

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: 5.8.14

Well information;

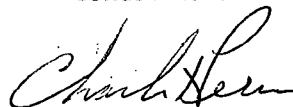
Operator Encana, Well Name and Number Gallo Canyon Unit #33-2306# 1H

API# 30.043.21233, Section 33, Township 230 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.


NMOCD Approved by Signature

6.26.2014
Date

RECEIVED

Form 3160-3
(August 2007)

MAY 09 2014

FORM APPROVED
OMB No. 1004-0137
Expires July 31, 2010UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFarmington Field Office
Bureau of Land Management
Lease Serial No.
NMNM 118218

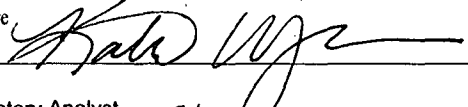
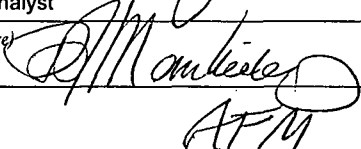
APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: ☒ DRILL ☐ REENTER		6. If Indian, Allottee or Tribe Name N/A	
1b. Type of Well: ☒ Oil Well ☐ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone		7. If Unit or CA Agreement, Name and No. NMNM 131017X	
2. Name of Operator Encana Oil & Gas (USA) Inc.		8. Lease Name and Well No. Gallo Canyon Unit H33-2306 01H	
3a. Address 370 17th Street, Suite 1700 Denver, CO 80202		9. API Well No. 30-043-21233	
3b. Phone No. (include area code) 720-876-3533		10. Field and Pool, or Exploratory Counselors Gallup-Dakota	
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface 1465' FNL and 64' FEL Section 33, T23N, R6W SENE At proposed prod. zone 330' FSL and 2215' FEL Section 34, T23N, R6W SWSE		11. Sec., T. R. M. or Blk. and Survey or Area SHL Section 33, T23N, R6W NMPM BHL Sec 34, T23N, R6W	
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		12. County or Parish Sandoval	
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 34, T23N, R6W		13. State NM	
16. No. of acres in lease NMNM 118218 - 1,920 ac.		17. Spacing Unit dedicated to this well 5,120 acres - Sections 22-26, 34-36	
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. Lybrook P28-2301 01H is +/- 1953.6' NW of SHL		20. BLM/BIA Bond No. on file COB-000235	
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 7,157 GL, 7,173' KB		22. Approximate date work will start* 11/08/2014	
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:

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

25. Signature 	Name (Printed/Typed) Katie Wegner	Date 5/8/14
Title Regulatory Analyst		
Approved by (Signature) 	Name (Printed/Typed) AFM	Date 6/17/14
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.

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)

(Continued on page 2)
and subject to technical and procedural review pursuant to 43 CFR 3165.3 and appeal pursuant to 43 CFR 3165.4

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

CONFIDENTIAL

NMOCF IV

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (505) 393-6161 Fax: (505) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone: (505) 748-1283 Fax: (505) 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

RECEIVED

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

Farmington Field Office
Bureau of Land Management
AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-043-21233	² Pool Code 13379	³ Pool Name COUNSELORS GALLUP-DAKOTA
⁴ Property Code 313412	⁵ Property Name GALLO CANYON UNIT H33-2306	⁶ Well Number 01H
⁷ OGRID No. 282327	⁸ Operator Name ENCANA OIL & GAS (USA) INC.	⁹ Elevation 7157.4

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
H	33	23-N	6-W		1465'	NORTH	64'	EAST	SANDOVAL

¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
O	34	23-N	6-W		330'	SOUTH	2215'	EAST	SANDOVAL
¹² Dedicated Acres 5,120 Acres Sec. 22-23, 34-36 - Undivided Unit Penetrated Spacing Units: NW 32 1/2 and S2 of Sec 34			¹³ Joint or Infill 480 acres *		¹⁴ Consolidation Code R-13718-A (5,120 acres)				

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.

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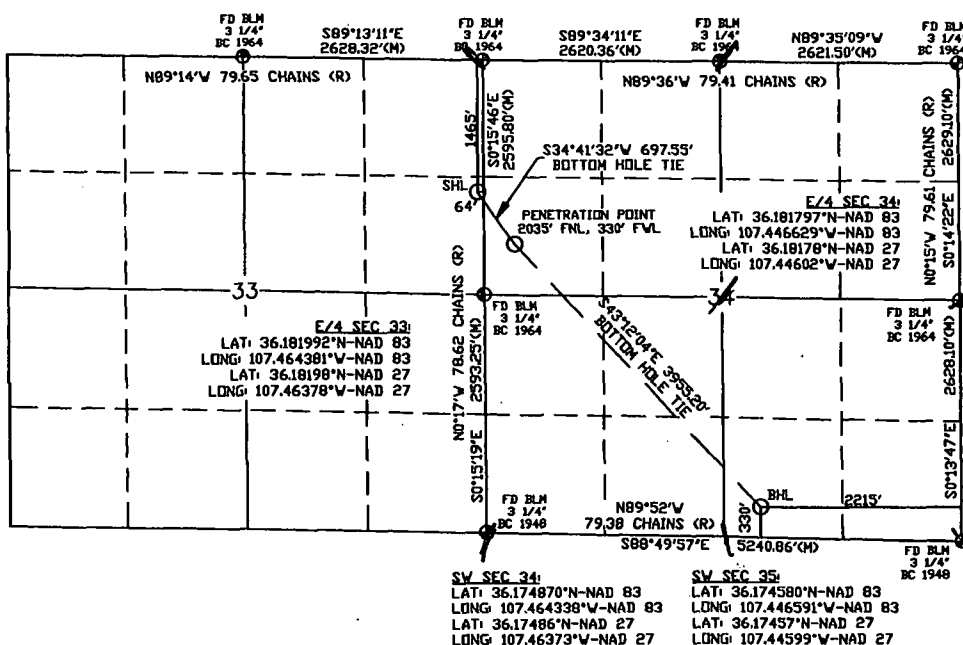
ENCANA OIL & GAS (USA) INC.
GALLO CANYON UNIT H33-2306 01H

SURFACE HOLE LOCATION:
LAT: 36.185100°N-NAD 83
LONG: 107.464617°W-NAD 83
LAT: 36.18509°N-NAD 27
LONG: 107.46401°W-NAD 27

PENETRATION POINT:
LAT: 36.183525°N-NAD 83
LONG: 107.463272°W-NAD 83
LAT: 36.18351°N-NAD 27
LONG: 107.46267°W-NAD 27

BOTTOM HOLE:
LAT: 36.175610°N-NAD 83
LONG: 107.454098°W-NAD 83
LAT: 36.17560°N-NAD 27
LONG: 107.45349°W-NAD 27

N/4 SEC 33: LAT: 36.189215°N-NAD 83
LONG: 107.473326°W-NAD 83
LAT: 36.18920°N-NAD 27
LONG: 107.47272°W-NAD 27
SW SEC 27: LAT: 36.189120°N-NAD 83
LONG: 107.464423°W-NAD 83
LAT: 36.18911°N-NAD 27
LONG: 107.46382°W-NAD 27
S/4 SEC 27: LAT: 36.189067°N-NAD 83
LONG: 107.455547°W-NAD 83
LAT: 36.20164°N-NAD 27
LONG: 107.45494°W-NAD 27
SW SEC 26: LAT: 36.189016°N-NAD 83
LONG: 107.446667°W-NAD 83
LAT: 36.18178°N-NAD 27
LONG: 107.44602°W-NAD 27



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 5/8/14
Signature Date
Katie Wegner
Printed Name
Katie.Wegner@encana.com
E-mail Address

¹⁸ SURVEYOR CERTIFICATION

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

JULY 14, 2013
Date of Survey
Signature and Seal of Professional Surveyor:
WILLIAM E. MAHNKE II
REGISTERED
8466
WILLIAM E. MAHNKE II
Certificate Number 8466

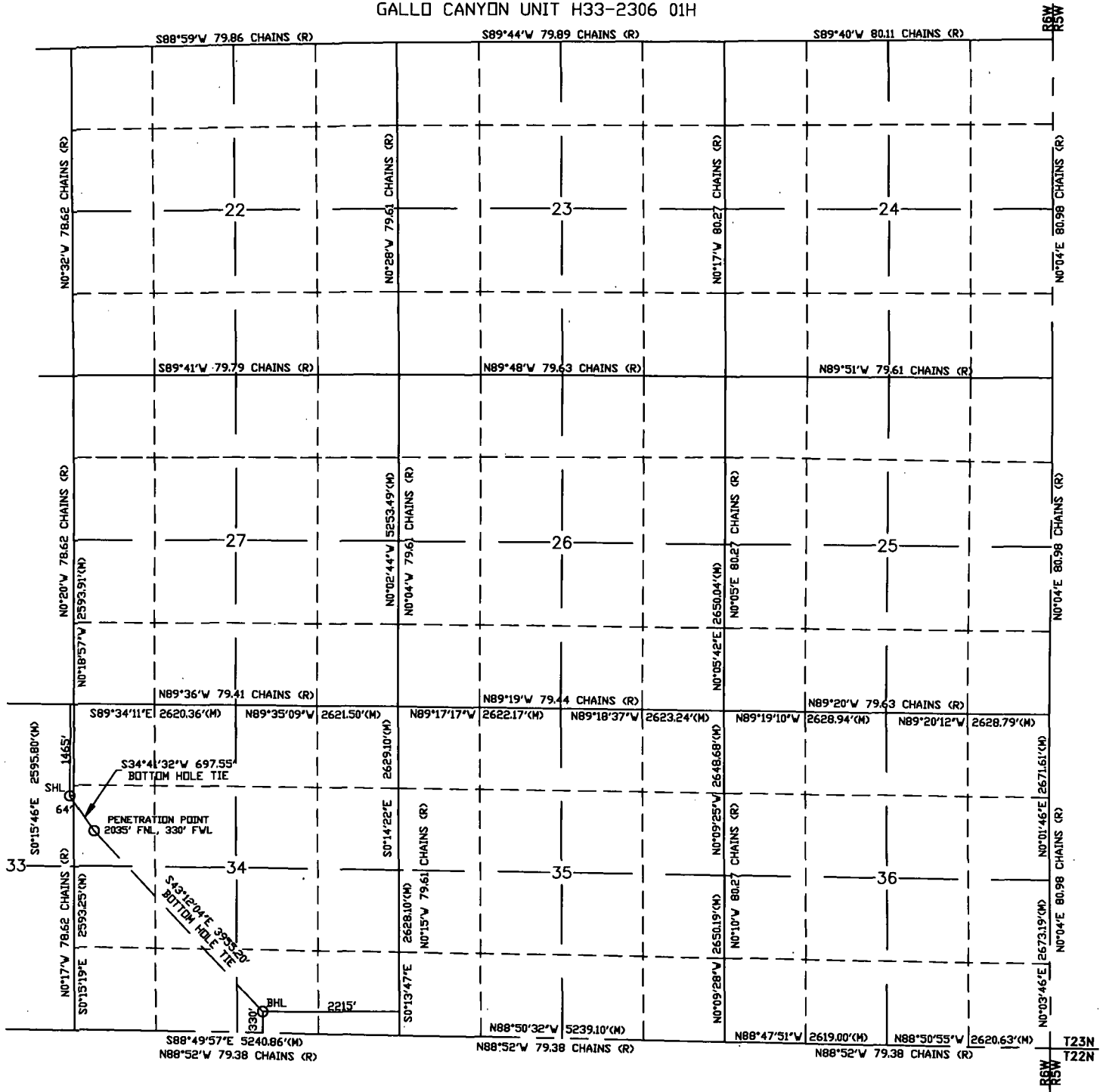
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Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
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Form C-102
Revised August 1, 2011
Submit one copy to
appropriate
District Office

☐ AMENDED REPORT

ENCANA OIL & GAS (USA) INC.
GALLO CANYON UNIT H33-2306 01H



SURFACE HOLE LOCATION:
LAT: 36.185100°N-NAD 83
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Gallo Canyon Unit H33-2306 01H
 SHL: SENE Section 33, T23N, R6W
 1465 FNL and 64 FEL
 BHL: SWSE Section 34, T23N, R6W
 330 FSL and 2215 FEL
 Sandoval, New Mexico
 Lease Number: NMNM 118128

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.	1,491
Kirtland Shale	1,640
Fruitland Coal	1,803
Pictured Cliffs Ss.	2,045
Lewis Shale	2,173
Cliffhouse Ss.	2,864
Menefee Fn.	3,595
Point Lookout Ss.	4,309
Mancos Shale	4,477
Mancos Silt	5,084
Gallup Fn.	5,350

The referenced surface elevation is 7157', KB 7173'

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

Substance	Formation	Depth (TVD) units = feet
Water/Gas	Fruitland Coal	1,803
Oil/Gas	Pictured Cliffs Ss.	2,045
Oil/Gas	Cliffhouse Ss.	2,864
Gas	Menefee Fn.	3,595
Oil/Gas	Point Lookout Ss.	4,309
Oil/Gas	Mancos Shale	4,477
Oil/Gas	Mancos Silt	5,084
Oil/Gas	Gallup Fn.	5,350

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.

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- 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'-5785'	8 3/4"	7"	26#	J55, LTC New
Production Liner	5585'-9884'	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.

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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, 1.38cuft/sk	Surface	1 per joint on bottom 3 joints
Intermediate	0'-5785'	30% open hole excess Stage 1 Lead: 399 sks Stage 1 Tail: 277 sks Stage 2 Lead: 198 sks	Lead (Stages 1 and 2): PremLite + 3% CaCl + 0.25lb/sk CelloFlake + 5lb/sk LCM, 12.1ppg 2.13cuft/sk Tail (Stage 1): Type III Cmt + 1% CaCl + 0.25lb/sk Cello Flake 14.5ppg 1.38cuft/sk	Surface	1 every 3 joints through water bearing zones
Production Liner	5585'-9884'	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	5577'/9884'	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'-5573'/5785'	Fresh Water LSND	9.5-8.8	40-50	8-10

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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"	5573'/5785'- 5577'/9884'	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 +/- 2618 psi based on a 9.0 ppg at 5593' TVD of the horizontal lateral target. No abnormal pressure or temperatures are anticipated.

No hydrogen sulfide gas is anticipated, however, if H₂S is encountered, the guidelines in Onshore Order No. 6 will be followed.

9. ANTICIPATED START DATE AND DURATION OF OPERATIONS

Drilling is estimated to commence on November 8, 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.



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

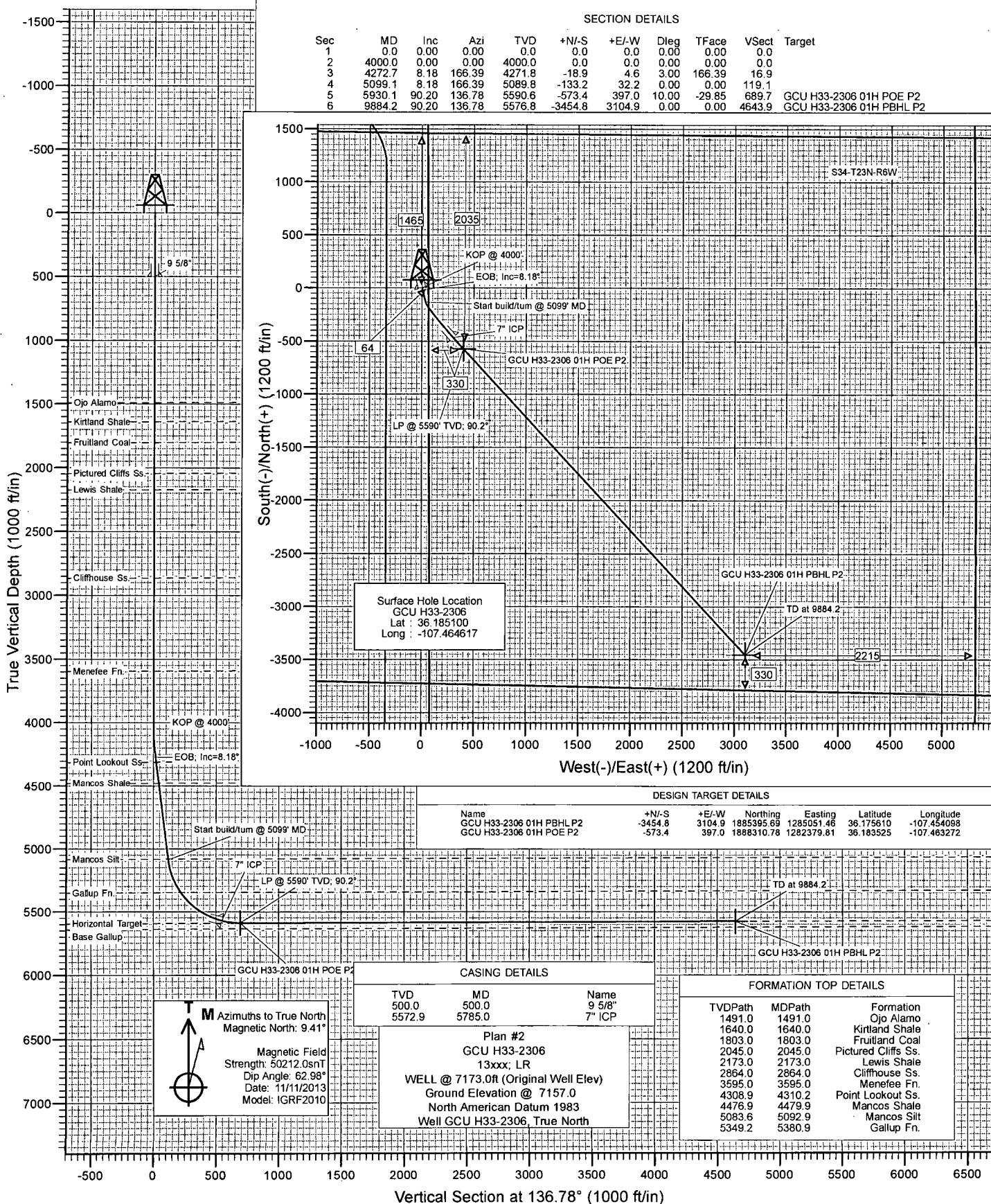
LOC: SW/4 NW/4 Sec 34 T23N R6W, 203			Encana Natural Gas			ENG: S Kuykendall 5/8/14			
County: Sandoval			WELL SUMMARY			RIG: Aztec 950			
WELL: GCU H33-2306 01H						GLE: 7157 RKBE: 7173			
MWD LWD	OPEN HOLE LOGGING	FORM	DEPTH		HOLE SIZE	CASING SPECS	MW	DEVIATION	
			TVD	MD			MUD TYPE	INFORMATION	
			60	60'		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					9 5/8" 36ppf J55 STC	Fresh wtr 8.4-8.6	Vertical <1°	
		Nacimiento 9 5/8" Csg	0 500	500.00		TOC Surface - 201 sks of Type III Cement			
Survey Every 60'-120', updating anticollision report after surveys. Stop operations and contact drilling engineer if separation factor approaches 1.5	No OH logs	Ojo Alamo Ss. Kirtland Shale	1,491 1,640		Stage tool @ ~ 2,223	7" 26ppf J55 LTC TOC @ surface 30% OH excess: 675 sksTotal. Stage 1 Lead: 399 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: 277 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. 198 Stage 2: 198 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°	
		Pictured Cliffs Ss. Lewis Shale	2,045 2,173						
Surveys every 30' through the curve	Mud logger onsite	Cliffhouse Ss. Menefee Fn.	2,864 3,595						
		Point Lookout Ss. Mancos Shale	4,309 4,477						
		KOP	4,000						4,000.0
		Mancos Silt	5,084						
		Gallup Fn.	5,350						
		7" Csg	5,573	5,785.0					
Surveys every stand to TD unless directed otherwise by Geologist	No OH Logs	Horizontal Target TD	5,593 5,577	9,884.2		200' overlap at liner top	Horizontal Inclination Horizontal TVD	Horz Inc/TVD /90.2 deg	
		Base Gallup	5,639			4099' Drilled Lateral	8.6-9.0 OBM	TD = 9,884.2 MD	
MWD Gamma Directional						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	Switch to OBM 8.6-9.0		

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 4000', 8 3/4 inch holesize
- 5) PU directional tools and start curve at 10deg/100' build rate
- 6) Drill to csg point of 5785' MD
- 7) R&C 7" csg, circ cmt to surface, switch to OBM
- 8) Land at 90 deg, drill lateral to 9884' run 4 1/2 inch liner with external swellable csg packers



Project: Sandoval County, NM
 Site: GCU
 Well: GCU H33-2306
 Wellbore: Hz
 Design: Plan #2



Vertical Section at 136.78° (1000 ft/in)

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well GCU H33-2306
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 7173.0ft (Original Well Elev)
Project:	Sandoval County, NM	MD Reference:	WELL @ 7173.0ft (Original Well Elev)
Site:	GCU	North Reference:	True
Well:	GCU H33-2306	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 H33-2306					
Well Position	+N/-S	0.0 ft	Northing:	1,888,889.10 ft	Latitude:	36.185100
	+E/-W	0.0 ft	Easting:	1,281,990.06 ft	Longitude:	-107.464617
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	7,157.0 ft

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/11/2013	9.41	62.98	50,212

Design	Plan #2			
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	136.78

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	
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
4,272.7	8.18	166.39	4,271.8	-18.9	4.6	3.00	3.00	0.00	166.39	
5,099.1	8.18	166.39	5,089.8	-133.2	32.2	0.00	0.00	0.00	0.00	
5,930.1	90.20	136.78	5,590.6	-573.4	397.0	10.00	9.87	-3.56	-29.85	GCU H33-2306 01H F
9,884.2	90.20	136.78	5,576.8	-3,454.8	3,104.9	0.00	0.00	0.00	0.00	GCU H33-2306 01H F

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well GCU H33-2306
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 7173.0ft (Original Well Elev)
Project:	Sandoval County, NM	MD Reference:	WELL @ 7173.0ft (Original Well Elev)
Site:	GCU	North Reference:	True
Well:	GCU H33-2306	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	
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	
1,491.0	0.00	0.00	1,491.0	0.0	0.0	0.0	0.00	0.00	Ojo Alamo
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	
1,640.0	0.00	0.00	1,640.0	0.0	0.0	0.0	0.00	0.00	Kirtland Shale
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	
1,803.0	0.00	0.00	1,803.0	0.0	0.0	0.0	0.00	0.00	Fruitland Coal
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	
2,045.0	0.00	0.00	2,045.0	0.0	0.0	0.0	0.00	0.00	Pictured Cliffs Ss.
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	
2,173.0	0.00	0.00	2,173.0	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	
2,864.0	0.00	0.00	2,864.0	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	
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	
3,595.0	0.00	0.00	3,595.0	0.0	0.0	0.0	0.00	0.00	Menefee Fn.
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	3.00	166.39	4,100.0	-2.5	0.6	2.3	3.00	3.00	
4,200.0	6.00	166.39	4,199.6	-10.2	2.5	9.1	3.00	3.00	
4,272.7	8.18	166.39	4,271.8	-18.9	4.6	16.9	3.00	3.00	EOB; Inc=8.18°
4,300.0	8.18	166.39	4,298.8	-22.7	5.5	20.3	0.00	0.00	

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well GCU H33-2306
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 7173.0ft (Original Well Elev)
Project:	Sandoval County, NM	MD Reference:	WELL @ 7173.0ft (Original Well Elev)
Site:	GCU	North Reference:	True
Well:	GCU H33-2306	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
4,310.2	8.18	166.39	4,308.9	-24.1	5.8	21.5	0.00	0.00	Point Lookout Ss.
4,400.0	8.18	166.39	4,397.8	-36.5	8.8	32.6	0.00	0.00	
4,479.9	8.18	166.39	4,476.9	-47.5	11.5	42.5	0.00	0.00	Mancos Shale
4,500.0	8.18	166.39	4,496.8	-50.3	12.2	45.0	0.00	0.00	
4,600.0	8.18	166.39	4,595.7	-64.2	15.5	57.4	0.00	0.00	
4,700.0	8.18	166.39	4,694.7	-78.0	18.9	69.8	0.00	0.00	
4,800.0	8.18	166.39	4,793.7	-91.8	22.2	82.1	0.00	0.00	
4,900.0	8.18	166.39	4,892.7	-105.6	25.6	94.5	0.00	0.00	
5,000.0	8.18	166.39	4,991.7	-119.5	28.9	106.9	0.00	0.00	
5,092.9	8.18	166.39	5,083.6	-132.3	32.0	118.4	0.00	0.00	Mancos Silt
5,099.1	8.18	166.39	5,089.8	-133.2	32.2	119.1	0.00	0.00	Start build/turn @ 5099' MD
5,100.0	8.26	166.09	5,090.7	-133.3	32.3	119.3	10.00	8.69	
5,200.0	17.65	149.68	5,188.0	-153.4	41.7	140.3	10.00	9.40	
5,300.0	27.47	144.64	5,280.3	-185.4	62.7	178.1	10.00	9.82	
5,380.9	35.49	142.51	5,349.2	-219.3	87.9	220.0	10.00	9.91	Gallup Fn.
5,400.0	37.38	142.12	5,364.6	-228.3	94.8	231.3	10.00	9.93	
5,500.0	47.33	140.55	5,438.4	-280.8	136.9	298.4	10.00	9.94	
5,600.0	57.29	139.41	5,499.4	-341.3	187.8	377.3	10.00	9.96	
5,700.0	67.26	138.50	5,545.9	-407.9	245.9	465.6	10.00	9.97	
5,785.0	75.73	137.83	5,572.9	-467.9	299.6	546.1	10.00	9.97	7" ICP
5,800.0	77.23	137.71	5,576.4	-478.7	309.4	560.7	10.00	9.97	
5,900.0	87.20	136.99	5,589.9	-551.5	376.4	659.7	10.00	9.97	
5,930.1	90.20	136.78	5,590.6	-573.4	397.0	689.7	10.00	9.97	LP @ 5590' TVD; 90.2°
6,000.0	90.20	136.78	5,590.3	-624.4	444.9	759.6	0.00	0.00	
6,100.0	90.20	136.78	5,590.0	-697.2	513.3	859.6	0.00	0.00	
6,200.0	90.20	136.78	5,589.6	-770.1	581.8	959.6	0.00	0.00	
6,300.0	90.20	136.78	5,589.3	-843.0	650.3	1,059.6	0.00	0.00	
6,400.0	90.20	136.78	5,588.9	-915.8	718.8	1,159.6	0.00	0.00	
6,500.0	90.20	136.78	5,588.6	-988.7	787.3	1,259.6	0.00	0.00	
6,600.0	90.20	136.78	5,588.3	-1,061.6	855.8	1,359.6	0.00	0.00	
6,700.0	90.20	136.78	5,587.9	-1,134.5	924.2	1,459.6	0.00	0.00	
6,800.0	90.20	136.78	5,587.6	-1,207.3	992.7	1,559.6	0.00	0.00	
6,900.0	90.20	136.78	5,587.2	-1,280.2	1,061.2	1,659.6	0.00	0.00	
7,000.0	90.20	136.78	5,586.9	-1,353.1	1,129.7	1,759.6	0.00	0.00	
7,100.0	90.20	136.78	5,586.5	-1,425.9	1,198.2	1,859.6	0.00	0.00	
7,200.0	90.20	136.78	5,586.2	-1,498.8	1,266.7	1,959.6	0.00	0.00	
7,300.0	90.20	136.78	5,585.8	-1,571.7	1,335.1	2,059.6	0.00	0.00	
7,400.0	90.20	136.78	5,585.5	-1,644.5	1,403.6	2,159.6	0.00	0.00	
7,500.0	90.20	136.78	5,585.1	-1,717.4	1,472.1	2,259.6	0.00	0.00	
7,600.0	90.20	136.78	5,584.8	-1,790.3	1,540.6	2,359.6	0.00	0.00	
7,700.0	90.20	136.78	5,584.4	-1,863.2	1,609.1	2,459.6	0.00	0.00	
7,800.0	90.20	136.78	5,584.1	-1,936.0	1,677.5	2,559.6	0.00	0.00	
7,900.0	90.20	136.78	5,583.7	-2,008.9	1,746.0	2,659.6	0.00	0.00	
8,000.0	90.20	136.78	5,583.4	-2,081.8	1,814.5	2,759.6	0.00	0.00	
8,100.0	90.20	136.78	5,583.0	-2,154.6	1,883.0	2,859.6	0.00	0.00	
8,200.0	90.20	136.78	5,582.7	-2,227.5	1,951.5	2,959.6	0.00	0.00	
8,300.0	90.20	136.78	5,582.3	-2,300.4	2,020.0	3,059.6	0.00	0.00	
8,400.0	90.20	136.78	5,582.0	-2,373.2	2,088.4	3,159.6	0.00	0.00	
8,500.0	90.20	136.78	5,581.6	-2,446.1	2,156.9	3,259.6	0.00	0.00	
8,600.0	90.20	136.78	5,581.3	-2,519.0	2,225.4	3,359.6	0.00	0.00	
8,700.0	90.20	136.78	5,580.9	-2,591.9	2,293.9	3,459.6	0.00	0.00	
8,800.0	90.20	136.78	5,580.6	-2,664.7	2,362.4	3,559.6	0.00	0.00	

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well GCU H33-2306
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 7173.0ft (Original Well Elev)
Project:	Sandoval County, NM	MD Reference:	WELL @ 7173.0ft (Original Well Elev)
Site:	GCU	North Reference:	True
Well:	GCU H33-2306	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	136.78	5,580.2	-2,737.6	2,430.9	3,659.6	0.00	0.00	
9,000.0	90.20	136.78	5,579.9	-2,810.5	2,499.3	3,759.6	0.00	0.00	
9,100.0	90.20	136.78	5,579.5	-2,883.3	2,567.8	3,859.6	0.00	0.00	
9,200.0	90.20	136.78	5,579.2	-2,956.2	2,636.3	3,959.6	0.00	0.00	
9,300.0	90.20	136.78	5,578.8	-3,029.1	2,704.8	4,059.6	0.00	0.00	
9,400.0	90.20	136.78	5,578.5	-3,101.9	2,773.3	4,159.6	0.00	0.00	
9,500.0	90.20	136.78	5,578.1	-3,174.8	2,841.8	4,259.6	0.00	0.00	
9,600.0	90.20	136.78	5,577.8	-3,247.7	2,910.2	4,359.6	0.00	0.00	
9,700.0	90.20	136.78	5,577.4	-3,320.6	2,978.7	4,459.6	0.00	0.00	
9,800.0	90.20	136.78	5,577.1	-3,393.4	3,047.2	4,559.6	0.00	0.00	
9,884.2	90.20	136.78	5,576.8	-3,454.8	3,104.9	4,643.9	0.00	0.00	TD at 9884.2

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
GCU H33-2306 01H PO - hit/miss target - Shape - Point	0.00	0.00	5,588.0	-573.4	397.0	1,888,310.78	1,282,379.81	36.183525	-107.463272
- plan misses target center by 2.6ft at 5930.0ft MD (5590.6 TVD, -573.4 N, 396.9 E)									
GCU H33-2306 01H PBI - plan misses target center by 3.0ft at 9884.2ft MD (5576.8 TVD, -3454.8 N, 3104.9 E) - Point	0.00	0.00	5,573.8	-3,454.8	3,104.9	1,885,395.69	1,285,051.46	36.175610	-107.454098
GCU H33-2306 01H PBI - plan hits target center - Point	0.00	0.00	5,576.8	-3,454.8	3,104.9	1,885,395.69	1,285,051.46	36.175610	-107.454098
GCU H33-2306 01H PO - plan hits target center - Point	0.00	0.00	5,590.6	-573.4	397.0	1,888,310.78	1,282,379.81	36.183525	-107.463272

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
500.0	500.0	9 5/8"	0.000	0.000	
5,785.0	5,572.9	7" ICP	0.000	0.000	

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well GCU H33-2306
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 7173.0ft (Original Well Elev)
Project:	Sandoval County, NM	MD Reference:	WELL @ 7173.0ft (Original Well Elev)
Site:	GCU	North Reference:	True
Well:	GCU H33-2306	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #2		

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,491.0	1,491.0	Ojo Alamo		-0.20	136.78
1,640.0	1,640.0	Kirtland Shale		-0.20	136.78
1,803.0	1,803.0	Fruitland Coal		-0.20	136.78
2,045.0	2,045.0	Pictured Cliffs Ss.		-0.20	136.78
2,173.0	2,173.0	Lewis Shale		-0.20	136.78
2,864.0	2,864.0	Cliffhouse Ss.		-0.20	136.78
3,595.0	3,595.0	Menefee Fn.		-0.20	136.78
4,310.2	4,309.0	Point Lookout Ss.		-0.20	136.78
4,479.9	4,477.0	Mancos Shale		-0.20	136.78
5,092.9	5,084.0	Mancos Silt		-0.20	136.78
5,380.9	5,350.0	Gallup Fn.		-0.20	136.78

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
4,000.0	4,000.0	0.0	0.0	KOP @ 4000'
4,272.7	4,271.8	-18.9	4.6	EOB; Inc=8.18°
5,099.1	5,089.8	-133.2	32.2	Start build/turn @ 5099' MD
5,930.1	5,590.6	-573.4	397.0	LP @ 5590' TVD; 90.2°
9,884.2	5,576.8	-3,454.8	3,104.9	TD at 9884.2

EnCana Oil & Gas (USA) Inc

Sandoval County, NM

GCU

GCU H33-2306

Hz

Plan #2

Anticollision Report

05 March, 2014

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well GCU H33-2306
Project:	Sandoval County, NM	TVD Reference:	WELL @ 7173.0ft (Original Well Elev)
Reference Site:	GCU	MD Reference:	WELL @ 7173.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	GCU H33-2306	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #2	Offset TVD Reference:	Offset Datum

Reference	Plan #2
Filter type:	GLOBAL FILTER APPLIED: All wellpaths within 200'+ 100/1000 of reference
Interpolation Method:	MD Interval 100.0ft
Depth Range:	Unlimited
Results Limited by:	Maximum center-center distance of 1,188.5ft
Warning Levels Evaluated at:	2.00 Sigma
Error Model:	Systematic Ellipse
Scan Method:	Closest Approach 3D
Error Surface:	Elliptical Conic

Survey Tool Program	Date	3/5/2014
From (ft)	To (ft)	Survey (Wellbore)
0.0	9,884.2	Plan #2 (Hz)
		Tool Name
		Geolink MWD
		Description
		Geolink MWD

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Lybrook						
Lybrook A03-2206 01H - Hz - FINAL	9,884.7	6,946.2	1,171.7	1,039.9	8.890	CC, ES, SF
Lybrook P28-2306 02H - HZ - Plan #3	5,410.0	7,852.0	488.1	442.3	10.669	CC, ES
Lybrook P28-2306 02H - HZ - Plan #3	5,500.0	7,898.5	499.5	451.6	10.422	SF

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well GCU H33-2306
Project:	Sandoval County, NM	TVD Reference:	WELL @ 7173.0ft (Original Well Elev)
Reference Site:	GCU	MD Reference:	WELL @ 7173.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	GCU H33-2306	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Hz	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #2	Offset TVD Reference:	Offset Datum

Offset Design	Lybrook - Lybrook A03-2206 01H - Hz - FINAL											Offset Site Error:	0.0 ft
Survey Program:	510-MWD, 4728-MWD											Offset Well Error:	0.0 ft
Reference	Offset	Semi Major Axis		Distance								Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	
9,884.7	5,576.8	6,946.2	5,362.7	98.7	45.8	87.55	-4,624.3	3,038.3	1,171.7	1,039.9	131.80	8.890 CC, ES, SF	

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well GCU H33-2306
Project:	Sandoval County, NM	TVD Reference:	WELL @ 7173.0ft (Original Well Elev)
Reference Site:	GCU	MD Reference:	WELL @ 7173.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	GCU H33-2306	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #2	Offset TVD Reference:	Offset Datum

Offset Design Lybrook - Lybrook P28-2306 02H - HZ - Plan #3													Offset Site Error:	0.0 ft
Survey Program: 0-Geolink MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning	
4,500.0	4,496.8	7,684.5	5,641.8	7.9	40.3	122.25	-69.2	-340.8	1,146.9	1,108.7	38.15	30.066		
4,600.0	4,595.7	7,696.6	5,641.6	8.1	40.5	120.85	-81.3	-340.8	1,054.1	1,014.9	39.18	26.904		
4,700.0	4,694.7	7,708.7	5,641.4	8.3	40.7	119.02	-93.4	-340.8	962.5	922.3	40.22	23.932		
4,800.0	4,793.7	7,720.8	5,641.2	8.5	40.8	117.37	-105.5	-340.8	872.7	831.4	41.26	21.149		
4,900.0	4,892.7	7,732.9	5,641.0	8.8	41.0	115.69	-117.6	-340.8	785.1	742.8	42.31	18.558		
5,000.0	4,991.7	7,745.0	5,640.7	9.0	41.2	113.99	-129.7	-340.8	700.7	657.3	43.34	16.165		
5,100.0	5,090.7	7,757.1	5,640.5	9.2	41.4	112.63	-141.8	-340.8	620.6	576.3	44.35	13.992		
5,200.0	5,188.0	7,775.6	5,640.2	9.5	41.7	131.88	-160.2	-340.8	552.2	508.5	43.67	12.645		
5,300.0	5,280.3	7,805.9	5,639.7	9.9	42.1	136.04	-190.6	-340.8	506.1	462.0	44.13	11.470		
5,400.0	5,364.6	7,847.3	5,639.0	10.5	42.7	134.83	-232.0	-340.8	488.2	442.7	45.55	10.720		
5,410.0	5,372.5	7,852.0	5,638.9	10.6	42.8	134.50	-236.7	-340.9	488.1	442.3	45.75	10.669 CC, ES		
5,500.0	5,438.4	7,898.5	5,638.1	11.3	43.5	130.08	-283.1	-340.9	499.5	451.6	47.93	10.422 SF		
5,600.0	5,499.4	7,957.9	5,637.0	12.3	44.4	122.45	-342.5	-340.9	535.2	484.0	51.21	10.452		
5,700.0	5,545.9	8,023.7	5,635.9	13.5	45.4	112.64	-408.3	-340.9	587.9	532.9	54.96	10.696		
5,800.0	5,576.4	8,093.9	5,634.7	15.0	46.5	101.85	-478.5	-341.0	650.3	591.9	58.48	11.121		
5,900.0	5,589.9	8,166.4	5,633.4	16.7	47.7	91.46	-551.0	-341.0	717.5	656.2	61.32	11.701		
6,000.0	5,590.3	8,239.2	5,632.1	18.5	48.8	88.59	-623.8	-341.0	786.0	722.1	63.92	12.296		
6,100.0	5,590.0	8,312.1	5,630.9	20.3	50.0	88.60	-696.7	-341.0	854.5	787.8	66.65	12.820		
6,200.0	5,589.6	8,384.9	5,629.6	22.2	51.1	88.61	-769.5	-341.1	923.0	853.6	69.44	13.293		
6,300.0	5,589.3	8,457.8	5,628.3	24.1	52.3	88.62	-842.3	-341.1	991.5	919.3	72.26	13.722		
6,400.0	5,588.9	8,530.6	5,627.0	26.1	53.5	88.63	-915.1	-341.1	1,060.0	984.9	75.11	14.112		
6,500.0	5,588.6	8,603.4	5,625.8	28.1	54.6	88.64	-988.0	-341.2	1,128.6	1,050.6	77.99	14.470		

Anticollision Report

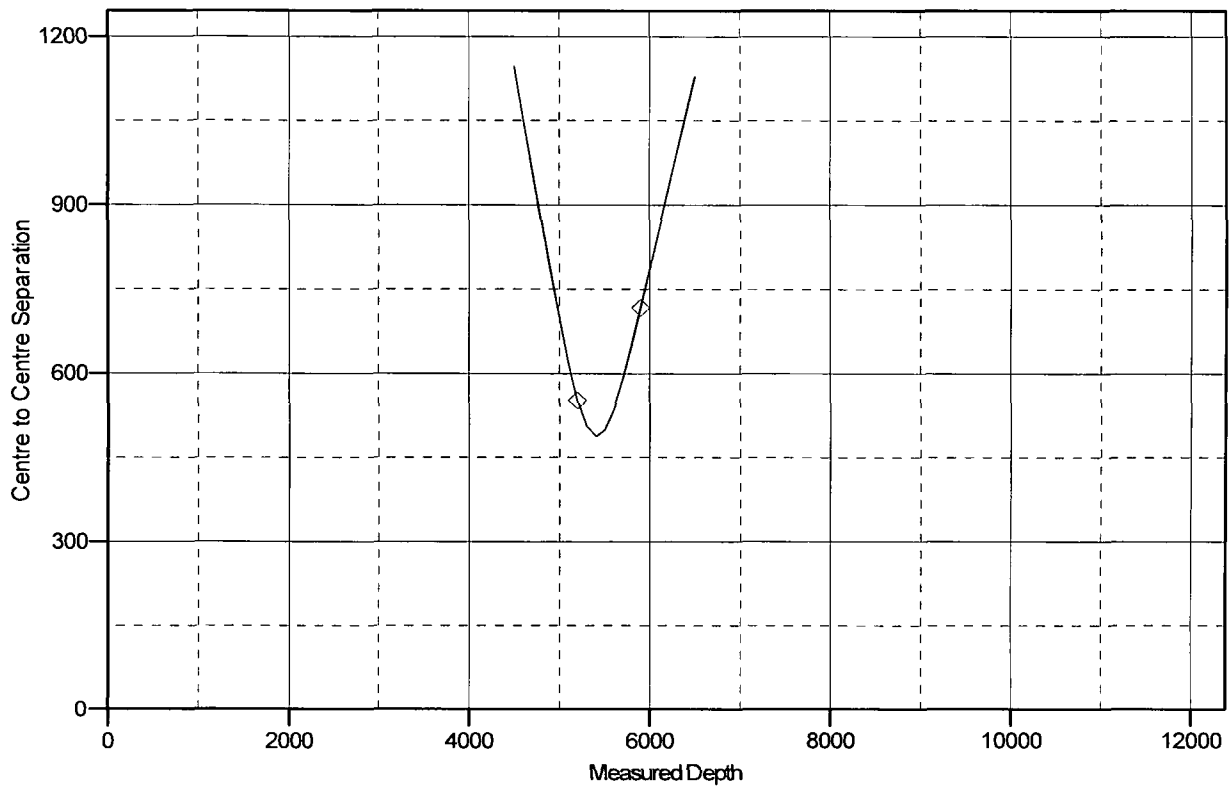
Company: EnCana Oil & Gas (USA) Inc
 Project: Sandoval County, NM
 Reference Site: GCU
 Site Error: 0.0ft
 Reference Well: GCU H33-2306
 Well Error: 0.0ft
 Reference Wellbore: Hz
 Reference Design: Plan #2

Local Co-ordinate Reference: Well GCU H33-2306
 TVD Reference: WELL @ 7173.0ft (Original Well Elev)
 MD Reference: WELL @ 7173.0ft (Original Well Elev)
 North Reference: True
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: USA EDM 5000 Multi Users DB
 Offset TVD Reference: Offset Datum

Reference Depths are relative to WELL @ 7173.0ft (Original Well Elev)
 Offset Depths are relative to Offset Datum
 Central Meridian is -106.250000°

Coordinates are relative to: GCU H33-2306
 Coordinate System is US State Plane 1983, New Mexico Central Zone
 Grid Convergence at Surface is: -0.72°

Ladder Plot



LEGEND

—●— Lybrook A03-2206 01H, Hz, FINAL V0 —◆— Lybrook P28-2306 02H, HZ, Plan #3 V0

encana

SANDOVAL COUNTY,
NEW MEXICO

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

2-2

22

23N
6W

23

**COUNSELORS
GALLUP
DAKOTA POOL**

GALLO CANYON 1

FEDERAL 26-22

26

GULF
FEDERAL 1 K

LULU 6

**LYBROOK
GALLUP
POOL**

LU-LU 4

Lybrook M28-2306 01H
Lybrook M28-2306 02H
Lybrook M28-2306 03H
Lybrook M28-2306 04H

Lybrook
A32-2306 01H

PINON TANK
ABZ FED 1

Lybrook H32-2306 01H

Lybrook I32-2306 02H

Lybrook I32-2306 04H

28 DOME-FEDERAL
28-23 2

DOM E ET AL
FED 28-1

DOM E FEDERAL 28-23 1

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

GCU M27A-2306 01H

Lybrook M27-2306 01H
Lybrook M27-2306 02H
Lybrook M27-2306 03H
Lybrook M27-2306 04H

Lybrook P28-2306 01H
Lybrook P28-2306 02H
Lybrook P28-2306 03H
Lybrook P28-2306 04H

GCU H33-2306 01H

33

DOM E ET AL FED-33 1

MADDOX F-A 1

34

1000'

35

GCU O26-2306 01H

GCU M26-2306 01H

Lybrook
A03-2206 01H

Lybrook
H03-2206 01H

2

3

22N
6W

4

Lybrook
P03-2206 01H

Lybrook
P03-2206 02H

LOGOS 3

0 0.125 0.25 0.5 Miles

WELLHEAD BLOWOUT CONTROL SYSTEM

encana

Well Name and Number:
GCU H33-2306 01H

