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: 3/25/15
Well information;
Operator Encana, Well Name and Number Lybrook P24A-2206 #1H

API# 30-043-21270, Section 24, Township 22 (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
- o Spacing rule violation. Operator must follow up with change of status notification on other well to be shut in or abandoned
- o 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
- o 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.

APD Held for corrected C-102 recd on 1-27-16

Charlie Perrin
NMOCD Approved by Signature

2-4-2016
Date

RV

1220 South St. Francis Drive • Santa Fe, New Mexico 87505
Phone (505) 476-3460 • Fax (505) 476-3462 • www.emnrd.state.nm.us/ocd

Form 3160-3
(March 2012)

RECEIVED
MAR 26 2015
Farmington Field Office
Bureau of Land Management

OIL CONS. DIV DIST. 3
DEC 16 2015

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.: NMNM 117563

6. If Indian, Allotee or Tribe Name: N/A

1a. Type of Work: ☑ DRILL ☐ REENTER

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

1b. Type of Well: ☑ Oil Well ☐ Gas Well ☐ Other ☑ Single Zone ☐ Multiple Zone

8. Lease Name and Well No.: Lybrook P24A-2206 01H

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

9. API Well No.: 30-043-21270

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

3b. Phone No. (include area code): 720-876-5994

10. Field and Pool, or Exploratory: Wildcat Gallup

4. Location of Well (Report location clearly and in accordance with any State requirements.*)

At surface: 626' FSL and 731' FEL Section 24, T22N, R6W

At proposed prod. zone: 330' FSL and 1780' FEL Section 25, T22N, R6W

11. Sec., T. R. M. or Blk. and Survey or Area: Section 24, T22N, R6W NMPM

14. Distance in miles and direction from nearest town or post office*: +/- 62.5 miles South from the intersection of HWY 64 and HWY 550 in Bloomfield, NM

12. County or Parish: Sandoval

13. State: NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any): BHL is 330' FSL Section 25, T22N, R6W

16. No. of acres in lease: NMNM 117563 - 1,120 acres

17. Spacing Unit dedicated to this well: 160.0 acres- W2E2 Section 25, T22N, R6W

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.: SHL +/-30' N Lybrook P24A-2206 02H

19. Proposed Depth: 5,283' TVD; 10,652' MD

20. BLM/BIA Bond No. on file: COB-000235

21. Elevations (Show whether DF, KDB, RT, GL, etc.): 7,207' GL 7,223' KB

22. Approximate date work will start*: 11/05/2015

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:

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

25. Signature: Shawn Turk — Name (Printed/Typed): Shawn Turk — Date: 3/25/15

Title: Regulatory Analyst

Approved by (Signature): /s/ Matthew Kade — Name (Printed/Typed): — Date: 12/14/15

Title: AFM — Office: FFO

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.
Conditions of approval, if any, are attached.

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 2)

*(Instructions on page 2)

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

NMOCD

DRILLING OPERATIONS AUTHORIZED ARE SUBJECT TO COMPLIANCE WITH ATTACHED "GENERAL REQUIREMENTS"
This action is subject to technical and procedural review pursuant to 43 CFR 3165.3 and appeal pursuant to 43 CFR 3165.4

CONFIDENTIAL

OIL CONS. DIV DIST. 3

DEC 16 2015

District I
1625 N. French Dr., Hobbs, NM 88240
Phone (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S St. Francis Dr., Santa Fe, NM 87505
Phone (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

[1] API Number	[2] Pool Code	[3] Pool Name
30-043-21270	97981	WILDCAT UC 22N6W22 Gallup

[4] Property Code	[5] Property Name	[6] Well Number
	LYBROOK P24A-2206	01H

[7] OGRID No.	[8] Operator Name	[9] Elevation
282327	ENCANA OIL & GAS (USA) INC.	7207.3'

[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
P	24	22N	06W		626	SOUTH	731	EAST	SANDOVAL

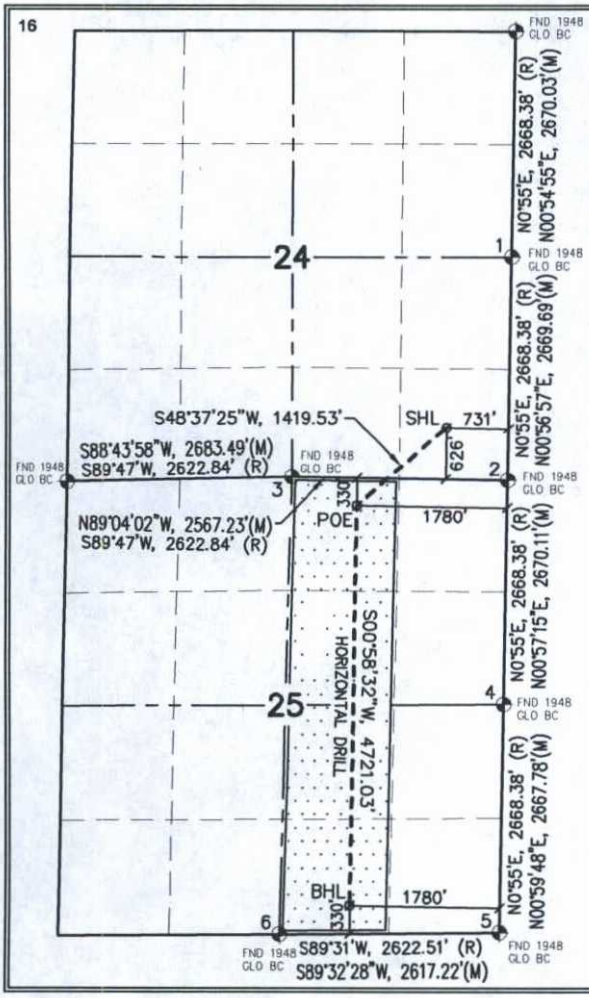
[11] Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West Line	County
O	25	22N	06W		330	SOUTH	1780	EAST	SANDOVAL

[12] Dedicated Acres (RECORD)	PROJECT AREA	[13] Joint or Infill	[14] Consolidation Code	[15] Order No.
160.00 ACRES	W/2 E/2 SECTION 25			

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



LYBROOK P24A-2206 01H WELL

SHL (WELL FLAG)
LAT. 36.117104°N (NAD83)
LONG. 107.414705°W (NAD83)
LAT. 36.117089°N (NAD27)
LONG. 107.414102°W (NAD27)

POE (POINT OF ENTRY)
LAT. 36.114526°N (NAD83)
LONG. 107.418309°W (NAD83)
LAT. 36.114511°N (NAD27)
LONG. 107.417706°W (NAD27)

BHL (BOTTOM HOLE LOCATION)
LAT. 36.101564°N (NAD83)
LONG. 107.418574°W (NAD83)
LAT. 36.101549°N (NAD27)
LONG. 107.417970°W (NAD27)

SECTION CORNERS

1 LAT. 36.122685°N (NAD83)
LONG. 107.412121°W (NAD83)
LAT. 36.122670°N (NAD27)
LONG. 107.411518°W (NAD27)

2 LAT. 36.115355°N (NAD83)
LONG. 107.412267°W (NAD83)
LAT. 36.115340°N (NAD27)
LONG. 107.411664°W (NAD27)

3 LAT. 36.115467°N (NAD83)
LONG. 107.420955°W (NAD83)
LAT. 36.115451°N (NAD27)
LONG. 107.420351°W (NAD27)

4 LAT. 36.108024°N (NAD83)
LONG. 107.412414°W (NAD83)
LAT. 36.108008°N (NAD27)
LONG. 107.411811°W (NAD27)

5 LAT. 36.100699°N (NAD83)
LONG. 107.412568°W (NAD83)
LAT. 36.100683°N (NAD27)
LONG. 107.411965°W (NAD27)

6 LAT. 36.100638°N (NAD83)
LONG. 107.421423°W (NAD83)
LAT. 36.100623°N (NAD27)
LONG. 107.420820°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.

Signature — Date: 3/25/15

Shawn Turk
Printed Name

shawn.turk@encana.com
E-mail Address

[18] SURVEYOR CERTIFICATION

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

September 8, 2014
Date of Survey

Signature and Seal of Professional Surveyor:

RICHARD L. MULLIKEN — NEW MEXICO — 16873 — 3-10-15 — PROFESSIONAL SURVEYOR

RICHARD L. MULLIKEN
Certificate Number 16873

Sheet A

Lybrook P24A-2206 01H
SHL: 626' FSL, 731' FEL Sec 24, T22N, R6W
BHL: 330' FSL, 1780' FEL Sec 25, T22N, R6W
Sandoval, New Mexico
Lease Number: NMNM 117563

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.	1,318
Kirtland Shale	1,524
Fruitland Coal	1,656
Pictured Cliffs Ss.	1,874
Lewis Shale	2,011
Cliffhouse Ss.	2,669
Menefee Fn.	3,378
Point Lookout Ss.	4,135
Mancos Shale	4,351
Mancos Silt	4,900
Gallup Fn.	5,168
Base Gallup	5,454

The referenced surface elevation is 7207', KB 7223'

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

Substance	Formation	Depth (TVD) units = feet
Water/Gas	Fruitland Coal	1,656
Oil/Gas	Pictured Cliffs Ss.	1,874
Oil/Gas	Cliffhouse Ss.	2,669
Gas	Menefee Fn.	3,378
Oil/Gas	Point Lookout Ss.	4,135
Oil/Gas	Mancos Shale	4,351
Oil/Gas	Mancos Silt	4,900
Oil/Gas	Gallup Fn.	5,168

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

Lybrook P24A-2206 01H
SHL: 626' FSL, 731' FEL Sec 24, T22N, R6W
BHL: 330' FSL, 1780' FEL Sec 25, T22N, R6W
Sandoval, New Mexico
Lease Number: NMNM 117563

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'-5529'	8 3/4"	7"	26#	J55, LTC New
Production Liner	5429'-10652'	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 P24A-2206 01H
SHL: 626' FSL, 731' FEL Sec 24, T22N, R6W
BHL: 330' FSL, 1780' FEL Sec 25, T22N, R6W
Sandoval, New Mexico
Lease Number: NMNM 117563

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'-5529'	100% open hole excess Stage 1 Lead: 515 sks Stage 1 Tail: 392 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	5429'-10652'	50% OH excess Stage 1 Blend Total: 295sks	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 500'. Directional plans are attached.

Description	Proposed Depth (TVD/MD)	Formation
Horizontal Lateral TD	5283'/10652'	Gallup

Lybrook P24A-2206 01H
SHL: 626' FSL, 731' FEL Sec 24, T22N, R6W
BHL: 330' FSL, 1780' FEL Sec 25, T22N, R6W
Sandoval, New Mexico
Lease Number: NMNM 117563

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'-5267'/5529	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"	5267'/5529'-5283'/10652'	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 +/- 2528 psi based on a 9.0 ppg at 5402' TVD of the horizontal lateral target. No abnormal pressure or temperatures are anticipated.

No hydrogen sulfide gas is anticipated, however, if H_2S 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: 626' FSL, 731' FEL Sec 24, T22N, R6W
County: Sandoval
WELL: Lybrook P24A-2206 01H

Encana Oil & Gas (USA) Inc.

WELL SUMMARY

ENG: David Scadden 3-24-15
RIG: Unassigned
GLE: 7207
RKBE: 7223

MWD LWD	OPEN HOLE LOGGING	FORM	DEPTH TVD	DEPTH MD	HOLE SIZE	CASING SPECS	MW MUD TYPE	DEVIATION INFORMATION
			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 LTC** 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.	Fresh wtr 8.3-10	Vertical <1°
		Nacimiento Fn.	surface					
		9 5/8" Csg	**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.	1,318		8 3/4	**7" 26ppf J55 LTC** TOC @ surface (100% OH excess - 70% Lead 30% Tail) Stage 1 Total: 908sks Stage 1 Lead: 515 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. Stage 1 Tail: 392 sks Type III Cement + 1% CaCl2 + 0.25#/sk Cello Flake + 0.2% FL-52A. Mixed at 14.6 ppg. Yield 1.38 cuft/sk.	Fresh Wtr 8.3-10	Vertical <1°
		Kirtland Shale	1,524					
		Fruitland Coal	1,656					
		Pictured Cliffs Ss.	1,874					
		Lewis Shale	2,011					
		Cliffhouse Ss.	2,669					
		Menefee Fn.	3,378					
		Point Lookout Ss.	4,135					
		Mancos Shale	4,351					
	Mud logger onsite	**KOP**	**500**	**500**				
Surveys every 30' through the curve		Mancos Silt	4,900					
		Gallup Fn.	5,168					
		7" Csg	**5,267**	**5,529'**				
Surveys every stand to TD unless directed otherwise by Geologist MWD Gamma Directional	No OH Logs	Horizontal Target	5,402		6 1/2	100' overlap at liner top		Horz Inc/TVD 91.2deg/5402ft
		TD	**5,283**	**10,652**		5123' Drilled Lateral		TD = 10652.3 MD
		Base Gallup	5,454			**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% 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.	**WBM** 8.3-10	

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 500', 8 3/4 inch holesize
5) Start curve at 10deg/100' build rate
6) Drill to csg point of 5529' MD
7) R&C 7" csg, circ cmt to surface
8) Land at ~55 deg, drill lateral to 10652' run 4 1/2 inch cemented liner

encana natural gas

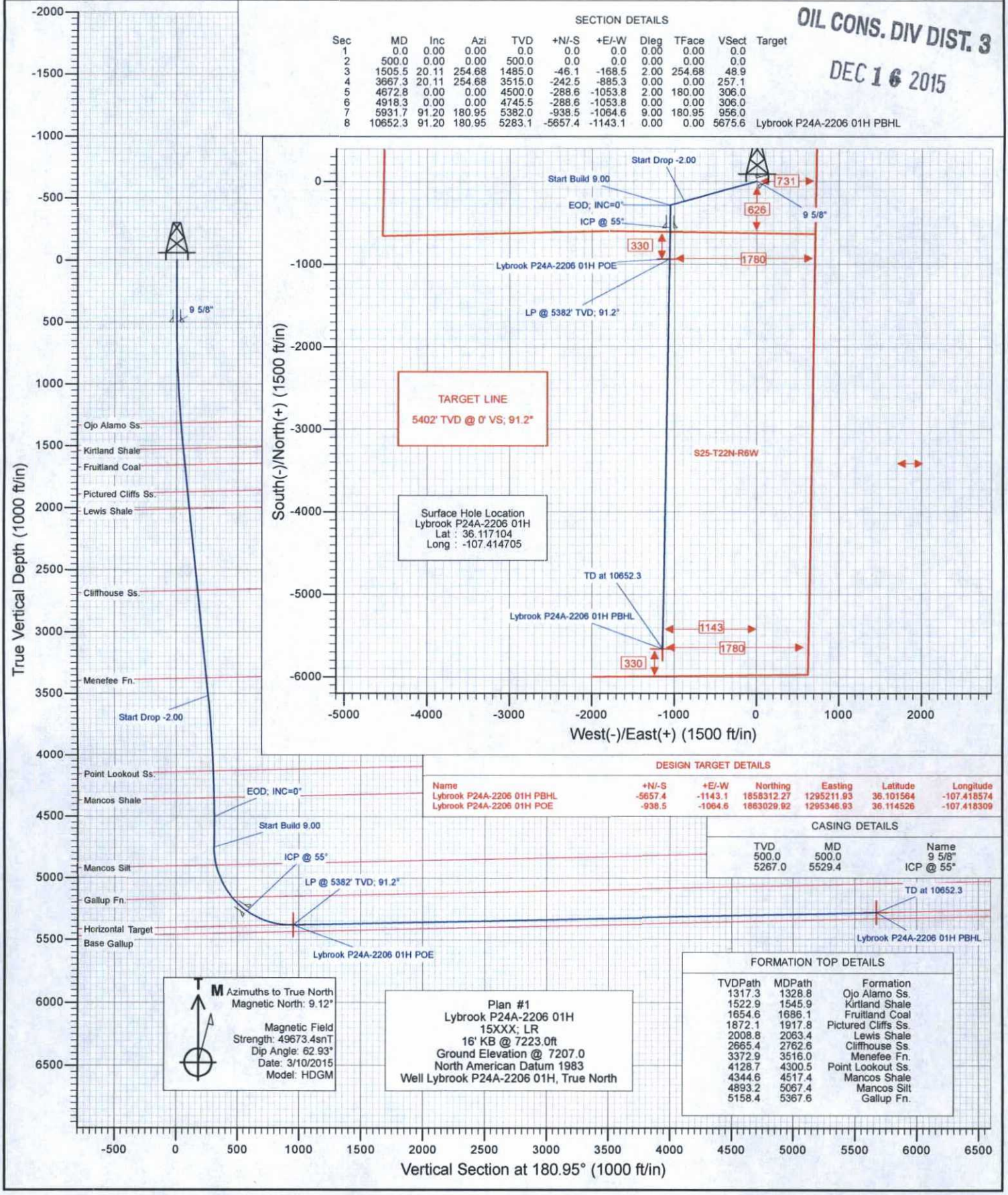
Project: Sandoval County, NM
Site: S24-T22N-R6W
Well: Lybrook P24A-2206 01H
Wellbore: HZ
Design: Plan #1

CATHEDRAL

OIL CONS. DIV DIST. 3
DEC 16 2015

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.0	
3	1505.5	20.11	254.68	1485.0	-46.1	-168.5	2.00	254.68	48.9	
4	3667.3	20.11	254.68	3515.0	-242.5	-885.3	0.00	0.00	257.1	
5	4672.8	0.00	0.00	4500.0	-288.6	-1053.8	2.00	180.00	306.0	
6	4918.3	0.00	0.00	4745.5	-288.6	-1053.8	0.00	0.00	306.0	
7	5931.7	91.20	180.95	5382.0	-938.5	-1064.6	9.00	180.95	956.0	
8	10652.3	91.20	180.95	5283.1	-5657.4	-1143.1	0.00	0.00	5675.6	Lybrook P24A-2206 01H PBHL



DESIGN TARGET DETAILS

Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Lybrook P24A-2206 01H PBHL	-5657.4	-1143.1	1858312.27	1295211.93	36.101564	-107.418574
Lybrook P24A-2206 01H POE	-938.5	-1064.6	1863029.92	1295346.93	36.114526	-107.418309

CASING DETAILS

TVD	MD	Name
500.0	500.0	9 5/8"
5267.0	5529.4	ICP @ 55°

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1317.3	1328.8	Ojo Alamo Ss.
1522.9	1545.9	Kirtland Shale
1654.6	1686.1	Fruitland Coal
1872.1	1917.8	Pictured Cliffs Ss.
2008.8	2063.4	Lewis Shale
2665.4	2762.6	Cliffhouse Ss.
3372.9	3516.0	Menefee Fn.
4128.7	4300.5	Point Lookout Ss.
4344.6	4517.4	Mancos Shale
4893.2	5067.4	Mancos Silt
5158.4	5367.6	Gallup Fn.

T M Azimuths to True North
Magnetic North: 9.12°

Magnetic Field
Strength: 49673.4snT
Dip Angle: 62.93°
Date: 3/10/2015
Model: HDGM

Plan #1
Lybrook P24A-2206 01H
15XXX; LR
16' KB @ 7223.0ft
Ground Elevation @ 7207.0
North American Datum 1983
Well Lybrook P24A-2206 01H, True North

Planning Report

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Lybrook P24A-2206 01H
Company:	EnCana Oil & Gas (USA) Inc	**TVD Reference:**	16' KB @ 7223.0ft
Project:	Sandoval County, NM	**MD Reference:**	16' KB @ 7223.0ft
Site:	S24-T22N-R6W	**North Reference:**	True
Well:	Lybrook P24A-2206 01H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

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	S24-T22N-R6W				
Site Position:		**Northing:**	1,863,955.62 ft	**Latitude:**	36.117104
From:	Lat/Long	**Easting:**	1,296,422.70 ft	**Longitude:**	-107.414705
Position Uncertainty:	0.0 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	-0.69 °

Well	Lybrook P24A-2206 01H				
Well Position	**+N/-S** 0.0 ft	**Northing:**	1,863,955.62 ft	**Latitude:**	36.117104
	+E/-W 0.0 ft	**Easting:**	1,296,422.70 ft	**Longitude:**	-107.414705
Position Uncertainty	0.0 ft	**Wellhead Elevation:**	0.0 ft	**Ground Level:**	7,207.0 ft

Wellbore	HZ			
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	HDGM	3/10/2015	9.12	62.93	49,673

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	180.95

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	
500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,505.5	20.11	254.68	1,485.0	-46.1	-168.5	2.00	2.00	0.00	254.68	
3,667.3	20.11	254.68	3,515.0	-242.5	-885.3	0.00	0.00	0.00	0.00	
4,672.8	0.00	0.00	4,500.0	-288.6	-1,053.8	2.00	-2.00	0.00	180.00	
4,918.3	0.00	0.00	4,745.5	-288.6	-1,053.8	0.00	0.00	0.00	0.00	
5,931.7	91.20	180.95	5,382.0	-938.5	-1,064.6	9.00	9.00	0.00	180.95	
10,652.3	91.20	180.95	5,283.1	-5,657.4	-1,143.1	0.00	0.00	0.00	0.00	Lybrook P24A-2206 0

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Lybrook P24A-2206 01H
Company:	EnCana Oil & Gas (USA) Inc	**TVD Reference:**	16' KB @ 7223.0ft
Project:	Sandoval County, NM	**MD Reference:**	16' KB @ 7223.0ft
Site:	S24-T22N-R6W	**North Reference:**	True
Well:	Lybrook P24A-2206 01H	**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	KOP @ 500' - 9 5/8"
600.0	2.00	254.68	600.0	-0.5	-1.7	0.5	2.00	2.00	
700.0	4.00	254.68	699.8	-1.8	-6.7	2.0	2.00	2.00	
800.0	6.00	254.68	799.5	-4.1	-15.1	4.4	2.00	2.00	
900.0	8.00	254.68	898.7	-7.4	-26.9	7.8	2.00	2.00	
1,000.0	10.00	254.68	997.5	-11.5	-42.0	12.2	2.00	2.00	
1,100.0	12.00	254.68	1,095.6	-16.5	-60.4	17.5	2.00	2.00	
1,200.0	14.00	254.68	1,193.1	-22.5	-82.1	23.8	2.00	2.00	
1,300.0	16.00	254.68	1,289.6	-29.3	-107.0	31.1	2.00	2.00	
1,328.8	16.58	254.68	1,317.3	-31.4	-114.8	33.3	2.00	2.00	Ojo Alamo Ss.
1,400.0	18.00	254.68	1,385.3	-37.0	-135.2	39.3	2.00	2.00	
1,500.0	20.00	254.68	1,479.8	-45.6	-166.6	48.4	2.00	2.00	
1,505.5	20.11	254.68	1,485.0	-46.1	-168.5	48.9	2.00	2.00	EOB; INC=20.11°
1,545.9	20.11	254.68	1,522.9	-49.8	-181.8	52.8	0.00	0.00	Kirtland Shale
1,600.0	20.11	254.68	1,573.7	-54.7	-199.8	58.0	0.00	0.00	
1,686.1	20.11	254.68	1,654.6	-62.5	-228.4	66.3	0.00	0.00	Fruitland Coal
1,700.0	20.11	254.68	1,667.6	-63.8	-233.0	67.7	0.00	0.00	
1,800.0	20.11	254.68	1,761.5	-72.9	-266.1	77.3	0.00	0.00	
1,900.0	20.11	254.68	1,855.4	-82.0	-299.3	86.9	0.00	0.00	
1,917.8	20.11	254.68	1,872.1	-83.6	-305.2	88.6	0.00	0.00	Pictured Cliffs Ss.
2,000.0	20.11	254.68	1,949.3	-91.0	-332.4	96.5	0.00	0.00	
2,063.4	20.11	254.68	2,008.8	-96.8	-353.5	102.6	0.00	0.00	Lewis Shale
2,100.0	20.11	254.68	2,043.2	-100.1	-365.6	106.2	0.00	0.00	
2,200.0	20.11	254.68	2,137.1	-109.2	-398.8	115.8	0.00	0.00	
2,300.0	20.11	254.68	2,231.0	-118.3	-431.9	125.4	0.00	0.00	
2,400.0	20.11	254.68	2,324.9	-127.4	-465.1	135.1	0.00	0.00	
2,500.0	20.11	254.68	2,418.9	-136.5	-498.2	144.7	0.00	0.00	
2,600.0	20.11	254.68	2,512.8	-145.5	-531.4	154.3	0.00	0.00	
2,700.0	20.11	254.68	2,606.7	-154.6	-564.6	164.0	0.00	0.00	
2,762.6	20.11	254.68	2,665.4	-160.3	-585.3	170.0	0.00	0.00	Cliffhouse Ss.
2,800.0	20.11	254.68	2,700.6	-163.7	-597.7	173.6	0.00	0.00	
2,900.0	20.11	254.68	2,794.5	-172.8	-630.9	183.2	0.00	0.00	
3,000.0	20.11	254.68	2,888.4	-181.9	-664.1	192.8	0.00	0.00	
3,100.0	20.11	254.68	2,982.3	-190.9	-697.2	202.5	0.00	0.00	
3,200.0	20.11	254.68	3,076.2	-200.0	-730.4	212.1	0.00	0.00	
3,300.0	20.11	254.68	3,170.1	-209.1	-763.5	221.7	0.00	0.00	
3,400.0	20.11	254.68	3,264.0	-218.2	-796.7	231.4	0.00	0.00	
3,500.0	20.11	254.68	3,357.9	-227.3	-829.9	241.0	0.00	0.00	
3,516.0	20.11	254.68	3,372.9	-228.7	-835.2	242.5	0.00	0.00	Menefee Fn.
3,600.0	20.11	254.68	3,451.8	-236.4	-863.0	250.6	0.00	0.00	
3,667.3	20.11	254.68	3,515.0	-242.5	-885.3	257.1	0.00	0.00	Start Drop -2.00
3,700.0	19.46	254.68	3,545.8	-245.4	-896.0	260.2	2.00	-2.00	
3,800.0	17.46	254.68	3,640.6	-253.7	-926.5	269.1	2.00	-2.00	
3,900.0	15.46	254.68	3,736.5	-261.2	-953.9	277.0	2.00	-2.00	
4,000.0	13.46	254.68	3,833.3	-267.8	-977.9	284.0	2.00	-2.00	
4,100.0	11.46	254.68	3,931.0	-273.5	-998.7	290.0	2.00	-2.00	
4,200.0	9.46	254.68	4,029.3	-278.3	-1,016.3	295.1	2.00	-2.00	

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Lybrook P24A-2206 01H
Company:	EnCana Oil & Gas (USA) Inc	**TVD Reference:**	16' KB @ 7223.0ft
Project:	Sandoval County, NM	**MD Reference:**	16' KB @ 7223.0ft
Site:	S24-T22N-R6W	**North Reference:**	True
Well:	Lybrook P24A-2206 01H	**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
4,300.0	7.46	254.68	4,128.2	-282.2	-1,030.4	299.2	2.00	-2.00	
4,300.5	7.45	254.68	4,128.7	-282.2	-1,030.5	299.3	2.00	-2.00	Point Lookout Ss.
4,400.0	5.46	254.68	4,227.6	-285.2	-1,041.3	302.4	2.00	-2.00	
4,500.0	3.46	254.68	4,327.3	-287.2	-1,048.8	304.6	2.00	-2.00	
4,517.4	3.11	254.68	4,344.6	-287.5	-1,049.7	304.9	2.00	-2.00	Mancos Shale
4,600.0	1.46	254.68	4,427.2	-288.4	-1,052.9	305.8	2.00	-2.00	
4,672.8	0.00	0.00	4,500.0	-288.6	-1,053.8	306.0	2.00	-2.00	EOD; INC=0°
4,700.0	0.00	0.00	4,527.2	-288.6	-1,053.8	306.0	0.00	0.00	
4,800.0	0.00	0.00	4,627.2	-288.6	-1,053.8	306.0	0.00	0.00	
4,900.0	0.00	0.00	4,727.2	-288.6	-1,053.8	306.0	0.00	0.00	
4,918.3	0.00	0.00	4,745.5	-288.6	-1,053.8	306.0	0.00	0.00	Start Build 9.00
5,000.0	7.35	180.95	4,826.9	-293.8	-1,053.9	311.3	9.00	9.00	
5,067.4	13.42	180.95	4,893.2	-306.0	-1,054.1	323.4	9.00	9.00	Mancos Silt
5,100.0	16.35	180.95	4,924.7	-314.3	-1,054.2	331.8	9.00	9.00	
5,200.0	25.35	180.95	5,018.1	-349.9	-1,054.8	367.3	9.00	9.00	
5,300.0	34.35	180.95	5,104.7	-399.6	-1,055.6	417.1	9.00	9.00	
5,367.6	40.44	180.95	5,158.4	-440.7	-1,056.3	458.1	9.00	9.00	Gallup Fn.
5,400.0	43.35	180.95	5,182.5	-462.3	-1,056.7	479.7	9.00	9.00	
5,500.0	52.35	180.95	5,249.5	-536.3	-1,057.9	553.8	9.00	9.00	
5,529.4	55.00	180.95	5,267.0	-560.0	-1,058.3	577.5	9.00	9.00	ICP @ 55°
5,600.0	61.35	180.95	5,304.2	-620.0	-1,059.3	637.4	9.00	9.00	
5,700.0	70.35	180.95	5,345.0	-711.1	-1,060.8	728.6	9.00	9.00	
5,800.0	79.35	180.95	5,371.1	-807.5	-1,062.4	825.0	9.00	9.00	
5,900.0	88.35	180.95	5,381.8	-906.8	-1,064.1	924.3	9.00	9.00	
5,931.7	91.20	180.95	5,382.0	-938.5	-1,064.6	956.0	9.00	9.00	LP @ 5382' TVD; 91.2°
5,931.7	91.20	180.95	5,382.0	-938.5	-1,064.6	956.0	0.00	0.00	Lybrook P24A-2206 01H POE
6,000.0	91.20	180.95	5,380.5	-1,006.8	-1,065.7	1,024.3	0.00	0.00	
6,100.0	91.20	180.95	5,378.4	-1,106.8	-1,067.4	1,124.3	0.00	0.00	
6,200.0	91.20	180.95	5,376.3	-1,206.7	-1,069.1	1,224.3	0.00	0.00	
6,300.0	91.20	180.95	5,374.2	-1,306.7	-1,070.7	1,324.3	0.00	0.00	
6,400.0	91.20	180.95	5,372.2	-1,406.6	-1,072.4	1,424.2	0.00	0.00	
6,500.0	91.20	180.95	5,370.1	-1,506.6	-1,074.0	1,524.2	0.00	0.00	
6,600.0	91.20	180.95	5,368.0	-1,606.6	-1,075.7	1,624.2	0.00	0.00	
6,700.0	91.20	180.95	5,365.9	-1,706.5	-1,077.4	1,724.2	0.00	0.00	
6,800.0	91.20	180.95	5,363.8	-1,806.5	-1,079.0	1,824.1	0.00	0.00	
6,900.0	91.20	180.95	5,361.7	-1,906.5	-1,080.7	1,924.1	0.00	0.00	
7,000.0	91.20	180.95	5,359.6	-2,006.4	-1,082.4	2,024.1	0.00	0.00	
7,100.0	91.20	180.95	5,357.5	-2,106.4	-1,084.0	2,124.1	0.00	0.00	
7,200.0	91.20	180.95	5,355.4	-2,206.4	-1,085.7	2,224.1	0.00	0.00	
7,300.0	91.20	180.95	5,353.3	-2,306.3	-1,087.3	2,324.0	0.00	0.00	
7,400.0	91.20	180.95	5,351.2	-2,406.3	-1,089.0	2,424.0	0.00	0.00	
7,500.0	91.20	180.95	5,349.1	-2,506.3	-1,090.7	2,524.0	0.00	0.00	
7,600.0	91.20	180.95	5,347.0	-2,606.2	-1,092.3	2,624.0	0.00	0.00	
7,700.0	91.20	180.95	5,344.9	-2,706.2	-1,094.0	2,723.9	0.00	0.00	
7,800.0	91.20	180.95	5,342.8	-2,806.1	-1,095.7	2,823.9	0.00	0.00	
7,900.0	91.20	180.95	5,340.7	-2,906.1	-1,097.3	2,923.9	0.00	0.00	
8,000.0	91.20	180.95	5,338.6	-3,006.1	-1,099.0	3,023.9	0.00	0.00	
8,100.0	91.20	180.95	5,336.6	-3,106.0	-1,100.6	3,123.9	0.00	0.00	
8,200.0	91.20	180.95	5,334.5	-3,206.0	-1,102.3	3,223.8	0.00	0.00	
8,300.0	91.20	180.95	5,332.4	-3,306.0	-1,104.0	3,323.8	0.00	0.00	
8,400.0	91.20	180.95	5,330.3	-3,405.9	-1,105.6	3,423.8	0.00	0.00	
8,500.0	91.20	180.95	5,328.2	-3,505.9	-1,107.3	3,523.8	0.00	0.00	

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Lybrook P24A-2206 01H
Company:	EnCana Oil & Gas (USA) Inc	**TVD Reference:**	16' KB @ 7223.0ft
Project:	Sandoval County, NM	**MD Reference:**	16' KB @ 7223.0ft
Site:	S24-T22N-R6W	**North Reference:**	True
Well:	Lybrook P24A-2206 01H	**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
8,600.0	91.20	180.95	5,326.1	-3,605.9	-1,108.9	3,623.7	0.00	0.00	
8,700.0	91.20	180.95	5,324.0	-3,705.8	-1,110.6	3,723.7	0.00	0.00	
8,800.0	91.20	180.95	5,321.9	-3,805.8	-1,112.3	3,823.7	0.00	0.00	
8,900.0	91.20	180.95	5,319.8	-3,905.7	-1,113.9	3,923.7	0.00	0.00	
9,000.0	91.20	180.95	5,317.7	-4,005.7	-1,115.6	4,023.7	0.00	0.00	
9,100.0	91.20	180.95	5,315.6	-4,105.7	-1,117.3	4,123.6	0.00	0.00	
9,200.0	91.20	180.95	5,313.5	-4,205.6	-1,118.9	4,223.6	0.00	0.00	
9,300.0	91.20	180.95	5,311.4	-4,305.6	-1,120.6	4,323.6	0.00	0.00	
9,400.0	91.20	180.95	5,309.3	-4,405.6	-1,122.2	4,423.6	0.00	0.00	
9,500.0	91.20	180.95	5,307.2	-4,505.5	-1,123.9	4,523.6	0.00	0.00	
9,600.0	91.20	180.95	5,305.1	-4,605.5	-1,125.6	4,623.5	0.00	0.00	
9,700.0	91.20	180.95	5,303.0	-4,705.5	-1,127.2	4,723.5	0.00	0.00	
9,800.0	91.20	180.95	5,300.9	-4,805.4	-1,128.9	4,823.5	0.00	0.00	
9,900.0	91.20	180.95	5,298.9	-4,905.4	-1,130.6	4,923.5	0.00	0.00	
10,000.0	91.20	180.95	5,296.8	-5,005.4	-1,132.2	5,023.4	0.00	0.00	
10,100.0	91.20	180.95	5,294.7	-5,105.3	-1,133.9	5,123.4	0.00	0.00	
10,200.0	91.20	180.95	5,292.6	-5,205.3	-1,135.5	5,223.4	0.00	0.00	
10,300.0	91.20	180.95	5,290.5	-5,305.2	-1,137.2	5,323.4	0.00	0.00	
10,400.0	91.20	180.95	5,288.4	-5,405.2	-1,138.9	5,423.4	0.00	0.00	
10,500.0	91.20	180.95	5,286.3	-5,505.2	-1,140.5	5,523.3	0.00	0.00	
10,600.0	91.20	180.95	5,284.2	-5,605.1	-1,142.2	5,623.3	0.00	0.00	
10,652.3	91.20	180.95	5,283.1	-5,657.4	-1,143.1	5,675.6	0.00	0.00	TD at 10652.3 - Lybrook P24A-2206 01H 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 P24A-2206 01H - plan misses target center by 0.1ft at 5931.7ft MD (5382.0 TVD, -938.5 N, -1064.6 E) - Point	0.00	0.00	5,381.9	-938.5	-1,064.6	1,863,029.92	1,295,346.93	36.114526	-107.418309
Lybrook P24A-2206 01H - plan hits target center - Point	0.00	0.00	5,283.1	-5,657.4	-1,143.1	1,858,312.27	1,295,211.93	36.101564	-107.418574

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
500.0	500.0	9 5/8"	0.000	0.000
5,529.4	5,267.0	ICP @ 55°	0.000	0.000

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Lybrook P24A-2206 01H
Company:	EnCana Oil & Gas (USA) Inc	**TVD Reference:**	16' KB @ 7223.0ft
Project:	Sandoval County, NM	**MD Reference:**	16' KB @ 7223.0ft
Site:	S24-T22N-R6W	**North Reference:**	True
Well:	Lybrook P24A-2206 01H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,328.8	1,318.0	Ojo Alamo Ss.		-1.20	180.95
1,545.9	1,524.0	Kirtland Shale		-1.20	180.95
1,686.1	1,656.0	Fruitland Coal		-1.20	180.95
1,917.8	1,874.0	Pictured Cliffs Ss.		-1.20	180.95
2,063.4	2,011.0	Lewis Shale		-1.20	180.95
2,762.6	2,669.0	Cliffhouse Ss.		-1.20	180.95
3,516.0	3,378.0	Menefee Fn.		-1.20	180.95
4,300.5	4,135.0	Point Lookout Ss.		-1.20	180.95
4,517.4	4,351.0	Mancos Shale		-1.20	180.95
5,067.4	4,900.0	Mancos Silt		-1.20	180.95
5,367.6	5,168.0	Gallup Fn.		-1.20	180.95

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
500.0	500.0	0.0	0.0	KOP @ 500'
1,505.5	1,485.0	-46.1	-168.5	EOB; INC=20.11°
3,667.3	3,515.0	-242.5	-885.3	Start Drop -2.00
4,672.8	4,500.0	-288.6	-1,053.8	EOD; INC=0°
4,918.3	4,745.5	-288.6	-1,053.8	Start Build 9.00
5,931.7	5,382.0	-938.5	-1,064.6	LP @ 5382' TVD; 91.2°
10,652.3	5,283.1	-5,657.4	-1,143.1	TD at 10652.3

EnCana Oil & Gas (USA) Inc

Sandoval County, NM
S24-T22N-R6W
Lybrook P24A-2206 01H
HZ
Plan #1

Anticollision Report

25 March, 2015

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Lybrook P24A-2206 01H
Project:	Sandoval County, NM	**TVD Reference:**	16' KB @ 7223.0ft
Reference Site:	S24-T22N-R6W	**MD Reference:**	16' KB @ 7223.0ft
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lybrook P24A-2206 01H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Reference	Plan #1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	**Error Model:**	Systematic Ellipse
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,000.0ft	**Error Surface:**	Elliptical Conic
Warning Levels Evaluated at:	2.00 **Sigma**		

Survey Tool Program **Date** 3/25/2015

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	10,652.3	Plan #1 (HZ)	Geolink MWD	Geolink MWD

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
S24-T22N-R6W						
Lybrook P24A-2206 02H - HZ - Plan #1	629.9	629.7	29.3	27.2	13.653	CC, ES
Lybrook P24A-2206 02H - HZ - Plan #1	700.0	699.0	30.2	27.8	12.592	SF

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Lybrook P24A-2206 01H
Project:	Sandoval County, NM	**TVD Reference:**	16' KB @ 7223.0ft
Reference Site:	S24-T22N-R6W	**MD Reference:**	16' KB @ 7223.0ft
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lybrook P24A-2206 01H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S24-T22N-R6W - Lybrook P24A-2206 02H - HZ - Plan #1 — **Offset Site Error:** 0.0 ft

Survey Program: 0-Geolink MWD — **Offset Well Error:** 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	180.00	-29.9	0.0	29.9				
100.0	100.0	100.0	100.0	0.1	0.1	180.00	-29.9	0.0	29.9	29.6	0.29	101.812	
200.0	200.0	200.0	200.0	0.3	0.3	180.00	-29.9	0.0	29.9	29.2	0.64	46.479	
300.0	300.0	300.0	300.0	0.5	0.5	180.00	-29.9	0.0	29.9	28.9	0.99	30.113	
400.0	400.0	400.0	400.0	0.7	0.7	180.00	-29.9	0.0	29.9	28.5	1.34	22.271	
500.0	500.0	500.0	500.0	0.8	0.8	180.00	-29.9	0.0	29.9	28.2	1.69	17.670	
600.0	600.0	600.0	600.0	1.0	1.0	-77.97	-29.9	0.0	29.4	27.4	2.04	14.430	
629.9	629.9	629.7	629.7	1.1	1.1	-80.46	-30.0	0.1	29.3	27.2	2.15	13.653	CC, ES
700.0	699.8	699.0	699.0	1.2	1.2	-89.98	-31.0	1.3	30.2	27.8	2.40	12.592	SF
800.0	799.5	797.2	797.0	1.4	1.4	-108.14	-34.3	5.1	36.4	33.6	2.78	13.116	
900.0	898.7	894.1	893.5	1.7	1.6	-123.58	-39.7	11.4	50.4	47.2	3.15	15.992	
1,000.0	997.5	990.2	989.0	1.9	1.8	-133.55	-46.9	19.8	71.7	68.2	3.53	20.332	
1,100.0	1,095.6	1,086.3	1,084.5	2.3	2.0	-140.08	-54.5	28.6	97.3	93.4	3.91	24.875	
1,200.0	1,193.1	1,181.6	1,179.0	2.7	2.2	-144.67	-61.9	37.2	126.4	122.1	4.30	29.377	
1,300.0	1,289.6	1,275.7	1,272.5	3.2	2.5	-148.10	-69.3	45.8	158.9	154.2	4.70	33.812	
1,400.0	1,385.3	1,368.7	1,364.8	3.7	2.7	-150.76	-76.6	54.3	194.7	189.6	5.10	38.178	
1,505.5	1,485.0	1,465.4	1,460.8	4.3	3.0	-152.99	-84.2	63.1	235.9	230.3	5.52	42.714	
1,600.0	1,573.7	1,551.3	1,546.1	4.9	3.2	-154.85	-90.9	70.9	274.5	268.5	5.91	46.408	
1,700.0	1,667.6	1,642.2	1,636.3	5.5	3.4	-156.33	-98.0	79.1	315.5	309.2	6.33	49.842	
1,800.0	1,761.5	1,733.1	1,726.6	6.1	3.7	-157.47	-105.2	87.4	356.7	350.0	6.75	52.865	
1,900.0	1,855.4	1,824.0	1,816.9	6.8	3.9	-158.37	-112.3	95.7	398.0	390.8	7.17	55.544	
2,000.0	1,949.3	1,915.0	1,907.1	7.4	4.2	-159.11	-119.4	103.9	439.3	431.8	7.58	57.932	
2,100.0	2,043.2	2,005.9	1,997.4	8.1	4.4	-159.72	-126.5	112.2	480.7	472.7	8.00	60.072	
2,200.0	2,137.1	2,096.8	2,087.6	8.7	4.6	-160.23	-133.7	120.5	522.2	513.8	8.42	62.000	
2,300.0	2,231.0	2,187.7	2,177.9	9.3	4.9	-160.67	-140.8	128.8	563.6	554.8	8.84	63.745	
2,400.0	2,324.9	2,278.6	2,268.2	10.0	5.1	-161.04	-147.9	137.0	605.1	595.9	9.26	65.333	
2,500.0	2,418.9	2,369.6	2,358.4	10.6	5.4	-161.37	-155.0	145.3	646.6	637.0	9.68	66.783	
2,600.0	2,512.8	2,460.5	2,448.7	11.3	5.6	-161.66	-162.2	153.6	688.2	678.1	10.10	68.111	
2,700.0	2,606.7	2,551.4	2,538.9	11.9	5.9	-161.92	-169.3	161.8	729.7	719.2	10.52	69.333	
2,800.0	2,700.6	2,642.3	2,629.2	12.6	6.1	-162.15	-176.4	170.1	771.2	760.3	10.95	70.461	
2,900.0	2,794.5	2,733.2	2,719.5	13.2	6.4	-162.35	-183.5	178.4	812.8	801.4	11.37	71.505	
3,000.0	2,888.4	2,824.2	2,809.7	13.9	6.6	-162.54	-190.7	186.6	854.4	842.6	11.79	72.474	
3,100.0	2,982.3	2,915.1	2,900.0	14.5	6.8	-162.71	-197.8	194.9	895.9	883.7	12.21	73.375	
3,200.0	3,076.2	3,006.0	2,990.3	15.2	7.1	-162.86	-204.9	203.2	937.5	924.9	12.63	74.217	
3,300.0	3,170.1	3,096.9	3,080.5	15.8	7.3	-163.00	-212.0	211.5	979.1	966.0	13.05	75.003	

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

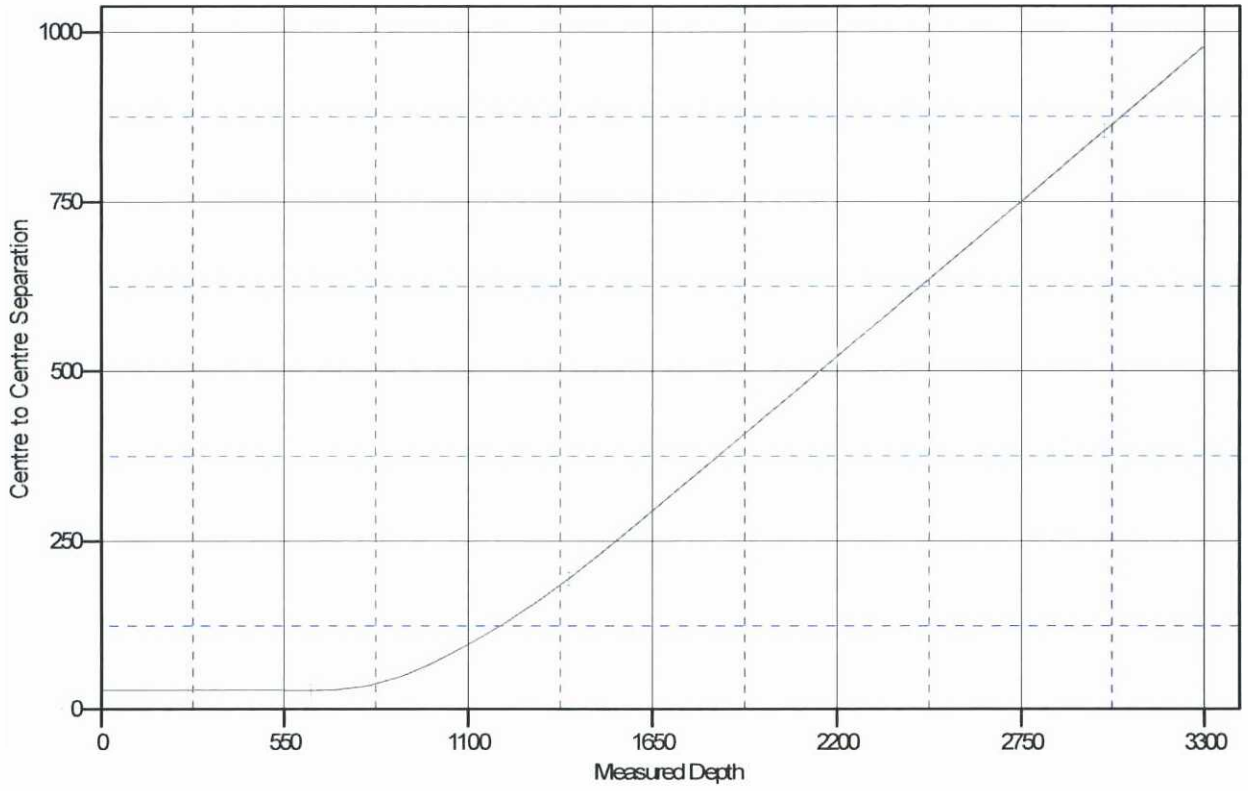
Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Lybrook P24A-2206 01H
Project:	Sandoval County, NM	**TVD Reference:**	16' KB @ 7223.0ft
Reference Site:	S24-T22N-R6W	**MD Reference:**	16' KB @ 7223.0ft
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lybrook P24A-2206 01H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to 16' KB @ 7223.0ft
Offset Depths are relative to Offset Datum
Central Meridian is -106.250000 °

Coordinates are relative to: Lybrook P24A-2206 01H
Coordinate System is US State Plane 1983, New Mexico Central Zone
Grid Convergence at Surface is: -0.69°

Ladder Plot



LEGEND

Lybrook P24A-2206 02H, HZ, Plan #1 V0

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

inch outside diameter, buried steel well connect pipeline that was submitted to the BLM concurrently with this Application for Permit to Drill.

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.

E. Sewage – self-contained, chemical toilets will be provided for human waste disposal. The toilet holding tanks will be pumped, as needed, and the contents thereof disposed of in an approved sewage disposal facility. The toilets will be onsite during all operations.

F. Garbage and other waste material – garbage, trash and other waste materials will be collected in a portable, self-contained and fully-enclosed trash container during drilling and completion operations. The accumulated trash will be removed, as needed, and will be disposed of at an authorized sanitary landfill. No trash will be buried or burned on location.

ENCANA OIL & GAS (USA) INC.

LYBROOK P24A-2206 #01H
626' FSL & 731' FEL
LOCATED IN THE SE/4 SE/4 OF SECTION 24
T22N, R06W, N.M.P.M.
SANDOVAL COUNTY, NEW MEXICO
1,100' +/- OF NEW ACCESS ACROSS BLM LANDS

DIRECTIONS

1) FROM THE INTERSECTION OF HWY 64 & HWY 550 IN BLOOMFIELD, NEW MEXICO, TRAVEL SOUTH ON HWY 550 FOR 54.4 MILES TO COUNSELOR, NEW MEXICO, TO INDIAN SERVICE ROUTE 474.

2) TURN RIGHT (SOUTH) AND FOLLOW FOR 3.5 MILES TO AN INTERSECTION WITH AN OILFIELD SERVICE ROAD.

3) TURN LEFT (SOUTHEAST) AND FOLLOW 2.3 MILES TO A THREE WAY INTERSECTION. **IT MUST BE NOTED THAT AT THIS POINT YOU ARE ENTERING THE JICARILLA APACHE NATION AND PERMIT IS REQUIRED TO ENTER AND USE THIS ACCESS ROAD.**

4) TURN RIGHT (SOUTH) AND TRAVEL 2.1 MILES TO THE PROPOSED LYBROOK P24A-2206 ACCESS ROAD.

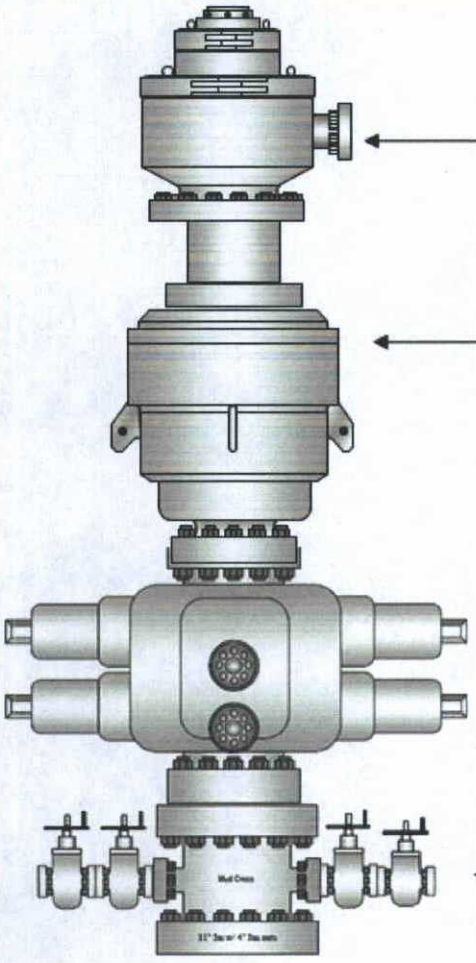
5) TURN RIGHT AND FOLLOW THE PROPOSED ACCESS ROAD SOUTHWEST FOR 0.2 MILES TO THE PROPOSED P24A-2206 LOCATION.

6) WELL FLAG LOCATED AT: LATITUDE: 36.117104° N, LONGITUDE: 107.414705° W (NAD 83)

WELLHEAD BLOWOUT CONTROL SYSTEM

encana

Well Name and Number:
Lybrook P24A-2206 01H



11" 3K Rotating Head

11" 3K Annular

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

3K Mud Cross 3" gate valves