

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

Form C-101
Revised October 25, 2012

Energy Minerals and Natural Resources

Oil Conservation Division

1220 South St. Francis Dr.

Santa Fe, NM 87505

☐ AMENDED REPORT

RCVD MAR 25 '13
OIL CONS. DIV.
DIST. 3

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

1. Operator Name and Address ENCANA OIL & GAS (USA) INC. 370 17TH STREET, SUITE 1700 DENVER, CO 80202		2. OGRID Number 282327
3. Property Code 39785		4. API Number 30-043-21146
5. Property Name Lybrook M31-2306		6. Well No. 02H

7. Surface Location

UL - Lot	Section	Township	Range	Lot Idn	Feet from	N/S Line	Feet From	E/W Line	County
SHL: M	31	23N	6W	4	1224	SOUTH	437	WEST	SANDOVAL

8. Proposed Bottom Hole Location

UL - Lot	Section	Township	Range	Lot Idn	Feet from	N/S Line	Feet From	E/W Line	County
BHL: L	36	23N	7W		1700	SOUTH	330	WEST	SANDOVAL

9. Pool Information

LYBROOK GALLUP (42289)

Additional Well Information

11. Work Type N	12. Well Type O	13. Cable/Rotary R	14. Lease Type S	15. Ground Level Elevation 7173'
16. Multiple N/A	17. Proposed Depth 5459' TVD / 10625' MD	18. Formation GALLUP	19. Contractor AZTEC	20. Spud Date 10/21/2013
Depth to Ground water UNKNOWN		Distance from nearest fresh water well GREATER THAN 5280'		Distance to nearest surface water ~6500'

21. Proposed Casing and Cement Program

Type	Hole Size	Casing Size	Casing Weight/ft	Setting Depth	Sacks of Cement	Estimated TOC
CONDUCTOR	30"	20"	94#	60'	100	SURFACE
SURFACE	12 1/4"	9 5/8"	36#	500'	178	SURFACE
INTERMEDIATE	8 3/4"	7"	26#	5485' TVD / 5881' MD	582 (30% EXCESS)	SURFACE
PROD. LINER	6 1/8"	4 1/2"	11.6#	5681' - 10625' MD	N/A	N/A

Casing/Cement Program: Additional Comments

HORIZONTAL LATERAL IN THE GALLUP FORMATION, NO CEMENT IN THE PRODUCTION LINER, WILL RUN EXTERNAL SWELL CASING PACKER SYSTEM. WILL USE OIL BASED MUD SYSTEM FROM 7" INTERMEDIATE CASING SETTING DEPTH TO TD OF HORIZONTAL LATERAL
--

22. Proposed Blowout Prevention Program

Type	Working Pressure	Test Pressure	Manufacturer
ANNULAR	3000	1500	TBD
DOUBLE RAM	3000	3000	TBD

23. I hereby certify that the information given above is true and complete to the best of my knowledge and belief. I further certify that I have complied with 19.15.14.9 (A) NMAC ☐ and/or 19.15.14.9 (B) NMAC ☐ if applicable. NO DRILLING PIT WILL BE USED		OIL CONSERVATION DIVISION	
Signature: <i>Brenda R. Linster</i>		Approved By: <i>Charles T. Linn</i> 3-28-13	
Printed name: Brenda R. Linster		Title: SUPERVISOR DISTRICT # 3	
Title: Regulatory Lead		Approved Date: MAR 28 2013 Expiration Date: MAR 28 2015	
E-mail Address: brenda.linster@encana.com		Conditions of Approval Attached	
Date: 03/20/2013		Phone: 720-876-3989	

Hold C104

for Directional Survey
and "As Drilled" plat

MAR 29 2013 ca

NOTIFY AZTEC OCD 24 HRS.
PRIOR TO CASING & CEMENT

Hold C104
for Directional Survey
and "As Drilled" plat

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Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department

Form C-102
Revised August 1, 2011

Submit one copy to
Appropriate District Office

OIL CONSERVATION DIVISION

1220 South St. Francis Drive
Santa Fe, NM 87505

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

*API Number 30-043-21146		*Pool Code 42289	*Pool Name LYBROOK GALLUP
*Property Code 39785	*Property Name LYBROOK M31-2306		*Well Number 02H
*GRID No. 282327	*Operator Name ENCANA OIL & GAS (USA) INC.		*Elevation 7173'

¹⁰ Surface Location

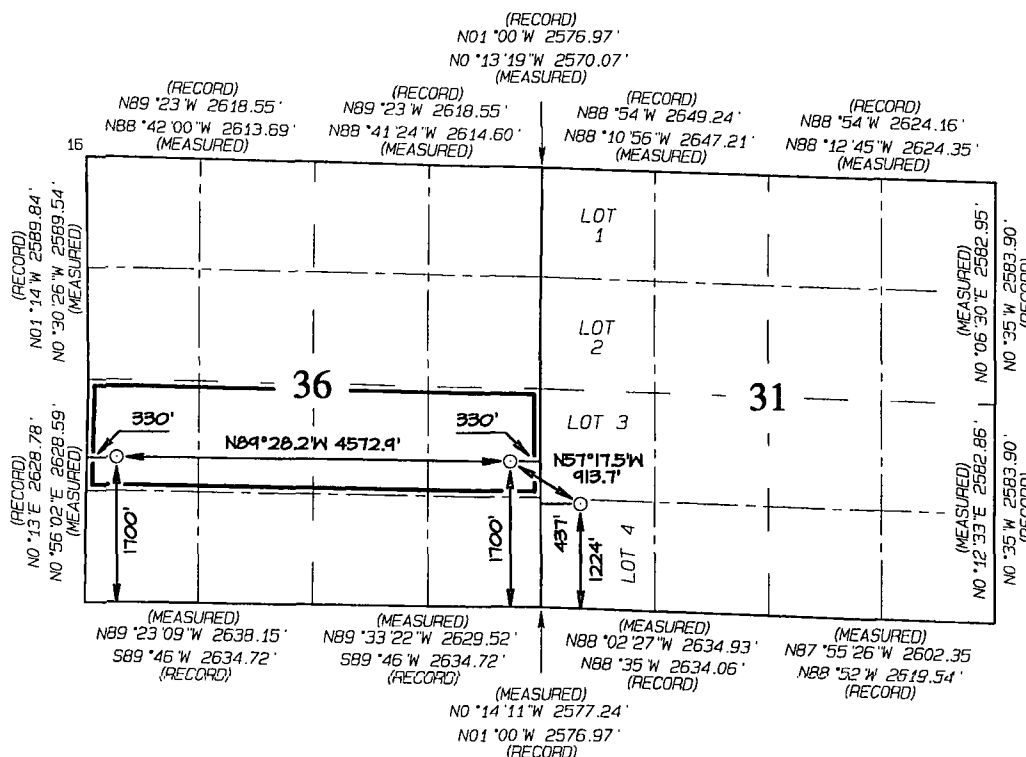
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	31	23N	6W	4	1224	SOUTH	437	WEST	SANDOVAL

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
L	36	23N	7W		1700	SOUTH	330	WEST	SANDOVAL

¹² Dedicated Acres 160.0 Acres N/2 S/2 - Section 36	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



END-OF-LATERAL
1700' FSL 330' FWL
SECTION 36, T23N, R7W
LAT: 36.18037°N
LONG: 107.53368°W
DATUM: NAD1927

LAT: 36.18038°N
LONG: 107.53429°W
DATUM: NAD1983

POINT-OF-ENTRY
1700' FSL 330' FWL
SECTION 36, T23N, R7W
LAT: 36.18042°N
LONG: 107.51819°W
DATUM: NAD1927

LAT: 36.18043°N
LONG: 107.51879°W
DATUM: NAD1983

SURFACE LOCATION
1224' FSL 437' FWL
SECTION 31, T23N, R6W
LAT: 36.17909°N
LONG: 107.51556°W
DATUM: NAD1927

LAT: 36.17910°N
LONG: 107.51617°W
DATUM: NAD1983

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.

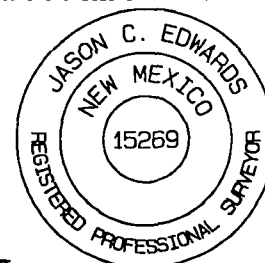
Signature: *Brenda R. Linster* Date: 3/20/13
Printed Name: Brenda R. Linster
E-mail Address: brenda.linster@encana.com

¹⁸ SURVEYOR CERTIFICATION

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

Date Revised: FEBRUARY 15, 2013
Date of Survey: MARCH 23, 2012

Signature and Seal of Professional Surveyor



JASON C. EDWARDS
Certificate Number 15269

Directions from the Intersection of US Hwy 550 & US Hwy 64
in Bloomfield, NM to Encana Oil & Gas (USA) Inc. Lybrook M31-2306 02H
1224' FSL & 437' FWL, Section 31, T23N, R6W, N.M.P.M., Sandoval County, NM

Latitude: 36.17910°N Longitude: 107.51617°W Datum: NAD1983

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

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

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

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

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

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

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

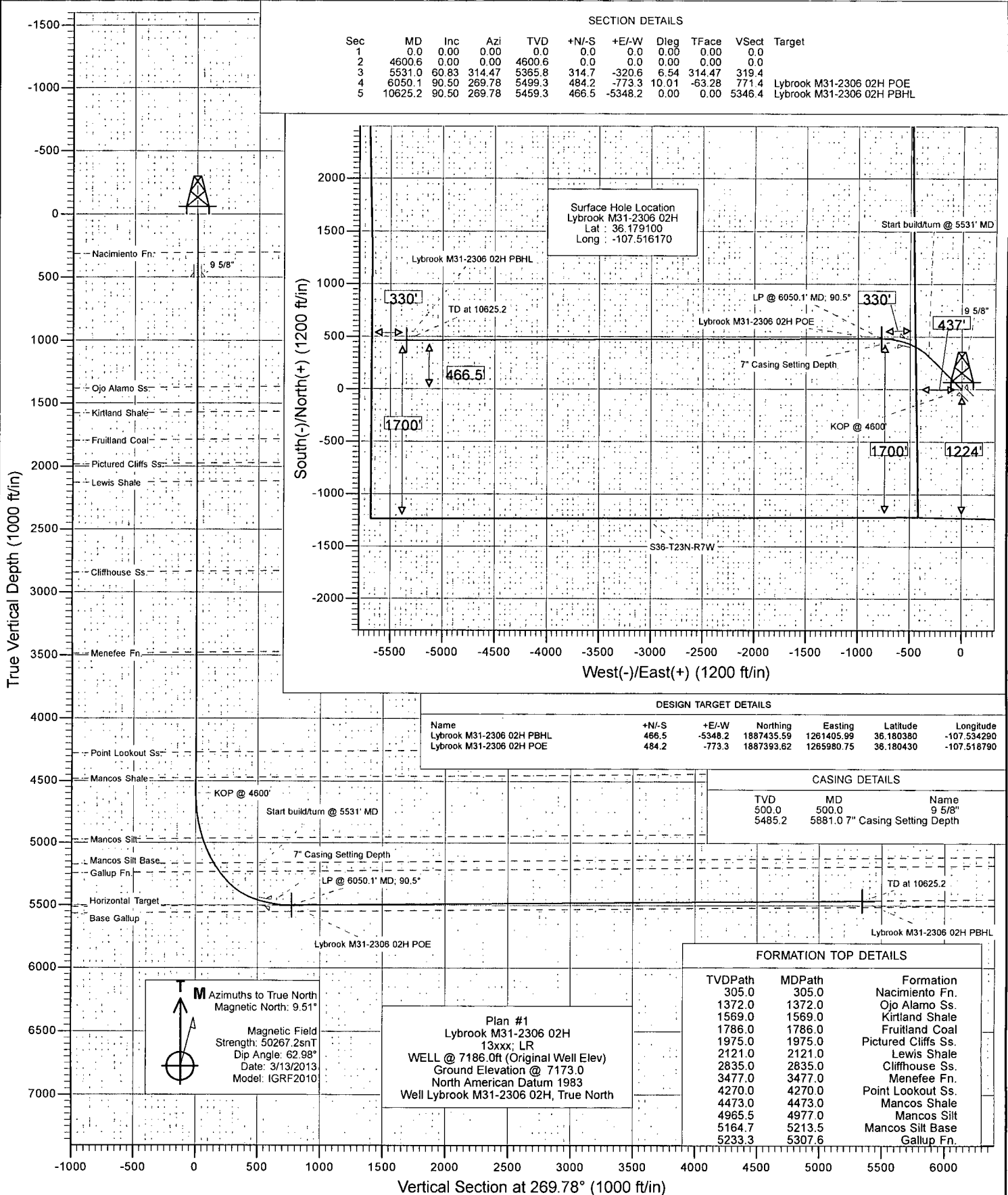
Go right (North-westerly) for 0.9 miles to fork in road;

Go right (North-easterly) for 0.7 miles to new access on left-hand side of existing roadway which continues for 258' to Encana Lybrook M31-2306 02H location.

encana.

natural gas

Project: Sandoval County, NM
Site: Lybrook
Well: Lybrook M31-2306 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: Lybrook
Well: Lybrook M31-2306 02H
Wellbore: Hz
Design: Plan #1

Local Co-ordinate Reference: Well Lybrook M31-2306 02H
TVD Reference: WELL @ 7186.0ft (Original Well Elev)
MD Reference: WELL @ 7186.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

Project	Sandoval County, NM		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Central Zone		

Site	Lybrook				
Site Position:		Northing:	1,882,676.45 ft	Latitude:	36.168210
From:	Lat/Long	Easting:	1,287,068.90 ft	Longitude:	-107.447150
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-0.71 °

Well	Lybrook M31-2306 02H					
Well Position	+N/-S	0.0 ft	Northing:	1,886,899.35 ft	Latitude:	36.179100
	+E/-W	0.0 ft	Easting:	1,266,747.68 ft	Longitude:	-107.516170
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	7,173.0 ft

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	3/13/2013	9.51	62.98	50,267

Design	Plan #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	269.78

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
4,600.6	0.00	0.00	4,600.6	0.0	0.0	0.00	0.00	0.00	0.00	
5,531.0	60.83	314.47	5,365.8	314.7	-320.6	6.54	6.54	0.00	314.47	
6,050.1	90.50	269.78	5,499.3	484.2	-773.3	10.01	5.71	-8.61	-63.28	Lybrook M31-2306 02
10,625.2	90.50	269.78	5,459.3	466.5	-5,348.2	0.00	0.00	0.00	0.00	Lybrook M31-2306 02

Planning Report

Database: USA EDM 5000 Multi Users DB
 Company: EnCana Oil & Gas (USA) Inc
 Project: Sandoval County, NM
 Site: Lybrook
 Well: Lybrook M31-2306 02H
 Wellbore: Hz
 Design: Plan #1

Local Co-ordinate Reference: Well Lybrook M31-2306 02H
 TVD Reference: WELL @ 7186.0ft (Original Well Elev)
 MD Reference: WELL @ 7186.0ft (Original Well Elev)
 North Reference: True
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	
305.0	0.00	0.00	305.0	0.0	0.0	0.0	0.00	0.00	Nacimiento Fn.
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	
1,372.0	0.00	0.00	1,372.0	0.0	0.0	0.0	0.00	0.00	Ojo Alamo Ss.
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	
1,569.0	0.00	0.00	1,569.0	0.0	0.0	0.0	0.00	0.00	Kirtland Shale
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	
1,786.0	0.00	0.00	1,786.0	0.0	0.0	0.0	0.00	0.00	Fruitland Coal
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	
1,975.0	0.00	0.00	1,975.0	0.0	0.0	0.0	0.00	0.00	Pictured Cliffs Ss.
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	
2,121.0	0.00	0.00	2,121.0	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	
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	
2,835.0	0.00	0.00	2,835.0	0.0	0.0	0.0	0.00	0.00	Cliffhouse Ss.
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	
3,477.0	0.00	0.00	3,477.0	0.0	0.0	0.0	0.00	0.00	Menefee Fn.
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	
4,270.0	0.00	0.00	4,270.0	0.0	0.0	0.0	0.00	0.00	Point Lookout Ss.

Planning Report

Database: USA EDM 5000 Multi Users DB
 Company: EnCana Oil & Gas (USA) Inc
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 Site: Lybrook
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 Wellbore: Hz
 Design: Plan #1

Local Co-ordinate Reference: Well Lybrook M31-2306 02H
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 MD Reference: WELL @ 7186.0ft (Original Well Elev)
 North Reference: True
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	
4,473.0	0.00	0.00	4,473.0	0.0	0.0	0.0	0.00	0.00	Mancos Shale
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	
4,600.6	0.00	0.00	4,600.6	0.0	0.0	0.0	0.00	0.00	KOP @ 4600'
4,700.0	6.50	314.47	4,699.8	3.9	-4.0	4.0	6.54	6.54	
4,800.0	13.04	314.47	4,798.3	15.8	-16.1	16.1	6.54	6.54	
4,900.0	19.58	314.47	4,894.2	35.5	-36.1	36.0	6.54	6.54	
4,977.0	24.61	314.47	4,965.5	55.8	-56.8	56.6	6.54	6.54	Mancos Silt
5,000.0	26.12	314.47	4,986.3	62.7	-63.8	63.6	6.54	6.54	
5,100.0	32.65	314.47	5,073.4	97.0	-98.8	98.5	6.54	6.54	
5,200.0	39.19	314.47	5,154.3	138.1	-140.7	140.2	6.54	6.54	
5,213.5	40.07	314.47	5,164.7	144.1	-146.8	146.3	6.54	6.54	Mancos Silt Base
5,300.0	45.73	314.47	5,228.1	185.4	-188.8	188.1	6.54	6.54	
5,307.6	46.23	314.47	5,233.3	189.2	-192.7	192.0	6.54	6.54	Gallup Fn.
5,400.0	52.27	314.47	5,293.6	238.2	-242.7	241.7	6.54	6.54	
5,500.0	58.81	314.47	5,350.2	295.9	-301.5	300.3	6.54	6.54	
5,531.0	60.83	314.47	5,365.8	314.7	-320.6	319.4	6.54	6.54	Start build/turn @ 5531' MD
5,600.0	64.11	307.61	5,397.7	354.8	-366.7	365.4	10.01	4.75	
5,700.0	69.39	298.35	5,437.2	404.6	-443.8	442.2	10.01	5.27	
5,800.0	75.12	289.74	5,467.7	443.2	-530.6	528.9	10.01	5.73	
5,881.0	79.99	283.10	5,485.2	465.5	-606.5	604.7	10.01	6.02	7" Casing Setting Depth
5,900.0	81.16	281.58	5,488.3	469.5	-624.8	623.0	10.01	6.13	
6,000.0	87.36	273.69	5,498.3	482.7	-723.3	721.4	10.01	6.21	
6,050.1	90.50	269.78	5,499.3	484.2	-773.3	771.4	10.01	6.26	LP @ 6050.1' MD; 90.5°
6,100.0	90.50	269.78	5,498.8	484.0	-823.2	821.4	0.00	0.00	
6,200.0	90.50	269.78	5,498.0	483.6	-923.2	921.3	0.00	0.00	
6,300.0	90.50	269.78	5,497.1	483.3	-1,023.2	1,021.3	0.00	0.00	
6,400.0	90.50	269.78	5,496.2	482.9	-1,123.2	1,121.3	0.00	0.00	
6,500.0	90.50	269.78	5,495.3	482.5	-1,223.2	1,221.3	0.00	0.00	
6,600.0	90.50	269.78	5,494.5	482.1	-1,323.2	1,321.3	0.00	0.00	
6,700.0	90.50	269.78	5,493.6	481.7	-1,423.2	1,421.3	0.00	0.00	
6,800.0	90.50	269.78	5,492.7	481.3	-1,523.2	1,521.3	0.00	0.00	
6,900.0	90.50	269.78	5,491.8	480.9	-1,623.2	1,621.3	0.00	0.00	
7,000.0	90.50	269.78	5,491.0	480.5	-1,723.2	1,721.3	0.00	0.00	
7,100.0	90.50	269.78	5,490.1	480.2	-1,823.2	1,821.3	0.00	0.00	
7,200.0	90.50	269.78	5,489.2	479.8	-1,923.2	1,921.3	0.00	0.00	
7,300.0	90.50	269.78	5,488.4	479.4	-2,023.2	2,021.3	0.00	0.00	
7,400.0	90.50	269.78	5,487.5	479.0	-2,123.2	2,121.3	0.00	0.00	
7,500.0	90.50	269.78	5,486.6	478.6	-2,223.2	2,221.3	0.00	0.00	
7,600.0	90.50	269.78	5,485.7	478.2	-2,323.1	2,321.3	0.00	0.00	
7,700.0	90.50	269.78	5,484.9	477.8	-2,423.1	2,421.3	0.00	0.00	
7,800.0	90.50	269.78	5,484.0	477.4	-2,523.1	2,521.3	0.00	0.00	
7,900.0	90.50	269.78	5,483.1	477.1	-2,623.1	2,621.3	0.00	0.00	
8,000.0	90.50	269.78	5,482.2	476.7	-2,723.1	2,721.3	0.00	0.00	
8,100.0	90.50	269.78	5,481.4	476.3	-2,823.1	2,821.3	0.00	0.00	
8,200.0	90.50	269.78	5,480.5	475.9	-2,923.1	2,921.3	0.00	0.00	
8,300.0	90.50	269.78	5,479.6	475.5	-3,023.1	3,021.3	0.00	0.00	
8,400.0	90.50	269.78	5,478.8	475.1	-3,123.1	3,121.3	0.00	0.00	
8,500.0	90.50	269.78	5,477.9	474.7	-3,223.1	3,221.3	0.00	0.00	
8,600.0	90.50	269.78	5,477.0	474.4	-3,323.1	3,321.3	0.00	0.00	

Planning Report

Database: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Site: Lybrook
Well: Lybrook M31-2306 02H
Wellbore: Hz
Design: Plan #1

Local Co-ordinate Reference: Well Lybrook M31-2306 02H
TVD Reference: WELL @ 7186.0ft (Original Well Elev)
MD Reference: WELL @ 7186.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
8,700.0	90.50	269.78	5,476.1	474.0	-3,423.1	3,421.3	0.00	0.00	
8,800.0	90.50	269.78	5,475.3	473.6	-3,523.1	3,521.2	0.00	0.00	
8,900.0	90.50	269.78	5,474.4	473.2	-3,623.1	3,621.2	0.00	0.00	
9,000.0	90.50	269.78	5,473.5	472.8	-3,723.1	3,721.2	0.00	0.00	
9,100.0	90.50	269.78	5,472.6	472.4	-3,823.1	3,821.2	0.00	0.00	
9,200.0	90.50	269.78	5,471.8	472.0	-3,923.1	3,921.2	0.00	0.00	
9,300.0	90.50	269.78	5,470.9	471.6	-4,023.1	4,021.2	0.00	0.00	
9,400.0	90.50	269.78	5,470.0	471.3	-4,123.1	4,121.2	0.00	0.00	
9,500.0	90.50	269.78	5,469.2	470.9	-4,223.1	4,221.2	0.00	0.00	
9,600.0	90.50	269.78	5,468.3	470.5	-4,323.1	4,321.2	0.00	0.00	
9,700.0	90.50	269.78	5,467.4	470.1	-4,423.1	4,421.2	0.00	0.00	
9,800.0	90.50	269.78	5,466.5	469.7	-4,523.0	4,521.2	0.00	0.00	
9,900.0	90.50	269.78	5,465.7	469.3	-4,623.0	4,621.2	0.00	0.00	
10,000.0	90.50	269.78	5,464.8	468.9	-4,723.0	4,721.2	0.00	0.00	
10,100.0	90.50	269.78	5,463.9	468.5	-4,823.0	4,821.2	0.00	0.00	
10,200.0	90.50	269.78	5,463.1	468.2	-4,923.0	4,921.2	0.00	0.00	
10,300.0	90.50	269.78	5,462.2	467.8	-5,023.0	5,021.2	0.00	0.00	
10,400.0	90.50	269.78	5,461.3	467.4	-5,123.0	5,121.2	0.00	0.00	
10,500.0	90.50	269.78	5,460.4	467.0	-5,223.0	5,221.2	0.00	0.00	
10,600.0	90.50	269.78	5,459.6	466.6	-5,323.0	5,321.2	0.00	0.00	
10,625.2	90.50	269.78	5,459.3	466.5	-5,348.2	5,346.4	0.00	0.00	TD at 10625.2

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 M31-2306 02H - plan hits target center - Point	0.00	0.00	5,459.3	466.5	-5,348.2	1,887,435.59	1,261,405.99	36.180380	-107.534290
Lybrook M31-2306 02H - plan hits target center - Point	0.00	0.00	5,499.3	484.2	-773.3	1,887,393.62	1,265,980.75	36.180430	-107.518790

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
5,881.0	5,485.2	7" Casing Setting Depth	0.000	0.000
500.0	500.0	9 5/8"	0.000	0.000

Planning Report

Database: USA EDM 5000 Multi Users DB
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Project: Sandoval County, NM
Site: Lybrook
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Wellbore: Hz
Design: Plan #1

Local Co-ordinate Reference: Well Lybrook M31-2306 02H
TVD Reference: WELL @ 7186.0ft (Original Well Elev)
MD Reference: WELL @ 7186.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
305.0	305.0	Nacimiento Fn.		-0.50	269.78
1,372.0	1,372.0	Ojo Alamo Ss.		-0.50	269.78
1,569.0	1,569.0	Kirtland Shale		-0.50	269.78
1,786.0	1,786.0	Fruitland Coal		-0.50	269.78
1,975.0	1,975.0	Pictured Cliffs Ss.		-0.50	269.78
2,121.0	2,121.0	Lewis Shale		-0.50	269.78
2,835.0	2,835.0	Cliffhouse Ss.		-0.50	269.78
3,477.0	3,477.0	Menefee Fn.		-0.50	269.78
4,270.0	4,270.0	Point Lookout Ss.		-0.50	269.78
4,473.0	4,473.0	Mancos Shale		-0.50	269.78
4,977.0	4,966.0	Mancos Silt		-0.50	269.78
5,213.5	5,166.0	Mancos Silt Base		-0.50	269.78
5,307.6	5,235.0	Gallup Fn.		-0.50	269.78

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
4,600.6	4,600.6	0.0	0.0	KOP @ 4600'
5,531.0	5,365.8	314.7	-320.6	Start build/turn @ 5531' MD
6,050.1	5,499.3	484.2	-773.3	LP @ 6050.1' MD; 90.5°
10,625.2	5,459.3	466.5	-5,348.2	TD at 10625.2

NOTES:

- 1) Drill with 30" bit to 60', set 20" 94# conductor pipe
- 2) Drill surface to 500', R&C 9 5/8" casing
- 3) N/U BOP and surface equipment
- 4) Drill to KOP of 4600' , 8 3/4" hole size,
- 5) PU directional tools and start curve at 10deg/100' build rate
- 6) Drill to casing point of 5746' MD
- 7) R&C 7" casing, circ cmt to surface, switch to OBM
- 8) Land at 90deg, drill 4575' lateral to 10625', run 4 1/2" liner with external swellable csg packers