

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: 3-14-14

Well information;

Operator Encana, Well Name and Number GCU M20-2306 #1H

API# 30-043-21205, Section 26, Township 23 N/S, Range 6 E W

Conditions of Approval:

(See the below checked and handwritten conditions)

- ☒ Notify Aztec OCD 24hrs prior to casing & cement.
- ☒ Hold C-104 for directional survey & "As Drilled" Plat
- ☐ Hold C-104 for NSL, NSP, DHC
- ☐ Spacing rule violation. Operator must follow up with change of status notification on other well to be shut in or abandoned
- ☐ Regarding the use of a pit, closed loop system or below grade tank, the operator must comply with the following as applicable:
 - A pit requires a complete C-144 be submitted and approved prior to the construction or use of the pit, pursuant to 19.15.17.8.A
 - A closed loop system requires notification prior to use, pursuant to 19.15.17.9.A
 - A below grade tank requires a registration be filed prior to the construction or use of the below grade tank, pursuant to 19.15.17.8.C
- ☐ Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string
- ☒ 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.

Charles Herrin
NMOCD Approved by Signature

5-29-14
Date

RECEIVED

MAR 18 2014

FORM APPROVED
OMB No. 1004-0137
Expires July 31, 2010

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Farmington Field Office

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: ☒ DRILL ☐ REENTER		5. Lease Serial No. NMNM-17009-NMNM-148128; V0 9212
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. NMNM 131017X
3a. Address 370 17th Street, Suite 1700 Denver, CO 80202	3b. Phone No. (include area code) 720-876-3533	8. Lease Name and Well No. Gallo Canyon Unit M26-2306 01H
4. Location of Well (Report location clearly and in accordance with any State requirements.) At surface M 75' FSL and 200' FWL Section 26, T23N, R6W SWSW At proposed prod. zone M 330' FSL and 730' FWL Section 36, T23N, R6W SWSW		9. API Well No. 30-043-21205
14. Distance in miles and direction from nearest town or post office* +/- 55.0 miles southeast of the intersection of US Hwy 550 & US Hwy 64 in Bloomfield, NM		10. Field and Pool, or Exploratory Counselors Gallup-Dakota
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) BHL is 330' from south lease line Section 36, T23N, R6W	16. No. of acres in lease NMNM 118128 - 1,920 ac. V-09212 - 640 ac. NMNM 17009 - 2560 ac.	11. Sec., T. R. M. or Blk. and Survey or Area SHL Section 26, T23N, R6W NMPM BHL Sec 36, T23N, R6W
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. GCU O27-230 01H is +/- 2000' NW of SHL	19. Proposed Depth 5426' TVD/12,679' MD	12. County or Parish Sandoval
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 6,938' GL, 6,954' KB	22. Approximate date work will start* 09/12/2014	13. State NM
17. Spacing Unit dedicated to this well 5,120 acres - Section 22-26 and 33-36		
20. BLM/BIA Bond No. on file COB-000235		
23. Estimated duration 20 days		

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No.1, must be attached to this form:

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

25. Signature	Name (Printed/Typed) Katie Wegner	Date 3/14/14
Title Regulatory Analyst		
Approved by (Signature)	Name (Printed/Typed) AFM	Date 5/9/14
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)
This action is subject to technical and procedural review pursuant to 43 CFR 3165.3 and appeal pursuant to 43 CFR 3165.4

OPERATOR FROM OBTAINING ANY OTHER
AUTHORIZATION REQUIRED FOR OPERATIONS
ON FEDERAL AND INDIAN LANDS

*(Instructions on page 2)
DRILLING OPERATIONS
AUTHORIZED ARE SUBJECT TO
COMPLIANCE WITH ATTACHED
"GENERAL REQUIREMENTS"

NMOCDA

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

Farmington Field Office
Bureau of Land Management

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

MAR 18 2014

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-043-21205	² Pool Code 13379	³ Pool Name COUNSELORS GALLUP-DAKOTA
⁴ Property Code 313305	⁵ Property Name GALLO CANYON UNIT M26-2306	⁶ Well Number 01H
⁷ GRID No. 282327	⁸ Operator Name ENCANA OIL & GAS (USA) INC.	⁹ Elevation 6938.5

¹⁰ Surface Location

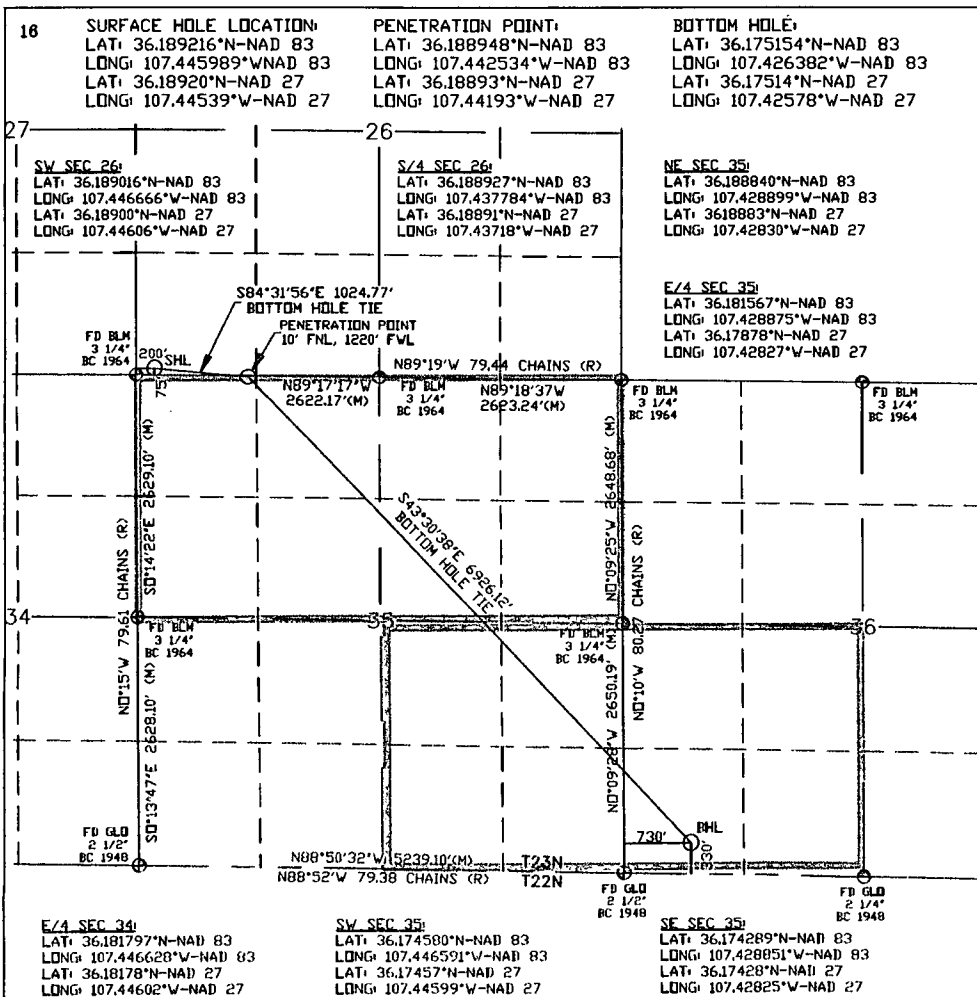
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	26	23-N	6-W		75'	SOUTH	200'	WEST	SANDOVAL

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
M	36	23-N	6-W		330'	SOUTH	730'	WEST	SANDOVAL

¹² Dedicated Acres 5,120 Acres Sec. 22-26, 34-36 - Undivided Unit Penetrated Spacing Units: N2 and SE Sec 35: SW Sec 36	¹³ Joint or Infill 640 ACRES	¹⁴ Consolidation Code	¹⁵ Order No. R-13718-A (5,120 acres)
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No allowable will be assigned to this completion until all interest 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 03/14/14
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.

JULY 17, 2013
Date of Survey
Signature and Seal of Professional Surveyor:

WILLIAM E. MAHANK II
NEW MEXICO
REGISTERED PROFESSIONAL SURVEYOR
8466
WILLIAM E. MAHANK II
Certificate Number 8466

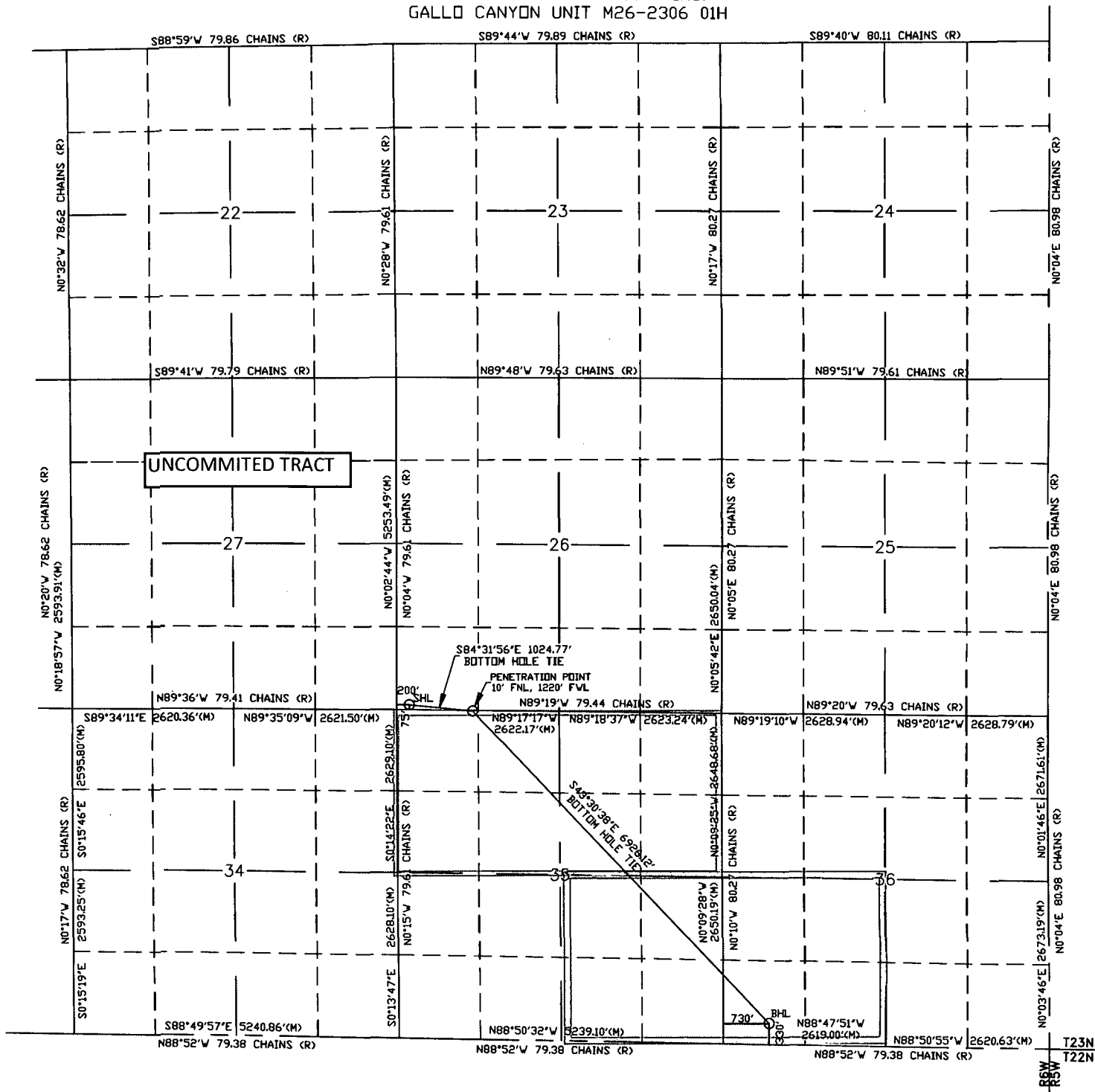
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Form C-102
Revised August 1, 2011
Submit one copy to
appropriate
District Office

☐ AMENDED REPORT

ENCANA OIL & GAS (USA) INC.
GALLO CANYON UNIT M26-2306 01H



SURFACE HOLE LOCATION:
LAT: 36.18921°N-NAD 83
LONG: 107.44599°W-NAD 83
LAT: 36.18920°N-NAD 27
LONG: 107.44539°W-NAD 27

PENETRATION POINT:
LAT: 36.188948°N-NAD 83
LONG: 107.442534°W-NAD 83
LAT: 36.18893°N-NAD 27
LONG: 107.44193°W-NAD 27

BOTTOM HOLE:
LAT: 36.175154°N-NAD 83
LONG: 107.426382°W-NAD 83
LAT: 36.17514°N-NAD 27
LONG: 107.42578°W-NAD 27

GCU M26-2306 01H
SHL: SWSW Sec 26 T23N R6W
75' FSL, 200' FWL
BHL: SWSW Sec 36 T23N R6W
330' FSL, 730' FWL
Sandoval, New Mexico

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

1. ESTIMATED TOPS OF GEOLOGICAL MARKERS (TVD)

The estimated tops of important geologic markers are as follows:

Formation	Depth (TVD) units = feet
Ojo Alamo Ss.	1,391
Kirtland Shale	1,507
Fruitland Coal	1,691
Pictured Cliffs Ss.	1,907
Lewis Shale	2,014
Cliffhouse Ss.	2,726
Menefee Fn.	3,449
Point Lookout Ss.	4,132
Mancos Shale	4,334
Mancos Silt	4,930
Gallup Fn.	5,194

The referenced surface elevation is 6938', KB 6954'

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

Substance	Formation	Depth (TVD) units = feet
Water/Gas	Fruitland Coal	1,691
Oil/Gas	Pictured Cliffs Ss.	1,907
Oil/Gas	Cliffhouse Ss.	2,726
Gas	Menefee Fn.	3,449
Oil/Gas	Point Lookout Ss.	4,132
Oil/Gas	Mancos Shale	4,334
Oil/Gas	Mancos Silt	4,930
Oil/Gas	Gallup Fn.	5,194

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.
- 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.

GCU M26-2306 01H
SHL: SWSW Sec 26 T23N R6W
75' FSL, 200' FWL
BHL: SWSW Sec 36 T23N R6W
330' FSL, 730' FWL
Sandoval, New Mexico

- 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'-6065'	8 3/4"	7"	26#	J55, LTC New
Production Liner	5865'-12679'	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.

GCU M26-2306 01H
 SHL: SWSW Sec 26 T23N R6W
 75' FSL, 200' FWL
 BHL: SWSW Sec 36 T23N R6W
 330' FSL, 730' FWL
 Sandoval, New Mexico

b) The proposed cementing program is as follows

Casing	Depth (MD)	Cement Volume (sks)	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'-6065'	30% open hole excess Stage 1 Lead: 359 sks Stage 1 Tail: 369 sks Stage 2 Lead: 178 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	5865'-12679'	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 4000'. Directional plans are attached.

Description	Proposed Depth (TVD/MD)	Formation
Horizontal Lateral TD	5426'/12679'	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'-5449'/6065'	Fresh Water LSND	9.5-8.8	40-50	8-10

GCÜ M26-2306 01H

SHL: SWSW Sec 26 T23N R6W

75' FSL, 200' FWL

BHL: SWSW Sec 36 T23N R6W

330' FSL, 730' FWL

Sandoval, 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"	5449'/6065'- 5426'/12679'	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 +/- 2552 psi based on a 9.0 ppg at 5453' 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 September 14, 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.

encana

**SANDOVAL COUNTY,
NEW MEXICO**

-  Abandoned
 -  Abandoned Gas
 -  Abandoned Oil
 -  Dry Hole
 -  GAS
 -  Injection
 -  OIL
-  Basin Mancos Gas Pool
- 1 inch = 2,333 feet

GCU P15-2306 GCU N14-2306 GCU P14-2306 01H Lybrook M13-2306 01H GCU N13-2306 01H
CHADWELL 1
ABSOLUT 1 GULF-FEDERAL-24 1

**COUNSELORS GALLUP
DAKOTA POOL**

23 24

TEXAS NATIONAL 1
GULF FEDERAL-25 1

23N
6W

Lybrook E27-2306 01H
Lybrook E27-2306 03H
Lybrook E27-2306 04H

DOMES FEDERAL
28-23 2

DOMES ET AL
FED-28 1

DOMES FEDERAL
28-3 1

27

GALLO CANYON 1

FEDERAL-26 22

26

GULF-FEDERAL 1K

25

Lybrook M27-2306 02H
Lybrook M27-2306 03H
Lybrook M27-2306 04H

GCU O27-2306 01H
GCU O27-2306 02H

GCU M26-2306 01H

GCU O26-2306 01H

GCU M25-2306 01H

GULF STATE 36-1

WARNER-GOVT 1

Lybrook
H03-2206 01H

34

35

36

MADDOX F-A 1

Lybrook
A03-2206 01H

Lybrook
H03-2206 01H

Lybrook A01-2206 01H
Lybrook A01-2206 02H
Lybrook A01-2206 03H
Lybrook A01-2206 04H

Lybrook H01-2206 01H

22N
6W

3

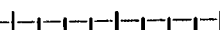
2

1

Lybrook
P03-2206 01H

Lybrook
P03-2206 02H

0 0.125 0.25 0.5 Miles





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

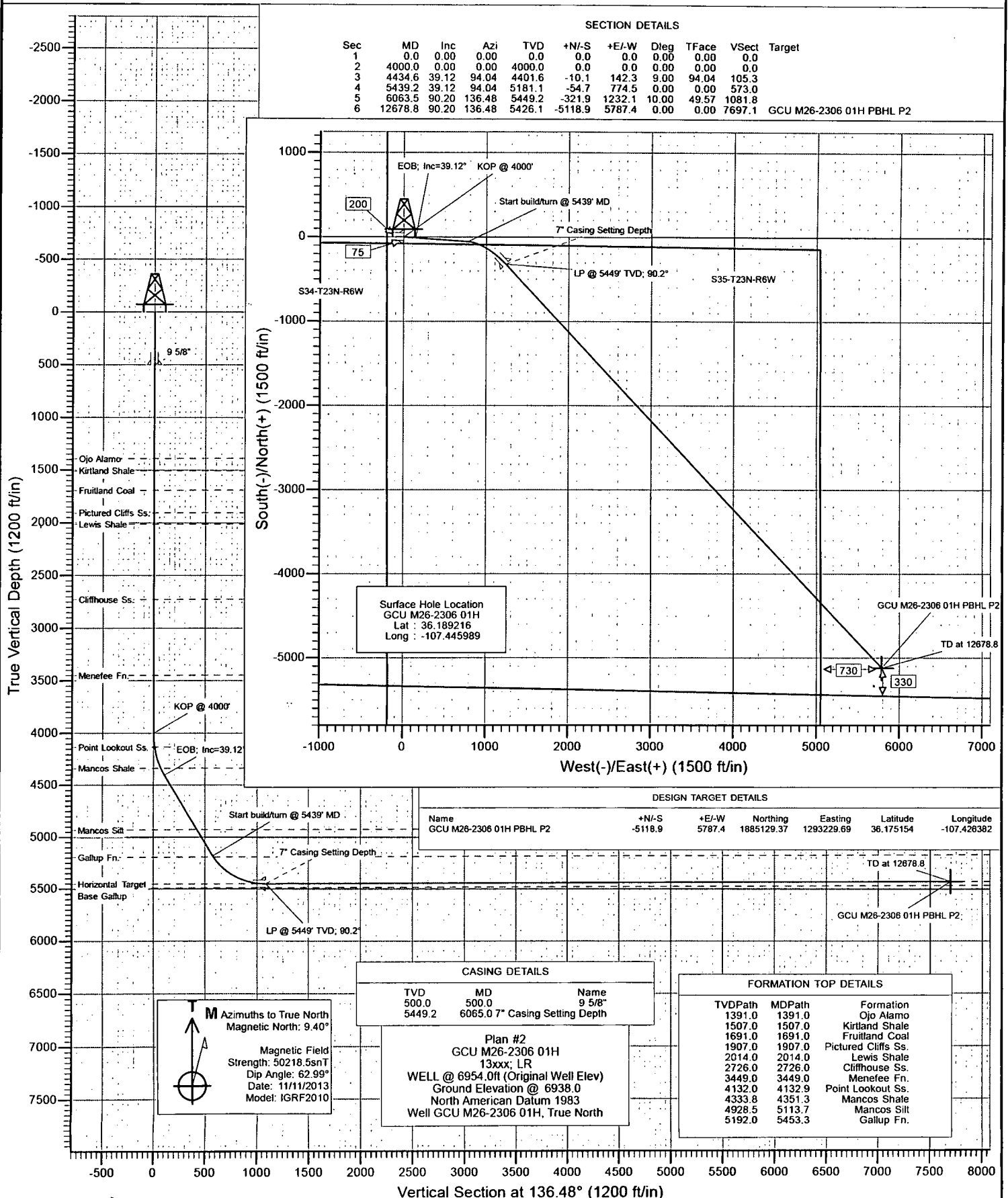
Drilling Mud Weight (ppg)	_____	9.625
Tension Safety Factor	_____	1.80
Maximum Tension Length (ft)	_____	9,630
Internal Yield Safety Factor	_____	1.10
Maximum Depth for Internal Yield (ft)	_____	14,150
Collapse Safety Factor	_____	1.125
Maximum Collapse Depth (ft)	_____	11,290

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: Sandoval County, NM
 Site: GCU
 Well: GCU M26-2306 01H
 Wellbore: Hz
 Design: Plan #2



Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well GCU M26-2306 01H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 6954.0ft (Original Well Elev)
Project:	Sandoval County, NM	MD Reference:	WELL @ 6954.0ft (Original Well Elev)
Site:	GCU	North Reference:	True
Well:	GCU M26-2306 01H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #2		

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	GCU				
Site Position:		Northing:	1,888,889.10 ft	Latitude:	36.185100
From:	Lat/Long	Easting:	1,281,990.06 ft	Longitude:	-107.464617
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-0.72 °

Well	GCU M26-2306 01H					
Well Position	+N/-S	0.0 ft	Northing:	1,890,319.20 ft	Latitude:	36.189216
	+E/-W	0.0 ft	Easting:	1,287,505.84 ft	Longitude:	-107.445989
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	6,938.0 ft

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/11/2013	9.40	62.99	50,218

Design	Plan #2			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(ft)	(ft)	(ft)	(°)
	0.0	0.0	0.0	136.48

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	
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
4,434.6	39.12	94.04	4,401.6	-10.1	142.3	9.00	9.00	0.00	94.04	
5,439.2	39.12	94.04	5,181.1	-54.7	774.5	0.00	0.00	0.00	0.00	
6,063.5	90.20	136.48	5,449.2	-321.9	1,232.1	10.00	8.18	6.80	49.57	
12,678.8	90.20	136.48	5,426.1	-5,118.9	5,787.4	0.00	0.00	0.00	0.00	GCU M26-2306 01H I

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well GCU M26-2306 01H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 6954.0ft (Original Well Elev)
Project:	Sandoval County, NM	MD Reference:	WELL @ 6954.0ft (Original Well Elev)
Site:	GCU	North Reference:	True
Well:	GCU M26-2306 01H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #2		

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	
1,391.0	0.00	0.00	1,391.0	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	
1,507.0	0.00	0.00	1,507.0	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	
1,691.0	0.00	0.00	1,691.0	0.0	0.0	0.0	0.00	0.00	Fruitland Coal
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	
1,907.0	0.00	0.00	1,907.0	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	
2,014.0	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	
2,726.0	0.00	0.00	2,726.0	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	
3,449.0	0.00	0.00	3,449.0	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	KOP @ 4000'
4,100.0	9.00	94.04	4,099.6	-0.6	7.8	5.8	9.00	9.00	
4,132.9	11.96	94.04	4,132.0	-1.0	13.8	10.2	9.00	9.00	Point Lookout Ss.
4,200.0	18.00	94.04	4,196.7	-2.2	31.1	23.0	9.00	9.00	
4,300.0	27.00	94.04	4,289.0	-4.9	69.2	51.2	9.00	9.00	

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well GCU M26-2306 01H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 6954.0ft (Original Well Elev)
Project:	Sandoval County, NM	MD Reference:	WELL @ 6954.0ft (Original Well Elev)
Site:	GCU	North Reference:	True
Well:	GCU M26-2306 01H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #2		

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
4,351.3	31.62	94.04	4,333.8	-6.7	94.3	69.7	9.00	9.00	Mancos Shale
4,400.0	36.00	94.04	4,374.2	-8.6	121.3	89.7	9.00	9.00	
4,434.6	39.12	94.04	4,401.6	-10.1	142.3	105.3	9.00	9.00	EOB; Inc=39.12°
4,500.0	39.12	94.04	4,452.4	-13.0	183.5	135.7	0.00	0.00	
4,600.0	39.12	94.04	4,530.0	-17.4	246.4	182.3	0.00	0.00	
4,700.0	39.12	94.04	4,607.5	-21.9	309.3	228.9	0.00	0.00	
4,800.0	39.12	94.04	4,685.1	-26.3	372.3	275.4	0.00	0.00	
4,900.0	39.12	94.04	4,762.7	-30.8	435.2	322.0	0.00	0.00	
5,000.0	39.12	94.04	4,840.3	-35.2	498.1	368.5	0.00	0.00	
5,100.0	39.12	94.04	4,917.9	-39.6	561.1	415.1	0.00	0.00	
5,113.7	39.12	94.04	4,928.5	-40.3	569.7	421.5	0.00	0.00	Mancos Silt
5,200.0	39.12	94.04	4,995.5	-44.1	624.0	461.7	0.00	0.00	
5,300.0	39.12	94.04	5,073.1	-48.5	686.9	508.2	0.00	0.00	
5,400.0	39.12	94.04	5,150.7	-53.0	749.9	554.8	0.00	0.00	
5,439.2	39.12	94.04	5,181.1	-54.7	774.5	573.0	0.00	0.00	Start build/turn @ 5439' MD
5,453.3	40.05	95.72	5,192.0	-55.5	783.5	579.8	10.00	6.57	Gallup Fn.
5,500.0	43.27	100.80	5,226.8	-60.0	814.2	604.1	10.00	6.90	
5,600.0	50.79	109.83	5,295.0	-79.6	884.4	666.8	10.00	7.52	
5,700.0	58.87	117.06	5,352.6	-112.3	959.2	741.9	10.00	8.08	
5,800.0	67.29	123.12	5,397.9	-157.1	1,036.1	827.4	10.00	8.42	
5,900.0	75.91	128.47	5,429.5	-212.6	1,112.9	920.5	10.00	8.62	
6,000.0	84.64	133.42	5,446.4	-277.1	1,187.2	1,018.5	10.00	8.73	
6,063.5	90.20	136.48	5,449.2	-321.9	1,232.1	1,081.8	10.00	8.77	LP @ 5449' TVD; 90.2°
6,065.0	90.20	136.48	5,449.2	-323.0	1,233.1	1,083.4	0.00	0.00	7" Casing Setting Depth
6,100.0	90.20	136.48	5,449.1	-348.4	1,257.2	1,118.4	0.00	0.00	
6,200.0	90.20	136.48	5,448.7	-420.9	1,326.1	1,218.4	0.00	0.00	
6,300.0	90.20	136.48	5,448.4	-493.4	1,395.0	1,318.4	0.00	0.00	
6,400.0	90.20	136.48	5,448.0	-566.0	1,463.8	1,418.4	0.00	0.00	
6,500.0	90.20	136.48	5,447.7	-638.5	1,532.7	1,518.4	0.00	0.00	
6,600.0	90.20	136.48	5,447.3	-711.0	1,601.5	1,618.4	0.00	0.00	
6,700.0	90.20	136.48	5,447.0	-783.5	1,670.4	1,718.4	0.00	0.00	
6,800.0	90.20	136.48	5,446.7	-856.0	1,739.3	1,818.4	0.00	0.00	
6,900.0	90.20	136.48	5,446.3	-928.5	1,808.1	1,918.4	0.00	0.00	
7,000.0	90.20	136.48	5,446.0	-1,001.0	1,877.0	2,018.4	0.00	0.00	
7,100.0	90.20	136.48	5,445.6	-1,073.5	1,945.8	2,118.4	0.00	0.00	
7,200.0	90.20	136.48	5,445.3	-1,146.1	2,014.7	2,218.4	0.00	0.00	
7,300.0	90.20	136.48	5,444.9	-1,218.6	2,083.6	2,318.4	0.00	0.00	
7,400.0	90.20	136.48	5,444.6	-1,291.1	2,152.4	2,418.4	0.00	0.00	
7,500.0	90.20	136.48	5,444.2	-1,363.6	2,221.3	2,518.4	0.00	0.00	
7,600.0	90.20	136.48	5,443.9	-1,436.1	2,290.1	2,618.4	0.00	0.00	
7,700.0	90.20	136.48	5,443.5	-1,508.6	2,359.0	2,718.4	0.00	0.00	
7,800.0	90.20	136.48	5,443.2	-1,581.1	2,427.9	2,818.4	0.00	0.00	
7,900.0	90.20	136.48	5,442.8	-1,653.6	2,496.7	2,918.4	0.00	0.00	
8,000.0	90.20	136.48	5,442.5	-1,726.2	2,565.6	3,018.4	0.00	0.00	
8,100.0	90.20	136.48	5,442.1	-1,798.7	2,634.4	3,118.4	0.00	0.00	
8,200.0	90.20	136.48	5,441.8	-1,871.2	2,703.3	3,218.4	0.00	0.00	
8,300.0	90.20	136.48	5,441.4	-1,943.7	2,772.2	3,318.4	0.00	0.00	
8,400.0	90.20	136.48	5,441.1	-2,016.2	2,841.0	3,418.4	0.00	0.00	
8,500.0	90.20	136.48	5,440.7	-2,088.7	2,909.9	3,518.4	0.00	0.00	
8,600.0	90.20	136.48	5,440.4	-2,161.2	2,978.7	3,618.4	0.00	0.00	
8,700.0	90.20	136.48	5,440.0	-2,233.7	3,047.6	3,718.4	0.00	0.00	
8,800.0	90.20	136.48	5,439.7	-2,306.3	3,116.5	3,818.4	0.00	0.00	

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well GCU M26-2306 01H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 6954.0ft (Original Well Elev)
Project:	Sandoval County, NM	MD Reference:	WELL @ 6954.0ft (Original Well Elev)
Site:	GCU	North Reference:	True
Well:	GCU M26-2306 01H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #2		

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
8,900.0	90.20	136.48	5,439.3	-2,378.8	3,185.3	3,918.4	0.00	0.00	
9,000.0	90.20	136.48	5,439.0	-2,451.3	3,254.2	4,018.4	0.00	0.00	
9,100.0	90.20	136.48	5,438.6	-2,523.8	3,323.0	4,118.4	0.00	0.00	
9,200.0	90.20	136.48	5,438.3	-2,596.3	3,391.9	4,218.4	0.00	0.00	
9,300.0	90.20	136.48	5,437.9	-2,668.8	3,460.8	4,318.4	0.00	0.00	
9,400.0	90.20	136.48	5,437.6	-2,741.3	3,529.6	4,418.4	0.00	0.00	
9,500.0	90.20	136.48	5,437.2	-2,813.9	3,598.5	4,518.4	0.00	0.00	
9,600.0	90.20	136.48	5,436.9	-2,886.4	3,667.3	4,618.4	0.00	0.00	
9,700.0	90.20	136.48	5,436.5	-2,958.9	3,736.2	4,718.4	0.00	0.00	
9,800.0	90.20	136.48	5,436.2	-3,031.4	3,805.1	4,818.4	0.00	0.00	
9,900.0	90.20	136.48	5,435.8	-3,103.9	3,873.9	4,918.4	0.00	0.00	
10,000.0	90.20	136.48	5,435.5	-3,176.4	3,942.8	5,018.4	0.00	0.00	
10,100.0	90.20	136.48	5,435.1	-3,248.9	4,011.6	5,118.4	0.00	0.00	
10,200.0	90.20	136.48	5,434.8	-3,321.4	4,080.5	5,218.4	0.00	0.00	
10,300.0	90.20	136.48	5,434.4	-3,394.0	4,149.4	5,318.4	0.00	0.00	
10,400.0	90.20	136.48	5,434.1	-3,466.5	4,218.2	5,418.4	0.00	0.00	
10,500.0	90.20	136.48	5,433.7	-3,539.0	4,287.1	5,518.4	0.00	0.00	
10,600.0	90.20	136.48	5,433.4	-3,611.5	4,355.9	5,618.4	0.00	0.00	
10,700.0	90.20	136.48	5,433.0	-3,684.0	4,424.8	5,718.4	0.00	0.00	
10,800.0	90.20	136.48	5,432.7	-3,756.5	4,493.7	5,818.4	0.00	0.00	
10,900.0	90.20	136.48	5,432.3	-3,829.0	4,562.5	5,918.4	0.00	0.00	
11,000.0	90.20	136.48	5,432.0	-3,901.5	4,631.4	6,018.4	0.00	0.00	
11,100.0	90.20	136.48	5,431.6	-3,974.1	4,700.2	6,118.4	0.00	0.00	
11,200.0	90.20	136.48	5,431.3	-4,046.6	4,769.1	6,218.4	0.00	0.00	
11,300.0	90.20	136.48	5,430.9	-4,119.1	4,838.0	6,318.4	0.00	0.00	
11,400.0	90.20	136.48	5,430.6	-4,191.6	4,906.8	6,418.4	0.00	0.00	
11,500.0	90.20	136.48	5,430.2	-4,264.1	4,975.7	6,518.4	0.00	0.00	
11,600.0	90.20	136.48	5,429.9	-4,336.6	5,044.5	6,618.4	0.00	0.00	
11,700.0	90.20	136.48	5,429.5	-4,409.1	5,113.4	6,718.3	0.00	0.00	
11,800.0	90.20	136.48	5,429.2	-4,481.7	5,182.3	6,818.3	0.00	0.00	
11,900.0	90.20	136.48	5,428.8	-4,554.2	5,251.1	6,918.3	0.00	0.00	
12,000.0	90.20	136.48	5,428.5	-4,626.7	5,320.0	7,018.3	0.00	0.00	
12,100.0	90.20	136.48	5,428.2	-4,699.2	5,388.9	7,118.3	0.00	0.00	
12,200.0	90.20	136.48	5,427.8	-4,771.7	5,457.7	7,218.3	0.00	0.00	
12,300.0	90.20	136.48	5,427.5	-4,844.2	5,526.6	7,318.3	0.00	0.00	
12,400.0	90.20	136.48	5,427.1	-4,916.7	5,595.4	7,418.3	0.00	0.00	
12,500.0	90.20	136.48	5,426.8	-4,989.2	5,664.3	7,518.3	0.00	0.00	
12,600.0	90.20	136.48	5,426.4	-5,061.8	5,733.2	7,618.3	0.00	0.00	
12,678.8	90.20	136.48	5,426.1	-5,118.9	5,787.4	7,697.1	0.00	0.00	TD at 12678.8

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well GCU M26-2306 01H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 6954.0ft (Original Well Elev)
Project:	Sandoval County, NM	MD Reference:	WELL @ 6954.0ft (Original Well Elev)
Site:	GCU	North Reference:	True
Well:	GCU M26-2306 01H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #2		

Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
GCU M26-2306 01H PB	0.00	0.00	5,426.1	-5,118.9	5,787.4	1,885,129.37	1,293,229.69	36.175154	-107.426382
- plan hits target center									
- Point									
GCU M26-2306 01H PO	0.00	0.00	5,427.2	-97.6	1,019.6	1,890,209.09	1,288,524.19	36.188948	-107.442534
- plan misses target center by 61.5ft at 5773.8ft MD (5387.3 TVD, -144.3 N, 1015.9 E)									
- Point									
GCU M26-2306 01H PB	0.00	0.00	5,404.1	-5,118.9	5,787.4	1,885,129.37	1,293,229.69	36.175154	-107.426382
- plan misses target center by 22.0ft at 12678.8ft MD (5426.1 TVD, -5118.9 N, 5787.4 E)									
- Point									

Casing Points				
Measured Depth	Vertical Depth	Name	Casing Diameter	Hole Diameter
(ft)	(ft)		(in)	(in)
500.0	500.0	9 5/8"	0.000	0.000
6,065.0	5,449.2	7" Casing Setting Depth	0.000	0.000

Formations					
Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction
(ft)	(ft)			(°)	(°)
1,391.0	1,391.0	Ojo Alamo		-0.20	136.48
1,507.0	1,507.0	Kirtland Shale		-0.20	136.48
1,691.0	1,691.0	Fruitland Coal		-0.20	136.48
1,907.0	1,907.0	Pictured Cliffs Ss.		-0.20	136.48
2,014.0	2,014.0	Lewis Shale		-0.20	136.48
2,726.0	2,726.0	Cliffhouse Ss.		-0.20	136.48
3,449.0	3,449.0	Menefee Fn.		-0.20	136.48
4,132.9	4,132.0	Point Lookout Ss.		-0.20	136.48
4,351.3	4,334.0	Mancos Shale		-0.20	136.48
5,113.7	4,930.0	Mancos Silt		-0.20	136.48
5,453.3	5,194.0	Gallup Fn.		-0.20	136.48

Plan Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)	
4,000.0	4,000.0	0.0	0.0	KOP @ 4000'
4,434.6	4,401.6	-10.1	142.3	EOB; Inc=39.12°
5,439.2	5,181.1	-54.7	774.5	Start build/turn @ 5439' MD
6,063.5	5,449.2	-321.9	1,232.1	LP @ 5449' TVD; 90.2°
12,678.8	5,426.1	-5,118.9	5,787.4	TD at 12678.8

encana

Well Name and Number:
GCU M26-2306 01H

