

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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

Of

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.

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

3b. Phone No. (include area code)

720-876-5339

4. Location of Well (Footage, Sec. T., R., M., or Survey Description)

1520' FSL & 1874' FWL, Sec. 28, T9S, R96W, 6thPM

5. Lease Serial No. **COC-071266 (SHL)**

COC-65789 (BHL)

6. If Indian, Allottee or Tribe Name

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

Place Mesa, COC-

8. Well Name and No.

Federal 28-11 (PL28SW)

9. API Well No.

05-077-10150-00

10. Field and Pool or Exploratory Area

Wildcat

11. County or Parish, State

Mesa, Colorado

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

OF SUBMISSION

TYPE OF ACTION

☐ Notice of Intent

☒ Subsequent Report

☐ Final Abandonment Notice

☐ Acidize

☐ Alter Casing

☐ Casing Repair

☒ Change Plans

☐ Convert to Injection

☐ Deepen

☐ Reclamation

☐ New Construction

☐ Plug and Abandon

☐ Plug Back

☐ Production (start/resume)

☐ Reclamation

☐ Recomplete

☐ Temporarily Abandon

☐ Water Disposal

☐ Water Shut-Off

☐ Well Integrity

☒ Other

New BHL & Name

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 recompleting 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 the BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleting 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. plans to drill the subject well as a horizontal well and move the BHL to the following:

New BHL will be located 899' FNL & 1983' FWL of Sec. 32, T9S, R96W located on federal lease COC-65789.

Please find attached a copy of the revised plat showing the new BHL with the proposed well bore trajectory, a revised directional plan and a revised 9-Point Drilling Plan.

Encana also plans to change the well name to the Federal 28-11H (PL28SW).

The additional water needed to drill this well as a horizontal well as apposed to drilling it as a directional well as originally planned is approximately three hundred thousand barrels.

14. I hereby certify that the foregoing is true and correct
Name (Printed/Typed)

Jevin Croteau

Title

Regulatory Analyst

Signature

Date

4/13/11

Approved by

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

PETROLEUM ENGINEER

Title

Grand Junction Field Office

Date

MAY 11 2011

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.

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.

RECEIVED
BUREAU OF LAND MGMT.
GRAND JCT. CO.
2011 APR 12 PM 1:34

CONDITIONS OF APPROVAL
Sundry Notice Drilling Modification

Company/Operator: Encana

Well Name & Number: Place Mesa 28-11 (PL28SW)

DOWNHOLE CONDITIONS OF APPROVAL FOR NOTICE TO DRILL

All conditions of approval for the Application for Permit to Drill that was approved on March 17, 2011 will continue to apply. In addition please note the following:

The plug back of the vertical hole will require isolation of all potential productive horizons. Contact this office for approval of your proposed plug back operation of the vertical pilot hole.

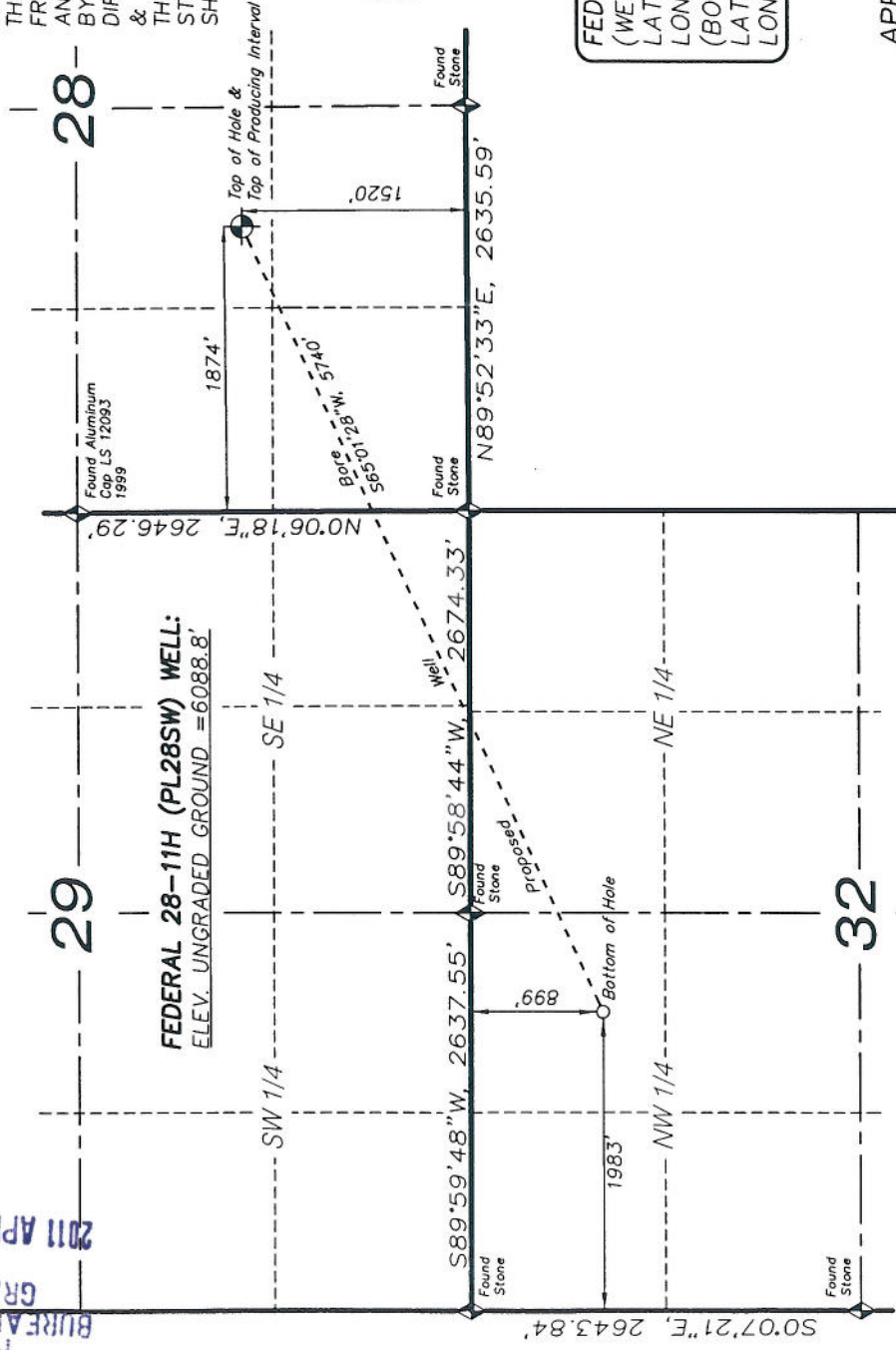
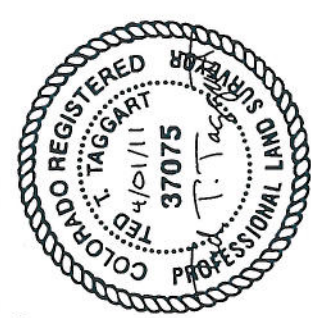
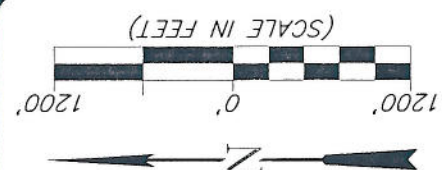
To ensure compliance with the terms and conditions of a Programmatic Biological Opinion (PBO) for water depletions associated with fluid minerals development on BLM lands, the operator shall report the total amount of new water used to drill and complete each horizontal well. "New" water is defined here as water that has not previously been used for the drilling of a well or produced from oil and gas operations. If recovered water is reused to drill multiple wells, the operator should report only the new fresh water used at a given well. This data must be submitted within 30 days of the well's completion. This COA does not apply to standard directional or vertical wells.

Complete plans for the storage and transportation of the "additional water" will be required prior to well completion activities begin.

RECEIVED
BUREAU OF LAND MGT
GRAND JCT. CO
2011 APR 12 PM 1:3

CERTIFICATE OF SURVEYOR

I, TED TAGGART OF FRUITA,
COLORADO HEREBY CERTIFY
THAT THIS MAP WAS MADE
FROM NOTES TAKEN DURING
AN ACTUAL SURVEY MADE
BY ME OR UNDER MY
DIRECTION FOR ENCANA OIL
& GAS (USA) INC. AND THAT
THIS LOCATION HAS BEEN
STAKED ON THE GROUND AS
SHOWN HEREON.



FEDERAL 28-11H WELL (PL28SW)
(WELLHEAD LOCATION) NAD 83
LATITUDE = 39.243207° N
LONGITUDE = 108.112173° W
(BOTTOM HOLE LOCATION) NAD 83
LATITUDE = 39.236555° N
LONGITUDE = 108.130537° W

MAP to ACCOMPANY
APPLICATION for PERMIT to DRILL
EnCana Oil & Gas (USA) Inc.
Federal 28-11H (PL28SW) Well
NE 1/4 SW 1/4, SECTION 28
T9S, R96W, 6th P.M.
MESA COUNTY, COLORADO

NOTES

1. WELL FOOTAGES ARE MEASURED AT RIGHT ANGLES TO SECTION LINES.
2. BASIS OF BEARING: GEODETIC- BASED ON GPS OBSERVATIONS.
3. ELEVATIONS BASED ON GPS OBSERVATIONS, NAVD 88 (GEOID 03), POST PROCESSED USING NGS OPUS.
4. SEE ADDENDUM TO LEGAL PLAT (SHEET 1a) FOR VISIBLE IMPROVEMENTS WITHIN 400 FEET OF THE PROPOSED OIL & GAS LOCATION.
5. CONTROL FOR SURVEY WAS ESTABLISHED USING DIFFERENTIALLY CORRECTED GPS FROM AN OPUS BASED CONTROL NETWORK. WELL LOCATION WAS ESTABLISHED USING NON-GPS CONVENTIONAL METHODS, THEREFORE NO PDOP READING WAS TAKEN.

- LEGEND
- SECTION CORNER LOCATED
 - SURFACE LOCATION
 - BOTTOM HOLE LOCATION
 - RECORD LOCATION OF CORNER

Location Plat	Scale: 1" = 1200'	SHEET
Project No. 09-04-32	Date Surveyed: 7/09/09	1
Date Drawn: 7/29/09	Latest Revision Date: 4/01/11	OF 10

905 Main Street
Evanston, Wyoming 82930
Phone No. (307) 789-4545

WASATCH
SURVEYING

ATTACHMENT TO FORM 3160-3
9 POINT DRILLING PLAN
Federal 28-11H (PL28SW)

1. **OPERATOR:** Encana Oil & Gas (USA).
WELL NAME: Federal 28-11H

LOCATION (SHL): NE SW 28-9S-96W
1550 FSL 1875 FWL
Mesa County, CO

LOCATION (BHL Pilot Hole): NE SW 28-9S-96W
1550 FSL 1875 FWL
Mesa County, CO

LOCATION (BHL Horizontal): NE NW 32-9S-96W
890 FNL 1950 FWL
Mesa County, CO

2. **ESTIMATED TOPS OF GEOLOGICAL MARKERS (MD/TVD)**

Formation	MD	TVD	VS
Green River	SURF	SURF	SURF
WASATCH FM	SURF	SURF	SURF
OHIO CREEK (Top Kmv)	1175	4932	1175
WILLIAMS FORK FM	1527	4580	1527
TOP GAS	2863	3244	2863
COAL RIDGE (Paludal)	3558	2549	3558
ROLLINS SS (Iles Fm)	3863	2244	3863
COZZETTE SS	4112	1995	4112
CORCORAN SS	4301	1806	4301
MANCOS A	5016	1091	5016
BUCK TONGUE	5021	1086	5021
CASTLEGATE	5549	513	5549
MANCOS B	5795	312	5795
PRAIRIE CANYON	6170	-63	6170
NIOBRARA FM	7097	-990	7097
HORIZONTAL TARGET	7817	-1276	7383
NIO. LAMINATED SLTST	7683	-1576	7683
FT HAYES	8227	-2120	8227
FRONTIER SS	8417	-2310	8417
DAKOTA FM	8614	-2507	8614
CEDAR MTN SS	8707	-2600	8707
Anticipated TD Pilot	8714	-2607	8714
Anticipated TD Horizontal	12779	-1102	7209
MORRISON FM	8821	-2714	8821
Permit TD Pilot	9176	-3069	9176
Permit TD Horizontal	12817	-1102	7209

ATTACHMENT TO FORM 3160-3

9 POINT DRILLING PLAN

Federal 28-11H (PL28SW)

3. ESTIMATED TOPS OF POSSIBLE WATER, OIL, GAS OR MINERALS

The estimated depths at which possible water, oil, gas or minerals will be encountered are as follows:

<u>Substance</u>	<u>Formation</u>	<u>Depth (TVD)</u>
Water	Wasatch	Surface
Gas	Williams Fork	1527'
Gas	TOG	2863'
Gas	Mancos	5016'
Gas	Niobrara	7097'

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 surface casing shall be cemented back to surface either during the primary cement job or by remedial cementing.

4. OPERATOR'S SPECIFICATIONS FOR PRESSURE CONTROL EQUIPMENT

- a. Minimum working pressure on rams and BOPE will be 5,000 psi.
- b. Function test and visual inspection of the BOP will be conducted daily and noted in the IADC Daily Drilling Report.
- c. Both high and low pressure tests of the BOPE will be conducted.
- d. The Annular BOP will be pressure tested to a minimum of 50% of its rated working pressure.
- e. Blind and Pipe Rams/BOP will be tested to a minimum of 100% of rated working pressure (against a test plug).
- f. Surface casing will be tested from surface to TD (float collar) at 1,500 psi surface pressure (prior to drilling out the float collar).
- g. All other casing will be pressure tested to 0.22 psi/ft or 1,500 psi, whichever is greater, but not to exceed 70% of the internal yield.
- 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 preventors.
- j. The kill line shall be 2" minimum and contain two kill line valves, one of which shall be a check valve.
- k. The choke line shall be 3" minimum and contain two choke line valves (3" minimum).
- l. The choke and manifold shall contain two adjustable chokes.
- m. Hand wheels shall be installed on all ram preventors,
- n. Safety valves and wrenches (with subs for all 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.
- p. Upper kelly cock valve (with handle) shall be available at all times.

Proposed BOP and Choke Manifold arrangements are attached.

Federal 28-11H (PL28SW)**5. PROPOSED CASING AND CEMENTING PROGRAM (Measured Depths)**

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 surface casing shall be cemented back to surface either during the primary cement job or by remedial cementing.

Casing and Cementing Program					
DEPTH	HOLE SIZE	SIZE	WEIGHT	GRADE	CEMENT VOLUME
CONDUCTOR					
0-40'	± 24"	16"	0.25" Wall PE	X42	± 5 yds ready mix (to surface)
SURFACE CASING					
0'-1500'	14-3/4"	10-3/4" 40.5# J/K55 STC		Cement with: Lead: 580 sxs 12.5 Glass G 2.11 ft³/sk (includes 80% OH excess) Tail: 238 sx 15.8, Class G 1.17 ft³/sk (No excess) TOC = surface	
NOTE: Lead cement includes excess equivalent to 80% Entire Annulus (Lead and Tail)					
INTERMEDIATE CASING					
0' -6200'	9-7/8"	7-5/8" 26.40# HC P110 LTC		Cement with: Lead: 294 sx, 12, TXI, 1.79 ft³/sk (includes 30% OH excess) Note: Stage tool set @ ~ +/-3000' Tail: 437 sx, 13, TXI, 1.43 ft³/sk (includes 30% OH excess) TOC = 200' above Mesaverde	
CEMENT PLUG					
6200' – 6700'	6-3/4"	500' plug		Cement with: 207 sxs, 17.9#, denseCRETE, .90 ft³/sk (Includes 50% open hole excess)	
PRODUCTION CASING					
0' to 12,817'	6-3/4"	5"	23.2#	P110EC, VAM SFC, New	Tail: 524 sx, 15 ASC, 1.98 ft³/sk (includes 30% OH excess) TOC = 500' inside intermediate csg

Casing String				Casing Strength Properties			Minimum Design Factors		
Size (in)	Weight (lb/ft)	Grade	Connection	Collapse (psi)	Burst (psi)	Tensile (1000 lb)	Collapse	Burst	Tension
10-3/4"	40.5	J-55	STC	1,580	3,130	420	1.00	1.10	1.50*
7-5/8"	26.4	HCP110	LTC	4,850	8,280	654	1.00	1.10	1.50*
5"	23.2	P110EC	VAM SFC	21,840	20,910	647	1.00	1.10	1.50*

*Tension design based on 1.5 OR Max Overpull of 100,000 lbs, whichever provides for higher safety.

ATTACHMENT TO FORM 3160-3
9 POINT DRILLING PLAN
Federal 28-11H (PL28SW)

Casing Design Considerations/Safety Factors:

**** Note:** Calculations consider both the pilot hole and the horizontal.

A. Surface casing @ 1500' MD / 1500' TVD; 10-3/4" 40.5# J-55 STC

Purpose: Protect shallow fresh water and contain MASP to TD

Maximum anticipated mud weight at surface casing depth: = 9.2 ppg

Maximum anticipated mud weight at Intermediate TD: = 9.5 ppg

Maximum anticipated equivalent formation pressure at Intermediate TD: = 0.60 psi/ft

TVD at intermediate casing point: = 6,200'

Collapse Design:

15.8 ppg cement from surface to TD (1500')

Load = $15.8 \times 0.052 \times 1500'$ = 1232 psig

Rating: = 1,580 psig

S.F. = 1.28

Evacuated casing with 9.2 ppg drilling fluid density:

Load = $9.2 \times 0.052 \times 1500'$ = 718 psig

Rating: = 1,580

S.F. = 2.20

Burst Design:

Assume kick with partially evacuated hole and an influx gradient of 0.22 psi/ft.
(Calculation assumes shoe will not break down.)

MASP (Load) = $6,200 \times (0.5 - 0.22)$ psi/ft = 1,736 psig

Rating: = 3,130 psig

S.F. = 1.80

Tensile Design:

Designed on Air Weight*buoyancy

Load = $1,500' \times 40.5\# \times \text{buoyancy}$ = 52 kips

Rating: = 420 kips

S.F. = 8.0

Overpull = 368,000 lbs

ATTACHMENT TO FORM 3160-3
9 POINT DRILLING PLAN
Federal 28-11H (PL28SW)

- B. Intermediate Casing @ 6,200' MD/ 6200' TVD; 7-5/8", 26.4#, HCP-110, LTC
Maximum Anticipated Mud Weight at Intermediate TD: = 910 ppg
Maximum Anticipated Equivalent Formation Pressure at Intermediate TD: = 0.45 psi/ft
Maximum Anticipated Equivalent Formation Pressure at Intermediate TD: = 8.9 ppg
Niobrara: pore press at deepest TVD in horiz well of 7209' TVD: = 0.60 psi/ft
Pore pressure @ pilot hole TD of 9176' TVD = .49 psi/ft

Collapse Design:

13.0 ppg cement from surface to TD (6100' TVD)
Fresh water gradient inside casing

Load = $(13.0 * 0.052 * 6200) - (8.33 * 0.052 * 6100)$ = 1506 psig
Rating: = 4850 psig
S.F. = 3.22

Evacuated casing with 10 ppg drilling fluid density:

Load = $10 * 0.052 * 6200$ = 3224 psig
Rating: = 4850 psig
S.F. = 1.50

Burst Design:

Assume kick with partially evacuated hole @ pilot hole TD and an influx gradient of 0.22 psi/ft. (Calculation assumes shoe will not break down.)

MASP (Load) = $9176 * (0.49 - 0.22)$ psi/ft = 2478 psig
Rating: = 8280 psig
S.F. = 3.34

Assume kick with partially evacuated hole @ horizontal TD and an influx gradient of 0.22 psi/ft. (Calculation assumes shoe will not break down.)

MASP (Load) = $7209 * (0.60 - 0.22)$ psi/ft = 2739 psig
Rating: = 8280 psig
S.F. = 3.02

Tensile Design:

Designed on Air Weight*buoyancy

Load: $6200 * 29.7$ #*buoyancy = 213 kips
Rating: = 769 kips
S.F. = 3.07

Overpull = 441,000 lbs

ATTACHMENT TO FORM 3160-3

9 POINT DRILLING PLAN

Federal 28-11H (PL28SW)

C.	<u>Production Casing @ 12,817' MD/ 7,209' TVD; 5", 23.2#, P110 VAM SFC</u>	
	Maximum Anticipated Mud Weight at Total Depth:	= 12 ppg
	Maximum Anticipated Equivalent Formation Pressure at Total Depth:	= 0.60 psi/ft
	Maximum Surface Treating Pressure for Fracturing Operations:	= 9,000 psig
	Assumed Gas Gradient for Production Operations:	= 0.115 psi/ft

Collapse Design:

Designed on evacuated casing properties with 13 ppg drilling fluid density with no internal back-up.

Load = $13 \times 0.052 \times 7209'$	= 4873 psig
Rating	= 21,840 psig
S.F.	= 4.5

Burst Design:

Assume maximum surface shut-in pressure during production, and maximum surface treating pressure during fracture stimulation operations.

Design Consideration #1: Maximum Surface Shut-In Pressure

MASSIP (Load) = $7209' \times (0.60 - 0.115) \text{ psi/ft}$	= 3496 psig
Rating	= 21,840 psig
S.F.	= 6.0

Design Consideration #2: Maximum Surface Treating Pressure During Frac Operations

MATP:	= 9,000 psig
Rating:	= 21,840 psig
S.F.	= 2.32

Tensile Design:

Designed on Air Weight*buoyancy

Load = $7209' \times 23.2\# \times \text{buoyancy}$	= 234 kips
Rating	= 647 kips
S.F.	= 2.7

Overpull = 413,000 lbs

ATTACHMENT TO FORM 3160-3
9 POINT DRILLING PLAN
Federal 28-11H (PL28SW)

***Cementing Volume Design Clarification:**

Surface Casing:

*Slurry designed for full coverage 14 3/4" hole plus 80% excess.

Intermediate Casing

*Slurry designed 200' above Mesaverde. Volume assumes 9 7/8" hole plus 30% excess.

*If open hole logs are run, cement volumes will be determined from the caliper plus 10% excess.

Production Casing

*Slurry designed with 500' overlap inside intermediate casing. Volume assumes 6 1/2" hole plus 30% excess.

*If open hole logs are run, cement volumes will be determined from the caliper plus 10% excess.

7. **DESCRIPTION OF WELL**

This well will be a plug-back horizontal. Plan will be to drill surface hole to 1500' and set surface casing, drill intermediate section to 6200' and set intermediate casing, drill 6-3/4" pilot hole to TD of 9176'. After reaching TD of the pilot-hole, open-hole logs will be run. Following the open hole logs on the pilot hole, a 500' denseCRETE cement kick off plug will be set from 6200' to 6700' to plug off the pilot hole. The cement plug will then be kicked off at a 5 deg slant for ~500' until the KOP for the horizontal. The 6-3/4" horizontal hole will be drilled to an angle of 92 deg at an azimuth of 247 deg to 12,692' TMD and 7,209' TVD. After reaching TD of the horizontal hole, open-hole logs will be run prior to running casing and cementing the 5" production casing.

7. **DIRECTIONAL DRILLING PROGRAM**

Directional plans are attached.

The well will be drilled with continuous MWD surveys at least every 200ft.

8. **PROPOSED DRILLING FLUIDS PROGRAM**

MUD PROGRAM				
DEPTH	MUD TYPE	DENSITY	VISCOSITY	FLUID LOSS
		lbs/gal	(sec/qt)	(cc)
0' -1500'	Fresh Water Gel	8.8 – 9.2	28 – 35	NC
1500' -6200'	LSND	9.2 – 9.5	35 – 55	5-10
6200' – TD Pilot (9,176')	LSND	9.5 – 12	35 – 55	5-10
6200' – TD Horiz (12,817')	LSND	9.5 - 10	35-55	5-10

Mud flow and volume will be monitored both visually and with electronic pit volume totalizers.

9. **TESTING, CORING AND LOGGING**

- a. Drill Stem Testing – None anticipated
- b. Mud Logging – 3800' to TD
- c. Logging – See Below:

Open Hole

Logging Interval

PILOT HOLE: PEX, Spectral GR, ECS
(Optional at operator's discretion)

From TD to top of Rollins

PILOT HOLE: FMI, SS
(Optional at operator's discretion)

From TD to top of Mancos

PILOT HOLE: SWC
(Optional at operator's discretion)

From TD to top of Mancos

ATTACHMENT TO FORM 3160-3
9 POINT DRILLING PLAN

Federal 28-11H (PL28SW)

LATERAL: LWD Resistivity, Neutron Density, SS
(Optional at operator's discretion)

From Landing point to TD

LATERAL: Shuttle-conveyed CMI
(Optional at operator's discretion)

From TD to KOP (6731' TMD)

Cased Hole

CBL (intermediate string)

As far through curve as possible with wireline to 500'
above TOC

10. **ABNORMAL PRESSURES OR TEMPERATURES; POTENTIAL HAZARDS**

Barite and a selection of 'sized' lost circulation materials will be kept on location during drilling operations.

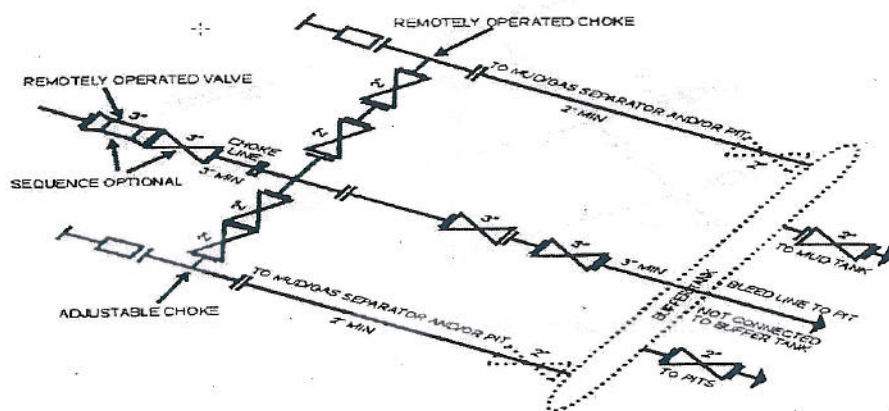
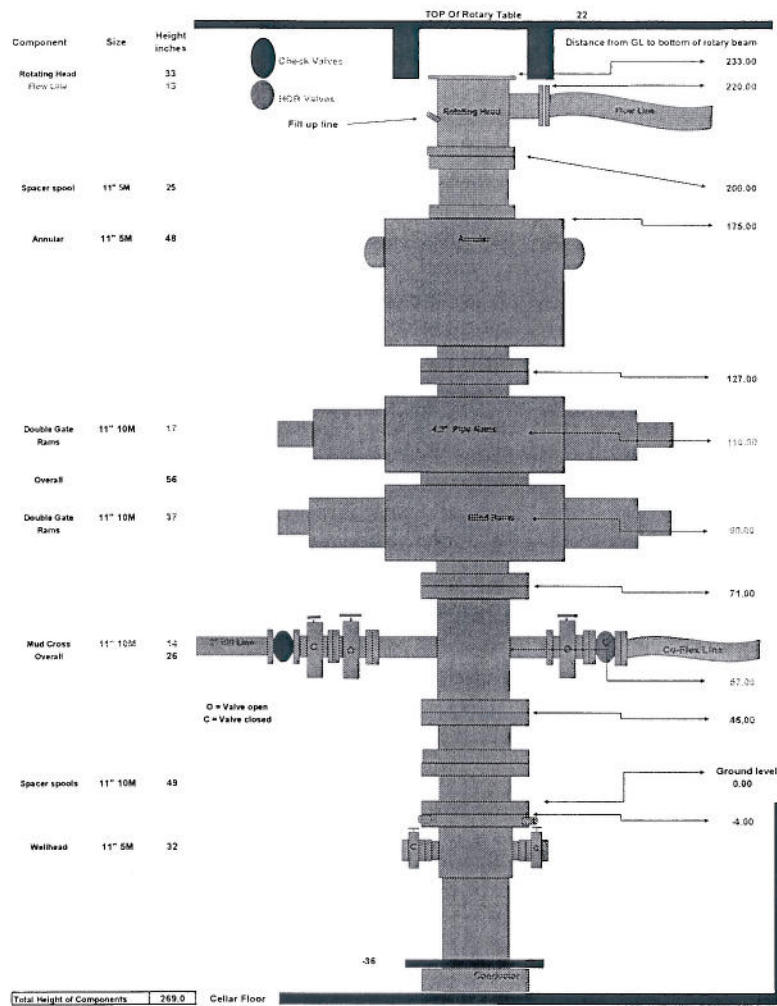
ABNORMAL PRESSURES / TEMPERATURES / POTENTIAL HAZARDS					
Anticipated BHP Pilot	4496	psig	9.4	ppg	Anticipated MASP
					2478
					psig
Anticipated BHP Horiz	4325	psig	11.5	ppg	Anticipated MASP
					2739
					psig

11. **ANTICIPATED STARTING DATE AND DURATION OF OPERATIONS**

The desired target spud date is contingent upon the regulatory approval date. However, the spud date could possibly be delayed or accelerated as required to fit rig schedules.

The drilling operation is anticipated to require ± 50 days on this well. Completion operations are anticipated to begin within 10 days of the drilling rig vacating the pad. Completion operations require approximately 90 days.

**ATTACHMENT TO FORM 3160-3
9 POINT DRILLING PLAN
Federal 28-11H (PL28SW)**



WELL Federal 28-11H			FIELD CO, Mesa Co.(NAD83UTM13)			STRUCTURE Encana 28-09S-96W (PL28SW)		
Magnetic Parameters Model: BGGM 2010 Dip: 65.541° Mag Dec: 19.405° Date: March 17, 2011 FS: 52103.5mT			Surface Location Lat: N 39 14 33.545 Lon: W 108 6 43.823 NAD83 UTM Zone 13N, US Feet Northing: 1426320.74 AUS Easting: 759217.14 AUS Grid Conv: -1.96997873 Scale Fact: 1.00048835			Miscellaneous Plot: Federal 28-11H Lateral R6 cns 06-Apr-11 TVD Ref: RKB(R107' above MSL) Srv Date: March 17, 2011		

Critical Point		Critical Points				
Central Point	SR	TSB	QTSB	TSB	SR	Net/Sec
Marker Medium	27.00	0.00	247.00	27.00	0.00	6.00
Class Chuck (Top Rock)	1175.00	0.00	247.00	1175.00	0.00	0.00
William Fork Em	1527.00	0.00	247.00	1527.00	0.00	0.00
Top Gls	2483.00	0.00	247.00	2483.00	0.00	0.00
Coal Rock (Rhyolite)	3558.00	0.00	247.00	3558.00	0.00	0.00
Rolling Surface East	6083.00	0.00	247.00	13663.00	0.00	0.00
Corrosion Ss	8172.00	0.00	247.00	8182.00	0.00	0.00
Concretion Ss	4301.00	0.00	247.00	4301.00	0.00	0.00
Manganese A	5016.00	0.00	247.00	5016.00	0.00	0.00
Back Terraces	5621.00	0.00	247.00	5621.00	0.00	0.00
Top to Plate	5200.00	0.00	247.00	5200.00	0.00	0.00
Caliche	5548.00	0.00	247.00	5549.00	0.00	0.00
Manganese B	5795.00	0.00	247.00	5795.00	0.00	0.00
Plastic Claystone	6170.00	0.00	247.00	6170.00	0.00	0.00
KOP, Build + DS	6200.00	0.00	247.00	6200.00	0.00	0.00
10'ld	6300.00	5.00	247.00	6299.87	4.56	-4.00
KOP, Build + DS	6780.44	0.00	247.00	6781.72	-16.30	-16.50
Shoshone Fan	7136.00	36.97	247.00	7097.00	37.54	-16.50
10'ld	7616.00	92.00	247.00	7612.00	90.00	-17.50
Unlabeled Image	Inf	Inf	Inf	7683.00	Inf	Inf
Point 26.1 PHOT YD	12378.82	97.00	247.00	7200.00	97.00	-6240.00
Net, Lateral Shift	Inf	Inf	Inf	7683.00	Inf	Inf

Surface Location

Working: 142565.20 7.4 Rating: 750217.14

Target Description

Shore	Major Axis	NE/SW
Point	0.00	1426.00 7.4

Grat Count

ES/E	SW/S
750017.58	7200.50

Local Count

NE/SW	ES/E
2242.07	2242.00

Local Name
Index 26-101
PROJ: TD

Rev 6

Grid North

True Course (41° - G 12 3245°)

Mag Dec (10.405°)

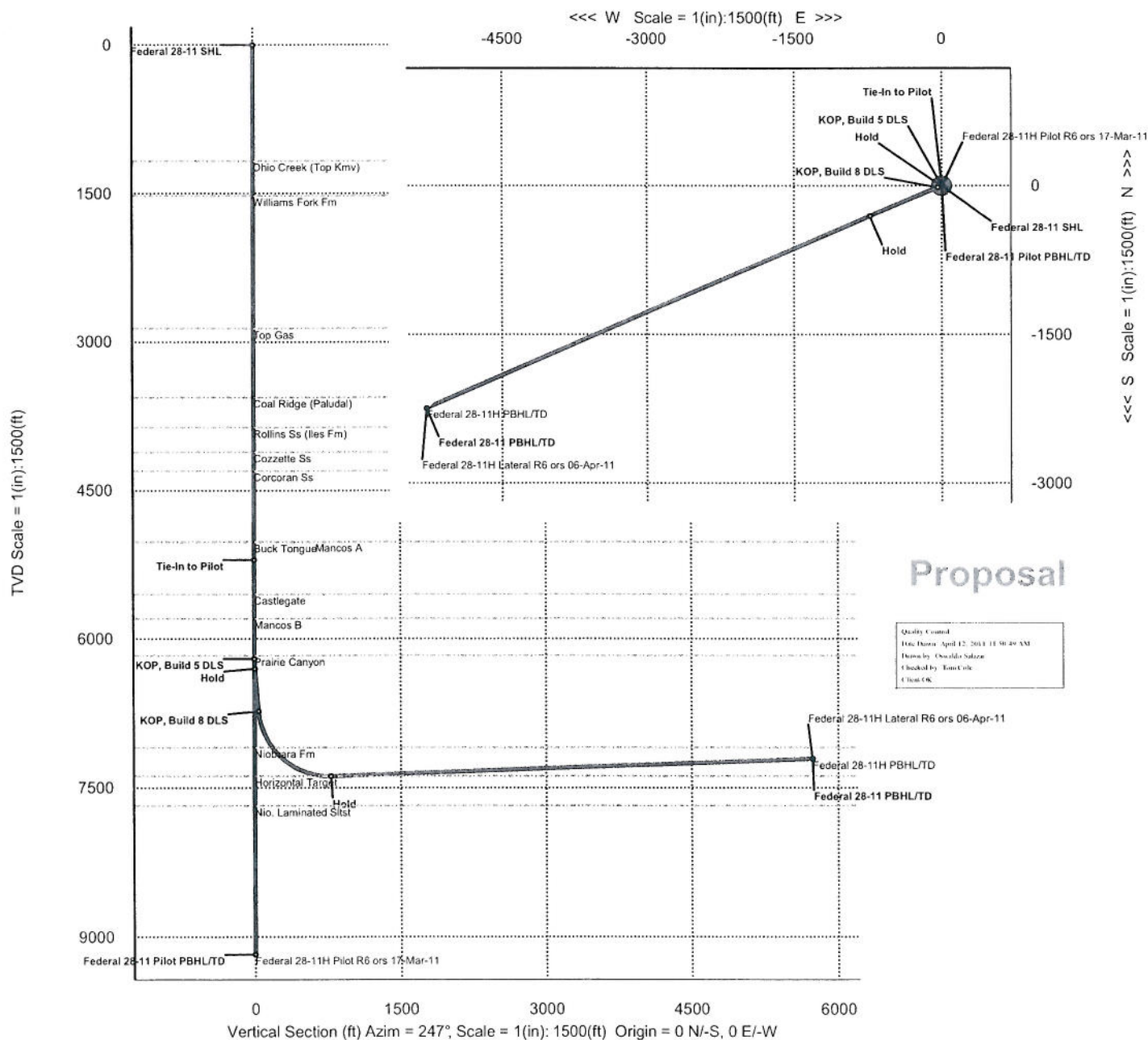
Grid Course (4.98097623°)



Great Circle (1-90/19.78°N)
 True Course (M) = 612.3745°
 Magnetic Dec = 16.405°
 Great Circle (1-90/19.78°N)



Rev 6



Federal 28-11H Lateral R6 ors 06-Apr-11 Proposal Report

(Def Plan)

Report Date: April 12, 2011 - 01:21 PM
 Client: EnCana Oil & Gas (USA) Inc.
 Field: CO, Mesa County (NAD 83 UTM 13) EnCana 2010
 Structure / Slot: Encana 28-09S-96W (PL28SW Pad) / Federal 28-11H
 Well: Federal 28-11H
 Borehole: Lateral
 UWI / API#: Unknown / Unknown
 Survey Name: Federal 28-11H Lateral R6 ors 06-Apr-11
 Survey Date: March 17, 2011
 Tort / AHD / DDI / ERD Ratio: 92.005 ° / 5738.150 ft / 5.961 / 0.777
 Coordinate Reference System: NAD83 UTM Zone 13N, US Feet
 Location Lat / Long: N 39° 14' 35.54500", W 108° 6' 43.82302"
 Location Grid N/E Y/X: N 14266320.744 RUS, E 759217.144 RUS
 CRS Grid Convergence Angle: -1.96997873 °
 Grid Scale Factor: 1.00048835

Survey / DLS Computation: Minimum Curvature / Lubinski
 Vertical Section Azimuth: 247.000 ° (Grid North)
 Vertical Section Origin: 0.000 ft, 0.000 ft
 TVD Reference Datum: RKB
 TVD Reference Elevation: 6107.000 ft above MSL
 Seabed / Ground Elevation: 6085.000 ft above MSL
 Magnetic Declination: 10.405 °
 Total Field Strength: 52103.495 nT
 Magnetic Dip Angle: 65.541 °
 Declination Date: March 17, 2011
 Magnetic Declination Model: BGGM 2010
 North Reference: Grid North
 Grid Convergence Used: -1.970 °
 Total Corr Mag North->Grid North: 12.375 °
 Local Coord Referenced To: Well Head

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (RUS)	Easting (RUS)	Latitude (N/S ° ' '')	Longitude (E/W ° ' '')
Federal 28-11 SHL	0.00	0.00	220.00	0.00	0.00	0.00	0.00	N/A	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
Marker MudLine	22.00	0.00	247.00	22.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
Ohio Creek (Top Kmv)	1175.00	0.00	247.00	1175.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
Williams Fork Fm	1527.00	0.00	247.00	1527.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
Top Gas	2863.00	0.00	247.00	2863.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
Coal Ridge (Paludal)	3558.00	0.00	247.00	3558.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
Rollins Ss (Iles Fm)	3863.00	0.00	247.00	3863.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
Cozzette Ss	4112.00	0.00	247.00	4112.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
Corcoran Ss	4301.00	0.00	247.00	4301.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
Mancos A	5016.00	0.00	247.00	5016.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
Buck Tongue	5021.00	0.00	247.00	5021.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
Tie-In to Pilot	5200.00	0.00	247.00	5200.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	5300.00	0.00	247.00	5300.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	5400.00	0.00	247.00	5400.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	5500.00	0.00	247.00	5500.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
Castlegate	5549.00	0.00	247.00	5549.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	5600.00	0.00	247.00	5600.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	5700.00	0.00	247.00	5700.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
Mancos B	5795.00	0.00	247.00	5795.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	5800.00	0.00	247.00	5800.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	5900.00	0.00	247.00	5900.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	6000.00	0.00	247.00	6000.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	6100.00	0.00	247.00	6100.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
Prairie Canyon	6170.00	0.00	247.00	6170.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
KOP, Build 5 DLS	6200.00	0.00	247.00	6200.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
Hold	6300.00	5.00	247.00	6299.87	4.36	-1.70	-4.01	5.00	14266319.04	759213.13	N 39 14 35.53 W 108	6 43.87
	6400.00	5.00	247.00	6399.49	13.08	-5.11	-12.04	0.00	14266315.63	759205.10	N 39 14 35.49 W 108	6 43.97
	6500.00	5.00	247.00	6499.11	21.79	-8.51	-20.06	0.00	14266312.23	759197.08	N 39 14 35.45 W 108	6 44.07
	6600.00	5.00	247.00	6598.73	30.51	-11.92	-28.08	0.00	14266308.82	759189.05	N 39 14 35.42 W 108	6 44.17
	6700.00	5.00	247.00	6698.35	39.22	-15.33	-36.10	0.00	14266305.41	759181.02	N 39 14 35.38 W 108	6 44.27
KOP, Build 8 DLS	6730.48	5.00	247.00	6728.72	41.88	-16.36	-38.55	0.00	14266304.37	759178.58	N 39 14 35.37 W 108	6 44.31
	6800.00	10.56	247.00	6797.57	51.29	-20.04	-47.21	8.00	14266300.69	759169.91	N 39 14 35.33 W 108	6 44.41
	6900.00	18.56	247.00	6894.28	76.41	-29.86	-70.34	8.00	14266290.87	759146.78	N 39 14 35.23 W 108	6 44.70
	7000.00	26.56	247.00	6986.55	114.75	-44.83	-105.62	8.00	14266275.89	759111.47	N 39 14 35.07 W 108	6 45.15
	7100.00	34.56	247.00	7072.59	165.55	-64.69	-152.39	8.00	14266256.03	759064.68	N 39 14 34.85 W 108	6 45.73
Niobrara Fm	7130.09	36.97	247.00	7097.00	183.14	-71.56	-168.58	8.00	14266249.15	759048.49	N 39 14 34.78 W 108	6 45.93
	7200.00	42.56	247.00	7150.72	227.84	-89.02	-209.72	8.00	14266231.68	759007.32	N 39 14 34.59 W 108	6 46.45
	7300.00	50.56	247.00	7219.42	300.39	-117.37	-276.51	8.00	14266203.32	758940.50	N 39 14 34.29 W 108	6 47.28
	7400.00	58.56	247.00	7277.35	381.80	-149.18	-351.45	8.00	14266171.49	758865.53	N 39 14 33.95 W 108	6 48.22
	7500.00	66.56	247.00	7323.40	470.47	-183.83	-433.07	8.00	14266136.83	758783.86	N 39 14 33.58 W 108	6 49.24
	7600.00	74.56	247.00	7356.65	564.70	-220.65	-519.81	8.00	14266099.99	758697.08	N 39 14 33.19 W 108	6 50.33
	7700.00	82.56	247.00	7376.46	662.63	-258.91	-609.96	8.00	14266061.71	758606.89	N 39 14 32.78 W 108	6 51.46
	7800.00	90.56	247.00	7382.46	762.37	-297.88	-701.77	8.00	14266022.72	758515.04	N 39 14 32.36 W 108	6 52.61
Hold	7818.04	92.00	247.00	7382.05	780.41	-304.93	-718.37	8.00	14266015.67	758498.43	N 39 14 32.29 W 108	6 52.82
	7900.00	92.00	247.00	7379.19	862.32	-336.93	-793.77	0.00	14265983.65	758422.99	N 39 14 31.95 W 108	6 53.76
	8000.00	92.00	247.00	7375.69	962.25	-375.98	-885.76	0.00	14265944.58	758330.95	N 39 14 31.53 W 108	6 54.91
	8100.00	92.00	247.00	7372.19	1062.19	-415.03	-977.75	0.00	14265905.51	758238.91	N 39 14 31.11 W 108	6 56.06
	8200.00	92.00	247.00	7368.69	1162.13	-454.08	-1069.75	0.00	14265866.44	758146.88	N 39 14 30.70 W 108	6 57.21
	8300.00	92.00	247.00	7365.19	1262.07	-493.13	-1161.74	0.00	14265827.37	758054.84	N 39 14 30.28 W 108	6 58.36
	8400.00	92.00	247.00	7361.69	1362.01	-532.18	-1253.74	0.00	14265788.31	757962.80	N 39 14 29.86 W 108	6 59.52
	8500.00	92.00	247.00	7358.19	1461.95	-571.23	-1345.73	0.00	14265749.24	757870.76	N 39 14 29.44 W 108	7 0.67
	8600.00	92.00	247.00	7354.70	1561.89	-610.28	-1437.72	0.00	14265710.17	757778.72	N 39 14 29.03 W 108	7 1.82
	8700.00	92.00	247.00	7351.20	1661.83	-649.33	-1529.72	0.00	14265671.10	757686.68	N 39 14 28.61 W 108	7 2.97
	8800.00	92.00	247.00	7347.70	1761.77	-688.38	-1621.71	0.00	14265632.03	757594.64	N 39 14 28.19 W 108	7 4.12
	8900.00	92.00	247.00	7344.20	1861.70	-727.43	-1713.71	0.00	14265592.96	757502.60	N 39 14 27.78 W 108	7 5.27
	9000.00	92.00	247.00	7340.70	1961.64	-766.47	-1805.70	0.00	14265553.90	757410.56	N 39 14 27.36 W 108	7 6.43
	9100.00	92.00	247.00	7337.20	2061.58	-805.52	-1897.70	0.00	14265514.83	757318.53	N 39 14 26.94 W 108	7 7.58
	9200.00	92.00	247.00	7333.71	2161.52	-844.57	-1989.69	0.00	14265475.76	757226.49	N 39 14 26.53 W 108	7 8.73
	9300.00	92.00	247.00	7330.21	2261.46	-883.62	-2081.68	0.00	14265436.69	757134.45	N 39 14 26.11 W 108	7 9.88
	9400.00	92.00	247.00	7326.71	2361.40	-922.67	-2173.68	0.00	14265397.62	757042.41	N 39 14 25.69 W 108	7 11.03
	9500.00	92.00	247.00	7323.21	2461.34	-961.72	-2265.67	0.00	14265358.56	756950.37	N 39 14 25.27 W 108	7 12.18
	9600.00	92.00	247.00	7319.71	2561.28	-1000.77	-2357.67	0.00	14265319.49	756858.33	N 39 14 24.86 W 108	7 13.33
	9700.00	92.00	247.00	7316.21	2661.21	-1039.82	-2449.66	0.00	14265280.42	756766.29	N 39 14 24.44 W 108	7 14.49
	9800.00	92.00	247.00	7312.71	2761.15	-1078.87	-2541.65	0.00	14265241.35	756674.25	N 39 14 24.02 W 108	7 15.64
	9900.00	92.00	247.00	7309.22	2861.09	-1117.92	-2633.65	0.00	14265202.28	756582.21	N 39 14 23.61 W 108	7 16.79

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS ("/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	10000.00	92.00	247.00	7305.72	2951.03	-1156.97	-2725.64	0.00	14265163.21	756490.18	N 39 14 23.19 W 108	7 17.94
	10100.00	92.00	247.00	7302.22	3060.97	-1196.02	-2817.64	0.00	14265124.15	756398.14	N 39 14 22.77 W 108	7 19.09
	10200.00	92.00	247.00	7298.72	3160.91	-1235.07	-2909.63	0.00	14265085.08	756306.10	N 39 14 22.36 W 108	7 20.24
	10300.00	92.00	247.00	7295.22	3260.85	-1274.11	-3001.63	0.00	14265046.01	756214.06	N 39 14 21.94 W 108	7 21.39
	10400.00	92.00	247.00	7291.72	3360.79	-1313.16	-3093.62	0.00	14265006.94	756122.02	N 39 14 21.52 W 108	7 22.55
	10500.00	92.00	247.00	7288.22	3460.72	-1352.21	-3185.61	0.00	14264967.87	756029.98	N 39 14 21.10 W 108	7 23.70
	10600.00	92.00	247.00	7284.73	3560.66	-1391.26	-3277.61	0.00	14264928.81	755937.94	N 39 14 20.69 W 108	7 24.85
	10700.00	92.00	247.00	7281.23	3660.60	-1430.31	-3369.60	0.00	14264889.74	755845.90	N 39 14 20.27 W 108	7 26.00
	10800.00	92.00	247.00	7277.73	3760.54	-1469.36	-3461.60	0.00	14264850.67	755753.86	N 39 14 19.85 W 108	7 27.15
	10900.00	92.00	247.00	7274.23	3860.48	-1508.41	-3553.59	0.00	14264811.60	755661.83	N 39 14 19.44 W 108	7 28.30
	11000.00	92.00	247.00	7270.73	3960.42	-1547.46	-3645.58	0.00	14264772.53	755569.79	N 39 14 19.02 W 108	7 29.45
	11100.00	92.00	247.00	7267.23	4060.36	-1586.51	-3737.58	0.00	14264733.46	755477.75	N 39 14 18.60 W 108	7 30.60
	11200.00	92.00	247.00	7263.74	4160.30	-1625.56	-3829.57	0.00	14264694.40	755385.71	N 39 14 18.18 W 108	7 31.76
	11300.00	92.00	247.00	7260.24	4260.23	-1664.61	-3921.57	0.00	14264655.33	755293.67	N 39 14 17.77 W 108	7 32.91
	11400.00	92.00	247.00	7256.74	4360.17	-1703.66	-4013.56	0.00	14264616.26	755201.63	N 39 14 17.35 W 108	7 34.06
	11500.00	92.00	247.00	7253.24	4460.11	-1742.70	-4105.55	0.00	14264577.19	755109.59	N 39 14 16.93 W 108	7 35.21
	11600.00	92.00	247.00	7249.74	4560.05	-1781.75	-4197.55	0.00	14264538.12	755017.55	N 39 14 16.52 W 108	7 36.36
	11700.00	92.00	247.00	7246.24	4659.99	-1820.80	-4289.54	0.00	14264499.06	754925.52	N 39 14 16.10 W 108	7 37.51
	11800.00	92.00	247.00	7242.74	4759.93	-1859.85	-4381.54	0.00	14264459.99	754833.48	N 39 14 15.68 W 108	7 38.66
	11900.00	92.00	247.00	7239.25	4859.87	-1898.90	-4473.53	0.00	14264420.92	754741.44	N 39 14 15.26 W 108	7 39.82
	12000.00	92.00	247.00	7235.75	4959.81	-1937.95	-4565.53	0.00	14264381.85	754649.40	N 39 14 14.85 W 108	7 40.97
	12100.00	92.00	247.00	7232.25	5059.74	-1977.00	-4657.52	0.00	14264342.78	754557.36	N 39 14 14.43 W 108	7 42.12
	12200.00	92.00	247.00	7228.75	5159.68	-2016.05	-4749.51	0.00	14264303.71	754465.32	N 39 14 14.01 W 108	7 43.27
	12300.00	92.00	247.00	7225.25	5259.62	-2055.10	-4841.51	0.00	14264264.65	754373.28	N 39 14 13.60 W 108	7 44.42
	12400.00	92.00	247.00	7221.75	5359.56	-2094.15	-4933.50	0.00	14264225.58	754281.24	N 39 14 13.18 W 108	7 45.57
	12500.00	92.00	247.00	7218.25	5459.50	-2133.20	-5025.50	0.00	14264186.51	754189.20	N 39 14 12.76 W 108	7 46.72
	12600.00	92.00	247.00	7214.76	5559.44	-2172.25	-5117.49	0.00	14264147.44	754097.17	N 39 14 12.34 W 108	7 47.87
	12700.00	92.00	247.00	7211.26	5659.38	-2211.29	-5209.48	0.00	14264108.37	754005.13	N 39 14 11.93 W 108	7 49.03
Federal 28-11H PBHL/TD	12778.82	92.00	247.00	7208.50	5738.15	-2242.07	-5281.99	0.00	14264077.58	753932.58	N 39 14 11.60 W 108	7 49.93

Survey Type: Def Plan

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma

Survey Program:

MD From (ft)	MD To (ft)	EOU Freq (ft)	Survey Tool Type	Borehole / Survey
0.000	22.000	1/100.000	SLB_MWD-STD-Depth Only	Pilot / Federal 28-11H Pilot R6 ors 17-Mar-11
22.000	5200.000	1/100.000	SLB_MWD-STD	Pilot / Federal 28-11H Pilot R6 ors 17-Mar-11
5200.000	12778.821	1/100.000	SLB_MWD-STD	Lateral / Federal 28-11H Lateral R6 ors 06-Apr-11

Federal 28-11H Pilot R6 ors 17-Mar-11 Proposal Report

(Def Plan)

Report Date: April 12, 2011 - 01:49 PM
 Client: EnCana Oil & Gas (USA) Inc.
 Field: CO, Mesa County (NAD 83 UTM 13) EnCana 2010
 Structure / Slot: Encana 28-09S-96W (PL28SW Pad) / Federal 28-11H
 Well: Federal 28-11H
 Borehole: Pilot
 UWI / API#: Unknown / Unknown
 Survey Name: Federal 28-11H Pilot R6 ors 17-Mar-11
 Survey Date: December 13, 2010
 Tort / AHD / DDI / ERD Ratio: 0.000 * / 0.000 ft / 0.000 / 0.000
 Coordinate Reference System: NAD83 UTM Zone 13N, US Feet
 Location Lat / Long: N 39° 14' 35.54500", W 108° 6' 43.82302"
 Location Grid N/E Y/X: N 14266320.744 ftUS, E 759217.144 ftUS
 CRS Grid Convergence Angle: -1.96997873 *
 Grid Scale Factor: 1.00048835

Survey / DLS Computation: Minimum Curvature / Lubinski
 Vertical Section Azimuth: 220.000 ° (Grid North)
 Vertical Section Origin: 0.000 ft, 0.000 ft
 TVD Reference Datum: RKB
 TVD Reference Elevation: 6107.000 ft above MSL
 Seabed / Ground Elevation: 6085.000 ft above MSL
 Magnetic Declination: 10.440 *
 Total Field Strength: 52132.470 nT
 Magnetic Dip Angle: 65.548 *
 Declination Date: December 13, 2010
 Magnetic Declination Model: BGGM 2010
 North Reference: Grid North
 Grid Convergence Used: -1.970 *
 Total Corr Mag North->Grid North: 12.410 *
 Local Coord Referenced To: Well Head

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (* / 100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' '')	Longitude (E/W ° ' '')
Federal 28-11 SHL	0.00	0.00	220.00	0.00	0.00	0.00	0.00	N/A	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	100.00	0.00	220.00	100.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	200.00	0.00	220.00	200.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	300.00	0.00	220.00	300.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	400.00	0.00	220.00	400.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	500.00	0.00	220.00	500.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	600.00	0.00	220.00	600.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	700.00	0.00	220.00	700.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	800.00	0.00	220.00	800.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	900.00	0.00	220.00	900.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	1000.00	0.00	220.00	1000.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	1100.00	0.00	220.00	1100.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
Ohio Creek (Top Kmv)	1175.00	0.00	220.00	1175.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	1200.00	0.00	220.00	1200.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	1300.00	0.00	220.00	1300.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	1400.00	0.00	220.00	1400.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	1500.00	0.00	220.00	1500.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
Williams Fork Fm	1527.00	0.00	220.00	1527.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	1600.00	0.00	220.00	1600.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	1700.00	0.00	220.00	1700.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	1800.00	0.00	220.00	1800.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	1900.00	0.00	220.00	1900.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	2000.00	0.00	220.00	2000.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	2100.00	0.00	220.00	2100.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	2200.00	0.00	220.00	2200.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	2300.00	0.00	220.00	2300.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	2400.00	0.00	220.00	2400.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	2500.00	0.00	220.00	2500.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	2600.00	0.00	220.00	2600.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	2700.00	0.00	220.00	2700.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	2800.00	0.00	220.00	2800.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
Top Gas	2863.00	0.00	220.00	2863.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	2900.00	0.00	220.00	2900.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	3000.00	0.00	220.00	3000.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	3100.00	0.00	220.00	3100.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	3200.00	0.00	220.00	3200.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	3300.00	0.00	220.00	3300.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	3400.00	0.00	220.00	3400.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	3500.00	0.00	220.00	3500.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
Coal Ridge (Paludal)	3558.00	0.00	220.00	3558.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	3600.00	0.00	220.00	3600.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	3700.00	0.00	220.00	3700.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	3800.00	0.00	220.00	3800.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
Rollins Ss (Iles Fm)	3863.00	0.00	220.00	3863.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	3900.00	0.00	220.00	3900.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	4000.00	0.00	220.00	4000.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	4100.00	0.00	220.00	4100.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
Cozzette Ss	4112.00	0.00	220.00	4112.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	4200.00	0.00	220.00	4200.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	4300.00	0.00	220.00	4300.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	4301.00	0.00	220.00	4301.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
Corcoran Ss	4400.00	0.00	220.00	4400.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	4500.00	0.00	220.00	4500.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	4600.00	0.00	220.00	4600.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	4700.00	0.00	220.00	4700.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	4800.00	0.00	220.00	4800.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	4900.00	0.00	220.00	4900.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	5000.00	0.00	220.00	5000.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
Mancos A	5016.00	0.00	220.00	5016.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
Buck Tongue	5021.00	0.00	220.00	5021.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	5100.00	0.00	220.00	5100.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	5200.00	0.00	220.00	5200.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	5300.00	0.00	220.00	5300.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	5400.00	0.00	220.00	5400.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82
	5500.00	0.00	220.00	5500.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55	W 108 6 43.82

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS ("/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
Castlegate	5549.00	0.00	220.00	5549.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	5600.00	0.00	220.00	5600.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	5700.00	0.00	220.00	5700.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	5795.00	0.00	220.00	5795.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
Mancos B	5800.00	0.00	220.00	5800.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	5900.00	0.00	220.00	5900.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	6000.00	0.00	220.00	6000.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	6100.00	0.00	220.00	6100.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
Prairie Canyon	6170.00	0.00	220.00	6170.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	6200.00	0.00	220.00	6200.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	6300.00	0.00	220.00	6300.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	6400.00	0.00	220.00	6400.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	6500.00	0.00	220.00	6500.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	6600.00	0.00	220.00	6600.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	6700.00	0.00	220.00	6700.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	6800.00	0.00	220.00	6800.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
Noabrara Fm	6900.00	0.00	220.00	6900.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	7000.00	0.00	220.00	7000.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	7097.00	0.00	220.00	7097.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	7100.00	0.00	220.00	7100.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
Horizontal Target	7200.00	0.00	220.00	7200.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	7300.00	0.00	220.00	7300.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	7383.00	0.00	220.00	7383.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	7400.00	0.00	220.00	7400.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	7500.00	0.00	220.00	7500.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	7600.00	0.00	220.00	7600.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	7683.00	0.00	220.00	7683.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	7700.00	0.00	220.00	7700.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
Nio. Laminated Siltst	7800.00	0.00	220.00	7800.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	7900.00	0.00	220.00	7900.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	8000.00	0.00	220.00	8000.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	8100.00	0.00	220.00	8100.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	8200.00	0.00	220.00	8200.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	8300.00	0.00	220.00	8300.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	8400.00	0.00	220.00	8400.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	8500.00	0.00	220.00	8500.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	8600.00	0.00	220.00	8600.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	8700.00	0.00	220.00	8700.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	8800.00	0.00	220.00	8800.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	8900.00	0.00	220.00	8900.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	9000.00	0.00	220.00	9000.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	9100.00	0.00	220.00	9100.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82
	9176.00	0.00	220.00	9176.00	0.00	0.00	0.00	0.00	14266320.74	759217.14	N 39 14 35.55 W 108	6 43.82

Survey Type: Def Plan

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma

Survey Program:

MD From (ft)	MD To (ft)	EOU Freq (ft)	Survey Tool Type	Borehole / Survey
0.000	22.000	1/100.000	SLB_MWD-STD-Depth Only	Pilot / Federal 28-11H Pilot R6 ors 17-Mar-11
22.000	9176.000	1/100.000	SLB_MWD-STD	Pilot / Federal 28-11H Pilot R6 ors 17-Mar-11