

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 3160-4 or 3160-5 form.

Operator Signature Date: 7/2/14

Well information:

API WELL #	Well Name	Well #	Operator Name	Type	Stat	County	Surf_Owner	UL	Sec	Twp	N/S	Rng	W/E
30-045-35481-00-00	ESCRITO L27 2409	002H	ENCANA OIL & GAS (USA) INC.	G	N	San Juan	F	L	27	24	N	9	W

Application Type:

☐ P&A ☐ Drilling/Casing Change ☐ Recomplete/DHC
☒ Location Change ☒ Other: TD correction

Conditions of Approval:

Notify NMOCD 24hrs prior to beginning operations

Hold C-104 for NSL, NSP, DHC

Hold C-104 for as drilled plat and directional survey

NMOCD Approved by Signature

7-15-14
Date

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

RECEIVED

JUN 06 2014

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

SUNDRY NOTICES AND REPORTS ON WELLS
Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

Release Serial No.
NMNM 12374

6. If Indian Allottee or Tribe Name
N/A

SUBMIT IN TRIPLICATE – Other instructions on page 2.

1. Type of Well

☒ Oil Well ☐ Gas Well ☐ Other

2. Name of Operator
Encana Oil & Gas (USA) Inc.

3a. Address
370 17th Street, Suite 1700
Denver, CO 80202

ATTN: Jessica Gregg

3b. Phone No. (include area code)
720-876-3926

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
SHL: 2369' FSL and 332' FWL, Sec 27, T24N, R9W
BHL: 2400' FSL and 330' FWL, Sec 28, T24N, R9W

7. If Unit of CA/Agreement, Name and/or No.

8. Well Name and No.
Escrito L27-2409 02H

9. API Well No.
30-045-35481

10. Field and Pool or Exploratory Area
Basin Mancos Gas and Bisti Lower - Gallup

11. Country or Parish, State
San Juan, New Mexico

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Fracture Treat	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☐ Other
	☒ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.)

Encana Oil & Gas (USA) Inc. (Encana) would like to adjust the point of entry and bottom hole locations for the Escrito L27-2409 02H well. The new point of entry location will be 2400 FSL and 330 FEL Sec 28, T24N, R9W. The new bottom hole location will be 2400 FSL and 330' FWL Sec 28, T24N, R9W. Please see attached C-102 and drilling plan for further detail.

OIL CONS. DIV DIST. 3

JUN 16 2014

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

CONDITIONS OF APPROVAL
Adhere to previously issued stipulations.

14. I hereby certify that the foregoing is true and correct.

Name (Printed/Typed)
Jessica Gregg

Title Regulatory Analyst

Signature

Jessica Gregg

Date 06/05/2014

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

Troy Salyers

Title Petroleum Engineer

Date 6/12/2014

Conditions of approval, if any, are attached. Approval of this notice 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.

Office

FFO

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.

(Instructions on page 2)

NMOCDA

District IV
1220 S. St. Francis Drive, Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

JASON C. EDWARDS
Certificate Number 15269

Escrito L27-2409 02H
SHL: NW/4 SW/4 27 24N 9W
2369 FSL 332 FEL
BHL: NW/4 SW/4 28 24N 9W
2400 FSL 330 FWL
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:

Formation	Depth (TVD) units = feet
Ojo Alamo Ss.	882
Kirtland Shale	1,070
Fruitland Coal	1,280
Pictured Cliffs Ss.	1,640
Lewis Shale	1,770
Cliffhouse Ss.	2,430
Menefee Fn.	3,190
Point Lookout Ss.	4,090
Mancos Shale	4,250
Mancos Silt	4,820
Mancos Silt Base	5,005
Gallup Fn.	5,065

The referenced surface elevation is 6924', KB 6940'

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

Substance	Formation	Depth (TVD) units = feet
Water/Gas	Fruitland Coal	1,280
Oil/Gas	Pictured Cliffs Ss.	1,640
Oil/Gas	Cliffhouse Ss.	2,430
Gas	Menefee Fn.	3,190
Oil/Gas	Point Lookout Ss.	4,090
Oil/Gas	Mancos Shale	4,250
Oil/Gas	Mancos Silt	4,820
Oil/Gas	Gallup Fn.	5,065

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.

Escrito L27-2409 02H

SHL: NW/4 SW/4 27 24N 9W

2369 FSL 332 FEL

BHL: NW/4 SW/4 28 24N 9W

2400 FSL 330 FWL

San Juan, New Mexico

- g) BOP controls must be installed prior to drilling the surface casing plug and will remain in use until the well is completed or abandoned.
- h) BOP testing procedures and testing frequency will conform to Onshore Order No. 2.
- i) BOP remote controls shall be located on the rig floor at a location readily accessible to the driller. Master controls shall be on the ground at the accumulator and shall have the capability to function all preventers.
- j) The kill line shall be 2-inch minimum and contain two kill line valves, one of which shall be a check valve.
- k) The choke line shall be a 2-inch minimum and contain two choke line valves (2-inch minimum).
- l) The choke and manifold shall contain two adjustable chokes.
- m) Hand wheels shall be installed on all ram preventers.
- n) Safety valves and wrenches (with subs for drill string connections) shall be available on the rig floor at all
- o) Inside BOP or float sub shall also be available on the rig floor at all times.

Proposed BOP and choke manifold arrangements are attached.

4. CASING & CEMENTING PROGRAM

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

- a) The proposed casing design is as follows:

Casing	Depth (MD)	Hole Size	Csg Size	Weight	Grade
Conductor	0'-60'	30"	20"	94#	
Surface	0'-500'	12 1/4"	9 5/8"	36#	J55, STC New
Intermediate	0'-5432'	8 3/4"	7"	26#	J55, LTC New
Production Liner	5232'-10669'	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.

Escrito L27-2409 02H
 SHL: NW/4 SW/4 27 24N 9W
 2369 FSL 332 FEL
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 2400 FSL 330 FWL
 San Juan, New Mexico

b) The proposed cementing program is as follows

Casing	Depth (MD)	Cement Volume (sacks)	Cement Type & Yield	Designed TOC	Centralizers
Conductor	0'-60'	100 sks	Type I Neat 16 ppg	Surface	None
Surface	0'-500'	314 sks	HALCEM™ SYSTEM + 2% CaCl ₂ + 0.125lbm/sk Poly-E-Flake. 15.8 ppg, 1.174 cuft/sk	Surface	1 per joint on bottom 3 joints
Intermediate	0'-5432'	30% open hole excess Stage 1 Lead: 354 sks Stage 1 Tail: 345 sks Stage 2 Lead: 176 sks	Stage 1 Lead: HALCEM™ SYSTEM + 0.2% HR-5 + 5lbm/sk Kol-Seal + 0.125lbm/sk Poly-E-Flake. 12.3 ppg, 1.948 cuft/sk Stage 1 Tail: VARICEM™ CEMENT + .15% CFR-3 + 5lbm/sk Kol-Seal + 0.125% Poly-E-Flake. 13.5 ppg, 1.308 cuft/sk. Stage 2 Contingency: HALCEM™ SYSTEM + 5lbm/sk Kol-Seal + 0.125lbm/sk Poly-E-Flake. 12.3 ppg,	Surface	1 every 3 joints through water bearing zones
Production Liner	5232'-10669'	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 4500'. Directional plans are attached.

Description	Proposed Depth (TVD/MD)	Formation
Horizontal Lateral TD	5097'/10669'	Gallup

Escrito L27-2409 02H

SHL: NW/4 SW/4 27 24N 9W

2369 FSL 332 FEL

BHL: NW/4 SW/4 28 24N 9W

2400 FSL 330 FWL

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'-5136'/5432'	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"	5136'/5432'- 5097'/10669'	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 +/- 2409 psi based on a 9.0 ppg at 5148' 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.

Escrito L27-2409 02H

SHL: NW/4 SW/4 27 24N 9W

2369 FSL 332 FEL

BHL: NW/4 SW/4 28 24N 9W

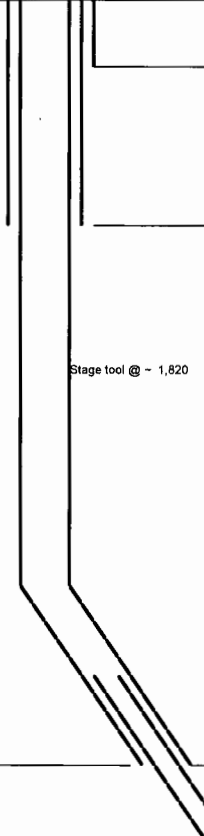
2400 FSL 330 FWL

San Juan, New Mexico

9. ANTICIPATED START DATE AND DURATION OF OPERATIONS

Drilling is estimated to commence on July 22, 2014. It is anticipated that completion operations will begin within 30 days after the well has been drilled depending on fracture treatment schedules with various pumping service companies.

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

LOC: NE/4 SE/4 28 24N 9W 2400 FSL 330			Encana Natural Gas				ENG: Michael Sanci		6/5/14	
County: San Juan			WELL SUMMARY				RIG: Artec 950			
WELL: Escrito L27-2409 02H							GLE: 6924			
							RKBE: 6940			
MWD	OPEN HOLE		DEPTH			HOLE	CASING	MW	DEVIATION	
LWD	LOGGING	FORM	TVD	MD						SIZE
			60	60'		30	20" 94# 100sx Type I Neat 16.0ppg cmt	Fresh wtr 8.3-9.2		
Multi-Well pad - take survey every stand and run anti- collision report prior to spud	None	Nacimiento 9 5/8" Csg	0 500	500.00		12 1/4	9 5/8" 36ppf J55 STC TOC Surface with 100% OH Excess: 314 sks of HALCEM™ SYSTEM + 2% CaCl2 + 0.125lbm/sk Poly-E-Flake. Mixed at 15.8 ppg. Yield 1.174 cuft/sk.	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	882 1,070 1,280 1,640 1,770 2,430 3,190 4,090 4,250			8 3/4	7" 26ppf J55 LTC TOC @ surface (30% OH excess) Stage 1 Total: 699sks If necessary, Stage 2 Total: 176sks Stage 1 Lead: 355 sks HALCEM™ SYSTEM + 0.2% HR-5 + 5lbm/sk Kol- Seal + 0.125lbm/sk Poly-E-Flake. Mixed at 12.3 ppg. Yield 1.948 cuft/sk. Stage 1 Tail: 345 sks VARICEM™ CEMENT + .15% CFR-3 + 5lbm/sk Kol- Seal + 0.125% Poly-E-Flake. Mixed at 13.5 ppg. Yield 1.308 cuft/sk. Stage 2: 176 sks HALCEM™ SYSTEM + 5lbm/sk Kol-Seal + 0.125lbm/sk Poly- E-Flake. Mixed at 12.3 ppg. Yield 1.946 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	4,500 4,820 5,065 5,136	4,500 5,432'		6 1/8	200' overlap at liner top 5237' Drilled Lateral			Horiz Inc/TVD 90.6°deg/5148ft
Surveys every stand to TD unless directed otherwise by Geologist	No OH Logs	Horizontal Target TD Base Gallup	5,148 5,097 5,380	10,669		4 1/2" 11.6ppf SB80 LTC Running external swellable csg packers for isolation of prod string	WBM 8.3-10	TD = 10669.3 MD		
MWD Gamma Directional										

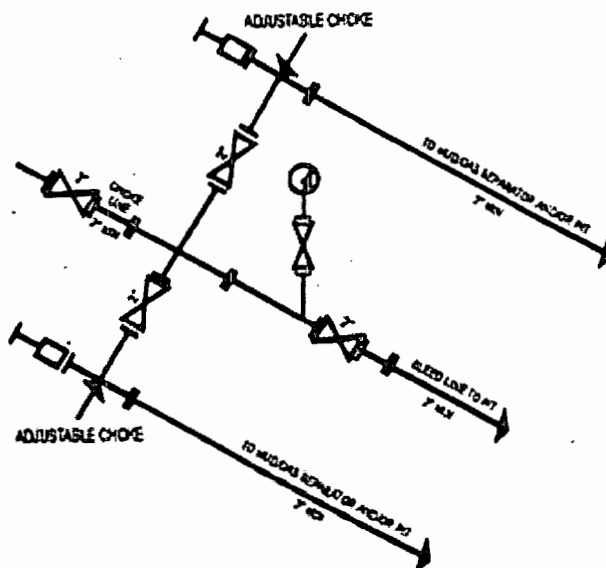
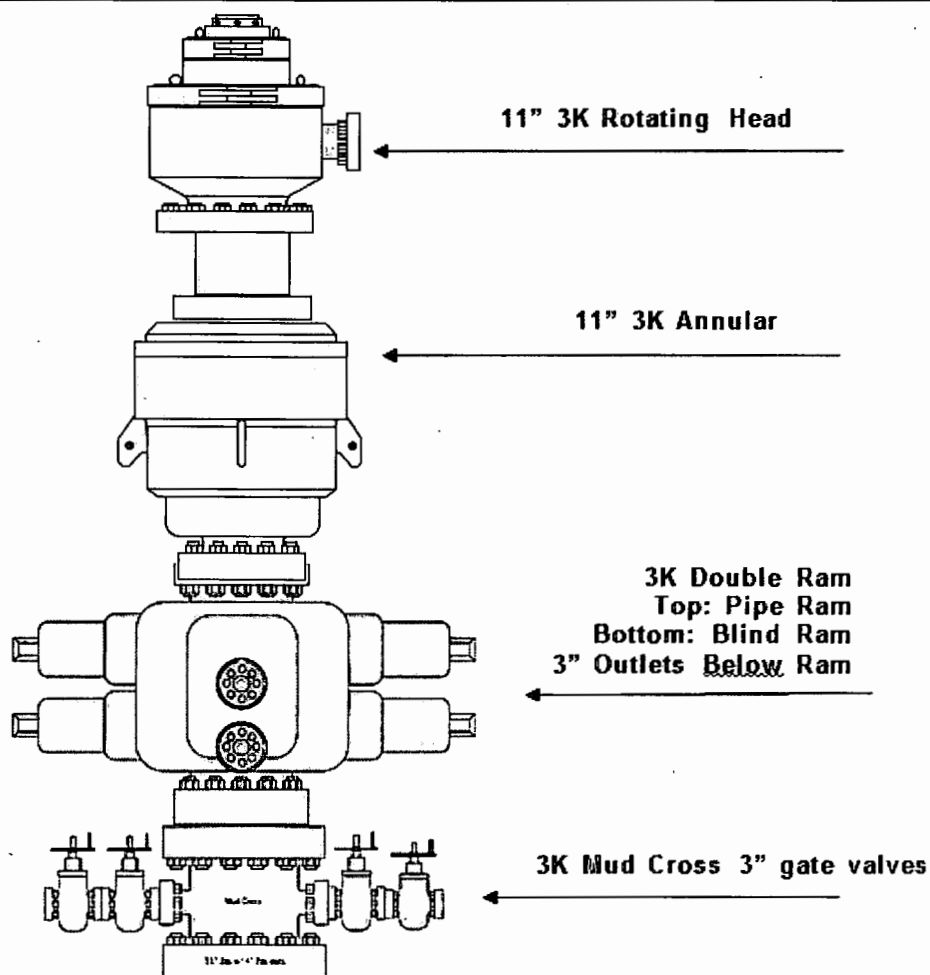
NOTES:

- 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 4500', 8 3/4 inch holesize
- 5) Start curve at 10deg/100' build rate
- 6) Drill to csg point of 5432' MD
- 7) R&C 7" csg, circ cmt to surface, switch to WBM
- 8) Land at 90 deg, drill lateral to 10669' run 4 1/2 inch liner with external swellable csg packers

WELLHEAD BLOWOUT CONTROL SYSTEM

encana

Well Name and Number:
Escrito L27-2409 02H





Boomerang Tube LLC

CASING (OR) TUBING DESCRIPTION AND PERFORMANCE PROPERTIES

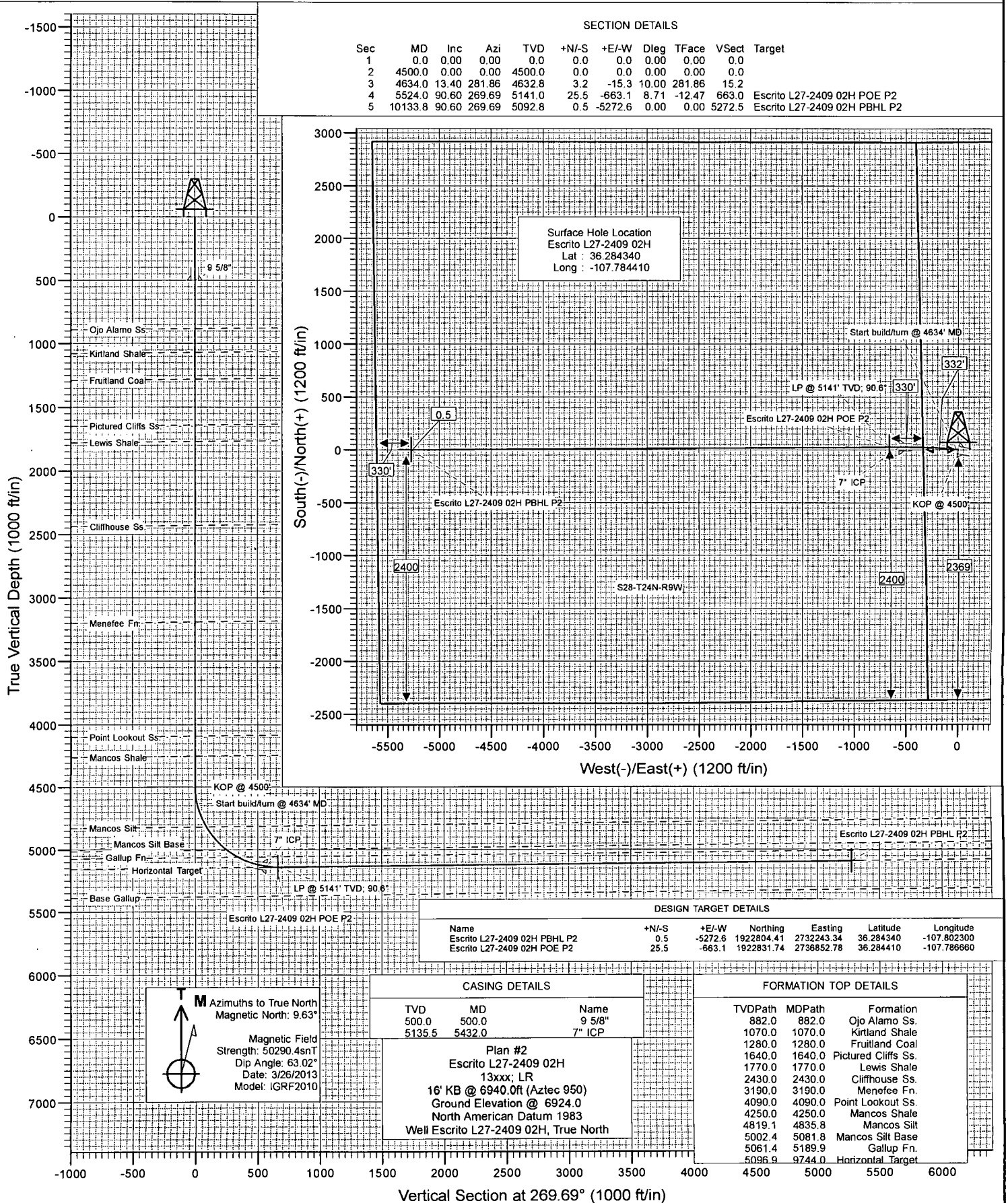
Pipe Outside Diameter (ins)	_____	4.500
Pipe Wall Thickness (ins)	_____	0.250
Nominal Weight Per Foot (lbs)	_____	11.60
Thread Name	_____	Long Thread CSG
Grade Name	_____	SB-80
Pipe Minimum Yield (psi)	_____	80,000
Pipe Minimum Ultimate (psi)	_____	90,000
Coupling Minimum Yield (psi)	_____	80,000
Coupling 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



Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Escrito L27-2409 02H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	16' KB @ 6940.0ft (Aztec 950)
Project:	San Juan County, NM	MD Reference:	16' KB @ 6940.0ft (Aztec 950)
Site:	S27-T24N-R9W	North Reference:	True
Well:	Escrito L27-2409 02H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #2		

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	S27-T24N-R9W				
Site Position:		Northing:	1,922,839.35 ft	Latitude:	36.284430
From:	Lat/Long	Easting:	2,737,515.90 ft	Longitude:	-107.784410
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.03 °

Well	Escrito L27-2409 02H					
Well Position	+N/-S	0.0 ft	Northing:	1,922,806.58 ft	Latitude:	36.284340
	+E/-W	0.0 ft	Easting:	2,737,515.92 ft	Longitude:	-107.784410
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	6,924.0 ft

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	3/26/2013	9.63	63.02	50,290

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	269.69

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	
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.00	0.00	0.00	0.00	
4,634.0	13.40	281.86	4,632.8	3.2	-15.3	10.00	10.00	0.00	281.86	
5,524.0	90.60	269.69	5,141.0	25.5	-663.1	8.71	8.67	-1.37	-12.47	Escrito L27-2409 02H
10,133.8	90.60	269.69	5,092.8	0.5	-5,272.6	0.00	0.00	0.00	0.00	Escrito L27-2409 02H

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Escrito L27-2409 02H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	16' KB @ 6940.0ft (Aztec 950)
Project:	San Juan County, NM	MD Reference:	16' KB @ 6940.0ft (Aztec 950)
Site:	S27-T24N-R9W	North Reference:	True
Well:	Escrito L27-2409 02H	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	
882.0	0.00	0.00	882.0	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	
1,070.0	0.00	0.00	1,070.0	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	
1,280.0	0.00	0.00	1,280.0	0.0	0.0	0.0	0.00	0.00	Fruitland Coal
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	
1,500.0	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	Pictured Cliffs Ss.
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	
1,770.0	0.00	0.00	1,770.0	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	
2,430.0	0.00	0.00	2,430.0	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	
3,190.0	0.00	0.00	3,190.0	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	
4,090.0	0.00	0.00	4,090.0	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	
4,250.0	0.00	0.00	4,250.0	0.0	0.0	0.0	0.00	0.00	Mancos Shale

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Escrito L27-2409 02H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	16' KB @ 6940.0ft (Aztec 950)
Project:	San Juan County, NM	MD Reference:	16' KB @ 6940.0ft (Aztec 950)
Site:	S27-T24N-R9W	North Reference:	True
Well:	Escrito L27-2409 02H	Survey Calculation Method:	Minimum Curvature
Wellbore:	H2		
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
4,300.0	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	
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	KOP @ 4500'
4,600.0	10.00	281.86	4,599.5	1.8	-8.5	8.5	10.00	10.00	
4,634.0	13.40	281.86	4,632.8	3.2	-15.3	15.2	10.00	10.00	Start build/turn @ 4634' MD
4,700.0	19.05	278.06	4,696.1	6.3	-33.4	33.4	8.71	8.56	
4,800.0	27.69	275.20	4,787.9	10.7	-72.8	72.7	8.71	8.64	
4,835.8	30.79	274.54	4,819.1	12.2	-90.2	90.1	8.71	8.66	Mancos Silt
4,900.0	36.36	273.62	4,872.6	14.7	-125.6	125.5	8.71	8.67	
5,000.0	45.04	272.59	4,948.3	18.2	-190.7	190.6	8.71	8.68	
5,081.8	52.15	271.95	5,002.4	20.6	-251.9	251.8	8.71	8.69	Mancos Silt Base
5,100.0	53.73	271.83	5,013.3	21.0	-266.5	266.3	8.70	8.69	
5,189.9	61.54	271.28	5,061.4	23.1	-342.3	342.2	8.71	8.69	Gallup Fn.
5,200.0	62.42	271.22	5,066.2	23.3	-351.2	351.1	8.70	8.69	
5,300.0	71.12	270.70	5,105.6	24.8	-443.0	442.9	8.71	8.70	
5,400.0	79.81	270.24	5,130.6	25.6	-539.7	539.6	8.71	8.70	
5,432.0	82.59	270.09	5,135.5	25.7	-571.3	571.2	8.71	8.70	7" ICP
5,500.0	88.51	269.79	5,140.8	25.6	-639.1	639.0	8.71	8.70	
5,524.0	90.60	269.69	5,141.0	25.5	-663.1	663.0	8.71	8.70	LP @ 5141' TVD; 90.6°
5,600.0	90.60	269.69	5,140.2	25.1	-739.1	738.9	0.00	0.00	
5,700.0	90.60	269.69	5,139.2	24.5	-839.1	838.9	0.00	0.00	
5,800.0	90.60	269.69	5,138.1	24.0	-939.1	938.9	0.00	0.00	
5,900.0	90.60	269.69	5,137.1	23.5	-1,039.1	1,038.9	0.00	0.00	
6,000.0	90.60	269.69	5,136.0	22.9	-1,139.1	1,138.9	0.00	0.00	
6,100.0	90.60	269.69	5,135.0	22.4	-1,239.1	1,238.9	0.00	0.00	
6,200.0	90.60	269.69	5,133.9	21.8	-1,339.1	1,338.9	0.00	0.00	
6,300.0	90.60	269.69	5,132.9	21.3	-1,439.0	1,438.9	0.00	0.00	
6,400.0	90.60	269.69	5,131.8	20.7	-1,539.0	1,538.9	0.00	0.00	
6,500.0	90.60	269.69	5,130.8	20.2	-1,639.0	1,638.9	0.00	0.00	
6,600.0	90.60	269.69	5,129.7	19.7	-1,739.0	1,738.9	0.00	0.00	
6,700.0	90.60	269.69	5,128.7	19.1	-1,839.0	1,838.9	0.00	0.00	
6,800.0	90.60	269.69	5,127.7	18.6	-1,939.0	1,938.9	0.00	0.00	
6,900.0	90.60	269.69	5,126.6	18.0	-2,039.0	2,038.9	0.00	0.00	
7,000.0	90.60	269.69	5,125.6	17.5	-2,139.0	2,138.9	0.00	0.00	
7,100.0	90.60	269.69	5,124.5	16.9	-2,239.0	2,238.9	0.00	0.00	
7,200.0	90.60	269.69	5,123.5	16.4	-2,339.0	2,338.9	0.00	0.00	
7,300.0	90.60	269.69	5,122.4	15.9	-2,439.0	2,438.9	0.00	0.00	
7,400.0	90.60	269.69	5,121.4	15.3	-2,539.0	2,538.9	0.00	0.00	
7,500.0	90.60	269.69	5,120.3	14.8	-2,639.0	2,638.8	0.00	0.00	
7,600.0	90.60	269.69	5,119.3	14.2	-2,739.0	2,738.8	0.00	0.00	
7,700.0	90.60	269.69	5,118.2	13.7	-2,839.0	2,838.8	0.00	0.00	
7,800.0	90.60	269.69	5,117.2	13.1	-2,938.9	2,938.8	0.00	0.00	
7,900.0	90.60	269.69	5,116.2	12.6	-3,038.9	3,038.8	0.00	0.00	
8,000.0	90.60	269.69	5,115.1	12.1	-3,138.9	3,138.8	0.00	0.00	
8,100.0	90.60	269.69	5,114.1	11.5	-3,238.9	3,238.8	0.00	0.00	
8,200.0	90.60	269.69	5,113.0	11.0	-3,338.9	3,338.8	0.00	0.00	
8,300.0	90.60	269.69	5,112.0	10.4	-3,438.9	3,438.8	0.00	0.00	
8,400.0	90.60	269.69	5,110.9	9.9	-3,538.9	3,538.8	0.00	0.00	
8,500.0	90.60	269.69	5,109.9	9.3	-3,638.9	3,638.8	0.00	0.00	
8,600.0	90.60	269.69	5,108.8	8.8	-3,738.9	3,738.8	0.00	0.00	
8,700.0	90.60	269.69	5,107.8	8.3	-3,838.9	3,838.8	0.00	0.00	
8,800.0	90.60	269.69	5,106.7	7.7	-3,938.9	3,938.8	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Escrito L27-2409 02H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	16' KB @ 6940.0ft (Aztec 950)
Project:	San Juan County, NM	MD Reference:	16' KB @ 6940.0ft (Aztec 950)
Site:	S27-T24N-R9W	North Reference:	True
Well:	Escrito L27-2409 02H	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	90.60	269.69	5,105.7	7.2	-4,038.9	4,038.8	0.00	0.00	
9,000.0	90.60	269.69	5,104.6	6.6	-4,138.9	4,138.8	0.00	0.00	
9,100.0	90.60	269.69	5,103.6	6.1	-4,238.9	4,238.8	0.00	0.00	
9,200.0	90.60	269.69	5,102.6	5.6	-4,338.9	4,338.8	0.00	0.00	
9,300.0	90.60	269.69	5,101.5	5.0	-4,438.8	4,438.8	0.00	0.00	
9,400.0	90.60	269.69	5,100.5	4.5	-4,538.8	4,538.7	0.00	0.00	
9,500.0	90.60	269.69	5,099.4	3.9	-4,638.8	4,638.7	0.00	0.00	
9,600.0	90.60	269.69	5,098.4	3.4	-4,738.8	4,738.7	0.00	0.00	
9,700.0	90.60	269.69	5,097.3	2.8	-4,838.8	4,838.7	0.00	0.00	
9,744.0	90.60	269.69	5,096.9	2.6	-4,882.8	4,882.8	0.00	0.00	Horizontal Target
9,800.0	90.60	269.69	5,096.3	2.3	-4,938.8	4,938.7	0.00	0.00	
9,900.0	90.60	269.69	5,095.2	1.8	-5,038.8	5,038.7	0.00	0.00	
10,000.0	90.60	269.69	5,094.2	1.2	-5,138.8	5,138.7	0.00	0.00	
10,100.0	90.60	269.69	5,093.1	0.7	-5,238.8	5,238.7	0.00	0.00	
10,133.8	90.60	269.69	5,092.8	0.5	-5,272.6	5,272.5	0.00	0.00	TD at 10133.8

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Escrito L27-2409 02H PI - hit/miss target - Shape	0.00	0.00	4,913.8	149.7	-5,272.6	1,922,953.66	2,732,243.29	36.284750	-107.802300
- plan misses target center by 233.1ft at 10133.8ft MD (5092.8 TVD, 0.5 N, -5272.6 E)									
- Point									
Escrito L27-2409 02H PI - plan misses target center by 235.4ft at 5528.0ft MD (5141.0 TVD, 25.5 N, -667.1 E)	0.00	0.00	4,962.0	178.4	-666.1	1,922,984.63	2,736,849.76	36.284830	-107.786670
- Point									
Escrito L27-2409 02H PI - plan hits target center - Point	0.00	0.00	5,092.8	0.5	-5,272.6	1,922,804.41	2,732,243.34	36.284340	-107.802300
- Point									
Escrito L27-2409 02H PI - plan hits target center - Point	0.00	0.00	5,141.0	25.5	-663.1	1,922,831.74	2,736,852.78	36.284410	-107.786660
- Point									

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	
5,432.0	5,135.5	7" ICP	0.000	0.000	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Escrito L27-2409 02H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	16' KB @ 6940.0ft (Aztec 950)
Project:	San Juan County, NM	MD Reference:	16' KB @ 6940.0ft (Aztec 950)
Site:	S27-T24N-R9W	North Reference:	True
Well:	Escrito L27-2409 02H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #2		

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
882.0	882.0	Ojo Alamo Ss.		-0.60	269.64	
1,070.0	1,070.0	Kirtland Shale		-0.60	269.64	
1,280.0	1,280.0	Fruitland Coal		-0.60	269.64	
1,640.0	1,640.0	Pictured Cliffs Ss.		-0.60	269.64	
1,770.0	1,770.0	Lewis Shale		-0.60	269.64	
2,430.0	2,430.0	Cliffhouse Ss.		-0.60	269.64	
3,190.0	3,190.0	Menefee Fn.		-0.60	269.64	
4,090.0	4,090.0	Point Lookout Ss.		-0.60	269.64	
4,250.0	4,250.0	Mancos Shale		-0.60	269.64	
4,835.8	4,820.0	Mancos Silt		-0.60	269.64	
5,081.8	5,005.0	Mancos Silt Base		-0.60	269.64	
5,189.9	5,065.0	Gallup Fn.		-0.60	269.64	
9,744.0	5,148.0	Horizontal Target		-0.60	269.64	

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
4,500.0	4,500.0	0.0	0.0	KOP @ 4500'	
4,634.0	4,632.8	3.2	-15.3	Start build/turn @ 4634' MD	
5,524.0	5,141.0	25.5	-663.1	LP @ 5141' TVD; 90.6°	
10,133.8	5,092.8	0.5	-5,272.6	TD at 10133.8	