.00	

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook D22-2306 02H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	16' KB @ 7005.0ft
Project:	Sandoval County, NM	MD Reference:	16' KB @ 7005.0ft
Site:	S22-T23N-R6W	North Reference:	True
Well:	Lybrook D22-2306 02H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

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
8,800.0	90.40	269.92	5,568.3	-1,020.2	-3,531.2	3,532.6	0.00	0.00	
8,900.0	90.40	269.92	5,567.6	-1,020.4	-3,631.2	3,632.6	0.00	0.00	
9,000.0	90.40	269.92	5,566.9	-1,020.5	-3,731.1	3,732.6	0.00	0.00	
9,100.0	90.40	269.92	5,566.2	-1,020.7	-3,831.1	3,832.6	0.00	0.00	
9,200.0	90.40	269.92	5,565.5	-1,020.8	-3,931.1	3,932.6	0.00	0.00	
9,300.0	90.40	269.92	5,564.8	-1,020.9	-4,031.1	4,032.6	0.00	0.00	
9,400.0	90.40	269.92	5,564.1	-1,021.1	-4,131.1	4,132.6	0.00	0.00	
9,500.0	90.40	269.92	5,563.4	-1,021.2	-4,231.1	4,232.6	0.00	0.00	
9,600.0	90.40	269.92	5,562.7	-1,021.4	-4,331.1	4,332.6	0.00	0.00	
9,700.0	90.40	269.92	5,562.0	-1,021.5	-4,431.1	4,432.6	0.00	0.00	
9,800.0	90.40	269.92	5,561.3	-1,021.7	-4,531.1	4,532.6	0.00	0.00	
9,900.0	90.40	269.92	5,560.6	-1,021.8	-4,631.1	4,632.5	0.00	0.00	
10,000.0	90.40	269.92	5,559.9	-1,022.0	-4,731.1	4,732.5	0.00	0.00	
10,100.0	90.40	269.92	5,559.2	-1,022.1	-4,831.1	4,832.5	0.00	0.00	
10,200.0	90.40	269.92	5,558.5	-1,022.3	-4,931.1	4,932.5	0.00	0.00	
10,300.0	90.40	269.92	5,557.8	-1,022.4	-5,031.1	5,032.5	0.00	0.00	
10,400.0	90.40	269.92	5,557.1	-1,022.6	-5,131.1	5,132.5	0.00	0.00	
10,500.0	90.40	269.92	5,556.4	-1,022.7	-5,231.1	5,232.5	0.00	0.00	
10,600.0	90.40	269.92	5,555.7	-1,022.8	-5,331.1	5,332.5	0.00	0.00	
10,700.0	90.40	269.92	5,555.0	-1,023.0	-5,431.1	5,432.5	0.00	0.00	
10,800.0	90.40	269.92	5,554.3	-1,023.1	-5,531.1	5,532.5	0.00	0.00	
10,860.1	90.40	269.92	5,553.9	-1,023.2	-5,591.2	5,592.6	0.00	0.00	TD at 10860.1 - Lybrook D22-2306 02H PBHL

Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Lybrook D22-2306 02H I - plan hits target center - Point	0.00	0.00	5,553.9	-1,023.2	-5,591.2	1,898,763.91	1,277,158.53	36.212054	-107.481411
Lybrook D22-2306 02H I - plan hits target center - Point	0.00	0.00	5,586.2	-1,016.5	-969.2	1,898,712.87	1,281,780.24	36.212074	-107.465745
	500.0	500.0	9 5/8"					0.000	0.000
	5,743.0	5,470.3	7" ICP @ 55°					0.000	0.000

Planning Report

Database: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Site: S22-T23N-R6W
Well: Lybrook D22-2306 02H
Wellbore: HZ
Design: Plan #1

Local Co-ordinate Reference: Well Lybrook D22-2306 02H
TVD Reference: 16' KB @ 7005.0ft
MD Reference: 16' KB @ 7005.0ft
North Reference: True
Survey Calculation Method: Minimum Curvature

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,487.0	1,487.0	Ojo Alamo Ss.		-0.40	269.92	
1,668.0	1,668.0	Kirtland Shale		-0.40	269.92	
1,831.0	1,831.0	Fruitland Coal		-0.40	269.92	
2,054.0	2,054.0	Pictured Cliffs Ss.		-0.40	269.92	
2,183.0	2,183.0	Lewis Shale		-0.40	269.92	
2,875.1	2,875.0	Cliffhouse Ss.		-0.40	269.92	
3,610.9	3,596.0	Menefee Fn.		-0.40	269.92	
4,393.4	4,311.0	Point Lookout Ss.		-0.40	269.92	
4,625.4	4,520.0	Mancos Shale		-0.40	269.92	
5,283.7	5,113.0	Mancos Silt		-0.40	269.92	
5,554.4	5,345.0	Gallup Fn.		-0.40	269.92	

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
2,700.0	2,700.0	0.0	0.0	KOP @ 2700'	
3,993.2	3,949.7	-269.3	-99.2	EOB; Inc=25.86°	
5,321.4	5,144.9	-812.9	-299.5	Start build/turn @ 5321' MD	
6,138.0	5,586.9	-1,016.3	-869.2	LP @ 5586' TVD; 90.4°	
10,860.1	5,553.9	-1,023.2	-5,591.2	TD at 10860.1	

EnCana Oil & Gas (USA) Inc

Sandoval County, NM

S22-T23N-R6W

Lybrook D22-2306 02H

HZ

Plan #1

Anticollision Report

20 August, 2014

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lybrook D22-2306 02H
Project:	Sandoval County, NM	TVD Reference:	16' KB @ 7005.0ft
Reference Site:	S22-T23N-R6W	MD Reference:	16' KB @ 7005.0ft
Site Error:	0.0ft	North Reference:	True
Reference Well:	Lybrook D22-2306 02H	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 #1	Offset TVD Reference:	Offset Datum

Reference	Plan #1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0ft	Error Model:	Systematic Ellipse
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,236.6ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program	Date 8/20/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	10,860.1	Plan #1 (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						
S22-T23N-R6W						
Lybrook D22-2306 01H - HZ - Plan #1	2,700.0	2,700.0	29.9	20.5	3.187	CC, ES, SF

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lybrook D22-2306 02H
Project:	Sandoval County, NM	TVD Reference:	16' KB @ 7005.0ft
Reference Site:	S22-T23N-R6W	MD Reference:	16' KB @ 7005.0ft
Site Error:	0.0ft	North Reference:	True
Reference Well:	Lybrook D22-2306 02H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design S22-T23N-R6W - Lybrook D22-2306 01H - HZ - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-Geolink MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Semi Major Axis (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Distance Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-1.13		29.9	-0.6	29.9				
100.0	100.0	100.0	100.0	0.1	0.1	-1.13		29.9	-0.6	29.9	29.6	0.29	101.834	
200.0	200.0	200.0	200.0	0.3	0.3	-1.13		29.9	-0.6	29.9	29.2	0.64	46.490	
300.0	300.0	300.0	300.0	0.5	0.5	-1.13		29.9	-0.6	29.9	28.9	0.99	30.120	
400.0	400.0	400.0	400.0	0.7	0.7	-1.13		29.9	-0.6	29.9	28.5	1.34	22.276	
500.0	500.0	500.0	500.0	0.8	0.8	-1.13		29.9	-0.6	29.9	28.2	1.69	17.674	
600.0	600.0	600.0	600.0	1.0	1.0	-1.13		29.9	-0.6	29.9	27.8	2.04	14.647	
700.0	700.0	700.0	700.0	1.2	1.2	-1.13		29.9	-0.6	29.9	27.5	2.39	12.506	
800.0	800.0	800.0	800.0	1.4	1.4	-1.13		29.9	-0.6	29.9	27.1	2.74	10.911	
900.0	900.0	900.0	900.0	1.5	1.5	-1.13		29.9	-0.6	29.9	26.8	3.09	9.677	
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	-1.13		29.9	-0.6	29.9	26.4	3.43	8.693	
1,100.0	1,100.0	1,100.0	1,100.0	1.9	1.9	-1.13		29.9	-0.6	29.9	26.1	3.78	7.891	
1,200.0	1,200.0	1,200.0	1,200.0	2.1	2.1	-1.13		29.9	-0.6	29.9	25.7	4.13	7.225	
1,300.0	1,300.0	1,300.0	1,300.0	2.2	2.2	-1.13		29.9	-0.6	29.9	25.4	4.48	6.662	
1,400.0	1,400.0	1,400.0	1,400.0	2.4	2.4	-1.13		29.9	-0.6	29.9	25.0	4.83	6.181	
1,500.0	1,500.0	1,500.0	1,500.0	2.6	2.6	-1.13		29.9	-0.6	29.9	24.7	5.18	5.764	
1,600.0	1,600.0	1,600.0	1,600.0	2.8	2.8	-1.13		29.9	-0.6	29.9	24.3	5.53	5.400	
1,700.0	1,700.0	1,700.0	1,700.0	2.9	2.9	-1.13		29.9	-0.6	29.9	24.0	5.88	5.080	
1,800.0	1,800.0	1,800.0	1,800.0	3.1	3.1	-1.13		29.9	-0.6	29.9	23.6	6.23	4.795	
1,900.0	1,900.0	1,900.0	1,900.0	3.3	3.3	-1.13		29.9	-0.6	29.9	23.3	6.58	4.540	
2,000.0	2,000.0	2,000.0	2,000.0	3.5	3.5	-1.13		29.9	-0.6	29.9	22.9	6.93	4.312	
2,100.0	2,100.0	2,100.0	2,100.0	3.6	3.6	-1.13		29.9	-0.6	29.9	22.6	7.27	4.105	
2,200.0	2,200.0	2,200.0	2,200.0	3.8	3.8	-1.13		29.9	-0.6	29.9	22.2	7.62	3.917	
2,300.0	2,300.0	2,300.0	2,300.0	4.0	4.0	-1.13		29.9	-0.6	29.9	21.9	7.97	3.745	
2,400.0	2,400.0	2,400.0	2,400.0	4.2	4.2	-1.13		29.9	-0.6	29.9	21.5	8.32	3.588	
2,500.0	2,500.0	2,500.0	2,500.0	4.3	4.3	-1.13		29.9	-0.6	29.9	21.2	8.67	3.444	
2,600.0	2,600.0	2,600.0	2,600.0	4.5	4.5	-1.13		29.9	-0.6	29.9	20.8	9.02	3.310	
2,700.0	2,700.0	2,700.0	2,700.0	4.7	4.7	-1.13		29.9	-0.6	29.9	20.5	9.37	3.187	CC, ES, SF
2,800.0	2,800.0	2,800.0	2,800.0	4.9	4.9	159.79		29.9	-0.6	31.5	21.8	9.71	3.242	
2,900.0	2,899.8	2,899.8	2,899.8	5.0	5.0	162.60		29.9	-0.6	36.4	26.4	10.05	3.626	
3,000.0	2,999.5	2,999.5	2,999.5	5.2	5.2	165.89		29.9	-0.6	44.8	34.5	10.38	4.319	
3,100.0	3,098.7	3,098.7	3,098.7	5.4	5.4	168.85		29.9	-0.6	56.7	46.0	10.70	5.303	
3,200.0	3,197.5	3,197.5	3,197.5	5.6	5.6	171.20		29.9	-0.6	72.2	61.1	11.01	6.554	
3,300.0	3,295.6	3,295.6	3,295.6	5.9	5.7	172.99		29.9	-0.6	91.1	79.8	11.31	8.054	
3,400.0	3,393.1	3,393.1	3,393.1	6.1	5.9	174.33		29.9	-0.6	113.4	101.8	11.59	9.784	
3,500.0	3,489.6	3,489.6	3,489.6	6.5	6.1	175.34		29.9	-0.6	139.2	127.3	11.87	11.731	
3,600.0	3,585.3	3,585.3	3,585.3	6.8	6.2	176.11		29.9	-0.6	168.4	156.2	12.13	13.881	
3,700.0	3,679.8	3,679.8	3,679.8	7.2	6.4	176.70		29.9	-0.6	200.9	188.5	12.38	16.226	
3,800.0	3,773.2	3,771.5	3,771.5	7.7	6.6	176.88		30.4	-1.5	236.9	224.3	12.61	18.781	
3,900.0	3,865.2	3,860.7	3,860.6	8.2	6.7	176.32		32.6	-5.1	277.0	264.2	12.84	21.574	
4,000.0	3,955.8	3,947.6	3,947.2	8.8	6.9	175.32		36.4	-11.4	321.1	308.1	13.07	24.574	
4,100.0	4,045.8	4,032.6	4,031.6	9.5	7.0	174.12		41.7	-20.1	367.5	354.1	13.42	27.392	
4,200.0	4,135.8	4,116.3	4,114.2	10.1	7.2	172.76		48.4	-31.1	415.0	401.2	13.78	30.107	
4,300.0	4,225.8	4,200.0	4,196.5	10.8	7.4	171.28		56.6	-44.5	463.5	449.3	14.17	32.701	
4,400.0	4,315.8	4,278.8	4,273.3	11.5	7.6	169.81		65.6	-59.4	513.3	498.7	14.59	35.184	
4,500.0	4,405.8	4,357.5	4,349.4	12.2	7.8	168.31		75.9	-76.3	564.3	549.3	15.04	37.526	
4,600.0	4,495.7	4,434.2	4,423.0	12.9	8.0	166.81		87.2	-94.9	616.7	601.2	15.52	39.731	
4,700.0	4,585.7	4,509.0	4,494.0	13.6	8.3	165.35		99.4	-114.9	670.5	654.5	16.04	41.807	
4,800.0	4,675.7	4,589.6	4,570.0	14.3	8.6	163.85		113.3	-137.8	725.4	708.8	16.62	43.654	
4,900.0	4,765.7	4,671.6	4,647.4	15.0	8.9	162.52		127.5	-161.1	780.6	763.4	17.23	45.318	
5,000.0	4,855.7	4,753.7	4,724.8	15.8	9.3	161.37		141.7	-184.5	836.1	818.2	17.85	46.835	
5,100.0	4,945.7	4,835.8	4,802.2	16.5	9.6	160.35		155.9	-207.8	891.8	873.3	18.50	48.217	

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

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lybrook D22-2306 02H
Project:	Sandoval County, NM	TVD Reference:	16' KB @ 7005.0ft
Reference Site:	S22-T23N-R6W	MD Reference:	16' KB @ 7005.0ft
Site Error:	0.0ft	North Reference:	True
Reference Well:	Lybrook D22-2306 02H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design													S22-T23N-R6W - Lybrook D22-2306 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	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre +N/-S	+E/-W	Between Centres	Between Ellipses	Total Uncertainty Axis	Separation Factor						
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	(ft)	(ft)	(ft)	(ft)								
5,200.0	5,035.6	4,917.8	4,879.6	17.3	10.0	159.46	170.1	-231.1	947.6	928.5	19.15	49.480						
5,300.0	5,125.6	4,999.9	4,957.0	18.0	10.4	158.66	184.3	-254.4	1,003.6	983.8	19.82	50.634						
5,400.0	5,214.6	5,082.6	5,035.0	18.8	10.8	139.40	198.6	-277.9	1,059.4	1,038.1	21.31	49.709						
5,500.0	5,299.2	5,166.1	5,113.7	19.7	11.2	121.44	213.0	-301.7	1,113.1	1,089.9	23.20	47.984						
5,600.0	5,376.6	5,247.8	5,190.8	20.7	11.6	109.22	227.2	-324.9	1,163.6	1,138.5	25.05	46.455						
5,700.0	5,444.5	5,344.2	5,279.6	21.7	12.2	101.22	243.4	-358.2	1,210.0	1,183.1	26.90	44.973						

Anticollision Report

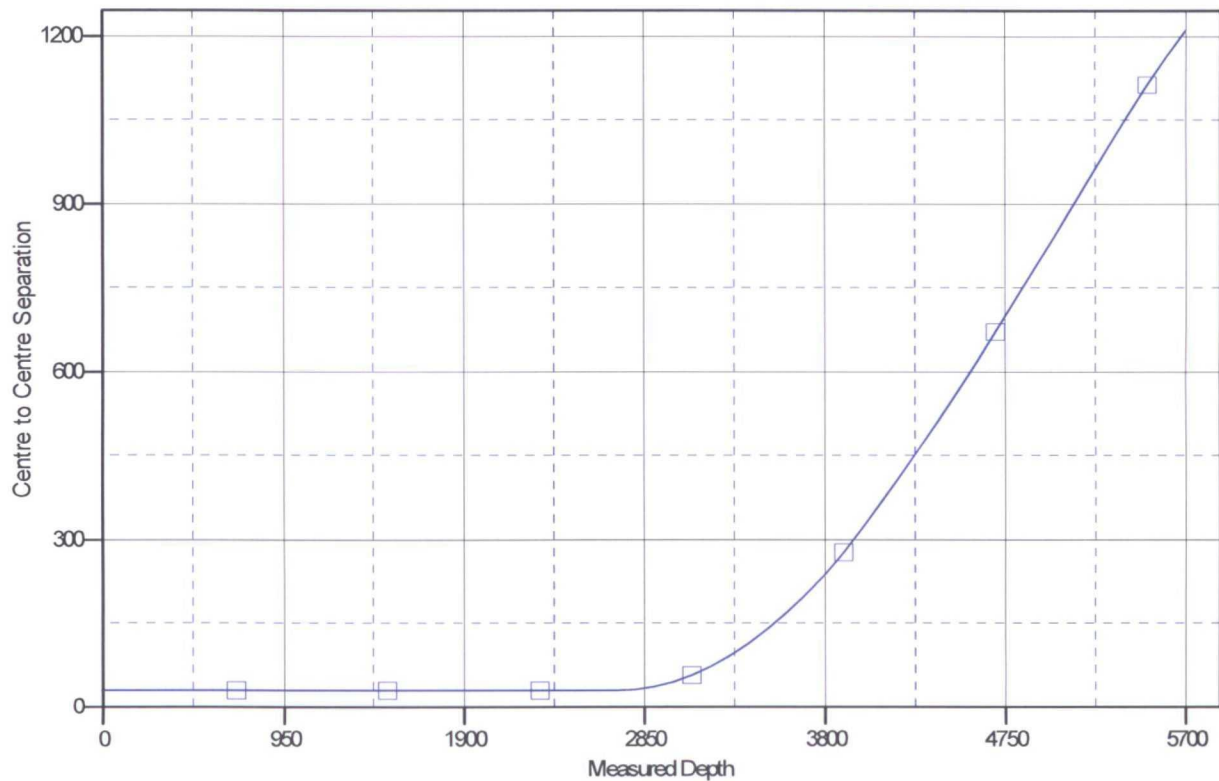
Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Reference Site: S22-T23N-R6W
Site Error: 0.0ft
Reference Well: Lybrook D22-2306 02H
Well Error: 0.0ft
Reference Wellbore: HZ
Reference Design: Plan #1

Local Co-ordinate Reference: Well Lybrook D22-2306 02H
TVD Reference: 16' KB @ 7005.0ft
MD Reference: 16' KB @ 7005.0ft
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 @ 7005.0ft
 Offset Depths are relative to Offset Datum
 Central Meridian is -106.250000 °

Coordinates are relative to: Lybrook D22-2306 02H
 Coordinate System is US State Plane 1983, New Mexico Central Zone
 Grid Convergence at Surface is: -0.72°

Ladder Plot



LEGEND

LybrookD22-2306 01H,HZ,Plan#1 V0

Lybrook D22-2206 02H

**SHL: NWNW Section 22, T23N, R6W
1015 FNL and 649 FWL**

**BHL: SWNW Section 21, T23N, R6W
2020 FNL and 330 FWL**

Sandoval County, New Mexico

Lease Number: NMNM112953 & FEE MINERAL TRACT

5. Construction equipment may include chain saws, a brush hog, scraper, maintainer, excavator, and dozer. Construction for the access road and well pad will take approximately 4 to 5 weeks.

C. Pipeline

See Standard SF-299 Application for authorization to construct, operate, maintain and terminate a 489 foot, up to 6-inch outside diameter, buried steel well connect pipeline that was submitted to the Bureau of Land Management. Final modifications to the SF-299 will be submitted concurrently with the APD.

7. METHODS FOR HANDLING WASTE

A. Cuttings

1. A closed-loop system will be used. Cuttings will be moved through a shaker system on the drill rig that separates drilling fluids from the cuttings. Cuttings will be stored onsite in above-ground storage tanks. Cuttings will be pulled from the storage tanks, mixed with saw dust or similar absorbent material, and disposed of at the Envirotech, Inc. and/or Industrial Ecosystem, Inc. waste disposal facilities.
2. The closed-loop system storage tanks will be adequately sized to ensure confinement of all fluids and will provide sufficient freeboard to prevent uncontrolled releases.
3. A 20-mil liner will be installed under tanks, pumps, ancillary facilities, and truck loading/unloading areas associated with the closed-loop system.

B. Drilling Fluids

1. A closed-loop system will be used. Drilling fluids will be stored onsite in above-ground storage tanks. Upon termination of drilling operations, the drilling fluids will be recycled and transferred to other permitted closed-loop systems or returned to the vendor for reuse, as practical. Residual fluids will be vacuumed from the storage tanks and disposed of at Basin Disposal, Inc. and/or Industrial Ecosystem, Inc. waste disposal facilities.
2. The closed-loop system storage tanks will be adequately sized to ensure confinement of all fluids and will provide sufficient freeboard to prevent uncontrolled releases.
3. The closed-loop system storage tanks will be placed in bermed secondary containment sized to accommodate a minimum of 110 percent of the volume of the largest storage tank.
4. A 20-mil liner will be installed under tanks, pumps, ancillary facilities, and truck loading/unloading areas associated with the closed-loop system.

C. Flowback Water

1. The water-based solution that flows back to the surface during and after completion operations will be placed in storage tanks on the location.
2. Flowback water will be confined to a storage tank for a period not to exceed 90 days after initial production and will be disposed of at Basin Disposal, Inc. and/or Industrial Ecosystem, Inc. waste disposal facilities.

- D. Spills** – any spills of non-freshwater fluids will be immediately cleaned up and removed to an approved disposal site. Encana will also notify the BLM within 24 hours of any spill.

ENCANA OIL & GAS (USA) INC.
LYBROOK D22-2306 #02H
1015' FNL & 649' FWL
LOCATED IN THE NW/4 NW/4 OF SECTION 22,
T23N, R6W, N.M.P.M.,
SANDOVAL COUNTY, NEW MEXICO

DIRECTIONS

- 1) FROM THE INTERSECTION OF HWY 64 & HWY 550 IN BLOOMFIELD, GO SOUTH ON HWY 550, 54.5 MILES TO STATE HWY 403 (M.P. 97.1).
- 2) TURN LEFT ONTO HWY 403 AND GO 0.5 MILES TO FACILITY PAD WHERE ACCESS IS STAKED ON WEST SIDE OF FACILITY PAD.

WELL FLAG LOCATED AT LAT. 36.214866° N, LONG. 107.462460° W (NAD 83).



encana

Well Name and Number:

Lybrook D22-2306 02H



11" 3K Annular

3K Double Ram
Top: Pipe Ram
Bottom: Blind Ram
3" Outlets Below Ram

3K Mud Cross 3" gate valves

