

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

David Martin
Cabinet Secretary-Designate

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

Jami Bailey, 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: 2-26-14

Well information:

Operator Encana, Well Name and Number Lybrook A12-2306 #1H

API# 30039-31219, Section 12, Township 23 NS, 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
- ☒ 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.

Charlie Perin
NMOCD Approved by Signature

6-20-2014
Date

RECEIVED

Form 3160-3
(August 2007)

MAR 03 2014

FORM APPROVED
OMB No. 1004-0137
Expires July 31, 2010UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
Farmington Field Office
Bureau of Land Management

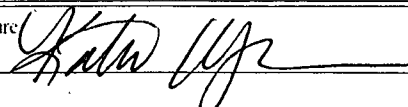
APPLICATION FOR PERMIT TO DRILL OR REENTER

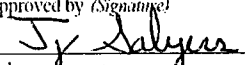
1a. Type of work: ☒ DRILL ☐ REENTER		5. Lease Serial No. NMNM 118127
1b. Type of Well: ☒ Oil Well ☐ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone		6. If Indian, Allottee or Tribe Name N/A
2. Name of Operator Encana Oil & Gas (USA) Inc.		7. If Unit or CA Agreement, Name and No. Pending
3a. Address 370 17th Street, Suite 1700 Denver, CO 80202		8. Lease Name and Well No. Lybrook A12-2306 01H
3b. Phone No. (include area code) 720-876-3533		9. API Well No. 30-039-31219
4. Location of Well (Report location clearly and in accordance with any State requirements.) At surface 81' FNL and 264' FEL Section 12, T23N, R6W At proposed prod. zone 330' FSL and 400' FEL Section 12, T23N, R6W		10. Field and Pool, or Exploratory Counselors Gallup- Dakota
14. Distance in miles and direction from nearest town or post office* +/- 65.6 miles southeast of the intersection of US Hwy 550 & US Hwy 64 in Bloomfield, NM		11. Sec., T. R. M. or Blk. and Survey or Area Section 12 T23N, R6W NPM
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) BHL is 330' from south lease line Section 12, T23N, R6W	16. No. of acres in lease NMNM 118127 - 1,160.0	17. Spacing Unit dedicated to this well 320 acres - E/2 of Section 12, T23N, R6W
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. Adare 1 is +/- 1000' SW of wellhead	19. Proposed Depth 5,561' TVD/10,263' MD	20. BLM/BIA Bond No. on file COB-000235
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 6,693' GL, 6,709' KB	22. Approximate date work will start* 10/02/2014	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 	Name (Printed/Typed) Katie Wegner	Date 2/26/14
Title Regulatory Analyst		

Approved by (Signature) 	Name (Printed/Typed) Troy Salyers	Date 6/16/2014
Title Petroleum Engineer (Acting AFM) 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.

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

*(Instructions on page 2)

NMOCDFV

CONFIDENTIAL

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

This action is subject to technical and procedural review pursuant to 43 CFR 3165.9 and appeal pursuant to 43 CFR 3165.4

DISTRICT I
1625 N. French Dr., Hobbs, N.M. 88240
Phone: (505) 893-6181 Fax: (505) 893-0700

DISTRICT II
811 S. First St., Artesia, N.M. 88210
Phone: (505) 748-1888 Fax: (505) 748-0720

DISTRICT III
1000 E. Brown Rd., Aiken, N.M. 87410
Phone: (505) 534-6178 Fax: (505) 534-6170

DISTRICT IV
1820 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-8460 Fax: (505) 476-8462

State of New Mexico
Energy, Minerals & Natural Resources Department

RECEIVED

Form C-102
Revised August 1, 2011

Submit one copy to appropriate
District Office

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

MAR 03 2014

Farmington Field Office ☐ AMENDED REPORT

Bureau of Land Management

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-039-31219	² Pool Code 13379	³ Pool Name COUNSELORS GALLUP / DAKOTA
⁴ Property Code 313381	⁵ Property Name LYBROOK A12-2306	⁶ Well Number 01H
⁷ GRID No. 282327	⁸ Operator Name ENCANA OIL & GAS (USA) INC.	⁹ Elevation 6693.0'

¹⁰ Surface Location

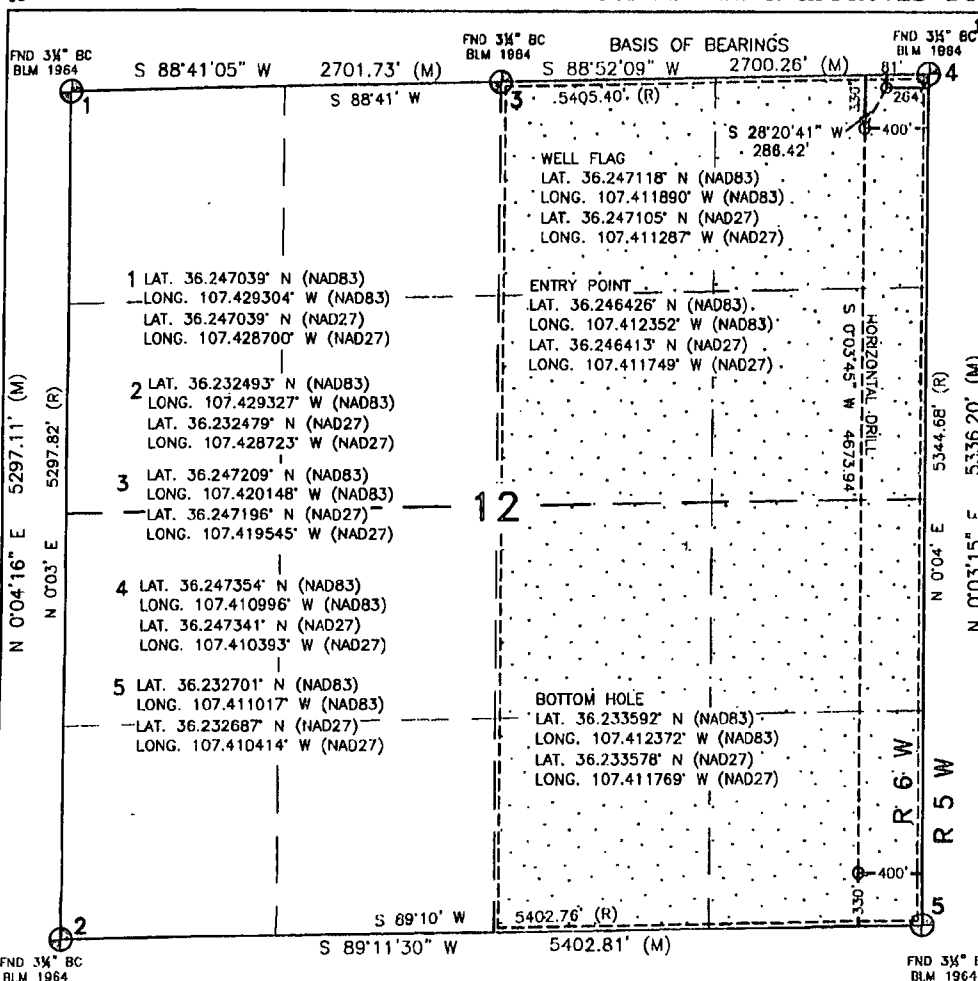
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	WEST/East line	County
A	12	23N	6W		81'	NORTH	264'	EAST	RIO ARriba

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	WEST/East line	County
P	12	23N	6W		330'	SOUTH	400'	EAST	RIO ARriba

¹² Dedicated Acres 320.00 ACRES E/2 SEC. 12	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



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.

Katie Wegner 2/26/14
Signature Date

Katie Wegner

Printed Name

Katie.Wegner@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.

OCTOBER 29, 2013

Date of Survey

Signature and Seal of Professional Surveyor

David Russell
NEW MEXICO
REGISTERED PROFESSIONAL LAND SURVEYOR
10201
DAVID RUSSELL
Certificate Number 10201

Lybrook A12-2306 01H
SHL: NENE Sec 12 T23N R6W
81' FNL 264' FEL
BHL: SESE Sec 12 T23N R6W
330' FNL 400' FWL
Lease Number: NMNM 118127
Rio Arriba, New Mexico

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

1. ESTIMATED TOPS OF GEOLOGICAL MARKERS (TVD)

The estimated tops of important geologic markers are as follows:

Formation	Depth (TVD) units = feet
Nacimiento Fn.	80
Ojo Alamo Ss.	1,305
Kirtland Shale	1,444
Fruitland Coal	1,545
Pictured Cliffs Ss.	1,827
Lewis Shale	1,945
Cliffhouse Ss.	2,667
Menefee Fn.	3,378
Point Lookout Ss.	4,073
Mancos Shale	4,280
Mancos Silt	4,842
Mancos Silt Base	5,020
Gallup Fn.	5,093

The referenced surface elevation is 6880', KB 6896'

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

Substance	Formation	Depth (TVD) units = feet
Water/Gas	Fruitland Coal	1,545
Oil/Gas	Pictured Cliffs Ss.	1,827
Oil/Gas	Cliffhouse Ss.	2,667
Gas	Menefee Fn.	3,378
Oil/Gas	Point Lookout Ss.	4,073
Oil/Gas	Mancos Shale	4,280
Oil/Gas	Mancos Silt	4,842
Oil/Gas	Gallup Fn.	5,093

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

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.

Lybrook A12-2306 01H

SHL: NENE Sec 12 T23N R6W

81' FNL 264' FEL

BHL: SESE Sec 12 T23N R6W

330' FNL 400' FWL

Lease Number: NMNM 118127

Rio Arriba, New Mexico

- 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
- 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'	30"	20"	94#	H40, STC New
Surface	0'-500'	12 1/4"	9 5/8"	36#	J55, STC New
Intermediate	0'-5733'	8 3/4"	7"	26#	J55, LTC New
Production Liner	5533'-10263'	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

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.

Lybrook A12-2306 01H
SHL: NENE Sec 12 T23N R6W
81' FNL 264' FEL
BHL: SESE Sec 12 T23N R6W
330' FNL 400' FWL
Lease Number: NMNM 118127
Rio Arriba, New Mexico

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'	201 sks	Type III Cement + 1% CaCl + 0.25lb/sk Cello Flake + 0.2% FL, 16ppg, 1.38cuf/sk	Surface	1 per joint on bottom 3 joints
Intermediate	0'-5733'	30% open hole excess Stage 1 Lead: 347 sks Stage 1 Tail: 219 sks Stage 2 Lead: 184 sks	Lead (Stages 1 and 2): PremLite + 3% CaCl + 0.25lb/sk CelloFlake + 5lb/sk LCM, 12.1ppg 2.13cuf/sk Tail (Stage 1): Type III Cmt + 1% CaCl + 0.25lb/sk Cello Flake 14.5ppg 1.38cuf/sk	Surface	1 every 3 joints through water bearing zones
Production Liner	5533'-10263'	None - External Casing Packers	N/A	N/A	N/A

*Production liner clarification: Utilizing external swell casing packer system for zonal isolation will not use cement in the production liner

Actual volumes will be calculated and determined by conditions onsite. All cement slurries will meet or exceed minimum BLM and New Mexico Oil Conservation Division requirements. Slurries used will be the slurries listed above or equivalent slurries depending on service provider selected. Cement yields may change depending on slurries selected

All waiting on cement times shall be a minimum of 8 hours or adequate to achieve 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 4989'. Directional plans are attached.

Description	Proposed Depth (TVD/MD)	Formation
Horizontal Lateral TD	5561'/10263'	Gallup

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	8.4-8.6	60-70	NC
8 3/4"	500'/500'-5545'/5733'	Fresh Water LSND	9.5-8.8	40-50	8-10

Lybrook A12-2306 01H

SHL: NENE Sec 12 T23N R6W

81' FNL 264' FEL

BHL: SESE Sec 12 T23N R6W

330' FNL 400' FWL

Lease Number: NMNM 118127

Rio Arriba, New Mexico

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"	5545'/5733'- 5561'/10263'	Synthetic Oil Based Mud	8.6-9.0	15-25	<15

c) There will be sufficient mud on location to control a blowout should one occur. Mud flow and volume will be monitored both visually and with electronic pit volume totalizers. Mud tests shall be performed every 24 hours after mudding up to determine, as applicable: density, viscosity, gel strength, filtration, and pH.

✓d) A closed-loop system will be used to recover drilling fluid and dry cuttings in both phases of the well and on all hole intervals, including fresh water and oil-based operations. Above-ground tanks will be utilized to hold cuttings and fluids for rig operations. A frac tank will be on location to store fresh water. Waste will be disposed of properly at an EPA-approved hazardous waste facility. Fresh water cuttings will be disposed of at Basin Disposal, Inc. and/or Industrial Ecosystems, Inc. The location will be lined in accordance with the Surface Use Plan of Operations.

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 +/- 2516 psi based on a 9.0 ppg at 5376' 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 October 2, 2014. 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: Sec 12-T23N-R6W County: Rio Arriba WELL: Lybrook A12-2306 01H			Encana Natural Gas WELL SUMMARY			ENG: S Kuykendall 2/26/14 RIG: TBD GLE: 6693 RKBE: 6709			
MWD LWD	OPEN HOLE LOGGING	FORM	DEPTH			HOLE SIZE	CASING SPECS	MW MUD TYPE	DEVIATION INFORMATION
			TVD	MD					
			60	60'		30	20" 94# 100sx Type I Neat 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	Nacimiento 9 5/8" Csg	0 500	500.00		12 1/4	9 5/8" 36ppf J55 STC TOC Surface - 201 sks of Type III Cement	Fresh wtr 8.4-8.6	Vertical <1°
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 Fruitland Coal Pictured Cliffs Ss. Lewis Shale Cliffhouse Ss. Menefee Fn. Point Lookout Ss. Mancos Shale	1,321 1,460 1,561 1,843 1,961 2,683 3,394 4,089 4,296		Stage tool @ ~ 2,200	8 3/4	7" 26ppf J55 LTC TOC @ surface 30% OH excess: 566 sks Total. Stage 1 Lead: 347 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: 219 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. 184 Stage 2: 184 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 8.5-8.8	Vertical <1° Build Rate
Surveys every 30' through the curve	Mud logger onsite	KOP Mancos Silt Gallup Fn. 7" Csg	4,989 4,858 5,109 5,545	4,988.5 5,733.0					
Surveys every stand to TD unless directed otherwise by Geologist	No OH Logs	Horizontal Target TD Base Gallup	5,376 5,561 #N/A	10,263.2		6 1/8	200' overlap at liner top 5,094' Drilled Lat, 4,634' Completable 4 1/2" 11.6ppf SB80 LTC Running external swellable csg packers for isolation of prod string Plan on setting top packer within 100' of intermediate casing shoe	Horizontal Inclination Horizontal TVD 8.6-9.0 OBM Switch to OBM 8.6-9.0	Horz Inc/TVD /5376 TD = 10,263.2 MC
MWD Gamma Directional									

NOTES:



Boomerang Tube LLC

CASING (OR) TUBING DESCRIPTION AND PERFORMANCE PROPERTIES

Pipe Outside Diameter (ins)	_____	4.500
Pipe Wall Thickness (ins)	_____	0.250
Nominal Weight Per Foot (lbs)	_____	11.60
Thread Name	_____	Long Thread CSG
Grade Name	_____	SB-80
Pipe Minimum Yield (psi)	_____	80,000
Pipe Minimum Ultimate (psi)	_____	90,000
Coupling Minimum Yield (psi)	_____	80,000
Coupling Minimum Ultimate (psi)	_____	100,000
Coupling or Joint Outside Diameter (ins)	_____	5.000
Drift Diameter (ins)	_____	3.875
Plain End Weight per Foot (lbs)	_____	11.36
Joint Strength (lbs)	_____	201,000
Internal Yield (psi)	_____	7,780
Collapse Rating (psi)	_____	6,350

MAXIMUM DEPTH/LENGTH BASED ON MUD WTS & SAFETY FACTORS

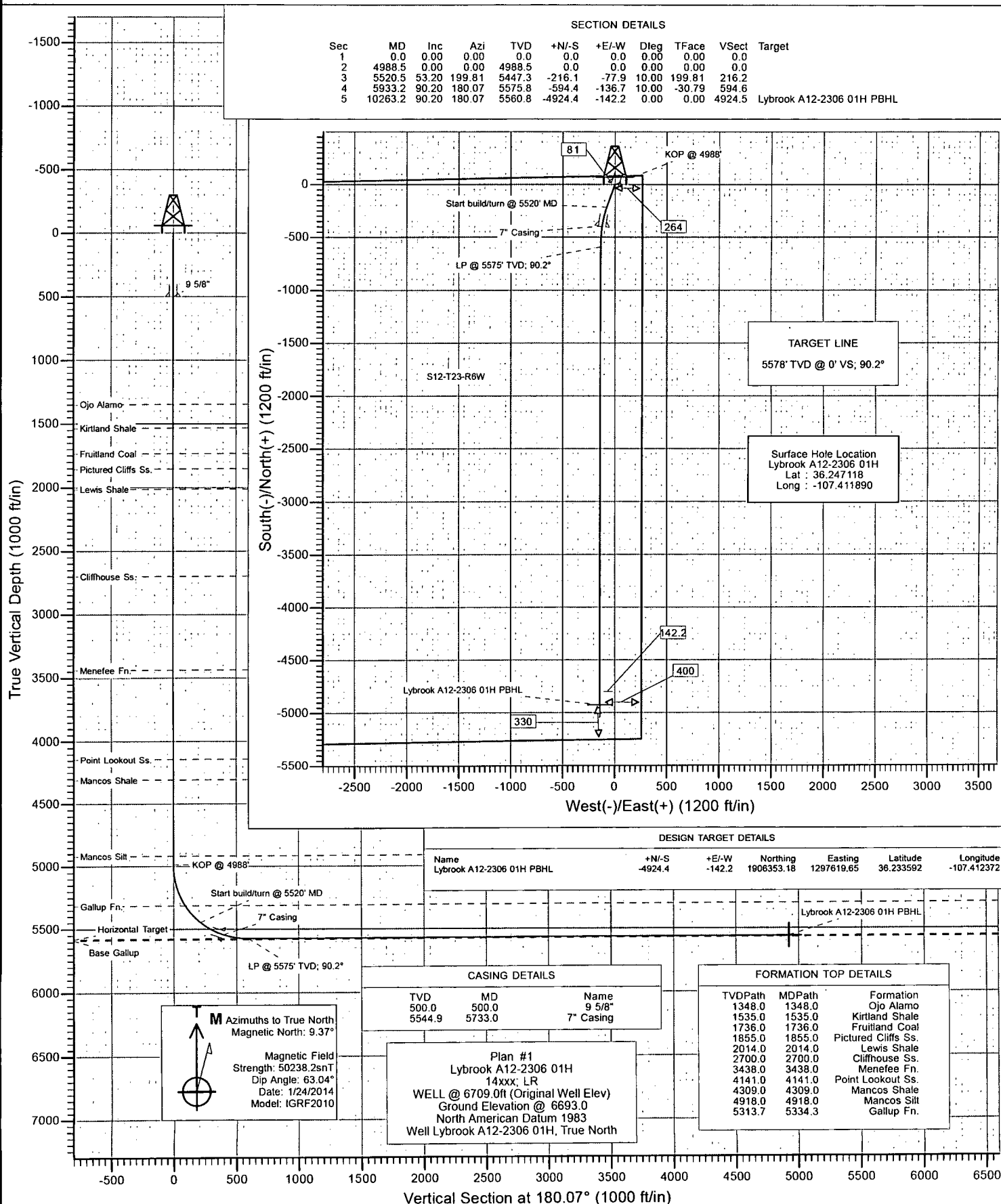
Drilling Mud Weight (ppg)	_____	9.625
Tension Safety Factor	_____	1.80
Maximum Tension Length (ft)	_____	9,630
Internal Yield Safety Factor	_____	1.10
Maximum Depth for Internal Yield (ft)	_____	14,150
Collapse Safety Factor	_____	1.125
Maximum Collapse Depth (ft)	_____	11,290

API RELATED VALUES and INTERMEDIATE CALCULATION RESULTS

Coupling Thread Fracture Strength	_____	464,000
Pipe Thread Fracture Strength (lbs)	_____	201,000
Pipe Body Plain End Yield (lbs)	_____	267,000
Round Thread Pull-Out (lbs)	_____	219,000
Minimum Make-up Torque (ft-lbs)	_____	1,640
Nominal Make-up Torque (ft-lbs)	_____	2,190
Maximum Make-up Torque (ft-lbs)	_____	2,740
Coupling Internal Yield (psi)	_____	10,660
Pipe Body Internal Yield (psi)	_____	7,780
Leak @ E1 or E7 plane (psi)	_____	17,920
Pipe Hydrostatic Test Pressure @ 80 % SMYS	_____	7,100



Project: Rio Arriba County, NM
 Site: S12-T23N-R6W
 Well: Lybrook A12-2306 01H
 Wellbore: Hz
 Design: Plan #1



Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook A12-2306 01H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 6709.0ft (Original Well Elev)
Project:	Rio Arriba County, NM	MD Reference:	WELL @ 6709.0ft (Original Well Elev)
Site:	S12-T23N-R6W	North Reference:	True
Well:	Lybrook A12-2306 01H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #1		

Project	Rio Arriba 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	S12-T23N-R6W
Site Position:	
From:	Lat/Long
Position Uncertainty:	0.0 ft
Northing:	1,911,275.48 ft
Easting:	1,297,820.84 ft
Slot Radius:	13.200 in
Latitude:	36.247118
Longitude:	-107.411890
Grid Convergence:	-0.69 °

Well	Lybrook A12-2306 01H
Well Position	+N/-S 0.0 ft
	+E/-W 0.0 ft
Position Uncertainty	0.0 ft
Northing:	1,911,275.48 ft
Easting:	1,297,820.84 ft
Wellhead Elevation:	ft
Latitude:	36.247118
Longitude:	-107.411890
Ground Level:	6,693.0 ft

Wellbore	Hz
Magnetics	Model Name
	Sample Date
	Declination (°)
	Dip Angle (°)
	Field Strength (nT)
	IGRF2010
	1/24/2014
	9.37
	63.04
	50,238

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
	180.07

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	
4,988.5	0.00	0.00	4,988.5	0.0	0.0	0.00	0.00	0.00	0.00	
5,520.5	53.20	199.81	5,447.3	-216.1	-77.9	10.00	10.00	0.00	199.81	
5,933.2	90.20	180.07	5,575.8	-594.4	-136.7	10.00	8.97	-4.78	-30.79	
10,263.2	90.20	180.07	5,560.8	-4,924.4	-142.2	0.00	0.00	0.00	0.00	Lybrook A12-2306 01H

Planning Report

Database: USA EDM 5000 Multi Users DB
 Company: EnCana Oil & Gas (USA) Inc
 Project: Rio Arriba County, NM
 Site: S12-T23N-R6W
 Well: Lybrook A12-2306 01H
 Wellbore: Hz
 Design: Plan #1

Local Co-ordinate Reference: Well Lybrook A12-2306 01H
 TVD Reference: WELL @ 6709.0ft (Original Well Elev)
 MD Reference: WELL @ 6709.0ft (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	
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	
1,348.0	0.00	0.00	1,348.0	0.0	0.0	0.0	0.00	0.00	Ojo Alamo
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	
1,535.0	0.00	0.00	1,535.0	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	
1,736.0	0.00	0.00	1,736.0	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	
1,855.0	0.00	0.00	1,855.0	0.0	0.0	0.0	0.00	0.00	Pictured Cliffs Ss.
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	
2,014.0	0.00	0.00	2,014.0	0.0	0.0	0.0	0.00	0.00	Lewis Shale
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	Cliffhouse Ss.
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	
3,438.0	0.00	0.00	3,438.0	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	
4,141.0	0.00	0.00	4,141.0	0.0	0.0	0.0	0.00	0.00	Point Lookout Ss.
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	
4,309.0	0.00	0.00	4,309.0	0.0	0.0	0.0	0.00	0.00	Mancos Shale

Planning Report

Database: USA EDM 5000 Multi Users DB
 Company: EnCana Oil & Gas (USA) Inc
 Project: Rio Arriba County, NM
 Site: S12-T23N-R6W
 Well: Lybrook A12-2306 01H
 Wellbore: Hz
 Design: Plan #1

Local Co-ordinate Reference: Well Lybrook A12-2306 01H
 TVD Reference: WELL @ 6709.0ft (Original Well Elev)
 MD Reference: WELL @ 6709.0ft (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
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	
4,700.0	0.00	0.00	4,700.0	0.0	0.0	0.0	0.00	0.00	
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	
4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	0.00	
4,918.0	0.00	0.00	4,918.0	0.0	0.0	0.0	0.00	0.00	Mancos Silt
4,988.5	0.00	0.00	4,988.5	0.0	0.0	0.0	0.00	0.00	KOP @ 4988'
5,000.0	1.15	199.81	5,000.0	-0.1	0.0	0.1	10.00	10.00	
5,100.0	11.15	199.81	5,099.3	-10.2	-3.7	10.2	10.00	10.00	
5,200.0	21.15	199.81	5,195.2	-36.3	-13.1	36.3	10.00	10.00	
5,300.0	31.15	199.81	5,284.9	-77.7	-28.0	77.7	10.00	10.00	
5,334.3	34.57	199.81	5,313.7	-95.2	-34.3	95.2	10.00	10.00	Gallup Fn.
5,400.0	41.14	199.81	5,365.5	-133.1	-48.0	133.2	10.00	10.00	
5,500.0	51.14	199.81	5,434.7	-200.9	-72.4	201.0	10.00	10.00	
5,520.5	53.20	199.81	5,447.3	-216.1	-77.9	216.2	10.00	10.00	Start build/turn @ 5520' MD
5,600.0	60.12	195.13	5,491.0	-279.4	-97.7	279.6	10.00	8.71	
5,700.0	69.03	190.08	5,533.9	-367.5	-117.2	367.6	10.00	8.91	
5,733.0	72.00	188.56	5,544.9	-398.2	-122.2	398.3	10.00	9.01	7" Casing
5,800.0	78.07	185.61	5,562.2	-462.4	-130.2	462.5	10.00	9.06	
5,900.0	87.17	181.43	5,575.1	-561.2	-136.2	561.4	10.00	9.11	
5,933.2	90.20	180.07	5,575.8	-594.4	-136.7	594.6	10.00	9.12	LP @ 5575' TVD; 90.2°
6,000.0	90.20	180.07	5,575.6	-661.2	-136.8	661.4	0.00	0.00	
6,100.0	90.20	180.07	5,575.2	-761.2	-136.9	761.4	0.00	0.00	
6,200.0	90.20	180.07	5,574.9	-861.2	-137.0	861.4	0.00	0.00	
6,300.0	90.20	180.07	5,574.5	-961.2	-137.1	961.4	0.00	0.00	
6,400.0	90.20	180.07	5,574.2	-1,061.2	-137.3	1,061.4	0.00	0.00	
6,500.0	90.20	180.07	5,573.8	-1,161.2	-137.4	1,161.4	0.00	0.00	
6,600.0	90.20	180.07	5,573.5	-1,261.2	-137.5	1,261.4	0.00	0.00	
6,700.0	90.20	180.07	5,573.2	-1,361.2	-137.6	1,361.4	0.00	0.00	
6,800.0	90.20	180.07	5,572.8	-1,461.2	-137.8	1,461.4	0.00	0.00	
6,900.0	90.20	180.07	5,572.5	-1,561.2	-137.9	1,561.4	0.00	0.00	
7,000.0	90.20	180.07	5,572.1	-1,661.2	-138.0	1,661.4	0.00	0.00	
7,100.0	90.20	180.07	5,571.8	-1,761.2	-138.2	1,761.4	0.00	0.00	
7,200.0	90.20	180.07	5,571.4	-1,861.2	-138.3	1,861.4	0.00	0.00	
7,300.0	90.20	180.07	5,571.1	-1,961.2	-138.4	1,961.4	0.00	0.00	
7,400.0	90.20	180.07	5,570.7	-2,061.2	-138.5	2,061.4	0.00	0.00	
7,500.0	90.20	180.07	5,570.4	-2,161.2	-138.7	2,161.4	0.00	0.00	
7,600.0	90.20	180.07	5,570.0	-2,261.2	-138.8	2,261.4	0.00	0.00	
7,700.0	90.20	180.07	5,569.7	-2,361.2	-138.9	2,361.4	0.00	0.00	
7,800.0	90.20	180.07	5,569.3	-2,461.2	-139.0	2,461.4	0.00	0.00	
7,900.0	90.20	180.07	5,569.0	-2,561.2	-139.2	2,561.4	0.00	0.00	
8,000.0	90.20	180.07	5,568.6	-2,661.2	-139.3	2,661.4	0.00	0.00	
8,100.0	90.20	180.07	5,568.3	-2,761.2	-139.4	2,761.4	0.00	0.00	
8,200.0	90.20	180.07	5,568.0	-2,861.2	-139.5	2,861.4	0.00	0.00	
8,300.0	90.20	180.07	5,567.6	-2,961.2	-139.7	2,961.4	0.00	0.00	
8,400.0	90.20	180.07	5,567.3	-3,061.2	-139.8	3,061.4	0.00	0.00	
8,500.0	90.20	180.07	5,566.9	-3,161.2	-139.9	3,161.4	0.00	0.00	
8,600.0	90.20	180.07	5,566.6	-3,261.2	-140.0	3,261.4	0.00	0.00	
8,700.0	90.20	180.07	5,566.2	-3,361.2	-140.2	3,361.4	0.00	0.00	
8,800.0	90.20	180.07	5,565.9	-3,461.2	-140.3	3,461.4	0.00	0.00	
8,900.0	90.20	180.07	5,565.5	-3,561.2	-140.4	3,561.4	0.00	0.00	

Planning Report

Database: USA EDM 5000 Multi Users DB
 Company: EnCana Oil & Gas (USA) Inc
 Project: Rio Arriba County, NM
 Site: S12-T23N-R6W
 Well: Lybrook A12-2306 01H
 Wellbore: Hz
 Design: Plan #1

Local Co-ordinate Reference: Well Lybrook A12-2306 01H
 TVD Reference: WELL @ 6709.0ft (Original Well Elev)
 MD Reference: WELL @ 6709.0ft (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
9,000.0	90.20	180.07	5,565.2	-3,661.2	-140.6	3,661.4	0.00	0.00	
9,100.0	90.20	180.07	5,564.8	-3,761.2	-140.7	3,761.4	0.00	0.00	
9,200.0	90.20	180.07	5,564.5	-3,861.2	-140.8	3,861.4	0.00	0.00	
9,300.0	90.20	180.07	5,564.1	-3,961.2	-140.9	3,961.4	0.00	0.00	
9,400.0	90.20	180.07	5,563.8	-4,061.2	-141.1	4,061.4	0.00	0.00	
9,500.0	90.20	180.07	5,563.4	-4,161.2	-141.2	4,161.4	0.00	0.00	
9,600.0	90.20	180.07	5,563.1	-4,261.2	-141.3	4,261.4	0.00	0.00	
9,700.0	90.20	180.07	5,562.8	-4,361.2	-141.4	4,361.4	0.00	0.00	
9,800.0	90.20	180.07	5,562.4	-4,461.2	-141.6	4,461.4	0.00	0.00	
9,900.0	90.20	180.07	5,562.1	-4,561.2	-141.7	4,561.4	0.00	0.00	
10,000.0	90.20	180.07	5,561.7	-4,661.2	-141.8	4,661.4	0.00	0.00	
10,100.0	90.20	180.07	5,561.4	-4,761.2	-141.9	4,761.4	0.00	0.00	
10,200.0	90.20	180.07	5,561.0	-4,861.2	-142.1	4,861.4	0.00	0.00	
10,263.2	90.20	180.07	5,560.8	-4,924.4	-142.2	4,924.5	0.00	0.00	TD at 10263.2

Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
Lybrook A12-2306 01H F	0.00	0.00	5,560.8	-4,924.4	-142.2	1,906,353.18	1,297,619.65	36.233592	-107.412372
- plan hits target center									
- Point									

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
5,733.0	5,544.9	7" Casing	0.000	0.000
500.0	500.0	9 5/8"	0.000	0.000

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,348.0	1,348.0	Ojo Alamo		-0.20	180.07
1,535.0	1,535.0	Kirtland Shale		-0.20	180.07
1,736.0	1,736.0	Fruitland Coal		-0.20	180.07
1,855.0	1,855.0	Pictured Cliffs Ss.		-0.20	180.07
2,014.0	2,014.0	Lewis Shale		-0.20	180.07
2,700.0	2,700.0	Cliffhouse Ss.		-0.20	180.07
3,438.0	3,438.0	Menefee Fn.		-0.20	180.07
4,141.0	4,141.0	Point Lookout Ss.		-0.20	180.07
4,309.0	4,309.0	Mancos Shale		-0.20	180.07
4,918.0	4,918.0	Mancos Silt		-0.20	180.07
5,334.3	5,314.0	Gallup Fn.		-0.20	180.07

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook A12-2306 01H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 6709.0ft (Original Well Elev)
Project:	Rio Arriba County, NM	MD Reference:	WELL @ 6709.0ft (Original Well Elev)
Site:	S12-T23N-R6W	North Reference:	True
Well:	Lybrook A12-2306 01H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #1		

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
4,988.5	4,988.5	0.0	0.0	KOP @ 4988'
5,520.5	5,447.3	-216.1	-77.9	Start build/turn @ 5520' MD
5,933.2	5,575.8	-594.4	-136.7	LP @ 5575' TVD; 90.2°
10,263.2	5,560.8	-4,924.4	-142.2	TD at 10263.2

ENCANA OIL & GAS (USA) INC.

LYBROOK A12-2306 #01H

81' FNL & 264' FEL

LOCATED IN THE NE/4 NE/4 OF SECTION 12,
T23N, R6W, N.M.P.M.,
RIO ARriba COUNTY, NEW MEXICO

DIRECTIONS

- 1) FROM THE INTERSECTION OF HWY 64 & HWY 550 IN BLOOMFIELD, GO SOUTH ON HWY 550, 53.9 MILES TO CR 370 (M.P. 97.7, COUNSELORS STORE).
- 2) TURN LEFT ONTO CR 370 AND GO 7.8 MILES.
- 3) TURN RIGHT AND GO THROUGH WELL PAD 0.2 MILES TO "T" INTERSECTION.
- 4) TURN RIGHT AND GO 3.1 MILES.
- 5) TURN LEFT AND GO 0.6 MILES TO WHERE ACCESS IS STAKED.

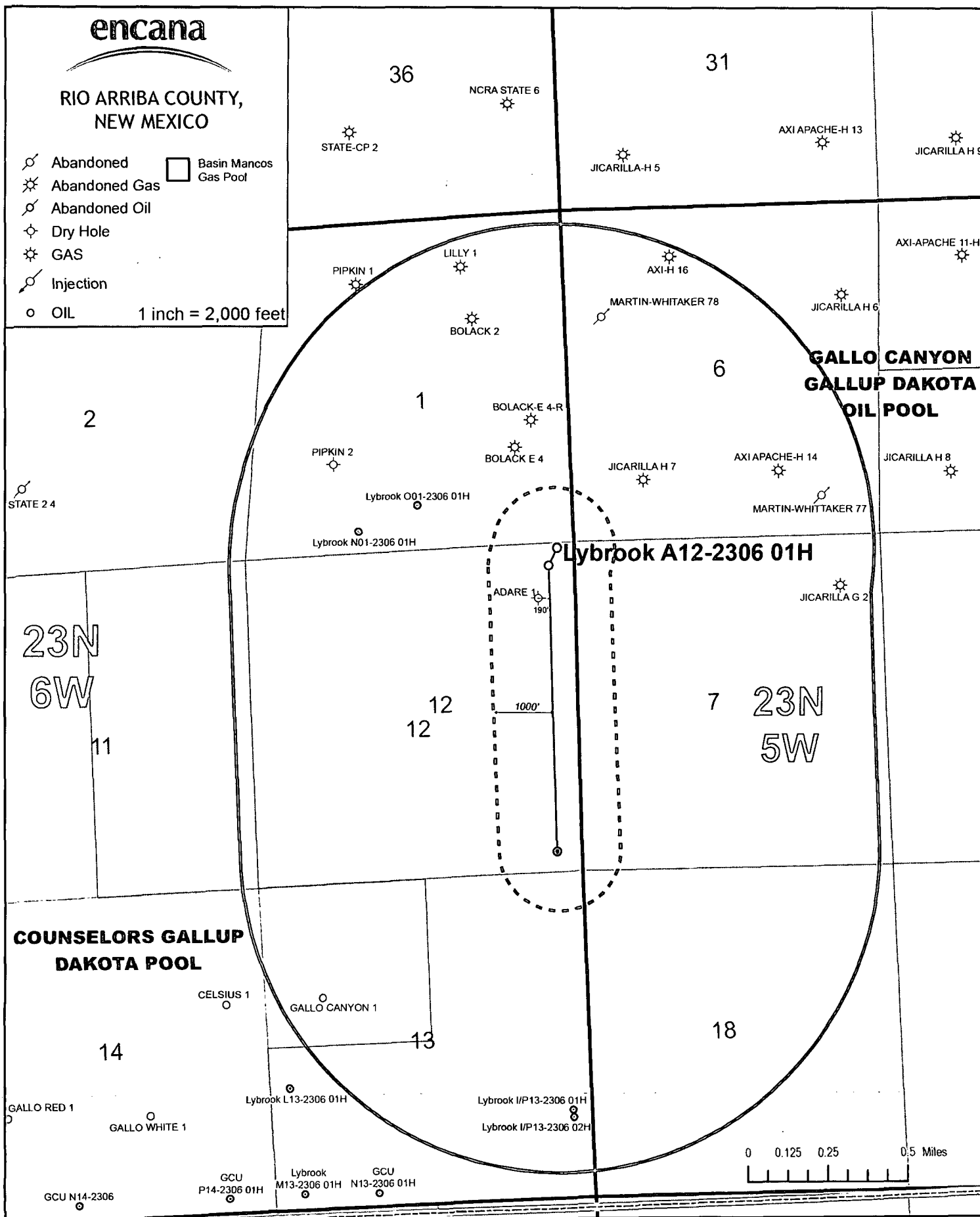
WELL FLAG LOCATED AT LAT. 36.247118° N, LONG. 107.411890° W (NAD 83).



encana

RIO ARRIBA COUNTY,
NEW MEXICO

- ⊗ Abandoned
 - ⊗ Abandoned Gas
 - ⊗ Abandoned Oil
 - ⊗ Dry Hole
 - ⊗ GAS
 - ⊗ Injection
 - OIL
 - Basin Mancos Gas Pool
- 1 inch = 2,000 feet



WELLHEAD BLOWOUT CONTROL SYSTEM

encana

Well Name and Number:
Lybrook A01-2206 01H

