

State of New Mexico  
Energy, Minerals and Natural Resources Department

Susana Martinez  
Governor

Ken McQueen  
Cabinet Secretary

Matthias Sayer  
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: 9/20/2016

Well information;

Operator Enzona, Well Name and Number Venado Canyon Unit 205H

API# 30-043-21291, Section 12, Township 22 N/S, Range 6 E/W

Conditions of Approval: (See the below checked and handwritten conditions)

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

Chad Bern  
NMOCD Approved by Signature

3-28-2017  
Date

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

FORM APPROVED  
OMB No. 1004-0137  
Expires October 31, 2014

**APPLICATION FOR PERMIT TO DRILL OR REENTER**

5a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. NMNM 109385
6a. Type of Well: <input checked="" type="checkbox"/> Oil Well <input 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
2. Name of Operator ENCANA OIL & GAS (USA) INC		7. If Unit or CA Agreement, Name and No. VENADO CANYON UNIT / NMNM13536
3a. Address 370 17TH STREET, SUITE 1700 DENVER CO		8. Lease Name and Well No. VENADO CANYON UNIT 205H
3b. Phone No. (include area code) (720)876-5331		9. API Well No. 30-043-21291
4. Location of Well (Report location clearly and in accordance with any State requirements.)* At surface NWSW / 1350 FSL / 188 FWL / LAT 36.148471 / LONG -107.428709 At proposed prod. zone NENW / 330 FNL / 2340 FWL / LAT 36.158764 / LONG -107.438892		10. Field and Pool, or Exploratory Wildcat
14. Distance in miles and direction from nearest town or post office* 59.3 miles		11. Sec., T. R. M. or Blk. and Survey or Area SEC 12 / T22N / R6W / NMP
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 330 feet	16. No. of acres in lease 1440	12. County or Parish SANDOVAL
17. Spacing Unit dedicated to this well 5280	13. State NM	
18. Distance from proposed location* to nearest well, drilling, completed, 30 feet applied for, on this lease, ft.	19. Proposed Depth 5388 feet / 10317 feet	20. BLM/BIA Bond No. on file FED: COB000235
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 7040 feet	22. Approximate date work will start* 02/01/2017	23. Estimated duration 20 days

24. Attachments

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

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

25. Signature (Electronic Submission)	Name (Printed/Typed) Katie Wegner / Ph: (720)876-3533	Date 09/20/2016
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Title Regulatory Analyst		
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Approved by (Signature) <i>[Signature]</i>	Name (Printed/Typed) AFM	Date 3/16/17
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Title AFM	Office FARMINGTON	
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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)

\*(Instructions on page 2)

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

**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**

**This action is subject to  
technical and procedural review  
pursuant to 43 CFR 3165.3 and  
appeal pursuant to 43 CFR 3165.4**

**NMOC**  
R



**DISTRICT I**  
1025 N. French Dr., Hobbs, N.M. 88240  
Phone: (575) 393-6161 Fax: (575) 393-0720

**DISTRICT II**  
811 S. First St., Artesia, N.M. 88210  
Phone: (575) 748-1283 Fax: (575) 748-9720

**DISTRICT III**  
1000 Rio Brazos Rd., Artec, N.M. 87410  
Phone: (505) 334-6178 Fax: (505) 334-6170

**DISTRICT IV**  
1220 S. St. Francis Dr., Santa Fe, NM 87505  
Phone: (505) 476-3460 Fax: (505) 476-3482

State of New Mexico  
Energy, Minerals & Natural Resources Department

Form C-102  
Revised August 1, 2011

Submit one copy to appropriate  
District Office

OIL CONSERVATION DIVISION  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-043-21291		Pool Code 42289	Pool Name LYBROOK GALLUP
Property Code 310075	Property Name VENADO CANYON UNIT		Well Number 205H
OGRID No. 282327	Operator Name ENCANA OIL & GAS (USA) INC.		Elevation 7040.4'

<sup>10</sup> Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	WEST/West line	County
L	12	22N	6W		1350'	SOUTH	188'	WEST	SANDOVAL

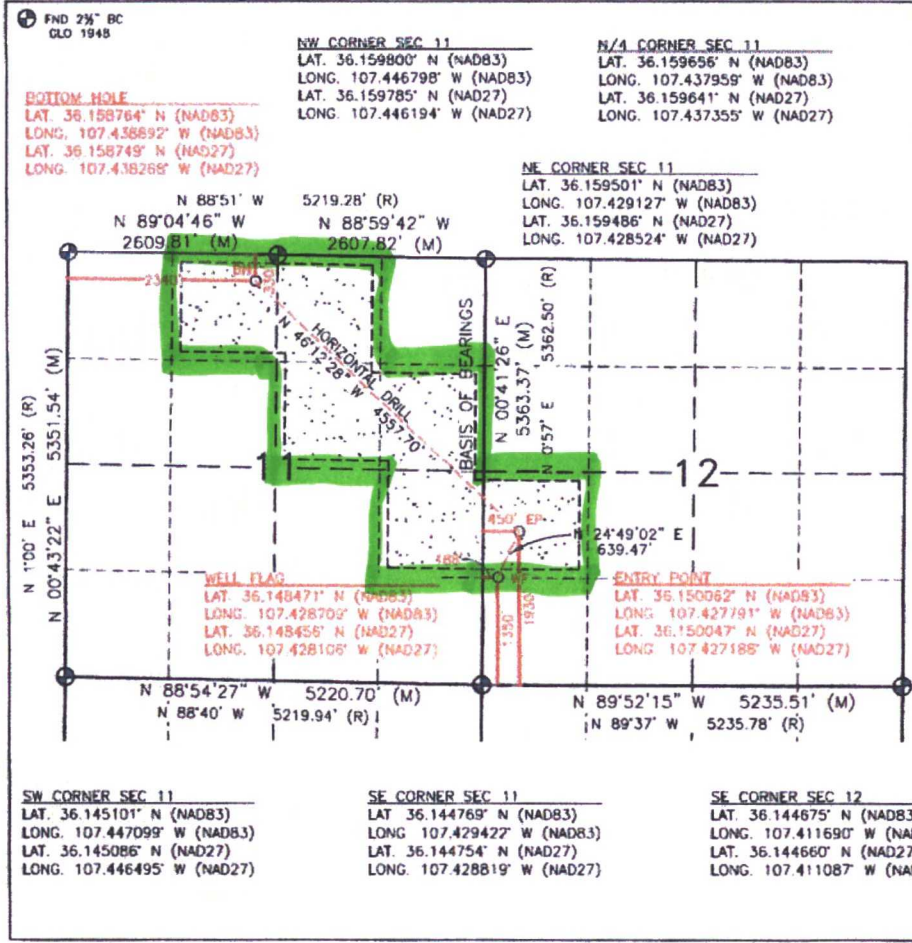
<sup>11</sup> Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	WEST/West line	County
C	11	22N	6W		330'	NORTH	2340'	WEST	SANDOVAL

<sup>12</sup> Dedicated Acres PENETRATED SPACING UNIT: NE/NE, NW/NE, SW/NE & NE/SE SEC 11 (200 ACRES) & NW/SW SEC 12 (40 ACRES) 4226-29-4285-21-22-23-24-25-26-27-28-29-30-31-32-33-34-35-36-37-38-39-40-41-42-43-44-45-46-47-48-49-50-51-52-53-54-55-56-57-58-59-60-61-62-63-64-65-66-67-68-69-70-71-72-73-74-75-76-77-78-79-80-81-82-83-84-85-86-87-88-89-90-91-92-93-94-95-96-97-98-99-100-101-102-103-104-105-106-107-108-109-110-111-112-113-114-115-116-117-118-119-120-121-122-123-124-125-126-127-128-129-130-131-132-133-134-135-136-137-138-139-140-141-142-143-144-145-146-147-148-149-150-151-152-153-154-155-156-157-158-159-160-161-162-163-164-165-166-167-168-169-170-171-172-173-174-175-176-177-178-179-180-181-182-183-184-185-186-187-188-189-190-191-192-193-194-195-196-197-198-199-200-201-202-203-204-205-206-207-208-209-210-211-212-213-214-215-216-217-218-219-220-221-222-223-224-225-226-227-228-229-230-231-232-233-234-235-236-237-238-239-240	<sup>13</sup> Joint or Infill	<sup>14</sup> Consolidation Code	<sup>15</sup> Order No. R-14067A (5,280 acres)
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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

Total 240 acres



<sup>16</sup> **17 OPERATOR CERTIFICATION**  
I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.  
Signature: *Katie Wegner* 09/26/16  
Date: 09/26/16  
Printed Name: Katie Wegner  
E-mail Address: katie.wegner@encana.com

**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.  
MARCH 30, 2016  
Date of Survey  
Signature and Seal of Professional Surveyor:  
HENRY P. BROADHURST, JR.  
NEW MEXICO  
PROFESSIONAL SURVEYOR  
09/23/2016  
Certificate Number: 11393

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 1625 N. French Dr., Hobbs, N.M. 88240  
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State of New Mexico  
 Energy, Minerals & Natural Resources Department

Form C-102  
 Revised August 1, 2011

Submit one copy to appropriate  
 District Office

OIL CONSERVATION DIVISION  
 1220 South St. Francis Dr.  
 Santa Fe, NM 87505

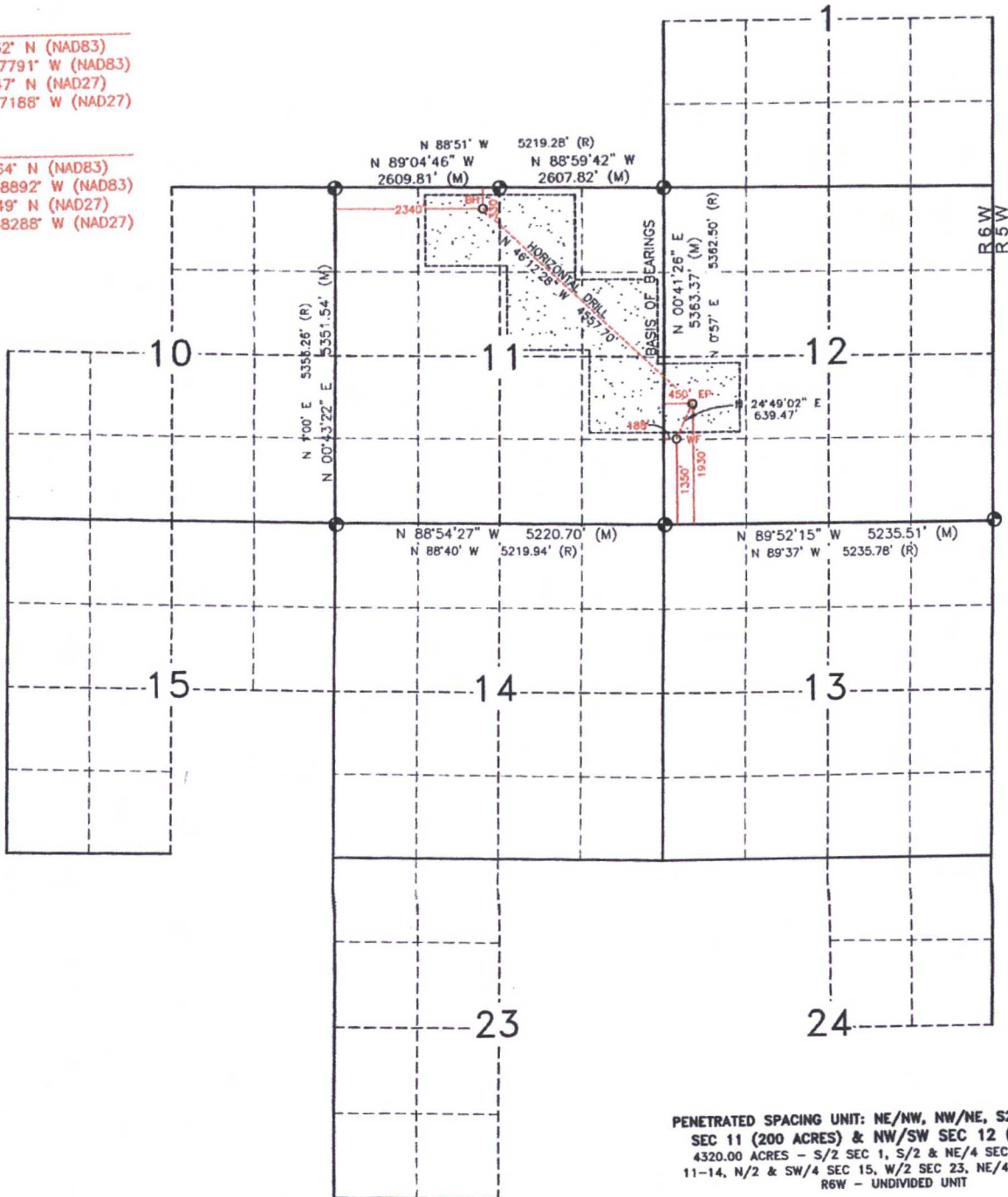
AMENDED REPORT

ENCANA OIL & GAS (USA) INC.  
 VENADO CANYON UNIT #205H

**WELL FLAG**  
 LAT. 36.148471' N (NAD83)  
 LONG. 107.428709' W (NAD83)  
 LAT. 36.148456' N (NAD27)  
 LONG. 107.428106' W (NAD27)

**ENTRY POINT**  
 LAT. 36.150062' N (NAD83)  
 LONG. 107.427791' W (NAD83)  
 LAT. 36.150047' N (NAD27)  
 LONG. 107.427188' W (NAD27)

**BOTTOM HOLE**  
 LAT. 36.158764' N (NAD83)  
 LONG. 107.438892' W (NAD83)  
 LAT. 36.158749' N (NAD27)  
 LONG. 107.438288' W (NAD27)



PENETRATED SPACING UNIT: NE/NW, NW/NE, S2/NE & NE/SE  
 SEC 11 (200 ACRES) & NW/SW SEC 12 (40 ACRES)  
 4320.00 ACRES - S/2 SEC 1, S/2 & NE/4 SEC 10, ALL SEC  
 11-14, N/2 & SW/4 SEC 15, W/2 SEC 23, NE/4 SEC 24, T22N  
 R6W - UNDIVIDED UNIT



Venado Canyon Unit 205H  
 SHL: NW/4 SW/4 Sec 12 T22N R6W, 1350' FSL, 188' FWL  
 BHL: NE/4 NW/4 Sec 11 T22N R6W, 330' FNL, 2340' FWL  
 Sandoval, New Mexico  
 Lease Number: NMNM 117562 & NMNM 109390

**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.	1,385
Kirtland Shale	1,482
Fruitland Coal	1,669
Pictured Cliffs Ss.	1,878
Lewis Shale	1,986
Cliffhouse Ss.	2,710
Menefee Fn.	3,404
Point Lookout Ss.	4,105
Mancos Shale	4,283
Mancos Silt	4,890
Gallup Fn.	5,175
Base Gallup	5,504

The referenced surface elevation is 7040', KB 7056'

**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	1,669
Oil/Gas	Pictured Cliffs Ss.	1,878
Oil/Gas	Cliffhouse Ss.	2,710
Gas	Menefee Fn.	3,404
Oil/Gas	Point Lookout Ss.	4,105
Oil/Gas	Mancos Shale	4,283
Oil/Gas	Mancos Silt	4,890
Oil/Gas	Gallup Fn.	5,175

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

**Venado Canyon Unit 205H**

**SHL: NW/4 SW/4 Sec 12 T22N R6W, 1350' FSL, 188' FWL**

**BHL: NE/4 NW/4 Sec 11 T22N R6W, 330' FNL, 2340' FWL**

**Sandoval, New Mexico**

**Lease Number: NMNM 117562 & NMNM 109390**

**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'-5500'	8 3/4"	7"	26#	J55, LTC New
Production Liner	5400'-10317'	6 1/8"	4 1/2"	11.6#	N80, 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	N80	LTC	6350	7780	201	1.125	1.1	1.5

All casing strings will be API grades and connections

Casing design is subject to revision based on geologic conditions encountered.



**Venado Canyon Unit 205H**

**SHL: NW/4 SW/4 Sec 12 T22N R6W, 1350' FSL, 188' FWL**

**BHL: NE/4 NW/4 Sec 11 T22N R6W, 330' FNL, 2340' FWL**

**Sandoval, New Mexico**

**Lease Number: NMNM 117562 & NMNM 109390**

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	Design	Centralizers
Conductor	0'-60'	100 sks	Type I Neat 16 ppg @ 4.5 ft3/sk	Surface	None
Surface	0'-500'	228 sks	Type III Cement 14.6 ppg with 1% bwoc Calcium Chloride + 0.25 lbs/sack Cello Flake + 0.2% bwoc FL-52A + 58.9% Fresh Water @ 1.38 ft3/sk	Surface	1 per joint on bottom 3 joints
Intermediate	0'-5500'	100% open hole excess Stage 1 Lead: 512 sks Stage 1 Tail: 391 sks	Lead: PremLite + 3% CaCl + 0.25lb/sk CelloFlake + 5lb/sk LCM, 12.1ppg 2.13 ft3/sk Tail: Type III Cmt + 1% CaCl + 0.25lb/sk Cello Flake 14.5ppg @ 1.38 ft3/sk	Surface	1 every 3 joints through water bearing zones
Production Liner	5400'-10317'	50% OH excess Stage 1 Blend Total: 279sks	Blend: Premium Lite High Strength FM 13.5 ppg with 0.7% bwoc R-3 + 3% bwow 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**

The proposed horizontal well will have a kick off point of 4855'. Directional plans are attached.

Description	Proposed Depth (TVD/MD)	Formation
Horizontal Lateral TD	5388'/10317'	Gallup

**Venado Canyon Unit 205H**

**SHL: NW/4 SW/4 Sec 12 T22N R6W, 1350' FSL, 188' FWL**

**BHL: NE/4 NW/4 Sec 11 T22N R6W, 330' FNL, 2340' FWL**

**Sandoval, New Mexico**

**Lease Number: NMNM 117562 & NMNM 109390**

**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'-5347'/5500'	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"	5347'/5500'- 5388'/10317'	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 test shall be performed every 24 hours after mudding up to determine, as applicable: density, viscosity, gel strength, filtration, and pH. Sized LCM material (such as sawdust & wood fiber) will be kept on location in order to mitigate lost circulation. Electronic PVT totalizers will be used to monitor drilling fluid volumes.

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 +/- 2537 psi based on a 9.0 ppg at 5421' TVD of the horizontal lateral target. No abnormal pressure or temperatures are anticipated. The expected bottom hole temperature is 172 deg F.

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 March 1, 2017. 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

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



LOC: NW/4 SW/4 Sec 12 T22N R6W, 1350' FS		Encana Oil & Gas (USA) Inc.			ENG: 0		3-15-17	
County: Sandoval		WELL SUMMARY			RIG: Unassigned			
WELL: Venado Canyon Unit 205H					GLE: 7040.4			
					RKBE: 7056.4			
MWD LWD	OPEN HOLE LOGGING	FORM	DEPTH		HOLE SIZE	CASING SPECS	MW MUD TYPE	DEVIATION INFORMATION
			TVD	MD				
			60	60'		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			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	1,385 1,482 1,669 1,878 1,986 2,710 3,404 4,105 4,283			7" 26ppf J55 LTC TOC @ surface (100% OH excess - 70% Lead 30% Tail) Stage 1 Total: 903sks  Stage 1 Lead: 512 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: 391 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 on site	KOP Mancos Silt Gallup Fn. 7" Csg	4,855 4,890 5,175 5,347	4,900 5,500'				
Surveys every stand to TD unless directed otherwise by Geologist	No OH Logs	Horizontal Target TD Base Gallup	5,421 5,388 5,504	10,317		100' overlap at liner top 4817' Drilled Lateral		Horz Inc/TVD 90.2deg/5421.4ft TD = 10316.6 MD
MWD Gamma Directional						4 1/2" 11.6ppf N80 LTC TOC @ hanger (50% OH excess) Stage 1 Total: 279sks  Stage 1 Blend: 279 sks Premium Lite High Strength FM + 0.7% bwoc R-3 + 3% bwow 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 4900', 8 3/4 inch holesize
- 5) Start curve at 10deg/100' build rate
- 6) Drill to csg point of 5500' MD
- 7) R&C 7" csg, circ cmt to surface
- 8) Land at ~55 deg, drill lateral to 10317' run 4 1/2 inch cemented liner

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

**Sandoval County, NM**

**S12-T22N-R6W**

**VCU L12-2206 03H (205H)**

**OH**

**PLAN #1**

## **Anticollision Report**

**30 August, 2016**



# Cathedral Energy Services

## Anticollision Report

<b>Company:</b> EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b> Well VCU L12-2206 03H (205H)
<b>Project:</b> Sandoval County, NM	<b>TVD Reference:</b> 16' KB @ 7058.0ft
<b>Reference Site:</b> S12-T22N-R6W	<b>MD Reference:</b> 16' KB @ 7056.0ft
<b>Site Error:</b> 0.0ft	<b>North Reference:</b> True
<b>Reference Well:</b> VCU L12-2206 03H (205H)	<b>Survey Calculation Method:</b> Minimum Curvature
<b>Well Error:</b> 0.0ft	<b>Output errors are at:</b> 2.00 sigma
<b>Reference Wellbore:</b> OH	<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>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	Stations	<b>Error Model:</b>	Systematic Ellipse
<b>Depth Range:</b>	Unlimited	<b>Scan Method:</b>	Closest Approach 3D
<b>Results Limited by:</b>	Maximum center-center distance of 1,500.0ft	<b>Error Surface:</b>	Elliptical Conic
<b>Warning Levels Evaluated at:</b>	2.00 Sigma		

<b>Survey Tool Program</b>	Date	8/30/2016	
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>
0.0	10,341.7	PLAN #1 (OH)	MWD+HDGM
			<b>Description</b>
			OWSG MWD + HDGM

Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
<b>Summary</b>						
Offset Well - Wellbore - Design						
S12-T22N-R6W						
VCU A11-2206 01H (207H) - OH - PLAN #1	9,131.9	5,394.2	1,382.0	1,263.9	11.707	CC
VCU A11-2206 01H (207H) - OH - PLAN #1	9,200.0	5,339.7	1,382.5	1,263.0	11.572	ES
VCU A11-2206 01H (207H) - OH - PLAN #1	9,500.0	5,167.5	1,404.1	1,279.0	11.218	SF
VCU L12-2206 01H (203H) - OH - PLAN #1	500.0	500.0	59.9	56.8	18.913	CC, ES
VCU L12-2206 01H (203H) - OH - PLAN #1	10,341.7	10,352.5	1,367.6	1,105.8	5.223	SF
VCU L12-2206 02H (204H) - OH - PLAN #1	500.0	500.0	30.0	26.8	9.456	CC, ES
VCU L12-2206 02H (204H) - OH - PLAN #1	700.0	697.7	36.6	31.9	7.839	SF
VCU L12-2206 04H (206H) - OH - PLAN #1	500.0	500.0	30.4	27.2	9.594	CC, ES
VCU L12-2206 04H (206H) - OH - PLAN #1	5,585.6	5,552.5	117.8	76.6	2.861	SF

# Cathedral Energy Services

## Anticollision Report

**Company:** EnCana Oil & Gas (USA) Inc  
**Project:** Sandoval County, NM  
**Reference Site:** S12-T22N-R6W  
**Site Error:** 0.0ft  
**Reference Well:** VCU L12-2206 03H (205H)  
**Well Error:** 0.0ft  
**Reference Wellbore:** OH  
**Reference Design:** PLAN #1

**Local Co-ordinate Reference:** Well VCU L12-2206 03H (205H)  
**TVD Reference:** 16' KB @ 7056.0ft  
**MD Reference:** 16' KB @ 7056.0ft  
**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 S12-T22N-R6W - VCU A11-2206 01H (207H) - OH - PLAN #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD+HOGM													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (ft)	Offset Wellbore Centre +E/W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axial	Separation Factor		
5,750.0	5,432.1	8,775.8	5,339.3	22.2	94.1	88.69	1,572.4	1,259.4	1,499.8	1,383.5	116.23	12.903		
5,800.0	5,435.6	8,726.2	5,339.4	22.7	92.8	89.09	1,806.7	1,223.6	1,494.5	1,379.0	115.53	12.936		
5,819.8	5,435.8	8,706.5	5,339.5	23.0	92.3	89.30	1,620.3	1,209.4	1,492.4	1,377.1	115.27	12.947		
5,900.0	5,435.3	8,626.8	5,339.8	24.0	90.2	89.32	1,675.4	1,151.7	1,483.8	1,369.6	114.26	12.987		
6,000.0	5,434.6	8,527.3	5,340.1	25.5	87.7	89.36	1,744.2	1,079.9	1,473.2	1,360.0	113.16	13.019		
6,100.0	5,433.9	8,427.9	5,340.5	27.1	85.2	89.40	1,812.9	1,008.0	1,462.5	1,350.3	112.21	13.034		
6,200.0	5,433.2	8,328.5	5,340.8	28.8	82.6	89.43	1,881.6	936.2	1,451.9	1,340.5	111.39	13.034		
6,300.0	5,432.5	8,229.1	5,341.2	30.7	80.1	89.47	1,950.3	864.3	1,441.2	1,330.5	110.67	13.022		
6,400.0	5,431.8	8,129.6	5,341.5	32.6	77.6	89.51	2,019.1	792.5	1,430.5	1,320.5	110.05	12.999		
6,500.0	5,431.1	8,030.2	5,341.9	34.6	75.0	89.55	2,087.8	720.6	1,419.9	1,310.4	109.51	12.966		
6,606.4	5,430.4	7,924.4	5,342.2	36.8	72.4	89.59	2,160.9	644.2	1,408.5	1,299.5	109.00	12.923		
6,700.0	5,429.7	7,831.2	5,342.6	38.8	70.0	89.61	2,225.4	576.8	1,400.4	1,291.8	108.63	12.892		
6,800.0	5,429.0	7,731.3	5,342.9	41.0	67.5	89.64	2,294.4	504.6	1,396.0	1,287.6	108.33	12.887		
6,841.7	5,428.7	7,689.6	5,343.1	42.0	66.4	89.65	2,323.2	474.5	1,395.4	1,287.1	108.23	12.893		
6,900.0	5,428.3	7,631.3	5,343.3	43.3	65.0	89.67	2,363.5	432.4	1,395.1	1,286.9	108.11	12.904		
7,000.0	5,427.6	7,531.3	5,343.6	45.6	62.5	89.71	2,432.6	360.1	1,394.5	1,286.6	107.95	12.918		
7,100.0	5,426.9	7,431.3	5,344.0	48.0	60.0	89.76	2,501.8	287.9	1,394.0	1,286.2	107.83	12.928		
7,200.0	5,426.2	7,331.3	5,344.3	50.4	57.5	89.80	2,570.9	215.6	1,393.4	1,285.7	107.74	12.934		
7,300.0	5,425.5	7,231.3	5,344.7	52.8	55.1	89.84	2,640.0	143.3	1,392.9	1,285.2	107.68	12.935		
7,400.0	5,424.8	7,131.3	5,345.0	55.2	52.6	89.89	2,709.1	71.1	1,392.4	1,284.7	107.67	12.932		
7,500.0	5,424.1	7,031.3	5,345.4	57.7	50.2	89.93	2,778.2	-1.2	1,391.9	1,284.2	107.68	12.926		
7,600.0	5,423.4	6,931.4	5,345.7	60.1	47.8	89.97	2,847.3	-73.4	1,391.3	1,283.6	107.73	12.915		
7,700.0	5,422.7	6,831.4	5,346.1	62.6	45.4	90.02	2,916.5	-145.7	1,390.8	1,283.0	107.82	12.900		
7,800.0	5,422.0	6,731.4	5,346.4	65.1	43.0	90.06	2,985.6	-217.9	1,390.3	1,282.3	107.94	12.880		
7,900.0	5,421.3	6,631.4	5,346.8	67.6	40.7	90.10	3,054.7	-290.2	1,389.7	1,281.6	108.11	12.855		
8,000.0	5,420.6	6,531.4	5,347.1	70.1	38.4	90.14	3,123.8	-362.5	1,389.2	1,280.9	108.32	12.825		
8,100.0	5,420.0	6,431.4	5,347.5	72.6	36.2	90.19	3,192.9	-434.7	1,388.7	1,280.1	108.59	12.789		
8,200.0	5,419.3	6,331.4	5,347.8	75.1	34.0	90.23	3,262.0	-507.0	1,388.2	1,279.2	108.91	12.746		
8,300.0	5,418.6	6,231.4	5,348.2	77.6	31.9	90.27	3,331.2	-579.2	1,387.6	1,278.3	109.31	12.694		
8,400.0	5,417.9	6,131.4	5,348.5	80.1	29.8	90.32	3,400.3	-651.5	1,387.1	1,277.3	109.80	12.633		
8,500.0	5,417.2	6,031.4	5,348.9	82.7	27.9	90.36	3,469.4	-723.8	1,386.6	1,276.2	110.38	12.561		
8,600.0	5,416.5	5,931.4	5,349.2	85.2	26.1	90.40	3,538.5	-796.0	1,386.1	1,275.0	111.10	12.476		
8,700.0	5,415.8	5,831.4	5,349.6	87.7	24.4	90.45	3,607.6	-868.3	1,385.5	1,273.6	111.96	12.376		
8,800.0	5,415.1	5,731.4	5,349.9	90.3	22.9	90.49	3,676.7	-940.5	1,385.0	1,272.0	113.00	12.257		
8,900.0	5,414.4	5,624.7	5,346.3	92.8	21.5	90.37	3,750.3	-1,017.7	1,384.3	1,270.2	114.14	12.128		
9,000.0	5,413.7	5,518.0	5,324.3	95.4	20.3	89.49	3,821.8	-1,093.5	1,383.1	1,267.5	115.59	11.966		
9,100.0	5,413.0	5,422.0	5,288.3	97.9	19.6	88.03	3,882.4	-1,158.6	1,382.1	1,264.7	117.41	11.771		
9,131.9	5,412.7	5,394.2	5,275.2	98.8	19.4	87.49	3,899.0	-1,176.6	1,382.0	1,263.9	118.05	11.707 CC		
9,200.0	5,412.3	5,339.7	5,246.0	100.5	19.1	86.29	3,930.1	-1,210.6	1,382.5	1,263.0	119.47	11.572 ES		
9,300.0	5,411.6	5,270.9	5,203.2	103.1	18.8	84.53	3,966.2	-1,250.4	1,385.6	1,264.1	121.56	11.399		
9,400.0	5,410.9	5,214.2	5,163.3	105.6	18.6	82.90	3,993.0	-1,280.4	1,392.6	1,269.1	123.50	11.276		
9,500.0	5,410.2	5,167.5	5,127.5	108.2	18.5	81.44	4,012.9	-1,303.0	1,404.1	1,279.0	125.17	11.218 SF		
9,600.0	5,409.5	5,128.8	5,096.2	110.8	18.4	80.16	4,027.8	-1,320.0	1,420.8	1,294.3	126.50	11.232		
9,700.0	5,408.8	5,100.0	5,071.9	113.3	18.3	79.18	4,037.8	-1,331.7	1,442.8	1,315.3	127.46	11.320		
9,800.0	5,408.1	5,069.3	5,045.1	115.9	18.2	78.10	4,047.6	-1,343.3	1,470.2	1,342.2	127.99	11.487		

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:** Sandoval County, NM  
**Reference Site:** S12-T22N-R6W  
**Site Error:** 0.0ft  
**Reference Well:** VCU L12-2206 03H (205H)  
**Well Error:** 0.0ft  
**Reference Wellbore:** OH  
**Reference Design:** PLAN #1

**Local Co-ordinate Reference:** Well VCU L12-2206 03H (205H)  
**TVD Reference:** 16' KB @ 7056.0ft  
**MD Reference:** 16' KB @ 7056.0ft  
**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 S12-T22N-R6W - VCU L12-2206 01H (203H) - OH - PLAN #1													Offset Site Error:	0.0 ft
Survey Program: G-MWD+HDCM													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance			Total		Separation	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipse (ft)	Uncertainty Axis	Factor		
0.0	0.0	0.0	0.0	0.0	0.0	-119.88	-29.9	-52.0	59.9					
100.0	100.0	100.0	100.0	0.2	0.2	-119.88	-29.9	-52.0	59.9	59.6	0.30	199.032		
200.0	200.0	200.0	200.0	0.5	0.5	-119.88	-29.9	-52.0	59.9	58.9	1.02	58.869		
300.0	300.0	300.0	300.0	0.9	0.9	-119.88	-29.9	-52.0	59.9	58.2	1.74	34.543		
400.0	400.0	400.0	400.0	1.2	1.2	-119.88	-29.9	-52.0	59.9	57.5	2.45	24.442		
500.0	500.0	500.0	500.0	1.6	1.6	-119.88	-29.9	-52.0	59.9	56.8	3.17	18.913 CC, ES		
600.0	600.0	598.6	598.6	1.9	1.9	-121.07	-31.5	-52.3	61.1	57.2	3.88	15.748		
700.0	700.0	697.0	696.8	2.3	2.3	-124.37	-36.5	-53.3	64.7	60.1	4.60	14.052		
800.0	800.0	794.8	794.2	2.7	2.6	151.90	-44.7	-55.0	72.7	67.3	5.35	13.577		
900.0	899.8	891.6	890.3	3.0	2.9	148.39	-56.0	-57.4	86.6	80.5	6.11	14.167		
1,000.0	999.5	986.9	984.5	3.4	3.3	145.80	-70.3	-60.3	106.3	99.5	6.88	15.463		
1,100.0	1,098.7	1,083.1	1,079.2	3.7	3.7	144.21	-86.8	-63.8	130.9	123.3	7.57	17.283		
1,200.0	1,197.5	1,179.2	1,173.9	4.1	4.0	143.74	-103.5	-67.2	158.3	150.0	8.26	19.166		
1,281.6	1,277.6	1,257.1	1,250.5	4.4	4.4	143.86	-117.0	-70.0	182.7	173.8	8.83	20.697		
1,300.0	1,295.6	1,274.6	1,267.7	4.5	4.4	143.99	-120.0	-70.6	188.4	179.4	8.96	21.030		
1,400.0	1,393.6	1,369.6	1,361.3	4.9	4.8	144.58	-136.5	-74.0	219.3	209.7	9.65	22.721		
1,500.0	1,491.5	1,464.7	1,454.8	5.3	5.2	145.02	-153.0	-77.4	250.3	240.0	10.36	24.156		
1,600.0	1,589.5	1,559.8	1,548.4	5.7	5.6	145.36	-169.4	-80.8	281.3	270.3	11.08	25.387		
1,700.0	1,687.4	1,654.8	1,642.0	6.2	6.0	145.63	-185.9	-84.2	312.3	300.5	11.81	26.452		
1,800.0	1,785.4	1,749.9	1,735.5	6.6	6.4	145.86	-202.4	-87.6	343.4	330.8	12.54	27.380		
1,900.0	1,883.3	1,844.9	1,829.1	7.1	6.8	146.05	-218.8	-91.0	374.4	361.1	13.28	28.195		
2,000.0	1,981.3	1,940.0	1,922.6	7.5	7.2	146.21	-235.3	-94.4	405.4	391.4	14.02	28.915		
2,100.0	2,079.2	2,035.1	2,016.2	7.9	7.7	146.34	-251.8	-97.8	436.4	421.7	14.77	29.555		
2,200.0	2,177.2	2,130.1	2,109.8	8.4	8.1	146.46	-268.2	-101.2	467.5	451.9	15.52	30.129		
2,300.0	2,275.1	2,225.2	2,203.3	8.8	8.5	146.57	-284.7	-104.7	498.5	482.2	16.27	30.644		
2,400.0	2,373.0	2,320.2	2,296.9	9.3	8.9	146.66	-301.2	-108.1	529.5	512.5	17.02	31.110		
2,500.0	2,471.0	2,415.3	2,390.5	9.7	9.3	146.74	-317.6	-111.5	560.5	542.8	17.78	31.533		
2,600.0	2,568.9	2,510.4	2,484.0	10.2	9.7	146.81	-334.1	-114.9	591.6	573.0	18.53	31.918		
2,700.0	2,666.9	2,605.4	2,577.6	10.7	10.1	146.88	-350.5	-118.3	622.6	603.3	19.29	32.270		
2,800.0	2,764.8	2,700.5	2,671.1	11.1	10.5	146.94	-367.0	-121.7	653.6	633.6	20.05	32.594		
2,900.0	2,862.8	2,795.5	2,764.7	11.6	11.0	146.99	-383.5	-125.1	684.7	663.9	20.82	32.892		
3,000.0	2,960.7	2,890.6	2,858.3	12.0	11.4	147.04	-399.9	-128.5	715.7	694.1	21.58	33.168		
3,100.0	3,058.7	2,985.7	2,951.8	12.5	11.8	147.08	-416.4	-131.9	746.8	724.4	22.34	33.423		
3,200.0	3,156.6	3,080.7	3,045.4	12.9	12.2	147.13	-432.9	-135.3	777.8	754.7	23.11	33.660		
3,300.0	3,254.6	3,175.8	3,139.0	13.4	12.6	147.16	-449.3	-138.7	808.8	784.9	23.87	33.881		
3,400.0	3,352.5	3,270.9	3,232.5	13.9	13.0	147.20	-465.8	-142.1	839.9	815.2	24.64	34.087		
3,471.3	3,422.4	3,338.7	3,299.2	14.2	13.3	147.22	-477.6	-144.5	862.0	836.8	25.19	34.226		
3,500.0	3,450.5	3,365.9	3,326.1	14.3	13.4	147.33	-482.3	-145.5	870.8	845.4	25.40	34.276		
3,600.0	3,548.9	3,461.7	3,420.3	14.7	13.9	147.58	-498.9	-148.9	899.6	873.4	26.16	34.382		
3,700.0	3,647.9	3,558.2	3,515.3	15.2	14.3	147.69	-515.6	-152.4	925.6	898.7	26.92	34.386		
3,800.0	3,747.4	3,655.4	3,611.0	15.5	14.7	147.65	-532.4	-155.9	948.8	921.1	27.66	34.297		
3,900.0	3,847.1	3,753.1	3,707.1	15.9	15.1	147.48	-549.3	-159.4	969.1	940.7	28.40	34.122		
4,000.0	3,947.1	3,851.2	3,803.7	16.2	15.6	147.19	-566.3	-162.9	986.6	957.4	29.13	33.870		
4,052.9	4,000.0	3,903.3	3,855.0	16.4	15.8	-133.42	-575.4	-164.7	994.7	965.2	29.51	33.711		
4,100.0	4,047.1	3,949.6	3,900.5	16.5	16.0	-133.69	-583.4	-166.4	1,001.5	971.7	29.84	33.565		
4,200.0	4,147.1	4,048.0	3,997.4	16.8	16.4	-134.25	-600.4	-169.9	1,016.2	985.7	30.55	33.266		
4,300.0	4,247.1	4,146.4	4,094.3	17.1	16.9	-134.80	-617.5	-173.5	1,031.0	999.7	31.26	32.983		
4,400.0	4,347.1	4,244.8	4,191.2	17.4	17.3	-135.33	-634.5	-177.0	1,045.9	1,013.9	31.97	32.715		
4,500.0	4,447.1	4,343.3	4,288.0	17.8	17.7	-135.85	-651.6	-180.5	1,060.8	1,028.1	32.68	32.462		
4,600.0	4,547.1	4,441.7	4,384.9	18.1	18.2	-136.36	-668.6	-184.0	1,075.8	1,042.4	33.39	32.221		
4,700.0	4,647.1	4,540.1	4,481.8	18.4	18.6	-136.85	-685.7	-187.6	1,090.9	1,056.8	34.10	31.993		
4,800.0	4,747.1	4,638.5	4,578.6	18.7	19.0	-137.32	-702.7	-191.1	1,106.1	1,071.3	34.81	31.776		

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:** Sandoval County, NM  
**Reference Site:** S12-T22N-R6W  
**Site Error:** 0.0ft  
**Reference Well:** VCU L12-2206 03H (205H)  
**Well Error:** 0.0ft  
**Reference Wellbore:** OH  
**Reference Design:** PLAN #1

**Local Co-ordinate Reference:** Well VCU L12-2206 03H (205H)  
**TVD Reference:** 16' KB @ 7056.0ft  
**MD Reference:** 16' KB @ 7056.0ft  
**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 S12-T22N-R6W - VCU L12-2206 01H (203H) - OH - PLAN #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance							Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty	Separation Factor		
4,900.0	4,847.1	4,737.0	4,675.5	19.0	19.5	-137.79	-719.8	-194.6	1,121.4	1,085.9	35.52	31.570		
4,915.8	4,862.9	4,752.6	4,690.9	19.1	19.5	-137.86	-722.5	-195.2	1,123.8	1,088.2	35.63	31.538		
4,950.0	4,897.0	4,786.0	4,723.8	19.2	19.7	-97.36	-728.3	-196.4	1,129.2	1,093.3	35.87	31.479		
5,000.0	4,946.7	4,834.5	4,771.5	19.3	19.9	-97.00	-736.7	-198.1	1,137.6	1,101.3	36.21	31.419		
5,050.0	4,995.8	4,887.6	4,823.9	19.5	20.1	-96.72	-744.1	-201.9	1,146.4	1,109.9	36.56	31.358		
5,100.0	5,043.9	4,941.9	4,877.5	19.6	20.3	-96.39	-748.2	-209.4	1,155.7	1,118.8	36.90	31.321		
5,150.0	5,090.6	4,997.5	4,931.9	19.7	20.5	-96.02	-748.6	-220.8	1,165.2	1,128.0	37.22	31.305		
5,200.0	5,135.5	5,054.4	4,986.5	19.8	20.7	-95.60	-745.1	-236.4	1,175.0	1,137.4	37.53	31.304		
5,250.0	5,178.4	5,112.7	5,040.8	19.9	20.8	-95.14	-737.5	-256.2	1,184.8	1,147.0	37.84	31.311		
5,300.0	5,218.9	5,172.4	5,094.0	20.0	20.9	-94.65	-725.5	-280.2	1,194.6	1,156.5	38.15	31.314		
5,350.0	5,256.7	5,233.4	5,145.4	20.1	21.0	-94.11	-708.9	-308.6	1,204.4	1,165.9	38.48	31.300		
5,400.0	5,291.5	5,295.8	5,194.2	20.3	21.1	-93.55	-687.8	-341.2	1,214.0	1,175.1	38.85	31.252		
5,450.0	5,323.0	5,359.4	5,239.4	20.4	21.1	-92.95	-662.0	-377.7	1,223.3	1,184.0	39.28	31.144		
5,500.0	5,351.0	5,424.1	5,280.1	20.5	21.2	-92.31	-631.9	-417.9	1,232.2	1,192.4	39.81	30.954		
5,550.0	5,375.3	5,489.8	5,315.6	20.7	21.2	-91.85	-597.5	-461.2	1,240.7	1,200.2	40.46	30.665		
5,600.0	5,395.7	5,556.2	5,344.8	20.9	21.2	-90.97	-559.4	-507.1	1,248.6	1,207.4	41.27	30.257		
5,650.0	5,412.0	5,623.2	5,367.2	21.3	21.2	-90.26	-518.1	-554.7	1,256.0	1,213.7	42.27	29.716		
5,700.0	5,424.2	5,690.3	5,382.2	21.7	21.7	-89.53	-474.4	-603.3	1,262.6	1,219.3	43.37	29.114		
5,750.0	5,432.1	5,757.4	5,389.6	22.2	22.6	-88.79	-428.9	-652.1	1,268.6	1,223.9	44.67	28.401		
5,800.0	5,435.6	5,815.3	5,390.3	22.7	23.3	-88.11	-388.7	-693.8	1,273.8	1,227.8	45.97	27.708		
5,819.8	5,435.8	5,835.1	5,390.2	23.0	23.6	-87.90	-375.0	-708.0	1,275.8	1,229.4	46.48	27.449		
5,900.0	5,435.3	5,914.8	5,389.9	24.0	24.8	-87.92	-319.6	-765.4	1,283.9	1,235.3	48.67	26.379		
6,000.0	5,434.6	6,014.3	5,389.6	25.5	26.4	-87.95	-250.5	-836.9	1,294.1	1,242.3	51.73	25.017		
6,100.0	5,433.9	6,113.8	5,389.2	27.1	28.2	-87.99	-181.3	-908.4	1,304.2	1,249.1	55.08	23.678		
6,200.0	5,433.2	6,213.3	5,388.9	28.8	30.1	-88.02	-112.2	-980.0	1,314.3	1,255.6	58.68	22.398		
6,300.0	5,432.5	6,312.8	5,388.5	30.7	32.1	-88.05	-43.1	-1,051.5	1,324.4	1,261.9	62.48	21.196		
6,400.0	5,431.8	6,412.2	5,388.2	32.6	34.2	-88.08	26.1	-1,123.0	1,334.5	1,268.1	66.46	20.081		
6,500.0	5,431.1	6,511.7	5,387.8	34.6	36.3	-88.10	95.2	-1,194.6	1,344.7	1,274.1	70.57	19.054		
6,606.4	5,430.4	6,617.6	5,387.4	36.8	38.6	-88.14	168.8	-1,270.7	1,355.4	1,280.4	75.08	18.054		
6,700.0	5,429.7	6,710.9	5,387.1	38.8	40.7	-88.18	233.6	-1,337.8	1,363.0	1,283.9	79.16	17.218		
6,800.0	5,429.0	6,810.8	5,386.8	41.0	43.0	-88.22	303.0	-1,409.6	1,367.0	1,283.3	83.67	16.338		
6,841.7	5,428.7	6,852.5	5,386.6	42.0	44.0	-88.24	332.0	-1,439.6	1,367.4	1,281.8	85.59	15.975		
6,900.0	5,428.3	6,910.8	5,386.4	43.3	45.3	-88.24	372.5	-1,481.5	1,367.4	1,279.1	88.30	15.486		
7,000.0	5,427.6	7,010.8	5,386.1	45.6	47.7	-88.26	442.0	-1,553.4	1,367.4	1,274.4	92.99	14.704		
7,100.0	5,426.9	7,110.8	5,385.7	48.0	50.1	-88.27	511.5	-1,625.3	1,367.4	1,269.6	97.74	13.990		
7,200.0	5,426.2	7,210.8	5,385.4	50.4	52.5	-88.29	581.0	-1,697.2	1,367.4	1,264.8	102.53	13.336		
7,300.0	5,425.5	7,310.8	5,385.0	52.8	54.9	-88.30	650.5	-1,769.2	1,367.4	1,260.0	107.37	12.735		
7,400.0	5,424.8	7,410.8	5,384.7	55.2	57.3	-88.32	719.9	-1,841.1	1,367.4	1,255.2	112.24	12.182		
7,500.0	5,424.1	7,510.8	5,384.3	57.7	59.8	-88.33	789.4	-1,913.0	1,367.4	1,250.3	117.15	11.673		
7,600.0	5,423.4	7,610.8	5,384.0	60.1	62.3	-88.35	858.9	-1,984.9	1,367.4	1,245.3	122.07	11.201		
7,700.0	5,422.7	7,710.8	5,383.6	62.6	64.7	-88.36	928.4	-2,056.8	1,367.4	1,240.4	127.03	10.765		
7,800.0	5,422.0	7,810.8	5,383.3	65.1	67.2	-88.38	997.9	-2,128.7	1,367.4	1,235.4	132.00	10.359		
7,900.0	5,421.3	7,910.8	5,382.9	67.6	69.7	-88.39	1,067.4	-2,200.6	1,367.4	1,230.4	137.00	9.981		
8,000.0	5,420.6	8,010.8	5,382.6	70.1	72.2	-88.40	1,136.9	-2,272.5	1,367.4	1,225.4	142.01	9.629		
8,100.0	5,420.0	8,110.8	5,382.2	72.6	74.7	-88.42	1,206.4	-2,344.4	1,367.4	1,220.4	147.04	9.300		
8,200.0	5,419.3	8,210.8	5,381.9	75.1	77.3	-88.43	1,275.9	-2,416.3	1,367.4	1,215.4	152.08	8.992		
8,300.0	5,418.6	8,310.8	5,381.5	77.6	79.8	-88.45	1,345.4	-2,488.2	1,367.4	1,210.3	157.13	8.703		
8,400.0	5,417.9	8,410.8	5,381.2	80.1	82.3	-88.46	1,414.9	-2,560.1	1,367.5	1,205.3	162.19	8.431		
8,500.0	5,417.2	8,510.8	5,380.8	82.7	84.9	-88.48	1,484.4	-2,632.0	1,367.5	1,200.2	167.27	8.175		
8,600.0	5,416.5	8,610.8	5,380.5	85.2	87.4	-88.49	1,553.8	-2,704.0	1,367.5	1,195.1	172.35	7.934		
8,700.0	5,415.8	8,710.8	5,380.1	87.7	90.0	-88.51	1,623.3	-2,775.9	1,367.5	1,190.0	177.44	7.707		
8,800.0	5,415.1	8,810.8	5,379.8	90.3	92.5	-88.52	1,692.8	-2,847.8	1,367.5	1,184.9	182.54	7.491		

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 VCU L12-2206 03H (205H)
<b>Project:</b>	Sandoval County, NM	<b>TVD Reference:</b>	16' KB @ 7056.0ft
<b>Reference Site:</b>	S12-T22N-R6W	<b>MD Reference:</b>	16' KB @ 7056.0ft
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	VCU L12-2206 03H (205H)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	OH	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	PLAN #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S12-T22N-R6W - VCU L12-2206 01H (203H) - OH - PLAN #1													Offset Site Error:	0.0 ft
Survey Program: G-MND+HDGM													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Total Uncertainty Axis	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)				
8,900.0	5,414.4	8,910.8	5,379.4	92.8	95.1	-88.54	1,782.3	-2,919.7	1,367.5	1,179.8	187.85	7.287		
9,000.0	5,413.7	9,010.8	5,379.1	95.4	97.6	-88.55	1,831.8	-2,991.6	1,367.5	1,174.7	192.76	7.094		
9,100.0	5,413.0	9,110.8	5,378.7	97.9	100.2	-88.57	1,901.3	-3,063.5	1,367.5	1,169.6	197.88	6.911		
9,200.0	5,412.3	9,210.8	5,378.4	100.5	102.7	-88.58	1,970.8	-3,135.4	1,367.5	1,164.5	203.01	6.736		
9,300.0	5,411.6	9,310.8	5,378.0	103.1	105.3	-88.60	2,040.3	-3,207.3	1,367.5	1,159.4	208.14	6.570		
9,400.0	5,410.9	9,410.8	5,377.7	105.6	107.9	-88.61	2,109.8	-3,279.2	1,367.5	1,154.2	213.28	6.412		
9,500.0	5,410.2	9,510.8	5,377.4	108.2	110.4	-88.62	2,179.3	-3,351.1	1,367.5	1,149.1	218.42	6.261		
9,600.0	5,409.5	9,610.8	5,377.0	110.8	113.0	-88.64	2,248.8	-3,423.0	1,367.5	1,144.0	223.56	6.117		
9,700.0	5,408.8	9,710.8	5,376.7	113.3	115.6	-88.65	2,318.2	-3,494.9	1,367.5	1,138.8	228.71	5.979		
9,800.0	5,408.1	9,810.8	5,376.3	115.9	118.2	-88.67	2,387.7	-3,566.8	1,367.6	1,133.7	233.86	5.848		
9,900.0	5,407.4	9,910.8	5,376.0	118.5	120.7	-88.68	2,457.2	-3,638.8	1,367.6	1,128.5	239.02	5.722		
10,000.0	5,406.7	10,010.8	5,375.6	121.1	123.3	-88.70	2,526.7	-3,710.7	1,367.6	1,123.4	244.18	5.601		
10,100.0	5,406.0	10,110.8	5,375.3	123.7	125.9	-88.71	2,596.2	-3,782.6	1,367.6	1,118.2	249.34	5.485		
10,200.0	5,405.3	10,210.8	5,374.9	126.2	128.5	-88.73	2,665.7	-3,854.5	1,367.6	1,113.1	254.50	5.374		
10,300.0	5,404.6	10,310.8	5,374.6	128.8	131.1	-88.74	2,735.2	-3,926.4	1,367.6	1,107.9	259.67	5.267		
10,341.7	5,404.3	10,352.5	5,374.4	129.9	132.1	-88.75	2,764.2	-3,956.4	1,367.6	1,105.8	261.83	5.223 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:** Sandoval County, NM  
**Reference Site:** S12-T22N-R6W  
**Site Error:** 0.0ft  
**Reference Well:** VCU L12-2206 03H (205H)  
**Well Error:** 0.0ft  
**Reference Wellbore:** OH  
**Reference Design:** PLAN #1

**Local Co-ordinate Reference:** Well VCU L12-2206 03H (205H)  
**TVD Reference:** 16' KB @ 7056.0ft  
**MD Reference:** 16' KB @ 7056.0ft  
**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 S12-T22N-R6W - VCU L12-2206 02H (204H) - OH - PLAN #1													Offset Site Error:	0.0 ft
Survey Program: S-MWD+HDGM													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface		Offset Wellbore Centre		Distance		Total Uncertainty	Separation Factor	Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Axis			
0.0	0.0	0.0	0.0	0.0	0.0	-119.88	-14.9	-26.0	30.0					
100.0	100.0	100.0	100.0	0.2	0.2	-119.88	-14.9	-26.0	30.0	29.7	0.30	99.516		
200.0	200.0	200.0	200.0	0.5	0.5	-119.88	-14.9	-26.0	30.0	28.9	1.02	29.434		
300.0	300.0	300.0	300.0	0.9	0.9	-119.88	-14.9	-26.0	30.0	28.2	1.74	17.271		
400.0	400.0	400.0	400.0	1.2	1.2	-119.88	-14.9	-26.0	30.0	27.5	2.45	12.221		
500.0	500.0	500.0	500.0	1.6	1.6	-119.88	-14.9	-26.0	30.0	26.8	3.17	9.456 CC, ES		
600.0	600.0	599.0	599.0	1.9	1.9	-118.91	-15.3	-27.7	31.6	27.7	3.90	8.101		
700.0	700.0	697.7	697.6	2.3	2.3	-116.53	-16.3	-32.7	36.6	31.9	4.67	7.839 SF		
800.0	800.0	795.8	795.3	2.7	2.6	167.10	-18.0	-40.9	46.7	41.2	5.45	8.563		
900.0	899.8	892.5	891.3	3.0	3.0	170.22	-20.3	-52.3	63.5	57.3	6.23	10.197		
1,000.0	999.5	987.1	984.8	3.4	3.3	172.55	-23.3	-66.4	87.2	80.2	7.01	12.446		
1,100.0	1,098.7	1,079.4	1,075.4	3.7	3.7	174.16	-26.7	-83.2	117.4	109.6	7.75	15.147		
1,200.0	1,197.5	1,173.1	1,167.3	4.1	4.1	175.28	-30.5	-101.4	152.2	143.9	8.38	18.158		
1,281.6	1,277.6	1,248.6	1,241.3	4.4	4.4	175.92	-33.5	-116.1	183.1	174.2	8.91	20.559		
1,300.0	1,295.6	1,265.5	1,257.8	4.5	4.5	176.05	-34.2	-119.4	190.3	181.3	9.03	21.081		
1,400.0	1,393.6	1,357.5	1,348.0	4.9	4.9	176.61	-37.9	-137.3	229.5	219.8	9.66	23.756		
1,500.0	1,491.5	1,449.5	1,438.2	5.3	5.3	177.02	-41.6	-155.2	268.7	258.4	10.30	26.078		
1,600.0	1,589.5	1,541.5	1,528.3	5.7	5.7	177.32	-45.3	-173.1	307.9	296.9	10.95	28.105		
1,700.0	1,687.4	1,633.4	1,618.5	6.2	6.1	177.55	-49.0	-191.0	347.1	335.5	11.61	29.888		
1,800.0	1,785.4	1,725.4	1,708.6	6.6	6.5	177.73	-52.7	-208.9	386.3	374.0	12.28	31.464		
1,900.0	1,883.3	1,817.4	1,798.8	7.1	6.9	177.88	-56.4	-226.8	425.5	412.6	12.95	32.865		
2,000.0	1,981.3	1,909.4	1,888.9	7.5	7.3	178.01	-60.0	-244.7	464.7	451.1	13.62	34.118		
2,100.0	2,079.2	2,001.4	1,979.1	7.9	7.8	178.11	-63.7	-262.6	503.9	489.6	14.30	35.244		
2,200.0	2,177.2	2,093.4	2,069.2	8.4	8.2	178.20	-67.4	-280.5	543.2	528.2	14.98	36.261		
2,300.0	2,275.1	2,185.4	2,159.4	8.8	8.6	178.28	-71.1	-298.4	582.4	566.7	15.66	37.182		
2,400.0	2,373.0	2,277.4	2,249.5	9.3	9.0	178.35	-74.8	-316.3	621.6	605.2	16.35	38.021		
2,500.0	2,471.0	2,369.3	2,339.7	9.7	9.4	178.41	-78.5	-334.2	660.8	643.8	17.04	38.787		
2,600.0	2,568.9	2,461.3	2,429.8	10.2	9.9	178.46	-82.2	-352.1	700.0	682.3	17.73	39.490		
2,700.0	2,666.9	2,553.3	2,520.0	10.7	10.3	178.51	-85.9	-370.0	739.2	720.8	18.42	40.137		
2,800.0	2,764.8	2,645.3	2,610.1	11.1	10.7	178.56	-89.6	-387.9	778.5	759.3	19.11	40.734		
2,900.0	2,862.8	2,737.3	2,700.3	11.6	11.1	178.59	-93.3	-405.8	817.7	797.9	19.81	41.286		
3,000.0	2,960.7	2,829.3	2,790.4	12.0	11.6	178.63	-97.0	-423.7	856.9	836.4	20.50	41.798		
3,100.0	3,058.7	2,921.3	2,880.6	12.5	12.0	178.66	-100.7	-441.6	896.1	874.9	21.20	42.275		
3,200.0	3,156.6	3,013.2	2,970.7	12.9	12.4	178.69	-104.4	-459.5	935.3	913.4	21.89	42.719		
3,300.0	3,254.6	3,105.2	3,060.9	13.4	12.8	178.72	-108.1	-477.4	974.6	952.0	22.59	43.135		
3,400.0	3,352.5	3,197.2	3,151.0	13.9	13.3	178.74	-111.7	-495.3	1,013.8	990.5	23.29	43.524		
3,471.3	3,422.4	3,262.8	3,215.3	14.2	13.6	178.76	-114.4	-508.1	1,041.8	1,018.0	23.79	43.786		
3,500.0	3,450.5	3,289.3	3,241.3	14.3	13.7	178.77	-115.4	-513.3	1,052.9	1,028.9	23.99	43.884		
3,600.0	3,548.9	3,382.3	3,332.4	14.7	14.1	178.81	-119.2	-531.4	1,089.6	1,064.9	24.69	44.125		
3,700.0	3,647.9	3,476.5	3,424.8	15.2	14.6	178.83	-123.0	-549.7	1,123.0	1,097.6	25.40	44.219		
3,800.0	3,747.4	3,571.9	3,518.2	15.5	15.0	178.86	-126.8	-568.3	1,153.1	1,127.0	26.10	44.177		
3,900.0	3,847.1	3,668.2	3,612.7	15.9	15.4	178.87	-130.7	-587.0	1,179.8	1,153.0	26.81	44.011		
4,000.0	3,947.1	3,765.5	3,708.0	16.2	15.9	178.88	-134.6	-605.9	1,203.2	1,175.7	27.51	43.730		
4,052.9	4,000.0	3,817.3	3,758.7	16.4	16.1	-101.52	-136.6	-616.0	1,214.2	1,186.3	27.89	43.543		
4,100.0	4,047.1	3,863.4	3,803.9	16.5	16.3	-101.52	-138.5	-625.0	1,223.5	1,195.3	28.21	43.367		
4,200.0	4,147.1	3,961.4	3,900.0	16.8	16.8	-101.52	-142.4	-644.1	1,243.4	1,214.5	28.91	43.003		
4,300.0	4,247.1	4,059.4	3,996.0	17.1	17.3	-101.52	-146.4	-663.1	1,263.3	1,233.7	29.62	42.654		
4,400.0	4,347.1	4,208.1	4,142.2	17.4	17.9	-101.53	-151.9	-689.9	1,281.9	1,251.2	30.69	41.764		
4,500.0	4,447.1	4,388.4	4,320.9	17.8	18.6	-101.53	-156.6	-712.6	1,294.8	1,262.9	31.90	40.595		
4,600.0	4,547.1	4,570.9	4,503.0	18.1	19.3	-101.53	-159.0	-724.4	1,301.4	1,268.4	32.97	39.477		
4,700.0	4,647.1	4,714.9	4,647.1	18.4	19.7	-101.53	-159.3	-726.0	1,302.3	1,268.5	33.78	38.553		
4,800.0	4,747.1	4,814.9	4,747.1	18.7	20.0	-101.53	-159.3	-726.0	1,302.3	1,267.8	34.44	37.812		

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:** Sandoval County, NM  
**Reference Site:** S12-T22N-R6W  
**Site Error:** 0.0ft  
**Reference Well:** VCU L12-2206 03H (205H)  
**Well Error:** 0.0ft  
**Reference Wellbore:** OH  
**Reference Design:** PLAN #1

**Local Co-ordinate Reference:** Well VCU L12-2206 03H (205H)  
**TVD Reference:** 16' KB @ 7056.0ft  
**MD Reference:** 16' KB @ 7056.0ft  
**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 S12-T22N-R6W - VCU L12-2206 02H (204H) - OH - PLAN #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
4,900.0	4,847.1	5,858.2	5,389.4	19.0	23.8	-131.29	-646.4	-301.1	1,255.8	1,218.5	37.33	33.643		
4,915.8	4,862.9	5,858.1	5,389.4	19.1	23.8	-131.28	-646.3	-301.1	1,249.0	1,211.5	37.57	33.243		
4,950.0	4,897.0	5,856.9	5,389.4	19.2	23.7	-92.59	-645.4	-302.0	1,235.1	1,197.0	38.08	32.432		
5,000.0	4,946.7	5,851.4	5,389.4	19.3	23.7	-94.35	-641.3	-305.6	1,216.2	1,177.4	38.75	31.387		
5,050.0	4,995.8	5,841.6	5,389.5	19.5	23.6	-95.65	-633.9	-312.0	1,199.4	1,160.1	39.31	30.507		
5,100.0	5,043.9	5,827.5	5,389.6	19.6	23.4	-96.50	-623.3	-321.3	1,184.7	1,144.9	39.78	29.785		
5,150.0	5,090.6	5,809.4	5,389.7	19.7	23.2	-96.93	-609.6	-333.2	1,172.3	1,132.1	40.13	29.214		
5,200.0	5,135.5	5,786.0	5,389.9	19.8	22.9	-96.93	-592.0	-348.6	1,162.0	1,121.6	40.36	28.791		
5,250.0	5,178.4	5,745.2	5,388.5	19.9	22.5	-95.99	-561.3	-375.4	1,153.6	1,113.3	40.33	28.606		
5,300.0	5,218.9	5,707.8	5,384.7	20.0	22.2	-95.04	-533.2	-399.8	1,147.0	1,106.6	40.33	28.438		
5,350.0	5,256.7	5,672.8	5,378.9	20.1	21.9	-94.03	-507.2	-422.5	1,142.1	1,101.7	40.36	28.299		
5,400.0	5,291.5	5,639.5	5,371.5	20.3	21.7	-92.95	-482.8	-443.8	1,138.8	1,098.4	40.40	28.191		
5,450.0	5,323.0	5,607.5	5,362.6	20.4	21.6	-91.78	-459.6	-464.0	1,137.2	1,096.8	40.47	28.104		
5,477.7	5,338.9	5,590.2	5,357.1	20.4	21.6	-91.10	-447.3	-474.8	1,137.0	1,096.5	40.49	28.081		
5,500.0	5,351.0	5,578.5	5,352.4	20.5	21.5	-90.54	-437.6	-483.3	1,137.1	1,096.6	40.59	28.013		
5,550.0	5,375.3	5,546.3	5,340.9	20.7	21.4	-89.22	-416.5	-501.6	1,138.5	1,097.8	40.70	27.969		
5,600.0	5,395.7	5,516.7	5,328.3	20.9	21.4	-87.82	-396.4	-519.2	1,141.1	1,100.2	40.89	27.904		
5,650.0	5,412.0	5,487.6	5,314.5	21.3	21.3	-86.37	-377.0	-536.1	1,144.9	1,103.8	41.12	27.843		
5,700.0	5,424.2	5,458.9	5,299.7	21.7	21.3	-84.87	-358.6	-552.2	1,149.7	1,108.3	41.41	27.766		
5,750.0	5,432.1	5,430.6	5,283.8	22.2	21.2	-83.34	-340.8	-567.6	1,155.4	1,113.6	41.75	27.673		
5,800.0	5,435.6	5,400.0	5,265.4	22.7	21.2	-81.71	-322.4	-583.7	1,161.8	1,119.7	42.12	27.584		
5,819.8	5,435.8	5,391.5	5,260.1	23.0	21.2	-81.18	-317.4	-588.1	1,164.5	1,122.2	42.31	27.521		
5,900.0	5,435.3	5,350.0	5,232.7	24.0	21.1	-79.85	-294.0	-608.5	1,177.2	1,134.1	43.08	27.327		
6,000.0	5,434.6	5,300.0	5,196.7	25.5	21.1	-78.13	-267.8	-631.3	1,197.7	1,153.6	44.12	27.148		
6,100.0	5,433.9	5,265.6	5,170.3	27.1	21.0	-76.88	-251.2	-645.8	1,223.8	1,178.4	45.31	27.010		
6,200.0	5,433.2	5,232.6	5,143.8	28.8	21.0	-75.63	-236.5	-658.7	1,255.5	1,209.0	46.47	27.015		
6,300.0	5,432.5	5,200.0	5,116.4	30.7	20.9	-74.36	-223.0	-670.4	1,292.8	1,245.2	47.57	27.175		
6,400.0	5,431.8	5,179.7	5,099.0	32.6	20.9	-73.55	-215.3	-677.2	1,335.5	1,286.8	48.68	27.436		
6,500.0	5,431.1	5,150.0	5,072.7	34.6	20.8	-72.36	-204.8	-686.4	1,383.3	1,333.7	49.60	27.892		
6,606.4	5,430.4	5,150.0	5,072.7	36.8	20.8	-72.36	-204.8	-686.4	1,439.4	1,388.7	50.89	28.398		
6,700.0	5,429.7	5,123.1	5,048.4	38.8	20.8	-71.77	-196.1	-693.9	1,491.2	1,439.8	51.37	29.030		

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 VCU L12-2206 03H (205H)
<b>Project:</b>	Sandoval County, NM	<b>TVD Reference:</b>	16' KB @ 7056.0ft
<b>Reference Site:</b>	S12-T22N-R6W	<b>MD Reference:</b>	16' KB @ 7056.0ft
<b>Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	VCU L12-2206 03H (205H)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	OH	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	PLAN #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S12-T22N-R6W - VCU L12-2206 04H (206H) - OH - PLAN #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highface Toolface (°)	Offset Wellbore Centra +N-S (ft)	+E-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axle	Separation Factor	Warning	
0.0	0.0	0.0	0.0	0.0	0.0	59.81	15.3	26.3	30.4					
100.0	100.0	100.0	100.0	0.2	0.2	59.81	15.3	26.3	30.4	30.1	0.30	100.970		
200.0	200.0	200.0	200.0	0.5	0.5	59.81	15.3	26.3	30.4	29.4	1.02	29.864		
300.0	300.0	300.0	300.0	0.9	0.9	59.81	15.3	26.3	30.4	28.7	1.74	17.524		
400.0	400.0	400.0	400.0	1.2	1.2	59.81	15.3	26.3	30.4	28.0	2.45	12.400		
500.0	500.0	500.0	500.0	1.6	1.6	59.81	15.3	26.3	30.4	27.2	3.17	9.594 CC, ES		
600.0	600.0	599.3	599.3	1.9	1.9	57.36	17.0	26.5	31.5	27.6	3.90	8.087		
700.0	700.0	698.4	698.2	2.3	2.3	51.02	22.1	27.3	35.1	30.5	4.65	7.553		
800.0	800.0	797.0	796.5	2.7	2.7	-37.89	30.5	28.5	40.5	35.1	5.44	7.457		
900.0	899.8	895.0	893.7	3.0	3.0	-49.50	42.2	30.3	47.5	41.3	6.25	7.611		
1,000.0	999.5	993.3	991.0	3.4	3.4	-61.40	56.5	32.4	57.0	50.0	6.99	8.148		
1,100.0	1,098.7	1,092.1	1,088.6	3.7	3.8	-72.42	71.2	34.6	67.3	59.6	7.68	8.759		
1,200.0	1,197.5	1,190.5	1,185.9	4.1	4.1	-82.67	85.8	36.7	79.0	70.6	8.38	9.425		
1,281.6	1,277.6	1,270.5	1,265.0	4.4	4.5	-90.46	97.6	38.5	90.0	81.1	8.97	10.043		
1,300.0	1,295.6	1,288.5	1,282.8	4.5	4.5	-92.16	100.3	38.9	92.7	83.6	9.10	10.193		
1,400.0	1,393.6	1,386.3	1,379.5	4.9	4.9	-99.84	114.8	41.1	108.6	98.8	9.83	11.045		
1,500.0	1,491.5	1,484.1	1,476.2	5.3	5.3	-105.52	129.3	43.2	125.9	115.4	10.59	11.897		
1,600.0	1,589.5	1,581.9	1,572.9	5.7	5.7	-109.82	143.8	45.4	144.2	132.8	11.35	12.705		
1,700.0	1,687.4	1,679.7	1,669.8	6.2	6.1	-113.14	158.3	47.5	163.0	150.9	12.12	13.452		
1,800.0	1,785.4	1,777.5	1,766.3	6.6	6.5	-115.77	172.8	49.7	182.3	169.4	12.90	14.135		
1,900.0	1,883.3	1,875.3	1,863.0	7.1	6.9	-117.90	187.4	51.8	201.9	188.2	13.68	14.758		
2,000.0	1,981.3	1,973.2	1,959.8	7.5	7.3	-119.65	201.9	54.0	221.7	207.2	14.46	15.325		
2,100.0	2,079.2	2,071.0	2,056.5	7.9	7.7	-121.11	216.4	56.1	241.6	226.4	15.25	15.842		
2,200.0	2,177.2	2,168.8	2,153.2	8.4	8.1	-122.35	230.9	58.3	261.7	245.7	16.04	16.313		
2,300.0	2,275.1	2,266.6	2,249.9	8.8	8.5	-123.42	245.4	60.4	281.9	265.1	16.84	16.744		
2,400.0	2,373.0	2,364.4	2,346.6	9.3	8.9	-124.34	259.9	62.6	302.2	284.5	17.63	17.139		
2,500.0	2,471.0	2,462.2	2,443.3	9.7	9.2	-125.14	274.4	64.7	322.5	304.1	18.43	17.503		
2,600.0	2,568.9	2,560.1	2,540.0	10.2	9.6	-125.85	288.9	66.9	342.9	323.7	19.22	17.838		
2,700.0	2,666.9	2,657.9	2,636.7	10.7	10.0	-126.49	303.4	69.0	363.3	343.3	20.02	18.148		
2,800.0	2,764.8	2,755.7	2,733.4	11.1	10.4	-127.05	317.9	71.2	383.8	363.0	20.82	18.435		
2,900.0	2,862.8	2,853.5	2,830.1	11.6	10.8	-127.55	332.4	73.4	404.3	382.7	21.62	18.701		
3,000.0	2,960.7	2,951.3	2,926.9	12.0	11.2	-128.01	346.9	75.5	424.8	402.4	22.42	18.949		
3,100.0	3,058.7	3,049.1	3,023.6	12.5	11.6	-128.43	361.4	77.7	445.4	422.2	23.22	19.181		
3,200.0	3,156.6	3,146.9	3,120.3	12.9	12.0	-128.81	375.9	79.8	466.0	442.0	24.02	19.398		
3,300.0	3,254.6	3,244.8	3,217.0	13.4	12.4	-129.15	390.4	82.0	486.6	461.7	24.82	19.601		
3,400.0	3,352.5	3,342.6	3,313.7	13.9	12.8	-129.47	405.0	84.1	507.2	481.6	25.63	19.791		
3,471.3	3,422.4	3,412.3	3,382.7	14.2	13.1	-129.68	415.3	85.7	521.9	495.7	26.20	19.920		
3,500.0	3,450.5	3,440.4	3,410.4	14.3	13.2	-129.84	419.5	86.3	527.7	501.3	26.43	19.968		
3,600.0	3,548.9	3,538.6	3,507.5	14.7	13.6	-130.19	434.0	88.4	546.6	519.4	27.22	20.080		
3,700.0	3,647.9	3,637.2	3,605.0	15.2	14.0	-130.22	448.6	90.6	563.3	535.3	28.00	20.116		
3,800.0	3,747.4	3,736.0	3,702.7	15.5	14.4	-129.95	463.3	92.8	577.8	549.0	28.77	20.082		
3,900.0	3,847.1	3,835.0	3,800.5	15.9	14.8	-129.42	478.0	95.0	590.1	560.6	29.53	19.986		
4,000.0	3,947.1	3,933.9	3,898.4	16.2	15.2	-128.63	492.7	97.1	600.4	570.1	30.27	19.836		
4,052.9	4,000.0	3,986.3	3,950.1	16.4	15.5	-48.51	500.4	98.3	605.0	574.4	30.65	19.739		
4,100.0	4,047.1	4,032.8	3,996.1	16.5	15.6	-47.96	507.3	99.3	608.9	577.9	30.99	19.649		
4,200.0	4,147.1	4,131.7	4,093.9	16.8	16.1	-46.81	522.0	101.5	617.4	585.7	31.71	19.471		
4,300.0	4,247.1	4,230.6	4,191.6	17.1	16.5	-45.69	536.7	103.7	626.2	593.7	32.43	19.309		
4,400.0	4,347.1	4,329.4	4,289.4	17.4	16.9	-44.61	551.3	105.9	635.1	602.0	33.15	19.161		
4,500.0	4,447.1	4,428.3	4,387.1	17.8	17.3	-43.55	566.0	108.0	644.3	610.4	33.86	19.028		
4,600.0	4,547.1	4,527.2	4,484.9	18.1	17.7	-42.52	580.6	110.2	653.7	619.1	34.58	18.907		
4,700.0	4,647.1	4,626.0	4,582.6	18.4	18.1	-41.52	595.3	112.4	663.3	628.0	35.29	18.797		
4,800.0	4,747.1	4,724.9	4,680.4	18.7	18.5	-40.55	610.0	114.6	673.1	637.1	36.00	18.698		

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-ordinates Reference:</b>	Well VCU L12-2206 03H (205H)
<b>Project:</b>	Sandoval County, NM	<b>TVD Reference:</b>	16' KB @ 7056.0ft
<b>Reference Site:</b>	S12-T22N-R6W	<b>MD Reference:</b>	16' KB @ 7056.0ft
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	VCU L12-2206 03H (205H)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	OH	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	PLAN #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S12-T22N-R6W - VCU L12-2206 04H (206H) - OH - PLAN #1													Offset Site Error:	0.0 ft
Survey Program: G-MWD+HDGM													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance					Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (ft)	+E-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning	
4,900.0	4,847.1	5,907.5	5,418.7	19.0	24.5	45.07	214.0	663.2	593.6	582.1	11.55	51.410		
4,915.8	4,862.9	5,907.4	5,418.7	19.1	24.5	45.04	214.0	663.2	578.4	566.7	11.73	49.316		
4,950.0	4,897.0	5,906.1	5,418.7	19.2	24.5	96.26	214.9	662.3	545.7	533.5	12.16	44.874		
5,000.0	4,946.7	5,900.6	5,418.8	19.3	24.4	109.22	218.7	658.3	498.2	485.3	12.89	38.647		
5,050.0	4,995.8	5,890.9	5,418.9	19.5	24.3	118.17	225.4	651.3	451.7	437.9	13.77	32.790		
5,100.0	5,043.9	5,876.9	5,419.0	19.6	24.1	123.90	235.0	641.1	406.5	391.6	14.85	27.379		
5,150.0	5,090.6	5,858.9	5,419.1	19.7	23.8	127.27	247.5	628.1	363.1	347.0	16.16	22.479		
5,200.0	5,135.5	5,836.8	5,419.2	19.8	23.5	128.85	262.7	612.1	322.1	304.3	17.75	18.146		
5,250.0	5,178.4	5,811.0	5,419.4	19.9	23.2	128.99	280.5	593.4	283.7	264.0	19.68	14.418		
5,300.0	5,218.9	5,789.6	5,418.8	20.0	22.6	125.66	309.0	563.4	248.0	225.9	22.15	11.195		
5,350.0	5,256.7	5,725.2	5,415.0	20.1	22.1	120.40	339.1	531.1	214.1	188.6	25.43	8.418		
5,400.0	5,291.5	5,684.6	5,408.5	20.3	21.6	114.17	366.2	501.5	182.7	153.3	29.37	6.218		
5,450.0	5,323.0	5,646.6	5,399.9	20.4	21.2	106.81	391.0	473.9	155.2	121.4	33.79	4.592		
5,500.0	5,351.0	5,610.6	5,389.6	20.5	20.9	97.45	413.8	448.1	133.6	95.5	38.08	3.508		
5,550.0	5,375.3	5,576.2	5,377.7	20.7	20.6	86.73	434.9	423.8	120.6	79.7	40.90	2.948		
5,585.6	5,390.2	5,552.5	5,368.4	20.9	20.4	78.41	449.1	407.2	117.8	76.6	41.17	2.861 SF		
5,600.0	5,395.7	5,543.1	5,364.5	20.9	20.3	74.96	454.6	400.7	118.2	77.4	40.80	2.898		
5,650.0	5,412.0	5,511.0	5,350.0	21.3	20.3	63.13	473.1	378.8	126.3	88.2	38.14	3.312		
5,700.0	5,424.2	5,479.7	5,334.4	21.7	20.3	52.27	490.3	357.8	142.3	107.5	34.82	4.087		
5,750.0	5,432.1	5,450.0	5,318.2	22.2	20.3	43.18	506.0	338.5	163.2	130.8	32.39	5.037		
5,800.0	5,435.6	5,419.0	5,300.1	22.7	20.2	35.38	521.6	318.8	186.6	155.7	30.89	6.041		
5,819.8	5,435.8	5,407.2	5,292.8	23.0	20.2	32.81	527.3	311.5	196.3	165.7	30.60	6.414		
5,900.0	5,435.3	5,362.8	5,263.7	24.0	20.2	26.35	547.7	284.8	240.1	209.7	30.39	7.901		
6,000.0	5,434.6	5,315.4	5,230.0	25.5	20.2	20.66	567.5	258.0	304.9	273.7	31.20	9.773		
6,100.0	5,433.9	5,275.4	5,199.6	27.1	20.1	16.76	582.4	236.9	377.5	345.2	32.31	11.685		
6,200.0	5,433.2	5,250.0	5,179.3	28.8	20.1	14.64	591.0	224.2	455.8	422.0	33.77	13.498		
6,300.0	5,432.5	5,212.8	5,148.5	30.7	20.0	11.99	602.3	206.7	537.8	503.5	34.25	15.699		
6,400.0	5,431.8	5,200.0	5,137.6	32.6	20.0	11.18	605.9	201.0	623.2	587.8	35.37	17.616		
6,500.0	5,431.1	5,166.8	5,108.7	34.6	19.9	9.32	614.3	187.0	710.4	674.8	35.61	19.951		
6,606.4	5,430.4	5,150.0	5,093.7	36.8	19.9	8.49	618.0	180.4	805.5	769.3	36.20	22.249		
6,700.0	5,429.7	5,131.8	5,077.3	38.8	19.9	2.73	621.7	173.6	890.6	854.0	36.53	24.376		
6,800.0	5,429.0	5,117.2	5,063.8	41.0	19.8	-3.41	624.4	168.3	982.6	945.7	36.90	26.628		
6,841.7	5,428.7	5,100.0	5,047.9	42.0	19.8	-6.03	627.3	162.5	1,021.5	984.7	36.86	27.715		
6,900.0	5,428.3	5,100.0	5,047.9	43.3	19.8	-6.03	627.3	162.5	1,075.6	1,038.4	37.16	28.942		
7,000.0	5,427.6	5,100.0	5,047.9	45.6	19.8	-6.03	627.3	162.5	1,169.4	1,131.8	37.60	31.101		
7,100.0	5,426.9	5,081.6	5,030.7	48.0	19.7	-6.08	629.9	156.6	1,263.7	1,226.0	37.73	33.493		
7,200.0	5,426.2	5,072.0	5,021.7	50.4	19.7	-6.10	631.2	153.7	1,358.6	1,320.7	37.93	35.818		
7,300.0	5,425.5	5,050.0	5,000.7	52.8	19.7	-6.16	633.6	147.4	1,454.3	1,416.3	37.98	38.295		

# Cathedral Energy Services

## Anticollision Report

**Company:** EnCana Oil & Gas (USA) Inc  
**Project:** Sandoval County, NM  
**Reference Site:** S12-T22N-R6W  
**Site Error:** 0.0ft  
**Reference Well:** VCU L12-2206 03H (205H)  
**Well Error:** 0.0ft  
**Reference Wellbore:** OH  
**Reference Design:** PLAN #1

**Local Co-ordinate Reference:** Well VCU L12-2206 03H (205H)  
**TVD Reference:** 16' KB @ 7056.0ft  
**MD Reference:** 16' KB @ 7056.0ft  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at:** 2.00 sigma  
**Database:** USA EDM 5000 Multi Users DB  
**Offset TVD Reference:** Offset Datum

Reference Depths are relative to 16' KB @ 7056.0ft  
 Offset Depths are relative to Offset Datum  
 Central Meridian is -106.250000 °

Coordinates are relative to: VCU L12-2206 03H (205H)  
 Coordinate System is US State Plane 1983, New Mexico Central Zone  
 Grid Convergence at Surface is: -0.70°



### LEGEND

- VCUL12-2206 01H(203H), OH, PLAN#1 V0
 
 VCUL12-2206 04H(206H), OH, PLAN#1 V0
- VCUL12-2206 02H(204H), OH, PLAN#1 V0
 
 VCUA11-2206 01H(207H), OH, PLAN#1 V0

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





SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Diag	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	700.0	0.00	0.00	700.0	0.0	0.0	0.00	0.00	0.0	
3	1177.9	9.56	79.59	1175.7	7.2	39.1	2.00	79.59	-23.1	
4	4066.6	8.56	79.59	4024.3	93.8	510.9	0.00	0.00	-302.1	
5	4544.5	0.00	0.00	4500.0	101.0	550.0	2.00	180.00	-325.2	
6	4890.8	0.00	0.00	4846.3	101.0	550.0	0.00	0.00	-325.2	
7	5794.8	90.40	319.75	5419.2	541.4	177.3	10.00	319.75	248.8	
8	6625.9	90.40	319.75	5413.5	1175.7	-359.7	0.00	0.00	1075.7	
9	6816.6	90.40	314.03	5412.1	1314.9	-490.0	3.00	-89.96	1266.2	
10	10316.6	90.40	314.03	5387.7	3747.5	-3006.3	0.00	0.00	4766.1	VCU 205H PBHL

Project: Sandoval County, NM  
 Site: S12-T22N-R6W  
 Well: VCU L12-2206 03H (205H)  
 Wellbore: OH  
 Design: PLAN #1

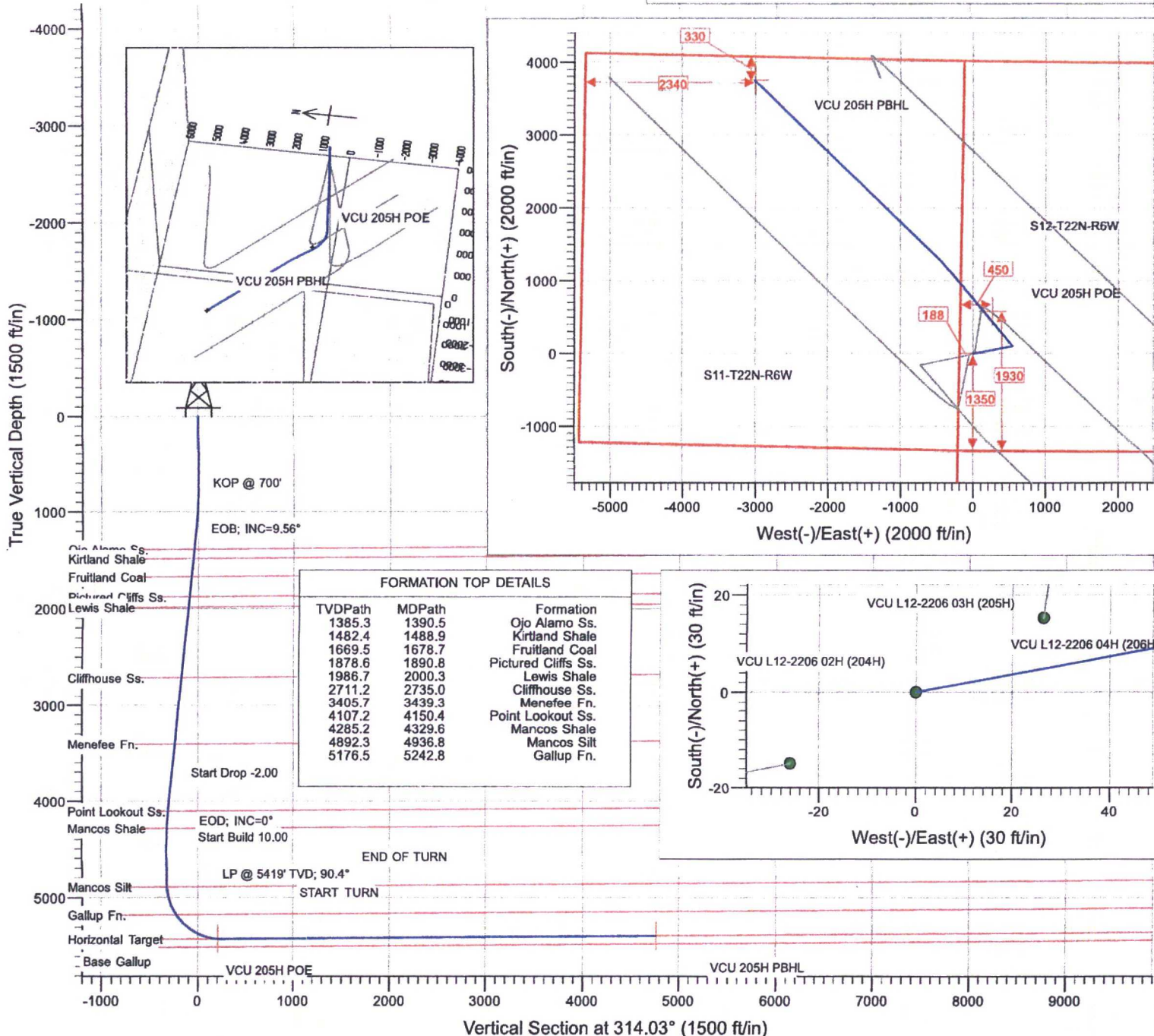


Azimuths to True North  
 Magnetic North: 8.95°

Magnetic Field  
 Strength: 49575.8snT  
 Dip Angle: 62.92°  
 Date: 8/30/2016  
 Model: HDGM

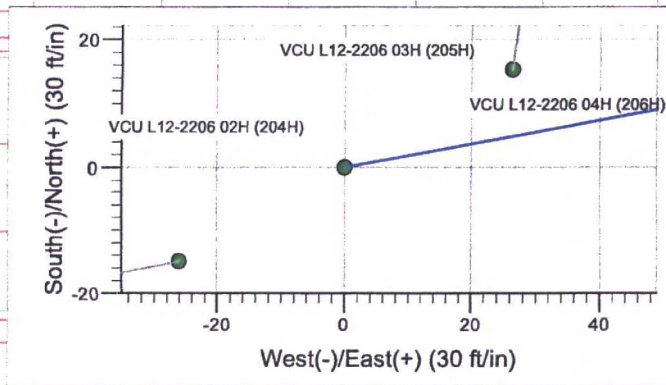
PLAN #1  
 VCU L12-2206 03H (205H)  
 18300.118  
 19' KD @ 7000.00  
 Ground Level @ 7040.0  
 North American Datum 1983  
 Well VCU L12-2206 03H (205H), True North

Name	Type	Target No/Target (Freshwater)	Azimuth	Origin Type	N/S	E/W	From TVD
VCU 205H PBHL	VCU 205H PBHL		5387.7	+N/-S	-3006.3	36.150874	-107.427791
VCU 205H PDF	VCU 205H PDF		6420.3	+N/-S	879.2	38.150082	-107.427791



FORMATION TOP DETAILS

TVDPPath	MDPath	Formation
1385.3	1390.5	Ojo Alamo Ss.
1482.4	1488.9	Kirtland Shale
1669.5	1678.7	Fruitland Coal
1878.6	1890.8	Pictured Cliffs Ss.
1986.7	2000.3	Lewis Shale
2711.2	2735.0	Cliffhouse Ss.
3405.7	3439.3	Menefee Fn.
4107.2	4150.4	Point Lookout Ss.
4285.2	4329.6	Mancos Shale
4892.3	4936.8	Mancos Silt
5176.5	5242.8	Gallup Fn.



WELL DETAILS: VCU L12-2206 03H (205H)

+N/-S	+E/-W	Northing	Ground Level: Easting	Latitude	Longitude
0.0	0.0	1875424.14	1292424.96	36.148471	-107.428709



# Cathedral Energy Services

## Planning Report

**Database:** USA EDM 5000 Multi Users DB  
**Company:** EnCana Oil & Gas (USA) Inc  
**Project:** Sandoval County, NM  
 S12-T22N-R6W  
 VCU L12-2206 03H (205H)  
**Wellbore:** OH  
**Design:** PLAN #1

**Local Co-ordinate Reference:** Well VCU L12-2206 03H (205H)  
**TVD Reference:** 16" KB @ 7056.0ft  
**MD Reference:** 16" KB @ 7056.0ft  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature

<b>Project</b>	Sandoval County, NM		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	New Mexico Central Zone		

<b>S12-T22N-R6W</b>					
<b>Site Position:</b>		<b>Northing:</b>	1,874,151.44 ft	<b>Latitude:</b>	36.145101
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,296,213.30 ft	<b>Longitude:</b>	-107.415828
<b>Position Uncertainty:</b>	0.0 ft	<b>Slot Radius:</b>	13.200 in	<b>Grid Convergence:</b>	-0.69 °

<b>VCU L12-2206 03H (205H)</b>						
<b>Well Position</b>	<b>+N/-S</b>	0.0 ft	<b>Northing:</b>	1,875,424.14 ft	<b>Latitude:</b>	36.148471
	<b>+E/-W</b>	0.0 ft	<b>Easting:</b>	1,292,424.96 ft	<b>Longitude:</b>	-107.428709
<b>Position Uncertainty</b>		0.0 ft	<b>Wellhead Elevation:</b>	0.0 ft	<b>Ground Level:</b>	7,040.0 ft

<b>Wellbore</b>	OH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	HDGM	8/30/2016	8.95	62.92	49,576

<b>Design</b>	PLAN #1				
<b>Audit Notes:</b>					
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.0	
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	314.03	

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)	TFD (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
700.0	0.00	0.00	700.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,177.9	9.56	79.59	1,175.7	7.2	39.1	2.00	2.00	0.00	79.59	
4,066.6	9.56	79.59	4,024.3	93.8	510.9	0.00	0.00	0.00	0.00	
4,544.5	0.00	0.00	4,500.0	101.0	550.0	2.00	-2.00	0.00	180.00	
4,890.8	0.00	0.00	4,846.3	101.0	550.0	0.00	0.00	0.00	0.00	
5,794.8	90.40	319.75	5,419.2	541.4	177.3	10.00	10.00	0.00	319.75	
6,625.9	90.40	319.75	5,413.5	1,175.7	-359.7	0.00	0.00	0.00	0.00	
6,816.6	90.40	314.03	5,412.1	1,314.9	-490.0	3.00	0.00	-3.00	-89.96	
10,316.6	90.40	314.03	5,387.7	3,747.5	-3,006.3	0.00	0.00	0.00	0.00	VCU 205H PBHL



# Cathedral Energy Services

## Planning Report

**Database:** USA EDM 5000 Multi Users DB  
**Company:** EnCana Oil & Gas (USA) Inc  
**Project:** Sandoval County, NM  
**Site:** S12-T22N-R6W  
**Well:** VCU L12-2206 03H (205H)  
**Wellbore:** OH  
**Design:** PLAN #1

**Local Co-ordinate Reference:** Well VCU L12-2206 03H (205H)  
**TVD Reference:** 16' KB @ 7056.0ft  
**MD Reference:** 16' KB @ 7056.0ft  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature

### 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	
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	KOP @ 700'
800.0	2.00	79.59	800.0	0.3	1.7	-1.0	2.00	2.00	
900.0	4.00	79.59	899.8	1.3	6.9	-4.1	2.00	2.00	
1,000.0	6.00	79.59	999.5	2.8	15.4	-9.1	2.00	2.00	
1,100.0	8.00	79.59	1,098.7	5.0	27.4	-16.2	2.00	2.00	
1,177.9	9.56	79.59	1,175.7	7.2	39.1	-23.1	2.00	2.00	EOB; INC=9.56°
1,200.0	9.56	79.59	1,197.5	7.8	42.7	-25.3	0.00	0.00	
1,300.0	9.56	79.59	1,296.1	10.8	59.1	-34.9	0.00	0.00	
1,390.5	9.56	79.59	1,385.3	13.6	73.8	-43.7	0.00	0.00	Ojo Alamo Ss.
1,400.0	9.56	79.59	1,394.7	13.8	75.4	-44.6	0.00	0.00	
1,488.9	9.56	79.59	1,482.4	16.5	89.9	-53.2	0.00	0.00	Kirtland Shale
1,500.0	9.56	79.59	1,493.3	16.8	91.7	-54.2	0.00	0.00	
1,600.0	9.56	79.59	1,591.9	19.8	108.1	-63.9	0.00	0.00	
1,678.7	9.56	79.59	1,669.5	22.2	120.9	-71.5	0.00	0.00	Fruitland Coal
1,700.0	9.56	79.59	1,690.5	22.8	124.4	-73.6	0.00	0.00	
1,800.0	9.56	79.59	1,789.2	25.8	140.7	-83.2	0.00	0.00	
1,890.8	9.56	79.59	1,878.6	28.6	155.5	-92.0	0.00	0.00	Pictured Cliffs Ss.
1,900.0	9.56	79.59	1,887.8	28.8	157.0	-92.9	0.00	0.00	
2,000.0	9.56	79.59	1,986.4	31.8	173.4	-102.5	0.00	0.00	
2,000.3	9.56	79.59	1,986.7	31.8	173.4	-102.6	0.00	0.00	Lewis Shale
2,100.0	9.56	79.59	2,085.0	34.8	189.7	-112.2	0.00	0.00	
2,200.0	9.56	79.59	2,183.6	37.8	206.0	-121.8	0.00	0.00	
2,300.0	9.56	79.59	2,282.2	40.8	222.4	-131.5	0.00	0.00	
2,400.0	9.56	79.59	2,380.8	43.8	238.7	-141.2	0.00	0.00	
2,500.0	9.56	79.59	2,479.4	46.8	255.0	-150.8	0.00	0.00	
2,600.0	9.56	79.59	2,578.1	49.8	271.4	-160.5	0.00	0.00	
2,700.0	9.56	79.59	2,676.7	52.8	287.7	-170.1	0.00	0.00	
2,735.0	9.56	79.59	2,711.2	53.9	293.4	-173.5	0.00	0.00	Cliffhouse Ss.
2,800.0	9.56	79.59	2,775.3	55.8	304.0	-179.8	0.00	0.00	
2,900.0	9.56	79.59	2,873.9	58.8	320.4	-189.4	0.00	0.00	
3,000.0	9.56	79.59	2,972.5	61.8	336.7	-199.1	0.00	0.00	
3,100.0	9.56	79.59	3,071.1	64.8	353.0	-208.8	0.00	0.00	
3,200.0	9.56	79.59	3,169.7	67.8	369.4	-218.4	0.00	0.00	
3,300.0	9.56	79.59	3,268.3	70.8	385.7	-228.1	0.00	0.00	
3,400.0	9.56	79.59	3,366.9	73.8	402.0	-237.7	0.00	0.00	
3,439.3	9.56	79.59	3,405.7	75.0	408.4	-241.5	0.00	0.00	Menefee Fn.
3,500.0	9.56	79.59	3,465.6	76.8	418.3	-247.4	0.00	0.00	
3,600.0	9.56	79.59	3,564.2	79.8	434.7	-257.0	0.00	0.00	
3,700.0	9.56	79.59	3,662.8	82.8	451.0	-266.7	0.00	0.00	
3,800.0	9.56	79.59	3,761.4	85.8	467.3	-276.4	0.00	0.00	
3,900.0	9.56	79.59	3,860.0	88.8	483.7	-286.0	0.00	0.00	
4,000.0	9.56	79.59	3,958.6	91.8	500.0	-295.7	0.00	0.00	
4,066.6	9.56	79.59	4,024.3	93.8	510.9	-302.1	0.00	0.00	Start Drop -2.00
4,100.0	8.89	79.59	4,057.3	94.8	516.1	-305.2	2.00	-2.00	
4,150.4	7.88	79.59	4,107.2	96.1	523.4	-309.5	2.00	-2.00	Point Lookout Ss.



# Cathedral Energy Services

## Planning Report

**Database:** USA EDM 5000 Multi Users DB  
**Company:** EnCana Oil & Gas (USA) Inc  
**Project:** Sandoval County, NM  
**Site:** S12-T22N-R6W  
**Well:** VCU L12-2206 03H (205H)  
**Wellbore:** OH  
**Design:** PLAN #1

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

Well VCU L12-2206 03H (205H)  
 16' KB @ 7056.0ft  
 16' KB @ 7056.0ft  
 True  
 Minimum Curvature

### 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
4,200.0	6.89	79.59	4,156.3	97.3	529.6	-313.2	2.00	-2.00	
4,300.0	4.89	79.59	4,255.8	99.1	539.7	-319.2	2.00	-2.00	
4,329.6	4.30	79.59	4,285.2	99.5	542.1	-320.5	2.00	-2.00	Mancos Shale
4,400.0	2.89	79.59	4,355.5	100.3	546.4	-323.1	2.00	-2.00	
4,500.0	0.89	79.59	4,455.5	100.9	549.7	-325.0	2.00	-2.00	
4,544.5	0.00	0.00	4,500.0	101.0	550.0	-325.2	2.00	-2.00	EOD; INC=0°
4,600.0	0.00	0.00	4,555.5	101.0	550.0	-325.2	0.00	0.00	
4,700.0	0.00	0.00	4,655.5	101.0	550.0	-325.2	0.00	0.00	
4,800.0	0.00	0.00	4,755.5	101.0	550.0	-325.2	0.00	0.00	
4,890.8	0.00	0.00	4,846.3	101.0	550.0	-325.2	0.00	0.00	Start Build 10.00
4,900.0	0.92	319.75	4,855.5	101.1	550.0	-325.2	9.99	9.99	
4,936.8	4.60	319.75	4,892.3	102.4	548.8	-323.4	10.00	10.00	Mancos Silt
5,000.0	10.92	319.75	4,954.8	108.9	543.3	-314.9	10.00	10.00	
5,100.0	20.92	319.75	5,050.9	129.8	525.6	-287.7	10.00	10.00	
5,200.0	30.92	319.75	5,140.7	163.1	497.4	-244.2	10.00	10.00	
5,242.8	35.20	319.75	5,176.5	181.0	482.3	-221.0	10.00	10.00	Gallup Fn.
5,300.0	40.92	319.75	5,221.6	207.9	459.5	-185.9	10.00	10.00	
5,400.0	50.92	319.75	5,291.1	262.6	413.2	-114.5	10.00	10.00	
5,500.0	60.92	319.75	5,347.0	325.8	350.8	-32.2	10.00	10.00	
5,600.0	70.92	319.75	5,387.8	395.4	300.8	58.5	10.00	10.00	
5,700.0	80.92	319.75	5,412.1	469.3	238.3	154.9	10.00	10.00	
5,794.8	90.40	319.75	5,419.2	541.4	177.3	248.8	10.00	10.00	LP @ 5419' TVD; 90.4°
5,800.0	90.40	319.75	5,419.2	545.3	173.9	254.0	0.00	0.00	
5,900.0	90.40	319.75	5,418.5	621.7	109.3	353.5	0.00	0.00	
6,000.0	90.40	319.75	5,417.8	698.0	44.7	453.0	0.00	0.00	
6,100.0	90.40	319.75	5,417.1	774.3	-19.9	552.5	0.00	0.00	
6,200.0	90.40	319.75	5,416.4	850.6	-84.5	652.0	0.00	0.00	
6,300.0	90.40	319.75	5,415.7	927.0	-149.1	751.5	0.00	0.00	
6,400.0	90.40	319.75	5,415.0	1,003.3	-213.7	851.0	0.00	0.00	
6,500.0	90.40	319.75	5,414.3	1,079.6	-278.3	950.5	0.00	0.00	
6,600.0	90.40	319.75	5,413.6	1,155.9	-343.0	1,050.0	0.00	0.00	
6,625.9	90.40	319.75	5,413.5	1,175.7	-359.7	1,075.7	0.00	0.00	START TURN
6,700.0	90.40	317.53	5,412.9	1,231.3	-408.6	1,149.6	3.00	0.00	
6,800.0	90.40	314.53	5,412.3	1,303.3	-478.1	1,249.5	3.00	0.00	
6,816.6	90.40	314.03	5,412.1	1,314.9	-490.0	1,266.2	3.00	0.00	END OF TURN
6,900.0	90.40	314.03	5,411.6	1,372.8	-549.9	1,349.5	0.00	0.00	
7,000.0	90.40	314.03	5,410.9	1,442.3	-621.8	1,449.5	0.00	0.00	
7,100.0	90.40	314.03	5,410.2	1,511.8	-693.7	1,549.5	0.00	0.00	
7,200.0	90.40	314.03	5,409.5	1,581.3	-765.6	1,649.5	0.00	0.00	
7,300.0	90.40	314.03	5,408.8	1,650.8	-837.5	1,749.5	0.00	0.00	
7,400.0	90.40	314.03	5,408.1	1,720.3	-909.4	1,849.5	0.00	0.00	
7,500.0	90.40	314.03	5,407.4	1,789.8	-981.3	1,949.5	0.00	0.00	
7,600.0	90.40	314.03	5,406.7	1,859.3	-1,053.2	2,049.5	0.00	0.00	
7,700.0	90.40	314.03	5,406.0	1,928.9	-1,125.1	2,149.5	0.00	0.00	
7,800.0	90.40	314.03	5,405.3	1,998.4	-1,197.0	2,249.5	0.00	0.00	
7,900.0	90.40	314.03	5,404.6	2,067.9	-1,268.9	2,349.5	0.00	0.00	
8,000.0	90.40	314.03	5,403.9	2,137.4	-1,340.8	2,449.5	0.00	0.00	
8,100.0	90.40	314.03	5,403.2	2,206.9	-1,412.7	2,549.5	0.00	0.00	
8,200.0	90.40	314.03	5,402.5	2,276.4	-1,484.6	2,649.5	0.00	0.00	
8,300.0	90.40	314.03	5,401.8	2,345.9	-1,556.5	2,749.5	0.00	0.00	
8,400.0	90.40	314.03	5,401.1	2,415.4	-1,628.4	2,849.5	0.00	0.00	
8,500.0	90.40	314.03	5,400.4	2,484.9	-1,700.2	2,949.5	0.00	0.00	



# Cathedral Energy Services

## Planning Report

<b>Database:</b> USA EDM 5000 Multi Users DB <b>Company:</b> EnCana Oil & Gas (USA) Inc <b>Project:</b> Sandoval County, NM <b>Site:</b> S12-T22N-R6W VCU L12-2206 03H (205H)  <b>Wellbore:</b> OH <b>Design:</b> PLAN #1	<b>Local Co-ordinate Reference:</b> <b>TVD Reference:</b> <b>MD Reference:</b> <b>North Reference:</b> <b>Survey Calculation Method:</b>	Well VCU L12-2206 03H (205H) 16' KB @ 7056.0R 16' KB @ 7056.0R True Minimum Curvature
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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
8,600.0	90.40	314.03	5,399.7	2,554.4	-1,772.1	3,049.5	0.00	0.00	
8,700.0	90.40	314.03	5,399.0	2,623.9	-1,844.0	3,149.5	0.00	0.00	
8,800.0	90.40	314.03	5,398.3	2,693.4	-1,915.9	3,249.5	0.00	0.00	
8,900.0	90.40	314.03	5,397.6	2,762.9	-1,987.8	3,349.5	0.00	0.00	
9,000.0	90.40	314.03	5,396.9	2,832.4	-2,059.7	3,449.5	0.00	0.00	
9,100.0	90.40	314.03	5,396.2	2,901.9	-2,131.6	3,549.5	0.00	0.00	
9,200.0	90.40	314.03	5,395.5	2,971.4	-2,203.5	3,649.5	0.00	0.00	
9,300.0	90.40	314.03	5,394.8	3,040.9	-2,275.4	3,749.5	0.00	0.00	
9,400.0	90.40	314.03	5,394.1	3,110.4	-2,347.3	3,849.5	0.00	0.00	
9,500.0	90.40	314.03	5,393.4	3,179.9	-2,419.2	3,949.5	0.00	0.00	
9,600.0	90.40	314.03	5,392.7	3,249.4	-2,491.1	4,049.5	0.00	0.00	
9,700.0	90.40	314.03	5,392.0	3,318.9	-2,563.0	4,149.5	0.00	0.00	
9,800.0	90.40	314.03	5,391.3	3,388.4	-2,634.9	4,249.5	0.00	0.00	
9,900.0	90.40	314.03	5,390.6	3,457.9	-2,706.8	4,349.5	0.00	0.00	
10,000.0	90.40	314.03	5,389.9	3,527.4	-2,778.7	4,449.5	0.00	0.00	
10,100.0	90.40	314.03	5,389.2	3,596.9	-2,850.6	4,549.5	0.00	0.00	
10,200.0	90.40	314.03	5,388.5	3,666.4	-2,922.5	4,649.5	0.00	0.00	
10,300.0	90.40	314.03	5,387.8	3,735.9	-2,994.4	4,749.5	0.00	0.00	
10,316.6	90.40	314.03	5,387.7	3,747.5	-3,006.3	4,766.1	0.00	0.00	TD at 10316.6

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
VCU 205H PBHL - plan hits target center - Point	0.00	0.00	5,387.7	3,747.5	-3,006.3	1,879,207.81	1,289,464.33	36.158764	-107.438892
VCU 205H POE - plan misses target center by 96.1ft at 5763.2ft MD (5418.6 TVD, 517.3 N, 197.6 E) - Point	0.00	0.00	5,420.3	579.2	271.1	1,876,000.03	1,292,703.02	36.150062	-107.427791

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,390.5	1,385.0	Ojo Alamo Ss.		-0.40	314.03	
1,488.9	1,482.0	Kirtland Shale		-0.40	314.03	
1,678.7	1,669.0	Fruitland Coal		-0.40	314.03	
1,890.8	1,878.0	Pictured Cliffs Ss.		-0.40	314.03	
2,000.3	1,986.0	Lewis Shale		-0.40	314.03	
2,735.0	2,710.0	Cliffhouse Ss.		-0.40	314.03	
3,439.3	3,404.0	Menefee Fn.		-0.40	314.03	
4,150.4	4,105.0	Point Lookout Ss.		-0.40	314.03	
4,329.6	4,283.0	Mancos Shale		-0.40	314.03	
4,936.8	4,890.0	Mancos Silt		-0.40	314.03	
5,242.8	5,175.0	Gallup Fn.		-0.40	314.03	

# Cathedral Energy Services

## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well VCU L12-2206 03H (205H)
<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>TYD Reference:</b>	16' KB @ 7056.0ft
<b>Project:</b>	Sandoval County, NM	<b>MD Reference:</b>	16' KB @ 7056.0ft
<b>Site:</b>	S12-T22N-R6W	<b>North Reference:</b>	True
	VCU L12-2206 03H (205H)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PLAN #1		

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		→N-S (ft)	→E-W (ft)	
700.0	700.0	0.0	0.0	KOP @ 700'
1,177.9	1,175.7	7.2	39.1	EOB; INC=9.56°
4,066.6	4,024.3	93.8	510.9	Start Drop -2.00
4,544.5	4,500.0	101.0	550.0	EOD; INC=0°
4,890.8	4,846.3	101.0	550.0	Start Build 10.00
5,794.8	5,419.2	541.4	177.3	LP @ 5419' TVD; 90.4°
6,625.9	5,413.5	1,175.7	-359.7	START TURN
6,816.6	5,412.1	1,314.9	-490.0	END OF TURN
10,316.6	5,387.7	3,747.5	-3,006.3	TD at 10316.6



**Venado Canyon Unit 205H**

**SHL: NWSW Section 12, T22N, R6W  
1350 FSL and 188 FWL**

**BHL: NENW Section 11, T22N, R6W  
330 FNL and 2340 FWL**

**Sandoval County, New Mexico**

**Unit Number: NMNM 135367X**

**Lease Number: NMNM 109385 & FEE**

4. After removal of vegetation, topsoil will be segregated and windrowed on the edge of the access road. Topsoil will be defined as the top six (6) inches of soil. The stockpiled topsoil will be free of brush and tree limbs, trunks and root balls, but may include chipped or mulched material so long as it is incorporated into the topsoil stockpile.

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

5. All construction materials for the pipeline will consist of native borrow and subsoil accumulated during pipeline 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.
6. Construction equipment may include chain saws, a brush hog, scraper, maintainer, excavator, dozer, backhoe, hydrovac, welder, trencher, side-boom, and misc. specialty equipment. Construction of the pipeline will take approximately 2-4 weeks.

**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 practical. Residual fluids will be vacuumed from the storage tanks and disposed of at Basin Disposal, 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. The closed-loop system storage tanks will be placed in bermed secondary containment sized to accommodate a minimum of 110 percent of the volume of the largest storage tank.
4. A 20-mil liner will be installed under tanks, pumps, ancillary facilities, and truck loading/unloading areas associated with the closed-loop system.

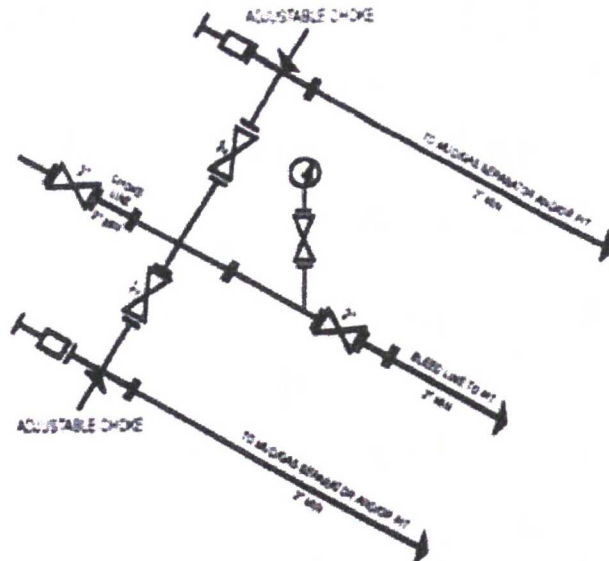
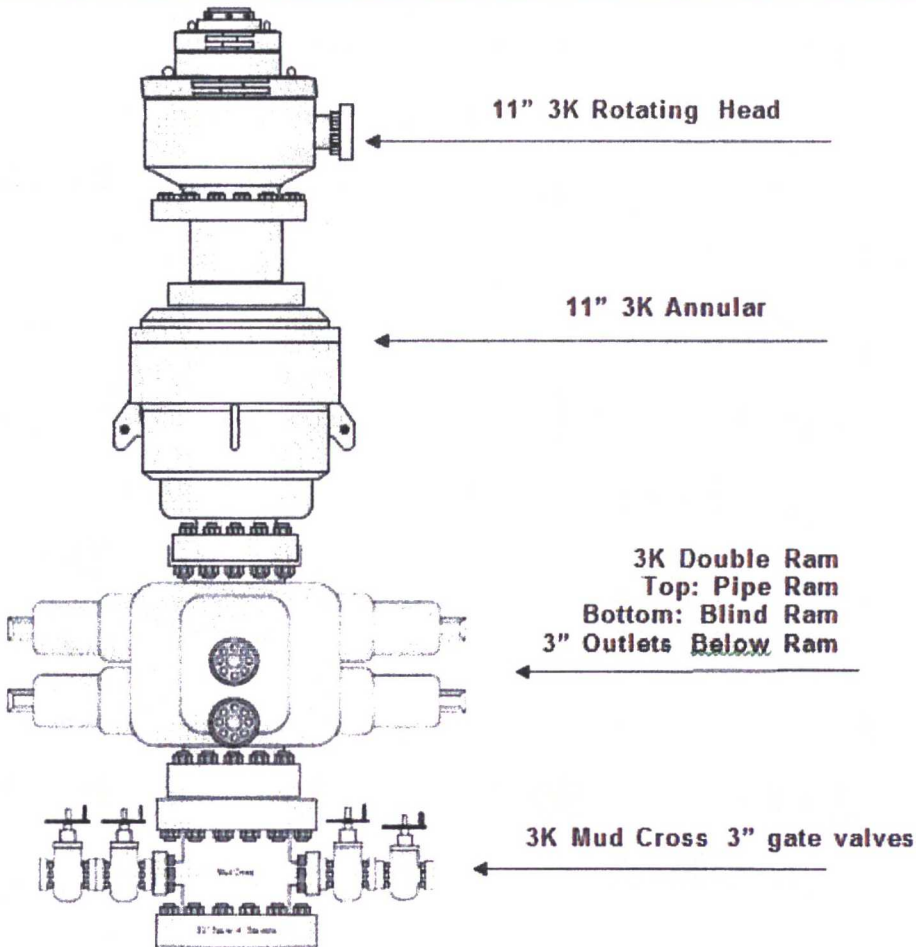
**C. Flowback Water**

1. The water-based solution that flows back to the surface during and after completion operations will be placed in storage tanks on the location.

WELLHEAD BLOWOUT CONTROL SYSTEM

**encana**

Well Name and Number:  
Venado Canyon Unit 205H





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

**VENADO CANYON UNIT #205H**

1320' FSL & 188' FWL

LOCATED IN THE SW/4 SW/4 OF SECTION 12,

T22N, R6W, N.M.P.M.,

SANDOVAL COUNTY, NEW MEXICO

**DIRECTIONS**

- 1) FROM THE INTERSECTION OF HWY 64 & HWY 550 IN BLOOMFIELD, GO SOUTH ON HWY 550 FOR 54.3 MILES TO INDIAN SERVICE ROUTE 474 ON THE RIGHT (SOUTH).
- 2) TURN RIGHT ONTO I.S.R. 474 AND GO 3.5 MILES TO A DIRT ROAD ON LEFT.
- 3) TURN LEFT AND GO 0.6 MILES TO A "Y" INTERSECTION.
- 4) TURN RIGHT AND GO 0.9 MILES WHERE ACCESS IS STAKED ON RIGHT SIDE OF ROAD.

WELL FLAG LOCATED AT LAT. 36.148471° N, LONG.107.428709° W (NAD 83).



JOB No.: VCU #205H\_REV1  
DATE: 05/18/16

**CCI**

**CHENAULT CONSULTING INC.**

4800 COLLEGE BLVD  
SUITE 201  
FARMINGTON, NM 87402  
(505) 325-7707