

State of New Mexico  
Energy, Minerals and Natural Resources Department

Susana Martinez  
Governor

David Martin  
Cabinet Secretary

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

Jami Bailey, Division Director  
Oil Conservation Division



New Mexico Oil Conservation Division approval and conditions  
listed below are made in accordance with OCD Rule 19.15.7.11  
and are in addition to the actions approved by BLM on the  
following 3160-4 or 3160-5 form.

Operator Signature Date: 9/2/2014

Well information:

| API WELL #         | Well Name        | Well # | Operator Name               | Type | Stat | County   | Surf_Owner | UL | Sec | Twp | N/S | Rng | W/E |
|--------------------|------------------|--------|-----------------------------|------|------|----------|------------|----|-----|-----|-----|-----|-----|
| 30-045-35328-00-00 | LYBROOK H04 2208 | 001H   | ENCANA OIL & GAS (USA) INC. | O    | N    | San Juan | F          | H  | 4   | 22  | N   | 8   | W   |

Application Type:

- ☐ P&A    ☒ Drilling/Casing Change    ☐ Location Change
- ☐ Recomplete/DHC (For hydraulic fracturing operations review EPA Underground injection control Guidance #84)
- ☐ Other:

Conditions of Approval:

Notify NMOCD 24hrs prior to beginning operations  
Hold C-104 for: NSL/ "As Drilled" C102/ Directional Survey  
Adhere to original Conditions of approval.

(For hydraulic fracturing operations review EPA Underground injection control  
Guidance #84)

NMOCD Approved by Signature

9-12-14  
Date

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

CONFIDENTIAL

FORM APPROVED  
OMB No. 1004-0137  
Expires: July 31, 2019

RECEIVED

SEP 03 2014

Albuquerque Field Office  
Bureau of Land Management

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

|                                                                                                                                                                        |                                                   |                                                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|----------------------------------------------------------|
| <b>SUBMIT IN TRIPLICATE – Other instructions on page 2.</b>                                                                                                            |                                                   | 7. If Unit of CA/Agreement, Name and/or No.<br>N/A       |
| 1. Type of Well<br><input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other                                       |                                                   | 8. Well Name and No.<br>Lybrook H04-2208 01H             |
| 2. Name of Operator<br>Encana Oil & Gas (USA) Inc.                                                                                                                     |                                                   | 9. API Well No.<br>30-045-35328                          |
| 3a. Address<br>370 17th Street, Suite 1700<br>Denver, CO 80202                                                                                                         | 3b. Phone No. (include area code)<br>720-876-5867 | 10. Field and Pool or Exploratory Area<br>Lybrook Gallup |
| 4. Location of Well (Footage, Sec., T., R., M., or Survey Description)<br>SHL: 1980' FNL and 330' FEL Sec 4, T22N, R8W<br>BHL: 1980' FNL and 330' FWL Sec 5, T22N, R8W |                                                   | 11. Country or Parish, State<br>San Juan, NM             |

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

| TYPE OF SUBMISSION                                   | TYPE OF ACTION                                   |                                           |                                                    |                                         |
|------------------------------------------------------|--------------------------------------------------|-------------------------------------------|----------------------------------------------------|-----------------------------------------|
| <input checked="" type="checkbox"/> Notice of Intent | <input type="checkbox"/> Acidize                 | <input type="checkbox"/> Deepen           | <input type="checkbox"/> Production (Start/Resume) | <input type="checkbox"/> Water Shut-Off |
| <input type="checkbox"/> Subsequent Report           | <input type="checkbox"/> Alter Casing            | <input type="checkbox"/> Fracture Treat   | <input type="checkbox"/> Reclamation               | <input type="checkbox"/> Well Integrity |
| <input type="checkbox"/> Final Abandonment Notice    | <input type="checkbox"/> Casing Repair           | <input type="checkbox"/> New Construction | <input type="checkbox"/> Recomplete                | <input type="checkbox"/> Other _____    |
|                                                      | <input checked="" type="checkbox"/> Change Plans | <input type="checkbox"/> Plug and Abandon | <input type="checkbox"/> Temporarily Abandon       |                                         |
|                                                      | <input type="checkbox"/> Convert to Injection    | <input type="checkbox"/> Plug Back        | <input type="checkbox"/> Water Disposal            |                                         |

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

Encana Oil & Gas (USA) Inc. (Encana) wishes to modify the drilling plan for the Lybrook H04-2208 01H well to cement the 4 1/2" production liner, instead of running open hole swell packers, as previously planned. Attached is an updated Directional Drilling Plan, 10-Point Drilling Plan and Wellbore Diagram that reflect this change. Please note, the 7" ICP was also moved from approximately 72 degrees to approximately 55 degrees.

**CONDITIONS OF APPROVAL**

Adhere to previously issued stipulations

**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**

RCVD SEP 11 '14

OIL CONS. DIV.

|                                                                                                      |                             |
|------------------------------------------------------------------------------------------------------|-----------------------------|
| 14. I hereby certify that the foregoing is true and correct.<br>Name (Printed/Typed)<br>Cristi Bauer | Title Operations Technician |
| Signature <i>Cristi Bauer</i>                                                                        | Date 09/02/2014             |

DIST. 3

**THIS SPACE FOR FEDERAL OR STATE OFFICE USE**

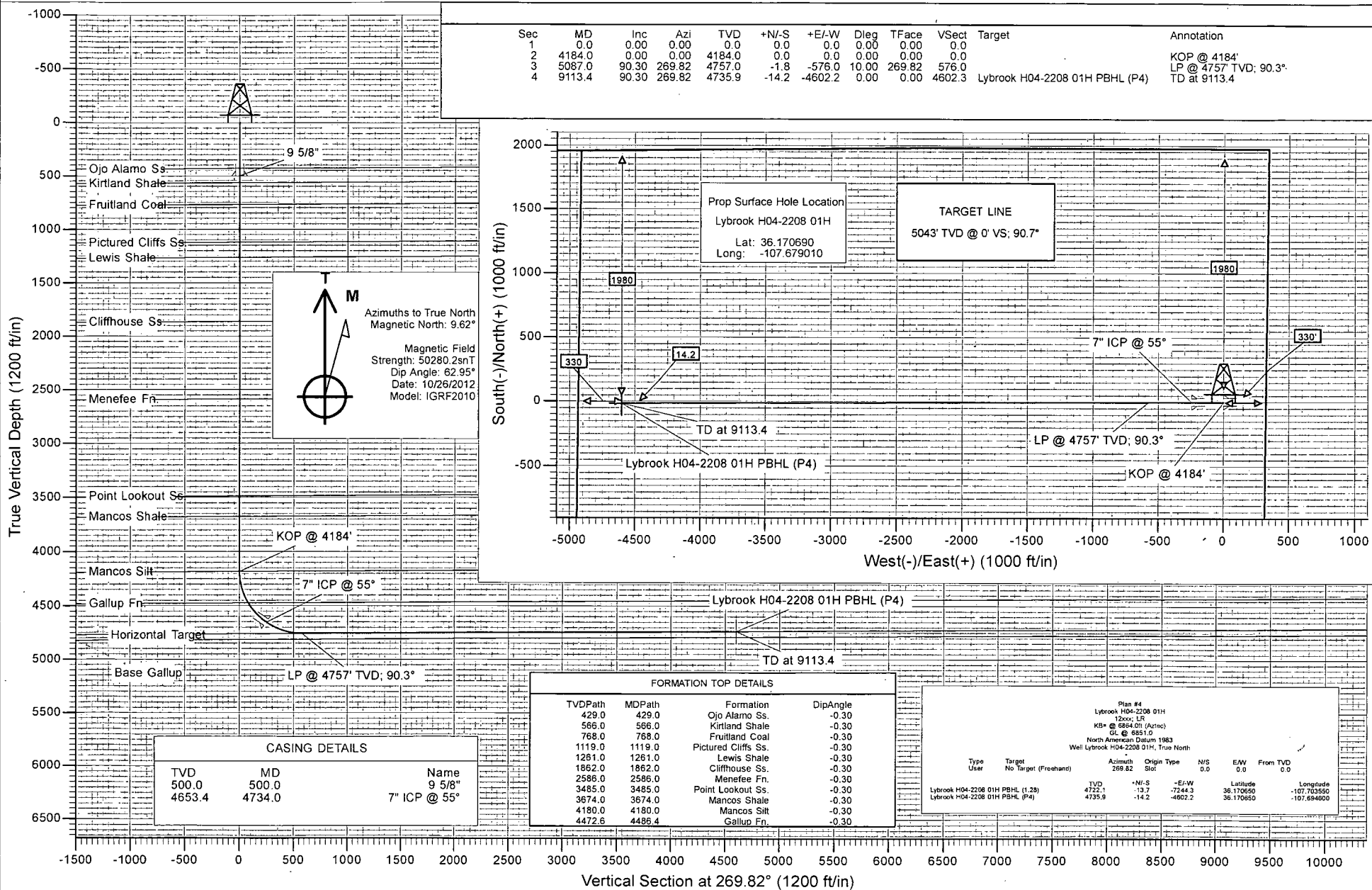
|                                                                                                                                                                                                                                                           |                                 |                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----------------------|
| Approved by <i>William Tambekou</i>                                                                                                                                                                                                                       | Title <i>Petroleum Engineer</i> | Date <i>9/9/2014</i> |
| Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon. | Office <i>FFD</i>               |                      |

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.

NMOCDA



Project: San Juan County, NM CZ  
 Site: S4-T22N-R8W (Lybrook)  
 Well: Lybrook H04-2208 01H  
 Wellbore: Hz  
 Design: Plan #4



# Planning Report

**Database:** USA EDM 5000 Multi Users DB  
**Company:** EnCana Oil & Gas (USA) Inc  
**Project:** San Juan County, NM CZ  
**Site:** S4-T22N-R8W (Lybrook)  
**Well:** Lybrook H04-2208 01H  
**Wellbore:** Hz  
**Design:** Plan #4

**Local Co-ordinate Reference:** Well Lybrook H04-2208 01H  
**TVD Reference:** KB= @ 6864.0ft (Aztec)  
**MD Reference:** KB= @ 6864.0ft (Aztec)  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature

**Project** San Juan County, NM CZ  
**Map System:** US State Plane 1983 **System Datum:** Mean Sea Level  
**Geo Datum:** North American Datum 1983  
**Map Zone:** New Mexico Central Zone

**Site** S4-T22N-R8W (Lybrook)  
**Site Position:** Northing: 1,884,505.10 ft Latitude: 36.170690  
**From:** Lat/Long Easting: 1,218,642.36 ft Longitude: -107.679010  
**Position Uncertainty:** 0.0 ft Slot Radius: 13.200 in Grid Convergence: -0.84 °

**Well** Lybrook H04-2208 01H  
**Well Position** +N/-S 0.0 ft Northing: 1,884,505.10 ft Latitude: 36.170690  
 +E/-W 0.0 ft Easting: 1,218,642.36 ft Longitude: -107.679010  
**Position Uncertainty** 0.0 ft Wellhead Elevation: ft Ground Level: 6,851.0 ft

**Wellbore** Hz  
**Magnetics** Model Name Sample Date Declination (°) Dip Angle (°) Field Strength (nT)  
 IGRF2010 10/26/2012 9.62 62.95 50,280

**Design** Plan #4  
**Audit Notes:**  
**Version:** Phase: PLAN Tie On Depth: 0.0  
**Vertical Section:** Depth From (TVD) +N/-S +E/-W Direction  
 (ft) (ft) (ft) (°)  
 0.0 0.0 0.0 269.82

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) | TFO (°) | Target              |
|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|----------------------|---------------------|---------|---------------------|
| 0.0                 | 0.00            | 0.00        | 0.0                 | 0.0        | 0.0        | 0.00                  | 0.00                 | 0.00                | 0.00    |                     |
| 4,184.0             | 0.00            | 0.00        | 4,184.0             | 0.0        | 0.0        | 0.00                  | 0.00                 | 0.00                | 0.00    |                     |
| 5,087.0             | 90.30           | 269.82      | 4,757.0             | -1.8       | -576.0     | 10.00                 | 10.00                | 0.00                | 269.82  |                     |
| 9,113.4             | 90.30           | 269.82      | 4,735.9             | -14.2      | -4,602.2   | 0.00                  | 0.00                 | 0.00                | 0.00    | Lybrook H04-2208 01 |

# Planning Report

**Database:** USA EDM 5000 Multi Users DB  
**Company:** EnCana Oil & Gas (USA) Inc  
**Project:** San Juan County, NM CZ  
**Site:** S4-T22N-R8W (Lybrook)  
**Well:** Lybrook H04-2208 01H  
**Wellbore:** Hz  
**Design:** Plan #4

**Local Co-ordinate Reference:** Well Lybrook H04-2208 01H  
**TVD Reference:** KB= @ 6864.0ft (Aztec)  
**MD Reference:** KB= @ 6864.0ft (Aztec)  
**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                 |                       |
| 429.0               | 0.00            | 0.00        | 429.0               | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 | Ojo Alamo Ss.         |
| 500.0               | 0.00            | 0.00        | 500.0               | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 | 9 5/8"                |
| 566.0               | 0.00            | 0.00        | 566.0               | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 | Kirtland Shale        |
| 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                 |                       |
| 768.0               | 0.00            | 0.00        | 768.0               | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 | Fruitland Coal        |
| 800.0               | 0.00            | 0.00        | 800.0               | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 900.0               | 0.00            | 0.00        | 900.0               | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 1,000.0             | 0.00            | 0.00        | 1,000.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 1,100.0             | 0.00            | 0.00        | 1,100.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 1,119.0             | 0.00            | 0.00        | 1,119.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 | Pictured Cliffs Ss.   |
| 1,200.0             | 0.00            | 0.00        | 1,200.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 1,261.0             | 0.00            | 0.00        | 1,261.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 | Lewis Shale           |
| 1,300.0             | 0.00            | 0.00        | 1,300.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 1,400.0             | 0.00            | 0.00        | 1,400.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 1,500.0             | 0.00            | 0.00        | 1,500.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 1,600.0             | 0.00            | 0.00        | 1,600.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 1,700.0             | 0.00            | 0.00        | 1,700.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 1,800.0             | 0.00            | 0.00        | 1,800.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 1,862.0             | 0.00            | 0.00        | 1,862.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 | Cliffhouse Ss.        |
| 1,900.0             | 0.00            | 0.00        | 1,900.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 2,000.0             | 0.00            | 0.00        | 2,000.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 2,100.0             | 0.00            | 0.00        | 2,100.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 2,200.0             | 0.00            | 0.00        | 2,200.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 2,300.0             | 0.00            | 0.00        | 2,300.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 2,400.0             | 0.00            | 0.00        | 2,400.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 2,500.0             | 0.00            | 0.00        | 2,500.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 2,586.0             | 0.00            | 0.00        | 2,586.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 | Menefee Fn.           |
| 2,600.0             | 0.00            | 0.00        | 2,600.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 2,700.0             | 0.00            | 0.00        | 2,700.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 2,800.0             | 0.00            | 0.00        | 2,800.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 2,900.0             | 0.00            | 0.00        | 2,900.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 3,000.0             | 0.00            | 0.00        | 3,000.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 3,100.0             | 0.00            | 0.00        | 3,100.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 3,200.0             | 0.00            | 0.00        | 3,200.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 3,300.0             | 0.00            | 0.00        | 3,300.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 3,400.0             | 0.00            | 0.00        | 3,400.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 3,485.0             | 0.00            | 0.00        | 3,485.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 | Point Lookout Ss.     |
| 3,500.0             | 0.00            | 0.00        | 3,500.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 3,600.0             | 0.00            | 0.00        | 3,600.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 3,674.0             | 0.00            | 0.00        | 3,674.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 | Mancos Shale          |
| 3,700.0             | 0.00            | 0.00        | 3,700.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 3,800.0             | 0.00            | 0.00        | 3,800.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 3,900.0             | 0.00            | 0.00        | 3,900.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 4,000.0             | 0.00            | 0.00        | 4,000.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 4,100.0             | 0.00            | 0.00        | 4,100.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 |                       |
| 4,180.0             | 0.00            | 0.00        | 4,180.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 | Mancos Silt           |

# Planning Report

|                  |                             |                                     |                           |
|------------------|-----------------------------|-------------------------------------|---------------------------|
| <b>Database:</b> | USA EDM 5000 Multi Users DB | <b>Local Co-ordinate Reference:</b> | Well Lybrook H04-2208 01H |
| <b>Company:</b>  | EnCana Oil & Gas (USA) Inc  | <b>TVD Reference:</b>               | KB= @ 6864.0ft (Aztec)    |
| <b>Project:</b>  | San Juan County, NM CZ      | <b>MD Reference:</b>                | KB= @ 6864.0ft (Aztec)    |
| <b>Site:</b>     | S4-T22N-R8W (Lybrook)       | <b>North Reference:</b>             | True                      |
| <b>Well:</b>     | Lybrook H04-2208 01H        | <b>Survey Calculation Method:</b>   | Minimum Curvature         |
| <b>Wellbore:</b> | Hz                          |                                     |                           |
| <b>Design:</b>   | Plan #4                     |                                     |                           |

## 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 |
|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|-----------------------|
| 4,184.0             | 0.00            | 0.00        | 4,184.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 | KOP @ 4184'           |
| 4,200.0             | 1.60            | 269.82      | 4,200.0             | 0.0        | -0.2       | 0.2                   | 9.99                  | 9.99                 |                       |
| 4,300.0             | 11.60           | 269.82      | 4,299.2             | 0.0        | -11.7      | 11.7                  | 10.00                 | 10.00                |                       |
| 4,400.0             | 21.60           | 269.82      | 4,394.9             | -0.1       | -40.2      | 40.2                  | 10.00                 | 10.00                |                       |
| 4,486.4             | 30.24           | 269.82      | 4,472.6             | -0.2       | -78.0      | 78.0                  | 10.00                 | 10.00                | Gallup Fn.            |
| 4,500.0             | 31.60           | 269.82      | 4,484.2             | -0.3       | -84.9      | 84.9                  | 9.99                  | 9.99                 |                       |
| 4,600.0             | 41.60           | 269.82      | 4,564.4             | -0.4       | -144.5     | 144.5                 | 10.00                 | 10.00                |                       |
| 4,700.0             | 51.60           | 269.82      | 4,633.0             | -0.7       | -217.0     | 217.0                 | 10.00                 | 10.00                |                       |
| 4,734.0             | 55.00           | 269.82      | 4,653.4             | -0.8       | -244.3     | 244.3                 | 10.00                 | 10.00                | 7" ICP @ 55°          |
| 4,800.0             | 61.60           | 269.82      | 4,688.0             | -0.9       | -300.4     | 300.4                 | 10.00                 | 10.00                |                       |
| 4,900.0             | 71.60           | 269.82      | 4,727.7             | -1.2       | -392.1     | 392.1                 | 10.00                 | 10.00                |                       |
| 5,000.0             | 81.60           | 269.82      | 4,750.8             | -1.5       | -489.2     | 489.2                 | 10.00                 | 10.00                |                       |
| 5,087.0             | 90.30           | 269.82      | 4,757.0             | -1.8       | -576.0     | 576.0                 | 10.00                 | 10.00                | LP @ 4757' TVD; 90.3° |
| 5,100.0             | 90.30           | 269.82      | 4,756.9             | -1.8       | -588.9     | 588.9                 | 0.00                  | 0.00                 |                       |
| 5,200.0             | 90.30           | 269.82      | 4,756.4             | -2.1       | -688.9     | 688.9                 | 0.00                  | 0.00                 |                       |
| 5,300.0             | 90.30           | 269.82      | 4,755.9             | -2.4       | -788.9     | 788.9                 | 0.00                  | 0.00                 |                       |
| 5,400.0             | 90.30           | 269.82      | 4,755.3             | -2.7       | -888.9     | 888.9                 | 0.00                  | 0.00                 |                       |
| 5,500.0             | 90.30           | 269.82      | 4,754.8             | -3.1       | -988.9     | 988.9                 | 0.00                  | 0.00                 |                       |
| 5,600.0             | 90.30           | 269.82      | 4,754.3             | -3.4       | -1,088.9   | 1,088.9               | 0.00                  | 0.00                 |                       |
| 5,700.0             | 90.30           | 269.82      | 4,753.8             | -3.7       | -1,188.9   | 1,188.9               | 0.00                  | 0.00                 |                       |
| 5,800.0             | 90.30           | 269.82      | 4,753.2             | -4.0       | -1,288.9   | 1,288.9               | 0.00                  | 0.00                 |                       |
| 5,900.0             | 90.30           | 269.82      | 4,752.7             | -4.3       | -1,388.9   | 1,388.9               | 0.00                  | 0.00                 |                       |
| 6,000.0             | 90.30           | 269.82      | 4,752.2             | -4.6       | -1,488.9   | 1,488.9               | 0.00                  | 0.00                 |                       |
| 6,100.0             | 90.30           | 269.82      | 4,751.7             | -4.9       | -1,588.9   | 1,588.9               | 0.00                  | 0.00                 |                       |
| 6,200.0             | 90.30           | 269.82      | 4,751.2             | -5.2       | -1,688.9   | 1,688.9               | 0.00                  | 0.00                 |                       |
| 6,300.0             | 90.30           | 269.82      | 4,750.6             | -5.5       | -1,788.9   | 1,788.9               | 0.00                  | 0.00                 |                       |
| 6,400.0             | 90.30           | 269.82      | 4,750.1             | -5.8       | -1,888.9   | 1,888.9               | 0.00                  | 0.00                 |                       |
| 6,500.0             | 90.30           | 269.82      | 4,749.6             | -6.1       | -1,988.9   | 1,988.9               | 0.00                  | 0.00                 |                       |
| 6,600.0             | 90.30           | 269.82      | 4,749.1             | -6.4       | -2,088.9   | 2,088.9               | 0.00                  | 0.00                 |                       |
| 6,700.0             | 90.30           | 269.82      | 4,748.5             | -6.8       | -2,188.9   | 2,188.9               | 0.00                  | 0.00                 |                       |
| 6,800.0             | 90.30           | 269.82      | 4,748.0             | -7.1       | -2,288.9   | 2,288.9               | 0.00                  | 0.00                 |                       |
| 6,900.0             | 90.30           | 269.82      | 4,747.5             | -7.4       | -2,388.9   | 2,388.9               | 0.00                  | 0.00                 |                       |
| 7,000.0             | 90.30           | 269.82      | 4,747.0             | -7.7       | -2,488.9   | 2,488.9               | 0.00                  | 0.00                 |                       |
| 7,100.0             | 90.30           | 269.82      | 4,746.4             | -8.0       | -2,588.9   | 2,588.9               | 0.00                  | 0.00                 |                       |
| 7,200.0             | 90.30           | 269.82      | 4,745.9             | -8.3       | -2,688.9   | 2,688.9               | 0.00                  | 0.00                 |                       |
| 7,300.0             | 90.30           | 269.82      | 4,745.4             | -8.6       | -2,788.9   | 2,788.9               | 0.00                  | 0.00                 |                       |
| 7,400.0             | 90.30           | 269.82      | 4,744.9             | -8.9       | -2,888.9   | 2,888.9               | 0.00                  | 0.00                 |                       |
| 7,500.0             | 90.30           | 269.82      | 4,744.3             | -9.2       | -2,988.9   | 2,988.9               | 0.00                  | 0.00                 |                       |
| 7,600.0             | 90.30           | 269.82      | 4,743.8             | -9.5       | -3,088.9   | 3,088.9               | 0.00                  | 0.00                 |                       |
| 7,700.0             | 90.30           | 269.82      | 4,743.3             | -9.8       | -3,188.9   | 3,188.9               | 0.00                  | 0.00                 |                       |
| 7,800.0             | 90.30           | 269.82      | 4,742.8             | -10.1      | -3,288.9   | 3,288.9               | 0.00                  | 0.00                 |                       |
| 7,900.0             | 90.30           | 269.82      | 4,742.3             | -10.5      | -3,388.9   | 3,388.9               | 0.00                  | 0.00                 |                       |
| 8,000.0             | 90.30           | 269.82      | 4,741.7             | -10.8      | -3,488.9   | 3,488.9               | 0.00                  | 0.00                 |                       |
| 8,100.0             | 90.30           | 269.82      | 4,741.2             | -11.1      | -3,588.9   | 3,588.9               | 0.00                  | 0.00                 |                       |
| 8,200.0             | 90.30           | 269.82      | 4,740.7             | -11.4      | -3,688.9   | 3,688.9               | 0.00                  | 0.00                 |                       |
| 8,300.0             | 90.30           | 269.82      | 4,740.2             | -11.7      | -3,788.9   | 3,788.9               | 0.00                  | 0.00                 |                       |
| 8,400.0             | 90.30           | 269.82      | 4,739.6             | -12.0      | -3,888.9   | 3,888.9               | 0.00                  | 0.00                 |                       |
| 8,500.0             | 90.30           | 269.82      | 4,739.1             | -12.3      | -3,988.9   | 3,988.9               | 0.00                  | 0.00                 |                       |
| 8,600.0             | 90.30           | 269.82      | 4,738.6             | -12.6      | -4,088.9   | 4,088.9               | 0.00                  | 0.00                 |                       |
| 8,700.0             | 90.30           | 269.82      | 4,738.1             | -12.9      | -4,188.9   | 4,188.9               | 0.00                  | 0.00                 |                       |
| 8,800.0             | 90.30           | 269.82      | 4,737.5             | -13.2      | -4,288.9   | 4,288.9               | 0.00                  | 0.00                 |                       |
| 8,900.0             | 90.30           | 269.82      | 4,737.0             | -13.5      | -4,388.9   | 4,388.9               | 0.00                  | 0.00                 |                       |

# Planning Report

Database: USA EDM 5000 Multi Users DB  
 Company: EnCana Oil & Gas (USA) Inc  
 Project: San Juan County, NM CZ  
 Site: S4-T22N-R8W (Lybrook)  
 Well: Lybrook H04-2208 01H  
 Wellbore: Hz  
 Design: Plan #4

Local Co-ordinate Reference: Well Lybrook H04-2208 01H  
 TVD Reference: KB= @ 6864.0ft (Aztec)  
 MD Reference: KB= @ 6864.0ft (Aztec)  
 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 |
|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|-----------------------|
| 9,000.0             | 90.30           | 269.82      | 4,736.5             | -13.8      | -4,488.9   | 4,488.9               | 0.00                  | 0.00                 |                       |
| 9,100.0             | 90.30           | 269.82      | 4,736.0             | -14.2      | -4,588.9   | 4,588.9               | 0.00                  | 0.00                 |                       |
| 9,113.4             | 90.30           | 269.82      | 4,735.9             | -14.2      | -4,602.2   | 4,602.3               | 0.00                  | 0.00                 | TD at 9113.4          |

## Targets

| Target Name                                                                             | Dip Angle (°) | Dip Dir. (°) | TVD (ft) | +N/-S (ft) | +E/-W (ft) | Northing (ft) | Easting (ft) | Latitude  | Longitude   |
|-----------------------------------------------------------------------------------------|---------------|--------------|----------|------------|------------|---------------|--------------|-----------|-------------|
| - hit/miss target                                                                       |               |              |          |            |            |               |              |           |             |
| - Shape                                                                                 |               |              |          |            |            |               |              |           |             |
| Lybrook H04-2208 01H I                                                                  | 0.00          | 0.00         | 4,722.1  | -13.7      | -7,244.3   | 1,884,598.10  | 1,211,398.60 | 36.170650 | -107.703550 |
| - plan misses target center by 2642.1ft at 9113.4ft MD (4735.9 TVD, -14.2 N, -4602.2 E) |               |              |          |            |            |               |              |           |             |
| - Point                                                                                 |               |              |          |            |            |               |              |           |             |
| Lybrook H04-2208 01H I                                                                  | 0.00          | 0.00         | 4,735.9  | -14.2      | -4,602.2   | 1,884,558.66  | 1,214,040.40 | 36.170650 | -107.694600 |
| - plan hits target center                                                               |               |              |          |            |            |               |              |           |             |
| - Point                                                                                 |               |              |          |            |            |               |              |           |             |

## Casing Points

| Measured Depth (ft) | Vertical Depth (ft) | Name         | Casing Diameter (in) | Hole Diameter (in) |
|---------------------|---------------------|--------------|----------------------|--------------------|
| 500.0               | 500.0               | 9 5/8"       | 0.000                | 0.000              |
| 4,734.0             | 4,653.4             | 7" ICP @ 55° | 0.000                | 0.000              |

## Formations

| Measured Depth (ft) | Vertical Depth (ft) | Name                | Lithology | Dip (°) | Dip Direction (°) |
|---------------------|---------------------|---------------------|-----------|---------|-------------------|
| 429.0               | 429.0               | Ojo Alamo Ss.       |           | -0.30   | 269.82            |
| 566.0               | 566.0               | Kirtland Shale      |           | -0.30   | 269.82            |
| 768.0               | 768.0               | Fruitland Coal      |           | -0.30   | 269.82            |
| 1,119.0             | 1,119.0             | Pictured Cliffs Ss. |           | -0.30   | 269.82            |
| 1,261.0             | 1,261.0             | Lewis Shale         |           | -0.30   | 269.82            |
| 1,862.0             | 1,862.0             | Cliffhouse Ss.      |           | -0.30   | 269.82            |
| 2,586.0             | 2,586.0             | Menefee Fn.         |           | -0.30   | 269.82            |
| 3,485.0             | 3,485.0             | Point Lookout Ss.   |           | -0.30   | 269.82            |
| 3,674.0             | 3,674.0             | Mancos Shale        |           | -0.30   | 269.82            |
| 4,180.0             | 4,180.0             | Mancos Silt         |           | -0.30   | 269.82            |
| 4,486.4             | 4,473.0             | Gallup Fn.          |           | -0.30   | 269.82            |

## Plan Annotations

| Measured<br>Depth<br>(ft) | Vertical<br>Depth<br>(ft) | Local Coordinates |               | Comment               |
|---------------------------|---------------------------|-------------------|---------------|-----------------------|
|                           |                           | +N/-S<br>(ft)     | +E/-W<br>(ft) |                       |
| 4,184.0                   | 4,184.0                   | 0.0               | 0.0           | KOP @ 4184'           |
| 5,087.0                   | 4,757.0                   | -1.8              | -576.0        | LP @ 4757' TVD; 90.3° |
| 9,113.4                   | 4,735.9                   | -14.2             | -4,602.2      | TD at 9113.4          |

Lybrook H04-2208 01H

SHL: SE/4 NE/4 Sec 4 T22N R8W 1,980' FNL, 330' FEL

BHL: SW/4 NW/4 Sec 4 T22N R8W 1,980' FNL, 330' FWL

San Juan, New Mexico

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

**1. ESTIMATED TOPS OF GEOLOGICAL MARKERS (TVD)**

The estimated tops of important geologic markers are as follows:

| <b>Formation</b>    | <b>Depth (TVD) units = feet</b> |
|---------------------|---------------------------------|
| Ojo Alamo Ss.       | 429                             |
| Kirtland Shale      | 566                             |
| Fruitland Coal      | 768                             |
| Pictured Cliffs Ss. | 1,119                           |
| Lewis Shale         | 1,261                           |
| Cliffhouse Ss.      | 1,862                           |
| Menefee Fn.         | 2,586                           |
| Point Lookout Ss.   | 3,485                           |
| Mancos Shale        | 3,674                           |
| Mancos Silt         | 4,180                           |
| Gallup Fn.          | 4,473                           |
| Horizontal Target   | 4,760                           |
| Base Gallup         | 4,814                           |
|                     |                                 |

The referenced surface elevation is 0', KB 4760'

**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      | 768                             |
| Oil/Gas          | Pictured Cliffs Ss. | 1,119                           |
| Oil/Gas          | Cliffhouse Ss.      | 1,862                           |
| Gas              | Menefee Fn.         | 2,586                           |
| Oil/Gas          | Point Lookout Ss.   | 3,485                           |
| Oil/Gas          | Mancos Shale        | 3,674                           |
| Oil/Gas          | Mancos Silt         | 4,180                           |
| Oil/Gas          | Gallup Fn.          | 4,473                           |

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

Lybrook H04-2208 01H

SHL: SE/4 NE/4 Sec 4 T22N R8W 1,980' FNL, 330' FEL

BHL: SW/4 NW/4 Sec 4 T22N R8W 1,980' FNL, 330' FWL

San Juan, New Mexico

### 3. PRESSURE CONTROL

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

Proposed BOP and choke manifold arrangements are attached.

### 4. CASING & CEMENTING PROGRAM

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

- a) The proposed casing design is as follows:

| Casing           | Depth (MD)  | Hole Size | Csg Size | Weight | Grade         |
|------------------|-------------|-----------|----------|--------|---------------|
| Conductor        | 0'-60'      | 30"       | 16"      | 42.09# |               |
| Surface          | 0'-500'     | 12 1/4"   | 9 5/8"   | 36#    | J55, STC New  |
| Intermediate     | 0'-4734'    | 8 3/4"    | 7"       | 26#    | J55, LTC New  |
| Production Liner | 4684'-9113' | 6 1/8"    | 4 1/2"   | 11.6#  | B80*, LTC New |

| Casing String |              |       |            | Casing Strength Properties |             |                   | Minimum Design Factors |       |         |
|---------------|--------------|-------|------------|----------------------------|-------------|-------------------|------------------------|-------|---------|
| Size          | Weight (ppf) | Grade | Connection | Collapse (psi)             | Burst (psi) | Tensile (1000lbs) | Collapse               | Burst | Tension |
| 9 5/8"        | 36           | J55   | STC        | 2020                       | 3520        | 394               | 1.125                  | 1.1   | 1.5     |
| 7"            | 26           | J55   | LTC        | 4320                       | 4980        | 367               | 1.125                  | 1.1   | 1.5     |
| 4.5"          | 11.6         | B80   | LTC        | 6350                       | 7780        | 201               | 1.125                  | 1.1   | 1.5     |

\*B80 pipe specifications are attached

Casing design is subject to revision based on geologic conditions encountered

**Lybrook H04-2208 01H****SHL: SE/4 NE/4 Sec 4 T22N R8W 1,980' FNL, 330' FEL****BHL: SW/4 NW/4 Sec 4 T22N R8W 1,980' FNL, 330' FWL****San Juan, New Mexico**

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

| <b>Casing</b>       | <b>Depth (MD)</b> | <b>Cement Volume (sacks)</b>                                                  | <b>Cement Type &amp; Yield</b>                                                                                                                                                                            | <b>Designed TOC</b> | <b>Centralizers</b>                                |
|---------------------|-------------------|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------------------------------------------------|
| Conductor           | 0'-60'            | 100 sks                                                                       | Type I Neat 16 ppg                                                                                                                                                                                        | Surface             | None                                               |
| Surface             | 0'-500'           | 276 sks                                                                       | Type III Cement + 1% bwoc<br>Calcium Chloride + 0.25 lbs/sack<br>Cello Flake + 0.2% bwoc FL-52A +<br>58.9% Fresh Water                                                                                    | Surface             | 1 per joint on<br>bottom 3 joints                  |
| Intermediate        | 0'-4734'          | 100% open hole excess<br>Stage 1 Lead:<br>378 sks<br>Stage 1 Tail:<br>319 sks | Lead: PremLite + 3% CaCl +<br>0.25lb/sk CelloFlake + 5lb/sk LCM,<br>12.1ppg 2.13cuft/sk<br>Tail: Type III Cmt + 1% CaCl +<br>0.25lb/sk Cello Flake 14.5ppg<br>1.38cuft/sk                                 | Surface             | 1 every 3 joints<br>through water<br>bearing zones |
| Production<br>Liner | 4684'-<br>9113'   | 50% OH excess<br>Stage 1 Blend Total:<br>277sks                               | Blend: Premium Lite High Strength<br>FM + 2% bwow Potassium<br>Chloride + 0.3% bwoc R-3 + 0.25<br>lbs/sack Cello Flake + 0.3% bwoc<br>CD-32 + 5 lbs/sack LCM-1 + 1%<br>bwoc FL-52 + 101.1% Fresh<br>Water | Liner<br>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 4184'. Directional plans are attached.

| <b>Description</b>    | <b>Proposed Depth (TVD/MD)</b> | <b>Formation</b> |
|-----------------------|--------------------------------|------------------|
| Horizontal Lateral TD | 4736'/9113'                    | Gallup           |

**Lybrook H04-2208 01H****SHL: SE/4 NE/4 Sec 4 T22N R8W 1,980' FNL, 330' FEL****BHL: SW/4 NW/4 Sec 4 T22N R8W 1,980' FNL, 330' FWL****San Juan, New Mexico****6. DRILLING FLUIDS PROGRAM**

## a) Surface through Intermediate Casing Point:

| Hole Size (in) | Depth (TVD/MD)        | Mud Type         | Density (ppg) | Viscosity (sec/qt) | Fluid Loss (cc) |
|----------------|-----------------------|------------------|---------------|--------------------|-----------------|
| 30"            | 0-60'/60'             | Fresh Water      | 8.3-9.2       | 38-100             | 4-28            |
| 12 1/4"        | 0'-500'/500'          | Fresh Water      | 8.3-10        | 60-70              | NC              |
| 8 3/4"         | 500'/500'-4653'/4734' | 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"         | 4653'/4734'-<br>4736'/9113' | Fresh Water LSND | 8.3-10        | 15-25              | <15             |

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

**7. TESTING, CORING, & LOGGING**

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

Cased Hole:

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

**8. ABNORMAL PRESSURES & HYDROGEN SULFIDE**

The anticipated bottom hole pressure is +/- 2228 psi based on a 9.0 ppg at 4760' TVD of the horizontal lateral target. No abnormal pressure or temperatures are anticipated.

No hydrogen sulfide gas is anticipated, however, if H<sub>2</sub>S is encountered, the guidelines in Onshore Order No. 6 will be followed.

**9. ANTICIPATED START DATE AND DURATION OF OPERATIONS**

Drilling is estimated to commence on October 9, 2014. It is anticipated that completion operations will begin within 30 days after the well has been drilled depending on fracture treatment schedules with various pumping service companies.

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

| LOC: Lybrook H04-2208 01H<br>County: 0<br>WELL: Lybrook H04-2208 01H                                                                                                                                                                       |                      |                                    | Encana Natural Gas<br><br>WELL SUMMARY |        |  | ENG: 0<br>RIG: Aztec 950<br>GLE: 0<br>RKBE: 4750 |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      | 9/2/14                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------------------------|----------------------------------------|--------|--|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----------------------------|
| MWD<br>LWD                                                                                                                                                                                                                                 | OPEN HOLE<br>LOGGING | FORM                               | DEPTH                                  |        |  | HOLE<br>SIZE                                     | CASING<br>SPECS                                                                                                                                                                                                                                                                                                                                                                                                                                             | MW<br>MUD TYPE       | DEVIATION<br>INFORMATION    |
|                                                                                                                                                                                                                                            |                      |                                    | TVD                                    | MD     |  |                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                             |
|                                                                                                                                                                                                                                            |                      |                                    | 60                                     | 60'    |  | 30                                               | 16" 42.09#<br>100sx Type I Neat 16.0ppg cmt                                                                                                                                                                                                                                                                                                                                                                                                                 | Fresh wtr<br>8.3-9.2 |                             |
| Multi-Well pad<br>take survey<br>every stand<br>and run anti-<br>collision<br>report prior to<br>spud                                                                                                                                      | None                 | San Jose Fn.                       | 0                                      |        |  | 12 1/4                                           | 9 5/8" 36ppf J55 STC<br>TOC Surface with 100% OH Excess:<br>276 sks Type III Cement + 1% bwoc<br>Calcium Chloride + 0.25 lbs/sack Cello<br>Flake + 0.2% bwoc FL-52A + 58.9%<br>Fresh Water.                                                                                                                                                                                                                                                                 | Fresh wtr<br>8.3-10  | Vertical<br><1°             |
|                                                                                                                                                                                                                                            |                      | Nacimiento Fn.<br>9 5/8" Csg       | 0<br>500                               | 500.00 |  |                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                             |
| Survey Every<br>60'-120',<br>updating<br>anticollision<br>report after<br>surveys. Stop<br>operations and<br>contact drilling<br>engineer if<br>separation<br>factor<br>approaches<br>1.5<br><br>Surveys every<br>30' through<br>the curve | No OH logs           | Ojo Alamo Ss.                      | 429                                    |        |  | 8 3/4                                            | 7" 26ppf J55 LTC<br>TOC @ surface<br>(100% OH excess - 70% Lead 30%<br>Tail)<br>Stage 1 Total: 697sks<br><br>Stage 1 Lead: 378 sks Premium Lite<br>FM + 3% CaCl2 + 0.25/sk Cello Flake<br>+ 5#/sk LCM-1 + 8% Bentonite + 0.4%<br>FL-52A + 0.4% Sodium Metasilicate.<br>Mixed at 12.1 ppg. Yield 2.13 cuft/sk.<br><br>Stage 1 Tail: 319 sks Type III Cement +<br>1% CaCl2 + 0.25#/sk Cello Flake +<br>0.2% FL-52A. Mixed at 14.6 ppg. Yield<br>1.38 cuft/sk. | Fresh Wtr<br>8.3-10  | Vertical<br><1°             |
|                                                                                                                                                                                                                                            |                      | Kirtland Shale                     | 565                                    |        |  |                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                             |
|                                                                                                                                                                                                                                            |                      | Fruitland Coal                     | 768                                    |        |  |                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                             |
|                                                                                                                                                                                                                                            |                      | Pictured Cliffs Ss.<br>Lewis Shale | 1,119<br>1,261                         |        |  |                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                             |
|                                                                                                                                                                                                                                            |                      | Cliffhouse Ss.<br>Menelee Fn.      | 1,862<br>2,586                         |        |  |                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                             |
|                                                                                                                                                                                                                                            |                      | Point Lookout Ss.<br>Mancos Shale  | 3,485<br>3,674                         |        |  |                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                             |
|                                                                                                                                                                                                                                            | Mud logger<br>onsite | KOP                                | 4,184                                  | 4,184  |  |                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                             |
|                                                                                                                                                                                                                                            |                      | Mancos Silt                        | 4,180                                  |        |  |                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                             |
|                                                                                                                                                                                                                                            |                      | Gallup Fn.<br>7" Csg               | 4,473<br>4,653                         | 4,734' |  |                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                             |
| Surveys every<br>stand to TD<br>unless<br>directed<br>otherwise by<br>Geologist<br><br>MWD<br>Gamma<br>Directional                                                                                                                         | No OH Logs           | Horizontal Target<br>TD            | 4,760<br>4,736                         | 9,113  |  | 6 1/8                                            | 50' overlap at liner top<br><br>4379' Drilled Lateral                                                                                                                                                                                                                                                                                                                                                                                                       |                      | Horz Inc/TVD<br>deg/90.3°ft |
|                                                                                                                                                                                                                                            |                      | Base Gallup                        | 4,814                                  |        |  |                                                  | 4 1/2" 11.6ppf SB80 LTC<br>TOC @ hanger<br>(50% OH excess)<br>Stage 1 Total: 277sks<br><br>Stage 1 Blend: 277 sks Premium Lite High<br>Strength FM + 2% bwow Potassium Chloride<br>+ 0.3% bwoc R-3 + 0.25 lbs/sack Cello Flake<br>+ 0.3% bwoc CD-32 + 5 lbs/sack LCM-1 +<br>1% bwoc FL-52 + 101.1% Fresh Water                                                                                                                                              | WBM<br>8.3-10        | TD = 9113.4 MD              |
|                                                                                                                                                                                                                                            |                      |                                    |                                        |        |  |                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                             |

**NOTES:**

- 1) Drill with 30" bit to 60', set 20" 94# conductor pipe
- 2) Drill surface to 500', R&C 9 5/8" casing
- 3) N/U BOP and surface equipment
- 4) Drill to KOP of 4184', 8 3/4 inch holedize
- 5) Start curve at 10deg/100' build rate
- 6) Drill to csg point of 4734' MD
- 7) R&C 7" csg, circ cmt to surface
- 8) Land at -90 deg, drill lateral to 9113' run 4 1/2 inch cemented liner