

State of New Mexico  
Energy, Minerals and Natural Resources Department

**Susana Martinez**  
Governor

**David Martin**  
Cabinet Secretary

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

**David R. Catanach** Division Director  
Oil Conservation Division



New Mexico Oil Conservation Division approval and conditions listed below are made in accordance with OCD Rule 19.15.7.11 and are in addition to the actions approved by BLM on the following 3160-3 APD form.

Operator Signature Date: 3-2-15

Well information;

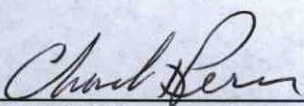
Operator Encana, Well Name and Number Escrito m30 2408 #2H

API# 30-045-35649, Section 30, Township 24 N/S, Range 08 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
- ☒ Regarding Hydraulic Fracturing, review EPA Underground Injection Control Guidance 84
- ☒ Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system.
- ☒ Well-bore communication is regulated under 19.15.29 NMAC. This requires well-bore Communication to be reported in accordance with 19.15.29.8.

  
NMOCD Approved by Signature

10-9-2015  
Date



## OIL CONS. DIV DIST. 3

Form 3160-3  
(March 2012)

SEP 23 2015

FORM APPROVED  
OMB No. 1004-0137  
Expires October 31, 2014UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

## APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. NMSF 078860
1b. Type of Well: <input type="checkbox"/> Oil Well <input checked="" type="checkbox"/> Gas Well <input type="checkbox"/> Other <input checked="" type="checkbox"/> Single Zone <input type="checkbox"/> 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. N/A
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. Escrito M30-2408 02H
4. Location of Well (Report location clearly and in accordance with any State requirements.)* At surface 1133' FSL, 447' FWL, Section 30, T24N, R8W SWSW At proposed prod. zone 555' FSL, 330' FWL, Section 25, T24N, R9W SWSW		9. API Well No. 30-045-35649
14. Distance in miles and direction from nearest town or post office* +/- 35.7 miles South from the intersection of HWY 64 & US HWY 550 in Bloomfield, NM		10. Field and Pool, or Exploratory Basin Mancos
15. Distance from proposed* location to nearest property or lease line, ft. POE is 330 FEL Section 25, T24N, R9W (Also to nearest drig. unit line, if any)	16. No. of acres in lease NMSF 078860- 2,560 acres	11. Sec., T. R. M. or Blk. and Survey or Area Section 30, T24N, R8W NMPM Sec 25, T24N, R8W
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. SHL is +/- 30' North of Escrito M30-2408 01H	19. Proposed Depth 5268' TVD, 10568' MD	12. County or Parish San Juan
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 6801' GL; 6817' KB	22. Approximate date work will start* 08/25/2015	13. State NM
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 3/2/15
Title Regulatory Analyst		
Approved by (Signature) 	Name (Printed/Typed) AFN	Date 9/17/15
Title AFN	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

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

NMOC DRY

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



**DISTRICT I**  
1685 N. French Dr., Hobbs, N.M. 88240  
Phone: (505) 598-6161 Fax: (505) 598-0720

**DISTRICT II**  
611 S. First St., Artesia, N.M. 80610  
Phone: (505) 748-1883 Fax: (505) 748-9780

**DISTRICT III**  
1000 Rio Brazos Rd., Aztec, N.M. 87410  
Phone: (505) 834-6176 Fax: (505) 834-6170

**DISTRICT IV**  
1830 S. St. Francis Dr., Santa Fe, NM 87506  
Phone: (505) 478-9480 Fax: (505) 478-9488

State of New Mexico  
Energy, Minerals & Natural Resources Department

Form C-102  
Revised August 1, 2011

OIL CONSERVATION DIVISION  
1220 South St. Francis Dr.  
Santa Fe, NM 87506

Submit one copy to appropriate  
District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

*API Number 30-045-35649		*Pool Code 97232	*Pool Name BASIN MANCOS
*Property Code 315290	*Property Name ESCRITO M30-2408		*Well Number 02H
*GRID No. 282327	*Operator Name ENCANA OIL & GAS (USA) INC.		*Elevation 6800.6'

<sup>10</sup> 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	30	24N	8W	4	1133'	SOUTH	447'	WEST	SAN JUAN

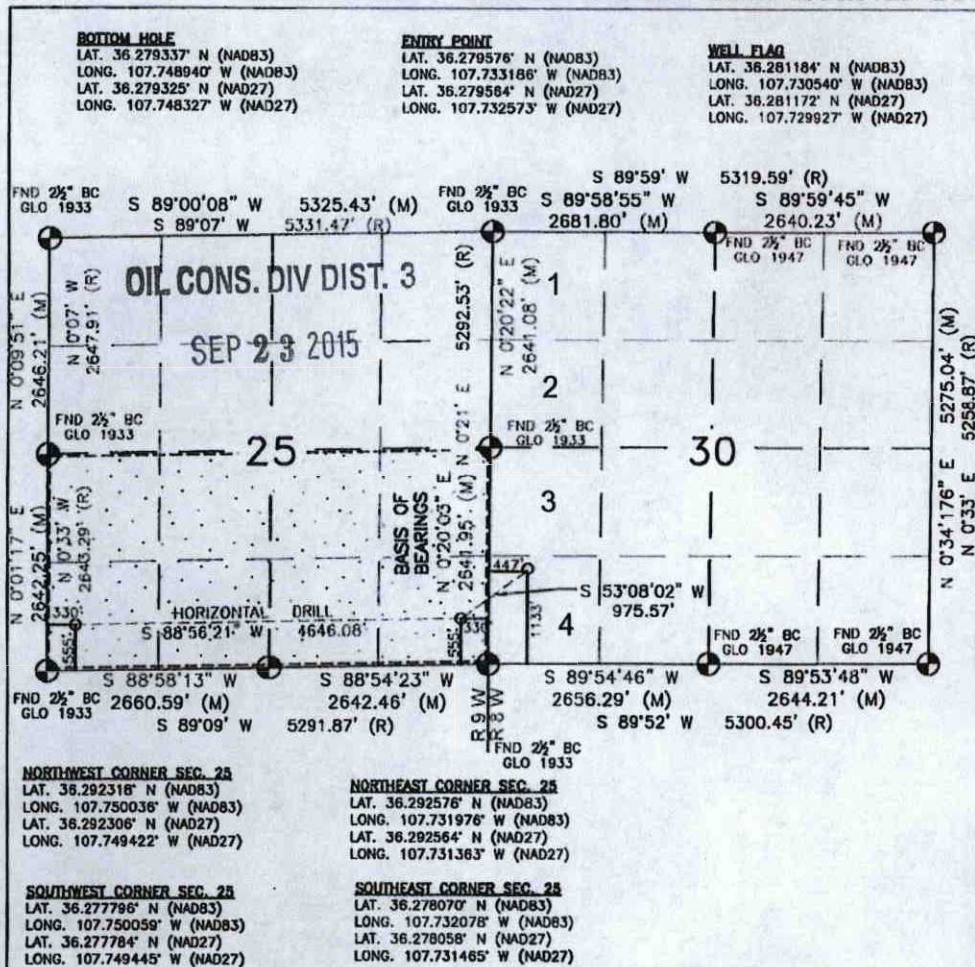
<sup>11</sup> Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	25	24N	9W		555'	SOUTH	330'	WEST	SAN JUAN

<sup>12</sup> Dedicated Acres 320.00 ACRES PROJECT AREA S/2 SEC. 25		<sup>13</sup> Joint or Infill	<sup>14</sup> Consolidation Code	<sup>15</sup> 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

16



<sup>17</sup> OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Signature: *Kathryn Wegner* Date: 3/2/15

Printed Name: Kathryn Wegner

E-mail Address: Kathryn.Wegner@encana.com

E-mail Address

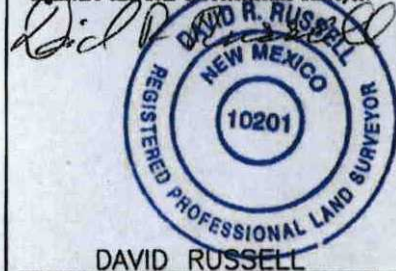
SURVEYOR CERTIFICATION

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.

APRIL 1, 2014

Date of Survey

Signature and Seal of Professional Surveyor:



Certificate Number

10201



Escrito M30-2408 02H

SHL: 1133' FSL, 447' FWL, Sec 30, T24N, R8W

BHL: 555' FSL, 330' FWL, Sec 25, T24N, R9W

San Juan, 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:

<b>Formation</b>	<b>Depth (TVD) units = feet</b>
San Jose Fn.	n/a
Nacimiento Fn.	surface
Ojo Alamo Ss.	849
Kirtland Shale	1,076
Fruitland Coal	1,331
Pictured Cliffs Ss.	1,615
Lewis Shale	1,709
Cliffhouse Ss.	2,452
Menefee Fn.	3,119
Point Lookout Ss.	4,016
Mancos Shale	4,239
Mancos Silt	4,768
Gallup Fn.	5,046
Base Gallup	5,377

The referenced surface elevation is 6801', KB 6817'

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

<b>Substance</b>	<b>Formation</b>	<b>Depth (TVD) units = feet</b>
Water/Gas	Fruitland Coal	1,331
Oil/Gas	Pictured Cliffs Ss.	1,615
Oil/Gas	Cliffhouse Ss.	2,452
Gas	Menefee Fn.	3,119
Oil/Gas	Point Lookout Ss.	4,016
Oil/Gas	Mancos Shale	4,239
Oil/Gas	Mancos Silt	4,768
Oil/Gas	Gallup Fn.	5,046

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



Escrito M30-2408 02H

SHL: 1133' FSL, 447' FWL, Sec 30, T24N, R8W

BHL: 555' FSL, 330' FWL, Sec 25, T24N, R9W

San Juan, New Mexico

### 3. PRESSURE CONTROL

- a) Pressure control equipment and configuration will be designed to meet 2M standards.
- b) Working pressure on rams and BOPE will be 3,000 psi.
- c) Function test and visual inspection of the BOP will be conducted daily and noted in the IADC Daily Drilling Report.
- d) The Annular BOP will be pressure tested to a minimum of 50 percent of its rated working pressure.
- e) Blind and Pipe Rams/BOP will be tested against a test plug to 100 percent of rated working pressure.
- f) Pressure tests are required before drilling out from under all casing strings set and cemented in place.
- g) BOP controls must be installed prior to drilling the surface casing plug and will remain in use until the well is completed or abandoned.
- h) BOP testing procedures and testing frequency will conform to Onshore Order No. 2.
- i) BOP remote controls shall be located on the rig floor at a location readily accessible to the driller. Master controls shall be on the ground at the accumulator and shall have the capability to function all preventers.
- j) The kill line shall be 2-inch minimum and contain two kill line valves, one of which shall be a check valve.
- k) The choke line shall be a 2-inch minimum and contain two choke line valves (2-inch minimum).
- l) The choke and manifold shall contain two adjustable chokes.
- m) Hand wheels shall be installed on all ram preventers.
- n) Safety valves and wrenches (with subs for drill string connections) shall be available on the rig floor at all times.
- o) Inside BOP or float sub shall also be available on the rig floor at all times.

Proposed BOP and choke manifold arrangements are attached.

### 4. CASING & CEMENTING PROGRAM

The proposed casing and cementing program has been designed to protect and/or isolate all usable water zones, potentially productive zones, lost circulation zones, abnormally pressured zones, and any prospectively valuable deposits of minerals. Any isolating medium other than cement shall receive approval prior to use. The casing setting depth shall be calculated to position the casing seat opposite a competent formation which will contain the maximum pressure to which it will be exposed during normal drilling operations. All indications of useable water shall be reported.

- a) The proposed casing design is as follows:

Casing	Depth (MD)	Hole Size	Csg Size	Weight	Grade
Conductor	0'-60'	26"	16"	42.09#	
Surface	0'-500'	12 1/4"	9 5/8"	36#	J55, STC New
Intermediate	0'-5206'	8 3/4"	7"	26#	J55, LTC New
Production Liner	5106'-10568'	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



**Escrito M30-2408 02H****SHL: 1133' FSL, 447' FWL, Sec 30, T24N, R8W****BHL: 555' FSL, 330' FWL, Sec 25, T24N, R9W****San Juan, New Mexico**

6. All casing strings below the conductor shall be pressure tested to 0.22 psi per foot of casing string length or 1,500 psi, whichever is greater, but not to exceed 70 percent of the minimum internal yield. If pressure declines more than 10 percent in 30 minutes, corrective action shall be taken.

- b) The proposed cementing program is as follows:

Casing	Depth (MD)	Cement Volume (sacks)	Cement Type & Yield	Designed TOC	Centralizers
Conductor	0'-60'	100 sks	Type I Neat 16 ppg	Surface	None
Surface	0'-500'	228 sks	Type III Cement + 1% bwoc Calcium Chloride + 0.25 lbs/sack Cello Flake + 0.2% bwoc FL-52A + 58.9% Fresh Water	Surface	1 per joint on bottom 3 joints
Intermediate	0'-5206'	100% open hole excess Stage 1 Lead: 483 sks Stage 1 Tail: 371 sks	Lead: PremLite + 3% CaCl + 0.25lb/sk CelloFlake + 5lb/sk LCM, 12.1ppg 2.13cuft/sk Tail: Type III Cmt + 1% CaCl + 0.25lb/sk Cello Flake 14.5ppg 1.38cuft/sk	Surface	1 every 3 joints through water bearing zones
Production Liner	5106'-10568'	50% OH excess Stage 1 Blend Total: 308sks	Blend: Premium Lite High Strength FM + 0.7% bwoc R-3 + 3% bwoc Potassium Chloride + 0.25lbs/sack Cello Flake + 0.5% bwoc CD-32 + 1.15% bwoc FL- 52A + 60 lbs/sack Calcium Carbonate + 124.4% Fresh Water. Yield 2.63 cuft/sk	Liner Hanger	N/A

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

All waiting on cement times shall be a minimum of 8 hours or adequate to achieve minimum of 500 psi compressive strength at the casing shoe prior to drilling out.

**5. WELL PLAN & DIRECTIONAL DRILLING PROGRAM**

9. The proposed horizontal well will have a kick off point of 4425'. Directional plans are attached.

Description	Proposed Depth (TVD/MD)	Formation
Horizontal Lateral TD	5268'/10568'	Gallup



Escrito M30-2408 02H

SHL: 1133' FSL, 447' FWL, Sec 30, T24N, R8W

BHL: 555' FSL, 330' FWL, Sec 25, T24N, R9W

San Juan, New Mexico

## 6. DRILLING FLUIDS PROGRAM

a) Surface through Intermediate Casing Point:

Hole Size (in)	Depth (TVD/MD)	Mud Type	Density (ppg)	Viscosity (sec/qt)	Fluid Loss (cc)
30"	0-60'/60'	Fresh Water	8.3-9.2	38-100	4-28
12 1/4"	0'-500'/500'	Fresh Water	8.3-10	60-70	NC
8 3/4"	500'/500'-5069'/5206'	Fresh Water LSND	8.3-10	40-50	8-10

b) Intermediate Casing Point to TD:

Hole Size (in)	Depth (TVD/MD)	Mud Type	Density (ppg)	Viscosity (sec/qt)	Fluid Loss (cc)
6 1/8"	5069'/5206'- 5268'/10568'	Fresh Water LSND	8.3-10	15-25	<15

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

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

## 7. TESTING, CORING, & LOGGING

- a) Drill Stem Testing - None anticipated.
- b) Coring - None anticipated.
- c) Mudd Logging - Mud loggers will be on location from kick off point to TD.
- d) Logging - See below

Cased Hole:

CBL/CCL/GR/VDL will be run as needed for perforating control

## 8. ABNORMAL PRESSURES & HYDROGEN SULFIDE

The anticipated bottom hole pressure is +/- 2478 psi based on a 9.0 ppg at 5296' TVD of the horizontal lateral target. No abnormal pressure or temperatures are anticipated.

No hydrogen sulfide gas is anticipated, however, if H<sub>2</sub>S 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 August 25, 2015. It is anticipated that completion operations will begin within 30 days after the well has been drilled depending on fracture treatment schedules with various pumping service companies.

It is anticipated that the drilling of this well will take approximately 20 days.



LOC: 1133' FSL, 447' FWL, Sec 30, T24N, R8W County: San Juan WELL: Escrito M30-2408 02H			Encana Natural Gas  WELL SUMMARY			ENG: 0 RIG: Unassigned GLE: 6800.6 RKBE: 6816.6			2-27-15
MWD LWD	OPEN HOLE LOGGING	FORM	DEPTH			HOLE SIZE	CASING SPECS	MW MUD TYPE	DEVIATION INFORMATION
			TVD	MD					
			60	60'		26	16" 42.09# 100sx Type I Neat 16.0ppg cmt	Fresh wtr 8.3-9.2	
Multi-Well pad - take survey every stand and run anti- collision report prior to spud	None	San Jose Fn.  Nacimiento Fn. 9 5/8" Csg	0  surface 500	  500.00		12 1/4	9 5/8" 36ppf J55 LTC  TOC Surface with 100% OH Excess: 228 sks Type III Cement + 1% bwoc Calcium Chloride + 0.25 lbs/sack Cello Flake + 0.2% bwoc FL-52A + 58.9% Fresh Water.	Fresh wtr  8.3-10	Vertical -<1°
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	849 1,076  1,331  1,615 1,709  2,452 3,119  4,016 4,239			8 3/4	7" 26ppf J55 LTC  TOC @ surface (100% OH excess - 70% Lead 30% Tail) Stage 1 Total: 855sks  Stage 1 Lead: 483 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: 371 sks Type III Cement + 1% CaCl2 + 0.25#/sk Cello Flake + 0.2% FL-52A. Mixed at 14.6 ppg. Yield 1.38 cuft/sk.	Fresh Wtr  8.3-10	Vertical -<1°
Surveys every 30' through the curve	Mud logger onsite	KOP  Mancos Silt  Gallup Fn.  7" Csg	4,425  4,768  5,046 5,069	4,425    5,206'					
Surveys every stand to TD unless directed otherwise by Geologist	No OH Logs	Horizontal Target TD  Base Gallup	5,296 5,268 5,377	10,568		6 1/8	100' overlap at liner top  5362' Drilled Lateral		Horz Inc/TVD 90.27deg/5295.6ft  TD = 10568 MD
MWD Gamma Directional							4 1/2" 11.6ppf SB80 LTC  TOC @ hanger (50% OH excess) Stage 1 Total: 308sks  Stage 1 Blend: 308 sks Premium Lite High Strength FM + 0.7% bwoc R-3 + 3% bwoc Potassium Chloride + 0.25lbs/sack Cello Flake + 0.5% bwoc CD-32 + 1.15% bwoc FL- 52A + 60 lbs/sack Calcium Carbonate + 124.4% Fresh Water. Yield 2.63 cuft/sk.	WBM 8.3-10	

# NOTES:

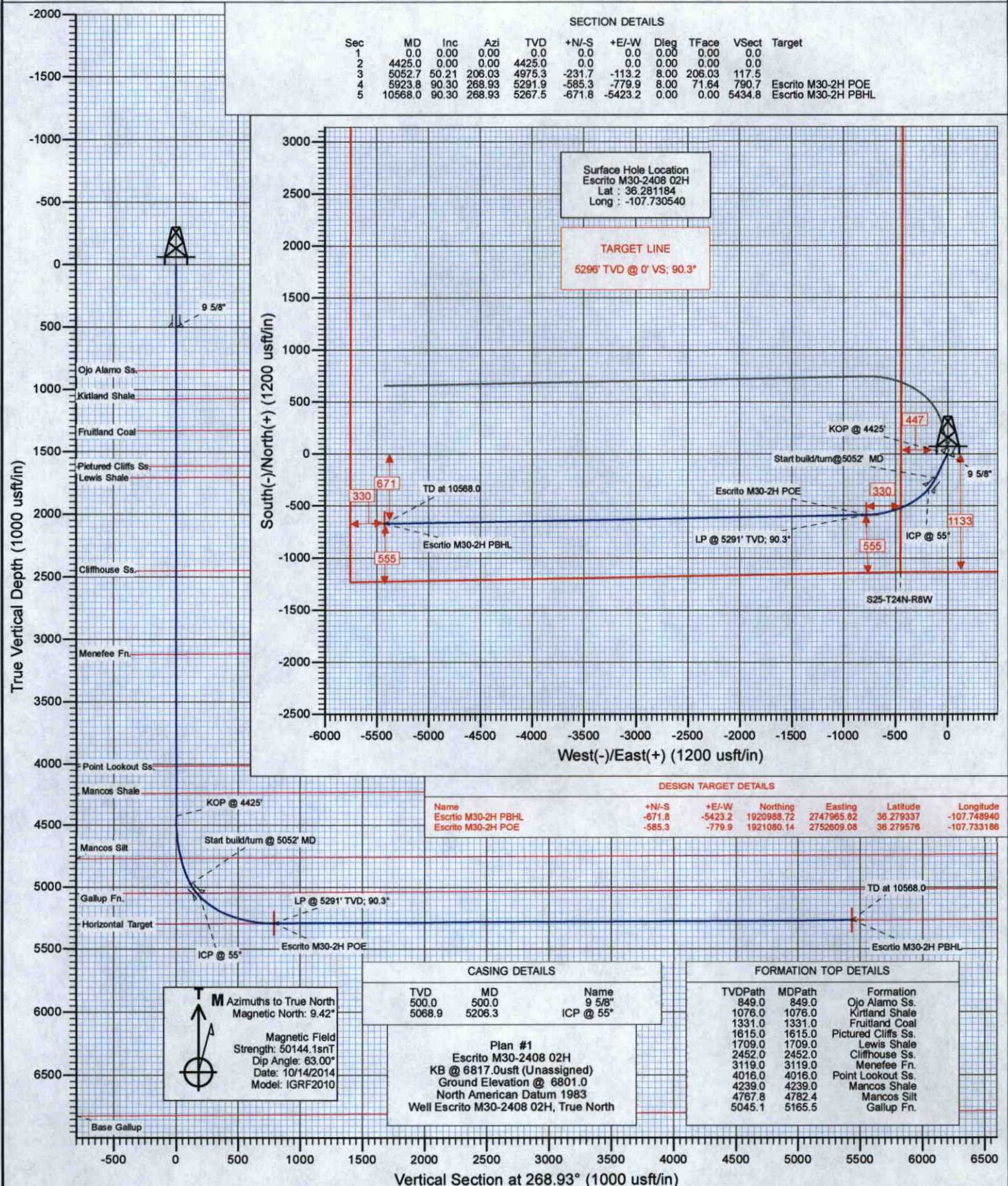
- 1) Drill with 26" bit to 60', set 16" 42.09ppf conductor pipe
- 2) Drill surface to 500', R&C 9 5/8" casing
- 3) N/U BOP and surface equipment
- 4) Drill to KOP of 4425', 8 3/4 inch holesize
- 5) Start curve at 10deg/100' build rate
- 6) Drill to csg point of 5206' MD
- 7) R&C 7" csg, circ cmt to surface
- 8) Land at ~90 deg, drill lateral to 10568' run 4 1/2 inch cemented liner





Project: San Juan County, NM  
 Site: S30-T24N-R8W  
 Well: Escrito M30-2408 02H  
 Wellbore: HZ  
 Design: Plan #1

SEP 23 2015  
**CATHEDRAL**





SEP 23 2015

## Planning Report

Database: USA EDM 5000 Multi Users DB  
 Company: EnCana Oil & Gas (USA) Inc  
 Project: San Juan County, NM  
 Site: S30-T24N-R8W  
 Well: Escrito M30-2408 02H  
 Wellbore: HZ  
 Design: Plan #1

Local Co-ordinate Reference: Well Escrito M30-2408 02H  
 TVD Reference: KB @ 6817.0usft (Unassigned)  
 MD Reference: KB @ 6817.0usft (Unassigned)  
 North Reference: True  
 Survey Calculation Method: Minimum Curvature

Project San Juan County, NM

Map System: US State Plane 1983 System Datum: Mean Sea Level  
 Geo Datum: North American Datum 1983  
 Map Zone: New Mexico Western Zone

Site S30-T24N-R8W

Site Position: Northing: 1,925,369.88 usft Latitude: 36.291358  
 From: Lat/Long Easting: 2,753,359.06 usft Longitude: -107.730626  
 Position Uncertainty: 0.0 usft Slot Radius: 13-3/16" Grid Convergence: 0.06 "

Well Escrito M30-2408 02H

Well Position +N/-S 0.0 usft Northing: 1,921,666.31 usft Latitude: 36.281184  
 +E/-W 0.0 usft Easting: 2,753,388.34 usft Longitude: -107.730540  
 Position Uncertainty 0.0 usft Wellhead Elevation: 0.0 usft Ground Level: 6,801.0 usft

Wellbore HZ

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/14/2014	9.42	63.00	50,144

Design Plan #1

Audit Notes:

Version: Phase: PLAN Tie On Depth: 0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	268.93

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
4,425.0	0.00	0.00	4,425.0	0.0	0.0	0.00	0.00	0.00	0.00	
5,052.7	50.21	206.03	4,975.3	-231.7	-113.2	8.00	8.00	0.00	206.03	
5,923.8	90.30	268.93	5,291.9	-585.3	-779.9	8.00	4.60	7.22	71.64	Escrito M30-2H POE
10,568.0	90.30	268.93	5,267.5	-671.8	-5,423.2	0.00	0.00	0.00	0.00	Escrito M30-2H PBHL



# Planning Report

Database: USA EDM 5000 Multi Users DB  
Company: EnCana Oil & Gas (USA) Inc  
Project: San Juan County, NM  
Site: S30-T24N-R8W  
Well: Escrito M30-2408 02H  
Wellbore: HZ  
Design: Plan #1

Local Co-ordinate Reference: Well Escrito M30-2408 02H  
TVD Reference: KB @ 6817.0usft (Unassigned)  
MD Reference: KB @ 6817.0usft (Unassigned)  
North Reference: True  
Survey Calculation Method: Minimum Curvature

## Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	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	
849.0	0.00	0.00	849.0	0.0	0.0	0.0	0.00	0.00	Ojo Alamo Ss.
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	
1,076.0	0.00	0.00	1,076.0	0.0	0.0	0.0	0.00	0.00	Kirtland Shale
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	
1,331.0	0.00	0.00	1,331.0	0.0	0.0	0.0	0.00	0.00	Fruitland Coal
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	
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	
1,615.0	0.00	0.00	1,615.0	0.0	0.0	0.0	0.00	0.00	Pictured Cliffs Ss.
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	
1,709.0	0.00	0.00	1,709.0	0.0	0.0	0.0	0.00	0.00	Lewis Shale
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	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	
2,200.0	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	
2,452.0	0.00	0.00	2,452.0	0.0	0.0	0.0	0.00	0.00	Cliffhouse Ss.
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	
2,900.0	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	
3,119.0	0.00	0.00	3,119.0	0.0	0.0	0.0	0.00	0.00	Menefee Fn.
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	
3,600.0	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	
4,016.0	0.00	0.00	4,016.0	0.0	0.0	0.0	0.00	0.00	Point Lookout Ss.
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	
4,239.0	0.00	0.00	4,239.0	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: San Juan County, NM  
Site: S30-T24N-R8W  
Well: Escrito M30-2408 02H  
Wellbore: HZ  
Design: Plan #1

Local Co-ordinate Reference:  
TVD Reference:  
MD Reference:  
North Reference:  
Survey Calculation Method:

Well Escrito M30-2408 02H  
KB @ 6817.0usft (Unassigned)  
KB @ 6817.0usft (Unassigned)  
True  
Minimum Curvature

## Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Comments / Formations
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	
4,425.0	0.00	0.00	4,425.0	0.0	0.0	0.0	0.00	0.00	KOP @ 4425'
4,500.0	6.00	206.03	4,499.9	-3.5	-1.7	1.8	8.00	8.00	
4,600.0	14.00	206.03	4,598.3	-19.1	-9.3	9.7	8.00	8.00	
4,700.0	22.00	206.03	4,693.3	-46.9	-22.9	23.8	8.00	8.00	
4,782.4	28.60	206.03	4,767.8	-78.5	-38.3	39.8	8.00	8.00	Mancos Silt
4,800.0	30.00	206.03	4,783.1	-86.2	-42.1	43.7	8.00	8.00	
4,900.0	38.00	206.03	4,865.9	-136.4	-66.6	69.2	8.00	8.00	
5,000.0	46.00	206.03	4,940.2	-196.5	-96.0	99.6	8.00	8.00	
5,052.7	50.21	206.03	4,975.3	-231.7	-113.2	117.5	8.00	8.00	Start build/turn @ 5052' MD
5,100.0	51.50	210.62	5,005.2	-264.0	-130.6	135.5	8.00	2.71	
5,165.5	53.56	216.70	5,045.1	-307.3	-159.4	165.1	8.00	3.15	Gallup Fn.
5,200.0	54.76	219.76	5,065.3	-329.2	-176.7	182.8	8.00	3.49	
5,206.3	54.99	220.31	5,068.9	-333.1	-180.0	186.2	8.00	3.62	ICP @ 55°
5,300.0	58.66	228.13	5,120.3	-389.2	-234.7	241.9	8.00	3.91	
5,400.0	63.05	235.80	5,169.0	-442.8	-303.5	311.7	8.00	4.39	
5,500.0	67.83	242.86	5,210.6	-489.1	-381.7	390.8	8.00	4.78	
5,600.0	72.88	249.45	5,244.2	-527.0	-467.8	477.5	8.00	5.06	
5,700.0	78.15	255.68	5,269.3	-555.9	-560.1	570.4	8.00	5.26	
5,800.0	83.54	261.68	5,285.2	-575.3	-656.8	667.4	8.00	5.39	
5,900.0	89.00	267.54	5,291.7	-584.6	-756.1	766.9	8.00	5.46	
5,923.8	90.30	268.93	5,291.9	-585.3	-779.9	790.7	8.00	5.48	LP @ 5291' TVD; 90.3°
6,000.0	90.30	268.93	5,291.5	-586.8	-856.1	866.9	0.00	0.00	
6,100.0	90.30	268.93	5,290.9	-588.6	-956.0	966.9	0.00	0.00	
6,200.0	90.30	268.93	5,290.4	-590.5	-1,056.0	1,066.9	0.00	0.00	
6,300.0	90.30	268.93	5,289.9	-592.3	-1,156.0	1,166.9	0.00	0.00	
6,400.0	90.30	268.93	5,289.4	-594.2	-1,256.0	1,266.9	0.00	0.00	
6,500.0	90.30	268.93	5,288.8	-596.1	-1,356.0	1,366.9	0.00	0.00	
6,600.0	90.30	268.93	5,288.3	-597.9	-1,455.9	1,466.9	0.00	0.00	
6,700.0	90.30	268.93	5,287.8	-599.8	-1,555.9	1,566.9	0.00	0.00	
6,800.0	90.30	268.93	5,287.3	-601.7	-1,655.9	1,666.9	0.00	0.00	
6,900.0	90.30	268.93	5,286.7	-603.5	-1,755.9	1,766.9	0.00	0.00	
7,000.0	90.30	268.93	5,286.2	-605.4	-1,855.9	1,866.9	0.00	0.00	
7,100.0	90.30	268.93	5,285.7	-607.2	-1,955.9	1,966.8	0.00	0.00	
7,200.0	90.30	268.93	5,285.2	-609.1	-2,055.8	2,066.8	0.00	0.00	
7,300.0	90.30	268.93	5,284.6	-611.0	-2,155.8	2,166.8	0.00	0.00	
7,400.0	90.30	268.93	5,284.1	-612.8	-2,255.8	2,266.8	0.00	0.00	
7,500.0	90.30	268.93	5,283.6	-614.7	-2,355.8	2,366.8	0.00	0.00	
7,600.0	90.30	268.93	5,283.1	-616.6	-2,455.8	2,466.8	0.00	0.00	
7,700.0	90.30	268.93	5,282.5	-618.4	-2,555.7	2,566.8	0.00	0.00	
7,800.0	90.30	268.93	5,282.0	-620.3	-2,655.7	2,666.8	0.00	0.00	
7,900.0	90.30	268.93	5,281.5	-622.1	-2,755.7	2,766.8	0.00	0.00	
8,000.0	90.30	268.93	5,281.0	-624.0	-2,855.7	2,866.8	0.00	0.00	
8,100.0	90.30	268.93	5,280.4	-625.9	-2,955.7	2,966.8	0.00	0.00	
8,200.0	90.30	268.93	5,279.9	-627.7	-3,055.6	3,066.8	0.00	0.00	
8,300.0	90.30	268.93	5,279.4	-629.6	-3,155.6	3,166.8	0.00	0.00	
8,400.0	90.30	268.93	5,278.9	-631.5	-3,255.6	3,266.8	0.00	0.00	
8,500.0	90.30	268.93	5,278.3	-633.3	-3,355.6	3,366.8	0.00	0.00	
8,600.0	90.30	268.93	5,277.8	-635.2	-3,455.6	3,466.8	0.00	0.00	
8,700.0	90.30	268.93	5,277.3	-637.0	-3,555.5	3,566.8	0.00	0.00	
8,800.0	90.30	268.93	5,276.8	-638.9	-3,655.5	3,666.8	0.00	0.00	



# Planning Report

Database: USA EDM 5000 Multi Users DB  
 Company: EnCana Oil & Gas (USA) Inc  
 Project: San Juan County, NM  
 Site: S30-T24N-R8W  
 Well: Escrito M30-2408 02H  
 Wellbore: HZ  
 Design: Plan #1

Local Co-ordinate Reference:  
 TVD Reference:  
 MD Reference:  
 North Reference:  
 Survey Calculation Method:

Well Escrito M30-2408 02H  
 KB @ 6817.0usft (Unassigned)  
 KB @ 6817.0usft (Unassigned)  
 True  
 Minimum Curvature

## Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Comments / Formations
8,900.0	90.30	268.93	5,276.2	-640.8	-3,755.5	3,766.8	0.00	0.00	
9,000.0	90.30	268.93	5,275.7	-642.6	-3,855.5	3,866.8	0.00	0.00	
9,100.0	90.30	268.93	5,275.2	-644.5	-3,955.5	3,966.8	0.00	0.00	
9,200.0	90.30	268.93	5,274.7	-646.4	-4,055.5	4,066.8	0.00	0.00	
9,300.0	90.30	268.93	5,274.1	-648.2	-4,155.4	4,166.8	0.00	0.00	
9,400.0	90.30	268.93	5,273.6	-650.1	-4,255.4	4,266.8	0.00	0.00	
9,500.0	90.30	268.93	5,273.1	-651.9	-4,355.4	4,366.8	0.00	0.00	
9,600.0	90.30	268.93	5,272.6	-653.8	-4,455.4	4,466.8	0.00	0.00	
9,700.0	90.30	268.93	5,272.1	-655.7	-4,555.4	4,566.8	0.00	0.00	
9,800.0	90.30	268.93	5,271.5	-657.5	-4,655.3	4,666.8	0.00	0.00	
9,900.0	90.30	268.93	5,271.0	-659.4	-4,755.3	4,766.8	0.00	0.00	
10,000.0	90.30	268.93	5,270.5	-661.3	-4,855.3	4,866.8	0.00	0.00	
10,100.0	90.30	268.93	5,270.0	-663.1	-4,955.3	4,966.8	0.00	0.00	
10,200.0	90.30	268.93	5,269.4	-665.0	-5,055.3	5,066.8	0.00	0.00	
10,300.0	90.30	268.93	5,268.9	-666.8	-5,155.2	5,166.8	0.00	0.00	
10,400.0	90.30	268.93	5,268.4	-668.7	-5,255.2	5,266.8	0.00	0.00	
10,500.0	90.30	268.93	5,267.9	-670.6	-5,355.2	5,366.8	0.00	0.00	
10,568.0	90.30	268.93	5,267.5	-671.8	-5,423.2	5,434.8	0.00	0.00	TD at 10568.0

## Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Escrito M30-2H PBHL - plan hits target center - Point	0.00	0.00	5,267.5	-671.8	-5,423.2	1,920,988.72	2,747,965.82	36.279337	-107.748940
Escrito M30-2H POE - plan hits target center - Point	0.00	0.00	5,291.9	-585.3	-779.9	1,921,080.14	2,752,609.08	36.279576	-107.733186

## Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
5,206.3	5,068.9	ICP @ 55°	0	0
500.0	500.0	9 5/8"	0	0



# **EnCana Oil & Gas (USA) Inc**

**San Juan County, NM**

**S30-T24N-R8W**

**Escrito M30-2408 02H**

**HZ**

**Plan #1**

## **Anticollision Report**

**24 October, 2014**



# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Escrito M30-2408 02H
<b>Project:</b>	San Juan County, NM	<b>TVD Reference:</b>	KB @ 6817.0usft (Unassigned)
<b>Reference Site:</b>	S30-T24N-R8W	<b>MD Reference:</b>	KB @ 6817.0usft (Unassigned)
<b>Site Error:</b>	0.0usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Escrito M30-2408 02H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	Plan #1
<b>Filter type:</b>	GLOBAL FILTER APPLIED: All wellpaths within 200'+ 100/1000 of reference
<b>Interpolation Method:</b>	MD Interval 100.0usft
<b>Depth Range:</b>	Unlimited
<b>Results Limited by:</b>	Maximum center-center distance of 1,255.7usft
<b>Warning Levels Evaluated at:</b>	2.00 Sigma
<b>Error Model:</b>	Systematic Ellipse
<b>Scan Method:</b>	Closest Approach 3D
<b>Error Surface:</b>	Elliptical Conic

<b>Survey Tool Program</b>	<b>Date</b>	10/24/2014
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>
0.0	10,556.2	Plan #1 (HZ)
		<b>Tool Name</b>
		Geolink MWD
		<b>Description</b>
		Geolink MWD

<b>Summary</b>						
<b>Site Name</b>	<b>Reference Measured Depth (usft)</b>	<b>Offset Measured Depth (usft)</b>	<b>Distance Between Centres (usft)</b>	<b>Distance Between Ellipses (usft)</b>	<b>Separation Factor</b>	<b>Warning</b>
Offset Well - Wellbore - Design						
S30-T24N-R8W						
Escrito M30-2408 01H - HZ - Plan #1	4,359.4	4,359.4	30.1	15.0	1.986	CC, ES
Escrito M30-2408 01H - HZ - Plan #1	4,400.0	4,399.4	30.3	15.0	1.981	SF

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



# Cathedral Energy Services

## Anticollision Report

Company: EnCana Oil & Gas (USA) Inc  
Project: San Juan County, NM  
Reference Site: S30-T24N-R8W  
Site Error: 0.0usft  
Reference Well: Escrito M30-2408 02H  
Well Error: 0.0usft  
Reference Wellbore: HZ  
Reference Design: Plan #1

Local Co-ordinate Reference: Well Escrito M30-2408 02H  
TVD Reference: KB @ 6817.0usft (Unassigned)  
MD Reference: KB @ 6817.0usft (Unassigned)  
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

Offset Design S30-T24N-R8W - Escrito M30-2408 01H - HZ - Plan #1													Offset Site Error: 0.0 usft
Survey Program: 0-Geolink MWD													Offset Well Error: 0.0 usft
Reference	Offset	Semi Major Axis		Distance		Total		Separation		Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Uncertainty Axis	Factor	
0.0	0.0	0.0	0.0	0.0	0.0	14.74	29.1	7.7	30.1	29.8	0.29	102.700	
100.0	100.0	100.0	100.0	0.1	0.1	14.74	29.1	7.7	30.1	29.5	0.64	46.885	
200.0	200.0	200.0	200.0	0.3	0.3	14.74	29.1	7.7	30.1	29.1	0.99	30.376	
300.0	300.0	300.0	300.0	0.5	0.5	14.74	29.1	7.7	30.1	28.8	1.34	22.468	
400.0	400.0	400.0	400.0	0.7	0.7	14.74	29.1	7.7	30.1	28.4	1.69	17.824	
500.0	500.0	500.0	500.0	0.8	0.8	14.74	29.1	7.7	30.1	28.1	2.04	14.772	
600.0	600.0	600.0	600.0	1.0	1.0	14.74	29.1	7.7	30.1	27.7	2.39	12.612	
700.0	700.0	700.0	700.0	1.2	1.2	14.74	29.1	7.7	30.1	27.4	2.74	11.004	
800.0	800.0	800.0	800.0	1.4	1.4	14.74	29.1	7.7	30.1	27.0	3.09	9.759	
900.0	900.0	900.0	900.0	1.5	1.5	14.74	29.1	7.7	30.1	26.7	3.43	8.767	
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	14.74	29.1	7.7	30.1	26.3	3.78	7.958	
1,100.0	1,100.0	1,100.0	1,100.0	1.9	1.9	14.74	29.1	7.7	30.1	26.0	4.13	7.286	
1,200.0	1,200.0	1,200.0	1,200.0	2.1	2.1	14.74	29.1	7.7	30.1	25.6	4.48	6.719	
1,300.0	1,300.0	1,300.0	1,300.0	2.2	2.2	14.74	29.1	7.7	30.1	25.3	4.83	6.233	
1,400.0	1,400.0	1,400.0	1,400.0	2.4	2.4	14.74	29.1	7.7	30.1	24.9	5.18	5.813	
1,500.0	1,500.0	1,500.0	1,500.0	2.6	2.6	14.74	29.1	7.7	30.1	24.6	5.53	5.446	
1,600.0	1,600.0	1,600.0	1,600.0	2.8	2.8	14.74	29.1	7.7	30.1	24.2	5.88	5.123	
1,700.0	1,700.0	1,700.0	1,700.0	2.9	2.9	14.74	29.1	7.7	30.1	23.9	6.23	4.836	
1,800.0	1,800.0	1,800.0	1,800.0	3.1	3.1	14.74	29.1	7.7	30.1	23.5	6.58	4.579	
1,900.0	1,900.0	1,900.0	1,900.0	3.3	3.3	14.74	29.1	7.7	30.1	23.2	6.93	4.348	
2,000.0	2,000.0	2,000.0	2,000.0	3.5	3.5	14.74	29.1	7.7	30.1	22.8	7.27	4.140	
2,100.0	2,100.0	2,100.0	2,100.0	3.6	3.6	14.74	29.1	7.7	30.1	22.5	7.62	3.950	
2,200.0	2,200.0	2,200.0	2,200.0	3.8	3.8	14.74	29.1	7.7	30.1	22.1	7.97	3.777	
2,300.0	2,300.0	2,300.0	2,300.0	4.0	4.0	14.74	29.1	7.7	30.1	21.8	8.32	3.619	
2,400.0	2,400.0	2,400.0	2,400.0	4.2	4.2	14.74	29.1	7.7	30.1	21.4	8.67	3.473	
2,500.0	2,500.0	2,500.0	2,500.0	4.3	4.3	14.74	29.1	7.7	30.1	21.1	9.02	3.339	
2,600.0	2,600.0	2,600.0	2,600.0	4.5	4.5	14.74	29.1	7.7	30.1	20.7	9.37	3.214	
2,700.0	2,700.0	2,700.0	2,700.0	4.7	4.7	14.74	29.1	7.7	30.1	20.4	9.72	3.099	
2,800.0	2,800.0	2,800.0	2,800.0	4.9	4.9	14.74	29.1	7.7	30.1	20.0	10.07	2.991	
2,900.0	2,900.0	2,900.0	2,900.0	5.0	5.0	14.74	29.1	7.7	30.1	19.7	10.42	2.891	
3,000.0	3,000.0	3,000.0	3,000.0	5.2	5.2	14.74	29.1	7.7	30.1	19.3	10.77	2.797	
3,100.0	3,100.0	3,100.0	3,100.0	5.4	5.4	14.74	29.1	7.7	30.1	19.0	11.11	2.709	
3,200.0	3,200.0	3,200.0	3,200.0	5.6	5.6	14.74	29.1	7.7	30.1	18.7	11.46	2.627	
3,300.0	3,300.0	3,300.0	3,300.0	5.7	5.7	14.74	29.1	7.7	30.1	18.3	11.81	2.549	
3,400.0	3,400.0	3,400.0	3,400.0	5.9	5.9	14.74	29.1	7.7	30.1	18.0	12.16	2.476	
3,500.0	3,500.0	3,500.0	3,500.0	6.1	6.1	14.74	29.1	7.7	30.1	17.6	12.51	2.407	
3,600.0	3,600.0	3,600.0	3,600.0	6.3	6.3	14.74	29.1	7.7	30.1	17.3	12.86	2.342	
3,700.0	3,700.0	3,700.0	3,700.0	6.4	6.4	14.74	29.1	7.7	30.1	16.9	13.21	2.280	
3,800.0	3,800.0	3,800.0	3,800.0	6.6	6.6	14.74	29.1	7.7	30.1	16.6	13.56	2.221	
3,900.0	3,900.0	3,900.0	3,900.0	6.8	6.8	14.74	29.1	7.7	30.1	16.2	13.91	2.165	
4,000.0	4,000.0	4,000.0	4,000.0	7.0	7.0	14.74	29.1	7.7	30.1	15.9	14.26	2.112	
4,100.0	4,100.0	4,100.0	4,100.0	7.1	7.1	14.74	29.1	7.7	30.1	15.5	14.60	2.062	
4,200.0	4,200.0	4,200.0	4,200.0	7.3	7.3	14.74	29.1	7.7	30.1	15.2	14.95	2.014	
4,300.0	4,300.0	4,300.0	4,300.0	7.5	7.5	14.74	29.1	7.7	30.1	15.0	15.16	1.986 CC, ES	
4,359.4	4,359.4	4,359.4	4,359.4	7.6	7.6	14.74	29.1	7.7	30.1	15.0	15.30	1.981 SF	
4,400.0	4,400.0	4,399.4	4,399.4	7.7	7.7	14.55	29.3	7.6	30.3	15.0	15.30		
4,500.0	4,499.9	4,494.3	4,493.8	7.8	7.8	163.73	37.7	5.6	42.3	26.7	15.59	2.711	
4,600.0	4,598.3	4,580.8	4,578.2	8.0	8.0	160.22	55.8	1.2	78.2	62.5	15.69	4.986	
4,700.0	4,693.3	4,650.0	4,643.8	8.2	8.2	157.97	77.3	-4.0	135.0	119.4	15.61	8.650	
4,800.0	4,783.1	4,709.0	4,697.8	8.6	8.3	155.39	100.4	-9.5	207.8	192.4	15.41	13.488	
4,900.0	4,865.9	4,750.0	4,734.0	9.0	8.5	151.18	119.0	-14.0	292.3	277.0	15.22	19.198	
5,000.0	4,940.2	4,775.7	4,758.1	9.7	8.6	142.85	131.7	-17.1	384.4	369.0	15.48	24.835	

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



# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Escrito M30-2408 02H
<b>Project:</b>	San Juan County, NM	<b>TVD Reference:</b>	KB @ 6817.0usft (Unassigned)
<b>Reference Site:</b>	S30-T24N-R8W	<b>MD Reference:</b>	KB @ 6817.0usft (Unassigned)
<b>Site Error:</b>	0.0usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Escrito M30-2408 02H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S30-T24N-R8W - Escrito M30-2408 01H - HZ - Plan #1													Offset Site Error:	0.0 usft
Survey Program: 0-Geolink MWD													Offset Well Error:	0.0 usft
Reference	Offset		Semi Major Axis		Distance		Total		Separation		Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Uncertainty	Factor		
5,100.0	5,005.2	4,800.0	4,776.7	10.5	8.7	123.55	144.4	-20.1	480.8	463.5	17.35	27.718		
5,200.0	5,065.3	4,800.0	4,776.7	11.5	8.7	99.96	144.4	-20.1	576.3	556.6	19.65	29.322		
5,300.0	5,120.3	4,815.8	4,789.8	12.7	8.7	87.44	153.0	-22.2	669.6	648.6	21.01	31.871		
5,400.0	5,169.0	4,826.2	4,798.3	14.1	8.8	78.00	158.8	-23.6	760.1	738.0	22.05	34.477		
5,500.0	5,210.6	4,835.6	4,805.9	15.6	8.8	71.20	164.1	-24.9	847.2	824.3	22.89	37.005		
5,600.0	5,244.2	4,850.0	4,817.4	17.3	8.9	66.82	172.5	-26.9	930.8	906.9	23.70	39.269		
5,700.0	5,269.3	4,850.0	4,817.4	19.0	8.9	62.48	172.5	-26.9	1,009.5	985.3	24.23	41.657		
5,800.0	5,285.2	4,850.0	4,817.4	20.9	8.9	59.48	172.5	-26.9	1,083.9	1,059.2	24.68	43.922		
5,900.0	5,291.7	4,866.3	4,830.3	22.8	9.0	58.63	182.3	-29.3	1,153.0	1,127.7	25.29	45.592		
6,000.0	5,291.5	4,872.9	4,835.4	24.7	9.0	58.71	186.3	-30.3	1,219.7	1,192.8	26.91	45.319		



# Cathedral Energy Services

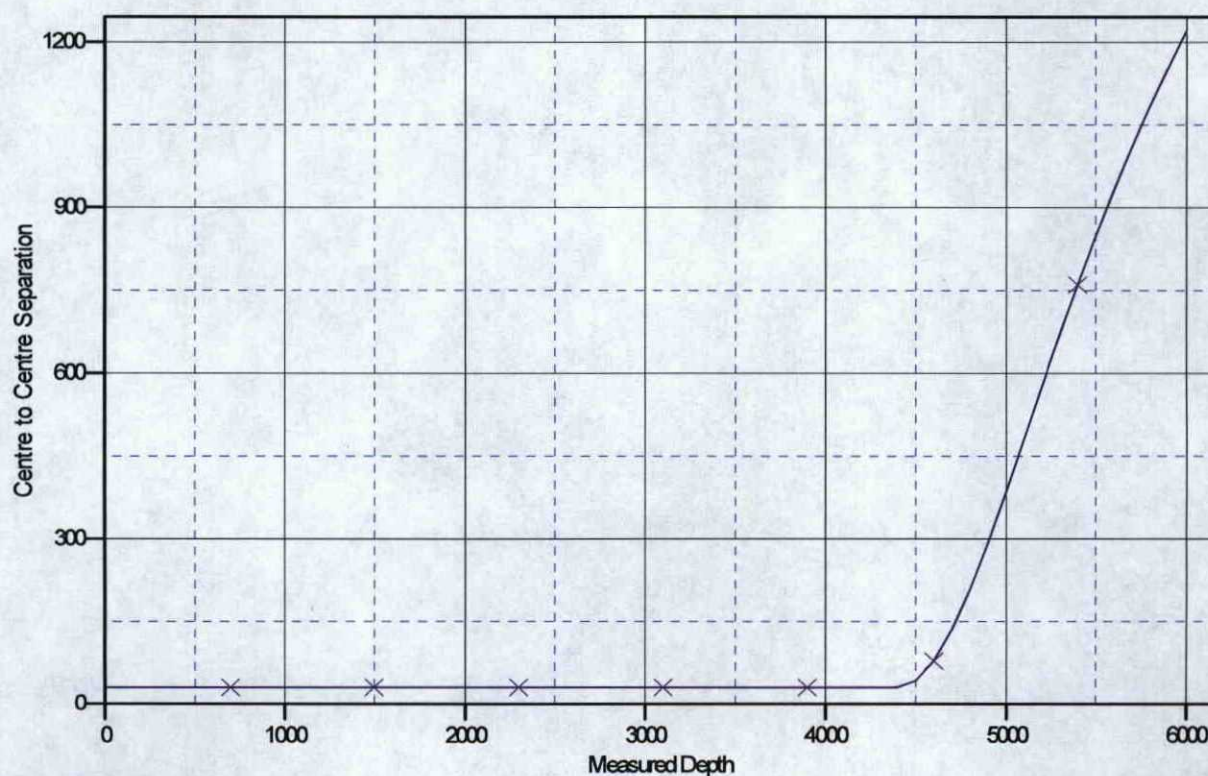
## Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Escrito M30-2408 02H
Project:	San Juan County, NM	TVD Reference:	KB @ 6817.0usft (Unassigned)
Reference Site:	S30-T24N-R8W	MD Reference:	KB @ 6817.0usft (Unassigned)
Site Error:	0.0usft	North Reference:	True
Reference Well:	Escrito M30-2408 02H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB @ 6817.0usft (Unassigned)  
Offset Depths are relative to Offset Datum  
Central Meridian is -107.833333 °

Coordinates are relative to: Escrito M30-2408 02H  
Coordinate System is US State Plane 1983, New Mexico Western Zone  
Grid Convergence at Surface is: 0.06°

### Ladder Plot



### LEGEND

✕ Escrito M30-2408 01H, HZ, Plan #1 V0

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



# Planning Report

**Database:** USA EDM 5000 Multi Users DB  
**Company:** EnCana Oil & Gas (USA) Inc  
**Project:** San Juan County, NM  
**Site:** S30-T24N-R8W  
**Well:** Escrito M30-2408 02H  
**Wellbore:** HZ  
**Design:** Plan #1

**Local Co-ordinate Reference:**  
**TVD Reference:**  
**MD Reference:**  
**North Reference:**  
**Survey Calculation Method:**

Well Escrito M30-2408 02H  
 KB @ 6817.0usft (Unassigned)  
 KB @ 6817.0usft (Unassigned)  
 True  
 Minimum Curvature

## Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
849.0	849.0	Ojo Alamo Ss.		-0.30	268.93
1,076.0	1,076.0	Kirtland Shale		-0.30	268.93
1,331.0	1,331.0	Fruitland Coal		-0.30	268.93
1,615.0	1,615.0	Pictured Cliffs Ss.		-0.30	268.93
1,709.0	1,709.0	Lewis Shale		-0.30	268.93
2,452.0	2,452.0	Cliffhouse Ss.		-0.30	268.93
3,119.0	3,119.0	Menefee Fn.		-0.30	268.93
4,016.0	4,016.0	Point Lookout Ss.		-0.30	268.93
4,239.0	4,239.0	Mancos Shale		-0.30	268.93
4,782.4	4,768.0	Mancos Silt		-0.30	268.93
5,165.5	5,046.0	Gallup Fn.		-0.30	268.93

## Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
4,425.0	4,425.0	0.0	0.0	KOP @ 4425'
5,052.7	4,975.3	-231.7	-113.2	Start build/turn @ 5052' MD
5,923.8	5,291.9	-585.3	-779.9	LP @ 5291' TVD; 90.3°
10,568.0	5,267.5	-671.8	-5,423.2	TD at 10568.0



**Escrito M30-2408 02H**

**SHL: SWSW Section 30, T24N, R8W  
1133 FSL and 447 FWL**

**BHL: SWSW Section 25, T24N, R9W  
555 FSL and 330 FWL**

**San Juan County, New Mexico**

**Lease Number: NMSF 078860**

Topsoil will not be stripped when soils are moisture-saturated or frozen below the stripping depth.

If the location becomes prone to wind or water erosion, Encana will take appropriate measures to prevent topsoil loss from wind. Such measures may include using tackifiers or water to wet the topsoil stockpile so that a crust is created across the exposed soil to prevent soil loss.

4. All construction materials for the well pad will consist of native borrow and subsoil accumulated during well pad construction. If additional fill or surfacing material is required, it will be obtained from existing permitted or private sources and will be hauled in by trucks over existing access roads.

The maximum cut will be approximately 14.6 feet on corner 3 and the maximum fill will be approximately 11.7 feet on the corner 6.

5. As determined during the onsite on September 10, 2014, the following best management practices will be implemented:
  - a. Water will be diverted around the pad from corner 3 toward corner 2. Water will be diverted around the pad from corner 3 toward corner 5.
  - b. Silt traps will be installed upon interim reclamation.
6. Construction equipment may include chain saws, a brush hog, scraper, maintainer, excavator, and dozer. Construction for the access road and well pad will take approximately 2 to 4 weeks.

**C. Pipeline**

See the Plan of Development submitted with the final modifications to the Standard SF-299 Application for authorization to construct, operate, maintain and terminate a 55 foot, up to 6-inch outside diameter, buried steel well connect pipeline that was submitted to the BLM concurrently with the APD.

**7. METHODS FOR HANDLING WASTE**

**A. Cuttings**

1. A closed-loop system will be used. Cuttings will be moved through a shaker system on the drill rig that separates drilling fluids from the cuttings. Cuttings will be stored onsite in above-ground storage tanks. Cuttings will be pulled from the storage tanks, mixed with saw dust or similar absorbent material, and disposed of at the Envirotech, Inc. and/or Industrial Ecosystem, Inc. waste disposal facilities.
2. The closed-loop system storage tanks will be adequately sized to ensure confinement of all fluids and will provide sufficient freeboard to prevent uncontrolled releases.
3. A 20-mil liner will be installed under tanks, pumps, ancillary facilities, and truck loading/unloading areas associated with the closed-loop system.

**B. Drilling Fluids**

1. A closed-loop system will be used. Drilling fluids will be stored onsite in above-ground storage tanks. Upon termination of drilling operations, the drilling fluids will be recycled and transferred to other permitted closed-loop systems or returned to the vendor for reuse, as



**ENCANA OIL & GAS (USA) INC.**

ESCRITO M30-2408 #02H

1133' FSL & 447' FWL

LOCATED IN THE SW/4 SW/4 OF SECTION 30, T24N, R8W, N.M.P.M.,  
SAN JUAN COUNTY, NEW MEXICO

**DIRECTIONS**

- 1) FROM THE INTERSECTION OF HWY 64 & HWY 550 IN BLOOMFIELD, GO SOUTH ON HWY 550, 35.0 MILES TO ISR 459. (M.P. 116.6).
- 2) TURN LEFT AND GO 0.7 MILES TO "Y" INTERSECTION.
- 3) CONTINUE RIGHT AND GO 300 FEET TO WHERE ACCESS IS STAKED ON RIGHT SIDE OF ROAD.

WELL FLAG LOCATED AT LAT. 36.281184° N, LONG. 107.730540° W (NAD 83).

JOB No.: ENC254  
DATE: 07/22/2014  
DRAWN BY: TWT



Scorpion Survey & Consulting, L.L.C.  
302 S. Ash  
Aztec, New Mexico 87410  
(505) 334-4007



# encana

Well Name and Number:  
Escrito M30-2408 02H

