

Scott A. Stoll
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February 15, 2012

BY COURIER

Kirsten Walli
Board Secretary
2300 Yonge Street
27th Floor, Box 2329
Toronto, ON
M4P 1E4

Dear Ms. Walli:

Re: EB-2012-0060 - Application to Drill Wells into a Designated Storage Area

On Tuesday February 14th, 2012, Enbridge Gas Distribution Inc. ("Enbridge") applied to the Ministry of Natural Resources ("MNR") for permission to drill four (4) observation wells within the Kimball-Colinville designated storage area. Pursuant to section 40 of the *Ontario Energy Board Act, 1998*, S.O. 1998 c.15, Schedule B, the Minister of Natural Resources is obligated to refer the application for the granting of a licence related to a well in a designated storage area to the Ontario Energy Board for a report.

These are observation wells therefore and do not require a pipeline to connect to the existing storage network and no leave to construct application is required.

Enclosed please find the observation well applications filed by Enbridge with the MNR.

If you require further information regarding this matter please contact the undersigned at your earliest convenience.

Yours truly,

AIRD & BERLIS LLP

Original Signed

Scott A. Stoll

SAS/ hm

11902447.1

Gas Storage Operations
3595 Tecumseh Road
Mooretown, ON N0N 1M0
(519) 862-1473
(519) 862-1168 Fax



February 14th, 2012

Ministry of Natural Resources
Petroleum Resources Centre
659 Exeter Road
London, Ontario
N6E 1L3

Attention: Manager, Petroleum Operations Section

**Subject: Submittal of Four Drilling Applications for Observation Wells in the
Kimball-Colinville Designated Storage Area**

Enclosed, please find four (4) drilling applications for the proposed observation wells to be drilled in the Kimball-Colinville Designated Storage Area (DSA).

For each well application you will find 2 copies of the Form 1, 2 copies of the Wellsite Survey and 2 copies of the Drilling Program plus the drilling application fee. It is our hope to start the drilling of the wells by March 15th, 2012. We would be pleased to meet with you to review or clarify any portion of the application.

We have been in contact with the Ontario Energy Board (OEB) to inform them of the applications for 4 Observation Wells. The OEB has assigned docket number EB-2012-0060. For your information, Enbridge has also submitted a package containing the drilling applications to the OEB.

If any further information is required please contact the undersigned at 519-862-6032.

Yours truly,

{ORIGINAL SIGNED}

Kathy McConnell, P.Geo
Senior Project Geologist

Encls.



Oil, Gas and Salt Resources Act
Application for a Well Licence

Filed: 2012-02-15
EB-2012-0060
Attachment 3
Page 1 of 25

Form 1 To the Minister of Natural Resources v.2010-07-01
The undersigned operator applies for a well licence under the Oil, Gas and Salt Resources Act and the Regulations thereunder and submits the following information, together with the application fee of \$100 + 13% HST.

1. WELL NAME TKC # 65 Moore 1-14-IV Target Formation A-1 Carbonate

Purpose of Proposed Well (Well Type) Observation Well

2. OPERATOR Enbridge Gas Distribution Inc. Tel # 519-862-1473 Fax # 519-862-1168

Street Address 3595 Tecumseh Road City Mooretown Prov. ON Postal Code N0N 1M0

Mailing Address 3595 Tecumseh Road City Mooretown Prov. ON Postal Code N0N 1M0

Contact Name Kathy McConnell Contact Tel # 519-862-6032

3. LOCATION County Lambton Township Moore

Tract 1 Lot 14 Concession IV Lake Erie: Truck Trail Licence/Lease No

Surface location, 113.05 m North South X Latitude 42° 48' 42.407" Bottom-hole Lat. 42° 48' 42.407"

metres from Lot Boundaries 335.60 m East X West Longitude 82° 20' 19.581" Bottom-hole Long. 82° 20' 19.581"

Within 1.6 km of Designated Storage Area? Yes X No Off-target? Yes No X

4. WELL PARTICULARS Vertical X Horizontal Directional Deepening Re-entry Lateral

Rig Type: Rotary X Cable Well to be cored? Yes No X Formation at TD A-1 Evaporite

Ground Elevation 190.45 Proposed Depth 688.0 Proposed Depth TVD 688.0 Proposed Start Date 15.Mar.12

5. LANDOWNER Tel #

Street Address City Prov. Postal Code

The landowner hereby provides consent for the collection of their personal information, via the operator, as per Section 12 of this form. Landowner Signature: (Original Signed)

Pooling of the Spacing Unit or unitization of the Unit Area shown on the attached well location plan has been completed (see Ont. Reg. 245/97 definitions for "pooled spacing unit" and "unitize") Yes X No

6. DRILLING CONTRACTOR T.W. Marsh Well Drilling and Servicing / Bradco Drilling Inc. Tel # 519-695-6062 / 519-689-4692

Address Box 53 / 14 Hattie St., Box 99 City Bothwell / Merlin Prov. ON Postal Code N0P 2C0 / N0P 1W0

7. PROPOSED CASING AND CEMENTING PROGRAM

Hole Size (mm)	Casing O.D. (mm)	Weight (kg/m)	Grade	New, Used or in-hole	Setting Depth TVD	Setting Formation	CASING SETTING INFORMATION		
							How Set	Cement Type	Cement Top KB / RF
340	340	81.10	LS	New	43	Kettle Point	Driven	nil	nil
312	244	48.06	H40	New	58	Kettle Point	Cement	G	surface
222	178	29.76	J55	New	391	F Shale	Cement	G	surface
159	114	15.62	J55	New	647.5	A-2 Anhydrite	Cement	G	surface

8. BLOW-OUT PREVENTION EQUIPMENT	9" 2M Annular Preventor
	7-1/16" 3M Annular Preventor and Double Gate

9. WELL SECURITY Name of Trustee Harrison Pensa LLP Total # Unplugged Wells 162 Current Balance \$70,000

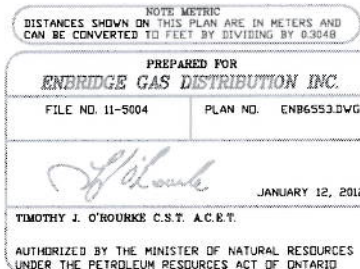
10. REMARKS

11. ENCLOSURES Fee X Location Plan X (Land wells only) Drilling Program X

12. NOTICE OF COLLECTION
The Ministry of Natural Resources is collecting your personal information under the authority of the Oil, Gas and Salt Resources Act. Any personal information provided on this application will be used for licensing and law enforcement purposes only and will be protected in accordance with the Freedom of Information and Protection of Privacy Act. If you have questions about use of your personal information, please contact the Policy and Program Officer, Petroleum Resources Centre, Ministry of Natural Resources, 650 Exeter Road, London N6E 1J3, 519-371-4638.

13. AUTHORITY
The undersigned certifies that the information provided herein is complete and accurate, the operator has the right to drill or operate a well in the above location, and he/she has authority to bind the operator.

Date (d/m/y)	08.Feb.12	Name	J.E. Sanders	Signature	(Original Signed)
Date of Birth	04.Apr.62	Company	Enbridge Gas Distribution Inc.	Title	Director, Storage Operations



TKC # 65, Moore 1-14-IV

DRILLING PROGRAM

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SECTION 1.0 - GENERAL DATA

Section 1.1 - Well Summary

Well Name: TKC # 65 Moore 1-14-IV

Operator: Enbridge Gas Distribution Inc.

Surface Location: Tract 1, Lot 14, Con. 4, Moore Twp, Lambton County

Surface Coordinates: 113.05m South; 335.60m East

Ground Elevation: 190.45m

KB Elevation: 191.75m

Total Depth: 688m

Target Formation: A-1 Carbonate

Logging Program: Gamma Ray / Neutron from TD to base of Surface Casing
Porosity / Density Log A-2 Anhydrite to TD
CBL-GR – 114mm casing
Vertilog – 114mm casing

Spud Date: March 15th, 2012

Duration: 45 days

Section 1.2 – Special Notes

1. Safety of personnel and environment is our primary concern. Section 6.1 of this program, outlines Enbridge's general safety requirements which obliges all personnel on the wellsite to follow the Occupational Health and Safety Act and Regulations (Ministry of Labour) and the Oil, Gas & Salt Resources Act and Regulations (Ministry of Natural Resources). Safety and/or environmental ("tailgate") meetings shall be conducted as per Section 6. Wellsite Supervisor shall conduct daily 'walk around' inspections of the equipment on site and record the results on the daily reports. Please refer to Section 5.2 for the procedure to be followed if a worker injury occurs.
2. The Wellsite Supervisor has authority over all activities conducted on the drilling location. The Wellsite Supervisor shall ensure that all applicable regulations and policies (MNR, MOL, MOEE, and Enbridge) are followed and that all permits are kept on site and/or signed off as required.

3. All operations are to be to MNR standards.
4. BOPs are to be installed, maintained and used as per MNR requirements. Testing of the BOPs must be in accordance with Section 6.2 of this program.
5. Tower sheets must be completed daily and will include the information listed in Section 5.1 of this program. The Wellsite Supervisor will complete daily reports and forward the reports to Enbridge's office by 10am the following day.
6. The production casing will be set in the A-2 Anhydrite to allow for an effective cement job and successful pressure testing, prior to penetrating the A-1 Carbonate formation.

Section 1.3 - Contact Numbers

Enbridge Gas Distribution Inc.

Kathy McConnell	Senior Project Geologist	Office: 519-862-6032 Fax: 519-862-1168 Cell: 519-312-2168 kathy.mcconnell@enbridge.com
Paul Druet	Manager, Reservoir Development	Office: 519-862-6016 Fax: 519-862-1168 Cell: 519-383-4012 paul.druet@enbridge.com
Terry Chupa	Land Administrator	Office: 519-862-6008 Fax: 519-862-1168 Cell: 519-384-0215 terry.chupa@enbridge.com
Control Room		Office: 519-862-6012

Drilling Supervisor:

Steve Thompson	Cell: 519-383-5404 omniconsulting@rogers.com
Wayne Bolton	Cell: 519-312-8437 kegconsulting@aim.com

Geologist:

Neil Hoey

Office: 519-472-4776
Fax: 519-472-4776
Cell: 519-649-6918
neil_hoey@hotmail.com

Cable Tool Rig - Terry Marsh Well Drilling & Servicing

Terry Marsh

Owner / Operator

Office: 519-695-6060
Fax: 519-695-6464
Cell: 519-359-9804
twmarshca@yahoo.com

Rotary Rig – Bradco Drilling Inc.

Brad Stevenson

Owner / Operator

Office: 519-689-4692
Fax: 519-689-7516
Cell: 519-358-3742
bradco@ciaccess.com

Cementing

Ian Veen

Black Creek Well Service
President

Office: 519-882-4732
519-834-2941
Fax: 519-834-2466
Cell: 519-686-4645

Jay Rookes

Schlumberger Canada
Engineer-In-Charge

Office: 519-652-5053
Fax: 519-652-6002
rookes1@slb.com

Casing & Wellheads – Wellmaster Pipe & Supply Inc.

Andy Arnoczki

Sales Representative

Office: 519-688-0500
Fax: 519-688-0563
Cell: 519-537-0559
aarnoczki@wellmaster.ca

Bill Hedges

Inside Sales

Office: 519-688-0500
Fax: 519-688-0563
bhedges@wellmaster.ca

Graham Shone

Operations Manager

Office: 519-336-9797
Fax: 519-336-9733
Cell: 519-331-2534
gshone@cefranklin.com

Larry Rushton	Owner	Office: 519-326-8884 Fax: 519-326-8882 rushtonsupply@sympatico.ca
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Wireline Services

Gord MacKenzie	Baker Atlas Base Manager	Office: 519-332-8030 Fax: 519-332-4714 Cell: 519-339-6783 gord.mackenzie@bakerhughes.com
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Dave Tipping	Weatherford Canada – Wireline & Logging Services Station Manager	Office: 519-683-2010 Fax: 519-683-2577 Cell: 519-436-3541 dave.tipping@canada.weatherford.com
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Snubbing Services

Derrick Jacobson	President Quattro Energy Services Inc.	Office: 877-829-7242 Fax: 403-720-6319 Cell: 403-828-7242 derrick@quattroenergy.ca
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Jeff Redmond	Team Snubbing Services Inc.	Office: 403-314-4220 Fax: 403-844-2148 Cell: 403-896-8363 jredmond@teamsnubbing.com
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Water Hauling

Melvin McKeegan	President McKeegan Trucking Limited	Office: 519-864-1037 Fax: 519-864-1036 Cell: 519-490-4028
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Denis Marcus	President Harold Marcus Limited	Office: 519-695-3735 Fax: 519-695-2249 Cell: 519-380-5238 dmarcus@haroldmarcus.com
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Aaron Verstraete	President Oil Patch Services	Office: 519-676-6747 Fax: 519-676-7932 Cell: 519-380-5473 ops.aaron@bellnet.ca
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Rental Equipment

Derrick Holland	Wheatley Wireline Services Ltd.	Office: 519-825-3680 Fax: 519-825-9348 Cell: 519-322-8439 dholland891@hotmail.com
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Wade Glass	Wheatley Wireline Services Ltd.	Office: 519-825-3680 Fax: 519-825-9348 Cell: 519-322-9275
Orval Beam	Orval L. Beam Limited Operations Manager Tank Rentals	Office: 519-436-0164 Fax: 519-436-0164 Cell: 519-436-4801
Jim Seward	JW Seward Enterprises Ltd Crane Trucks, Steel Plates	Office: 519-867-5526 Fax: 519-867-5312 Cell: 519-332-7689

Welders – St. Clair Mechanical

John Dawson	President	Office: 519-864-0927 Fax: 519-864-0801 Cell: 519-330-9672
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Government & Other Agencies

MNR	Petroleum Resources Centre	Office: 519-873-4634 Fax: 519-873-4645 ogsr.mnr.gov.on.ca
MOEE	Spill Reporting	1-800-268-6060
MOL	Health & Safety	1-800-265-1676
	Health & Safety Inspector	Office: 519-646-3238 Fax: 519-672-0268
Richard Ostrowski	Oil, Gas & Salt Resources Library	Office: 519-686-2772 Fax: 519-686-7225 richard@ogsrlibrary.com
Police, Fire & Ambulance		911

SECTION 2.0 - GEOLOGICAL PROGNOSIS

County: Lambton Township: Moore
Concession: IV Lot: 14 Tract: 1

Elevation: 190.2m Estimated

Formation	Top	Elevation	Thickness	Gas	Oil	Water
K.B.	0.0	191.7	1.5			
Drift	1.5	190.2	41.2			Fresh@41.1m
Kettle Point	42.7	149.0	36.8			
Hamilton	79.5	112.2	79.9			
Dundee	159.4	32.3	28.6			
Lucas	188.0	3.7	149.7			Sulphur@196.6m
Amherstburg	0.0	0.0	0.0			
Bois Blanc	0.0	0.0	0.0			
Bass Islands	336.8	-146.0	25.3			
G-Shale	362.1	-171.3	23.8			
F-Shale	385.9	-195.1	47.8			
F-Salt	0.0	0.0	0.0			
E-Carbonate	433.7	-242.0	26.2			
D-Salt	459.9	-269.1	8.9			
C-Shale	468.8	-278.0	24.7			
B-Salt	493.5	-302.7	82.6			
A-2 Carbonate	576.1	-385.3	42.0			
A-2 Salt	618.1	-427.3	29.0			
A-2 Anhydrite	647.1	-456.3	0.6			
A-1 Carbonate	647.7	-456.9	38.7	648m; 653m		
A-1 Evaporite	686.4	-495.6	3.4			
TD	687.4	-496.6				

***Note: Prognosis with TVD tops.
***Note: used Kimball No. 5 to build prog

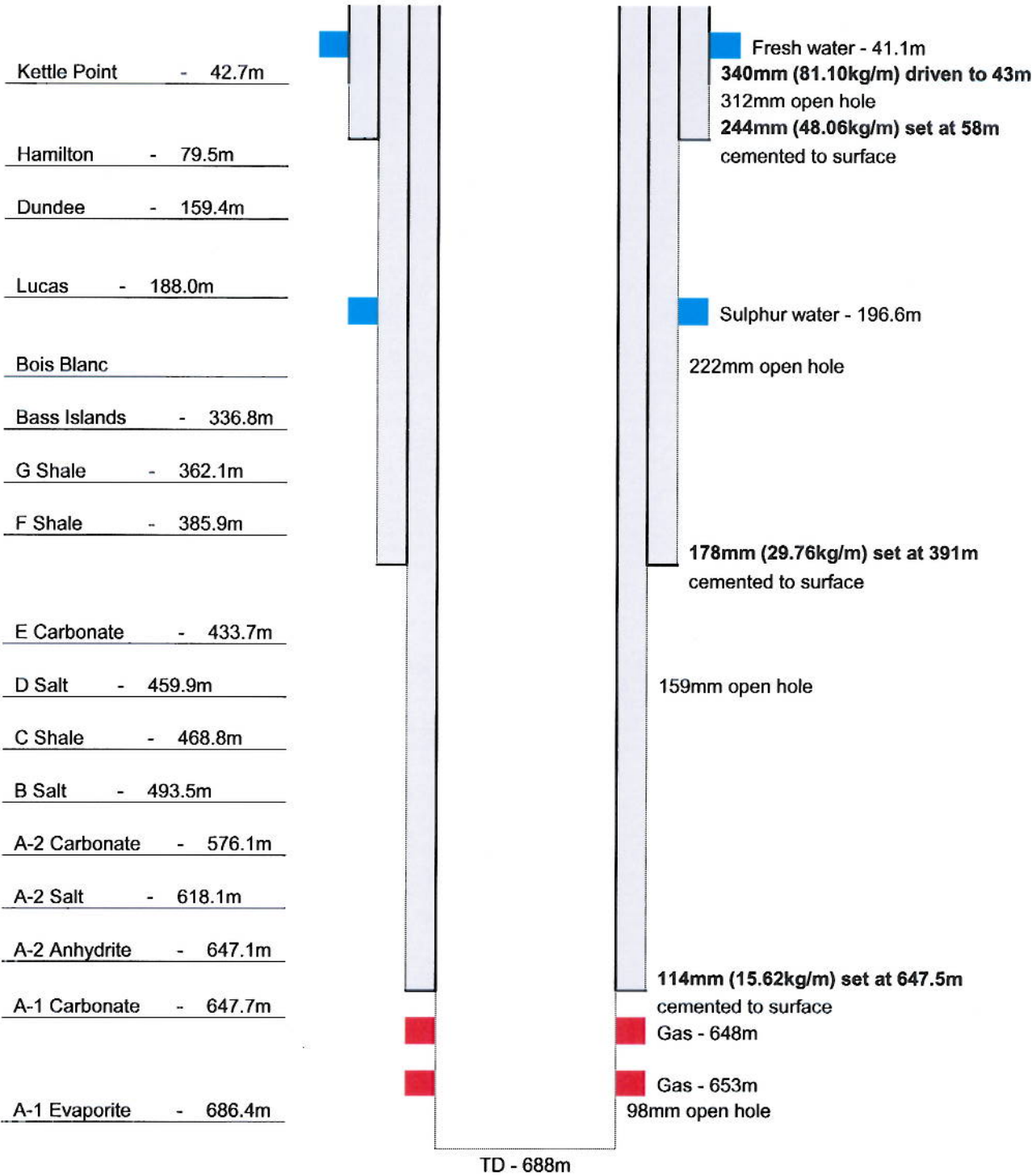
SECTION 3.0 - CASING AND CEMENTING SUMMARY

Section 3.1 - Summary

Hole Size (mm)	Casing Size (mm)	Casing Grade	Casing Weight (kg/m)	Setting Depth (mKB)	How Set
340	340	LS	81.10	43	Driven – cement squeeze if necessary
312	244	H40	48.06	58	Cemented to surface with 100% excess Class G 0-1-0 cement + 2 – 3% CaCl ₂
222	178	J55	29.76	391	Cemented to surface with Class ‘G’ 0-1-8% plus 1 to 3% CaCl ₂ , followed by Class ‘G’ neat cement plus 1 to 3% CaCl ₂ . Cement volumes will be calculated with a 50% excess- gel cement and 30% excess – neat cement. Depending upon hole conditions, consideration may be given to running thixotropic cement plus additional loss circulation materials, across porous zone(s).
159	114	J55	15.62	647.5	Cemented to surface with Class ‘G’ 0-1-0% plus 1 to 2% CaCl ₂ plus 10% NaCl. Cement volumes will be calculated with a 50% excess on the open hole section and 30% excess on the cased hole section.

Main Hole: 98mm open hole will be drilled from 647.5m to 688m

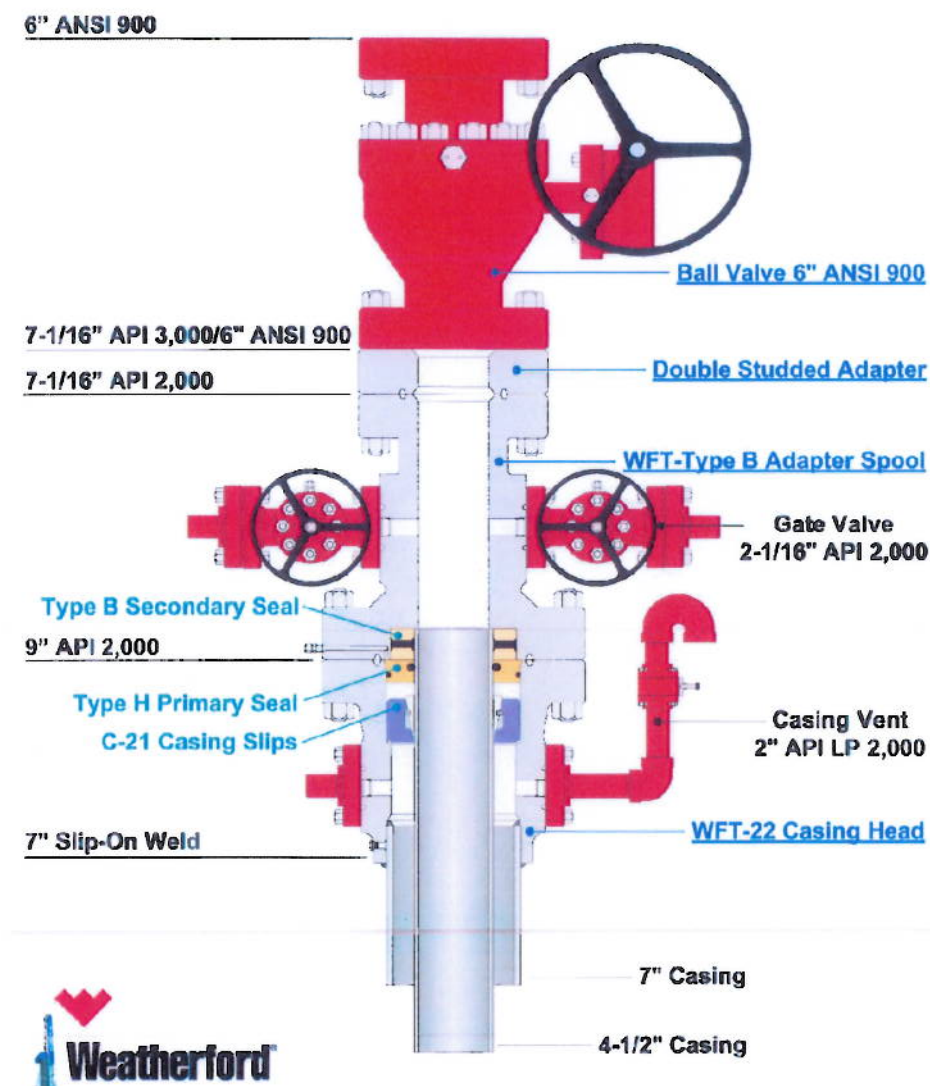
Section 3.2 - Wellbore Diagram



Section 3.3 - Wellhead Summary

Weatherford 13.8 MPa Wellhead:

244mm x 279mm slip on weld on casing bowl for BOP installation
 178mm x 229mm slip on weld on casing bowl
 229mm x 179mm spool c/w 2 gate valves on side outlets
 179mm 13.MPa x 179mm x 20.7 MPa double studded adapter
 152mm ANSI 900 Cameron Grove full port ball valve



SECTION 4.0 - DRILLING PROCEDURES

Section 4.1 - Pre Spud

1. Fresh Water Well Samples

Obtain samples from all fresh water wells located within a 750 metre radius of the proposed well. Have routine water analysis done on all water samples by an independent laboratory in Sarnia. Ensure that copies of these reports are placed in the well files in Enbridge's office

2. Site Preparation

Prepare drilling location as follows:

- a. Locate all drainage tiles crossing lease area
- b. Strip and properly stock pile all soil from the lease
- c. Cut, block and divert drainage tiles as required
- d. Construct adequate berms around lease and access road as required

3. Government Notification of Spud

48 hours prior to spud, notify the Ministry of Natural Resources – Petroleum Resources Section by fax @ (519) 873 – 4645 of the date of commencement of drilling operations

4. Signs

Install rig signs on access road to lease.

5. Safety Meeting

Conduct a pre-spud safety meeting for Rig crews. Tool push and all crewmembers must be present. A similar meeting shall be conducted with the remaining crew(s) as they come on duty. Additional safety meetings shall be conducted as per Section 6.1 of this program.

Section 4.2 - Conductor Casing

1. Drilling Method

Move in and rig up Cable Tool Rig. Measure and record the distance from RF to ground and the RF elevation – include these measurements on the tower sheets and the daily report. Drill and drive 340mm casing to bedrock, to an approximate depth of 43m. Note any occurrence of water and record type of water, depth encountered, and static level of water and/or flow rate. If fresh water is encountered during

drilling, the well must be bail tested for at least 15 minutes, after the casing is landed, to ensure that the fresh water has been shut-off. If the fresh water has not been shut-off, contact Enbridge's office and be prepared to perform a cement squeeze as per Enbridge's requirements.

2. Cement Squeeze (if necessary)

If fresh water is found in the drift and is not shut-off by the conductor casing, a flow rate will be established and a cement squeeze will be performed, using the cement volumes determined by Enbridge. Wait on cement 12 hours and bail the hole dry and monitor the well for at least 15 minutes to determine if the water has been shut-off. If necessary, the process will be repeated until the water is shut-off.

Section 4.3 - Surface Hole & Surface Casing

1. Drilling Method

Drill a 312mm hole 15 metres $\pm$ into the Kettle Point formation, to an approximate depth of 58m. Ensure that drill cutting samples are taken every 3 metres and placed in the sample bags provided by the Ministry of Natural Resources. The sample bags must be labeled with the well name, Township, Lot, Concession and Enbridge's name. Record on daily drilling reports any influx of fluids and/or hydrocarbons, static levels, pressures and any unusual hole conditions.

2. Casing Installation

Depending upon hole conditions encountered, the 244mm casing will be run in the following manner:

- Texas Shoe on bottom of first joint
- Centralizers on the top and bottom of the first joint and coincident with the shoe of the conductor casing
- 244mm casing to surface

3. Cementing Procedures

Move in and rig up Cementers. Ensure pressure recorder is rigged in and serviceable. Pressure charts will be attached to the job ticket. Conduct a pre-job safety meeting to confirm volumes and procedures. Establish circulation using pump truck. The casing and the hole will be circulated with fresh water for 15 minutes to clean the borehole and to fill the casing and hole prior to cementing. Pressure test surface equipment to 14 MPa. Ensure that preflush and mix water are from a clean source and that the water trucks are uncontaminated. Pump preflush of 2.0m³ of fresh water, with the addition of loss circulation material if necessary. Ensure that a minimum of 4 cement samples are taken and represent the cement at the beginning, middle and end of the cement job. Mix and pump sufficient Class 'G' 0-1-0% cement plus 2 to 3% CaCl₂

with a density of 1901 kg/m^3 to cement the casing to surface with 100% excess. Displace cement with fresh water – ensure that cement is under displaced and that the bottom joint of casing is full of cement. Shut-in cementing valve at surface and wait on cement at least 12 hours before slacking off casing.

4. Install 244mm x 279mm slip on weld on casing bowl for BOP installation. Arrange to have surface hole cuttings solidified and then disposed in an approved manner.
5. Release the Cable Tool Rig.

Section 4.4 - Intermediate Hole & Intermediate Casing

1. BOP Installation and Pressure Testing

Move in and rig up Rotary Rig. Measure and record the distance from KB to ground and the KB elevation – include these measurements on the tower sheets and the daily report.

Install Class A (Rotary) BOPs as per MNR requirements. After BOPs are installed and the cement samples indicate that the cement is competent, the rig will proceed to pressure test the BOPs, casing and shoe. Pressure test casing and each component of the BOPs as per Section 6.2. After successfully pressure testing the BOPs and casing, drill out cement and 0.5m of new formation and conduct a PIT, with the hole full of fresh water, using a bottom hole pressure equivalent to 18 kPa/m.

2. Drilling Method

Drill a 222mm hole with fresh water to $5\text{m} \pm$ into the F Shale formation, to an approximate depth of 391m. Notify Geologist 12 hours in advance of reaching intermediate casing point, so that they can be on site to determine the proper casing setting depth. When casing setting depth has been determined, circulated the hole clean. Perform a flow check prior to tripping and strap out of the hole. Fast tripping of the drill string is to be avoided in order to eliminate high annular velocities, pressure surges and swabbing (maximum rate of 27 metres per minute). Keeping the hole full of fluid, trip out of the hole and laydown bottom hole assembly and depending upon rotary rig type, standback or laydown drill collars and drill pipe.

The potential for loss circulation exists while drilling through the Detroit River formations (Lucas and Amherstburg formations). If loss circulation is encountered use the loss circulation contingency program located in Section 4.7. Note all lost circulation intervals and monitor and record fluid loss volumes. If pit fluid must be hauled to disposal, keep solid content to a minimum to reduce costs.

Ensure that drill cutting samples are taken every 3 metres and placed in the sample bags provided by the Ministry of Natural Resources. Record on daily tower sheets

any influx of fluids and static levels (water and/or hydrocarbons), gas and/or any unusual hole conditions.

3. Casing Installation

Ensure that the threads are protected while hoisting casing to the floor. Drift all casing prior to running the casing in the well and apply proper API make-up torque to each connection.

Depending upon hole conditions encountered, the 178mm casing will be run in the following manner:

- Guide shoe
- 178mm joint of casing
- 178mm Float Insert or Float Collar
- Tack weld guide shoe, float collar and bottom 2 joints and use API modified pipe dope on all connections
- Centralizers will be installed one metre above the guide shoe, over the bottom of the first 2 collars and every 5 joints to surface
- 178mm casing to surface

4. Cementing Procedures

Move in and rig up Cementers. Ensure pressure recorder is rigged in and serviceable. Pressure charts will be attached to the job ticket. Conduct a pre-job safety meeting to confirm volumes and procedures. Fill hole and establish circulation using pump truck. The casing and the hole will be circulated with fresh water for 15 minutes to clean the borehole and to fill the casing and hole prior to cementing. Pressure test surface equipment to 14MPa for 10 minutes. Preflush and mix water must be obtained from a clean source and the water trucks must be uncontaminated. Pump preflush of 3.0m³ of fresh water, with the addition of loss circulation material if necessary. Ensure that a minimum of 4 cement samples are taken and represent the cement at the beginning, middle and end of the cement job. Mix and pump sufficient 0-1-8 Class 'G' cement plus 1 to 3% CaCl₂ (50% excess) followed by 0-1-0 Class 'G' cement plus 1 to 3% CaCl₂ (30% excess) to cement casing to surface. Depending upon the severity of the loss circulation zones, thixotropic cement with additional loss circulation materials may be used to cover the loss zone. If there are no cement returns to surface, a feed rate will be established and the annulus will be grouted to surface. Drop wiper plug and displace cement and bump plug to 3.5 Mpa over final pumping pressure – do not exceed 60% of internal yield pressure of casing. Once plug is bumped and it is determined that the float is holding, bleed casing pressure back to final pumping pressure, close casing valves and bleed off surface line pressure and wash out BOPs. Wait on cement 24 hours before slacking off casing. Remove 244mm x 279mm casing bowl and install 178mm x 229mm casing bowl on the 178mm casing.

Section 4.5 - Production Hole & Production Casing

1. Pressure Testing

Check cement samples for hardness – if cement samples are set to the satisfaction of the Wellsite Supervisor, proceed with installation of the BOPS. Install Class B (Rotary) BOPs as per MNR requirements on 178mm casing bowl. After BOPs are installed and the cement samples indicate that the cement is competent, the rig will proceed to pressure test the BOPs, casing and shoe. Pressure test casing and each component of the BOPs as per Section 6.2. After successfully pressure testing the BOPs and casing, drill out cement and 0.5m of new formation and conduct a PIT, with the hole full of fresh water, using a bottom hole pressure equivalent to 18 kPa/m.

2. Drilling Method

Drill a 159mm hole using brine to prevent the dissolution of the salt layers. Ensure that drill cutting samples are taken every 3 metres and placed in the sample bags provided by the Ministry of Natural Resources. Record on daily tower sheets any influx of fluids and static levels (water and/or hydrocarbons), gas and any unusual hole conditions.

Prior to penetrating the A-2 Carbonate, the Wellsite Geologist and Wellsite Supervisor must be on-site and a BOP drill shall be completed to familiarize all on-site personnel with the proper procedures.

Drill a 159mm hole $1 \pm$ metres into the A-2 Anhydrite formation, to an approximate depth of 647.5m. The final casing point will be determined by the Wellsite Geologist.

If the reef pressure is above 7000kPa, drilling will be suspended and the rig will be moved off location after the 114mm casing is installed and cemented. The rig will be brought back onto location to complete the drilling of the well when the reef pressure is below 7000kPa.

3. Casing Installation

Ensure that the threads are protected while hoisting casing to the floor. Drift all casing prior to running the casing in the well and apply proper API make-up torque to each connection.

Depending upon hole conditions encountered, the 114mm casing will be run in the following manner:

- Guide shoe
- 114mm joint of casing
- Float Insert or Float Collar

- Tack weld guide shoe, float collar and bottom 4 joints and use API modified pipe dope on all connections
- Centralizers will be installed on bottom 5 joints of casing – on every 5th joint to surface
- 114mm casing to surface

4. Cementing Procedures

Move in and rig up Cementers. Ensure pressure recorder is rigged in and serviceable. Pressure charts will be attached to the job ticket. Conduct a pre-job safety meeting to confirm volumes and procedures.

Establish circulation using pump truck. The casing and the hole will be filled with brine and circulated for 15 minutes to clean the borehole and to fill the casing and hole prior to cementing. Pressure test surface equipment to 14 MPa for 10 minutes. Preflush and mix water must be obtained from a clean source and the water trucks must be uncontaminated. Pump preflush of 3.0m³ of clean brine, with the addition of loss circulation material if necessary. Ensure that a minimum of 4 cement samples are taken and represent the cement at the beginning, middle and end of the cement job. Mix and pump sufficient Class 'G' 0-1-0 cement plus 10% NaCl, to cement the 114mm casing to surface plus 50% excess over open hole and 30% excess in cased hole. Drop wiper plug and displace cement with fresh water and bump plug to 3500 kPa over final pumping pressure – do not exceed 60% of internal yield pressure of casing. Once plug is bumped and it is determined that the float is holding, bleed casing pressure back to final pumping pressure, close casing valves and bleed off surface line pressure. Wash out BOPs and split BOP stack at 229mm flange, install 114mm slips and set slips in casing bowl. Wait on cement 24 hours and cut casing and remove BOPs. Cut and bevel 114mm casing and install primary and secondary seals. Install 229mm x 179mm spool piece and and test wellhead seals to 14 Mpa for 10 minutes. Install 179mm 14MPa x 21MPa double studded adapter and ANSI 900 Master Valve and shut-in well. 48 hours after cementing operations have been completed – pressure test casing, wellhead and master valve to 12,410kPa for a minimum of 4 hours – ensure that a digital pressure gauge is installed. Report results to the Enbridge Office - do not proceed with BOP installation until the pressure test has been successfully completed.

If the Master Valve is too high above the drill floor, the BOPs will be installed on the top of the spool piece and when the well is completed, a WR-1 plug will be set in the base of the casing and successfully pressure tested to 8300 kPa. The BOPs will then be removed and the Master Valve installed. Once the Master Valve has been installed and successfully pressure tested, the plug will be retrieved with a Wireline Service company.

Section 4.6 - Main Hole

1. Installation of the BOPs

Check cement samples for hardness – if cement samples are set to the satisfaction of the Wellsite Supervisor, proceed with installation of the BOPS. Install Class B (Rotary) BOPs as per MNR requirements. After BOPs and lubricator are installed and a minimum of 48 hours 'wait-on-cement-time' has passed and the cement samples indicate that the cement is competent, a cement bond log will be run on the 114mm casing. Consideration may be given to moving out the Rotary Rig and moving in a Cable Tool Rig. The Cable Tool Rig will install Class B (Cable Tool) BOPs.

2. Logging

Move in and rig up Wireline Company. With hole full of fresh water, run a Cement Bond Log, both a non-pressure and pressure pass. Run a Gamma-Ray / Neutron Log from TD to the base of the surface casing. Rig out Wireline Company and release.

3. Drilling Method

Each component of the BOPs and the casing will be pressure tested as per Section 6.2. Upon successful completion of the pressure testing of the BOPs, the cement, shoe and 0.5m of new formation will be drilled out and a PIT will be conducted, with the hole full of fresh water, using a bottom hole pressure equivalent to 18 kPa/m.

Drill a 98mm hole through the A-1 Carbonate and 1 metre into the A-1 Evaporite Formation – final TD will be determined by the Wellsite Geologist. While drilling the main hole ensure that drill cutting samples are taken every 3 metres and placed in the sample bags provided by the Ministry of Natural Resources. Record on daily tower sheets any influx of fluids and static levels (water and/or hydrocarbons), gas and any unusual hole conditions.

Drilling of the well may be suspended if sufficient permeability and porosity are encountered prior to reaching the proposed TD. If drilling is suspended, the rig will be moved off location and a variety of pressure tests will be performed on the well during withdrawal / injection operations. If the testing of the well shows that the porosity and permeability of the well are not suitable, a rig will be moved back onto location and the well will be drilled to the original TD – 1 metre into the A-1 Evaporite.

4. Logging

Move in and rig up Wireline Company to run a Gamma-Ray/Neutron/Density Log over the open hole section of the well and run a Casing Inspection Log over the 114mm casing.

5. BOP Removal

Close master valve and nipple down BOPs and install 152mm (6") blind flange. If the master valve was not used for the drilling of the well – move in and rig up Wireline and Tool Companies and install a WR-1 plug in the base of the 114mm casing. Bleed down and fill the well with fresh water and pressure test the plug to 8300 kPa. Upon successful completion of the pressure test, remove BOPs and install master valve. Install a digital pressure recorder and pressure test casing, wellhead and master valve, with the hole full of fresh water to a surface pressure of 12,410kPa for a minimum of 4 hours. Report results to Enbridge Office. Do not rig down until well passes the pressure test. Move in Wireline Company to retrieve WR-1 plug.

6. Rig down rotary rig and move off of location and restore wellsite to Enbridge's specifications.

Section 4.7 - Loss Circulation Procedure

1. Before drilling out the casing shoe:

- a. Identify sources and location of fresh water and/or brine, loss circulation materials and weight materials
- b. Ensure BOPs and manifold are properly installed
- c. Ensure auxiliary tanks are connected to the pumping system and a standby mud pump is hooked up for annular injection in case of severe loss circulation (so that fluid can be pumped down both the drill pipe and annulus simultaneously)
- d. Pressure test BOPs prior to drill out

2. After drilling out shoe:

- a. Alert water suppliers and haulers
- b. Ensure adequate amounts of fresh water and/or brine are readily available prior to penetrating the Detroit River formation.
- c. Mechanically test BOPs and perform BOP drill prior to penetrating the Detroit River formation.

3. Drilling Blind – Detroit River formations:

- a. In an attempt to maintain or re-establish circulation, pump fluid down both the annulus and the drill pipe simultaneously
- b. Should severe loss circulation occur while drilling, the thief zone may be plugged with cement and/or loss circulation material at Enbridge's discretion.

SECTION 5.0 - REPORTING PROCEDURES

Section 5.1 - Tower Sheets

Shall be completed daily and shall include:

1. Bit size, jars, depth at the beginning of the shift and end of each shift.
2. Casing size, grade, weight, and number of joints, centralizers, cement baskets, total length and setting depth.
3. Cementing information – Service Company, cement type, amount, slurry density, additives, annular fluid returns, volume of displacement fluid and plug down time.
4. Water, gas or oil – type, depth encountered depth of sample collected and the static level and/or rate of flow.
5. Pressure tests – individually, surface pressures, fluid density used in the tests, bleed-off rate and duration of test.
6. Logging Details – type and interval.
7. Abandonment details – intervals, amount and type of cement, top of plug and time felt.
8. Rig release – date and time.

Section 5.2 – Worker Injury

Every work related accident or injury shall be reported immediately to the Wellsite Supervisor. The Supervisor shall immediately contact the Ministry of Labour @ 1-800-265-5140 and the Ministry of Natural Resources @ 519-873-4634. The verbal report shall be followed with a written report as per the Occupational Health and Safety Act and the Oil, Gas & Salt Resources Act and Section 13 of the Operational Standards. The Supervisor will also be responsible for notifying the Operator (Enbridge Gas Distribution Inc.) and shall be responsible for the completion of Enbridge's Accident Report Form.

SECTION 6.0 - SAFETY AND PROCEDURES

Section 6.1 - General Safety

1. All works at the wellsite shall be in compliance with the Occupational Health and Safety Act and the Oil, Gas & Salt Resources Act and all associated legislation. In addition, all work at the wellsite shall be done in compliance with good oil field practices. All verbal notifications given to and approvals received from government agencies shall be recorded on the tower sheets.
2. The Enbridge 'Job Safety Analysis Form' (JSA) shall be thoroughly reviewed by the Wellsite Supervisor with all onsite personnel through the daily safety meetings and any changes to the JSA will be noted on the Enbridge Safety Meeting / Tool Box Form.
3. Daily safety ('tailgate') meetings are to be conducted with each shift and recorded on the Enbridge Safety Meeting / Tool Box Form. Additional safety meetings are to be held with each crew, at the start of the well and safety meetings shall also be held prior to cementing and upon arrival of the logging company and prior to penetrating the Detroit River formations and the A-2 Carbonate formation.
4. The Wellsite Supervisor shall ensure that the operations are in compliance with all applicable government regulations and shall complete daily walk around rig inspections and record the results on their daily reports.

Section 6.2 – Well Control

All blowout prevention systems are to be in strict compliance with MNR regulations. The function and pressure testing guidelines required by the regulatory bodies (such as daily function testing of the pipe rams) will be strictly adhered to.

1. All pressure tests of blowout prevention equipment will be conducted with fresh water and will be conducted in 2 stages – low and high pressure. It is essential that the low pressure test be done first, to prevent the high pressure test from healing leaks that would have been noted at low pressures.
2. The following pressure tests will be conducted with fresh water prior to drilling out each casing string and the results recorded on the tower sheets and daily reports:

Rotary:

- a. The blind rams, kill lines and choke manifold and casing will be tested individually for 10 minutes each to:
 - i. Intermediate casing 2000 kPa low & 9000 kPa high
 - ii. Production casing 2000 kPa low and 10000 kPa high

- b. Run in hole with BHA, drill pipe and drill collars and pressure test the pipe rams, kelly cock, stand pipe, swivel, safety valves, etc. will be tested individually for 10 minutes each to:
 - i. Surface casing 1400 kPa low and 3500 kPa high (using AP)
 - ii. Intermediate casing 2000kPa low & 9000 kPa high
 - iii. Production casing 2000 kPa low and 10000 kPa high
- c. The annular preventer will be tested for 10 minutes to
 - i. Surface casing 1400 kPa low and 3500 kPa high
 - ii. Intermediate casing 2000 kPa low & 9000 kPa high
 - iii. Production casing 2000 kPa low and 10000 kPa high

Cable Tool:

- a. The blind rams, kill lines and casing will be tested individually for 10 minutes each to:
 - i. Intermediate casing 2000 kPa low & 8000 kPa high
 - ii. Production casing 2000 kPa low and 10000 kPa high
 - b. Function test the pipe rams / shear rams, safety valves, etc. individually for 10 minutes each to:
 - i. Intermediate casing 2000kPa low & 8000 kPa high
 - ii. Production casing 2000 kPa low and 10000 kPa high
 - c. The annular preventer will be tested for 10 minutes to
 - i. Surface casing 1400 kPa low and 3500 kPa high
 - ii. Intermediate casing 2000 kPa low & 8000 kPa high
 - iii. Production casing 2000 kPa low and 10000 kPa high
 - d. The lubricator system will be tested for 10 minutes to
 - i. Production casing 2000 kPa low and 8000 kPa high
 - e. A full lubricator system will be required when:
 - i. gas is encountered with H₂S content greater than 100ppm,
 - ii. when crude oil flows to surface or is capable of unloading during bailing operations, or
 - iii. when flows of natural gas exceed $7.0 \times 10^3 \text{ m}^3/\text{D}$ (250Mcf/d).
2. Upon drilling out the casing, drill 0.5m to 1.0m of new hole and test the formation, with the hole full of fresh water, to a minimum bottom hole pressure of 18 kPa per metre.
3. After one day of drilling below the casing shoe, check the entire blowout prevention system and tighten all bolts.

4. Crews should be kept alert and familiar with the blowout prevention equipment. At least one member of the crew who has been trained in blowout prevention and well control procedures must be on the floor at all times.
5. Conduct blowout prevention drills prior to drilling out casing and once per week thereafter. Ensure that the drills are recorded in the tour book.
6. The blowout preventers are to be function tested once per tour. Ensure that the function test is recorded on the tower sheets.



Oil, Gas and Salt Resources Act
Application for a Well Licence

Filed: 2012-02-15
EB-2012-0060
Attachment 2
Page 1 of 25

Form 1 To the Minister of Natural Resources v.2010-07-01
The undersigned operator applies for a well licence under the Oil, Gas and Salt Resources Act and the Regulations thereunder and submits the following information, together with the application fee of \$100 + 13% HST.

1. WELL NAME TKC # 64 Moore 1-20-VI Target Formation A-1 Carbonate

Purpose of Proposed Well (Well Type) Observation Well

2. OPERATOR Enbridge Gas Distribution Inc. Tel # 519-862-1473 Fax # 519-862-1168

Street Address 3595 Tecumseh Road City Mooretown Prov ON Postal Code N0N 1M0

Mailing Address 3595 Tecumseh Road City Mooretown Prov ON Postal Code N0N 1M0

Contact Name Kathy McConnell Contact Tel # 519-862-6032

3. LOCATION County Lambton Township Moore

Tract 1 Lot 20 Concession VI Lake Erie: Block Tract License/Acquireable

Surface location, 150.90 m North South Latitude 42° 50' 12.525" Bottom-hole Lat. 42° 50' 12.525"

metres from Lot Boundaries 295.2 m East West Longitude 82° 22' 57.714" Bottom-hole Long. 82° 22' 57.714"

Within 1.6 km of Designated Storage Area? Yes No Off-target? Yes No

4. WELL PARTICULARS Vertical Horizontal Directional Deepening Re-entry Lateral

Rig Type: Rotary Cable Well to be cored? Yes No Formation at TD A-1 Evaporite

Ground Elevation 192.60 Proposed Depth 701.0 Proposed Depth TVD 701.0 Proposed Start Date 15.Mar.12

5. LANDOWNER Tel #

Street Address City Prov Postal Code

The landowner hereby provides consent for the collection of their personal information, via the operator, as per Section 12 of this form. Landowner Signature: (Original Signed)

Pooling of the Spacing Unit or unitization of the Unit Area shown on the attached well location plan has been completed (see Ont. Reg. 245/97 definitions for "pooled spacing unit" and "unitize") Yes No

6. DRILLING CONTRACTOR T.W. Marsh Well Drilling and Servicing / Bradco Drilling Inc. Tel # 519-695-6062 / 519-689-4692

Address Box 53 / 14 Hattie St., Box 99 City Bothwell / Merlin Prov ON Postal Code N0P 2C0 / N0P 1W0

7. PROPOSED CASING AND CEMENTING PROGRAM

Hole Size (mm)	Casing O.D. (mm)	Weight (kg/m)	Grade	New, Used or in-hole	Setting Depth TVD	Setting Formation	CASING SETTING INFORMATION		
							How Set	Cement Type	Cement Top KB / RF
340	340	81.10	LS	New	42	Kettle Point	Driven	nil	nil
312	244	48.06	H40	New	57	Kettle Point	Cement	G	surface
222	178	29.76	J55	New	385	F Shale	Cement	G	surface
159	114	15.62	J55	New	660	A-2 Anhydrite	Cement	G	surface

8. BLOW-OUT PREVENTION EQUIPMENT 9" 2M Annular Preventor
7-1/16" 3M Annular Preventor and Double Gate

9. WELL SECURITY Name of Trustee Harrison Pensa LLP Total # Unplugged Wells 162 Current Balance \$70,000

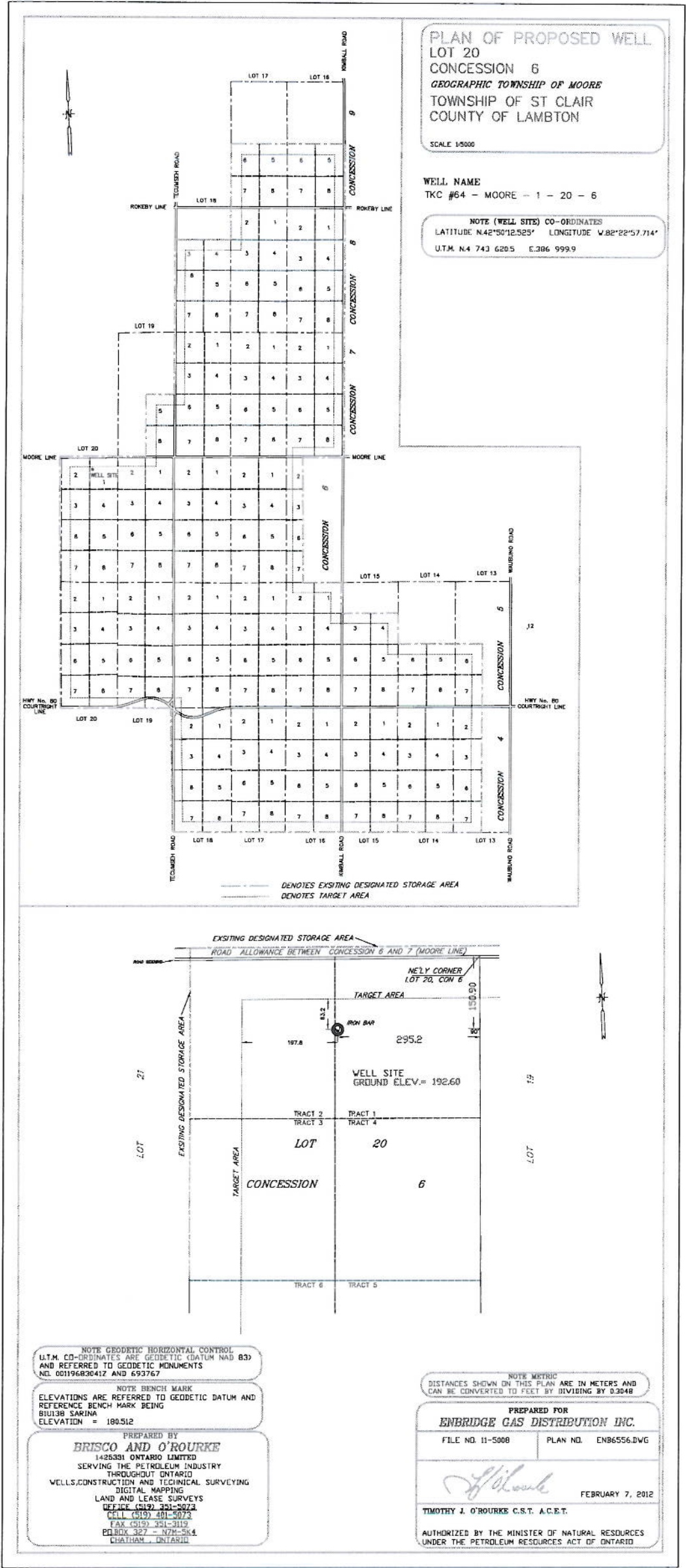
10. REMARKS

11. ENCLOSURES Fee Location Plan (Land wells only) Drilling Program

12. NOTICE OF COLLECTION
The Ministry of Natural Resources is collecting your personal information under the authority of the Oil, Gas and Salt Resources Act. Any personal information provided on this application will be used for licensing and law enforcement purposes only and will be protected in accordance with the Freedom of Information and Protection of Privacy Act.
If you have questions about use of your personal information, please contact the Policy and Program Officer, Petroleum Resources Centre, Ministry of Natural Resources, 659 Exeter Road, London N6E1L3, 519-373-4638.

13. AUTHORITY
The undersigned certifies that the information provided herein is complete and accurate, the operator has the right to drill or operate a well in the above location, and he/she has authority to bind the operator.

Date (d/m/y) 08.Feb.12 Name J.E Sanders Signature (Original Signed)
Date of Birth 04.Apr.62 Company Enbridge Gas Distribution Inc. Title Director, Storage Operations



TKC # 64, Moore 2-20-VI

DRILLING PROGRAM

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SECTION 1.0 - GENERAL DATA

Section 1.1 - Well Summary

Well Name: TKC # 64 Moore 2-20-VI

Operator: Enbridge Gas Distribution Inc.

Surface Location: Tract 2, Lot 20, Con. 6, Moore Twp, Lambton County

Surface Coordinates: 159.90m South; 295.2m West

Ground Elevation: 192.60m

KB Elevation: 193.90m

Total Depth: 701m

Target Formation: A-1 Carbonate

Logging Program: Gamma Ray / Neutron from TD to base of Surface Casing
Porosity / Density Log A-2 Anhydrite to TD
CBL-GR – 114mm casing
Vertilog – 114mm casing

Spud Date: March 15th, 2012

Duration: 45 days

Section 1.2 – Special Notes

1. Safety of personnel and environment is our primary concern. Section 6.1 of this program, outlines Enbridge's general safety requirements which obliges all personnel on the wellsite to follow the Occupational Health and Safety Act and Regulations (Ministry of Labour) and the Oil, Gas & Salt Resources Act and Regulations (Ministry of Natural Resources). Safety and/or environmental ("tailgate") meetings shall be conducted as per Section 6. Wellsite Supervisor shall conduct daily 'walk around' inspections of the equipment on site and record the results on the daily reports. Please refer to Section 5.2 for the procedure to be followed if a worker injury occurs.
2. The Wellsite Supervisor has authority over all activities conducted on the drilling location. The Wellsite Supervisor shall ensure that all applicable regulations and policies (MNR, MOL, MOEE, and Enbridge) are followed and that all permits are kept on site and/or signed off as required.

3. All operations are to be to MNR standards.
4. BOPs are to be installed, maintained and used as per MNR requirements. Testing of the BOPs must be in accordance with Section 6.2 of this program.
5. Tower sheets must be completed daily and will include the information listed in Section 5.1 of this program. The Wellsite Supervisor will complete daily reports and forward the reports to Enbridge's office by 10am the following day.
6. The production casing will be set in the A-2 Anhydrite to allow for an effective cement job and successful pressure testing, prior to penetrating the A-1 Carbonate formation.

Section 1.3 - Contact Numbers

Enbridge Gas Distribution Inc.

Kathy McConnell	Senior Project Geologist	Office: 519-862-6032 Fax: 519-862-1168 Cell: 519-312-2168 kathy.mcconnell@enbridge.com
Paul Druet	Manager, Reservoir Development	Office: 519-862-6016 Fax: 519-862-1168 Cell: 519-383-4012 paul.druet@enbridge.com
Terry Chupa	Land Administrator	Office: 519-862-6008 Fax: 519-862-1168 Cell: 519-384-0215 terry.chupa@enbridge.com
Control Room		Office: 519-862-6012

Drilling Supervisor:

Steve Thompson	Cell: 519-383-5404 omniconsulting@rogers.com
Wayne Bolton	Cell: 519-312-8437 kegconsulting@aim.com

Geologist:

Neil Hoey

Office: 519-472-4776
Fax: 519-472-4776
Cell: 519-649-6918
neil_hoey@hotmail.com

Cable Tool Rig - Terry Marsh Well Drilling & Servicing

Terry Marsh

Owner / Operator

Office: 519-695-6060
Fax: 519-695-6464
Cell: 519-359-9804
twmarshca@yahoo.com

Rotary Rig – Bradco Drilling Inc.

Brad Stevenson

Owner / Operator

Office: 519-689-4692
Fax: 519-689-7516
Cell: 519-358-3742
bradco@ciaccess.com

Cementing

Ian Veen

Black Creek Well Service
President

Office: 519-882-4732
519-834-2941
Fax: 519-834-2466
Cell: 519-686-4645

Jay Rookes

Schlumberger Canada
Engineer-In-Charge

Office: 519-652-5053
Fax: 519-652-6002
rookes1@slb.com

Casing & Wellheads – Wellmaster Pipe & Supply Inc.

Andy Arnoczki

Sales Representative

Office: 519-688-0500
Fax: 519-688-0563
Cell: 519-537-0559
aarnoczki@wellmaster.ca

Bill Hedges

Inside Sales

Office: 519-688-0500
Fax: 519-688-0563
bhedges@wellmaster.ca

Graham Shone

Operations Manager

Office: 519-336-9797
Fax: 519-336-9733
Cell: 519-331-2534
gshone@cefranklin.com

Larry Rushton	Owner	Office: 519-326-8884 Fax: 519-326-8882 rushtonsupply@sympatico.ca
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Wireline Services

Gord MacKenzie	Baker Atlas Base Manager	Office: 519-332-8030 Fax: 519-332-4714 Cell: 519-339-6783 gord.mackenzie@bakerhughes.com
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Dave Tipping	Weatherford Canada – Wireline & Logging Services Station Manager	Office: 519-683-2010 Fax: 519-683-2577 Cell: 519-436-3541 dave.tipping@canada.weatherford.com
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Snubbing Services

Derrick Jacobson	President Quattro Energy Services Inc.	Office: 877-829-7242 Fax: 403-720-6319 Cell: 403-828-7242 derrick@quattroenergy.ca
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Jeff Redmond	Team Snubbing Services Inc.	Office: 403-314-4220 Fax: 403-844-2148 Cell: 403-896-8363 jredmond@teamsnubbing.com
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Water Hauling

Melvin McKeegan	President McKeegan Trucking Limited	Office: 519-864-1037 Fax: 519-864-1036 Cell: 519-490-4028
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Denis Marcus	President Harold Marcus Limited	Office: 519-695-3735 Fax: 519-695-2249 Cell: 519-380-5238 dmarcus@haroldmarcus.com
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Aaron Verstraete	President Oil Patch Services	Office: 519-676-6747 Fax: 519-676-7932 Cell: 519-380-5473 ops.aaron@bellnet.ca
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Rental Equipment

Derrick Holland	Wheatley Wireline Services Ltd.	Office: 519-825-3680 Fax: 519-825-9348 Cell: 519-322-8439 dholland891@hotmail.com
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Wade Glass	Wheatley Wireline Services Ltd.	Office: 519-825-3680 Fax: 519-825-9348 Cell: 519-322-9275
Orval Beam	Orval L. Beam Limited Operations Manager Tank Rentals	Office: 519-436-0164 Fax: 519-436-0164 Cell: 519-436-4801
Jim Seward	JW Seward Enterprises Ltd Crane Trucks, Steel Plates	Office: 519-867-5526 Fax: 519-867-5312 Cell: 519-332-7689

Welders – St. Clair Mechanical

John Dawson	President	Office: 519-864-0927 Fax: 519-864-0801 Cell: 519-330-9672
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Government & Other Agencies

MNR	Petroleum Resources Centre	Office: 519-873-4634 Fax: 519-873-4645 ogsr.mnr.gov.on.ca
MOEE	Spill Reporting	1-800-268-6060
MOL	Health & Safety	1-800-265-1676
	Health & Safety Inspector	Office: 519-646-3238 Fax: 519-672-0268
Richard Ostrowski	Oil, Gas & Salt Resources Library	Office: 519-686-2772 Fax: 519-686-7225 richard@ogsrlibrary.com
Police, Fire & Ambulance		911

SECTION 2.0 - GEOLOGICAL PROGNOSIS

County: Lambton Township: Moore
Concession: VI Lot: 20 Tract: 2

Elevation: 192.9m Estimated

Formation	Top	Elevation	Thickness	Gas	Oil	Water
K.B.	0.0	194.4	1.5			
Drift	1.5	192.9	40.5			
Kettle Point	42.0	152.4	29.3			
Hamilton	71.3	123.1	77.7			
Dundee	149.0	45.4	34.2			
Lucas	183.2	11.2	151.8			Sulphur@188m
Amherstburg	0.0	0.0	0.0			
Bois Blanc	0.0	0.0	0.0			
Bass Islands	333.8	-140.6	41.1			
G-Shale	374.9	-181.7	5.2			
F-Shale	380.1	-186.9	48.1			
F-Salt	428.2	-235.0	13.8			
E-Carbonate	442.0	-248.8	27.7			
D-Salt	469.7	-276.5	6.4			
C-Shale	476.1	-282.9	42.1			
B-Salt	518.2	-324.9	68.0			
A-2 Carbonate	586.1	-392.9	47.0			
A-2 Salt	633.1	-439.9	25.6			
A-2 Anhydrite	658.7	-465.4	2.1			
A-1 Carbonate	660.8	-467.6	39.0	661; 665; 667	670	
A-1 Evaporite	699.8	-506.6	4.0			
TD	700.8	-507.6	0.0			

***Note: Prognosis with TVD tops.
***Note: used Kimball No.21 to build prog

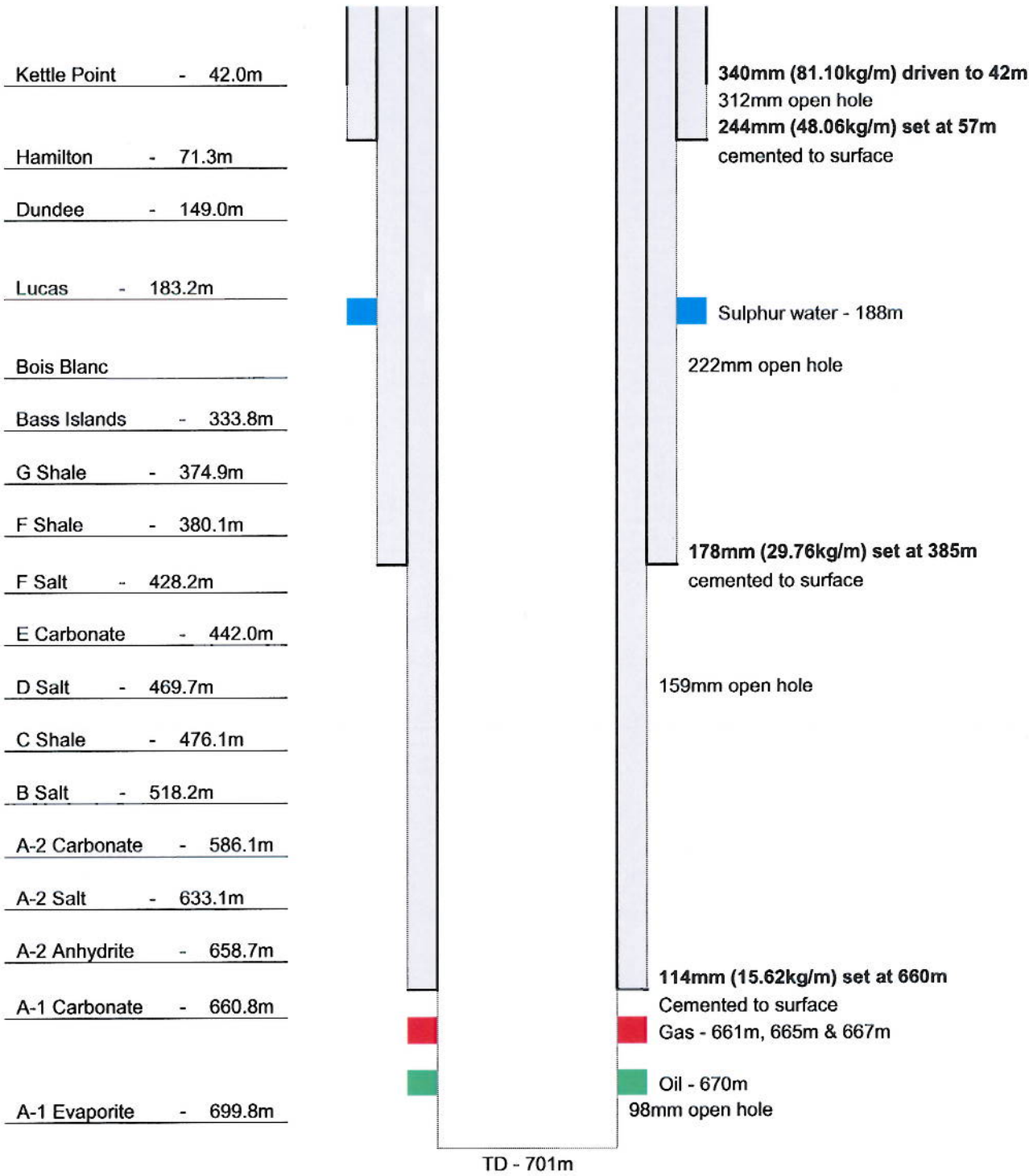
SECTION 3.0 - CASING AND CEMENTING SUMMARY

Section 3.1 - Summary

Hole Size (mm)	Casing Size (mm)	Casing Grade	Casing Weight (kg/m)	Setting Depth (mKB)	How Set
340	340	LS	81.10	42	Driven – cement squeeze if necessary
312	244	H40	48.06	57	Cemented to surface with 100% excess Class G 0-1-0 cement + 2 – 3% CaCl ₂
222	178	J55	29.76	385	Cemented to surface with Class ‘G’ 0-1-8% plus 1 to 3% CaCl ₂ , followed by Class ‘G’ neat cement plus 1 to 3% CaCl ₂ . Cement volumes will be calculated with a 50% excess- gel cement and 30% excess – neat cement. Depending upon hole conditions, consideration may be given to running thixotropic cement plus additional loss circulation materials, across porous zone(s).
159	114	J55	15.62	660	Cemented to surface with Class ‘G’ 0-1-0% plus 1 to 2% CaCl ₂ plus 10% NaCl. Cement volumes will be calculated with a 50% excess on the open hole section and 30% excess on the cased hole section.

Main Hole: 98mm open hole will be drilled from 660m to 701m

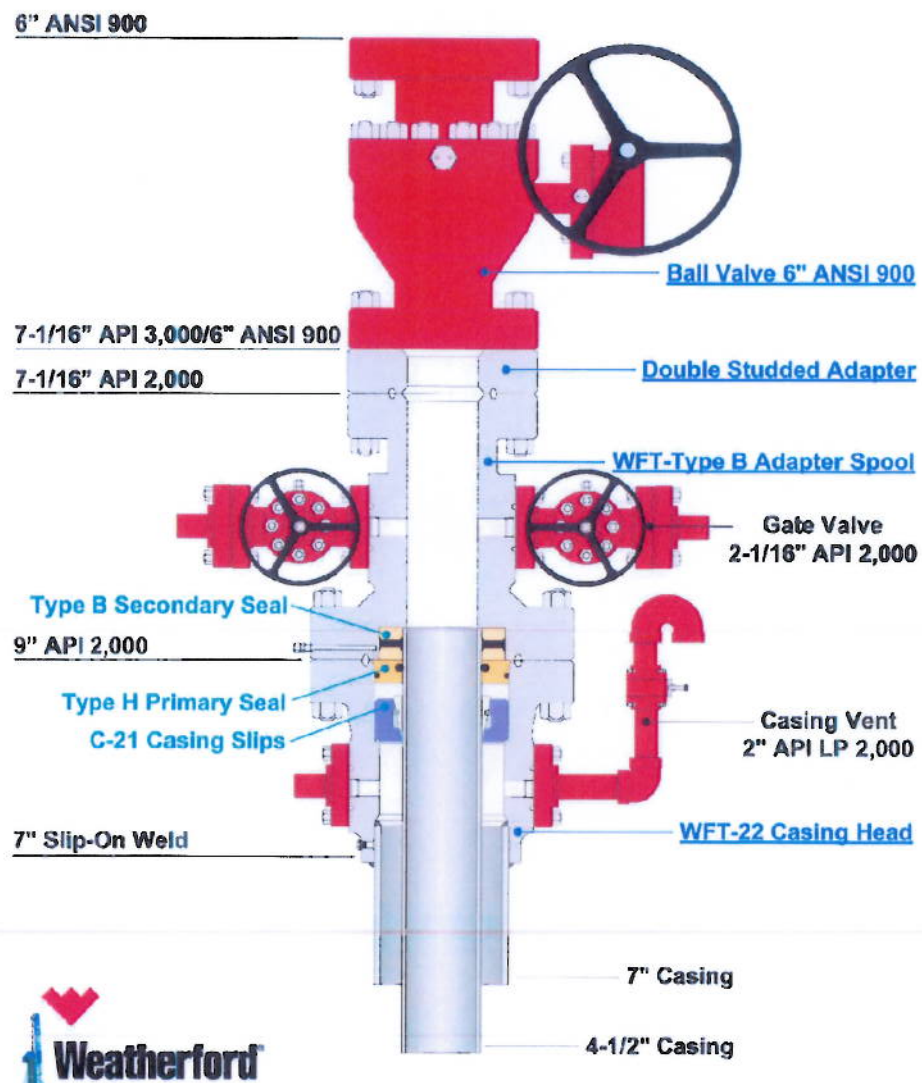
Section 3.2 - Wellbore Diagram



Section 3.3 - Wellhead Summary

Weatherford 13.8 MPa Wellhead:

244mm x 279mm slip on weld on casing bowl for BOP installation
 178mm x 229mm slip on weld on casing bowl
 229mm x 179mm spool c/w 2 gate valves on side outlets
 179mm 13.MPa x 179mm x 20.7 MPa double studded adapter
 152mm ANSI 900 Cameron Grove full port ball valve



SECTION 4.0 - DRILLING PROCEDURES

Section 4.1 - Pre Spud

1. Fresh Water Well Samples

Obtain samples from all fresh water wells located within a 750 metre radius of the proposed well. Have routine water analysis done on all water samples by an independent laboratory in Sarnia. Ensure that copies of these reports are placed in the well files in Enbridge's office

2. Site Preparation

Prepare drilling location as follows:

- a. Locate all drainage tiles crossing lease area
- b. Strip and properly stock pile all soil from the lease
- c. Cut, block and divert drainage tiles as required
- d. Construct adequate berms around lease and access road as required

3. Government Notification of Spud

48 hours prior to spud, notify the Ministry of Natural Resources – Petroleum Resources Section by fax @ (519) 873 – 4645 of the date of commencement of drilling operations

4. Signs

Install rig signs on access road to lease.

5. Safety Meeting

Conduct a pre-spud safety meeting for Rig crews. Tool push and all crewmembers must be present. A similar meeting shall be conducted with the remaining crew(s) as they come on duty. Additional safety meetings shall be conducted as per Section 6.1 of this program.

Section 4.2 - Conductor Casing

1. Drilling Method

Move in and rig up Cable Tool Rig. Measure and record the distance from RF to ground and the RF elevation – include these measurements on the tower sheets and the daily report. Drill and drive 340mm casing to bedrock, to an approximate depth of 42m. Note any occurrence of water and record type of water, depth encountered, and static level of water and/or flow rate. If fresh water is encountered during

drilling, the well must be bail tested for at least 15 minutes, after the casing is landed, to ensure that the fresh water has been shut-off. If the fresh water has not been shut-off, contact Enbridge's office and be prepared to perform a cement squeeze as per Enbridge's requirements.

2. Cement Squeeze (if necessary)

If fresh water is found in the drift and is not shut-off by the conductor casing, a flow rate will be established and a cement squeeze will be performed, using the cement volumes determined by Enbridge. Wait on cement 12 hours and bail the hole dry and monitor the well for at least 15 minutes to determine if the water has been shut-off. If necessary, the process will be repeated until the water is shut-off.

Section 4.3 - Surface Hole & Surface Casing

1. Drilling Method

Drill a 312mm hole 15 metres $\pm$ into the Kettle Point formation, to an approximate depth of 57m. Ensure that drill cutting samples are taken every 3 metres and placed in the sample bags provided by the Ministry of Natural Resources. The sample bags must be labeled with the well name, Township, Lot, Concession and Enbridge's name. Record on daily drilling reports any influx of fluids and/or hydrocarbons, static levels, pressures and any unusual hole conditions.

2. Casing Installation

Depending upon hole conditions encountered, the 244mm casing will be run in the following manner:

- Texas Shoe on bottom of first joint
- Centralizers on the top and bottom of the first joint and coincident with the shoe of the conductor casing
- 244mm casing to surface

3. Cementing Procedures

Move in and rig up Cementers. Ensure pressure recorder is rigged in and serviceable. Pressure charts will be attached to the job ticket. Conduct a pre-job safety meeting to confirm volumes and procedures. Establish circulation using pump truck. The casing and the hole will be circulated with fresh water for 15 minutes to clean the borehole and to fill the casing and hole prior to cementing. Pressure test surface equipment to 14 MPa. Ensure that preflush and mix water are from a clean source and that the water trucks are uncontaminated. Pump preflush of 2.0m³ of fresh water, with the addition of loss circulation material if necessary. Ensure that a minimum of 4 cement samples are taken and represent the cement at the beginning, middle and end of the cement job. Mix and pump sufficient Class 'G' 0-1-0% cement plus 2 to 3% CaCl₂

with a density of 1901 kg/m^3 to cement the casing to surface with 100% excess. Displace cement with fresh water – ensure that cement is under displaced and that the bottom joint of casing is full of cement. Shut-in cementing valve at surface and wait on cement at least 12 hours before slacking off casing.

4. Install 244mm x 279mm slip on weld on casing bowl for BOP installation. Arrange to have surface hole cuttings solidified and then disposed in an approved manner.
5. Release the Cable Tool Rig.

Section 4.4 - Intermediate Hole & Intermediate Casing

1. BOP Installation and Pressure Testing

Move in and rig up Rotary Rig. Measure and record the distance from KB to ground and the KB elevation – include these measurements on the tower sheets and the daily report.

Install Class A (Rotary) BOPs as per MNR requirements. After BOPs are installed and the cement samples indicate that the cement is competent, the rig will proceed to pressure test the BOPs, casing and shoe. Pressure test casing and each component of the BOPs as per Section 6.2. After successfully pressure testing the BOPs and casing, drill out cement and 0.5m of new formation and conduct a PIT, with the hole full of fresh water, using a bottom hole pressure equivalent to 18 kPa/m.

2. Drilling Method

Drill a 222mm hole with fresh water to $5\text{m} \pm$ into the F Shale formation, to an approximate depth of 385m. Notify Geologist 12 hours in advance of reaching intermediate casing point, so that they can be on site to determine the proper casing setting depth. When casing setting depth has been determined, circulated the hole clean. Perform a flow check prior to tripping and strap out of the hole. Fast tripping of the drill string is to be avoided in order to eliminate high annular velocities, pressure surges and swabbing (maximum rate of 27 metres per minute). Keeping the hole full of fluid, trip out of the hole and laydown bottom hole assembly and depending upon rotary rig type, standback or laydown drill collars and drill pipe.

The potential for loss circulation exists while drilling through the Detroit River formations (Lucas and Amherstburg formations). If loss circulation is encountered use the loss circulation contingency program located in Section 4.7. Note all lost circulation intervals and monitor and record fluid loss volumes. If pit fluid must be hauled to disposal, keep solid content to a minimum to reduce costs.

Ensure that drill cutting samples are taken every 3 metres and placed in the sample bags provided by the Ministry of Natural Resources. Record on daily tower sheets

any influx of fluids and static levels (water and/or hydrocarbons), gas and/or any unusual hole conditions.

3. Casing Installation

Ensure that the threads are protected while hoisting casing to the floor. Drift all casing prior to running the casing in the well and apply proper API make-up torque to each connection.

Depending upon hole conditions encountered, the 178mm casing will be run in the following manner:

- Guide shoe
- 178mm joint of casing
- 178mm Float Insert or Float Collar
- Tack weld guide shoe, float collar and bottom 2 joints and use API modified pipe dope on all connections
- Centralizers will be installed one metre above the guide shoe, over the bottom of the first 2 collars and every 5 joints to surface
- 178mm casing to surface

4. Cementing Procedures

Move in and rig up Cementers. Ensure pressure recorder is rigged in and serviceable. Pressure charts will be attached to the job ticket. Conduct a pre-job safety meeting to confirm volumes and procedures. Fill hole and establish circulation using pump truck. The casing and the hole will be circulated with fresh water for 15 minutes to clean the borehole and to fill the casing and hole prior to cementing. Pressure test surface equipment to 14MPa for 10 minutes. Preflush and mix water must be obtained from a clean source and the water trucks must be uncontaminated. Pump preflush of 3.0m³ of fresh water, with the addition of loss circulation material if necessary. Ensure that a minimum of 4 cement samples are taken and represent the cement at the beginning, middle and end of the cement job. Mix and pump sufficient 0-1-8 Class 'G' cement plus 1 to 3% CaCl₂ (50% excess) followed by 0-1-0 Class 'G' cement plus 1 to 3% CaCl₂ (30% excess) to cement casing to surface. Depending upon the severity of the loss circulation zones, thixotropic cement with additional loss circulation materials may be used to cover the loss zone. If there are no cement returns to surface, a feed rate will be established and the annulus will be grouted to surface. Drop wiper plug and displace cement and bump plug to 3.5 Mpa over final pumping pressure – do not exceed 60% of internal yield pressure of casing. Once plug is bumped and it is determined that the float is holding, bleed casing pressure back to final pumping pressure, close casing valves and bleed off surface line pressure and wash out BOPs. Wait on cement 24 hours before slacking off casing. Remove 244mm x 279mm casing bowl and install 178mm x 229mm casing bowl on the 178mm casing.

Section 4.5 - Production Hole & Production Casing

1. Pressure Testing

Check cement samples for hardness – if cement samples are set to the satisfaction of the Wellsite Supervisor, proceed with installation of the BOPS. Install Class B (Rotary) BOPs as per MNR requirements on 178mm casing bowl. After BOPs are installed and the cement samples indicate that the cement is competent, the rig will proceed to pressure test the BOPs, casing and shoe. Pressure test casing and each component of the BOPs as per Section 6.2. After successfully pressure testing the BOPs and casing, drill out cement and 0.5m of new formation and conduct a PIT, with the hole full of fresh water, using a bottom hole pressure equivalent to 18 kPa/m.

2. Drilling Method

Drill a 159mm hole using brine to prevent the dissolution of the salt layers. Ensure that drill cutting samples are taken every 3 metres and placed in the sample bags provided by the Ministry of Natural Resources. Record on daily tower sheets any influx of fluids and static levels (water and/or hydrocarbons), gas and any unusual hole conditions.

Prior to penetrating the A-2 Carbonate, the Wellsite Geologist and Wellsite Supervisor must be on-site and a BOP drill shall be completed to familiarize all on-site personnel with the proper procedures.

Drill a 159mm hole $1 \pm$ metres into the A-2 Anhydrite formation, to an approximate depth of 660m. The final casing point will be determined by the Wellsite Geologist.

If the reef pressure is above 7000kPa, drilling will be suspended and the rig will be moved off location after the 114mm casing is installed and cemented. The rig will be brought back onto location to complete the drilling of the well when the reef pressure is below 7000kPa.

3. Casing Installation

Ensure that the threads are protected while hoisting casing to the floor. Drift all casing prior to running the casing in the well and apply proper API make-up torque to each connection.

Depending upon hole conditions encountered, the 114mm casing will be run in the following manner:

- Guide shoe
- 114mm joint of casing
- Float Insert or Float Collar
- Tack weld guide shoe, float collar and bottom 4 joints and use API modified pipe dope on all connections

- Centralizers will be installed on bottom 5 joints of casing – on every 5th joint to surface
- 114mm casing to surface

4. Cementing Procedures

Move in and rig up Cementers. Ensure pressure recorder is rigged in and serviceable. Pressure charts will be attached to the job ticket. Conduct a pre-job safety meeting to confirm volumes and procedures.

Establish circulation using pump truck. The casing and the hole will be filled with brine and circulated for 15 minutes to clean the borehole and to fill the casing and hole prior to cementing. Pressure test surface equipment to 14 MPa for 10 minutes. Preflush and mix water must be obtained from a clean source and the water trucks must be uncontaminated. Pump preflush of 3.0m³ of clean brine, with the addition of loss circulation material if necessary. Ensure that a minimum of 4 cement samples are taken and represent the cement at the beginning, middle and end of the cement job. Mix and pump sufficient Class 'G' 0-1-0 cement plus 10% NaCl, to cement the 114mm casing to surface plus 50% excess over open hole and 30% excess in cased hole. Drop wiper plug and displace cement with fresh water and bump plug to 3500 kPa over final pumping pressure – do not exceed 60% of internal yield pressure of casing. Once plug is bumped and it is determined that the float is holding, bleed casing pressure back to final pumping pressure, close casing valves and bleed off surface line pressure. Wash out BOPs and split BOP stack at 229mm flange, install 114mm slips and set slips in casing bowl. Wait on cement 24 hours and cut casing and remove BOPs. Cut and bevel 114mm casing and install primary and secondary seals. Install 229mm x 179mm spool piece and and test wellhead seals to 14 Mpa for 10 minutes. Install 179mm 14MPa x 21MPa double studded adapter and ANSI 900 Master Valve and shut-in well. 48 hours after cementing operations have been completed – pressure test casing, wellhead and master valve to 12,410kPa for a minimum of 4 hours – ensure that a digital pressure gauge is installed. Report results to the Enbridge Office - do not proceed with BOP installation until the pressure test has been successfully completed.

If the Master Valve is too high above the drill floor, the BOPs will be installed on the top of the spool piece and when the well is completed, a WR-1 plug will be set in the base of the casing and successfully pressure tested to 8300 kPa. The BOPs will then be removed and the Master Valve installed. Once the Master Valve has been installed and successfully pressure tested, the plug will be retrieved with a Wireline Service company.

Section 4.6 - Main Hole

1. Installation of the BOPs

Check cement samples for hardness – if cement samples are set to the satisfaction of the Wellsite Supervisor, proceed with installation of the BOPS. Install Class B

(Rotary) BOPs as per MNR requirements. After BOPs and lubricator are installed and a minimum of 48 hours 'wait-on-cement-time' has passed and the cement samples indicate that the cement is competent, a cement bond log will be run on the 114mm casing. Consideration may be given to moving out the Rotary Rig and moving in a Cable Tool Rig. The Cable Tool Rig will install Class B (Cable Tool) BOPs.

2. Logging

Move in and rig up Wireline Company. With hole full of fresh water, run a Cement Bond Log, both a non-pressure and pressure pass. Run a Gamma-Ray / Neutron Log from TD to the base of the surface casing. Rig out Wireline Company and release.

3. Drilling Method

Each component of the BOPs and the casing will be pressure tested as per Section 6.2. Upon successful completion of the pressure testing of the BOPs, the cement, shoe and 0.5m of new formation will be drilled out and a PIT will be conducted, with the hole full of fresh water, using a bottom hole pressure equivalent to 18 kPa/m.

Drill a 98mm hole through the A-1 Carbonate and 1 metre into the A-1 Evaporite Formation – final TD will be determined by the Wellsite Geologist. While drilling the main hole ensure that drill cutting samples are taken every 3 metres and placed in the sample bags provided by the Ministry of Natural Resources. Record on daily tower sheets any influx of fluids and static levels (water and/or hydrocarbons), gas and any unusual hole conditions.

Drilling of the well may be suspended if sufficient permeability and porosity are encountered prior to reaching the proposed TD. If drilling is suspended, the rig will be moved off location and a variety of pressure tests will be performed on the well during withdrawal / injection operations. If the testing of the well shows that the porosity and permeability of the well are not suitable, a rig will be moved back onto location and the well will be drilled to the original TD – 1 metre into the A-1 Evaporite.

4. Logging

Move in and rig up Wireline Company to run a Gamma-Ray/Neutron/Density Log over the open hole section of the well and run a Casing Inspection Log over the 114mm casing.

5. BOP Removal

Close master valve and nipple down BOPs and install 152mm (6") blind flange. If the master valve was not used for the drilling of the well – move in and rig up Wireline and Tool Companies and install a WR-1 plug in the base of the 114mm casing. Bleed down and fill the well with fresh water and pressure test the plug to

8300 kPa. Upon successful completion of the pressure test, remove BOPs and install master valve. Install a digital pressure recorder and pressure test casing, wellhead and master valve, with the hole full of fresh water to a surface pressure of 12,410kPa for a minimum of 4 hours. Report results to Enbridge Office. Do not rig down until well passes the pressure test. Move in Wireline Company to retrieve WR-1 plug.

6. Rig down rotary rig and move off of location.
7. Restore wellsite to Enbridge's specifications.

Section 4.7 - Loss Circulation Procedure

1. Before drilling out the casing shoe:
 - a. Identify sources and location of fresh water and/or brine, loss circulation materials and weight materials
 - b. Ensure BOPs and manifold are properly installed
 - c. Ensure auxiliary tanks are connected to the pumping system and a standby mud pump is hooked up for annular injection in case of severe loss circulation (so that fluid can be pumped down both the drill pipe and annulus simultaneously)
 - d. Pressure test BOPs prior to drill out
2. After drilling out shoe:
 - a. Alert water suppliers and haulers
 - b. Ensure adequate amounts of fresh water and/or brine are readily available prior to penetrating the Detroit River formation.
 - c. Mechanically test BOPs and perform BOP drill prior to penetrating the Detroit River formation.
3. Drilling Blind – Detroit River formations:
 - a. In an attempt to maintain or re-establish circulation, pump fluid down both the annulus and the drill pipe simultaneously
 - b. Should severe loss circulation occur while drilling, the thief zone may be plugged with cement and/or loss circulation material at Enbridge's discretion.

SECTION 5.0 - REPORTING PROCEDURES

Section 5.1 - Tower Sheets

Shall be completed daily and shall include:

1. Bit size, jars, depth at the beginning of the shift and end of each shift.
2. Casing size, grade, weight, and number of joints, centralizers, cement baskets, total length and setting depth.
3. Cementing information – Service Company, cement type, amount, slurry density, additives, annular fluid returns, volume of displacement fluid and plug down time.
4. Water, gas or oil – type, depth encountered depth of sample collected and the static level and/or rate of flow.
5. Pressure tests – individually, surface pressures, fluid density used in the tests, bleed-off rate and duration of test.
6. Logging Details – type and interval.
7. Abandonment details – intervals, amount and type of cement, top of plug and time felt.
8. Rig release – date and time.

Section 5.2 – Worker Injury

Every work related accident or injury shall be reported immediately to the Wellsite Supervisor. The Supervisor shall immediately contact the Ministry of Labour @ 1-800-265-5140 and the Ministry of Natural Resources @ 519-873-4634. The verbal report shall be followed with a written report as per the Occupational Health and Safety Act and the Oil, Gas & Salt Resources Act and Section 13 of the Operational Standards. The Supervisor will also be responsible for notifying the Operator (Enbridge Gas Distribution Inc.) and shall be responsible for the completion of Enbridge's Accident Report Form.

SECTION 6.0 - SAFETY AND PROCEDURES

Section 6.1 - General Safety

1. All works at the wellsite shall be in compliance with the Occupational Health and Safety Act and the Oil, Gas & Salt Resources Act and all associated legislation. In addition, all work at the wellsite shall be done in compliance with good oil field practices. All verbal notifications given to and approvals received from government agencies shall be recorded on the tower sheets.
2. The Enbridge 'Job Safety Analysis Form' (JSA) shall be thoroughly reviewed by the Wellsite Supervisor with all onsite personnel through the daily safety meetings and any changes to the JSA will be noted on the Enbridge Safety Meeting / Tool Box Form.
3. Daily safety ('tailgate') meetings are to be conducted with each shift and recorded on the Enbridge Safety Meeting / Tool Box Form. Additional safety meetings are to be held with each crew, at the start of the well and safety meetings shall also be held prior to cementing and upon arrival of the logging company and prior to penetrating the Detroit River formations and the A-2 Carbonate formation.
4. The Wellsite Supervisor shall ensure that the operations are in compliance with all applicable government regulations and shall complete daily walk around rig inspections and record the results on their daily reports.

Section 6.2 – Well Control

All blowout prevention systems are to be in strict compliance with MNR regulations. The function and pressure testing guidelines required by the regulatory bodies (such as daily function testing of the pipe rams) will be strictly adhered to.

1. All pressure tests of blowout prevention equipment will be conducted with fresh water and will be conducted in 2 stages – low and high pressure. It is essential that the low pressure test be done first, to prevent the high pressure test from healing leaks that would have been noted at low pressures.
2. The following pressure tests will be conducted with fresh water prior to drilling out each casing string and the results recorded on the tower sheets and daily reports:

Rotary:

- a. The blind rams, kill lines and choke manifold and casing will be tested individually for 10 minutes each to:
 - i. Intermediate casing 2000 kPa low & 9000 kPa high
 - ii. Production casing 2000 kPa low and 10000 kPa high

- b. Run in hole with BHA, drill pipe and drill collars and pressure test the pipe rams, kelly cock, stand pipe, swivel, safety valves, etc. will be tested individually for 10 minutes each to:
 - i. Surface casing 1400 kPa low and 3500 kPa high (using AP)
 - ii. Intermediate casing 2000kPa low & 9000 kPa high
 - iii. Production casing 2000 kPa low and 10000 kPa high
- c. The annular preventer will be tested for 10 minutes to
 - i. Surface casing 1400 kPa low and 3500 kPa high
 - ii. Intermediate casing 2000 kPa low & 9000 kPa high
 - iii. Production casing 2000 kPa low and 10000 kPa high

Cable Tool:

- a. The blind rams, kill lines and casing will be tested individually for 10 minutes each to:
 - i. Intermediate casing 2000 kPa low & 8000 kPa high
 - ii. Production casing 2000 kPa low and 10000 kPa high
 - b. Function test the pipe rams / shear rams, safety valves, etc. individually for 10 minutes each to:
 - i. Intermediate casing 2000kPa low & 8000 kPa high
 - ii. Production casing 2000 kPa low and 10000 kPa high
 - c. The annular preventer will be tested for 10 minutes to
 - i. Surface casing 1400 kPa low and 3500 kPa high
 - ii. Intermediate casing 2000 kPa low & 8000 kPa high
 - iii. Production casing 2000 kPa low and 10000 kPa high
 - d. The lubricator system will be tested for 10 minutes to
 - i. Production casing 2000 kPa low and 8000 kPa high
 - e. A full lubricator system will be required when:
 - i. gas is encountered with H₂S content greater than 100ppm,
 - ii. when crude oil flows to surface or is capable of unloading during bailing operations, or
 - iii. when flows of natural gas exceed $7.0 \times 10^3 \text{ m}^3/\text{D}$ (250Mcf/d).
2. Upon drilling out the casing, drill 0.5m to 1.0m of new hole and test the formation, with the hole full of fresh water, to a minimum bottom hole pressure of 18 kPa per metre.
3. After one day of drilling below the casing shoe, check the entire blowout prevention system and tighten all bolts.

4. Crews should be kept alert and familiar with the blowout prevention equipment. At least one member of the crew who has been trained in blowout prevention and well control procedures must be on the floor at all times.
5. Conduct blowout prevention drills prior to drilling out casing and once per week thereafter. Ensure that the drills are recorded in the tour book.
6. The blowout preventers are to be function tested once per tour. Ensure that the function test is recorded on the tower sheets.



Oil, Gas and Salt Resources Act
Application for a Well Licence

Filed: 2012-02-15
EB-2012-0060
Attachment 1
Page 1 of 25

Form 1

To the Minister of Natural Resources

v.2010-07-01

The undersigned operator applies for a well licence under the Oil, Gas and Salt Resources Act and the Regulations thereunder and submits the following information, together with the application fee of \$100 + 13% HST.

1. WELL NAME TKC # 63 Moore 6-18-VIII Target Formation A-1 Carbonate

Purpose of Proposed Well (Well Type) Observation Well

2. OPERATOR Enbridge Gas Distribution Inc. Tel # 519-862-1473 Fax # 519-862-1168

Street Address 3595 Tecumseh Road City Mooretown Prov. ON Postal Code N0N 1M0

Mailing Address 3595 Tecumseh Road City Mooretown Prov. ON Postal Code N0N 1M0

Contact Name Kathy McConnell Contact Tel # 519-862-6032

3. LOCATION County Lambton Township Moore

Tract 6 Lot 18 Concession VIII Lake Erie: Block Tract Township

Surface location, 495.0 m North ☒ South ☐ Latitude 42°51'16.722" Bottom-hole Lat. 42°51'16.722"

Lot Boundaries 110.1 m East ☒ West ☐ Longitude 82°22'10.021" Bottom-hole Long. 82°22'10.021"

Within 1.6 km of Designated Storage Area? Yes ☒ No ☐ Off-target? Yes ☐ No ☒

4. WELL PARTICULARS Vertical ☒ Horizontal ☐ Directional ☐ Deepening ☐ Re-entry ☐ Lateral ☐

Rig Type: Rotary ☒ Cable ☒ Well to be cored? Yes ☐ No ☒ Formation at TD A-1 Evaporite

Ground Elevation 194.5 Proposed Depth 740.0 Proposed Depth TVD 740.00 Proposed Start Date 15.Mar.12

5. LANDOWNER Tel #

Street Address City Mooretown Prov. ON Postal Code

The landowner hereby provides consent for the collection of their personal information, via the operator, as per Section 12 of this form. Landowner Signature: (Original Signed)

Pooling of the Spacing Unit or unitization of the Unit Area shown on the attached well location plan has been completed (see Ont. Reg. 245/97 definitions for "pooled spacing unit" and "unitize") Yes ☒ No ☐

6. DRILLING CONTRACTOR T.W. Marsh Well Drilling and Servicing / Bradco Drilling Inc. Tel # 519-695-6060 / 519-689-4692

Address Box 53 / 14 Hattie St., Box 99 City Bothwell / Merlin Prov. ON Postal Code N0P 2C0 / N0P 1W0

7. PROPOSED CASING AND CEMENTING PROGRAM

Hole Size (mm)	Casing O.D. (mm)	Weight (kg/m)	Grade	New, Used or in-hole	Setting Depth TVD	Setting Formation	CASING SETTING INFORMATION		
							How Set	Cement Type	Cement Top KB / RF
340	340	81.1	LS	New	45	Kettle Point	Driven	nil	nil
312	244	48.06	H40	New	60	Kettle Point	Cement	G	surface
222	178	29.76	J55	New	402	F-Shale	Cement	G	surface
159	114	15.62	J55	New	699	A-2 Anhydrite	Cement	G	surface

8. BLOW-OUT PREVENTION EQUIPMENT 9" 2M Annular Preventor

7 - 1/16" 3M Annular Preventor and Double Gate

9. WELL SECURITY Name of Trustee Harrison Pensa LLP Total # Unplugged Wells 162 Current Balance \$70,000

10. REMARKS

11. ENCLOSURES Fee ☒ Location Plan ☒ (Land wells only) Drilling Program ☒

12. NOTICE OF COLLECTION

The Ministry of Natural Resources is collecting your personal information under the authority of the Oil, Gas and Salt Resources Act. Any personal information provided on this application will be used for licensing and law enforcement purposes only and will be protected in accordance with the Freedom of Information and Protection of Privacy Act. If you have questions about use of your personal information, please contact the Policy and Program Officer, Petroleum Resources Centre, Ministry of Natural Resources, 650 Bixler Road, London N6E1L3, 519-871-4638.

13. AUTHORITY

The undersigned certifies that the information provided herein is complete and accurate, the operator has the right to drill or operate a well in the above location, and he/she has authority to bind the operator.

Date (d/m/y) 08.Feb.12 Name J.E. Sanders Signature (Original Signed)
Date of Birth 04.Apr.62 Company Enbridge Gas Distribution Inc. Title Director, Storage Operations



TKC # 63, Moore 6-18-VIII

DRILLING PROGRAM

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SECTION 1.0 - GENERAL DATA

Section 1.1 - Well Summary

Well Name: TKC # 63 Moore 6-18-VIII

Operator: Enbridge Gas Distribution Inc.

Surface Location: Tract 6, Lot 18, Con. 8, Moore Twp, Lambton County

Surface Coordinates: 495.0m North; 110.10m East

Ground Elevation: 194.5m

KB Elevation: 195.8m

Total Depth: 740m

Target Formation: A-1 Carbonate

Logging Program: Gamma Ray / Neutron from TD to base of Surface Casing
Porosity / Density Log A-2 Anhydrite to TD
CBL-GR – 114mm casing
Vertilog – 114mm casing

Spud Date: March 15th, 2012

Duration: 45 days

Section 1.2 – Special Notes

1. Safety of personnel and environment is our primary concern. Section 6.1 of this program, outlines Enbridge's general safety requirements which obliges all personnel on the wellsite to follow the Occupational Health and Safety Act and Regulations (Ministry of Labour) and the Oil, Gas & Salt Resources Act and Regulations (Ministry of Natural Resources). Safety and/or environmental ("tailgate") meetings shall be conducted as per Section 6. Wellsite Supervisor shall conduct daily 'walk around' inspections of the equipment on site and record the results on the daily reports. Please refer to Section 5.2 for the procedure to be followed if a worker injury occurs.
2. The Wellsite Supervisor has authority over all activities conducted on the drilling location. The Wellsite Supervisor shall ensure that all applicable regulations and policies (MNR, MOL, MOEE, and Enbridge) are followed and that all permits are kept on site and/or signed off as required.

3. All operations are to be to MNR standards.
4. BOPs are to be installed, maintained and used as per MNR requirements. Testing of the BOPs must be in accordance with Section 6.2 of this program.
5. Tower sheets must be completed daily and will include the information listed in Section 5.1 of this program. The Wellsite Supervisor will complete daily reports and forward the reports to Enbridge's office by 10am the following day.
6. The production casing will be set in the A-2 Anhydrite to allow for an effective cement job and successful pressure testing, prior to penetrating the A-1 Carbonate formation.

Section 1.3 - Contact Numbers

Enbridge Gas Distribution Inc.

Kathy McConnell	Senior Project Geologist	Office: 519-862-6032 Fax: 519-862-1168 Cell: 519-312-2168 kathy.mcconnell@enbridge.com
Paul Druet	Manager, Reservoir Development	Office: 519-862-6016 Fax: 519-862-1168 Cell: 519-383-4012 paul.druet@enbridge.com
Terry Chupa	Land Administrator	Office: 519-862-6008 Fax: 519-862-1168 Cell: 519-384-0215 terry.chupa@enbridge.com
Control Room		Office: 519-862-6012

Drilling Supervisor:

Steve Thompson	Cell: 519-383-5404 omniconsulting@rogers.com
Wayne Bolton	Cell: 519-312-8437 kegconsulting@aim.com

Geologist:

Neil Hoey

Office: 519-472-4776
Fax: 519-472-4776
Cell: 519-649-6918
neil_hoey@hotmail.com

Cable Tool Rig - Terry Marsh Well Drilling & Servicing

Terry Marsh

Owner / Operator

Office: 519-695-6060
Fax: 519-695-6464
Cell: 519-359-9804
twmarshca@yahoo.com

Rotary Rig – Bradco Drilling Inc.

Brad Stevenson

Owner / Operator

Office: 519-689-4692
Fax: 519-689-7516
Cell: 519-358-3742
bradco@ciaccess.com

Cementing

Ian Veen

Black Creek Well Service
President

Office: 519-882-4732
519-834-2941
Fax: 519-834-2466
Cell: 519-686-4645

Jay Rookes

Schlumberger Canada
Engineer-In-Charge

Office: 519-652-5053
Fax: 519-652-6002
rookesl@slb.com

Casing & Wellheads – Wellmaster Pipe & Supply Inc.

Andy Arnoczki

Sales Representative

Office: 519-688-0500
Fax: 519-688-0563
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Bill Hedges

Inside Sales

Office: 519-688-0500
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Graham Shone

Operations Manager

Office: 519-336-9797
Fax: 519-336-9733
Cell: 519-331-2534
gshone@cefranklin.com

Larry Rushton	Owner	Office: 519-326-8884 Fax: 519-326-8882 rushtonsupply@sympatico.ca
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Wireline Services

Gord MacKenzie	Baker Atlas Base Manager	Office: 519-332-8030 Fax: 519-332-4714 Cell: 519-339-6783 gord.mackenzie@bakerhughes.com
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Dave Tipping	Weatherford Canada – Wireline & Logging Services Station Manager	Office: 519-683-2010 Fax: 519-683-2577 Cell: 519-436-3541 dave.tipping@canada.weatherford.com
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Snubbing Services

Derrick Jacobson	President Quattro Energy Services Inc.	Office: 877-829-7242 Fax: 403-720-6319 Cell: 403-828-7242 derrick@quattroenergy.ca
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Jeff Redmond	Team Snubbing Services Inc.	Office: 403-314-4220 Fax: 403-844-2148 Cell: 403-896-8363 jredmond@teamsnubbing.com
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Water Hauling

Melvin McKeegan	President McKeegan Trucking Limited	Office: 519-864-1037 Fax: 519-864-1036 Cell: 519-490-4028
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Denis Marcus	President Harold Marcus Limited	Office: 519-695-3735 Fax: 519-695-2249 Cell: 519-380-5238 dmarcus@haroldmarcus.com
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Aaron Verstraete	President Oil Patch Services	Office: 519-676-6747 Fax: 519-676-7932 Cell: 519-380-5473 ops.aaron@bellnet.ca
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Rental Equipment

Derrick Holland	Wheatley Wireline Services Ltd.	Office: 519-825-3680 Fax: 519-825-9348 Cell: 519-322-8439 dholland891@hotmail.com
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Wade Glass	Wheatley Wireline Services Ltd.	Office: 519-825-3680 Fax: 519-825-9348 Cell: 519-322-9275
Orval Beam	Orval L. Beam Limited Operations Manager Tank Rentals	Office: 519-436-0164 Fax: 519-436-0164 Cell: 519-436-4801
Jim Seward	JW Seward Enterprises Ltd Crane Trucks, Steel Plates	Office: 519-867-5526 Fax: 519-867-5312 Cell: 519-332-7689

Welders – St. Clair Mechanical

John Dawson	President	Office: 519-864-0927 Fax: 519-864-0801 Cell: 519-330-9672
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Government & Other Agencies

MNR	Petroleum Resources Centre	Office: 519-873-4634 Fax: 519-873-4645 ogsr.mnr.gov.on.ca
MOEE	Spill Reporting	1-800-268-6060
MOL	Health & Safety	1-800-265-1676
	Health & Safety Inspector	Office: 519-646-3238 Fax: 519-672-0268
Richard Ostrowski	Oil, Gas & Salt Resources Library	Office: 519-686-2772 Fax: 519-686-7225 richard@ogsrlibrary.com
Police, Fire & Ambulance		911

SECTION 2.0 - GEOLOGICAL PROGNOSIS

County: Lambton Township: Moore
Concession: VIII Lot: 18 Tract: 6

<i>Elevation: 196.0m</i>		<i>Estimated</i>				
Formation	Top	Elevation	Thickness	Gas	Oil	Water
K.B.	0.0	197.5	1.5			
Drift	1.5	196.0	43.0			Fresh@42.7m
Kettle Point	44.5	153.0	35.6			
Hamilton	80.1	117.4	78.4			
Dundee	158.5	39.0	31.7			
Lucas	190.2	7.3	104.8			Sulphur@196.3m
Amherstburg	0.0	0.0	0.0			
Bois Blanc	294.1	-97.5	49.1			
Bass Islands	343.2	-146.6	48.5			
G-Shale	391.7	-195.1	5.8			
F-Shale	397.5	-200.9	32.3			
F-Salt	429.2	-232.6	45.1			
E-Carbonate	474.3	-277.7	28.3			
D-Salt	502.6	-306.0	7.0			
C-Shale	509.6	-313.0	25.0			
B-Salt	534.6	-338.0	88.1			
A-2 Carbonate	622.7	-426.1	47.9			
A-2 Salt	670.6	-474.0	28.0			
A-2 Anhydrite	698.6	-502.0	1.5			
A-1 Carbonate	700.1	503.5	38.4		700-703	
A-1 Evaporite	738.5	-541.9	4.3			
TD	739.5	-542.9	0.0			

***Note: Prognosis with TVD tops.
***Note: used Imperial No. 603 to build prog

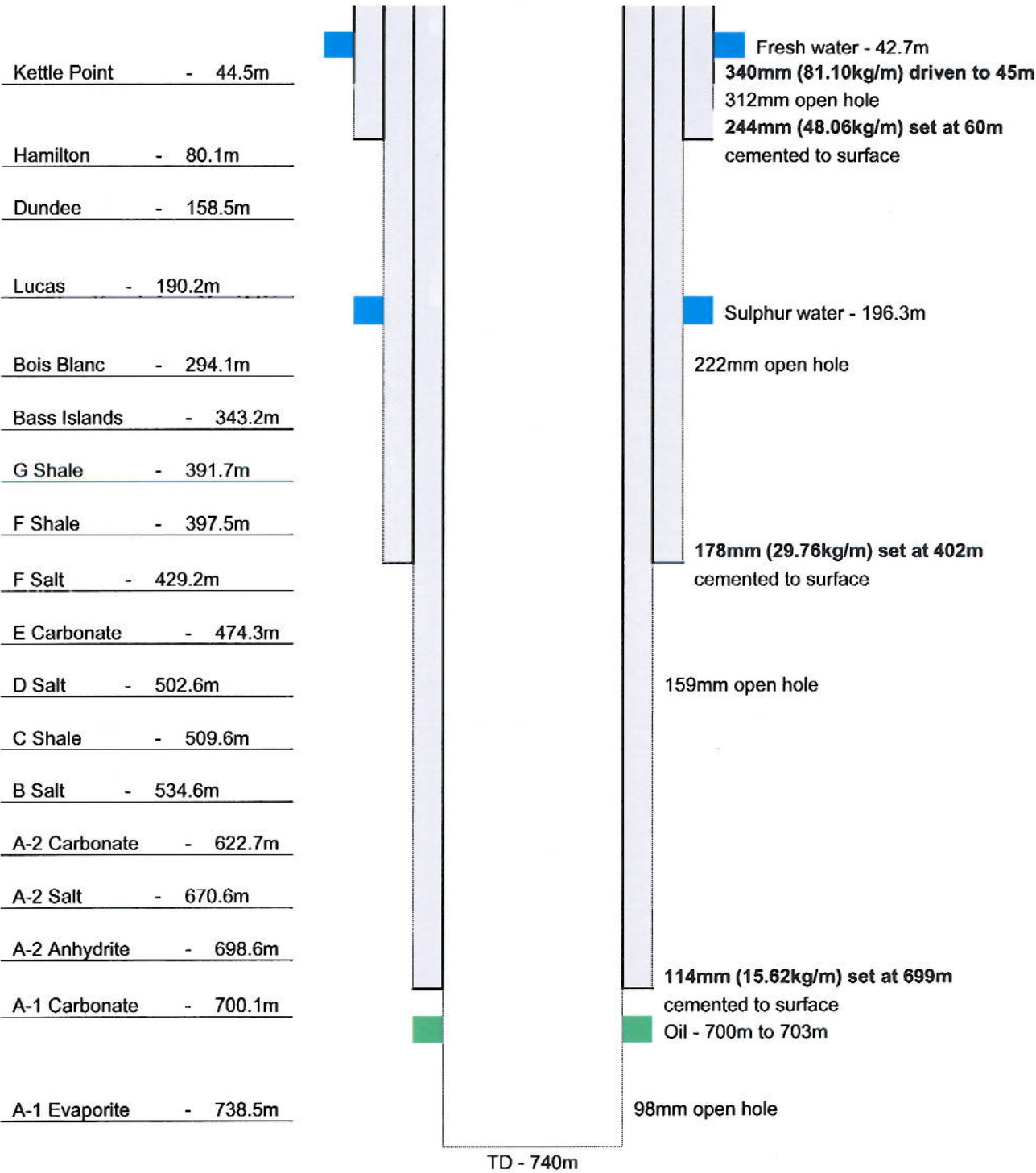
SECTION 3.0 - CASING AND CEMENTING SUMMARY

Section 3.1 - Summary

Hole Size (mm)	Casing Size (mm)	Casing Grade	Casing Weight (kg/m)	Setting Depth (mKB)	How Set
340	340	LS	81.10	45	Driven – cement squeeze if necessary
312	244	H40	48.06	60	Cemented to surface with 100% excess Class G 0-1-0 cement + 2 – 3% CaCl ₂
222	178	J55	29.76	402	Cemented to surface with Class ‘G’ 0-1-8% plus 1 to 3% CaCl ₂ , followed by Class ‘G’ neat cement plus 1 to 3% CaCl ₂ . Cement volumes will be calculated with a 50% excess- gel cement and 30% excess – neat cement. Depending upon hole conditions, consideration may be given to running thixotropic cement plus additional loss circulation materials, across porous zone(s).
159	114	J55	15.62	699	Cemented to surface with Class ‘G’ 0-1-0% plus 1 to 2% CaCl ₂ plus 10% NaCl. Cement volumes will be calculated with a 50% excess on the open hole section and 30% excess on the cased hole section.

Main Hole: 98mm open hole will be drilled from 699m to 740m

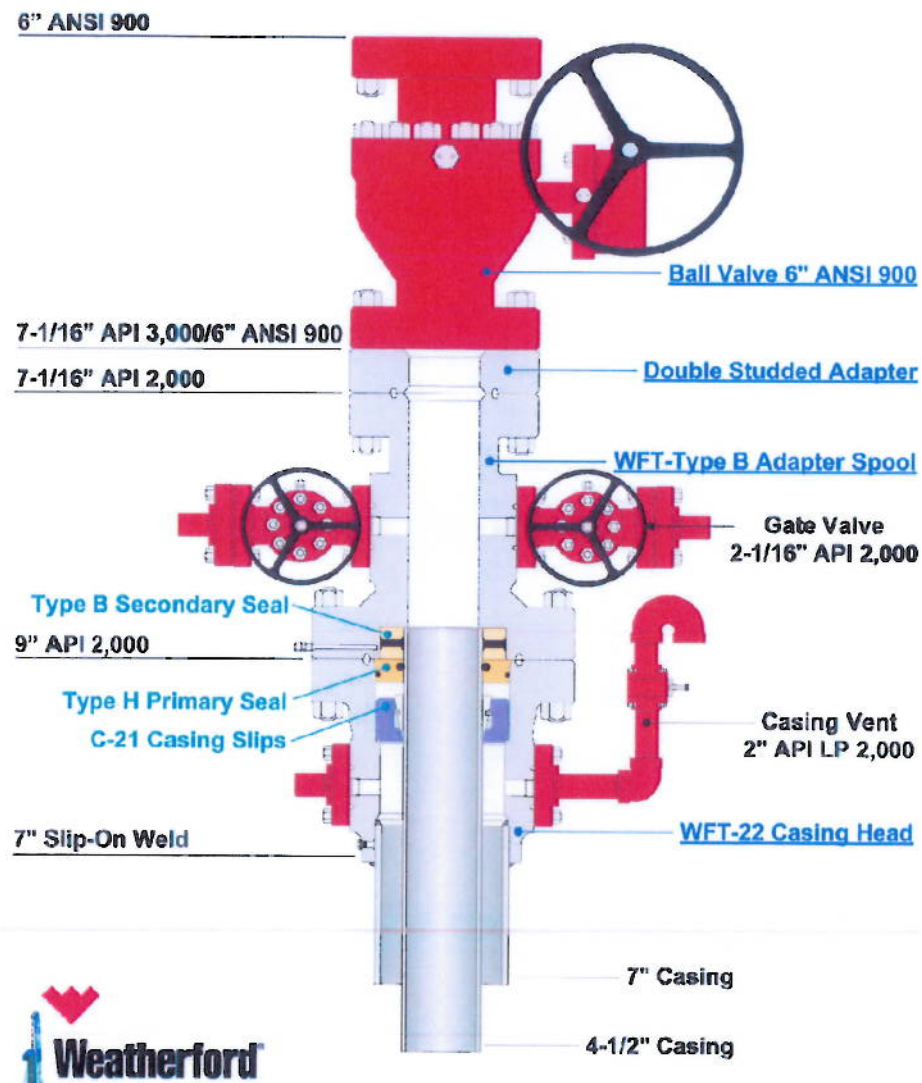
Section 3.2 - Wellbore Diagram



Section 3.3 - Wellhead Summary

Weatherford 13.8 MPa Wellhead:

244mm x 279mm slip on weld on casing bowl for BOP installation
 178mm x 229mm slip on weld on casing bowl
 229mm x 179mm spool c/w 2 gate valves on side outlets
 179mm 13.MPa x 179mm x 20.7 MPa double studded adapter
 152mm ANSI 900 Cameron Grove full port ball valve



SECTION 4.0 - DRILLING PROCEDURES

Section 4.1 - Pre Spud

1. Fresh Water Well Samples

Obtain samples from all fresh water wells located within a 750 metre radius of the proposed well. Have routine water analysis done on all water samples by an independent laboratory in Sarnia. Ensure that copies of these reports are placed in the well files in Enbridge's office

2. Site Preparation

Prepare drilling location as follows:

- a. Locate all drainage tiles crossing lease area
- b. Strip and properly stock pile all soil from the lease
- c. Cut, block and divert drainage tiles as required
- d. Construct adequate berms around lease and access road as required

3. Government Notification of Spud

48 hours prior to spud, notify the Ministry of Natural Resources – Petroleum Resources Section by fax @ (519) 873 – 4645 of the date of commencement of drilling operations

4. Signs

Install rig signs on access road to lease.

5. Safety Meeting

Conduct a pre-spud safety meeting for Rig crews. Tool push and all crewmembers must be present. A similar meeting shall be conducted with the remaining crew(s) as they come on duty. Additional safety meetings shall be conducted as per Section 6.1 of this program.

Section 4.2 - Conductor Casing

1. Drilling Method

Move in and rig up Cable Tool Rig. Measure and record the distance from RF to ground and the RF elevation – include these measurements on the tower sheets and the daily report. Drill and drive 340mm casing to bedrock, to an approximate depth of 45m. Note any occurrence of water and record type of water, depth encountered, and static level of water and/or flow rate. If fresh water is encountered during

drilling, the well must be bail tested for at least 15 minutes, after the casing is landed, to ensure that the fresh water has been shut-off. If the fresh water has not been shut-off, contact Enbridge's office and be prepared to perform a cement squeeze as per Enbridge's requirements.

2. Cement Squeeze (if necessary)

If fresh water is found in the drift and is not shut-off by the conductor casing, a flow rate will be established and a cement squeeze will be performed, using the cement volumes determined by Enbridge. Wait on cement 12 hours and bail the hole dry and monitor the well for at least 15 minutes to determine if the water has been shut-off. If necessary, the process will be repeated until the water is shut-off.

Section 4.3 - Surface Hole & Surface Casing

1. Drilling Method

Drill a 312mm hole 15 metres $\pm$ into the Kettle Point formation, to an approximate depth of 60m. Ensure that drill cutting samples are taken every 3 metres and placed in the sample bags provided by the Ministry of Natural Resources. The sample bags must be labeled with the well name, Township, Lot, Concession and Enbridge's name. Record on daily drilling reports any influx of fluids and/or hydrocarbons, static levels, pressures and any unusual hole conditions.

2. Casing Installation

Depending upon hole conditions encountered, the 244mm casing will be run in the following manner:

- Texas Shoe on bottom of first joint
- Centralizers on the top and bottom of the first joint and coincident with the shoe of the conductor casing
- 244mm casing to surface

3. Cementing Procedures

Move in and rig up Cementers. Ensure pressure recorder is rigged in and serviceable. Pressure charts will be attached to the job ticket. Conduct a pre-job safety meeting to confirm volumes and procedures. Establish circulation using pump truck. The casing and the hole will be circulated with fresh water for 15 minutes to clean the borehole and to fill the casing and hole prior to cementing. Pressure test surface equipment to 14 MPa. Ensure that preflush and mix water are from a clean source and that the water trucks are uncontaminated. Pump preflush of 2.0m³ of fresh water, with the addition of loss circulation material if necessary. Ensure that a minimum of 4 cement samples are taken and represent the cement at the beginning, middle and end of the cement job. Mix and pump sufficient Class 'G' 0-1-0% cement plus 2 to 3% CaCl₂

with a density of 1901 kg/m^3 to cement the casing to surface with 100% excess. Displace cement with fresh water – ensure that cement is under displaced and that the bottom joint of casing is full of cement. Shut-in cementing valve at surface and wait on cement at least 12 hours before slacking off casing.

4. Install 244mm x 279mm slip on weld on casing bowl for BOP installation. Arrange to have surface hole cuttings solidified and then disposed in an approved manner.
5. Release the Cable Tool Rig.

Section 4.4 - Intermediate Hole & Intermediate Casing

1. BOP Installation and Pressure Testing

Move in and rig up Rotary Rig. Measure and record the distance from KB to ground and the KB elevation – include these measurements on the tower sheets and the daily report.

Install Class A (Rotary) BOPs as per MNR requirements. After BOPs are installed and the cement samples indicate that the cement is competent, the rig will proceed to pressure test the BOPs, casing and shoe. Pressure test casing and each component of the BOPs as per Section 6.2. After successfully pressure testing the BOPs and casing, drill out cement and 0.5m of new formation and conduct a PIT, with the hole full of fresh water, using a bottom hole pressure equivalent to 18 kPa/m.

2. Drilling Method

Drill a 222mm hole with fresh water to $5\text{m} \pm$ into the F Shale formation, to an approximate depth of 402m. Notify Geologist 12 hours in advance of reaching intermediate casing point, so that they can be on site to determine the proper casing setting depth. When casing setting depth has been determined, circulated the hole clean. Perform a flow check prior to tripping and strap out of the hole. Fast tripping of the drill string is to be avoided in order to eliminate high annular velocities, pressure surges and swabbing (maximum rate of 27 metres per minute). Keeping the hole full of fluid, trip out of the hole and laydown bottom hole assembly and depending upon rotary rig type, standback or laydown drill collars and drill pipe.

The potential for loss circulation exists while drilling through the Detroit River formations (Lucas and Amherstburg formations). If loss circulation is encountered use the loss circulation contingency program located in Section 4.7. Note all lost circulation intervals and monitor and record fluid loss volumes. If pit fluid must be hauled to disposal, keep solid content to a minimum to reduce costs.

Ensure that drill cutting samples are taken every 3 metres and placed in the sample bags provided by the Ministry of Natural Resources. Record on daily tower sheets

any influx of fluids and static levels (water and/or hydrocarbons), gas and/or any unusual hole conditions.

3. Casing Installation

Ensure that the threads are protected while hoisting casing to the floor. Drift all casing prior to running the casing in the well and apply proper API make-up torque to each connection.

Depending upon hole conditions encountered, the 178mm casing will be run in the following manner:

- Guide shoe
- 178mm joint of casing
- 178mm Float Insert or Float Collar
- Tack weld guide shoe, float collar and bottom 2 joints and use API modified pipe dope on all connections
- Centralizers will be installed one metre above the guide shoe, over the bottom of the first 2 collars and every 5 joints to surface
- 178mm casing to surface

4. Cementing Procedures

Move in and rig up Cementers. Ensure pressure recorder is rigged in and serviceable. Pressure charts will be attached to the job ticket. Conduct a pre-job safety meeting to confirm volumes and procedures. Fill hole and establish circulation using pump truck. The casing and the hole will be circulated with fresh water for 15 minutes to clean the borehole and to fill the casing and hole prior to cementing. Pressure test surface equipment to 14MPa for 10 minutes. Preflush and mix water must be obtained from a clean source and the water trucks must be uncontaminated. Pump preflush of 3.0m³ of fresh water, with the addition of loss circulation material if necessary. Ensure that a minimum of 4 cement samples are taken and represent the cement at the beginning, middle and end of the cement job. Mix and pump sufficient 0-1-8 Class 'G' cement plus 1 to 3% CaCl₂ (50% excess) followed by 0-1-0 Class 'G' cement plus 1 to 3% CaCl₂ (30% excess) to cement casing to surface. Depending upon the severity of the loss circulation zones, thixotropic cement with additional loss circulation materials may be used to cover the loss zone. If there are no cement returns to surface, a feed rate will be established and the annulus will be grouted to surface. Drop wiper plug and displace cement and bump plug to 3.5 Mpa over final pumping pressure – do not exceed 60% of internal yield pressure of casing. Once plug is bumped and it is determined that the float is holding, bleed casing pressure back to final pumping pressure, close casing valves and bleed off surface line pressure and wash out BOPs. Wait on cement 24 hours before slacking off casing. Remove 244mm x 279mm casing bowl and install 178mm x 229mm casing bowl on the 178mm casing.

Section 4.5 - Production Hole & Production Casing

1. Pressure Testing

Check cement samples for hardness – if cement samples are set to the satisfaction of the Wellsite Supervisor, proceed with installation of the BOPS. Install Class B (Rotary) BOPs as per MNR requirements on 178mm casing bowl. After BOPs are installed and the cement samples indicate that the cement is competent, the rig will proceed to pressure test the BOPs, casing and shoe. Pressure test casing and each component of the BOPs as per Section 6.2. After successfully pressure testing the BOPs and casing, drill out cement and 0.5m of new formation and conduct a PIT, with the hole full of fresh water, using a bottom hole pressure equivalent to 18 kPa/m.

2. Drilling Method

Drill a 159mm hole using brine to prevent the dissolution of the salt layers. Ensure that drill cutting samples are taken every 3 metres and placed in the sample bags provided by the Ministry of Natural Resources. Record on daily tower sheets any influx of fluids and static levels (water and/or hydrocarbons), gas and any unusual hole conditions.

Prior to penetrating the A-2 Carbonate, the Wellsite Geologist and Wellsite Supervisor must be on-site and a BOP drill shall be completed to familiarize all on-site personnel with the proper procedures.

Drill a 159mm hole $1 \pm$ metres into the A-2 Anhydrite formation, to an approximate depth of 699m. The final casing point will be determined by the Wellsite Geologist.

If the reef pressure is above 7000kPa, drilling will be suspended and the rig will be moved off location after the 114mm casing is installed and cemented. The rig will be brought back onto location to complete the drilling of the well when the reef pressure is below 7000kPa.

3. Casing Installation

Ensure that the threads are protected while hoisting casing to the floor. Drift all casing prior to running the casing in the well and apply proper API make-up torque to each connection.

Depending upon hole conditions encountered, the 114mm casing will be run in the following manner:

- Guide shoe
- 114mm joint of casing
- Float Insert or Float Collar
- Tack weld guide shoe, float collar and bottom 4 joints and use API modified pipe dope on all connections

- Centralizers will be installed on bottom 5 joints of casing – on every 5th joint to surface
- 114mm casing to surface

4. Cementing Procedures

Move in and rig up Cementers. Ensure pressure recorder is rigged in and serviceable. Pressure charts will be attached to the job ticket. Conduct a pre-job safety meeting to confirm volumes and procedures.

Establish circulation using pump truck. The casing and the hole will be filled with brine and circulated for 15 minutes to clean the borehole and to fill the casing and hole prior to cementing. Pressure test surface equipment to 14 MPa for 10 minutes. Preflush and mix water must be obtained from a clean source and the water trucks must be uncontaminated. Pump preflush of 3.0m³ of clean brine, with the addition of loss circulation material if necessary. Ensure that a minimum of 4 cement samples are taken and represent the cement at the beginning, middle and end of the cement job. Mix and pump sufficient Class 'G' 0-1-0 cement plus 10% NaCl, to cement the 114mm casing to surface plus 50% excess over open hole and 30% excess in cased hole. Drop wiper plug and displace cement with fresh water and bump plug to 3500 kPa over final pumping pressure – do not exceed 60% of internal yield pressure of casing. Once plug is bumped and it is determined that the float is holding, bleed casing pressure back to final pumping pressure, close casing valves and bleed off surface line pressure. Wash out BOPs and split BOP stack at 229mm flange, install 114mm slips and set slips in casing bowl. Wait on cement 24 hours and cut casing and remove BOPs. Cut and bevel 114mm casing and install primary and secondary seals. Install 229mm x 179mm spool piece and test wellhead seals to 14 Mpa for 10 minutes. Install 179mm 14MPa x 21MPa double studded adapter and ANSI 900 Master Valve and shut-in well. 48 hours after cementing operations have been completed – pressure test casing, wellhead and master valve to 12,410kPa for a minimum of 4 hours – ensure that a digital pressure gauge is installed. Report results to the Enbridge Office - do not proceed with BOP installation until the pressure test has been successfully completed.

If the Master Valve is too high above the drill floor, the BOPs will be installed on the top of the spool piece and when the well is completed, a WR-1 plug will be set in the base of the casing and successfully pressure tested to 8300 kPa. The BOPs will then be removed and the Master Valve installed. Once the Master Valve has been installed and successfully pressure tested, the plug will be retrieved with a Wireline Service company.

Section 4.6 - Main Hole

1. Installation of the BOPs

Check cement samples for hardness – if cement samples are set to the satisfaction of the Wellsite Supervisor, proceed with installation of the BOPS. Install Class B

(Rotary) BOPs as per MNR requirements. After BOPs and lubricator are installed and a minimum of 48 hours 'wait-on-cement-time' has passed and the cement samples indicate that the cement is competent, a cement bond log will be run on the 114mm casing. Consideration may be given to moving out the Rotary Rig and moving in a Cable Tool Rig. The Cable Tool Rig will install Class B (Cable Tool) BOPs.

2. Logging

Move in and rig up Wireline Company. With hole full of fresh water, run a Cement Bond Log, both a non-pressure and pressure pass. Run a Gamma-Ray / Neutron Log from TD to the base of the surface casing. Rig out Wireline Company and release.

3. Drilling Method

Each component of the BOPs and the casing will be pressure tested as per Section 6.2. Upon successful completion of the pressure testing of the BOPs, the cement, shoe and 0.5m of new formation will be drilled out and a PIT will be conducted, with the hole full of fresh water, using a bottom hole pressure equivalent to 18 kPa/m.

Drill a 98mm hole through the A-1 Carbonate and 1 metre into the A-1 Evaporite Formation – final TD will be determined by the Wellsite Geologist. While drilling the main hole ensure that drill cutting samples are taken every 3 metres and placed in the sample bags provided by the Ministry of Natural Resources. Record on daily tower sheets any influx of fluids and static levels (water and/or hydrocarbons), gas and any unusual hole conditions.

Drilling of the well may be suspended if sufficient permeability and porosity are encountered prior to reaching the proposed TD. If drilling is suspended, the rig will be moved off location and a variety of pressure tests will be performed on the well during withdrawal / injection operations. If the testing of the well shows that the porosity and permeability of the well are not suitable, a rig will be moved back onto location and the well will be drilled to the original TD – 1 metre into the A-1 Evaporite.

4. Logging

Move in and rig up Wireline Company to run a Gamma-Ray/Neutron/Density Log over the open hole section of the well and run a Casing Inspection Log over the 114mm casing.

5. BOP Removal

Close master valve and nipple down BOPs and install 152mm (6") blind flange. If the master valve was not used for the drilling of the well – move in and rig up Wireline and Tool Companies and install a WR-1 plug in the base of the 114mm casing. Bleed down and fill the well with fresh water and pressure test the plug to

8300 kPa. Upon successful completion of the pressure test, remove BOPs and install master valve. Install a digital pressure recorder and pressure test casing, wellhead and master valve, with the hole full of fresh water to a surface pressure of 12,410kPa for a minimum of 4 hours. Report results to Enbridge Office. Do not rig down until well passes the pressure test. Move in Wireline Company to retrieve WR-1 plug.

6. Rig down rotary rig and move off of location.
7. Restore wellsite to Enbridge's specifications.

Section 4.7 - Loss Circulation Procedure

1. Before drilling out the casing shoe:
 - a. Identify sources and location of fresh water and/or brine, loss circulation materials and weight materials
 - b. Ensure BOPs and manifold are properly installed
 - c. Ensure auxiliary tanks are connected to the pumping system and a standby mud pump is hooked up for annular injection in case of severe loss circulation (so that fluid can be pumped down both the drill pipe and annulus simultaneously)
 - d. Pressure test BOPs prior to drill out
2. After drilling out shoe:
 - a. Alert water suppliers and haulers
 - b. Ensure adequate amounts of fresh water and/or brine are readily available prior to penetrating the Detroit River formation.
 - c. Mechanically test BOPs and perform BOP drill prior to penetrating the Detroit River formation.
3. Drilling Blind – Detroit River formations:
 - a. In an attempt to maintain or re-establish circulation, pump fluid down both the annulus and the drill pipe simultaneously
 - b. Should severe loss circulation occur while drilling, the thief zone may be plugged with cement and/or loss circulation material at Enbridge's discretion.

SECTION 5.0 - REPORTING PROCEDURES

Section 5.1 - Tower Sheets

Shall be completed daily and shall include:

1. Bit size, jars, depth at the beginning of the shift and end of each shift.
2. Casing size, grade, weight, and number of joints, centralizers, cement baskets, total length and setting depth.
3. Cementing information – Service Company, cement type, amount, slurry density, additives, annular fluid returns, volume of displacement fluid and plug down time.
4. Water, gas or oil – type, depth encountered depth of sample collected and the static level and/or rate of flow.
5. Pressure tests – individually, surface pressures, fluid density used in the tests, bleed-off rate and duration of test.
6. Logging Details – type and interval.
7. Abandonment details – intervals, amount and type of cement, top of plug and time felt.
8. Rig release – date and time.

Section 5.2 – Worker Injury

Every work related accident or injury shall be reported immediately to the Wellsite Supervisor. The Supervisor shall immediately contact the Ministry of Labour @ 1-800-265-5140 and the Ministry of Natural Resources @ 519-873-4634. The verbal report shall be followed with a written report as per the Occupational Health and Safety Act and the Oil, Gas & Salt Resources Act and Section 13 of the Operational Standards. The Supervisor will also be responsible for notifying the Operator (Enbridge Gas Distribution Inc.) and shall be responsible for the completion of Enbridge's Accident Report Form.

SECTION 6.0 - SAFETY AND PROCEDURES

Section 6.1 - General Safety

1. All works at the wellsite shall be in compliance with the Occupational Health and Safety Act and the Oil, Gas & Salt Resources Act and all associated legislation. In addition, all work at the wellsite shall be done in compliance with good oil field practices. All verbal notifications given to and approvals received from government agencies shall be recorded on the tower sheets.
2. The Enbridge 'Job Safety Analysis Form' (JSA) shall be thoroughly reviewed by the Wellsite Supervisor with all onsite personnel through the daily safety meetings and any changes to the JSA will be noted on the Enbridge Safety Meeting / Tool Box Form.
3. Daily safety ('tailgate') meetings are to be conducted with each shift and recorded on the Enbridge Safety Meeting / Tool Box Form. Additional safety meetings are to be held with each crew, at the start of the well and safety meetings shall also be held prior to cementing and upon arrival of the logging company and prior to penetrating the Detroit River formations and the A-2 Carbonate formation.
4. The Wellsite Supervisor shall ensure that the operations are in compliance with all applicable government regulations and shall complete daily walk around rig inspections and record the results on their daily reports.

Section 6.2 – Well Control

All blowout prevention systems are to be in strict compliance with MNR regulations. The function and pressure testing guidelines required by the regulatory bodies (such as daily function testing of the pipe rams) will be strictly adhered to.

1. All pressure tests of blowout prevention equipment will be conducted with fresh water and will be conducted in 2 stages – low and high pressure. It is essential that the low pressure test be done first, to prevent the high pressure test from healing leaks that would have been noted at low pressures.
2. The following pressure tests will be conducted with fresh water prior to drilling out each casing string and the results recorded on the tower sheets and daily reports:

Rotary:

- a. The blind rams, kill lines and choke manifold and casing will be tested individually for 10 minutes each to:
 - i. Intermediate casing 2000 kPa low & 9000 kPa high
 - ii. Production casing 2000 kPa low and 10000 kPa high

- b. Run in hole with BHA, drill pipe and drill collars and pressure test the pipe rams, kelly cock, stand pipe, swivel, safety valves, etc. will be tested individually for 10 minutes each to:
 - i. Surface casing 1400 kPa low and 3500 kPa high (using AP)
 - ii. Intermediate casing 2000kPa low & 9000 kPa high
 - iii. Production casing 2000 kPa low and 10000 kPa high
- c. The annular preventer will be tested for 10 minutes to
 - i. Surface casing 1400 kPa low and 3500 kPa high
 - ii. Intermediate casing 2000 kPa low & 9000 kPa high
 - iii. Production casing 2000 kPa low and 10000 kPa high

Cable Tool:

- a. The blind rams, kill lines and casing will be tested individually for 10 minutes each to:
 - i. Intermediate casing 2000 kPa low & 8000 kPa high
 - ii. Production casing 2000 kPa low and 10000 kPa high
 - b. Function test the pipe rams / shear rams, safety valves, etc. individually for 10 minutes each to:
 - i. Intermediate casing 2000kPa low & 8000 kPa high
 - ii. Production casing 2000 kPa low and 10000 kPa high
 - c. The annular preventer will be tested for 10 minutes to
 - i. Surface casing 1400 kPa low and 3500 kPa high
 - ii. Intermediate casing 2000 kPa low & 8000 kPa high
 - iii. Production casing 2000 kPa low and 10000 kPa high
 - d. The lubricator system will be tested for 10 minutes to
 - i. Production casing 2000 kPa low and 8000 kPa high
 - e. A full lubricator system will be required when:
 - i. gas is encountered with H₂S content greater than 100ppm,
 - ii. when crude oil flows to surface or is capable of unloading during bailing operations, or
 - iii. when flows of natural gas exceed $7.0 \times 10^3 \text{ m}^3/\text{D}$ (250Mcf/d).
2. Upon drilling out the casing, drill 0.5m to 1.0m of new hole and test the formation, with the hole full of fresh water, to a minimum bottom hole pressure of 18 kPa per metre.
3. After one day of drilling below the casing shoe, check the entire blowout prevention system and tighten all bolts.

4. Crews should be kept alert and familiar with the blowout prevention equipment. At least one member of the crew who has been trained in blowout prevention and well control procedures must be on the floor at all times.
5. Conduct blowout prevention drills prior to drilling out casing and once per week thereafter. Ensure that the drills are recorded in the tour book.
6. The blowout preventers are to be function tested once per tour. Ensure that the function test is recorded on the tower sheets.



Application for a Well Licence

Form 1

To the Minister of Natural Resources

v.2010-07-01

The undersigned operator applies for a well licence under the Oil, Gas and Salt Resources Act and the Regulations thereunder and submits the following information, together with the application fee of \$100 + 13% HST.

1. WELL NAME TKC # 66 Moore 1-16-VIII Target Formation A-1 Carbonate

Purpose of Proposed Well (Well Type) Observation Well

2. OPERATOR Enbridge Gas Distribution Inc. Tel # 519-862-1473 Fax # 519-862-1168

Street Address 3595 Tecumseh Road City Mooretown Prov. ON Postal Code N0N 1M0

Mailing Address 3595 Tecumseh Road City Mooretown Prov. ON Postal Code N0N 1M0

Contact Name Kathy McConnell Contact Tel # 519-862-6032

3. LOCATION County Lambton Township Moore

Tract 1 Lot 16 Concession VIII Lake Erie: Block Tract Unincorporated

Surface location, 117 m North ☐ South ☒ Latitude 42°51'39.012" Bottom-hole Lat. 42°51'39.012"

metres from Lot Boundaries 119.5 m East ☐ West ☒ Longitude 82°20'59.680" Bottom-hole Long. 82°20'59.680"

Within 1.6 km of Designated Storage Area? Yes ☒ No ☐ Off-target? Yes ☐ No ☒

4. WELL PARTICULARS Vertical ☒ Horizontal ☐ Directional ☐ Deepening ☐ Re-entry ☐ Lateral ☐

Rig Type Rotary ☒ Cable ☒ Well to be cored? Yes ☐ No ☒ Formation at TD A-1 Evaporite

Ground Elevation 195.5 Proposed Depth 727.0 Proposed Depth TVD 727.00 Proposed Start Date 15.Mar.12

5. LANDOWNER [REDACTED] Tel # [REDACTED]

Street Address [REDACTED] City [REDACTED] Prov. [REDACTED] Postal Code [REDACTED]

The landowner hereby provides consent for the collection of their personal information, via the operator, as per Section 12 of this form. Landowner Signature: [REDACTED] (Original Signed)

Pooling of the Spacing Unit or unitization of the Unit Area shown on the attached well location plan has been completed (see Ont. Reg. 245/97 definitions for "pooled spacing unit" and "unitize") Yes ☒ No ☐

6. DRILLING CONTRACTOR T.W. Marsh Well Drilling and Servicing / Bradco Drilling Inc. Tel # 519-695-6060 / 519-689-4692

Address Box 53 / 14 Hattie St., Box 99 City Bothwell / Merlin Prov. ON Postal Code N0P 2C0 / N0P 1W0

7. PROPOSED CASING AND CEMENTING PROGRAM

Hole Size (mm)	Casing O.D. (mm)	Weight (kg/m)	Grade	New, Used or in-hole	Setting Depth TVD	Setting Formation	CASING SETTING INFORMATION		
							How Set	Cement Type	Cement Top KB / RF
340	340	81.1	LS	New	42	Kettle Point	Driven	nil	nil
312	244	48.06	H40	New	57	Kettle Point	Cement	G	surface
222	178	29.76	J55	New	392	F-Shale	Cement	G	surface
159	114	15.62	J55	New	686	A-2 Anhydrite	Cement	G	surface

8. BLOW-OUT PREVENTION EQUIPMENT 9" 2M Annular Preventor
7 - 1/16" 3M Annular Preventor and Double Gate

9. WELL SECURITY Name of Trustee Harrison Pensa LLP Total # Unplugged Wells 162 Current Balance \$70,000

10. REMARKS

11. ENCLOSURES Fee ☒ Location Plan ☒ (Land wells only) Drilling Program ☒

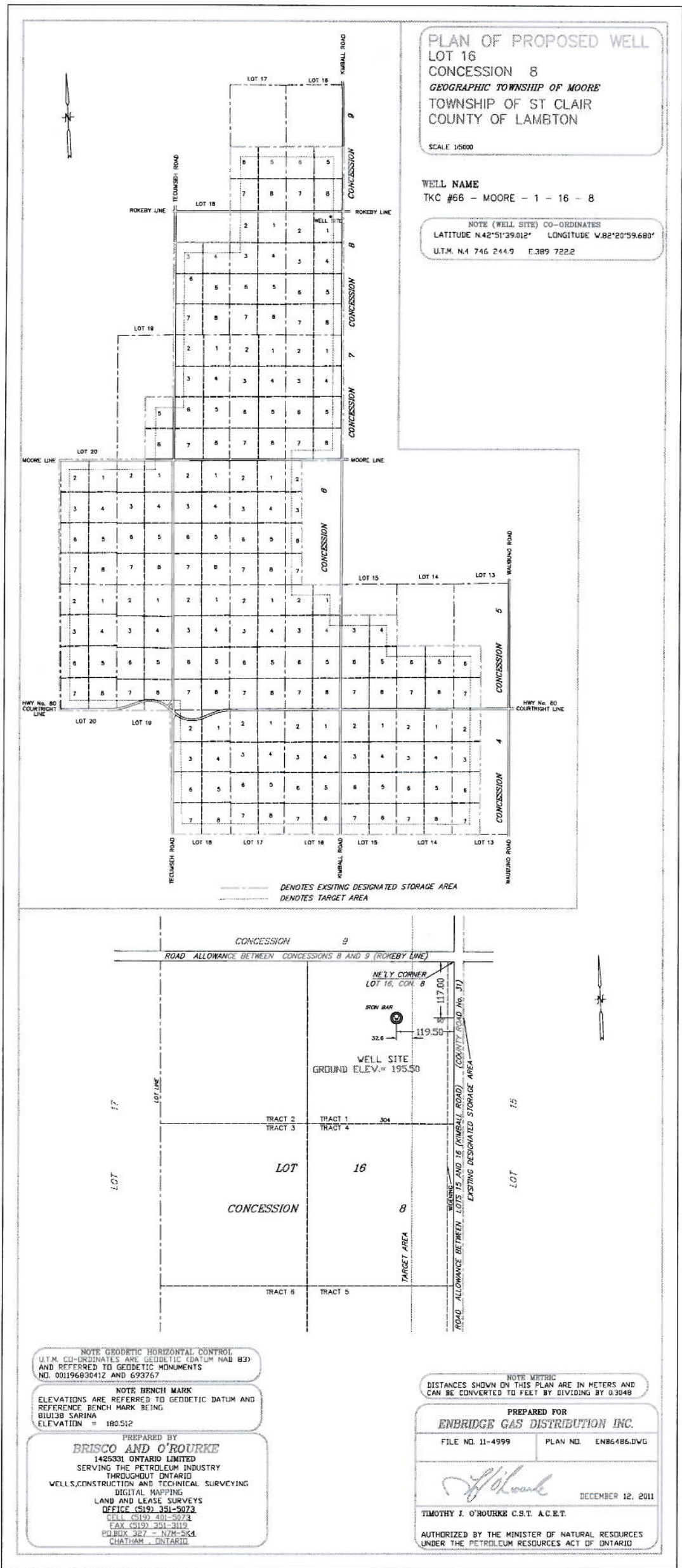
12. NOTICE OF COLLECTION

The Ministry of Natural Resources is collecting your personal information under the authority of the *Oil, Gas and Salt Resources Act*. Any personal information provided on this application will be used for licensing and law enforcement purposes only and will be protected in accordance with the *Freedom of Information and Protection of Privacy Act*. If you have questions about use of your personal information, please contact the Policy and Program Officer, Petroleum Resources Centre, Ministry of Natural Resources, 659 Fetzter Road, London N6B 1L1, 519-871-4638.

13. AUTHORITY

The undersigned certifies that the information provided herein is complete and accurate, the operator has the right to drill or operate a well in the above location, and he/she has authority to bind the operator.

Date (d/m/y) 08.Feb.12 Name J.E. Sanders Signature [REDACTED] (Original Signed)
Date of Birth 04.Apr.62 Company Enbridge Gas Distribution Inc. Title Director, Storage Operations



TKC # 66, Moore 1-16-VIII

DRILLING PROGRAM

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SECTION 1.0 - GENERAL DATA

Section 1.1 - Well Summary

Well Name:	TKC # 66 Moore 1-16-VIII
Operator:	Enbridge Gas Distribution Inc.
Surface Location:	Tract 1, Lot 16, Con. 8, Moore Twp, Lambton County
Surface Coordinates:	117.0m South; 119.5m West
Ground Elevation:	195.50m
KB Elevation:	196.80m
Total Depth:	727m
Target Formation:	A-1 Carbonate
Logging Program:	Gamma Ray / Neutron from TD to base of Surface Casing Porosity / Density Log A-2 Anhydrite to TD CBL-GR – 114mm casing Vertilog – 114mm casing
Spud Date:	March 15 th , 2012
Duration:	45 days

Section 1.2 – Special Notes

1. Safety of personnel and environment is our primary concern. Section 6.1 of this program, outlines Enbridge's general safety requirements which obliges all personnel on the wellsite to follow the Occupational Health and Safety Act and Regulations (Ministry of Labour) and the Oil, Gas & Salt Resources Act and Regulations (Ministry of Natural Resources). Safety and/or environmental ("tailgate") meetings shall be conducted as per Section 6. Wellsite Supervisor shall conduct daily 'walk around' inspections of the equipment on site and record the results on the daily reports. Please refer to Section 5.2 for the procedure to be followed if a worker injury occurs.
2. The Wellsite Supervisor has authority over all activities conducted on the drilling location. The Wellsite Supervisor shall ensure that all applicable regulations and policies (MNR, MOL, MOEE, and Enbridge) are followed and that all permits are kept on site and/or signed off as required.

3. All operations are to be to MNR standards.
4. BOPs are to be installed, maintained and used as per MNR requirements. Testing of the BOPs must be in accordance with Section 6.2 of this program.
5. Tower sheets must be completed daily and will include the information listed in Section 5.1 of this program. The Wellsite Supervisor will complete daily reports and forward the reports to Enbridge's office by 10am the following day.
6. The production casing will be set in the A-2 Anhydrite to allow for an effective cement job and successful pressure testing, prior to penetrating the A-1 Carbonate formation.

Section 1.3 - Contact Numbers

Enbridge Gas Distribution Inc.

Kathy McConnell	Senior Project Geologist	Office: 519-862-6032 Fax: 519-862-1168 Cell: 519-312-2168 kathy.mcconnell@enbridge.com
Paul Druet	Manager, Reservoir Development	Office: 519-862-6016 Fax: 519-862-1168 Cell: 519-383-4012 paul.druet@enbridge.com
Terry Chupa	Land Administrator	Office: 519-862-6008 Fax: 519-862-1168 Cell: 519-384-0215 terry.chupa@enbridge.com
Control Room		Office: 519-862-6012

Drilling Supervisor:

Steve Thompson	Cell: 519-383-5404 omniconsulting@rogers.com
Wayne Bolton	Cell: 519-312-8437 kegconsulting@aim.com

Geologist:

Neil Hoey

Office: 519-472-4776
Fax: 519-472-4776
Cell: 519-649-6918
neil_hoey@hotmail.com

Cable Tool Rig - Terry Marsh Well Drilling & Servicing

Terry Marsh

Owner / Operator

Office: 519-695-6060
Fax: 519-695-6464
Cell: 519-359-9804
twmarshca@yahoo.com

Rotary Rig – Bradco Drilling Inc.

Brad Stevenson

Owner / Operator

Office: 519-689-4692
Fax: 519-689-7516
Cell: 519-358-3742
bradco@ciaccess.com

Cementing

Ian Veen

Black Creek Well Service
President

Office: 519-882-4732
519-834-2941
Fax: 519-834-2466
Cell: 519-686-4645

Jay Rookes

Schlumberger Canada
Engineer-In-Charge

Office: 519-652-5053
Fax: 519-652-6002
rookes1@slb.com

Casing & Wellheads – Wellmaster Pipe & Supply Inc.

Andy Arnoczki

Sales Representative

Office: 519-688-0500
Fax: 519-688-0563
Cell: 519-537-0559
aarnoczki@wellmaster.ca

Bill Hedges

Inside Sales

Office: 519-688-0500
Fax: 519-688-0563
bhedges@wellmaster.ca

Graham Shone

Operations Manager

Office: 519-336-9797
Fax: 519-336-9733
Cell: 519-331-2534
gshone@cefranklin.com

Larry Rushton	Owner	Office: 519-326-8884 Fax: 519-326-8882 rushtonsupply@sympatico.ca
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Wireline Services

Gord MacKenzie	Baker Atlas Base Manager	Office: 519-332-8030 Fax: 519-332-4714 Cell: 519-339-6783 gord.mackenzie@bakerhughes.com
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Dave Tipping	Weatherford Canada – Wireline & Logging Services Station Manager	Office: 519-683-2010 Fax: 519-683-2577 Cell: 519-436-3541 dave.tipping@canada.weatherford.com
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Snubbing Services

Derrick Jacobson	President Quattro Energy Services Inc.	Office: 877-829-7242 Fax: 403-720-6319 Cell: 403-828-7242 derrick@quattroenergy.ca
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Jeff Redmond	Team Snubbing Services Inc.	Office: 403-314-4220 Fax: 403-844-2148 Cell: 403-896-8363 jredmond@teamsnubbing.com
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Water Hauling

Melvin McKeegan	President McKeegan Trucking Limited	Office: 519-864-1037 Fax: 519-864-1036 Cell: 519-490-4028
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Denis Marcus	President Harold Marcus Limited	Office: 519-695-3735 Fax: 519-695-2249 Cell: 519-380-5238 dmarcus@haroldmarcus.com
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Aaron Verstraete	President Oil Patch Services	Office: 519-676-6747 Fax: 519-676-7932 Cell: 519-380-5473 ops.aaron@bellnet.ca
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Rental Equipment

Derrick Holland	Wheatley Wireline Services Ltd.	Office: 519-825-3680 Fax: 519-825-9348 Cell: 519-322-8439 dholland891@hotmail.com
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Wade Glass	Wheatley Wireline Services Ltd.	Office: 519-825-3680 Fax: 519-825-9348 Cell: 519-322-9275
Orval Beam	Orval L. Beam Limited Operations Manager Tank Rentals	Office: 519-436-0164 Fax: 519-436-0164 Cell: 519-436-4801
Jim Seward	JW Seward Enterprises Ltd Crane Trucks, Steel Plates	Office: 519-867-5526 Fax: 519-867-5312 Cell: 519-332-7689

Welders – St. Clair Mechanical

John Dawson	President	Office: 519-864-0927 Fax: 519-864-0801 Cell: 519-330-9672
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Government & Other Agencies

MNR	Petroleum Resources Centre	Office: 519-873-4634 Fax: 519-873-4645 ogsr.mnr.gov.on.ca
MOEE	Spill Reporting	1-800-268-6060
MOL	Health & Safety	1-800-265-1676
	Health & Safety Inspector	Office: 519-646-3238 Fax: 519-672-0268
Richard Ostrowski	Oil, Gas & Salt Resources Library	Office: 519-686-2772 Fax: 519-686-7225 richard@ogsrlibrary.com
Police, Fire & Ambulance		911

SECTION 2.0 - GEOLOGICAL PROGNOSIS

County: Lambton Township: Moore
Concession: VIII Lot: 16 Tract: 1

Formation	Top	Elevation	Thickness	Gas	Oil	Water
K.B.	0.0	197.8	1.5			
Drift	1.5	196.3	39.6			Fresh@36.6m
Kettle Point	41.1	156.7	20.9			
Hamilton	62.0	135.8	80.3			
Dundee	142.3	55.5	33.4			Sulphur@150.9m
Detroit River	175.7	22.1	150.7			
Bass Islands	326.4	-128.6	53.1			
G-Shale	379.5	-181.7	7.3			
F-Shale	386.8	-189.0	36.4			
F-Salt	423.2	-225.4	39.0			
E-Carbonate	462.2	-264.4	30.3			
D-Salt	492.5	-294.7	5.9			
C-Shale	498.4	-300.6	27.7			
B-Salt	526.1	-328.3	82.0			
A-2 Carbonate	608.1	-410.3	45.3			
A-2 Salt	653.4	-455.6	31.5			
A-2 Anhydrite	684.9	-487.1	2.4			
A-1 Carbonate	687.3	-489.5	38.7	690m	690m	
A-1 Evaporite	726.0	-528.2	1+			
TD	727.0					

***Note: used Imperial Colinville No. 4 to build prog

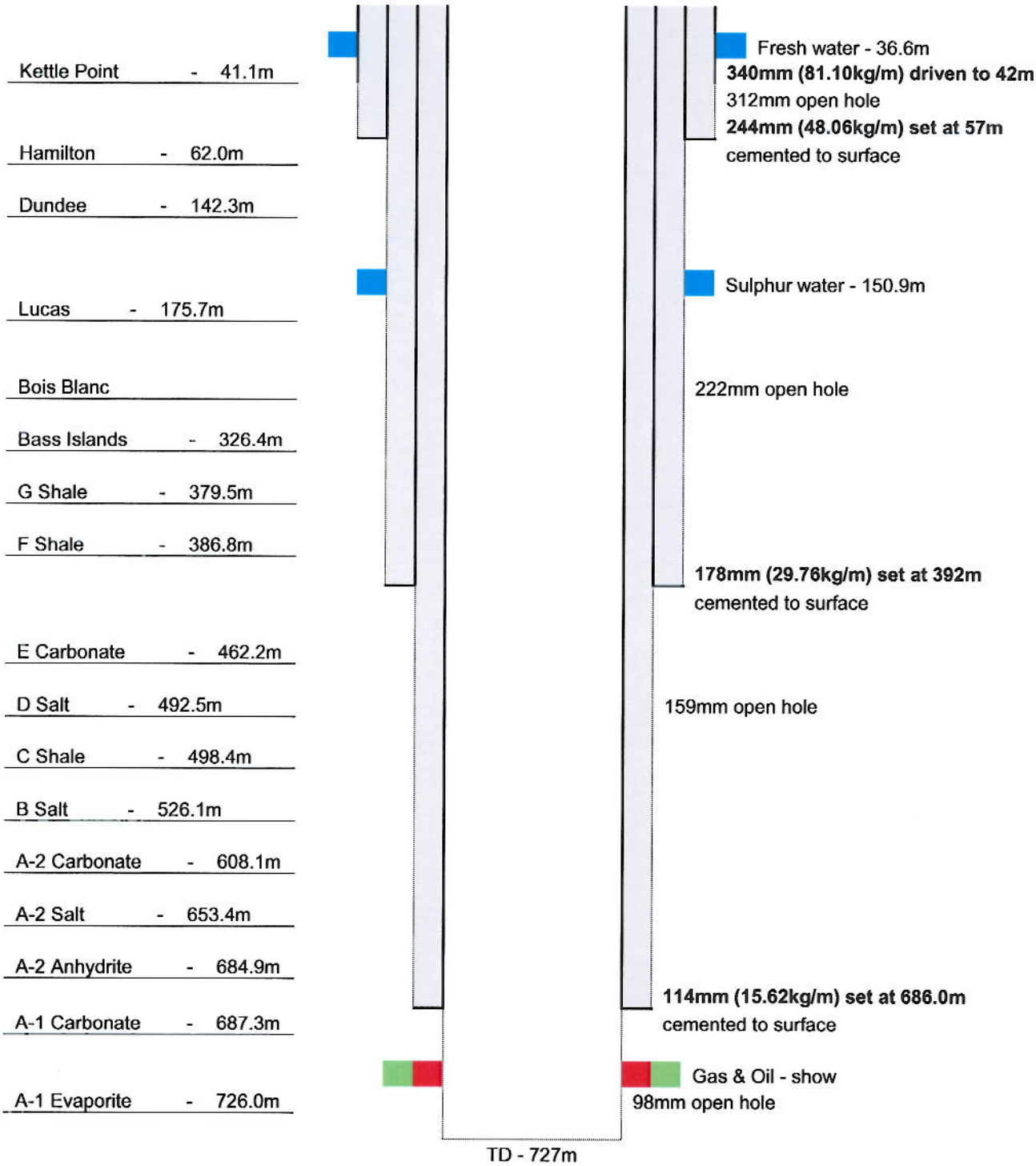
SECTION 3.0 - CASING AND CEMENTING SUMMARY

Section 3.1 - Summary

Hole Size (mm)	Casing Size (mm)	Casing Grade	Casing Weight (kg/m)	Setting Depth (mKB)	How Set
340	340	LS	81.10	42	Driven – cement squeeze if necessary
312	244	H40	48.06	57	Cemented to surface with 100% excess Class G 0-1-0 cement + 2 – 3% CaCl ₂
222	178	J55	29.76	392	Cemented to surface with Class ‘G’ 0-1-8% plus 1 to 3% CaCl ₂ , followed by Class ‘G’ neat cement plus 1 to 3% CaCl ₂ . Cement volumes will be calculated with a 50% excess- gel cement and 30% excess – neat cement. Depending upon hole conditions, consideration may be given to running thixotropic cement plus additional loss circulation materials, across porous zone(s).
159	114	J55	15.62	686	Cemented to surface with Class ‘G’ 0-1-0% plus 1 to 2% CaCl ₂ plus 10% NaCl. Cement volumes will be calculated with a 50% excess on the open hole section and 30% excess on the cased hole section.

Main Hole: 98mm open hole will be drilled from 686m to 727m

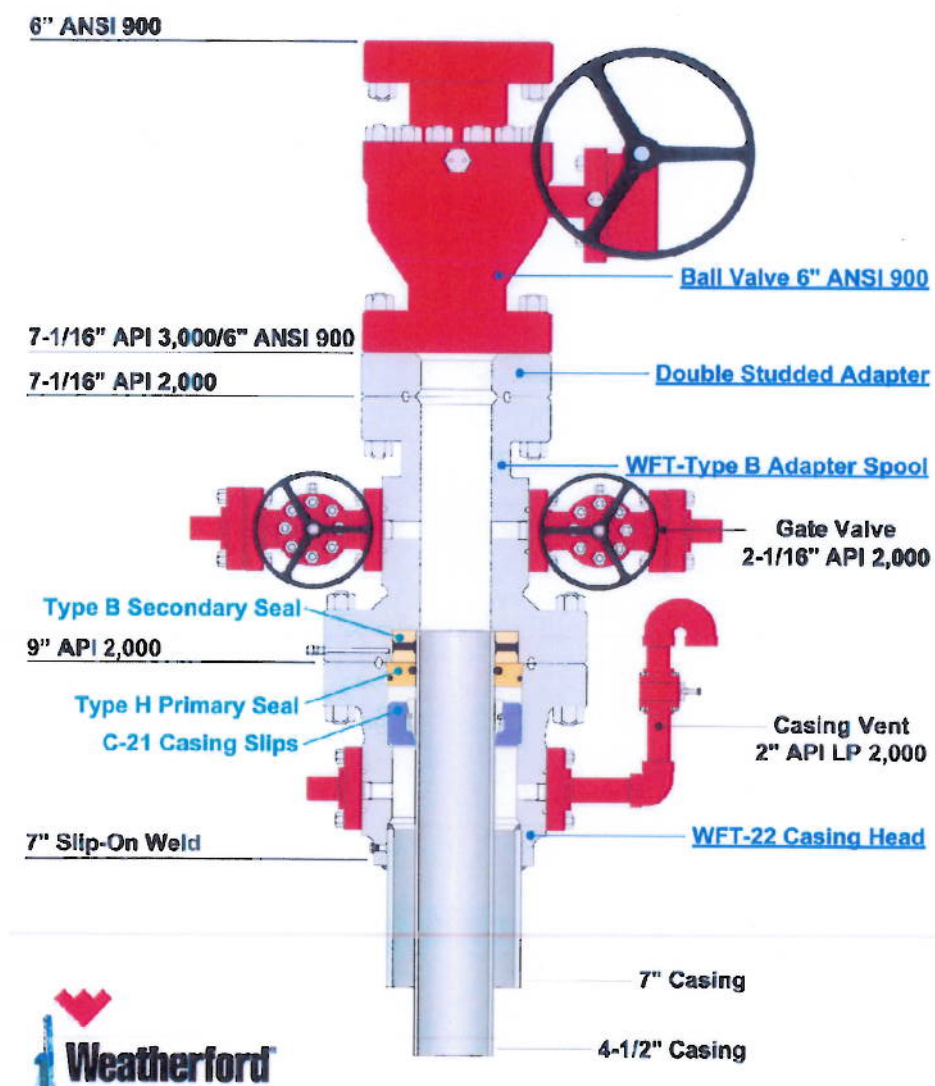
Section 3.2 - Wellbore Diagram



Section 3.3 - Wellhead Summary

Weatherford 13.8 MPa Wellhead:

244mm x 279mm slip on weld on casing bowl for BOP installation
 178mm x 229mm slip on weld on casing bowl
 229mm x 179mm spool c/w 2 gate valves on side outlets
 179mm 13.MPa x 179mm x 20.7 MPa double studded adapter
 152mm ANSI 900 Cameron Grove full port ball valve



SECTION 4.0 - DRILLING PROCEDURES

Section 4.1 - Pre Spud

1. Fresh Water Well Samples

Obtain samples from all fresh water wells located within a 750 metre radius of the proposed well. Have routine water analysis done on all water samples by an independent laboratory in Sarnia. Ensure that copies of these reports are placed in the well files in Enbridge's office

2. Site Preparation

Prepare drilling location as follows:

- a. Locate all drainage tiles crossing lease area
- b. Strip and properly stock pile all soil from the lease
- c. Cut, block and divert drainage tiles as required
- d. Construct adequate berms around lease and access road as required

3. Government Notification of Spud

48 hours prior to spud, notify the Ministry of Natural Resources – Petroleum Resources Section by fax @ (519) 873 – 4645 of the date of commencement of drilling operations

4. Signs

Install rig signs on access road to lease.

5. Safety Meeting

Conduct a pre-spud safety meeting for Rig crews. Tool push and all crewmembers must be present. A similar meeting shall be conducted with the remaining crew(s) as they come on duty. Additional safety meetings shall be conducted as per Section 6.1 of this program.

Section 4.2 - Conductor Casing

1. Drilling Method

Move in and rig up Cable Tool Rig. Measure and record the distance from RF to ground and the RF elevation – include these measurements on the tower sheets and the daily report. Drill and drive 340mm casing to bedrock, to an approximate depth of 42m. Note any occurrence of water and record type of water, depth encountered, and static level of water and/or flow rate. If fresh water is encountered during

drilling, the well must be bail tested for at least 15 minutes, after the casing is landed, to ensure that the fresh water has been shut-off. If the fresh water has not been shut-off, contact Enbridge's office and be prepared to perform a cement squeeze as per Enbridge's requirements.

2. Cement Squeeze (if necessary)

If fresh water is found in the drift and is not shut-off by the conductor casing, a flow rate will be established and a cement squeeze will be performed, using the cement volumes determined by Enbridge. Wait on cement 12 hours and bail the hole dry and monitor the well for at least 15 minutes to determine if the water has been shut-off. If necessary, the process will be repeated until the water is shut-off.

Section 4.3 - Surface Hole & Surface Casing

1. Drilling Method

Drill a 312mm hole 15 metres $\pm$ into the Kettle Point formation, to an approximate depth of 57m. Ensure that drill cutting samples are taken every 3 metres and placed in the sample bags provided by the Ministry of Natural Resources. The sample bags must be labeled with the well name, Township, Lot, Concession and Enbridge's name. Record on daily drilling reports any influx of fluids and/or hydrocarbons, static levels, pressures and any unusual hole conditions.

2. Casing Installation

Depending upon hole conditions encountered, the 244mm casing will be run in the following manner:

- Texas Shoe on bottom of first joint
- Centralizers on the top and bottom of the first joint and coincident with the shoe of the conductor casing
- 244mm casing to surface

3. Cementing Procedures

Move in and rig up Cementers. Ensure pressure recorder is rigged in and serviceable. Pressure charts will be attached to the job ticket. Conduct a pre-job safety meeting to confirm volumes and procedures. Establish circulation using pump truck. The casing and the hole will be circulated with fresh water for 15 minutes to clean the borehole and to fill the casing and hole prior to cementing. Pressure test surface equipment to 14 MPa. Ensure that preflush and mix water are from a clean source and that the water trucks are uncontaminated. Pump preflush of 2.0m³ of fresh water, with the addition of loss circulation material if necessary. Ensure that a minimum of 4 cement samples are taken and represent the cement at the beginning, middle and end of the cement job. Mix and pump sufficient Class 'G' 0-1-0% cement plus 2 to 3% CaCl₂

with a density of 1901 kg/m³ to cement the casing to surface with 100% excess. Displace cement with fresh water – ensure that cement is under displaced and that the bottom joint of casing is full of cement. Shut-in cementing valve at surface and wait on cement at least 12 hours before slacking off casing.

4. Install 244mm x 279mm slip on weld on casing bowl for BOP installation. Arrange to have surface hole cuttings solidified and then disposed in an approved manner.
5. Release the Cable Tool Rig.

Section 4.4 - Intermediate Hole & Intermediate Casing

1. BOP Installation and Pressure Testing

Move in and rig up Rotary Rig. Measure and record the distance from KB to ground and the KB elevation – include these measurements on the tower sheets and the daily report.

Install Class A (Rotary) BOPs as per MNR requirements. After BOPs are installed and the cement samples indicate that the cement is competent, the rig will proceed to pressure test the BOPs, casing and shoe. Pressure test casing and each component of the BOPs as per Section 6.2. After successfully pressure testing the BOPs and casing, drill out cement and 0.5m of new formation and conduct a PIT, with the hole full of fresh water, using a bottom hole pressure equivalent to 18 kPa/m.

2. Drilling Method

Drill a 222mm hole with fresh water to 5m ± into the F Shale formation, to an approximate depth of 392m. Notify Geologist 12 hours in advance of reaching intermediate casing point, so that they can be on site to determine the proper casing setting depth. When casing setting depth has been determined, circulated the hole clean. Perform a flow check prior to tripping and strap out of the hole. Fast tripping of the drill string is to be avoided in order to eliminate high annular velocities, pressure surges and swabbing (maximum rate of 27 metres per minute). Keeping the hole full of fluid, trip out of the hole and laydown bottom hole assembly and depending upon rotary rig type, standback or laydown drill collars and drill pipe.

The potential for loss circulation exists while drilling through the Detroit River formations (Lucas and Amherstburg formations). If loss circulation is encountered use the loss circulation contingency program located in Section 4.7. Note all lost circulation intervals and monitor and record fluid loss volumes. If pit fluid must be hauled to disposal, keep solid content to a minimum to reduce costs.

Ensure that drill cutting samples are taken every 3 metres and placed in the sample bags provided by the Ministry of Natural Resources. Record on daily tower sheets

any influx of fluids and static levels (water and/or hydrocarbons), gas and/or any unusual hole conditions.

3. Casing Installation

Ensure that the threads are protected while hoisting casing to the floor. Drift all casing prior to running the casing in the well and apply proper API make-up torque to each connection.

Depending upon hole conditions encountered, the 178mm casing will be run in the following manner:

- Guide shoe
- 178mm joint of casing
- 178mm Float Insert or Float Collar
- Tack weld guide shoe, float collar and bottom 2 joints and use API modified pipe dope on all connections
- Centralizers will be installed one metre above the guide shoe, over the bottom of the first 2 collars and every 5 joints to surface
- 178mm casing to surface

4. Cementing Procedures

Move in and rig up Cementers. Ensure pressure recorder is rigged in and serviceable. Pressure charts will be attached to the job ticket. Conduct a pre-job safety meeting to confirm volumes and procedures. Fill hole and establish circulation using pump truck. The casing and the hole will be circulated with fresh water for 15 minutes to clean the borehole and to fill the casing and hole prior to cementing. Pressure test surface equipment to 14MPa for 10 minutes. Preflush and mix water must be obtained from a clean source and the water trucks must be uncontaminated. Pump preflush of 3.0m³ of fresh water, with the addition of loss circulation material if necessary. Ensure that a minimum of 4 cement samples are taken and represent the cement at the beginning, middle and end of the cement job. Mix and pump sufficient 0-1-8 Class 'G' cement plus 1 to 3% CaCl₂ (50% excess) followed by 0-1-0 Class 'G' cement plus 1 to 3% CaCl₂ (30% excess) to cement casing to surface. Depending upon the severity of the loss circulation zones, thixotropic cement with additional loss circulation materials may be used to cover the loss zone. If there are no cement returns to surface, a feed rate will be established and the annulus will be grouted to surface. Drop wiper plug and displace cement and bump plug to 3.5 Mpa over final pumping pressure – do not exceed 60% of internal yield pressure of casing. Once plug is bumped and it is determined that the float is holding, bleed casing pressure back to final pumping pressure, close casing valves and bleed off surface line pressure and wash out BOPs. Wait on cement 24 hours before slacking off casing. Remove 244mm x 279mm casing bowl and install 178mm x 229mm casing bowl on the 178mm casing.

Section 4.5 - Production Hole & Production Casing

1. Pressure Testing

Check cement samples for hardness – if cement samples are set to the satisfaction of the Wellsite Supervisor, proceed with installation of the BOPS. Install Class B (Rotary) BOPs as per MNR requirements on 178mm casing bowl. After BOPs are installed and the cement samples indicate that the cement is competent, the rig will proceed to pressure test the BOPs, casing and shoe. Pressure test casing and each component of the BOPs as per Section 6.2. After successfully pressure testing the BOPs and casing, drill out cement and 0.5m of new formation and conduct a PIT, with the hole full of fresh water, using a bottom hole pressure equivalent to 18 kPa/m.

2. Drilling Method

Drill a 159mm hole using brine to prevent the dissolution of the salt layers. Ensure that drill cutting samples are taken every 3 metres and placed in the sample bags provided by the Ministry of Natural Resources. Record on daily tower sheets any influx of fluids and static levels (water and/or hydrocarbons), gas and any unusual hole conditions.

Prior to penetrating the A-2 Carbonate, the Wellsite Geologist and Wellsite Supervisor must be on-site and a BOP drill shall be completed to familiarize all on-site personnel with the proper procedures.

Drill a 159mm hole $1 \pm$ metres into the A-2 Anhydrite formation, to an approximate depth of 686.0m. The final casing point will be determined by the Wellsite Geologist.

If the reef pressure is above 7000kPa, drilling will be suspended and the rig will be moved off location after the 114mm casing is installed and cemented. The rig will be brought back onto location to complete the drilling of the well when the reef pressure is below 7000kPa.

3. Casing Installation

Ensure that the threads are protected while hoisting casing to the floor. Drift all casing prior to running the casing in the well and apply proper API make-up torque to each connection.

Depending upon hole conditions encountered, the 114mm casing will be run in the following manner:

- Guide shoe
- 114mm joint of casing
- Float Insert or Float Collar

- Tack weld guide shoe, float collar and bottom 4 joints and use API modified pipe dope on all connections
- Centralizers will be installed on bottom 5 joints of casing – on every 5th joint to surface
- 114mm casing to surface

4. Cementing Procedures

Move in and rig up Cementers. Ensure pressure recorder is rigged in and serviceable. Pressure charts will be attached to the job ticket. Conduct a pre-job safety meeting to confirm volumes and procedures.

Establish circulation using pump truck. The casing and the hole will be filled with brine and circulated for 15 minutes to clean the borehole and to fill the casing and hole prior to cementing. Pressure test surface equipment to 14 MPa for 10 minutes. Preflush and mix water must be obtained from a clean source and the water trucks must be uncontaminated. Pump preflush of 3.0m³ of clean brine, with the addition of loss circulation material if necessary. Ensure that a minimum of 4 cement samples are taken and represent the cement at the beginning, middle and end of the cement job. Mix and pump sufficient Class 'G' 0-1-0 cement plus 10% NaCl, to cement the 114mm casing to surface plus 50% excess over open hole and 30% excess in cased hole. Drop wiper plug and displace cement with fresh water and bump plug to 3500 kPa over final pumping pressure – do not exceed 60% of internal yield pressure of casing. Once plug is bumped and it is determined that the float is holding, bleed casing pressure back to final pumping pressure, close casing valves and bleed off surface line pressure. Wash out BOPs and split BOP stack at 229mm flange, install 114mm slips and set slips in casing bowl. Wait on cement 24 hours and cut casing and remove BOPs. Cut and bevel 114mm casing and install primary and secondary seals. Install 229mm x 179mm spool piece and test wellhead seals to 14 MPa for 10 minutes. Install 179mm 14MPa x 21MPa double studded adapter and ANSI 900 Master Valve and shut-in well. 48 hours after cementing operations have been completed – pressure test casing, wellhead and master valve to 12,410kPa for a minimum of 4 hours – ensure that a digital pressure gauge is installed. Report results to the Enbridge Office - do not proceed with BOP installation until the pressure test has been successfully completed.

If the Master Valve is too high above the drill floor, the BOPs will be installed on the top of the spool piece and when the well is completed, a WR-1 plug will be set in the base of the casing and successfully pressure tested to 8300 kPa. The BOPs will then be removed and the Master Valve installed. Once the Master Valve has been installed and successfully pressure tested, the plug will be retrieved with a Wireline Service company.

Section 4.6 - Main Hole

1. Installation of the BOPs

Check cement samples for hardness – if cement samples are set to the satisfaction of the Wellsite Supervisor, proceed with installation of the BOPS. Install Class B (Rotary) BOPs as per MNR requirements. After BOPs and lubricator are installed and a minimum of 48 hours 'wait-on-cement-time' has passed and the cement samples indicate that the cement is competent, a cement bond log will be run on the 114mm casing. Consideration may be given to moving out the Rotary Rig and moving in a Cable Tool Rig. The Cable Tool Rig will install Class B (Cable Tool) BOPs.

2. Logging

Move in and rig up Wireline Company. With hole full of fresh water, run a Cement Bond Log, both a non-pressure and pressure pass. Run a Gamma-Ray / Neutron Log from TD to the base of the surface casing. Rig out Wireline Company and release.

3. Drilling Method

Each component of the BOPs and the casing will be pressure tested as per Section 6.2. Upon successful completion of the pressure testing of the BOPs, the cement, shoe and 0.5m of new formation will be drilled out and a PIT will be conducted, with the hole full of fresh water, using a bottom hole pressure equivalent to 18 kPa/m.

Drill a 98mm hole through the A-1 Carbonate and 1 metre into the A-1 Evaporite Formation – final TD will be determined by the Wellsite Geologist. While drilling the main hole ensure that drill cutting samples are taken every 3 metres and placed in the sample bags provided by the Ministry of Natural Resources. Record on daily tower sheets any influx of fluids and static levels (water and/or hydrocarbons), gas and any unusual hole conditions.

Drilling of the well may be suspended if sufficient permeability and porosity are encountered prior to reaching the proposed TD. If drilling is suspended, the rig will be moved off location and a variety of pressure tests will be performed on the well during withdrawal / injection operations. If the testing of the well shows that the porosity and permeability of the well are not suitable, a rig will be moved back onto location and the well will be drilled to the original TD – 1 metre into the A-1 Evaporite.

4. Logging

Move in and rig up Wireline Company to run a Gamma-Ray/Neutron/Density Log over the open hole section of the well and run a Casing Inspection Log over the 114mm casing.

5. BOP Removal

Close master valve and nipple down BOPs and install 152mm (6") blind flange. If the master valve was not used for the drilling of the well – move in and rig up Wireline and Tool Companies and install a WR-1 plug in the base of the 114mm casing. Bleed down and fill the well with fresh water and pressure test the plug to 8300 kPa. Upon successful completion of the pressure test, remove BOPs and install master valve. Install a digital pressure recorder and pressure test casing, wellhead and master valve, with the hole full of fresh water to a surface pressure of 12,410kPa for a minimum of 4 hours. Report results to Enbridge Office. Do not rig down until well passes the pressure test. Move in Wireline Company to retrieve WR-1 plug.

6. Rig down rotary rig and move off of location and restore wellsite to Enbridge's specifications.

Section 4.7 - Loss Circulation Procedure

1. Before drilling out the casing shoe:

- a. Identify sources and location of fresh water and/or brine, loss circulation materials and weight materials
- b. Ensure BOPs and manifold are properly installed
- c. Ensure auxiliary tanks are connected to the pumping system and a standby mud pump is hooked up for annular injection in case of severe loss circulation (so that fluid can be pumped down both the drill pipe and annulus simultaneously)
- d. Pressure test BOPs prior to drill out

2. After drilling out shoe:

- a. Alert water suppliers and haulers
- b. Ensure adequate amounts of fresh water and/or brine are readily available prior to penetrating the Detroit River formation.
- c. Mechanically test BOPs and perform BOP drill prior to penetrating the Detroit River formation.

3. Drilling Blind – Detroit River formations:

- a. In an attempt to maintain or re-establish circulation, pump fluid down both the annulus and the drill pipe simultaneously
- b. Should severe loss circulation occur while drilling, the thief zone may be plugged with cement and/or loss circulation material at Enbridge's discretion.

SECTION 5.0 - REPORTING PROCEDURES

Section 5.1 - Tower Sheets

Shall be completed daily and shall include:

1. Bit size, jars, depth at the beginning of the shift and end of each shift.
2. Casing size, grade, weight, and number of joints, centralizers, cement baskets, total length and setting depth.
3. Cementing information – Service Company, cement type, amount, slurry density, additives, annular fluid returns, volume of displacement fluid and plug down time.
4. Water, gas or oil – type, depth encountered depth of sample collected and the static level and/or rate of flow.
5. Pressure tests – individually, surface pressures, fluid density used in the tests, bleed-off rate and duration of test.
6. Logging Details – type and interval.
7. Abandonment details – intervals, amount and type of cement, top of plug and time felt.
8. Rig release – date and time.

Section 5.2 – Worker Injury

Every work related accident or injury shall be reported immediately to the Wellsite Supervisor. The Supervisor shall immediately contact the Ministry of Labour @ 1-800-265-5140 and the Ministry of Natural Resources @ 519-873-4634. The verbal report shall be followed with a written report as per the Occupational Health and Safety Act and the Oil, Gas & Salt Resources Act and Section 13 of the Operational Standards. The Supervisor will also be responsible for notifying the Operator (Enbridge Gas Distribution Inc.) and shall be responsible for the completion of Enbridge's Accident Report Form.

SECTION 6.0 - SAFETY AND PROCEDURES

Section 6.1 - General Safety

1. All works at the wellsite shall be in compliance with the Occupational Health and Safety Act and the Oil, Gas & Salt Resources Act and all associated legislation. In addition, all work at the wellsite shall be done in compliance with good oil field practices. All verbal notifications given to and approvals received from government agencies shall be recorded on the tower sheets.
2. The Enbridge 'Job Safety Analysis Form' (JSA) shall be thoroughly reviewed by the Wellsite Supervisor with all onsite personnel through the daily safety meetings and any changes to the JSA will be noted on the Enbridge Safety Meeting / Tool Box Form.
3. Daily safety ('tailgate') meetings are to be conducted with each shift and recorded on the Enbridge Safety Meeting / Tool Box Form. Additional safety meetings are to be held with each crew, at the start of the well and safety meetings shall also be held prior to cementing and upon arrival of the logging company and prior to penetrating the Detroit River formations and the A-2 Carbonate formation.
4. The Wellsite Supervisor shall ensure that the operations are in compliance with all applicable government regulations and shall complete daily walk around rig inspections and record the results on their daily reports.

Section 6.2 – Well Control

All blowout prevention systems are to be in strict compliance with MNR regulations. The function and pressure testing guidelines required by the regulatory bodies (such as daily function testing of the pipe rams) will be strictly adhered to.

1. All pressure tests of blowout prevention equipment will be conducted with fresh water and will be conducted in 2 stages – low and high pressure. It is essential that the low pressure test be done first, to prevent the high pressure test from healing leaks that would have been noted at low pressures.
2. The following pressure tests will be conducted with fresh water prior to drilling out each casing string and the results recorded on the tower sheets and daily reports:

Rotary:

- a. The blind rams, kill lines and choke manifold and casing will be tested individually for 10 minutes each to:
 - i. Intermediate casing 2000 kPa low & 9000 kPa high
 - ii. Production casing 2000 kPa low and 10000 kPa high

- b. Run in hole with BHA, drill pipe and drill collars and pressure test the pipe rams, kelly cock, stand pipe, swivel, safety valves, etc. will be tested individually for 10 minutes each to:
 - i. Surface casing 1400 kPa low and 3500 kPa high (using AP)
 - ii. Intermediate casing 2000kPa low & 9000 kPa high
 - iii. Production casing 2000 kPa low and 10000 kPa high
- c. The annular preventer will be tested for 10 minutes to
 - i. Surface casing 1400 kPa low and 3500 kPa high
 - ii. Intermediate casing 2000 kPa low & 9000 kPa high
 - iii. Production casing 2000 kPa low and 10000 kPa high

Cable Tool:

- a. The blind rams, kill lines and casing will be tested individually for 10 minutes each to:
 - i. Intermediate casing 2000 kPa low & 8000 kPa high
 - ii. Production casing 2000 kPa low and 10000 kPa high
 - b. Function test the pipe rams / shear rams, safety valves, etc. individually for 10 minutes each to:
 - i. Intermediate casing 2000kPa low & 8000 kPa high
 - ii. Production casing 2000 kPa low and 10000 kPa high
 - c. The annular preventer will be tested for 10 minutes to
 - i. Surface casing 1400 kPa low and 3500 kPa high
 - ii. Intermediate casing 2000 kPa low & 8000 kPa high
 - iii. Production casing 2000 kPa low and 10000 kPa high
 - d. The lubricator system will be tested for 10 minutes to
 - i. Production casing 2000 kPa low and 8000 kPa high
 - e. A full lubricator system will be required when:
 - i. gas is encountered with H₂S content greater than 100ppm,
 - ii. when crude oil flows to surface or is capable of unloading during bailing operations, or
 - iii. when flows of natural gas exceed $7.0 \times 10^3 \text{ m}^3/\text{D}$ (250Mcf/d).
2. Upon drilling out the casing, drill 0.5m to 1.0m of new hole and test the formation, with the hole full of fresh water, to a minimum bottom hole pressure of 18 kPa per metre.
3. After one day of drilling below the casing shoe, check the entire blowout prevention system and tighten all bolts.

4. Crews should be kept alert and familiar with the blowout prevention equipment. At least one member of the crew who has been trained in blowout prevention and well control procedures must be on the floor at all times.
5. Conduct blowout prevention drills prior to drilling out casing and once per week thereafter. Ensure that the drills are recorded in the tour book.
6. The blowout preventers are to be function tested once per tour. Ensure that the function test is recorded on the tower sheets.