

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: 11-30-16

Well information;

Operator Encana, Well Name and Number N Alamo Unit #308H

API# 30043-21296, Section 34, Township 23N, Range 7E 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.

Charles P. ...
NMOCD Approved by Signature

1-25-2017
Date

Revised Est. HBP actual note 6/6/15

NOS:
APD:
MP:
SMA: BLM
BOND: COB000235
CA/PK: NM135229X

10400008120
ATS-F01017-27

Form 3160-3
(March 2012)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

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

1a. Type of work: ☒ DRILL ☐ REENTER		5. Lease Serial No. NMNM 6682
1b. Type of Well: ☒ Oil Well ☐ Gas Well ☐ Other ☒ Single Zone ☐ 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. /1/NORTH ALAMITO UNIT / NMNM1352
3a. Address 370 17TH STREET, SUITE 1700 DENVER CO		8. Lease Name and Well No. NORTH ALAMITO UNIT 308H
3b. Phone No. (include area code) (970)285-2600		9. API Well No. 30-043-21296
4. Location of Well (Report location clearly and in accordance with any State requirements.)* At surface L NWSW / 1462 FSL / 776 FWL / LAT 36.179842 / LONG -107.568345 At proposed prod. zone K NESW / 1810 FSL / 1700 FWL / LAT 36.195555 / LONG -107.583048		10. Field and Pool, or Exploratory ALAMITO MANCOS N (OIL)
14. Distance in miles and direction from nearest town or post office* 50.7 miles		11. Sec., T. R. M. or Blk. and Survey or Area SEC 34 / T23N / R7W / NMP
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 5285 feet	16. No. of acres in lease 2080	12. County or Parish SANDOVAL
17. Spacing Unit dedicated to this well 14262.78	18. Distance from proposed location* to nearest well, drilling, completed, 30 feet applied for, on this lease, ft.	13. State NM
19. Proposed Depth 5162 feet / 12545 feet	20. BLM/BIA Bond No. on file FED: COB000235	
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 6895 feet	22. Approximate date work will start* 03/01/2017	23. Estimated duration 20 days
24. Attachments		

OIL CONS. DIV DIST. 3
DEC 30 2016

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

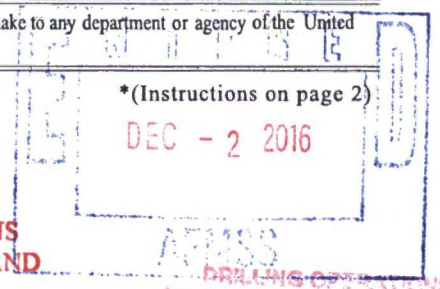
- | | |
|--|---|
| 1. Well plat certified by a registered surveyor. | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). |
| 2. A Drilling Plan. | 5. Operator certification |
| 3. A Surface Use Plan (if the location is on National Forest System Lands, the 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 11/30/2016
Title Regulatory Analyst		
Approved by (Signature) <i>[Signature]</i>	Name (Printed/Typed)	Date 12/28/16
Title AFN	Office FARMINGTON	

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.
Conditions of approval, if any, are attached.

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 2)



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

BLM'S APPROVAL OR ACCEPTANCE OF THIS ACTION DOES NOT RELIEVE THE LESSEE AND OPERATOR FROM OBTAINING ANY OTHER AUTHORIZATION REQUIRED FOR OPERATIONS ON FEDERAL AND INDIAN LANDS

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

NMOCD

DISTRICT I
1635 N. French Dr., Hobbs, N.M. 88240
Phone: (505) 393-8181 Fax: (505) 393-8720

DISTRICT II
811 S. First St., Artesia, N.M. 88210
Phone: (505) 748-1283 Fax: (505) 748-8720

DISTRICT III
1000 Rio Branson Rd., Artesia, N.M. 87410
Phone: (505) 334-6176 Fax: (505) 334-6170

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

State of New Mexico
Energy, Minerals & Natural Resources Department

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 30-043-21296		*Pool Code 98174	*Pool Name ALAMITO MANCOS N (OIL)
*Property Code 317188	*Property Name NORTH ALAMITO UNIT		*Well Number 308H
*OGRID No. 282327	*Operator Name ENCANA OIL & GAS (USA) INC.		*Elevation 6894.6'

¹⁰ Surface Location

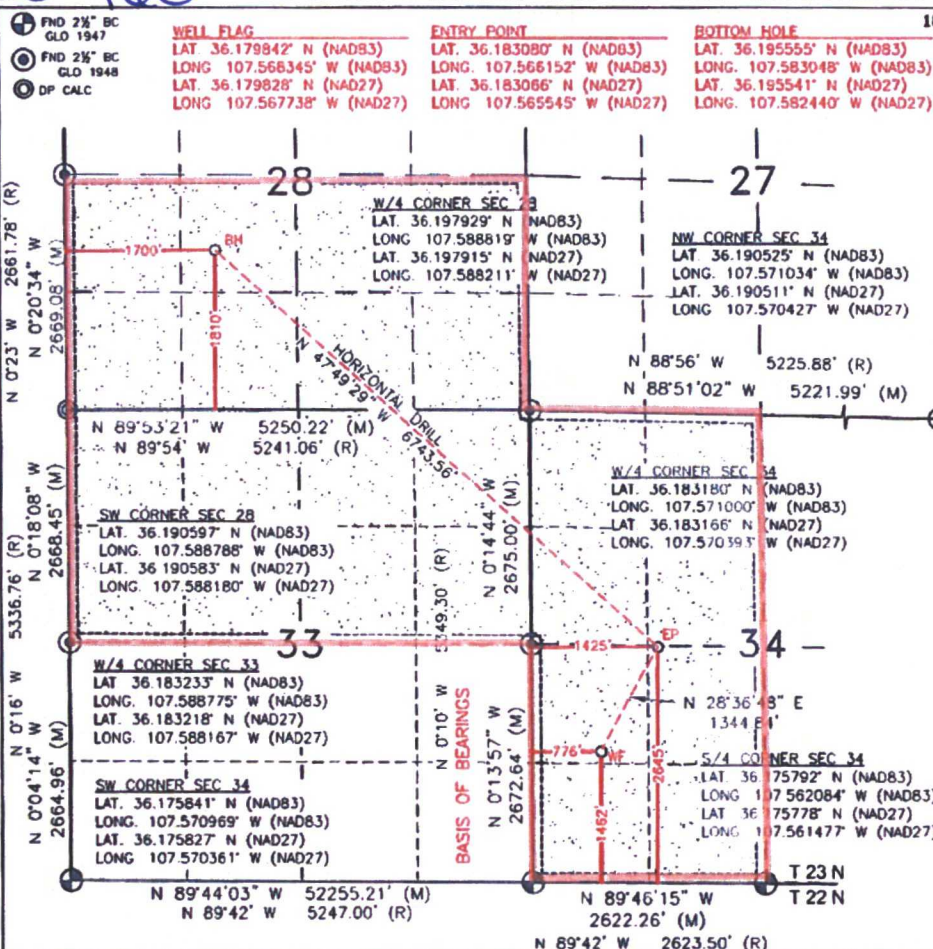
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
L	34	23N	7W		1462'	SOUTH	776'	WEST	SANDOVAL

¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
K	28	23N	7W		1810'	SOUTH	1700	WEST	SANDOVAL

*Dedicated Acres PENETRATED SPACING UNIT: 5/2 SEC. 28 (320 ACRES), W/2 SEC. 33 (320 ACRES), W/2 SEC. 34 (320 ACRES) TOTAL 14,262.78 ACRES: T23N 87W SEC. 10-23 (ALL); 28-34 (ALL); 35 (0W/4); T23N 87W SEC. 3 (0W/2); 4 (0W/2); 5 (0W/2); 6 (ALL); 7 (0W/2); 8 (0W/4); T23N 87W SEC. 25 & 36 (ALL); T23N 87W SEC. 1 (ALL); & 12 (0W/2) - UNDIVIDED UNIT		*Joint or Infill	*Consolidation Code	*Order No. R-14081-A (14,262.78 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



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* Date: 11/30/16

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 is true and correct to the best of my belief.

JANUARY 26, 2015

Date of Survey

Signature and Seal of Professional Surveyor:

HENRY P. BROADHURST JR.
NEW MEXICO
PROFESSIONAL SURVEYOR
11/04/2016

Certificate Number: 11393

North Alamito Unit 308H
SHL: NWSW Sec 34 T23N R7W
1462 FSL 776 FWL
BHL: NESW Sec 28 T23N R7W
1810 FSL 1700 FWL
Sandoval, New Mexico

**Encana Oil & Gas (USA) Inc.
Drilling Plan**

OIL CONS. DIV DIST. 3

JAN 19 2017

1. ESTIMATED TOPS OF GEOLOGICAL MARKERS (TVD)

The estimated tops of important geologic markers are as follows:

Formation	Depth (TVD) units = feet
Ojo Alamo	976
Kirtland Shale	1,161
Fruitland Coal	1,381
Pictured Cliffs Ss.	1,503
Lewis Shale	1,626
Cliffhouse Ss.	2,323
Menefee Fn.	3,037
Point Lookout Ss.	3,885
Mancos Shale	4,092
Mancos Silt	4,645
Gallup Fn.	4,905

The referenced surface elevation is 6895', KB 6911'

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

Substance	Formation	Depth (TVD) units = feet
Water/Gas	Fruitland Coal	1,381
Water/Gas	Pictured Cliffs Ss.	1,503
Water/Gas	Cliffhouse Ss.	2,323
Water/Gas	Menefee Fn.	3,037
Water/Gas	Point Lookout Ss.	3,885
Oil/Gas	Mancos Shale	4,092
Oil/Gas	Mancos Silt	4,645
Oil/Gas	Gallup Fn.	4,905

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

3. PRESSURE CONTROL

- Pressure control equipment and configuration will be designed to meet 2M standards.
- Working pressure on rams and BOPE will be 3,000 psi.
- Function test and visual inspection of the BOP will be conducted daily and noted in the IADC Daily Drilling Report.
- The Annular BOP will be pressure tested to a minimum of 50 percent of its rated working pressure.
- Blind and Pipe Rams/BOP will be tested against a test plug to 100 percent of rated working pressure.
- Pressure tests are required before drilling out from under all casing strings set and cemented in place.

North Alamito Unit 308H
 SHL: NWSW Sec 34 T23N R7W
 1462 FSL 776 FWL
 BHL: NESW Sec 28 T23N R7W
 1810 FSL 1700 FWL
 Sandoval, New Mexico

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

Proposed BOP and choke manifold arrangements are attached.

4. CASING & CEMENTING PROGRAM

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

- a) The proposed casing design is as follows:

Casing	Depth (MD)	Hole Size	Csg Size	Weight	Grade
Conductor	0'-60'	26"	16"	42	
Surface	0'-500'	12 1/4"	9 5/8"	32.3	J55, STC New
Intermediate	0'-5550'	8 3/4"	7"	26	J55, LTC New
Production Liner	5350'-12545'	6 1/8"	4 1/2"	11.6	B80*, BTC 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"	32.3	J55	STC	1370	2270	365	1.0	1.1	1.5
7"	26	J55	LTC	4330	4980	367	1.0	1.1	1.5
4.5"	11.6	B80	BTC	6350	7780	267	1.0	1.1	1.5

*B80 pipe specifications are attached

Casing design is subject to revision based on geologic conditions encountered

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

North Alamito Unit 308H
 SHL: NWSW Sec 34 T23N R7W
 1462 FSL 776 FWL
 BHL: NESW Sec 28 T23N R7W
 1810 FSL 1700 FWL
 Sandoval, New Mexico

b) The proposed cementing program is as follows

Casing	Depth (MD)	Cement Volume (sacks)	Cement Type & Yield	Designed TOC	Centralizers
Conductor	0'-60'	100 sks	Type I Neat 16 ppg	Surface	None
Surface	0'-500'	248 sks	Class G w/ 2% CaCl Weight: 14.6ppg Yield: 13.8 ft ³ /sk	Surface	1 per joint on bottom 3 joints
Intermediate	0'-5550'	100% open hole excess Stage 1 Lead: 625 sks Stage 1 Tail: 292 sks	Lead: Extended Class G w/ 6% BWOC bentonite + 5 lb/sk Kol-Seal + 0.125 lb/sk Poly-flake + 0.3% BWOC HR-5 Weight: 12.1ppg Yield: 2.038 ft ³ /sk Tail: Extended Class G w/ 1% BWOC bentonite + 0.3% BWOC Halad-567 + 0.2% BWOC Versaset + 0.05% SA-1015 Weight: 14.6ppg Yield: 1.059 ft ³ /sk	Surface	1 every 3 joints through water bearing zones
Production Liner	5350'-12545'	30% open hole excess Cement Vol: 680 sks	Extended Class G w/ 2.5 lb/sk Kol-seal + 0.7% BWOC Halad-567 + 0.20% BWOC Halad-9 + 0.05% SA-1015 Weight: 13.5ppg Yield: 1.302 ft ³ /sk	Top of Liner	N/A

North Alamito Unit 308H
SHL: NWSW Sec 34 T23N R7W
1462 FSL 776 FWL
BHL: NESW Sec 28 T23N R7W
1810 FSL 1700 FWL
Sandoval, New Mexico

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 4414'. Directional plans are attached.

Description	Proposed Depth (TVD/MD)	Formation
Horizontal Lateral TD	5162'/12545'	Gallup

6. DRILLING FLUIDS PROGRAM

a) Surface through Intermediate Casing Point:

Hole Size (in)	Depth (TVD/MD)	Mud Type	Density (ppg)	Viscosity (sec/qt)	Fluid Loss (cc)
26"	0-60'/60'	Fresh Water	8.3-9.2	38-100	NC
12 1/4"	0'-500'/500'	Fresh Water	8.3-10	60-70	NC
8 3/4"	500'/500'-5132'/5550'	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"	5132'/5550'- 5162'/12545'	Fresh Water LSND	8.3-10	15-25	<15

- c) There will be sufficient mud on location to control a blowout should one occur. Mud flow and volume will be monitored both visually and with electronic pit volume totalizers. Mud tests shall be performed every 24 hours after mudding up to determine, as applicable: density, viscosity, gel strength, filtration, and pH.
- d) A closed-loop system will be used to recover drilling fluid and dry cuttings in both phases of the well and on all hole intervals. Above-ground tanks will be utilized to hold cuttings and fluids for rig operations. A frac tank will be on location to store fresh water. Waste will be disposed of properly at an EPA-approved hazardous waste facility. Fresh water cuttings will be disposed of at Basin Disposal, Inc. and/or Industrial Ecosystems, Inc. The location will be lined in accordance with the Surface Use Plan of Operations.

7. TESTING, CORING, & LOGGING

- a) Drill Stem Testing - None anticipated.
b) Coring - None anticipated.
c) Mud Logging - Mancos Top to TD
d) Logging - See below

North Alamito Unit 308H
SHL: NWSW Sec 34 T23N R7W
1462 FSL 776 FWL
BHL: NESW Sec 28 T23N R7W
1810 FSL 1700 FWL
Sandoval, New Mexico

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 +/- 2421 psi based on a 9.0 ppg at 5174' TVD of the horizontal lateral target. No abnormal pressure or temperatures are anticipated.

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

9. ANTICIPATED START DATE AND DURATION OF OPERATIONS

Drilling is estimated to commence on March 1st, 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 companies.

It is anticipated that the drilling of this well will take approximately 10 days.

LOC: 1462' FSL, 776' FWL Sec 34 23N 07E County: San Juan WELL: NAU 308H			Encana Natural Gas WELL SUMMARY							ENG: L. Hubbard RIG: Unassigned GLE: 6895 RKBE: 6911		1-19-17
MWD LWD	OPEN HOLE LOGGING	FORM	DEPTH					HOLE SIZE	CASING SPECS	MW MUD TYPE	DEVIATION INFORMATION	
			TVD	MD								
			60	60'				26	16" 42# 100sx Type I Neat 16.0ppg cmt	Fresh wtr 8.3-9.2		
Multi-Well pad take survey stand and run anti-collision report prior to spud	None	Nacimiento 9 5/8" Csg	0 500	500.00				12 1/4	9 5/8" 32.3ppf J55 STC TOC to Surface 100% OHE	Fresh wtr 8.3-10	Vertical <1°	
Survey Every 60'-120', updating anticollision report after surveys. Stop operations contact drilling engineer if separation factor approaches 1.5	No OH logs	Ojo Alamo Kirtland Shale Fruitland Coal Pictured Cliffs Ss. Lewis Shale Cliffhouse Ss. Menefee Fn. Point Lookout Ss. Mancos Shale	976 1,161 1,381 1,503 1,626 2,323 3,037 3,885 4,092	4,594				8 3/4	7" 26ppf J55 LTC TOC @ surface (100% OH excess) Stage 1 Total: 918sk	Fresh Wtr 8.3-10	Vertical <1°	
Surveys every 30' through the curve		KOP	4,414									
		Mancos Silt	4,645									
		Gallup Fn. 7" Csg	4,905 5,132									
Surveys every stand to TD unless directed otherwise by Geologist	No OH Logs	Horizontal Target TD	5,174 5,162	12,545				6 1/8	200' overlap at liner top		Horz Inc/TVD 90.1deg/5174'	
MWD Gamma Directional		Base Gallup	5,256					6995' Drilled Lateral TOC @ Top of Liner (30% open hole excess)		WBM 8.3-10	TD = 12544.7' MD	

ENCANA™

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSet	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	600.0	0.00	0.00	600.0	0.0	0.0	0.00	0.00	0.0	
3	1539.8	18.80	62.80	1523.0	69.8	135.9	2.00	62.80	-53.4	
4	4593.9	18.80	62.80	4414.3	519.7	1011.1	0.00	0.00	-397.7	
5	5801.0	90.10	312.32	5173.5	1178.9	647.3	8.00	-109.44	315.1	NAU 308H POE 11.10
6	12544.7	90.10	312.32	5161.7	5719.3	-4338.9	0.00	0.00	7058.8	NAU 308H PBHL 11.10

Project: Sandoval County, NM
 Site: S34-T23N-R7W
 Well: NORTH ALAMITO UNIT 308H
 Wellbore: OH
 Design: PLAN #1



Azimuths to True North
 Magnetic North: 8.98°

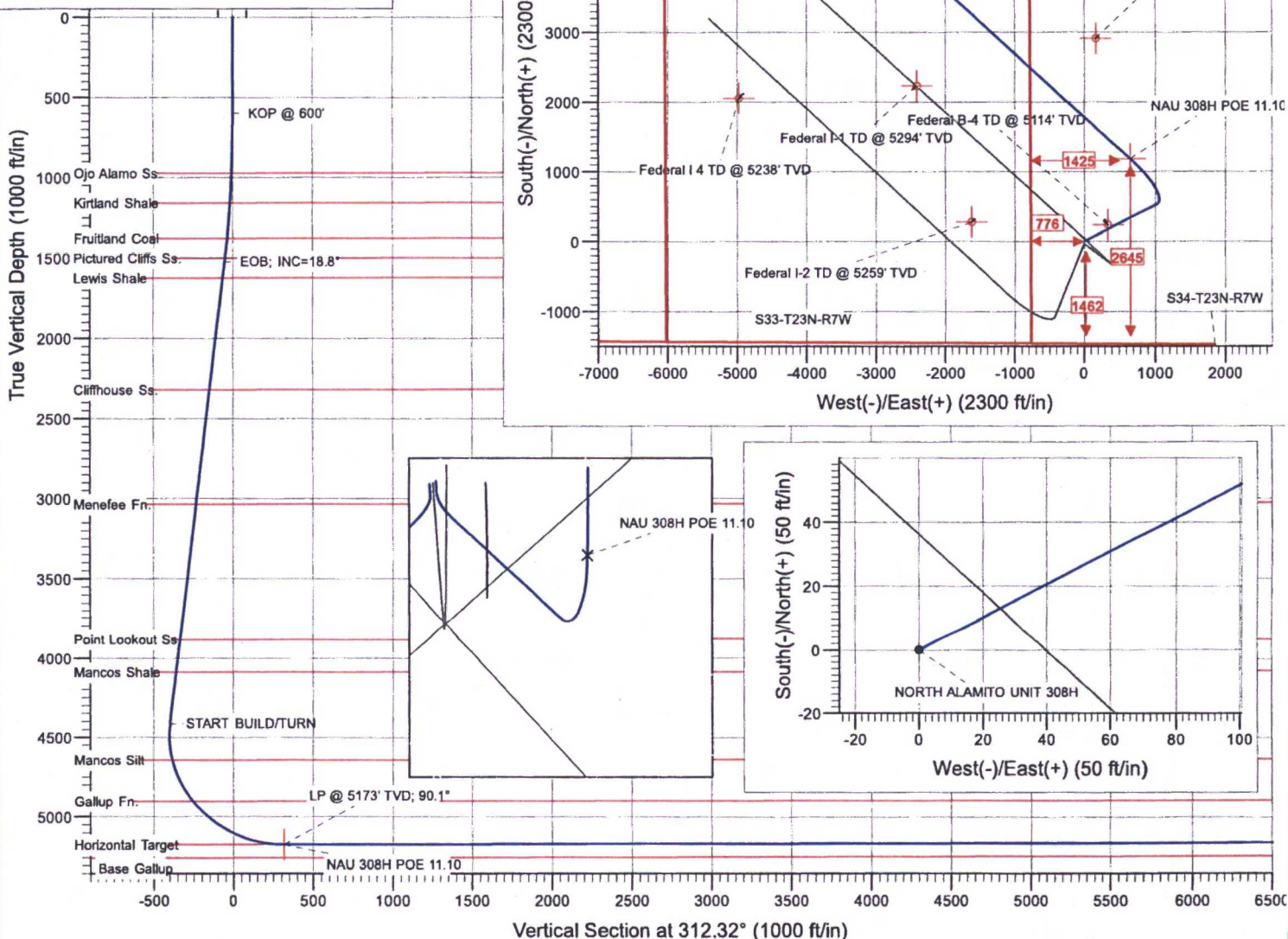
Magnetic Field
 Strength: 49646.4snT
 Dip Angle: 62.90°
 Date: 11/10/2016
 Model: HDGM

PLAN #1
 NORTH ALAMITO UNIT 308H
 18000 L.R.
 16' X 30' @ 3011.08
 Ground Level @ 6895.0
 North American Datum 1983
 Well NORTH ALAMITO UNIT 308H, True North

Type	Target	Admuth	Origin	Type	N/S	E/W	From	TVD
Name	No Target (Freehand)	212.32	Shot	0.0	0.0	0.0	0.0	0.0
NAU 308H PBHL 11.10		5161.7		+N/-S	+E/-W	Lat/Long		
NAU 308H POE 11.10		5173.5		5719.3	-4338.9	36.195650	-107.583048	
				1178.9	647.3	36.183090	-107.596152	

FORMATION TOP DETAILS

TVDPATH	MDPATH	Formation
976.0	977.1	Ojo Alamo Ss.
1161.0	1164.7	Kirtland Shale
1381.1	1391.1	Fruitland Coal
1503.1	1518.8	Pictured Cliffs Ss.
1626.1	1648.7	Lewis Shale
2323.3	2385.1	Cliffhouse Ss.
3037.4	3139.5	Menefee Fn.
3885.6	4035.4	Point Lookout Ss.
4092.6	4254.1	Mancos Shale
4645.7	4838.4	Mancos Silt
4905.5	5142.1	Gallup Fn.



WELL DETAILS: NORTH ALAMITO UNIT 308H

+N/-S	+E/-W	Northing	Ground Level:	Latitude	Longitude
0.0	0.0	1887374.52	Easting 6895.0	36.179842	-107.58345
			1251352.64		

CATHEDRAL



Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Site: S34-T23N-R7W
Well: NORTH ALAMITO UNIT 308H
Wellbore: OH
Design: PLAN #1

Local Co-ordinate Reference: Well NORTH ALAMITO UNIT 308H
TVD Reference: 16' KB @ 6911.0ft
MD Reference: 16' KB @ 6911.0ft
North Reference: True
Survey Calculation Method: Minimum Curvature

Project: Sandoval County, NM
Map System: US State Plane 1983
Geo Datum: North American Datum 1983
Map Zone: New Mexico Central Zone

System Datum: Mean Sea Level

Site: S34-T23N-R7W

Site Position:		Northing:	1,887,404.69 ft	Latitude:	36.179925
From:	Lat/Long	Easting:	1,251,356.59 ft	Longitude:	-107.568333
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-0.78 °

Well: NORTH ALAMITO UNIT 308H

Well Position	+N/-S	0.0 ft	Northing:	1,887,374.52 ft	Latitude:	36.179842
	+E/-W	0.0 ft	Easting:	1,251,352.64 ft	Longitude:	-107.568345
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	6,895.0 ft

Wellbore: OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	11/10/2016	8.98	62.90	49,646

Design: PLAN #1

Audit Notes:

Version: **Phase:** PLAN **Tie On Depth:** 0.0

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	312.32

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
600.0	0.00	0.00	600.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,539.8	18.80	62.80	1,523.0	69.8	135.9	2.00	2.00	0.00	62.80	
4,593.9	18.80	62.80	4,414.3	519.7	1,011.1	0.00	0.00	0.00	0.00	
5,801.0	90.10	312.32	5,173.5	1,178.9	647.3	8.00	5.91	-9.15	-109.44	NAU 308H POE 11.1
12,544.7	90.10	312.32	5,161.7	5,719.3	-4,338.9	0.00	0.00	0.00	0.00	NAU 308H PBHL 11.1

Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Site: S34-T23N-R7W
Well: NORTH ALAMITO UNIT 308H
Wellbore: OH
Design: PLAN #1

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

Well NORTH ALAMITO UNIT 308H
16' KB @ 6911.0ft
16' KB @ 6911.0ft
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
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	KOP @ 600'
700.0	2.00	62.80	700.0	0.8	1.6	-0.6	2.00	2.00	
800.0	4.00	62.80	799.8	3.2	6.2	-2.4	2.00	2.00	
900.0	6.00	62.80	899.5	7.2	14.0	-5.5	2.00	2.00	
977.1	7.54	62.80	976.0	11.3	22.0	-8.7	2.00	2.00	Ojo Alamo Ss.
1,000.0	8.00	62.80	998.7	12.7	24.8	-9.8	2.00	2.00	
1,100.0	10.00	62.80	1,097.5	19.9	38.7	-15.2	2.00	2.00	
1,164.7	11.29	62.80	1,161.0	25.4	49.3	-19.4	2.00	2.00	Kirtland Shale
1,200.0	12.00	62.80	1,195.6	28.6	55.7	-21.9	2.00	2.00	
1,300.0	14.00	62.80	1,293.1	38.9	75.7	-29.8	2.00	2.00	
1,391.1	15.82	62.80	1,381.1	49.6	96.5	-38.0	2.00	2.00	Fruitland Coal
1,400.0	16.00	62.80	1,389.6	50.7	98.7	-38.8	2.00	2.00	
1,500.0	18.00	62.80	1,485.3	64.1	124.7	-49.1	2.00	2.00	
1,518.8	18.38	62.80	1,503.1	66.8	129.9	-51.1	2.00	2.00	Pictured Cliffs Ss.
1,539.8	18.80	62.80	1,523.0	69.8	135.9	-53.4	2.00	2.00	EOB; INC=18.8°
1,600.0	18.80	62.80	1,580.0	78.7	153.1	-60.2	0.00	0.00	
1,648.7	18.80	62.80	1,626.1	85.9	167.1	-65.7	0.00	0.00	Lewis Shale
1,700.0	18.80	62.80	1,674.7	93.4	181.8	-71.5	0.00	0.00	
1,800.0	18.80	62.80	1,769.4	108.2	210.4	-82.8	0.00	0.00	
1,900.0	18.80	62.80	1,864.0	122.9	239.1	-94.0	0.00	0.00	
2,000.0	18.80	62.80	1,958.7	137.6	267.7	-105.3	0.00	0.00	
2,100.0	18.80	62.80	2,053.4	152.3	296.4	-116.6	0.00	0.00	
2,200.0	18.80	62.80	2,148.0	167.1	325.1	-127.9	0.00	0.00	
2,300.0	18.80	62.80	2,242.7	181.8	353.7	-139.1	0.00	0.00	
2,385.1	18.80	62.80	2,323.3	194.3	378.1	-148.7	0.00	0.00	Cliffhouse Ss.
2,400.0	18.80	62.80	2,337.4	196.5	382.4	-150.4	0.00	0.00	
2,500.0	18.80	62.80	2,432.0	211.3	411.0	-161.7	0.00	0.00	
2,600.0	18.80	62.80	2,526.7	226.0	439.7	-172.9	0.00	0.00	
2,700.0	18.80	62.80	2,621.4	240.7	468.3	-184.2	0.00	0.00	
2,800.0	18.80	62.80	2,716.0	255.4	497.0	-195.5	0.00	0.00	
2,900.0	18.80	62.80	2,810.7	270.2	525.6	-206.8	0.00	0.00	
3,000.0	18.80	62.80	2,905.4	284.9	554.3	-218.0	0.00	0.00	
3,100.0	18.80	62.80	3,000.0	299.6	583.0	-229.3	0.00	0.00	
3,139.5	18.80	62.80	3,037.4	305.4	594.3	-233.8	0.00	0.00	Menefee Fn.
3,200.0	18.80	62.80	3,094.7	314.4	611.6	-240.6	0.00	0.00	
3,300.0	18.80	62.80	3,189.4	329.1	640.3	-251.8	0.00	0.00	
3,400.0	18.80	62.80	3,284.0	343.8	668.9	-263.1	0.00	0.00	
3,500.0	18.80	62.80	3,378.7	358.5	697.6	-274.4	0.00	0.00	
3,600.0	18.80	62.80	3,473.4	373.3	726.2	-285.7	0.00	0.00	
3,700.0	18.80	62.80	3,568.0	388.0	754.9	-296.9	0.00	0.00	
3,800.0	18.80	62.80	3,662.7	402.7	783.5	-308.2	0.00	0.00	
3,900.0	18.80	62.80	3,757.4	417.5	812.2	-319.5	0.00	0.00	
4,000.0	18.80	62.80	3,852.1	432.2	840.9	-330.7	0.00	0.00	
4,035.4	18.80	62.80	3,885.6	437.4	851.0	-334.7	0.00	0.00	Point Lookout Ss.
4,100.0	18.80	62.80	3,946.7	446.9	869.5	-342.0	0.00	0.00	
4,200.0	18.80	62.80	4,041.4	461.6	898.2	-353.3	0.00	0.00	

Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
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Project: Sandoval County, NM
Site: S34-T23N-R7W
Well: NORTH ALAMITO UNIT 308H
Wellbore: OH
Design: PLAN #1

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

Well NORTH ALAMITO UNIT 308H
 16' KB @ 6911.0ft
 16' KB @ 6911.0ft
 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
4,254.1	18.80	62.80	4,092.6	469.6	913.7	-359.4	0.00	0.00	Mancos Shale
4,300.0	18.80	62.80	4,136.1	476.4	926.8	-364.6	0.00	0.00	
4,400.0	18.80	62.80	4,230.7	491.1	955.5	-375.8	0.00	0.00	
4,500.0	18.80	62.80	4,325.4	505.8	984.1	-387.1	0.00	0.00	START BUILD/TURN
4,593.9	18.80	62.80	4,414.3	519.7	1,011.1	-397.7	0.00	0.00	
4,600.0	18.64	61.37	4,420.1	520.6	1,012.8	-398.4	7.99	-2.57	
4,700.0	17.80	35.72	4,515.2	540.7	1,035.8	-401.8	8.00	-0.84	Mancos Silt
4,800.0	20.25	12.17	4,609.9	570.1	1,048.3	-391.3	8.00	2.45	
4,838.4	21.88	4.92	4,645.7	583.7	1,050.4	-383.7	8.00	4.25	
4,900.0	25.04	355.39	4,702.2	608.1	1,050.3	-367.2	8.00	5.13	Gallup Fn.
5,000.0	31.11	344.25	4,790.5	654.2	1,041.6	-329.7	8.00	6.07	
5,100.0	37.85	336.58	4,872.9	707.3	1,022.3	-279.7	8.00	6.73	
5,142.1	40.80	334.03	4,905.5	731.5	1,011.2	-255.2	8.00	7.02	LP @ 5173' TVD; 90.1°
5,200.0	44.95	330.99	4,947.9	766.4	993.0	-218.2	8.00	7.15	
5,300.0	52.26	326.64	5,014.0	830.4	954.0	-146.3	8.00	7.31	
5,400.0	59.70	323.09	5,069.9	898.1	906.3	-65.4	8.00	7.44	
5,500.0	67.22	320.05	5,114.6	968.1	850.7	22.8	8.00	7.52	
5,600.0	74.80	317.32	5,147.1	1,039.0	788.2	116.7	8.00	7.57	
5,700.0	82.40	314.79	5,166.8	1,109.5	720.3	214.4	8.00	7.61	
5,800.0	90.02	312.35	5,173.5	1,178.2	648.0	314.1	8.00	7.62	
5,801.0	90.10	312.32	5,173.5	1,178.9	647.3	315.1	8.00	7.62	
5,900.0	90.10	312.32	5,173.3	1,245.5	574.1	414.1	0.00	0.00	
6,000.0	90.10	312.32	5,173.1	1,312.9	500.1	514.1	0.00	0.00	
6,100.0	90.10	312.32	5,172.9	1,380.2	426.2	614.1	0.00	0.00	
6,200.0	90.10	312.32	5,172.8	1,447.5	352.3	714.1	0.00	0.00	
6,300.0	90.10	312.32	5,172.6	1,514.8	278.3	814.1	0.00	0.00	
6,400.0	90.10	312.32	5,172.4	1,582.2	204.4	914.1	0.00	0.00	
6,500.0	90.10	312.32	5,172.2	1,649.5	130.4	1,014.1	0.00	0.00	
6,600.0	90.10	312.32	5,172.1	1,716.8	56.5	1,114.1	0.00	0.00	
6,700.0	90.10	312.32	5,171.9	1,784.2	-17.4	1,214.1	0.00	0.00	
6,800.0	90.10	312.32	5,171.7	1,851.5	-91.4	1,314.1	0.00	0.00	
6,900.0	90.10	312.32	5,171.5	1,918.8	-165.3	1,414.1	0.00	0.00	
7,000.0	90.10	312.32	5,171.4	1,986.1	-239.2	1,514.1	0.00	0.00	
7,100.0	90.10	312.32	5,171.2	2,053.5	-313.2	1,614.1	0.00	0.00	
7,200.0	90.10	312.32	5,171.0	2,120.8	-387.1	1,714.1	0.00	0.00	
7,300.0	90.10	312.32	5,170.8	2,188.1	-461.1	1,814.1	0.00	0.00	
7,400.0	90.10	312.32	5,170.7	2,255.5	-535.0	1,914.1	0.00	0.00	
7,500.0	90.10	312.32	5,170.5	2,322.8	-608.9	2,014.1	0.00	0.00	
7,600.0	90.10	312.32	5,170.3	2,390.1	-682.9	2,114.1	0.00	0.00	
7,700.0	90.10	312.32	5,170.1	2,457.4	-756.8	2,214.1	0.00	0.00	
7,800.0	90.10	312.32	5,170.0	2,524.8	-830.8	2,314.1	0.00	0.00	
7,900.0	90.10	312.32	5,169.8	2,592.1	-904.7	2,414.1	0.00	0.00	
8,000.0	90.10	312.32	5,169.6	2,659.4	-978.6	2,514.1	0.00	0.00	
8,100.0	90.10	312.32	5,169.4	2,726.8	-1,052.6	2,614.1	0.00	0.00	
8,200.0	90.10	312.32	5,169.3	2,794.1	-1,126.5	2,714.1	0.00	0.00	
8,300.0	90.10	312.32	5,169.1	2,861.4	-1,200.4	2,814.1	0.00	0.00	
8,400.0	90.10	312.32	5,168.9	2,928.7	-1,274.4	2,914.1	0.00	0.00	
8,500.0	90.10	312.32	5,168.7	2,996.1	-1,348.3	3,014.1	0.00	0.00	
8,600.0	90.10	312.32	5,168.6	3,063.4	-1,422.3	3,114.1	0.00	0.00	
8,700.0	90.10	312.32	5,168.4	3,130.7	-1,496.2	3,214.1	0.00	0.00	
8,800.0	90.10	312.32	5,168.2	3,198.1	-1,570.1	3,314.1	0.00	0.00	
8,900.0	90.10	312.32	5,168.0	3,265.4	-1,644.1	3,414.1	0.00	0.00	

Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Site: S34-T23N-R7W
Well: NORTH ALAMITO UNIT 308H
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Local Co-ordinate Reference:
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North Reference:
Survey Calculation Method:

Well NORTH ALAMITO UNIT 308H
16' KB @ 6911.0ft
16' KB @ 6911.0ft
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
9,000.0	90.10	312.32	5,167.9	3,332.7	-1,718.0	3,514.1	0.00	0.00	
9,100.0	90.10	312.32	5,167.7	3,400.0	-1,792.0	3,614.1	0.00	0.00	
9,200.0	90.10	312.32	5,167.5	3,467.4	-1,865.9	3,714.1	0.00	0.00	
9,300.0	90.10	312.32	5,167.3	3,534.7	-1,939.8	3,814.1	0.00	0.00	
9,400.0	90.10	312.32	5,167.2	3,602.0	-2,013.8	3,914.1	0.00	0.00	
9,500.0	90.10	312.32	5,167.0	3,669.3	-2,087.7	4,014.1	0.00	0.00	
9,600.0	90.10	312.32	5,166.8	3,736.7	-2,161.6	4,114.1	0.00	0.00	
9,700.0	90.10	312.32	5,166.7	3,804.0	-2,235.6	4,214.1	0.00	0.00	
9,800.0	90.10	312.32	5,166.5	3,871.3	-2,309.5	4,314.1	0.00	0.00	
9,900.0	90.10	312.32	5,166.3	3,938.7	-2,383.5	4,414.1	0.00	0.00	
10,000.0	90.10	312.32	5,166.1	4,006.0	-2,457.4	4,514.1	0.00	0.00	
10,100.0	90.10	312.32	5,166.0	4,073.3	-2,531.3	4,614.1	0.00	0.00	
10,200.0	90.10	312.32	5,165.8	4,140.6	-2,605.3	4,714.1	0.00	0.00	
10,300.0	90.10	312.32	5,165.6	4,208.0	-2,679.2	4,814.1	0.00	0.00	
10,400.0	90.10	312.32	5,165.4	4,275.3	-2,753.2	4,914.1	0.00	0.00	
10,500.0	90.10	312.32	5,165.3	4,342.6	-2,827.1	5,014.1	0.00	0.00	
10,600.0	90.10	312.32	5,165.1	4,410.0	-2,901.0	5,114.1	0.00	0.00	
10,700.0	90.10	312.32	5,164.9	4,477.3	-2,975.0	5,214.1	0.00	0.00	
10,800.0	90.10	312.32	5,164.7	4,544.6	-3,048.9	5,314.1	0.00	0.00	
10,900.0	90.10	312.32	5,164.6	4,611.9	-3,122.9	5,414.1	0.00	0.00	
11,000.0	90.10	312.32	5,164.4	4,679.3	-3,196.8	5,514.1	0.00	0.00	
11,100.0	90.10	312.32	5,164.2	4,746.6	-3,270.7	5,614.1	0.00	0.00	
11,200.0	90.10	312.32	5,164.0	4,813.9	-3,344.7	5,714.1	0.00	0.00	
11,300.0	90.10	312.32	5,163.9	4,881.3	-3,418.6	5,814.1	0.00	0.00	
11,400.0	90.10	312.32	5,163.7	4,948.6	-3,492.5	5,914.1	0.00	0.00	
11,500.0	90.10	312.32	5,163.5	5,015.9	-3,566.5	6,014.1	0.00	0.00	
11,600.0	90.10	312.32	5,163.3	5,083.2	-3,640.4	6,114.1	0.00	0.00	
11,700.0	90.10	312.32	5,163.2	5,150.6	-3,714.4	6,214.1	0.00	0.00	
11,800.0	90.10	312.32	5,163.0	5,217.9	-3,788.3	6,314.1	0.00	0.00	
11,900.0	90.10	312.32	5,162.8	5,285.2	-3,862.2	6,414.1	0.00	0.00	
12,000.0	90.10	312.32	5,162.6	5,352.6	-3,936.2	6,514.1	0.00	0.00	
12,100.0	90.10	312.32	5,162.5	5,419.9	-4,010.1	6,614.1	0.00	0.00	
12,200.0	90.10	312.32	5,162.3	5,487.2	-4,084.1	6,714.1	0.00	0.00	
12,300.0	90.10	312.32	5,162.1	5,554.5	-4,158.0	6,814.1	0.00	0.00	
12,400.0	90.10	312.32	5,161.9	5,621.9	-4,231.9	6,914.1	0.00	0.00	
12,500.0	90.10	312.32	5,161.8	5,689.2	-4,305.9	7,014.1	0.00	0.00	
12,544.7	90.10	312.32	5,161.7	5,719.3	-4,338.9	7,058.8	0.00	0.00	TD at 12544.7

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
NAU 308H PBHL 11.10 - plan hits target center - Point	0.00	0.00	5,161.7	5,719.3	-4,338.9	1,893,152.20	1,247,091.85	36.195550	-107.583048
NAU 308H POE 11.10 - plan hits target center - Point	0.00	0.00	5,173.5	1,178.9	647.3	1,888,544.50	1,252,015.85	36.183080	-107.566152

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Project: Sandoval County, NM
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Well NORTH ALAMITO UNIT 308H
 16' KB @ 6911.0ft
 16' KB @ 6911.0ft
 True
 Minimum Curvature

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
977.1	976.0	Ojo Alamo Ss.		-0.10	312.16
1,164.7	1,161.0	Kirtland Shale		-0.10	312.16
1,391.1	1,381.0	Fruitland Coal		-0.10	312.16
1,518.8	1,503.0	Pictured Cliffs Ss.		-0.10	312.16
1,648.7	1,626.0	Lewis Shale		-0.10	312.16
2,385.1	2,323.0	Cliffhouse Ss.		-0.10	312.16
3,139.5	3,037.0	Menefee Fn.		-0.10	312.16
4,035.4	3,885.0	Point Lookout Ss.		-0.10	312.16
4,254.1	4,092.0	Mancos Shale		-0.10	312.16
4,838.4	4,645.0	Mancos Silt		-0.10	312.16
5,142.1	4,905.0	Gallup Fn.		-0.10	312.16

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
600.0	600.0	0.0	0.0	KOP @ 600'
1,539.8	1,523.0	69.8	135.9	EOB; INC=18.8°
4,593.9	4,414.3	519.7	1,011.1	START BUILD/TURN
5,801.0	5,173.5	1,178.9	647.3	LP @ 5173' TVD; 90.1°
12,544.7	5,161.7	5,719.3	-4,338.9	TD at 12544.7

EnCana Oil & Gas (USA) Inc

Sandoval County, NM

S34-T23N-R7W

NORTH ALAMITO UNIT 308H

OH

PLAN #1

Anticollision Report

10 November, 2016

Cal ral Energy Servi

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well NORTH ALAMITO UNIT 308H
Project:	Sandoval County, NM	TVD Reference:	16' KB @ 6911.0ft
Reference Site:	S34-T23N-R7W	MD Reference:	16' KB @ 6911.0ft
Site Error:	0.0ft	North Reference:	True
Reference Well:	NORTH ALAMITO UNIT 308H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	USA EDM 5000 Multi Users DB
Reference Design:	PLAN #1	Offset TVD Reference:	Offset Datum

Reference	PLAN #1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	Systematic Ellipse
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,500.0ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program		Date	11/10/2016		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.0	12,544.7	PLAN #1 (OH)	MWD+HDGM	OWSG MWD + HDGM	

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
S34-T23N-R7W						
Federal B-4 (Existing) - INC ONLY - INC ONLY	2,328.5	2,255.9	121.7	106.7	8.113	CC, ES
Federal B-4 (Existing) - INC ONLY - INC ONLY	2,400.0	2,323.6	123.9	108.4	8.008	SF
Federal B-5 (Existing) - INC ONLY - INC ONLY	7,322.7	5,167.4	950.8	882.9	13.995	CC, ES
Federal B-5 (Existing) - INC ONLY - INC ONLY	7,500.0	5,167.4	967.2	895.4	13.461	SF
Federal I-1 (Existing) - INC ONLY - SURVEYS	8,773.9	5,185.1	1,291.9	1,185.2	12.108	CC
Federal I-1 (Existing) - INC ONLY - SURVEYS	8,800.0	5,185.0	1,292.2	1,184.9	12.043	ES
Federal I-1 (Existing) - INC ONLY - SURVEYS	9,000.0	5,184.0	1,311.6	1,200.9	11.852	SF
Federal I-2 (Existing) - INC ONLY - SURVEYS						Out of range
Federal I-4 (Existing) - EXISTING - SURVEYS						Out of range
Federal I-1 (Existing) - INC ONLY - SURVEYS	10,174.2	5,156.1	251.4	108.7	1.762	CC, ES, SF
NORTH ALAMITO UNIT 306H - OH - PLAN #2	500.0	500.0	60.0	56.8	18.919	CC, ES
NORTH ALAMITO UNIT 306H - OH - PLAN #2	700.0	695.5	67.9	63.2	14.627	SF
NORTH ALAMITO UNIT 307H - OH - PLAN #1	600.0	600.0	29.7	25.8	7.641	CC, ES
NORTH ALAMITO UNIT 307H - OH - PLAN #1	12,500.0	12,332.9	1,301.1	914.6	3.366	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: S34-T23N-R7W
Site Error: 0.0ft
Reference Well: NORTH ALAMITO UNIT 308H
Well Error: 0.0ft
Reference Wellbore: OH
Reference Design: PLAN #1

Local Co-ordinate Reference: Well NORTH ALAMITO UNIT 308H
TVD Reference: 16' KB @ 6911.0ft
MD Reference: 16' KB @ 6911.0ft
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 S34-T23N-R7W - Federal B-4 (Existing) - INC ONLY - INC ONLY														Offset Site Error:	0.0 ft
Survey Program: 150-ISCWSA MWD														Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning		
0.0	0.0	0.0	0.0	0.0	0.0	43.28	308.7	290.7	424.4						
100.0	100.0	84.1	84.1	0.2	0.1	43.29	308.7	290.8	424.1	423.8	0.25	1,729.036			
200.0	200.0	184.3	184.3	0.5	0.2	43.31	308.5	290.8	424.0	423.3	0.75	561.743			
300.0	300.0	284.3	284.3	0.9	0.5	43.34	308.3	291.0	423.9	422.6	1.34	316.753			
400.0	400.0	384.4	384.4	1.2	0.7	43.38	308.0	291.1	423.9	421.9	1.92	220.526			
500.0	500.0	484.5	484.5	1.6	0.9	43.43	307.7	291.3	423.7	421.2	2.51	169.117			
600.0	600.0	584.5	584.5	1.9	1.1	43.48	307.4	291.5	423.6	420.5	3.09	137.124			
700.0	700.0	684.6	684.6	2.3	1.4	-19.34	306.9	291.8	421.8	418.2	3.67	114.961			
800.0	799.8	784.6	784.6	2.7	1.6	-19.53	306.4	292.1	416.7	412.5	4.25	98.075			
900.0	899.5	884.3	884.3	3.0	1.8	-19.91	305.9	292.4	408.3	403.5	4.83	84.510			
1,000.0	998.7	983.6	983.6	3.4	2.0	-20.49	305.2	292.8	396.7	391.3	5.42	73.226			
1,100.0	1,097.5	1,082.5	1,082.5	3.8	2.3	-21.30	304.5	293.2	381.8	375.8	6.01	63.575			
1,200.0	1,195.6	1,180.8	1,180.7	4.2	2.5	-22.40	303.7	293.6	363.7	357.1	6.60	55.131			
1,300.0	1,293.1	1,278.3	1,278.3	4.6	2.7	-23.85	302.9	294.1	342.6	335.5	7.20	47.617			
1,400.0	1,389.6	1,375.0	1,374.9	5.0	2.9	-25.76	302.0	294.6	318.6	310.8	7.80	40.838			
1,500.0	1,485.3	1,470.7	1,470.6	5.5	3.1	-28.30	301.1	295.1	291.9	283.5	8.42	34.659			
1,539.8	1,523.0	1,508.5	1,508.4	5.7	3.2	-29.54	300.7	295.4	280.6	271.9	8.88	32.338			
1,600.0	1,580.0	1,565.5	1,565.5	6.0	3.4	-31.45	300.1	295.7	263.4	254.3	9.06	29.054			
1,700.0	1,674.7	1,660.3	1,660.2	6.5	3.6	-35.23	299.1	296.3	235.4	225.7	9.73	24.193			
1,800.0	1,769.4	1,755.1	1,755.0	7.1	3.8	-39.94	298.0	296.9	208.6	198.2	10.44	19.987			
1,900.0	1,864.0	1,849.8	1,849.8	7.6	4.0	-45.91	296.9	297.6	183.5	172.3	11.20	16.385			
2,000.0	1,958.7	1,944.6	1,944.5	8.2	4.2	-53.55	295.7	298.3	161.0	148.9	12.04	13.370			
2,100.0	2,053.4	2,039.3	2,039.3	8.8	4.4	-63.26	294.4	299.0	142.1	129.1	12.95	10.968			
2,200.0	2,148.0	2,134.1	2,134.0	9.4	4.6	-75.23	293.1	299.8	128.5	114.6	13.91	9.242			
2,300.0	2,242.7	2,228.9	2,228.8	9.9	4.9	-89.00	291.7	300.6	122.1	107.3	14.79	8.257			
2,328.5	2,269.7	2,255.9	2,255.8	10.1	4.9	-93.08	291.3	300.8	121.7	106.7	15.01	8.113 CC, ES			
2,400.0	2,337.4	2,323.6	2,323.5	10.5	5.1	-103.23	290.3	301.4	123.9	108.4	15.47	8.008 SF			
2,500.0	2,432.0	2,418.3	2,418.1	11.1	5.3	-116.31	288.8	302.2	133.6	117.7	15.95	8.382			
2,600.0	2,526.7	2,513.0	2,512.8	11.7	5.5	-127.28	287.4	303.0	149.8	133.5	16.31	9.184			
2,700.0	2,621.4	2,607.6	2,607.5	12.3	5.7	-136.01	286.0	303.9	170.6	153.9	16.67	10.234			
2,800.0	2,716.0	2,702.3	2,702.1	12.9	5.9	-142.82	284.5	304.7	194.5	177.4	17.06	11.401			
2,900.0	2,810.7	2,797.0	2,796.8	13.5	6.2	-148.14	283.1	305.5	220.5	203.0	17.49	12.605			
3,000.0	2,905.4	2,891.7	2,891.5	14.1	6.4	-152.34	281.7	306.4	248.0	230.0	17.97	13.803			
3,100.0	3,000.0	2,986.5	2,986.3	14.7	6.6	-155.73	280.2	307.2	276.5	258.0	18.47	14.966			
3,200.0	3,094.7	3,081.3	3,081.0	15.3	6.8	-158.51	278.7	308.1	305.6	286.6	19.00	16.085			
3,300.0	3,189.4	3,176.1	3,175.8	15.9	7.0	-160.82	277.0	309.0	335.3	315.8	19.54	17.155			
3,400.0	3,284.0	3,270.9	3,270.6	16.5	7.2	-162.78	275.3	310.0	365.4	345.3	20.10	18.175			
3,500.0	3,378.7	3,365.6	3,365.3	17.1	7.5	-164.45	273.5	311.1	395.8	375.1	20.67	19.145			
3,600.0	3,473.4	3,460.3	3,460.0	17.7	7.7	-165.88	271.7	312.1	426.4	405.2	21.25	20.069			
3,700.0	3,568.0	3,555.0	3,554.6	18.3	7.9	-167.12	269.9	313.1	457.3	435.4	21.83	20.947			
3,800.0	3,662.7	3,649.6	3,649.3	18.9	8.1	-168.21	268.1	314.2	488.3	465.9	22.42	21.781			
3,900.0	3,757.4	3,744.3	3,743.9	19.5	8.3	-169.16	266.3	315.2	519.5	496.5	23.01	22.575			
4,000.0	3,852.0	3,839.1	3,838.7	20.1	8.5	-170.01	264.5	316.3	550.7	527.1	23.61	23.329			
4,100.0	3,946.7	3,933.9	3,933.4	20.7	8.8	-170.78	262.6	317.4	582.1	557.9	24.21	24.046			
4,200.0	4,041.4	4,028.6	4,028.2	21.3	9.0	-171.48	260.7	318.5	613.5	588.7	24.81	24.728			
4,300.0	4,136.0	4,123.4	4,122.9	21.9	9.2	-172.12	258.6	319.7	645.0	619.6	25.42	25.379			
4,400.0	4,230.7	4,218.2	4,217.7	22.5	9.4	-172.71	256.6	320.9	676.6	650.6	26.02	26.000			
4,500.0	4,325.4	4,312.9	4,312.3	23.2	9.6	-173.24	254.4	322.1	708.2	681.5	26.63	26.594			
4,593.9	4,414.3	4,401.8	4,401.2	23.7	9.8	-173.71	252.4	323.3	737.9	710.7	27.20	27.127			
4,600.0	4,420.1	4,407.6	4,407.0	23.8	9.8	-172.24	252.3	323.3	739.8	712.6	27.24	27.161			
4,650.0	4,467.6	4,455.0	4,454.4	24.1	10.0	-159.59	251.2	324.0	754.8	727.2	27.54	27.406			
4,700.0	4,515.2	4,502.5	4,501.9	24.3	10.1	-146.70	250.1	324.6	768.3	740.4	27.83	27.600			

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: S34-T23N-R7W
 Site Error: 0.0ft
 Reference Well: NORTH ALAMITO UNIT 308H
 Well Error: 0.0ft
 Reference Wellbore: OH
 Reference Design: PLAN #1

Local Co-ordinate Reference: Well NORTH ALAMITO UNIT 308H
 TVD Reference: 16' KB @ 6911.0ft
 MD Reference: 16' KB @ 6911.0ft
 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 S34-T23N-R7W - Federal B-4 (Existing) - INC ONLY - INC ONLY													Offset Site Error: 0.0 ft
Survey Program: 150-ISCWSA MWD													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)			
4,750.0	4,562.7	4,549.8	4,549.2	24.6	10.2	-134.72	249.0	325.2	780.3	752.2	28.12	27.746	
4,800.0	4,609.9	4,596.7	4,596.0	24.8	10.3	-124.51	248.0	325.8	791.1	762.7	28.41	27.848	
4,850.0	4,656.4	4,642.9	4,642.2	25.0	10.4	-116.36	246.9	326.4	800.6	771.9	28.68	27.911	
4,900.0	4,702.2	4,688.2	4,687.5	25.2	10.5	-110.14	245.9	327.0	808.9	780.0	28.95	27.939	
4,950.0	4,747.0	4,732.3	4,731.6	25.3	10.6	-105.52	244.9	327.6	816.3	787.1	29.22	27.937	
5,000.0	4,790.5	4,775.2	4,774.5	25.5	10.7	-102.18	243.9	328.1	823.0	793.5	29.49	27.907	
5,050.0	4,832.5	4,816.6	4,815.8	25.6	10.8	-99.83	243.0	328.7	829.0	799.3	29.76	27.853	
5,100.0	4,872.9	4,856.2	4,855.4	25.7	10.9	-98.22	242.1	329.2	834.8	804.7	30.05	27.778	
5,150.0	4,911.4	4,893.8	4,893.1	25.8	11.0	-97.18	241.2	329.7	840.4	810.0	30.36	27.684	
5,200.0	4,947.9	4,929.4	4,928.6	25.9	11.0	-96.54	240.4	330.2	846.1	815.5	30.69	27.573	
5,250.0	4,982.1	4,962.7	4,961.9	26.0	11.1	-96.18	239.7	330.6	852.3	821.2	31.05	27.448	
5,300.0	5,014.0	4,993.5	4,992.7	26.0	11.2	-95.98	239.0	331.0	859.1	827.6	31.45	27.312	
5,350.0	5,043.3	5,021.8	5,020.9	26.1	11.3	-95.86	238.3	331.4	866.7	834.8	31.90	27.169	
5,400.0	5,069.9	5,047.3	5,046.4	26.1	11.3	-95.73	237.8	331.7	875.3	842.9	32.39	27.025	
5,450.0	5,093.7	5,069.9	5,069.1	26.1	11.4	-95.53	237.3	332.0	885.2	852.3	32.92	26.886	
5,500.0	5,114.6	5,089.6	5,088.8	26.2	11.4	-95.21	236.8	332.3	896.4	862.9	33.50	26.760	
5,550.0	5,132.4	5,106.2	5,105.4	26.2	11.5	-94.73	236.4	332.5	909.1	875.0	34.10	26.655	
5,600.0	5,147.1	5,115.0	5,114.2	26.2	11.5	-93.74	236.2	332.6	923.2	888.5	34.69	26.612	
5,650.0	5,158.6	5,115.0	5,114.2	26.2	11.5	-92.16	236.2	332.6	938.9	903.7	35.24	26.645	
5,700.0	5,166.8	5,115.0	5,114.2	26.2	11.5	-90.55	236.2	332.6	956.1	920.3	35.82	26.695	
5,750.0	5,171.8	5,115.0	5,114.2	26.2	11.5	-88.92	236.2	332.6	974.7	938.2	36.42	26.765	
5,801.0	5,173.5	5,115.0	5,114.2	26.3	11.5	-87.23	236.2	332.6	994.7	957.7	37.04	26.858	
5,900.0	5,173.3	5,115.0	5,114.2	27.1	11.5	-87.23	236.2	332.6	1,038.7	1,000.5	38.19	27.195	
6,000.0	5,173.1	5,115.0	5,114.2	28.7	11.5	-87.23	236.2	332.6	1,090.4	1,051.2	39.24	27.789	
6,100.0	5,172.9	5,115.0	5,114.2	30.6	11.5	-87.23	236.2	332.6	1,148.6	1,108.4	40.15	28.609	
6,200.0	5,172.8	5,115.0	5,114.2	32.6	11.5	-87.23	236.2	332.6	1,212.2	1,171.3	40.92	29.623	
6,300.0	5,172.6	5,115.0	5,114.2	34.7	11.5	-87.23	236.2	332.6	1,280.5	1,238.9	41.57	30.802	
6,400.0	5,172.4	5,115.0	5,114.2	36.8	11.5	-87.23	236.2	332.6	1,352.7	1,310.6	42.11	32.119	
6,500.0	5,172.2	5,115.0	5,114.2	39.1	11.5	-87.23	236.2	332.6	1,428.3	1,385.7	42.57	33.553	

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: S34-T23N-R7W
 Site Error: 0.0ft
 Reference Well: NORTH ALAMITO UNIT 308H
 Well Error: 0.0ft
 Reference Wellbore: OH
 Reference Design: PLAN #1

Local Co-ordinate Reference: Well NORTH ALAMITO UNIT 308H
 TVD Reference: 16' KB @ 6911.0ft
 MD Reference: 16' KB @ 6911.0ft
 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 S34-T23N-R7W - Federal B-5 (Existing) - INC ONLY - INC ONLY													Offset Site Error:	0.0 ft
Survey Program: 2001-ISCWSA MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
6,200.0	5,172.8	5,167.4	5,167.1	32.6	9.4	90.74	2,906.4	162.3	1,471.2	1,433.1	38.16	38.552		
6,300.0	5,172.6	5,167.4	5,167.1	34.7	9.4	90.74	2,906.4	162.3	1,396.4	1,357.0	39.40	35.443		
6,400.0	5,172.4	5,167.4	5,167.1	36.8	9.4	90.74	2,906.4	162.3	1,324.9	1,284.0	40.96	32.344		
6,500.0	5,172.2	5,167.4	5,167.1	39.1	9.4	90.74	2,906.4	162.3	1,257.3	1,214.4	42.88	29.319		
6,600.0	5,172.1	5,167.4	5,167.1	41.3	9.4	90.74	2,906.4	162.3	1,194.3	1,149.1	45.18	26.435		
6,700.0	5,171.9	5,167.4	5,167.1	43.6	9.4	90.74	2,906.4	162.3	1,136.6	1,088.7	47.84	23.756		
6,800.0	5,171.7	5,167.4	5,167.1	46.0	9.4	90.74	2,906.4	162.3	1,085.0	1,034.2	50.84	21.340		
6,900.0	5,171.5	5,167.4	5,167.1	48.4	9.4	90.74	2,906.4	162.3	1,040.5	986.4	54.11	19.229		
7,000.0	5,171.4	5,167.4	5,167.1	50.8	9.4	90.74	2,906.4	162.3	1,004.1	946.5	57.55	17.448		
7,100.0	5,171.2	5,167.4	5,167.1	53.2	9.4	90.74	2,906.4	162.3	976.6	915.5	61.01	16.008		
7,200.0	5,171.0	5,167.4	5,167.1	55.6	9.4	90.74	2,906.4	162.3	958.7	894.4	64.32	14.906		
7,300.0	5,170.8	5,167.4	5,167.1	58.1	9.4	90.74	2,906.4	162.3	951.1	883.8	67.32	14.129		
7,322.7	5,170.8	5,167.4	5,167.1	58.7	9.4	90.74	2,906.4	162.3	950.8	882.9	67.94	13.995 CC, ES		
7,400.0	5,170.7	5,167.4	5,167.1	60.6	9.4	90.74	2,906.4	162.3	954.0	884.1	69.86	13.655		
7,500.0	5,170.5	5,167.4	5,167.1	63.1	9.4	90.74	2,906.4	162.3	967.2	895.4	71.85	13.461 SF		
7,600.0	5,170.3	5,167.4	5,167.1	65.6	9.4	90.74	2,906.4	162.3	990.4	917.2	73.27	13.518		
7,700.0	5,170.1	5,167.4	5,167.1	68.1	9.4	90.74	2,906.4	162.3	1,022.9	948.8	74.13	13.800		
7,800.0	5,170.0	5,167.4	5,167.1	70.6	9.4	90.74	2,906.4	162.3	1,063.9	989.4	74.50	14.280		
7,900.0	5,169.8	5,167.4	5,167.1	73.2	9.4	90.74	2,906.4	162.3	1,112.4	1,037.9	74.48	14.935		
8,000.0	5,169.6	5,167.4	5,167.1	75.7	9.4	90.74	2,906.4	162.3	1,167.4	1,093.2	74.15	15.743		
8,100.0	5,169.4	5,167.4	5,167.1	78.2	9.4	90.74	2,906.4	162.3	1,228.1	1,154.5	73.61	16.685		
8,200.0	5,169.3	5,167.4	5,167.1	80.8	9.4	90.74	2,906.4	162.3	1,293.7	1,220.8	72.92	17.742		
8,300.0	5,169.1	5,167.4	5,167.1	83.4	9.4	90.74	2,906.4	162.3	1,363.5	1,291.4	72.14	18.902		
8,400.0	5,168.9	5,167.4	5,167.1	85.9	9.4	90.74	2,906.4	162.3	1,436.9	1,365.6	71.31	20.150		

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: S34-T23N-R7W
Site Error: 0.0ft
Reference Well: NORTH ALAMITO UNIT 308H
Well Error: 0.0ft
Reference Wellbore: OH
Reference Design: PLAN #1

Local Co-ordinate Reference: Well NORTH ALAMITO UNIT 308H
TVD Reference: 16' KB @ 6911.0ft
MD Reference: 16' KB @ 6911.0ft
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 S34-T23N-R7W - Federal I-1 (Existing) - INC ONLY - SURVEYS														Offset Site Error:	0.0 ft
Survey Program: 525-ISCWSA MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor			
8,100.0	5,169.4	5,188.6	5,188.2	78.2	11.1	-91.59	2,225.6	-2,420.4	1,457.2	1,374.5	82.67	17.626			
8,200.0	5,169.3	5,188.1	5,187.7	80.8	11.1	-91.57	2,225.6	-2,420.4	1,413.7	1,327.0	86.74	16.298			
8,300.0	5,169.1	5,187.6	5,187.2	83.4	11.1	-91.55	2,225.6	-2,420.4	1,376.1	1,285.3	90.78	15.159			
8,400.0	5,168.9	5,187.1	5,186.6	85.9	11.1	-91.52	2,225.6	-2,420.4	1,345.0	1,250.3	94.71	14.201			
8,500.0	5,168.7	5,186.6	5,186.1	88.5	11.1	-91.50	2,225.6	-2,420.4	1,320.7	1,222.2	98.42	13.419			
8,600.0	5,168.6	5,186.1	5,185.6	91.1	11.1	-91.48	2,225.6	-2,420.5	1,303.6	1,201.8	101.82	12.803			
8,700.0	5,168.4	5,185.5	5,185.1	93.7	11.1	-91.46	2,225.6	-2,420.5	1,294.1	1,189.3	104.80	12.347			
8,773.9	5,168.3	5,185.1	5,184.7	95.6	11.1	-91.44	2,225.6	-2,420.5	1,291.9	1,185.2	106.70	12.108 CC			
8,800.0	5,168.2	5,185.0	5,184.6	96.2	11.1	-91.43	2,225.6	-2,420.5	1,292.2	1,184.9	107.30	12.043 ES			
8,900.0	5,168.0	5,184.5	5,184.0	98.8	11.1	-91.41	2,225.6	-2,420.5	1,298.1	1,188.8	109.27	11.880			
9,000.0	5,167.9	5,184.0	5,183.5	101.4	11.1	-91.39	2,225.6	-2,420.5	1,311.6	1,200.9	110.67	11.852 SF			
9,100.0	5,167.7	5,183.5	5,183.0	104.0	11.1	-91.36	2,225.6	-2,420.5	1,332.5	1,220.9	111.51	11.949			
9,200.0	5,167.5	5,182.9	5,182.5	106.6	11.1	-91.34	2,225.5	-2,420.5	1,360.4	1,248.5	111.84	12.163			
9,300.0	5,167.3	5,182.4	5,182.0	109.2	11.1	-91.32	2,225.5	-2,420.5	1,394.9	1,283.2	111.71	12.487			
9,400.0	5,167.2	5,181.9	5,181.5	111.8	11.1	-91.29	2,225.5	-2,420.5	1,435.6	1,324.5	111.18	12.913			
9,500.0	5,167.0	5,181.4	5,180.9	114.4	11.1	-91.27	2,225.5	-2,420.5	1,482.0	1,371.7	110.32	13.433			

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: S34-T23N-R7W
Site Error: 0.0ft
Reference Well: NORTH ALAMITO UNIT 308H
Well Error: 0.0ft
Reference Wellbore: OH
Reference Design: PLAN #1

Local Co-ordinate Reference: Well NORTH ALAMITO UNIT 308H
TVD Reference: 16' KB @ 6911.0ft
MD Reference: 16' KB @ 6911.0ft
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 S34-T23N-R7W - Federal L-1 (Existing) - INC ONLY - SURVEYS														Offset Site Error:	0.0 ft
Survey Program: 227-ISCWSA MWD														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)					
8,700.0	5,168.4	5,154.1	5,153.6	93.7	10.9	90.86	4,309.1	-2,417.0	1,495.5	1,455.6	39.94	37.446			
8,800.0	5,168.2	5,154.3	5,153.7	96.2	10.9	90.89	4,309.1	-2,417.0	1,397.0	1,356.4	40.64	34.374			
8,900.0	5,168.0	5,154.4	5,153.8	98.8	10.9	90.92	4,309.1	-2,417.0	1,298.8	1,257.2	41.53	31.276			
9,000.0	5,167.9	5,154.5	5,154.0	101.4	10.9	90.94	4,309.1	-2,417.0	1,200.8	1,158.2	42.65	28.158			
9,100.0	5,167.7	5,154.7	5,154.1	104.0	10.9	90.97	4,309.1	-2,417.0	1,103.2	1,059.2	44.07	25.031			
9,200.0	5,167.5	5,154.8	5,154.2	106.6	10.9	91.00	4,309.1	-2,417.0	1,006.1	960.2	45.91	21.913			
9,300.0	5,167.3	5,154.9	5,154.3	109.2	10.9	91.03	4,309.1	-2,417.0	909.6	861.3	48.31	18.829			
9,400.0	5,167.2	5,155.1	5,154.5	111.8	10.9	91.06	4,309.1	-2,417.0	814.0	762.5	51.47	15.816			
9,500.0	5,167.0	5,155.2	5,154.6	114.4	10.9	91.09	4,309.1	-2,417.0	719.6	663.9	55.68	12.922			
9,600.0	5,166.8	5,155.3	5,154.7	117.0	10.9	91.12	4,309.1	-2,417.0	626.8	565.4	61.40	10.209			
9,700.0	5,166.7	5,155.5	5,154.9	119.6	10.9	91.15	4,309.1	-2,417.0	536.7	467.5	69.26	7.750			
9,800.0	5,166.5	5,155.6	5,155.0	122.2	10.9	91.18	4,309.1	-2,417.0	450.8	370.6	80.20	5.621			
9,900.0	5,166.3	5,155.7	5,155.1	124.8	10.9	91.21	4,309.1	-2,417.0	372.0	276.7	95.34	3.902			
10,000.0	5,166.1	5,155.8	5,155.3	127.4	10.9	91.24	4,309.1	-2,417.0	305.9	190.9	114.98	2.660			
10,100.0	5,166.0	5,156.0	5,155.4	130.1	10.9	91.27	4,309.1	-2,417.0	262.1	127.3	134.87	1.944			
10,174.2	5,165.8	5,156.1	5,155.5	132.0	10.9	91.29	4,309.1	-2,417.0	251.4	108.7	142.71	1.762 CC, ES, SF			
10,200.0	5,165.8	5,156.1	5,155.5	132.7	10.9	91.30	4,309.1	-2,417.0	252.7	109.7	143.02	1.767			
10,300.0	5,165.6	5,156.2	5,155.7	135.3	10.9	91.33	4,309.1	-2,417.0	281.1	147.5	133.63	2.104			
10,400.0	5,165.4	5,156.4	5,155.8	137.9	10.9	91.36	4,309.1	-2,417.0	337.9	221.0	116.87	2.891			
10,500.0	5,165.3	5,156.5	5,155.9	140.5	10.9	91.39	4,309.1	-2,417.0	411.5	310.0	101.52	4.053			
10,600.0	5,165.1	5,156.6	5,156.0	143.1	10.9	91.42	4,309.1	-2,417.0	494.5	404.8	89.64	5.516			
10,700.0	5,164.9	5,156.8	5,156.2	145.8	10.9	91.45	4,309.1	-2,417.0	582.8	502.0	80.76	7.217			
10,800.0	5,164.7	5,156.9	5,156.3	148.4	10.9	91.48	4,309.1	-2,417.0	674.4	600.3	74.09	9.102			
10,900.0	5,164.6	5,157.0	5,156.4	151.0	10.9	91.51	4,309.1	-2,417.0	768.1	699.1	69.00	11.131			
11,000.0	5,164.4	5,157.2	5,156.6	153.6	10.9	91.54	4,309.1	-2,417.0	863.2	798.2	65.05	13.271			
11,100.0	5,164.2	5,157.3	5,156.7	156.2	10.9	91.57	4,309.1	-2,417.0	959.3	897.4	61.91	15.495			
11,200.0	5,164.0	5,157.4	5,156.8	158.9	10.9	91.60	4,309.1	-2,417.0	1,056.1	996.8	59.38	17.785			
11,300.0	5,163.9	5,157.5	5,157.0	161.5	10.9	91.63	4,309.1	-2,417.0	1,153.5	1,096.2	57.32	20.125			
11,400.0	5,163.7	5,157.7	5,157.1	164.1	10.9	91.66	4,309.1	-2,417.0	1,251.3	1,195.7	55.61	22.502			
11,500.0	5,163.5	5,157.8	5,157.2	166.8	10.9	91.69	4,309.1	-2,417.0	1,349.4	1,295.2	54.18	24.907			
11,600.0	5,163.3	5,157.9	5,157.4	169.4	10.9	91.72	4,309.1	-2,417.0	1,447.8	1,394.8	52.97	27.334			

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: S34-T23N-R7W
Site Error: 0.0ft
Reference Well: NORTH ALAMITO UNIT 308H
Well Error: 0.0ft
Reference Wellbore: OH
Reference Design: PLAN #1

Local Co-ordinate Reference: Well NORTH ALAMITO UNIT 308H
TVD Reference: 16' KB @ 6911.0ft
MD Reference: 16' KB @ 6911.0ft
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 S34-T23N-R7W - NORTH ALAMITO UNIT 306H - OH - PLAN #2													Offset Site Error:	0.0 ft
Survey Program: 0-MWD+HDGM													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 Ellipses (ft)	Uncertainty Axis	Factor		
0.0	0.0	0.0	0.0	0.0	0.0	-166.33	-58.3	-14.2	60.0					
100.0	100.0	100.0	100.0	0.2	0.2	-166.33	-58.3	-14.2	60.0	59.6	0.30	199.107		
200.0	200.0	200.0	200.0	0.5	0.5	-166.33	-58.3	-14.2	60.0	58.9	1.02	58.890		
300.0	300.0	300.0	300.0	0.9	0.9	-166.33	-58.3	-14.2	60.0	58.2	1.73	34.554		
400.0	400.0	400.0	400.0	1.2	1.2	-166.33	-58.3	-14.2	60.0	57.5	2.45	24.451		
500.0	500.0	500.0	500.0	1.6	1.6	-166.33	-58.3	-14.2	60.0	56.8	3.17	18.919 CC, ES		
600.0	600.0	597.9	597.9	1.9	1.9	-166.10	-59.8	-14.8	61.6	57.7	3.89	15.836		
700.0	700.0	695.5	695.4	2.3	2.2	132.71	-64.4	-16.7	67.9	63.2	4.64	14.627 SF		
800.0	799.8	792.2	791.7	2.7	2.6	135.91	-72.0	-19.8	80.0	74.6	5.41	14.792		
900.0	899.5	887.4	886.2	3.0	2.9	139.49	-82.5	-24.0	98.3	92.1	6.18	15.898		
1,000.0	998.7	980.5	978.3	3.4	3.3	142.69	-95.5	-29.3	122.7	115.8	6.94	17.677		
1,100.0	1,097.5	1,071.1	1,067.3	3.8	3.6	145.27	-110.8	-35.6	153.3	145.6	7.68	19.960		
1,200.0	1,195.6	1,158.7	1,153.0	4.2	4.0	147.23	-128.1	-42.6	189.8	181.4	8.40	22.592		
1,300.0	1,293.1	1,243.0	1,234.7	4.6	4.4	148.69	-147.0	-50.3	232.0	222.9	9.10	25.506		
1,400.0	1,389.6	1,323.7	1,312.4	5.0	4.7	149.73	-167.2	-58.5	279.6	269.8	9.76	28.636		
1,500.0	1,485.3	1,402.2	1,387.4	5.5	5.1	150.49	-188.7	-67.3	332.2	321.8	10.40	31.948		
1,539.8	1,523.0	1,435.3	1,418.9	5.7	5.3	150.77	-198.0	-71.1	354.1	343.5	10.65	33.267		
1,600.0	1,580.0	1,485.1	1,466.4	6.0	5.5	151.52	-212.0	-76.8	387.7	376.7	11.01	35.210		
1,700.0	1,674.7	1,567.9	1,545.2	6.5	5.9	152.50	-235.3	-86.3	443.5	431.9	11.63	38.139		
1,800.0	1,769.4	1,650.6	1,624.0	7.1	6.4	153.27	-258.6	-95.8	499.4	487.2	12.26	40.727		
1,900.0	1,864.0	1,733.4	1,702.9	7.6	6.8	153.88	-281.9	-105.3	555.4	542.5	12.91	43.022		
2,000.0	1,958.7	1,816.1	1,781.7	8.2	7.2	154.38	-305.2	-114.8	611.4	597.8	13.57	45.065		
2,100.0	2,053.4	1,898.9	1,860.5	8.8	7.7	154.80	-328.5	-124.3	667.4	653.2	14.23	46.890		
2,200.0	2,148.0	1,981.6	1,939.4	9.4	8.1	155.15	-351.8	-133.8	723.4	708.5	14.91	48.527		
2,300.0	2,242.7	2,064.4	2,018.2	9.9	8.6	155.46	-375.1	-143.3	779.5	763.9	15.59	50.000		
2,400.0	2,337.4	2,147.1	2,097.0	10.5	9.0	155.72	-398.4	-152.8	835.5	819.3	16.28	51.333		
2,500.0	2,432.0	2,229.9	2,175.9	11.1	9.5	155.95	-421.7	-162.3	891.6	874.7	16.97	52.542		
2,600.0	2,526.7	2,312.6	2,254.7	11.7	9.9	156.15	-445.0	-171.8	947.7	930.0	17.67	53.643		
2,700.0	2,621.4	2,395.4	2,333.5	12.3	10.4	156.33	-468.3	-181.3	1,003.8	985.4	18.37	54.648		
2,800.0	2,716.0	2,478.1	2,412.4	12.9	10.8	156.49	-491.6	-190.8	1,059.9	1,040.8	19.07	55.570		
2,900.0	2,810.7	2,560.9	2,491.2	13.5	11.3	156.63	-514.9	-200.3	1,116.0	1,096.2	19.78	56.416		
3,000.0	2,905.4	2,643.6	2,570.0	14.1	11.7	156.76	-538.2	-209.8	1,172.1	1,151.6	20.49	57.197		
3,100.0	3,000.0	2,726.4	2,648.9	14.7	12.2	156.88	-561.5	-219.3	1,228.2	1,207.0	21.21	57.918		
3,200.0	3,094.7	2,809.1	2,727.7	15.3	12.6	156.99	-584.8	-228.8	1,284.3	1,262.4	21.92	58.587		
3,300.0	3,189.4	2,891.9	2,806.5	15.9	13.1	157.09	-608.1	-238.2	1,340.4	1,317.8	22.64	59.208		
3,400.0	3,284.0	2,974.6	2,885.4	16.5	13.6	157.18	-631.4	-247.7	1,396.5	1,373.2	23.36	59.786		
3,500.0	3,378.7	3,057.4	2,964.2	17.1	14.0	157.26	-654.7	-257.2	1,452.7	1,428.6	24.08	60.325		

CC - Min centre to center distance or covergent 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: S34-T23N-R7W
Site Error: 0.0ft
Reference Well: NORTH ALAMITO UNIT 308H
Well Error: 0.0ft
Reference Wellbore: OH
Reference Design: PLAN #1

Local Co-ordinate Reference: Well NORTH ALAMITO UNIT 308H
TVD Reference: 16' KB @ 6911.0ft
MD Reference: 16' KB @ 6911.0ft
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 S34-T23N-R7W - NORTH ALAMITO UNIT 307H - 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		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 Ellipses (ft)	Total Uncertainty Axis	Separation Factor	
0.0	0.0	0.0	0.0	0.0	0.0	-165.61	-28.8	-7.4	29.7				
100.0	100.0	100.0	100.0	0.2	0.2	-165.61	-28.8	-7.4	29.7	29.4	0.30	98.611	
200.0	200.0	200.0	200.0	0.5	0.5	-165.61	-28.8	-7.4	29.7	28.7	1.02	29.167	
300.0	300.0	300.0	300.0	0.9	0.9	-165.61	-28.8	-7.4	29.7	28.0	1.74	17.114	
400.0	400.0	400.0	400.0	1.2	1.2	-165.61	-28.8	-7.4	29.7	27.2	2.45	12.110	
500.0	500.0	500.0	500.0	1.6	1.6	-165.61	-28.8	-7.4	29.7	26.5	3.17	9.370	
600.0	600.0	600.0	600.0	1.9	1.9	-165.61	-28.8	-7.4	29.7	25.8	3.89	7.841 CC, ES	
700.0	700.0	699.6	699.6	2.3	2.3	131.02	-29.8	-6.0	31.5	26.9	4.59	6.870	
800.0	799.8	798.9	798.8	2.7	2.6	129.64	-32.9	-1.9	37.0	31.7	5.29	6.996	
900.0	899.5	897.9	897.4	3.0	3.0	128.05	-38.1	5.0	46.2	40.2	6.01	7.683	
1,000.0	998.7	996.4	995.1	3.4	3.3	126.63	-45.2	14.5	59.0	52.2	6.74	8.748	
1,100.0	1,097.5	1,095.2	1,093.0	3.8	3.7	126.93	-53.1	25.0	74.4	66.9	7.47	9.965	
1,200.0	1,195.6	1,193.6	1,190.6	4.2	4.1	128.75	-61.0	35.5	92.0	83.8	8.21	11.206	
1,300.0	1,293.1	1,291.4	1,287.5	4.6	4.4	131.26	-68.8	45.9	111.9	102.9	8.97	12.480	
1,400.0	1,389.6	1,388.7	1,383.9	5.0	4.8	133.99	-76.6	56.3	134.3	124.6	9.74	13.796	
1,500.0	1,485.3	1,485.1	1,479.5	5.5	5.2	136.71	-84.3	66.6	159.5	149.0	10.52	15.160	
1,539.8	1,523.0	1,523.3	1,517.3	5.7	5.3	137.75	-87.4	70.6	170.3	159.5	10.84	15.713	
1,600.0	1,580.0	1,580.9	1,574.4	6.0	5.6	139.38	-92.0	76.8	187.1	175.8	11.32	16.534	
1,700.0	1,674.7	1,676.6	1,669.3	6.5	5.9	141.53	-99.7	87.0	215.2	203.1	12.11	17.770	
1,800.0	1,769.4	1,772.3	1,764.1	7.1	6.3	143.19	-107.3	97.2	243.5	230.6	12.91	18.862	
1,900.0	1,864.0	1,868.0	1,859.0	7.6	6.7	144.50	-115.0	107.4	272.0	258.3	13.71	19.831	
2,000.0	1,958.7	1,963.7	1,953.8	8.2	7.1	145.56	-122.7	117.6	300.5	286.0	14.52	20.694	
2,100.0	2,053.4	2,059.4	2,048.6	8.8	7.5	146.44	-130.3	127.8	329.2	313.9	15.33	21.468	
2,200.0	2,148.0	2,155.1	2,143.5	9.4	7.8	147.18	-138.0	138.0	357.9	341.7	16.15	22.163	
2,300.0	2,242.7	2,250.8	2,238.3	9.9	8.2	147.80	-145.7	148.2	386.6	369.7	16.96	22.792	
2,400.0	2,337.4	2,346.5	2,333.2	10.5	8.6	148.35	-153.3	158.4	415.4	397.7	17.78	23.362	
2,500.0	2,432.0	2,442.2	2,428.0	11.1	9.0	148.82	-161.0	168.6	444.3	425.7	18.60	23.881	
2,600.0	2,526.7	2,537.9	2,522.9	11.7	9.4	149.23	-168.7	178.8	473.1	453.7	19.42	24.356	
2,700.0	2,621.4	2,633.6	2,617.7	12.3	9.8	149.60	-176.3	189.0	502.0	481.7	20.25	24.792	
2,800.0	2,716.0	2,729.3	2,712.5	12.9	10.2	149.92	-184.0	199.2	530.9	509.8	21.07	25.193	
2,900.0	2,810.7	2,825.0	2,807.4	13.5	10.5	150.22	-191.7	209.4	559.7	537.9	21.90	25.564	
3,000.0	2,905.4	2,920.7	2,902.2	14.1	10.9	150.48	-199.3	219.6	588.7	565.9	22.72	25.907	
3,100.0	3,000.0	3,016.4	2,997.1	14.7	11.3	150.72	-207.0	229.8	617.6	594.0	23.55	26.225	
3,200.0	3,094.7	3,112.1	3,091.9	15.3	11.7	150.94	-214.7	240.0	646.5	622.1	24.38	26.521	
3,300.0	3,189.4	3,207.8	3,186.8	15.9	12.1	151.14	-222.3	250.2	675.4	650.2	25.20	26.798	
3,400.0	3,284.0	3,303.5	3,281.6	16.5	12.5	151.32	-230.0	260.4	704.4	678.3	26.03	27.056	
3,500.0	3,378.7	3,399.2	3,376.4	17.1	12.9	151.49	-237.6	270.6	733.3	706.5	26.86	27.299	
3,600.0	3,473.4	3,494.9	3,471.3	17.7	13.3	151.64	-245.3	280.8	762.3	734.6	27.69	27.526	
3,700.0	3,568.0	3,590.6	3,566.1	18.3	13.6	151.79	-253.0	291.0	791.2	762.7	28.52	27.740	
3,800.0	3,662.7	3,686.2	3,661.0	18.9	14.0	151.92	-260.6	301.2	820.2	790.8	29.35	27.942	
3,900.0	3,757.4	3,781.9	3,755.8	19.5	14.4	152.05	-268.3	311.4	849.2	819.0	30.19	28.132	
4,000.0	3,852.0	3,877.6	3,850.7	20.1	14.8	152.16	-276.0	321.6	878.1	847.1	31.02	28.312	
4,100.0	3,946.7	3,973.3	3,945.5	20.7	15.2	152.27	-283.6	331.8	907.1	875.3	31.85	28.482	
4,200.0	4,041.4	4,069.0	4,040.3	21.3	15.6	152.38	-291.3	342.0	936.1	903.4	32.68	28.643	
4,300.0	4,136.0	4,164.7	4,135.2	21.9	16.0	152.47	-299.0	352.2	965.1	931.6	33.51	28.797	
4,400.0	4,230.7	4,260.4	4,230.0	22.5	16.4	152.56	-306.6	362.4	994.0	959.7	34.35	28.942	
4,500.0	4,325.4	4,356.1	4,324.9	23.2	16.8	152.65	-314.3	372.6	1,023.0	987.9	35.18	29.081	
4,593.9	4,414.3	4,457.9	4,426.2	23.7	17.1	153.04	-318.8	379.4	1,049.8	1,013.8	36.00	29.162	
4,600.0	4,420.1	4,464.5	4,432.8	23.8	17.2	154.58	-318.8	379.5	1,051.5	1,015.5	36.05	29.171	
4,650.0	4,467.6	4,519.0	4,487.3	24.1	17.3	168.08	-316.9	378.5	1,065.6	1,029.2	36.41	29.267	
4,700.0	4,515.2	4,573.0	4,540.9	24.3	17.5	-177.85	-312.4	374.4	1,079.7	1,043.0	36.72	29.401	
4,750.0	4,562.7	4,626.5	4,593.5	24.6	17.6	-164.37	-305.2	367.4	1,093.8	1,056.8	37.00	29.562	

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: S34-T23N-R7W
Site Error: 0.0ft
Reference Well: NORTH ALAMITO UNIT 308H
Well Error: 0.0ft
Reference Wellbore: OH
Reference Design: PLAN #1

Local Co-ordinate Reference: Well NORTH ALAMITO UNIT 308H
TVD Reference: 16' KB @ 6911.0ft
MD Reference: 16' KB @ 6911.0ft
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 S34-T23N-R7W - NORTH ALAMITO UNIT 307H - 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		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 Ellipses (ft)	Uncertainty Axis	Factor			
4,800.0	4,609.9	4,679.6	4,644.7	24.8	17.7	-152.39	-295.5	357.6	1,107.9	1,070.6	37.25	29.742			
4,850.0	4,656.4	4,732.3	4,694.4	25.0	17.8	-142.25	-283.3	345.2	1,121.8	1,084.3	37.48	29.932			
4,900.0	4,702.2	4,784.5	4,742.4	25.2	17.9	-133.83	-268.9	330.1	1,135.6	1,097.9	37.70	30.124			
4,950.0	4,747.0	4,836.5	4,788.4	25.3	18.1	-126.86	-252.4	312.7	1,149.0	1,111.1	37.91	30.311			
5,000.0	4,790.5	4,888.1	4,832.2	25.5	18.2	-121.06	-233.7	292.9	1,162.2	1,124.0	38.13	30.482			
5,050.0	4,832.5	4,939.3	4,873.7	25.6	18.3	-116.17	-213.2	271.0	1,174.9	1,136.5	38.36	30.627			
5,100.0	4,872.9	4,990.3	4,912.8	25.7	18.5	-112.01	-190.9	247.0	1,187.2	1,148.5	38.62	30.737			
5,150.0	4,911.4	5,041.0	4,949.2	25.8	18.7	-108.43	-168.9	221.2	1,198.9	1,160.0	38.92	30.800			
5,200.0	4,947.9	5,091.4	4,982.9	25.9	18.9	-105.32	-141.4	193.7	1,210.0	1,170.8	39.28	30.805			
5,250.0	4,982.1	5,141.5	5,013.7	26.0	19.2	-102.61	-114.6	164.6	1,220.5	1,180.8	39.70	30.743			
5,300.0	5,014.0	5,191.4	5,041.5	26.0	19.5	-100.23	-86.5	134.1	1,230.3	1,190.1	40.20	30.603			
5,350.0	5,043.3	5,241.0	5,066.2	26.1	19.9	-98.14	-57.4	102.5	1,239.4	1,198.6	40.80	30.380			
5,400.0	5,069.9	5,290.4	5,087.8	26.1	20.3	-96.31	-27.5	69.8	1,247.7	1,206.2	41.49	30.072			
5,450.0	5,093.7	5,339.5	5,106.2	26.1	20.8	-94.70	3.2	36.2	1,255.1	1,212.8	42.29	29.677			
5,500.0	5,114.6	5,388.3	5,121.3	26.2	21.4	-93.31	34.5	2.0	1,261.7	1,218.5	43.21	29.200			
5,550.0	5,132.4	5,436.8	5,133.2	26.2	22.0	-92.11	66.2	-32.8	1,267.4	1,223.1	44.24	28.650			
5,600.0	5,147.1	5,485.0	5,141.9	26.2	22.6	-91.09	98.1	-67.9	1,272.1	1,226.8	45.37	28.036			
5,650.0	5,158.6	5,532.9	5,147.3	26.2	23.3	-90.25	130.0	-103.1	1,275.9	1,229.3	46.62	27.371			
5,700.0	5,166.8	5,580.4	5,149.5	26.2	24.1	-89.58	162.0	-138.3	1,278.8	1,230.8	47.95	26.670			
5,750.0	5,171.8	5,629.6	5,149.5	26.2	24.9	-89.10	195.0	-174.8	1,280.6	1,231.2	49.41	25.915			
5,801.0	5,173.5	5,680.6	5,149.4	26.3	25.8	-88.93	229.2	-212.6	1,281.3	1,230.3	51.02	25.114			
5,900.0	5,173.3	5,779.6	5,149.3	27.1	27.6	-88.93	295.6	-285.9	1,281.6	1,227.2	54.40	23.558			
6,000.0	5,173.1	5,879.6	5,149.1	28.7	29.5	-88.93	362.7	-360.1	1,281.9	1,223.8	58.10	22.063			
6,100.0	5,172.9	5,979.6	5,148.9	30.6	31.6	-88.93	429.9	-434.2	1,282.2	1,220.1	62.03	20.670			
6,200.0	5,172.8	6,079.6	5,148.7	32.6	33.7	-88.93	497.0	-508.3	1,282.4	1,216.3	66.15	19.386			
6,300.0	5,172.6	6,179.6	5,148.6	34.7	35.9	-88.93	564.1	-582.4	1,282.7	1,212.3	70.43	18.212			
6,400.0	5,172.4	6,279.6	5,148.4	36.8	38.1	-88.93	631.2	-656.6	1,283.0	1,208.2	74.84	17.142			
6,500.0	5,172.2	6,379.6	5,148.2	39.1	40.5	-88.93	698.3	-730.7	1,283.3	1,203.9	79.36	16.170			
6,600.0	5,172.1	6,479.6	5,148.0	41.3	42.8	-88.93	765.5	-804.8	1,283.6	1,199.6	83.97	15.285			
6,700.0	5,171.9	6,579.6	5,147.9	43.6	45.2	-88.93	832.6	-879.0	1,283.9	1,195.2	88.66	14.480			
6,800.0	5,171.7	6,679.6	5,147.7	46.0	47.6	-88.93	899.7	-953.1	1,284.1	1,190.7	93.42	13.747			
6,900.0	5,171.5	6,779.6	5,147.5	48.4	50.0	-88.93	966.8	-1,027.2	1,284.4	1,186.2	98.23	13.076			
7,000.0	5,171.4	6,879.6	5,147.3	50.8	52.5	-88.93	1,033.9	-1,101.3	1,284.7	1,181.6	103.08	12.463			
7,100.0	5,171.2	6,979.6	5,147.2	53.2	55.0	-88.93	1,101.1	-1,175.5	1,285.0	1,177.0	107.98	11.900			
7,200.0	5,171.0	7,079.6	5,147.0	55.6	57.4	-88.93	1,168.2	-1,249.6	1,285.3	1,172.4	112.92	11.382			
7,300.0	5,170.8	7,179.6	5,146.8	58.1	59.9	-88.93	1,235.3	-1,323.7	1,285.6	1,167.7	117.88	10.905			
7,400.0	5,170.7	7,279.6	5,146.6	60.6	62.5	-88.93	1,302.4	-1,397.9	1,285.8	1,163.0	122.88	10.464			
7,500.0	5,170.5	7,379.6	5,146.5	63.1	65.0	-88.93	1,369.5	-1,472.0	1,286.1	1,158.2	127.90	10.056			
7,600.0	5,170.3	7,479.6	5,146.3	65.6	67.5	-88.93	1,436.6	-1,546.1	1,286.4	1,153.5	132.94	9.677			
7,700.0	5,170.1	7,579.6	5,146.1	68.1	70.1	-88.93	1,503.8	-1,620.2	1,286.7	1,148.7	138.00	9.324			
7,800.0	5,170.0	7,679.6	5,145.9	70.6	72.6	-88.93	1,570.9	-1,694.4	1,287.0	1,143.9	143.08	8.995			
7,900.0	5,169.8	7,779.6	5,145.8	73.2	75.2	-88.93	1,638.0	-1,768.5	1,287.3	1,139.1	148.17	8.688			
8,000.0	5,169.6	7,879.6	5,145.6	75.7	77.7	-88.93	1,705.1	-1,842.6	1,287.5	1,134.3	153.28	8.400			
8,100.0	5,169.4	7,979.6	5,145.4	78.2	80.3	-88.93	1,772.2	-1,916.7	1,287.8	1,129.4	158.40	8.130			
8,200.0	5,169.3	8,079.6	5,145.2	80.8	82.9	-88.93	1,839.4	-1,990.9	1,288.1	1,124.6	163.53	7.877			
8,300.0	5,169.1	8,179.6	5,145.1	83.4	85.5	-88.93	1,906.5	-2,065.0	1,288.4	1,119.7	168.67	7.639			
8,400.0	5,168.9	8,279.6	5,144.9	85.9	88.1	-88.93	1,973.6	-2,139.1	1,288.7	1,114.8	173.82	7.414			
8,500.0	5,168.7	8,379.6	5,144.7	88.5	90.6	-88.93	2,040.7	-2,213.3	1,288.9	1,110.0	178.98	7.202			
8,600.0	5,168.6	8,479.6	5,144.6	91.1	93.2	-88.93	2,107.8	-2,287.4	1,289.2	1,105.1	184.15	7.001			
8,700.0	5,168.4	8,579.6	5,144.4	93.7	95.8	-88.93	2,174.9	-2,361.5	1,289.5	1,100.2	189.32	6.811			
8,800.0	5,168.2	8,679.6	5,144.2	96.2	98.4	-88.93	2,242.1	-2,435.6	1,289.8	1,095.3	194.50	6.631			
8,900.0	5,168.0	8,779.6	5,144.0	98.8	101.0	-88.93	2,309.2	-2,509.8	1,290.1	1,090.4	199.69	6.460			

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: S34-T23N-R7W
Site Error: 0.0ft
Reference Well: NORTH ALAMITO UNIT 308H
Well Error: 0.0ft
Reference Wellbore: OH
Reference Design: PLAN #1

Local Co-ordinate Reference: Well NORTH ALAMITO UNIT 308H
TVD Reference: 16' KB @ 6911.0ft
MD Reference: 16' KB @ 6911.0ft
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 S34-T23N-R7W - NORTH ALAMITO UNIT 307H - 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 Axis	Separation Factor			
9,000.0	5,167.9	8,879.6	5,143.9	101.4	103.6	-88.93	2,376.3	-2,583.9	1,290.4	1,085.5	204.89	6.298			
9,100.0	5,167.7	8,979.6	5,143.7	104.0	106.2	-88.93	2,443.4	-2,658.0	1,290.6	1,080.6	210.08	6.143			
9,200.0	5,167.5	9,079.6	5,143.5	106.6	108.8	-88.93	2,510.5	-2,732.2	1,290.9	1,075.6	215.29	5.996			
9,300.0	5,167.3	9,179.6	5,143.3	109.2	111.5	-88.93	2,577.7	-2,806.3	1,291.2	1,070.7	220.50	5.856			
9,400.0	5,167.2	9,279.6	5,143.2	111.8	114.1	-88.93	2,644.8	-2,880.4	1,291.5	1,065.8	225.71	5.722			
9,500.0	5,167.0	9,379.6	5,143.0	114.4	116.7	-88.93	2,711.9	-2,954.5	1,291.8	1,060.9	230.92	5.594			
9,600.0	5,166.8	9,479.6	5,142.8	117.0	119.3	-88.93	2,779.0	-3,028.7	1,292.1	1,055.9	236.14	5.471			
9,700.0	5,166.7	9,579.6	5,142.6	119.6	121.9	-88.93	2,846.1	-3,102.8	1,292.3	1,051.0	241.37	5.354			
9,800.0	5,166.5	9,679.6	5,142.5	122.2	124.5	-88.94	2,913.3	-3,176.9	1,292.6	1,046.0	246.59	5.242			
9,900.0	5,166.3	9,779.6	5,142.3	124.8	127.2	-88.94	2,980.4	-3,251.1	1,292.9	1,041.1	251.82	5.134			
10,000.0	5,166.1	9,879.6	5,142.1	127.4	129.8	-88.94	3,047.5	-3,325.2	1,293.2	1,036.1	257.06	5.031			
10,100.0	5,166.0	9,979.6	5,141.9	130.1	132.4	-88.94	3,114.6	-3,399.3	1,293.5	1,031.2	262.29	4.931			
10,200.0	5,165.8	10,079.6	5,141.8	132.7	135.0	-88.94	3,181.7	-3,473.4	1,293.8	1,026.2	267.53	4.836			
10,300.0	5,165.6	10,179.6	5,141.6	135.3	137.6	-88.94	3,248.8	-3,547.6	1,294.0	1,021.3	272.77	4.744			
10,400.0	5,165.4	10,279.6	5,141.4	137.9	140.3	-88.94	3,316.0	-3,621.7	1,294.3	1,016.3	278.01	4.656			
10,500.0	5,165.3	10,379.6	5,141.2	140.5	142.9	-88.94	3,383.1	-3,695.8	1,294.6	1,011.3	283.26	4.570			
10,600.0	5,165.1	10,479.6	5,141.1	143.1	145.5	-88.94	3,450.2	-3,770.0	1,294.9	1,006.4	288.50	4.488			
10,700.0	5,164.9	10,579.6	5,140.9	145.8	148.2	-88.94	3,517.3	-3,844.1	1,295.2	1,001.4	293.75	4.409			
10,800.0	5,164.7	10,679.6	5,140.7	148.4	150.8	-88.94	3,584.4	-3,918.2	1,295.5	996.5	299.00	4.333			
10,900.0	5,164.6	10,779.6	5,140.5	151.0	153.4	-88.94	3,651.6	-3,992.3	1,295.7	991.5	304.25	4.259			
11,000.0	5,164.4	10,879.6	5,140.4	153.6	156.0	-88.94	3,718.7	-4,066.5	1,296.0	986.5	309.51	4.187			
11,100.0	5,164.2	10,979.6	5,140.2	156.2	158.7	-88.94	3,785.8	-4,140.6	1,296.3	981.5	314.76	4.118			
11,200.0	5,164.0	11,079.6	5,140.0	158.9	161.3	-88.94	3,852.9	-4,214.7	1,296.6	976.6	320.02	4.052			
11,300.0	5,163.9	11,179.6	5,139.8	161.5	163.9	-88.94	3,920.0	-4,288.9	1,296.9	971.6	325.28	3.987			
11,400.0	5,163.7	11,279.6	5,139.7	164.1	166.6	-88.94	3,987.1	-4,363.0	1,297.1	966.6	330.53	3.924			
11,500.0	5,163.5	11,379.6	5,139.5	166.8	169.2	-88.94	4,054.3	-4,437.1	1,297.4	961.6	335.79	3.864			
11,600.0	5,163.3	11,479.6	5,139.3	169.4	171.8	-88.94	4,121.4	-4,511.2	1,297.7	956.7	341.06	3.805			
11,700.0	5,163.2	11,579.6	5,139.1	172.0	174.5	-88.94	4,188.5	-4,585.4	1,298.0	951.7	346.32	3.748			
11,800.0	5,163.0	11,679.6	5,139.0	174.6	177.1	-88.94	4,255.6	-4,659.5	1,298.3	946.7	351.58	3.693			
11,900.0	5,162.8	11,779.6	5,138.8	177.3	179.8	-88.94	4,322.7	-4,733.6	1,298.6	941.7	356.85	3.639			
12,000.0	5,162.6	11,879.6	5,138.6	179.9	182.4	-88.94	4,389.9	-4,807.7	1,298.8	936.7	362.11	3.587			
12,100.0	5,162.5	11,979.6	5,138.4	182.5	185.0	-88.94	4,457.0	-4,881.9	1,299.1	931.7	367.38	3.536			
12,200.0	5,162.3	12,079.6	5,138.3	185.2	187.7	-88.94	4,524.1	-4,956.0	1,299.4	926.8	372.65	3.487			
12,300.0	5,162.1	12,179.6	5,138.1	187.8	190.3	-88.94	4,591.2	-5,030.1	1,299.7	921.8	377.92	3.439			
12,400.0	5,161.9	12,279.6	5,137.9	190.4	192.9	-88.94	4,658.3	-5,104.3	1,300.0	916.8	383.19	3.393			
12,500.0	5,161.8	12,332.9	5,137.8	193.1	194.0	-88.94	4,694.2	-5,143.8	1,301.1	914.6	386.49	3.366 SF			
12,544.7	5,161.7	12,332.9	5,137.8	194.2	194.0	-88.94	4,694.2	-5,143.8	1,303.6	916.7	386.84	3.370			

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

Cathedral Energy Services

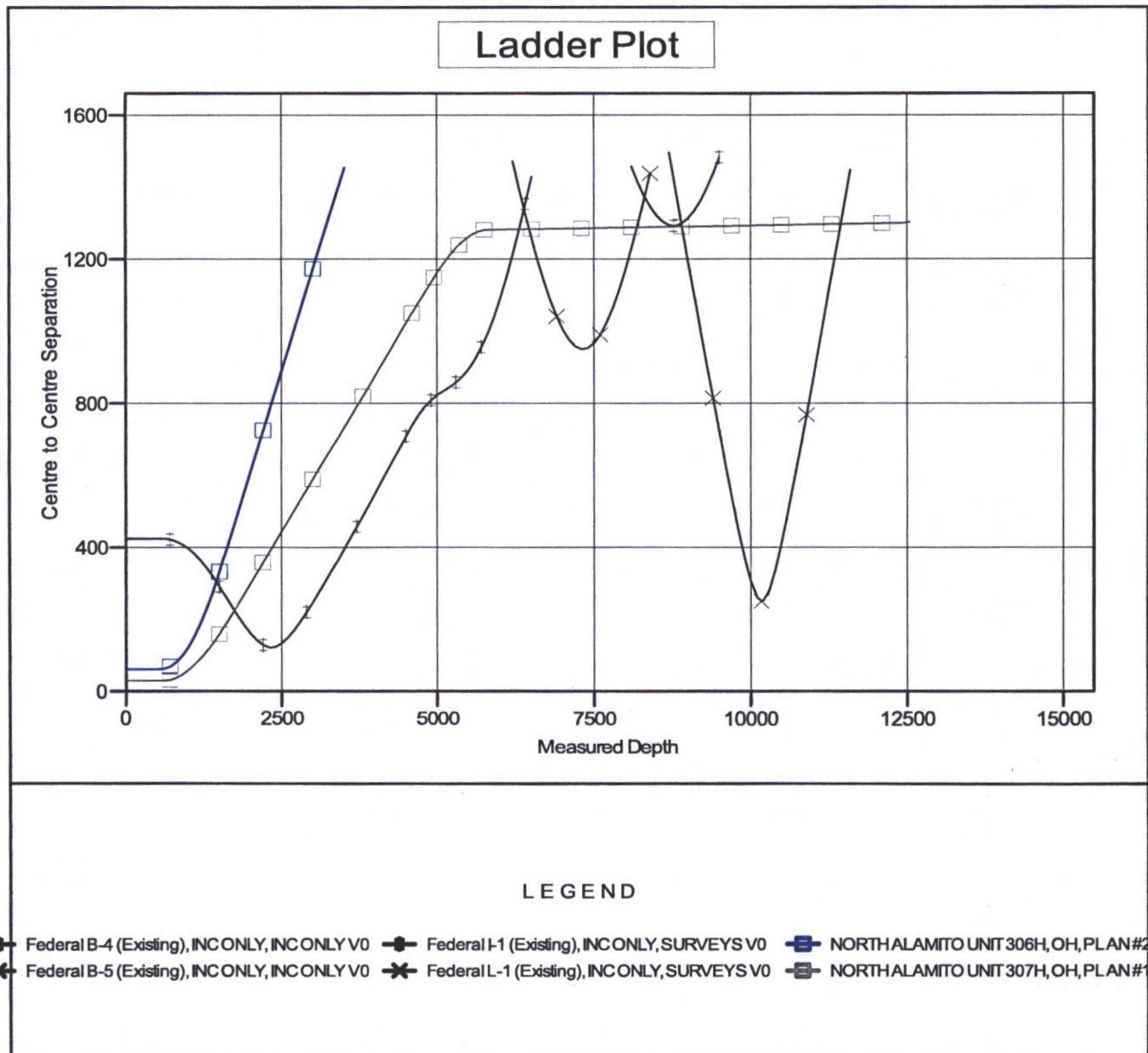
Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Reference Site: S34-T23N-R7W
Site Error: 0.0ft
Reference Well: NORTH ALAMITO UNIT 308H
Well Error: 0.0ft
Reference Wellbore: OH
Reference Design: PLAN #1

Local Co-ordinate Reference: Well NORTH ALAMITO UNIT 308H
TVD Reference: 16' KB @ 6911.0ft
MD Reference: 16' KB @ 6911.0ft
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 @ 6911.0ft
 Offset Depths are relative to Offset Datum
 Central Meridian is -106.250000 °

Coordinates are relative to: NORTH ALAMITO UNIT 308H
 Coordinate System is US State Plane 1983, New Mexico Central Zone
 Grid Convergence at Surface is: -0.78°



North Alamito Unit 308H (FKA Lybrook L34-2307 03H)

SHL: NSW Section 34, T23N, R7W

1462' FSL and 776' FWL

BHL: NESW Section 34, T23N, R7W

1810' FSL and 1700' FWL

Sandoval County, New Mexico

Lease Number: NMNM 16586

C. Pipeline

1. The pipeline will be designed and constructed in accordance with the BLM Gold Book Standards. After completion of clearing and grading activities and trenching activities will be conducted using a trencher or track hoe. The pipeline trench will be a minimum of 4 feet in depth. Under watercourses, the trenches will be deep enough to allow for 6 feet of soil cover between the pipes and the wash. The trenches will be a minimum of 16 inches in width. Soft plugs will be placed every quarter of a mile within the trench. No more than half a mile of open trench or the amount of trench that can be worked in a day will be opened at a time. Backfilling operations will be performed within a reasonable amount of time to ensure that the trench is not left open for more than 24 hours. If a trench is left open overnight, it will be fenced with a temporary fence or a night watchman will be utilized. After the pipe has been welded and coated a side-boom tractor will be used to place the pipe into the trench. After trenching and pipe placement in the trench, the soils excavated from the trenches will be returned and compacted to prevent subsidence.
2. There will be no fence cuts or cattle guards required for the installation of this pipeline.
3. Any trees larger than 3-inches in diameter will be cut at ground level and delimbed. The trunks will be stacked whole along the access road, well pad, and/or pipeline for wood gathering. Stumps will be cut as close to the ground as possible. Stumps and root balls will be hauled to an approved disposal site or stockpiled at the edge of the well pad and buried in the cut slopes of the pad during interim reclamation.

Any trees smaller than 3-inches in diameter, slash and brush will be chipped, shredded or mulched and incorporated into the topsoil for later use in interim reclamation.

Remaining brush will be brush-hogged or scalped at ground-level prior to ground disturbance.

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

ENCANA OIL & GAS (USA) INC.
NORTH ALAMITO UNIT 308H (FKA LYBROOK L34-2307 03H)

1462' FSL & 776' FWL
LOCATED IN THE NW/4 SW/4 OF SECTION 34,
T23N, R7W, 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, 39.0 MILES TO INDIAN ROUTE 7061 (M.P. 112.6).
- 2) TURN RIGHT AND GO 5.4 MILES.
- 3) TURN LEFT AND GO 6.3 MILES TO WHERE ACCESS IS STAKED ON 2-TRACK ON RIGHT SIDE OF ROAD.

WELL FLAG LOCATED AT LAT. 36.179842° N, LONG.107.568345° W (NAD 83).



JOB No.: NAU #308H_REV4
DATE: 11/01/16

CCI

CHENAULT CONSULTING

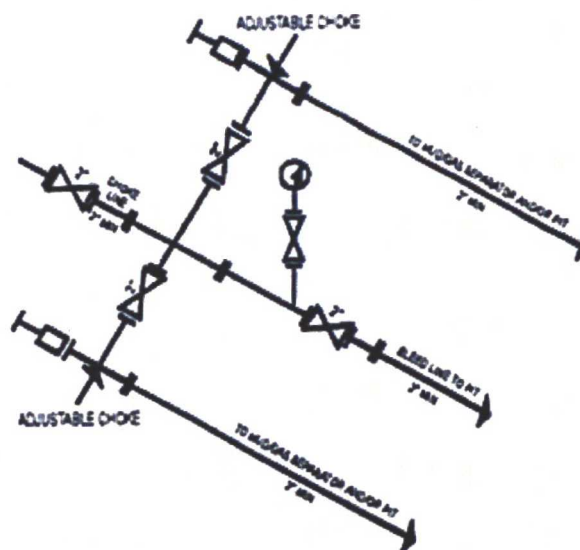
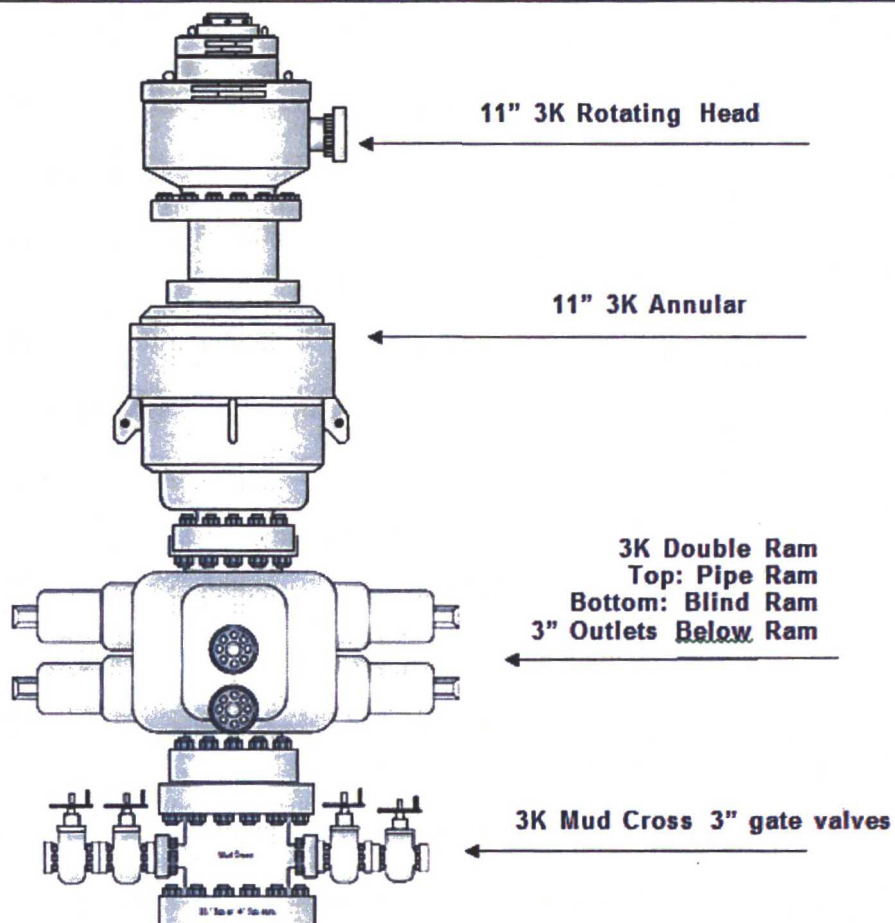
4600 COLLEGE BLVD.
SUITE 201
FARMINGTON, NM 87402
(505)-325-7707

SHEET C

WELLHEAD BLOWOUT CONTROL SYSTEM

encana

Well Name and Number:
North Alamito Unit 308H



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