



02055708

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FORM 4
Rev 12/05

State of Colorado
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 Phone: (303)894-2100 Fax: (303)894-2109



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DEC 17 2012

COGCC

Complete the Permitting Checklist

OP OGCC

Submit original plus one copy. This form is to be used for general, technical and environmental sundry information. For proposed or completed operations, describe in full on Technical Information Page (Page 2 of this form.) Identify well or other facility by API Number or by OGCC Facility ID. Operator shall send an informational copy of all sundry notices for wells located in High Density Areas to the Local Government Designee (Rule 603b.)

1. OGCC Operator Number: 100185	4. Contact Name: Ruthann Morss
2. Name of Operator: Encana Oil & Gas (USA) Inc.	Phone: (720) 876-5060
3. Address: 370 17th Street, Suite 1700	Fax: (720) 876-6060
City: Denver State: CO Zip: 80202	
5. API Number: 05-045147290000	OGCC Facility ID Number: 11-12BB (PK11)
6. Well/Facility Name: Map LLC	7. Well/Facility Number: 11-12BB (PK11)
8. Location (Otr, Sec, Twp, Rng, Meridian): N45W, 11, 75, 95W, 6 PM	Survey Plat: <input type="checkbox"/>
9. County: GARFIELD	Directional Survey: <input type="checkbox"/>
10. Field Name: Parachute	Surface Eqpt Diagram: <input type="checkbox"/>
11. Federal Indian or State Lease Number:	Technical Info Page: <input checked="" type="checkbox"/>
	Other: <input type="checkbox"/>

General Notice

<input type="checkbox"/> CHANGE OF LOCATION: Attach New Survey Plat (a change of surface qtr/qtr is substantive and requires a new permit)	
Change of Surface Footage from Exterior Section Lines	<input type="checkbox"/> FNL/FSL <input type="checkbox"/> FEL/FWL
Change of Surface Footage to Exterior Section Lines:	<input type="checkbox"/> <input type="checkbox"/>
Change of Bottomhole Footage from Exterior Section Lines:	<input type="checkbox"/> <input type="checkbox"/>
Change of Bottomhole Footage to Exterior Section Lines:	<input type="checkbox"/> <input type="checkbox"/> attach directional survey
Bottomhole location Qtr/Otr, Sec, Twp, Rng, Mer	
Latitude	Distance to nearest property line
Longitude	Distance to nearest bldg, public rd, utility or RR
Ground Elevation	Distance to nearest lease line
	Is location in a High Density Area (rule 603b)? Yes/No <input type="checkbox"/>
	Distance to nearest well same formation
	Surface owner consultation date:
GPS DATA:	
Date of Measurement	PDOP Reading
	Instrument Operator's Name
<input type="checkbox"/> CHANGE SPACING UNIT	
Formation	Formation Code
Spacing order number	Unit Acreage
	Unit configuration
<input type="checkbox"/> Remove from surface bond	
Signed surface use agreement attached	
<input type="checkbox"/> CHANGE OF OPERATOR (prior to drilling):	
Effective Date:	
Plugging Bond: <input type="checkbox"/> Blanket <input type="checkbox"/> Individual	
<input type="checkbox"/> CHANGE WELL NAME	
From:	NUMBER
To:	
Effective Date:	
<input type="checkbox"/> ABANDONED LOCATION:	
Was location ever built? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Is site ready for inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Date Ready for Inspection:	
<input type="checkbox"/> NOTICE OF CONTINUED SHUT IN STATUS	
Date well shut in or temporarily abandoned:	
Has Production Equipment been removed from site? <input type="checkbox"/> Yes <input type="checkbox"/> No	
MIT required if shut in longer than two years. Date of last MIT:	
<input type="checkbox"/> SPUD DATE:	
<input type="checkbox"/> REQUEST FOR CONFIDENTIAL STATUS (6 mos from date casing set)	
<input type="checkbox"/> SUBSEQUENT REPORT OF STAGE, SQUEEZE OR REMEDIAL CEMENT WORK	
Method used	Cementing tool setting/perf depth
Cement volume	Cement top
Cement bottom	Date
*submit cbl and cement job summaries	
<input type="checkbox"/> RECLAMATION: Attach technical page describing final reclamation procedures per Rule 1004	
Final reclamation will commence on approximately:	
<input type="checkbox"/> Final reclamation is completed and site is ready for inspection.	

Technical Engineering/Environmental Notice

<input checked="" type="checkbox"/> Notice of Intent		<input type="checkbox"/> Report of Work Done
Approximate Start Date: Jan 2, 2013		Date Work Completed:
Details of work must be described in full on Technical Information Page (Page 2 must be submitted.)		
<input type="checkbox"/> Intent to Recomplete (submit form 2)	<input type="checkbox"/> Request to Vent or Flare	<input type="checkbox"/> E&P Waste Disposal
<input type="checkbox"/> Change Drilling Plans	<input checked="" type="checkbox"/> Repair Well	<input type="checkbox"/> Beneficial Reuse of E&P Waste
<input type="checkbox"/> Gross Interval Changed?	<input type="checkbox"/> Rule 502 variance requested	<input type="checkbox"/> Status Update/Change of Remediation Plans
<input type="checkbox"/> Casing/Cementing Program Change	<input type="checkbox"/> Other:	for Spills and Releases

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct and complete.

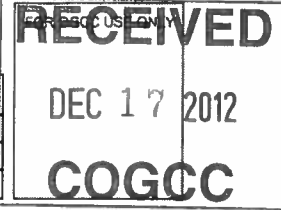
Signed: Ruthann Morss Date: 12/17/2012 Email: ruthann.morss@encana.com
Print Name: Ruthann Morss Title: Regulatory Analyst

COGCC Approved: David Anderson Title: PE II Date: 1/2/2013

CONDITIONS OF APPROVAL, IF ANY:

- 1) Run cement bond log (CBL) across both cement squeezes to verify remedial cement coverage.
- 2) Submit new Form 5 (Drilling Completion Report) showing new cement coverage, remedial cement tickets, and CBL within 30 days after the work is complete, as required by Rule 308A for a change of wellbore configuration.

TECHNICAL INFORMATION PAGE



1. OGCC Operator Number: 100185 API Number: 05045147290000
 2. Name of Operator: Encana Oil & Gas (USA) Inc. OGCC Facility ID #
 3. Well/Facility Name: Map LLC Well/Facility Number: 11-12BB (PK11)
 4. Location (QtrQtr, Sec, Twp, Rng, Meridian): NESW, 11, 7S, 95W, 6 PM

This form is to be completed whenever a Sundry Notice is submitted requiring detailed report of work to be performed or completed. This form shall be transmitted within 30 days of work completed as a "subsequent" report and must accompany Form 4, page 1.

5. DESCRIBE PROPOSED OR COMPLETED OPERATIONS

TD: 7973'
 PBTD: 5610' by CBP
 Perf interval: 5712' - 7640'

A casing leak between 2258' - 2289' has been identified on this well. A cement squeeze will be completed to fix the casing leak - using the following procedure - and a MIT performed. Following the MIT, the CBP @ 5610' will be drilled out and the well placed back on production.

1. MIRU workover rig ND tree, NU BOPs.
2. Establish injection rate RIH and set cement retainer @ ~ 2100'.
3. Sting into retainer and squeeze holes with ~50 sacks cement
4. Let cement set and drill out cement.
5. Perform MIT. Record pressure test and submit Form 21.
6. TIH and drill out CBP @ 5610'.
7. If fill is covering stage 1 perfs (7411' - 7638') prepare to move in N2 unit and clean out to TD.
8. Land 2 3/8" tubing and set F nipple at EOT @ 6571'.
9. RDMO.

*SQUEEZE/PLUG LENGTH INCREASED
 TO 200' AND ADDED
 SQUEEZE AT 3,300'
 SEE ATTACHED FOR DETAILS.*

D.A.

Summary

The Map LLC 11-12BB (PK11) well has a casing leak that was identified with a packer between 2258' – 2289'. Top of good cement has been picked at approximately 4800' with the CBL log. Based on the RST log multiple potential gas bearing sands exist between the TOC at 4800' and the casing leak at ~2275'. In addition, this well has seen high bradenhead pressure at surface since 2011. Bradenhead pressures are currently being mitigated by venting the bradenhead gas at surface to prevent pressure from building. Bradenhead pressures from annual 7-day buildups have been reduced on this well from 159psi in 2011 to 75psi in 2012 using the venting at surface method.

Encana proposes to remediate the casing leak with a cement squeeze. However, if the cement squeeze forms a pressure seal in the annular space, gas from the uncemented gas bearing zones below the casing leak could be trapped below the remedial cement. Since there would no longer be a pathway to vent the gas at surface, excess pressure would start to build beneath the annular cement plug.

Therefore, Encana also proposes to pump an additional cement squeeze approximately midway between the current TOC and the casing leak, at 3300'. By limiting the amount of uncemented interval in pressure communication the amount of excess pressure that could build below the casing leak cement plug would be significantly reduced.

Annular Pressure Calculations – Single cement squeeze at casing leak depth

First, the production casing – open hole annular pressures are calculated at the casing leak depth assuming the entire interval between TOC and the casing leak cement squeeze are left uncemented. Over time, gas from the gas bearing zones will enter the annular space and gravity segregate. As more gas enters the annular space and displaces water back into the formation, pressure will continue to build below the annular cement plug until equilibrium is achieved between the formation and the annular space. Assuming a gas column eventually fills the entire annular space (conservative scenario), the pressure just below the annular cement plug would be equal to the reservoir pressure at the deepest uncemented interval minus the weight of the gas column.

Reservoir Pressure (P*) at deepest uncemented interval (TOC)

$$P^* \text{ at TOC} = 4800' * 0.44\text{psi/ft (assuming normal pressure gradient)}$$

$$P^* \text{ at TOC} = 2112\text{psi}$$

Annular Pressure immediately below cement squeeze plug at 2275'

$$P \text{ below cement plug} = P^* \text{ at TOC} - \text{weight of the gas column}$$

$$P \text{ below cement plug} = 2112\text{psi} - 0.05\text{psi/ft} * (4800' - 2275')$$

$$P \text{ below cement plug} = 2037\text{psi}$$

Apparent Pressure Gradient immediately below cement squeeze plug at 2275'

$$P_{\text{grad below cement plug}} = 2037 \text{ psi} / 2275'$$

$$P_{\text{grad below cement plug}} = 0.87 \text{ psi/ft}$$

Annular Pressure Calculations – Additional cement squeeze at 3300'

Now, the production casing – open hole annular pressures are calculated assuming that we pump an additional cement squeeze approximately midway between the TOC depth and the casing leak depth, at 3300'. Again, assuming that a gas column eventually fills the entire annular space the pressure just below the annular cement plug at 3300' and the annular cement plug at 2275' would be equal to the reservoir pressure at the deepest uncemented interval minus the weight of the gas column.

Reservoir Pressure (P^*) at deepest uncemented interval (TOC)

$$P^* \text{ at TOC} = 4800' * 0.44 \text{ psi/ft (assuming normal pressure gradient)}$$

$$P^* \text{ at TOC} = 2112 \text{ psi}$$

Annular Pressure immediately below cement squeeze plug at 3300'

$$P \text{ below cement plug} = P^* \text{ at TOC} - \text{weight of the gas column}$$

$$P \text{ below cement plug} = 2112 \text{ psi} - 0.05 \text{ psi/ft} * (4800' - 3300')$$

$$P \text{ below cement plug} = 2037 \text{ psi}$$

Apparent Pressure Gradient immediately below cement squeeze plug at 3300'

$$P_{\text{grad below cement plug}} = 2037 \text{ psi} / 3300'$$

$$P_{\text{grad below cement plug}} = 0.62 \text{ psi/ft}$$

Reservoir Pressure (P^*) at deepest uncemented interval (immediately above cement plug at 3300')

$$P^* \text{ at } 3300' = 3300' * 0.44 \text{ psi/ft (assuming normal pressure gradient)}$$

$$P^* \text{ at } 3300' = 1452 \text{ psi}$$

Annular Pressure immediately below cement squeeze plug at 2275'

$$P \text{ below cement plug} = P^* \text{ at TOC} - \text{weight of the gas column}$$

$$P \text{ below cement plug} = 1452 \text{ psi} - 0.05 \text{ psi/ft} * (3300' - 2275')$$

$$P \text{ below cement plug} = 1401 \text{ psi}$$

Apparent Pressure Gradient immediately below cement squeeze plug at 2275'

$$P_{\text{grad below cement plug}} = 1401 \text{ psi} / 2275'$$

$$P_{\text{grad below cement plug}} = 0.62 \text{ psi/ft}$$

Annular Pressure Calculations – Discussion

From the calculations above, assuming the entire interval from TOC to the casing leak is left uncemented the estimated maximum pressure that could build below the cement squeeze plug at 2275' would be approximately 2037psi (0.87psi/ft). By pumping one additional cement squeeze at 3300', the estimated maximum pressure that could build below the cement squeeze plug at 2275' would be approximately 1401psi (0.62psi/ft). This is a reduction of 636psi (0.25psi/ft). Likewise, the estimated maximum pressure that could build below the additional cement squeeze plug at 3300' would be approximately 2037psi (0.62psi/ft).

These calculations assume that both annular cement plugs establish pressure isolation. Additionally, they assume that an entire gas column fills the annular space. This is a very conservative assumption considering that the maximum recorded bradenhead pressure at surface for this well to date has been 159psi. This equates to a gas column of approximately 360ft at the top of the annulus with a water column of 4440ft. If there was an entire gas column from 4800ft to surface, the bradenhead pressure at surface would be approximately 1870psi.

Proposed Forward Plans

Encana proposes to fix the casing leak at 2275' with a cement squeeze. Additionally, another cement squeeze is proposed at 3300' to reduce the total uncemented interval between TOC and the casing leak. Encana will design to pump at least enough cement volume to form 200' annular cement plugs at both squeeze depths. If injection rates cannot be established to place the necessary amount of cement, Encana will contact the COGCC.