

Appendix A – Groundwater Exploration Program Background Information





Our File: 0820-1
April 19, 2010

NB Department of Environment
P.O. Box 6000
Fredericton, N.B.
E3B 5H1

Attention: Mr. Pierre Doucet - Project Assessment (EIA)

Dear Sir,

**Summary of Work to Date and Alternative Drilling Sites -
Amendment to EIA Registration Document No. 4561-3-1228
Water Supply Source Assessment - Memramcook Water System - 30 Year Projection
Village de Memramcook, N.B.**

In regard to the above, Crandall is pleased to provide the NBDENV with the following summary of work to date. It shall be noted that only preliminary drilling investigations have been undertaken at this time, without any pumping tests. Observations from the drilling equipment were used to establish potential yields:

Area A (Ward 2)

A preliminary test hole was performed on January 21, 2010, at the proposed Site 09-02 (PID 00918805). Results were not conclusive (low yield). This test hole was completed as per the NBDENV Guidelines for a residential type well and was turned over to the Owner for private use. For additional details, please refer to Appendix A - Progress Report #5 by TerrAtlantic Engineering Ltd.

Area B (Ward 1)

Preliminary drilling investigations in Area B were not undertaken due to the unsuccessful results of the nearby Area A.

Area E (Ward 3)

Preliminary test holes were performed on October 19 and 20, 2009 at the following proposed sites:

Site 09-06 (PID 00912642): Results were not conclusive and test hole was abandoned in accordance with the NBDENV Guidelines.



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Our File: 0820-1
April 19, 2010
Page 2 of 3

Site 09-07 (PID 70122338): Results were not conclusive and test hole was abandoned in accordance with the NBDENV Guidelines.

For additional details, please refer to Appendix A - Progress Report #3 by TerrAtlantic Engineering Ltd.

Area G (Ward 5)

Preliminary test holes were performed on January 18 and 19, 2010 at the following proposed sites:

Site 09-11 (PID 70001623): Results were conclusive and a well cap was installed on top of the casing. In addition, preliminary water samples were taken and the results are shown in Progress Report #5 in Appendix A.

Site 09-10 (PID 70003835): Results were not conclusive and test hole was abandoned in accordance with the NBDENV Guidelines.

For additional details, please refer to Appendix A - Progress Report #5 by TerrAtlantic Engineering Ltd.

Request for Alternative Drilling Sites:

The Village de Memramcook is proposing the following alternative drilling sites for Ward 1. This is required to replace the proposed Drilling Area B where drilling investigation was not undertaken due to the unsuccessful results of Area A and unsuccessful discussion with some landowners:

New Drilling Area H

Test Hole 10-04: PID 00916015, PID 70182266

Test Hole 10-05: PID 70049481, PID 00916098 & PID 00916213

Test Hole 10-06: PID 70045869 & 70045893 70038765

As noted in Section 1.0 (v), Property Ownership, of the EIA Registration Document, the Village de Memramcook does not presently own the properties where preliminary drilling targets have been identified. However, the Village has been or will be in discussion with each landowner prior to the start of the on-site work.

Please refer to Appendix B (Drawing 0820-1P-C09-C010 and Progress Reports #6 from TerrAtlantic Engineering Ltd.) for additional information on the new proposed drilling sites for Area H (Ward 1).



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Our File: 0820-1
April 19, 2010
Page 3 of 3

It is the intent of the Village de Memramcook to access the alternative locations and proceed with the preliminary drilling investigations prior to the end of May 2010.

Please do not hesitate to contact us should you require additional information.

Yours very truly,

CRANDALL ENGINEERING LTD.

A handwritten signature in black ink, appearing to read 'Pierre Plourde', written over a horizontal line.

Pierre Plourde, P.Eng.
Project Manager

- C. Mr. Pierre LaForest, CAO - Village de Memramcook
- Mr. Michel Cormier, P. Eng., Vice-President - Crandall Engineering Ltd.
- Mr. Geoff Dickinson, M. Eng., P. Eng., FEC - TerrAtlantic Engineering Ltd.

C:\Users\PP\Desktop\Request for Additional Drilling Sites Ward 1 - April 19, 2010.doc



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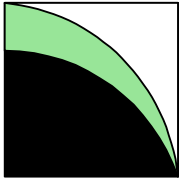
Appendix A - Progress Report #3 and #5 - TerrAtlantic Engineering Ltd.



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October 28, 2009

File: 225.03

Mr. Pierre Plourde, P. Eng.
Crandall Engineering Ltd.
1077 St. George Blvd.
Moncton, NB, E1E 4C9:

Dear Mr. Plourde:

RE: WATER SUPPLY STUDY, TARGET AREA E, MEMRAMCOOK, PROGRESS REPORT #3

Introduction

On October 19, and 20, 2009, test wells 09-01 and 09-02 were completed at Target E in the community of Memramcook. This letter describes our findings.

Test Well 09-01

Test well 09-01 was drilled approximately 125 m southwest of Production Well 3 and was abandoned after drilling to a depth of 66.6 m. Water was found near the top of this well in grey shale and fine-grained sandstone but this zone was cased off due to a significant hydrogen sulphide odour. From a depth of 10 m to 51 m, red to light brown shale was intersected. This section did not yield any water but a strong hydrogen sulphide odour was again noted at 27.5 m. From 51 m to the bottom of the hole (at 66.6 m) conglomerate and brown shale was intersected and a very strong hydrocarbon gas odour was noted when drilling the lower conglomerate. This well was abandoned by filling the hole with bentonite grout.

This well intersected Boss Point Formation in the first 10 m but from that point to the end of the hole at 66.6 m the rock is believed to be from the Albert Formation which is the host rock for hydrocarbons. The Provincial geology map: "Bedrock Geology Of The Hillsborough Area, NTS 21 H/15 Albert and Westmorland Counties" shows the drill locations this well (and also 09-02) to be underlain by Boss Point and Hopewell Cape Formations. However, only a thin section of the Boss Point was present and no Hopewell Cape Formation was mapped.

Test Well 09-02

Test hole 09-02 was located 400 m northwest of Production Well 2 and was drilled to a total depth of 45.4 m. The hole intersected red-brown mud to 10 m where a 1.5 m section of grey shale was noted. From that point [11.5 m] to 39.4 m grey and red-brown mudstone was intersected and a strong odour of hydrocarbon gas observed at 35.1 m. Brown and grey conglomerate was intersected to 45.4 m the bottom of this hole where more strong gas odours were noted. This well was abandoned by filling the hole with bentonite grout.

Closure

It is recommended that no further testing be completed in the immediate area of Production Wells 1 and 2 unless test locations can be secured to the south of these wells. The objective is to avoid the Albert Formation which hosts hydrocarbons - caution should be exercised when drilling in any area where such rock is located. Unfortunately bedrock outcrops are few and far between, and as shown by the most recent drilling, as a result the available geological mapping can be unreliable.

Please contact either of the undersigned if we can clarify the above or otherwise be of further assistance.

Sincerely,



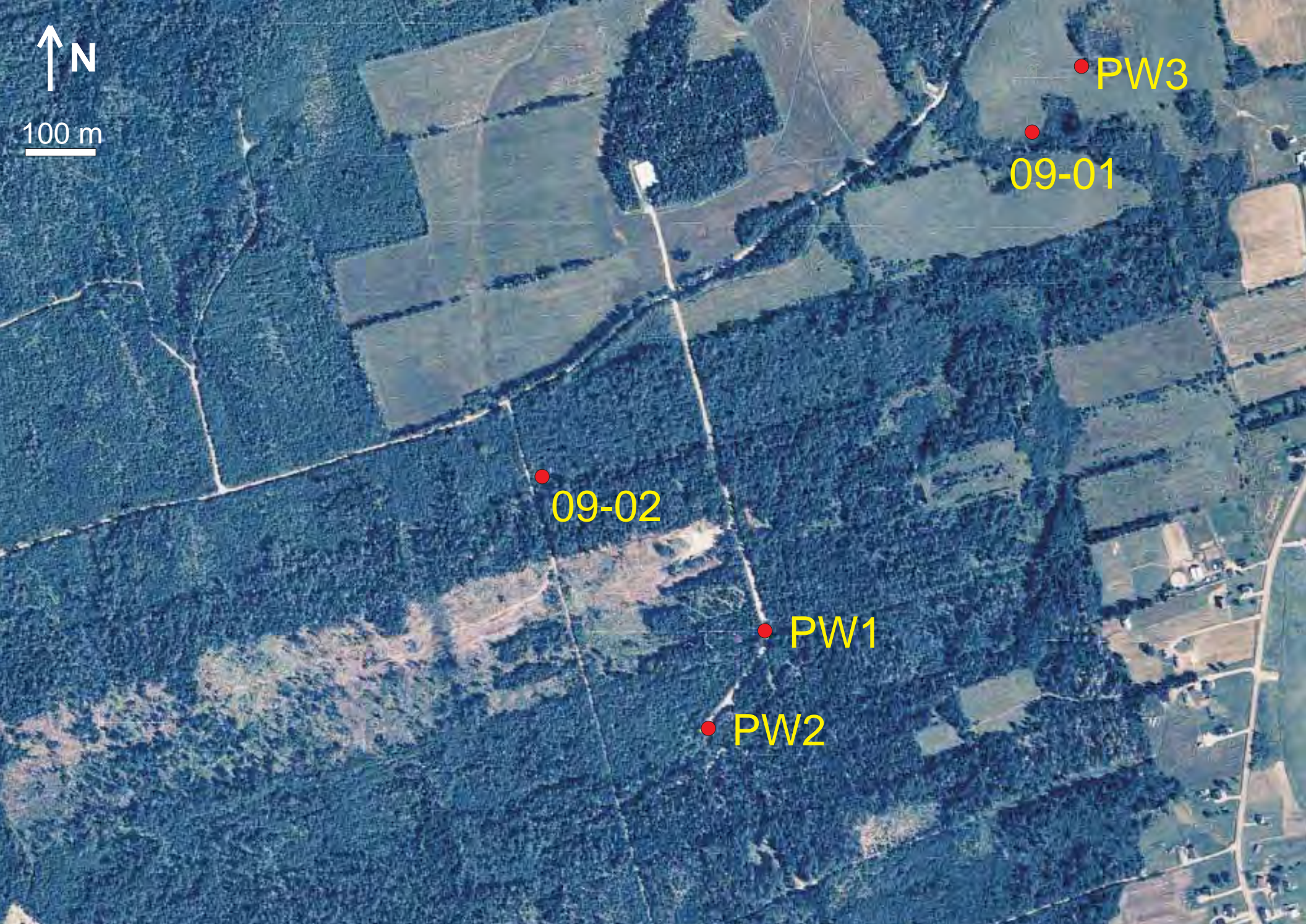
JOHN N. HART, B.Sc.
CONSULTANT HYDROGEOLOGIST



GEOFF R. E. DICKINSON, M. ENG., P. ENG., P.E.
PRINCIPAL HYDROGEOLOGIST

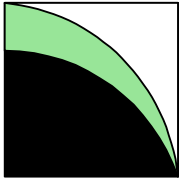


100 m



TerrAtlantic
Engineering Limited

SKETCH SHOWING APPROXIMATE LOCATIONS
OF TEST WELLS, MEMRAMCOOK, NB - OCTOBER, 2009



February 3, 2010

File: 225.03

Mr. Pierre Plourde, P. Eng.
Crandall Engineering Ltd.
1077 St. George Blvd.
Moncton, NB, E1E 4C9:

Dear Mr. Plourde:

**RE: WATER SUPPLY STUDY, TARGET AREAS
E AND A, MEMRAMCOOK, PROGRESS REPORT #5¹**

Introduction

Between January 18 and 20, 2010, test wells 10-01 and 10-02 were drilled at Target Area G in Ward 5 of East Memramcook, while well 10-03 was completed at Target Area A in Ward 2. This letter describes our findings. The drilling was undertaken by Eastern Well Drillers under the direction of TerrAtlantic Engineering personnel.

Test Well 10-01

On January 18, 2010 test well 10-01 (also known in the field as well G1) was drilled in Ward 5, East Memramcook. The location shown in Figures 1 and 2 was selected so as to at the northern extension of a 340 degree trending bedrock-controlled lineation. This orientation is very similar to a mapped fault which is present about a kilometre to the west. As shown in Figure 1, the area is mapped as Boss Point Formation bedrock, which again overlies rock of the Hopewell Cape Formation.

Prior to beginning the drilling process a sediment trap was constructed nearby using bailed straw wrapped with filter fabric. Drilling at 203 mm (8 inch) diameter proceeded. Four (4) metres of clay till overlies the bedrock which comprised quartz-pebble conglomerate of the Boss Point Formation. A 5.9 m section of steel casing was installed, without a drive shoe, to prevent the collapse of the unconsolidated till. From the bottom of the casing to 36.3 m, quartz-pebble conglomerate and grey sandstone with minor sections of brown mudstone and thin shale zones were intersected. Significant inflow of water occurred below 21 m, particularly at depths of 23, 25.7, 27.3, 29.7 and 36 m below grade. The highest yielding fractures were noted at changes in the stratigraphy, that is to say where there was a change from grey sandstone to brown mudstone. At 36 m depth the quantity of water being air-lifted from the hole was estimated at 11.3 L/s (150 igpm) and a decision was made to stop drilling and to case the hole to this depth to permit better evaluation of the deeper rock units. The contractor therefore removed the (152 mm diameter) casing, reamed the hole to 203 mm diameter and installed steel casing to 36 m, again without a drive shoe.

¹ Our January 21, 2010 report entitled "Reaming and Grouting of Replacement Well #2, (Well 08-01), Memramcook, NB" was Progress Report #4 although not labelled as such at the time.

After installing the casing, drilling continued at 152 mm (6 inch) diameter. Alternating layers of grey sandstone and/or conglomerate, grey shale and brown mudstone were intersected to a depth of 73.3 m. Significant fractures were noted at 50.6, 58.5, 67.9 and 72.7 m. The contractor estimated the amount of water being air-lifted from the hole at a depth of 51.5 m, where drilling stopped for the day, to be 11.3 L/s (150 igpm). Drilling continued on the following day a further increase in the amount of air-lifted water was noted after the 72.2 m depth. There was also a change in lithology at 75.5 m when the underlying Hopewell Cape unit was intersected. Drilling continued to 97 m with no additional major fractures being intersected. The drill hole was completed at that depth. The total yield of a sufficiently large diameter well here is estimated to be above 20 L/s based on the water return information.

A stratigraphic log of this hole is presented in Figure 3.

A water sample recovered from this well was submitted to Caduceon Environmental Laboratories for chemical analysis. The water proved to be of calcium bicarbonate type, meeting all Canadian Drinking Water Guidelines except for turbidity (1.25 NTU) and manganese (0.106 mg/L). A trace of toluene was detected, probably attributed to the pumping/drilling activity. Laboratory certificates are attached.

Test Well 10-02

Test well 10-02 (also known in the field as well G2) was drilled to a depth of 120 m (395 feet) on January 19, 2010 at the location near Breau Creek shown in Figures 1 and 2. The location was chosen so as to be on or close to the pronounced north-south trending bedrock-controlled lineation now occupied by a small stream. The steep eastern slope of this feature, and the requirement to be at least 30 m from the stream, precluded drilling as close to what may be a fractured zone in the bedrock than would have been preferred.

Following the installation of a sediment trap, drilling began at a 203 mm (8 inch) diameter. The drill intersected 3.0 m of till followed by grey pebble conglomerate. Steel casing was installed to 6.0 m and drilling continued to a depth of 54.5 m with alternating layers of grey sandstone and conglomerate, grey shale and brown mudstone/shale being intersected. Despite the significant thickness of Boss Point Formation intersected to 54 m there was very little water noted in the section, this being estimated at less than 1 L/s. On January 20 drilling continued to a depth of 119.7 m with no more water being found. The bottom part of the hole, from 54.5 to 119.7 was primarily red to brown pebble mudstone and shale. The stratigraphy is illustrated in the attached Figure 4. Following completion, the contractor was instructed to abandon the hole according to acceptable Department of Environment standards.

Test Well 10-03

Test well 10-03 (also known in the field as well A1) was drilled to a depth of 103.6 metres (340 feet) on January 20, 2010 at the location shown in Figures 1 and 2. The location was chosen so as to be within the area mapped as Boss Point Formation bedrock.

Drilling proceeded at a 150 mm (6 inch) diameter. Approximately 9 metres of sandstone and 12 metres of mudstone was underlain by 15 or so metres of sandstone and conglomerate which was in turn underlain by interlayered mudstone and conglomerate. Then followed an 24 metre sequence of grey sandstone above conglomerate and then finally, at a depth of about 73 metres, a thick sequence of mudstone and shale which extended to the end of the hole. The stratigraphy is illustrated in the attached Figure 5.

None of the section was particularly productive, and the well yielded less than 1.5 L/s (20 igpm) at full depth.

It is understood that the property owner wishes to utilize this well at some point in the future and it was therefore not decommissioned. It should be noted, however, that this was a test well only, with no casing shoe utilized.

Recommendations

- Drill a test well (G3) within 9 metres (30 feet) or so of 10-01 following the same procedure as adopted for 10-01 but to a depth of 68.5 m (225 feet).
- Convert the least productive of these wells (i.e. 10-01 or G3) into an observation well by: (a) pulling out the 203 mm casing and installing two 50 mm diameter stand-pipes, one screened in the upper part of the well (from say 27.5 to 38.0 metres) and the other screened in the lower part of the well (from say 45.5 metres to the bottom of the hole).
- Enlarge the most productive of the two wells to 254 mm (10-inch) diameter for its complete depth, with the casing length and grouting details to be established later.
- Conduct a 72 hour constant rate pumping test to establish the long-term sustainable yield when recharge to the aquifer is at a minimum.
- Drill at least one exploratory well in Target Area B (at the Ward 1/2 boundary) to establish the potential there.

Closure

Please contact either of the undersigned if we can clarify the above. We will otherwise await your instructions.

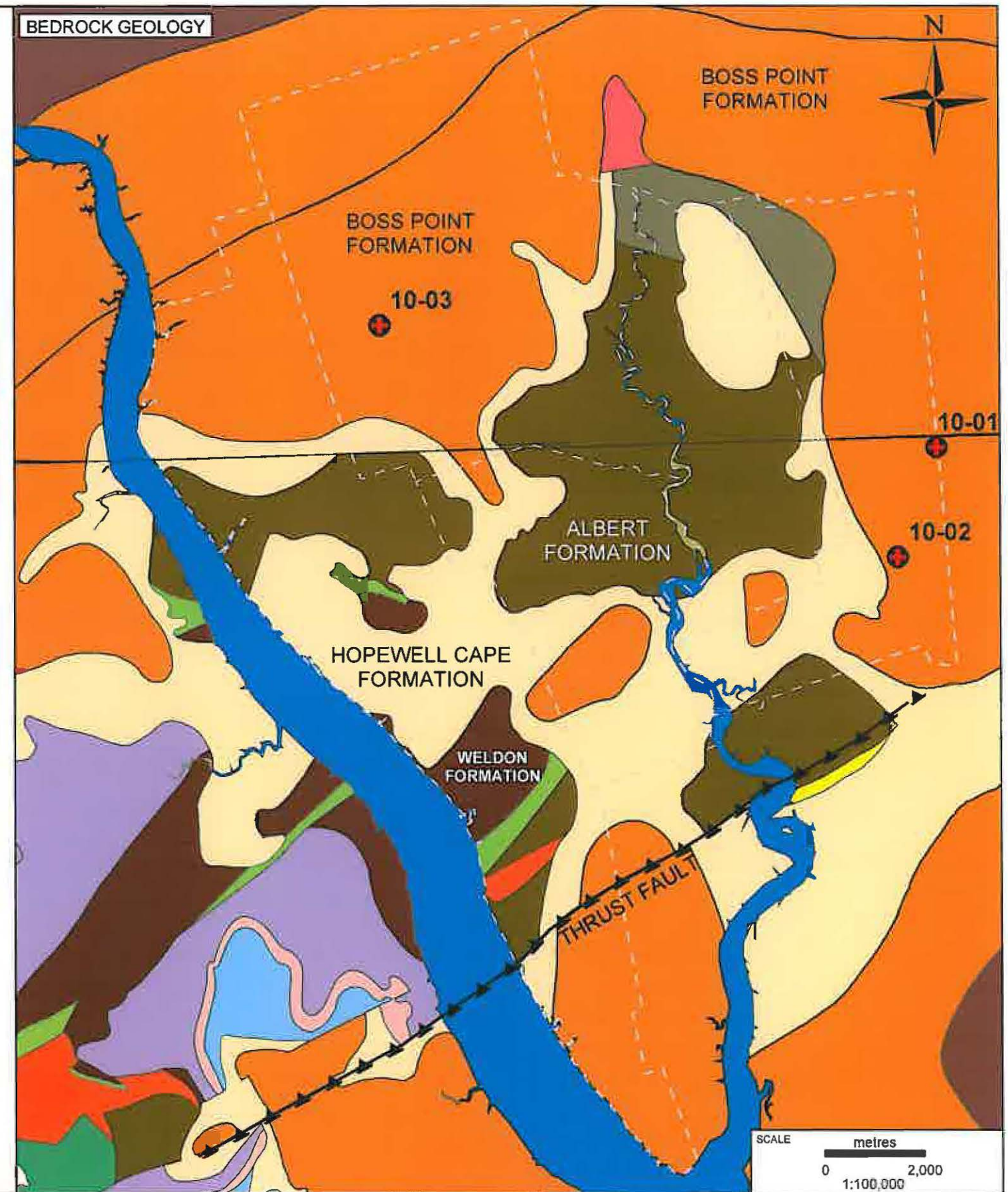
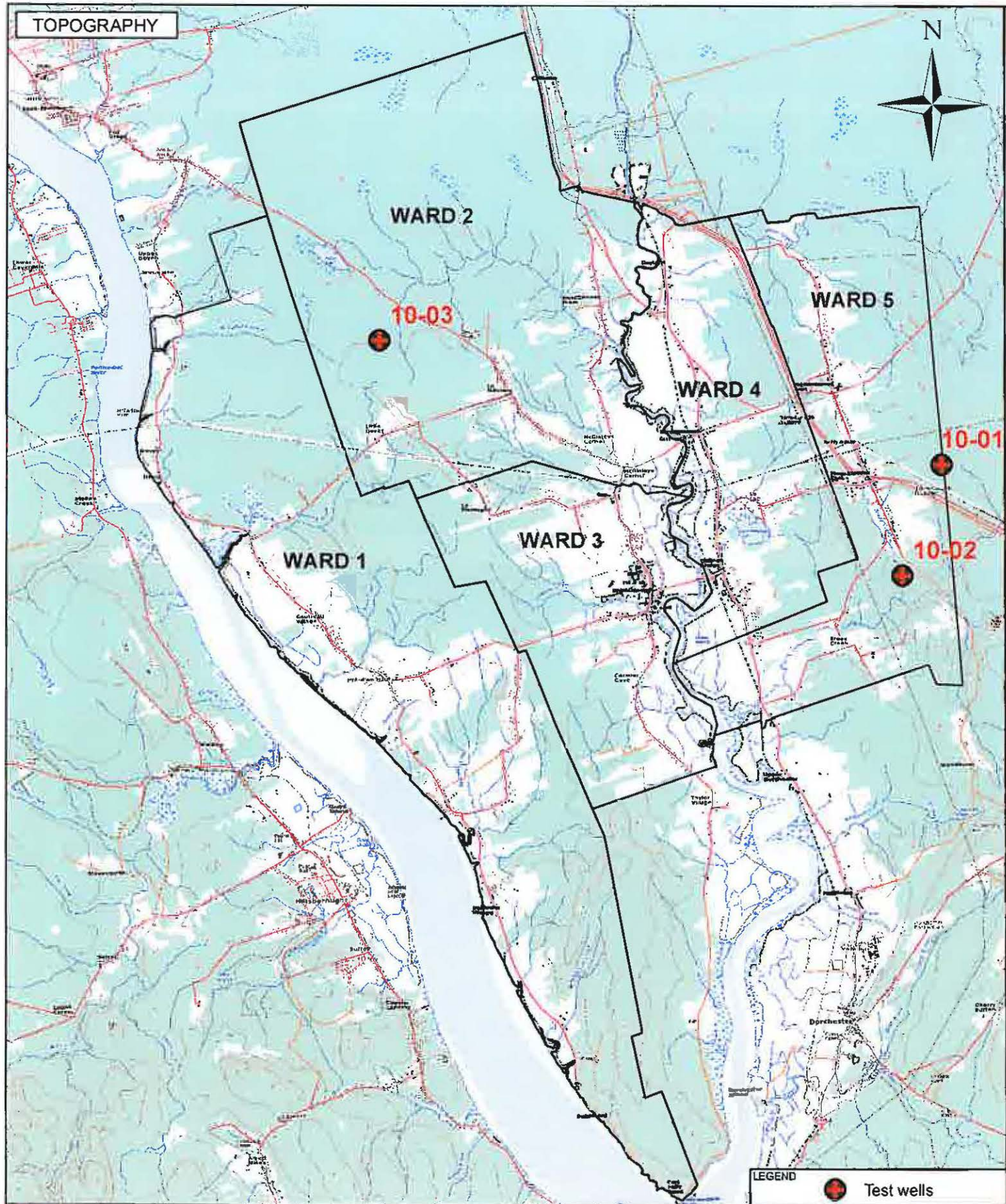
Sincerely,



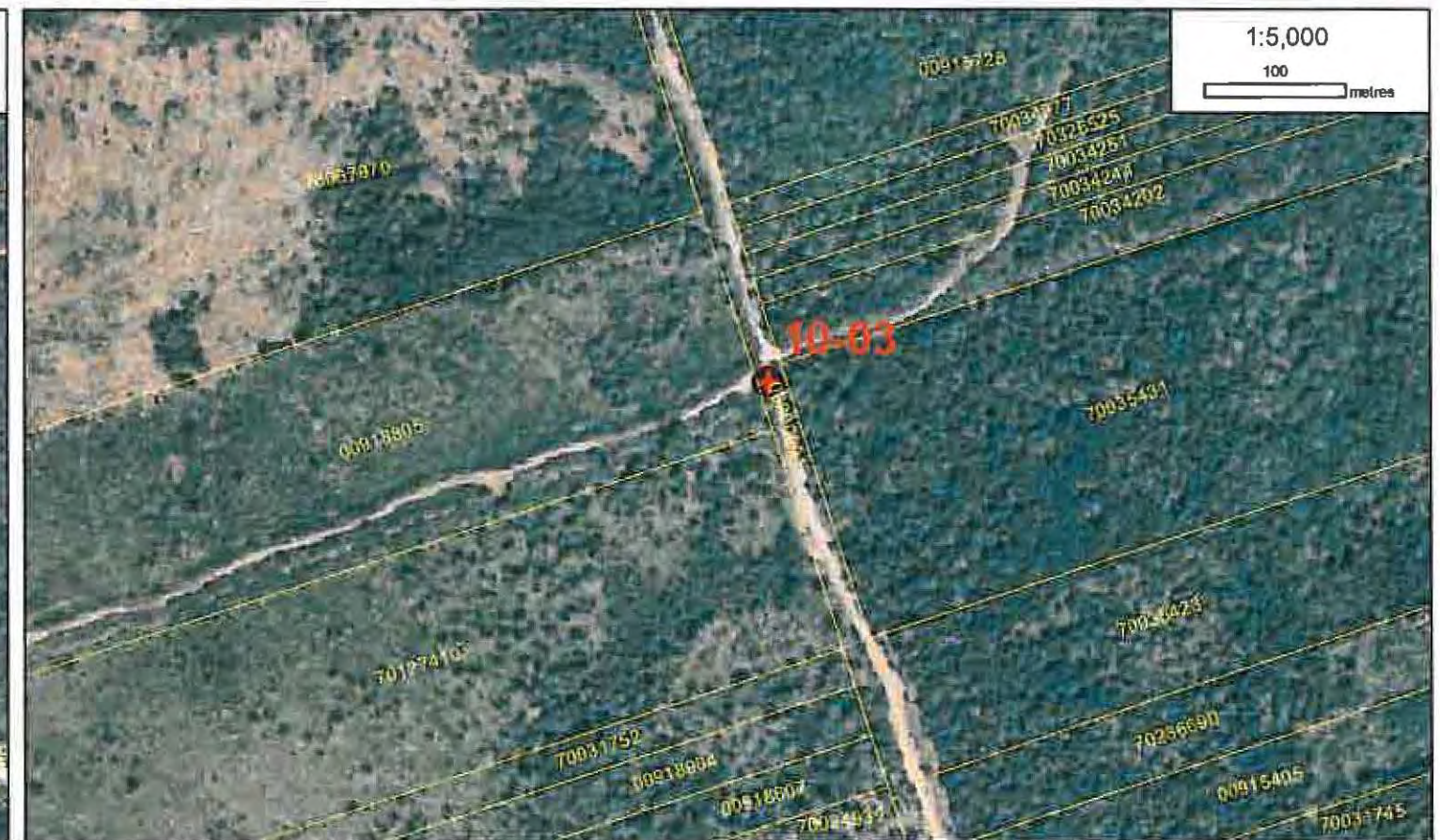
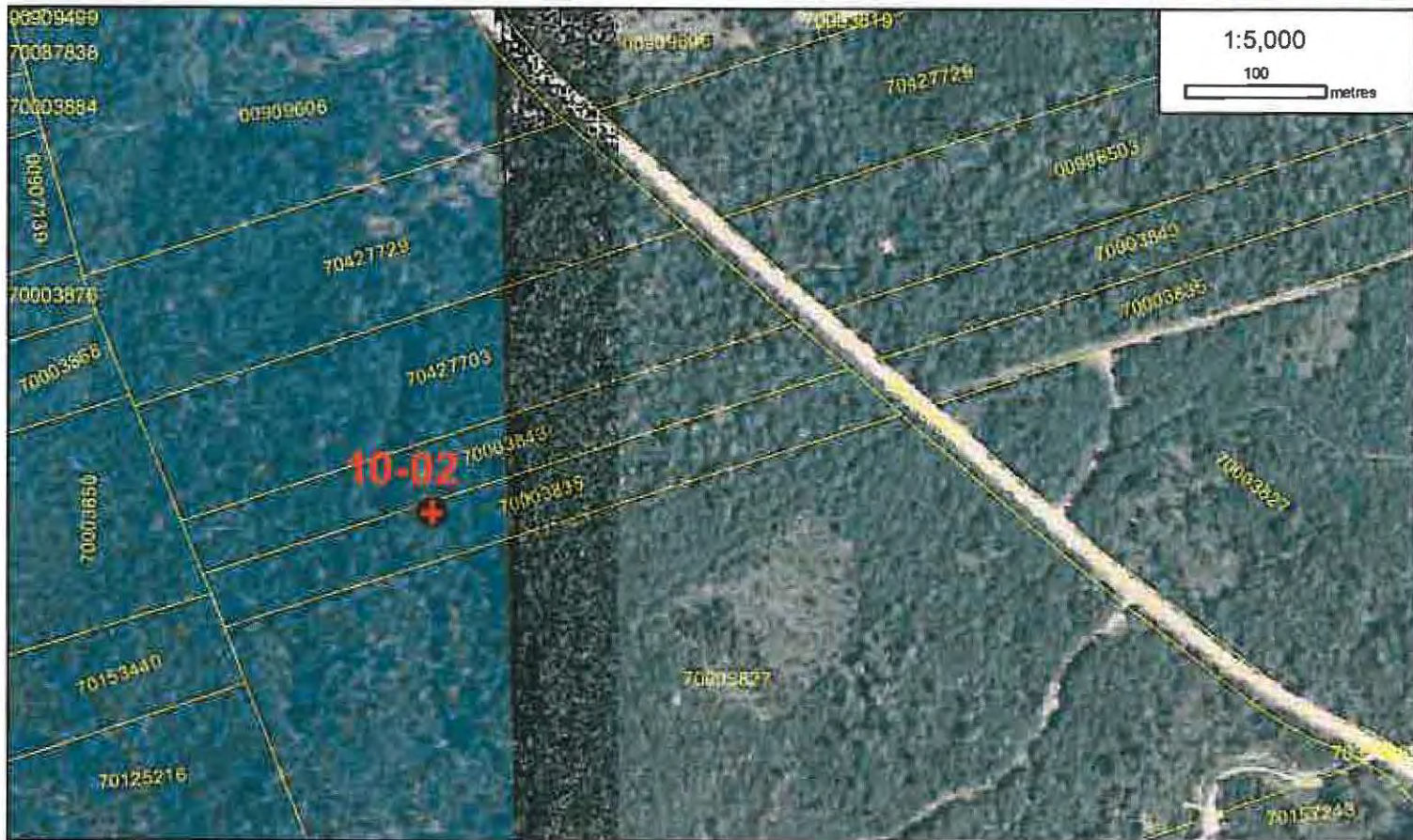
JOHN N. HART, B.Sc.
CONSULTANT HYDROGEOLOGIST




GEOFF R. E. DICKINSON, M. ENG., P. ENG., P.E.
PRINCIPAL HYDROGEOLOGIST



	PROJECT	WATER SUPPLY INVESTIGATION MEMRAMCOOK, NB	DRAWING	WELLS 10-01, 10-02 and 10-03 WITH TOPOGRAPHY AND GEOLOGY	DATE	FEBRUARY, 2010	SHEET	FIGURE 1
					PROJECT NO	225.03	DRAWING NO	22503008

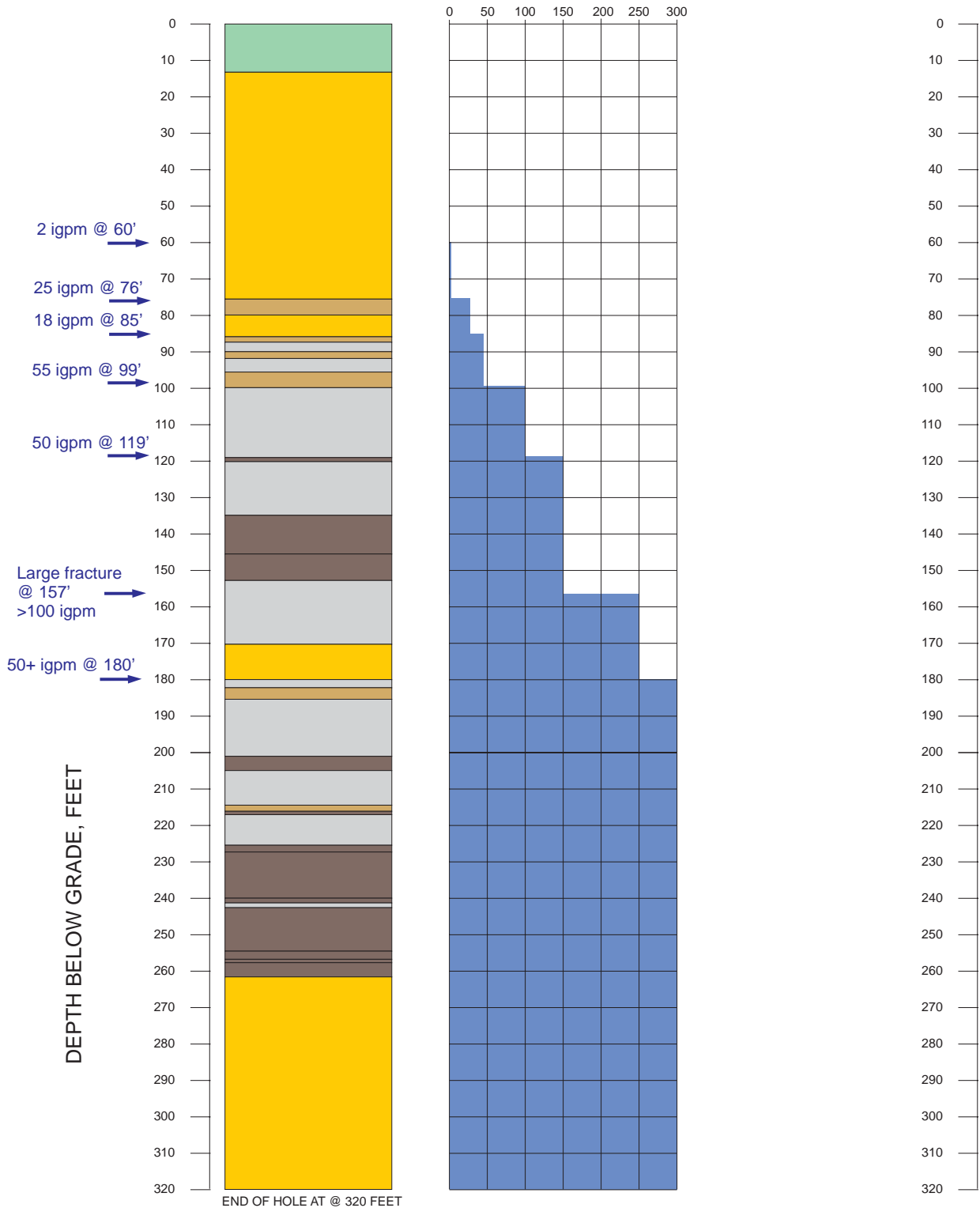


 TerrAtlantic Engineering Limited	PROJECT	WATER SUPPLY INVESTIGATION MEMRAMCOOK, NB	DRAWING	LOCATIONS OF TEST WELLS 10-01, 10-02 AND 10-03	DATE	FEBRUARY, 1010	SHEET	FIGURE 2
					PROJECT NO.	225.03	DRAWING NO.	22503009

ESTIMATED WATER INFLOW, igpm

ESTIMATED WATER RETURN, igpm

WELL 10-01 (G1)



NOTE: Stopped at 120 feet, reamed out the hole to 8 inch diameter and cased to 120 feet, sealing off upper unit. Then drilled at 8 inch diameter from 120 to 320 feet. Yield below 120 feet is rough estimate only.



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Legend:

- OVERBURDEN
- GREY SANDSTONE
- BROWN SANDSTONE
- SANDSTONE / CONGLOMERATE
- MUDSTONE / SHALE

WATER BEARING FRACTURE →

COAL FRAGMENTS ↘

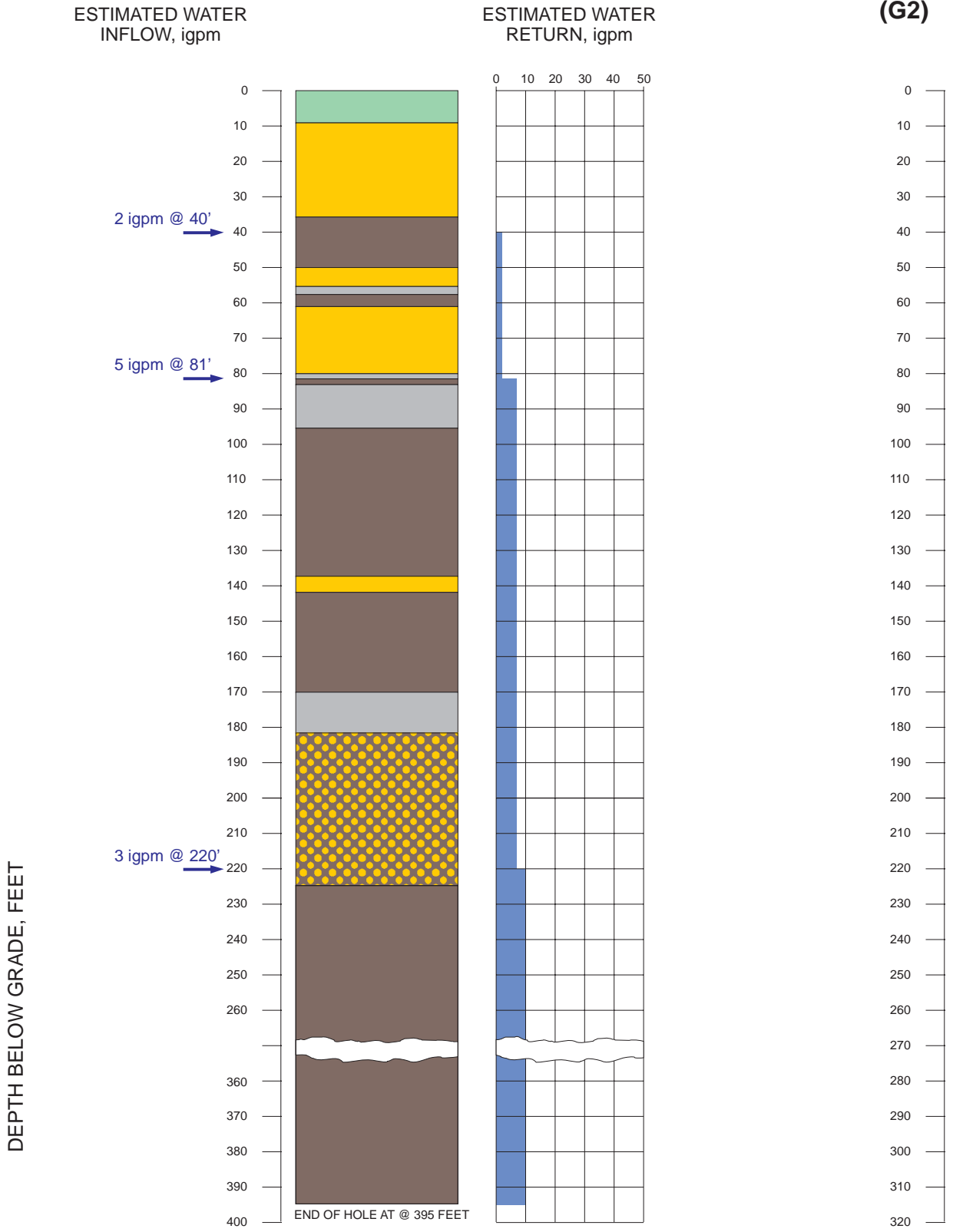
Project: TEST WELL 10-01 (G1)
MEMRAMCOOK, NB

Drawing: FIGURE 3 - WELL DETAILS

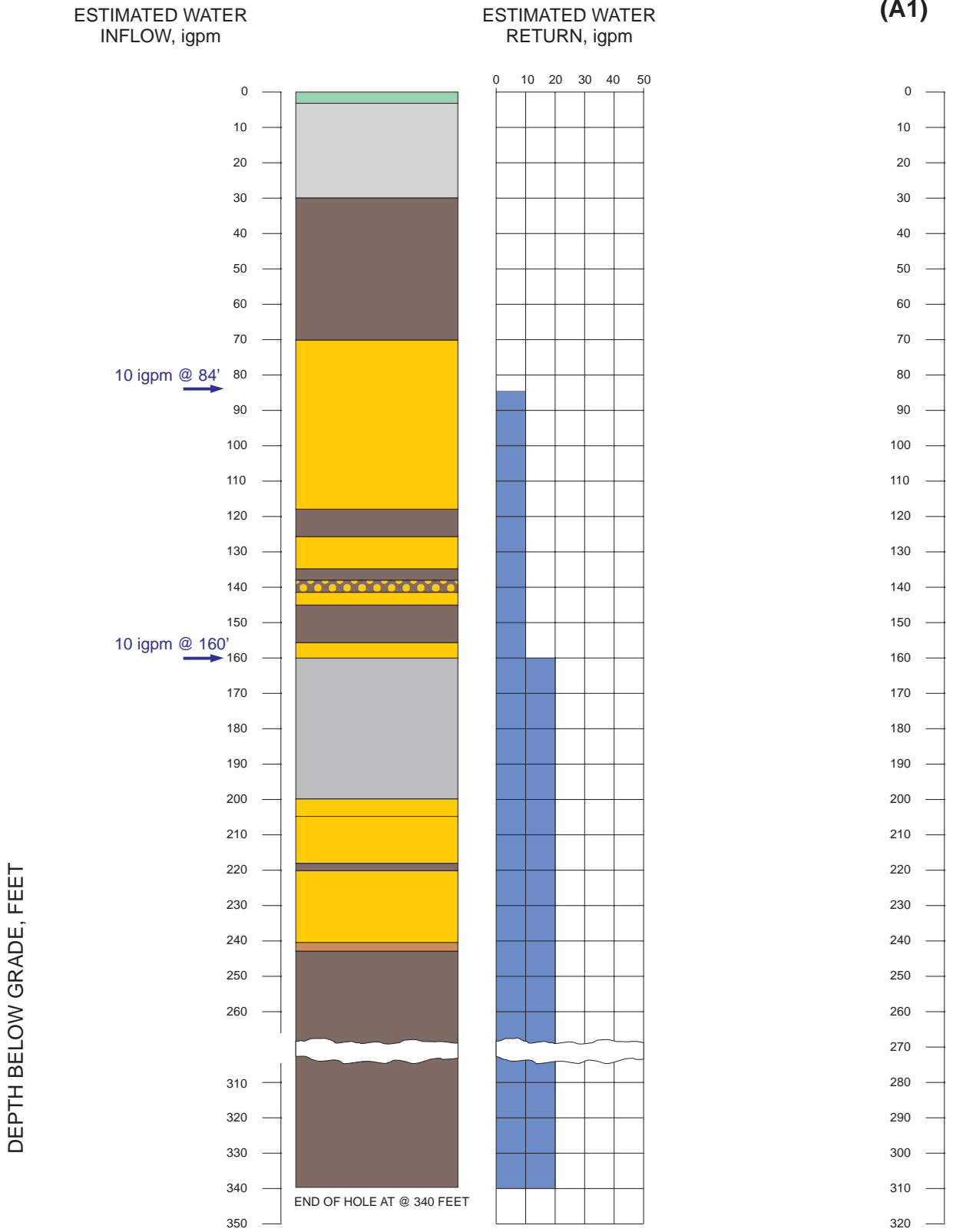
Drawn By: AD

Date: 225.03
FEBRUARY, 2010

**WELL 10-02
(G2)**



WELL 10-03 (A1)



C.O.C.: M19629

REPORT No. B10-01782 (i)

Report To:

Eastern Well Drillers Ltd.
 814 Ohio Road P.O. Box 5102
 Shediac, NB, E4P 8T8

Attention: Val LeBlanc

Caduceon Environmental Laboratories

150 Lutz Street
 Moncton, New Brunswick, E1C 5E9
 Tel: 506-855-6472
 Fax: 506-855-8294

DATE RECEIVED: 20-Jan-10

JOB/PROJECT NO.: Village of Memramcook

DATE REPORTED: 26-Jan-10

P.O. NUMBER: NBP-TH-2010

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Client I.D.:	New Well
Sample I.D.:	B10-01782-1
Date Collected:	20-Jan-10

Parameter	Units	M.D.L.	Reference Method	Date/Site Analyzed	CDWG Guideline			
pH	pH Units		SM4300H+	22-Jan-10/M	6.5-8.5	8.05		
Conductivity	µmho/cm	2	SM2513	22-Jan-10/M		270		
Alkalinity (as CaCO3)	mg/L	3	SM 2320	22-Jan-10/M		112		
Ammonia (N)-Total	mg/L	0.01	EPA 350.2	21-Jan-10/O		< 0.01		
Carbonate (as CaCO3)	mg/L	3	SM 2320	22-Jan-10/M		< 3		
Bicarbonate(as CaCO3)	mg/L	3	SM 2320	22-Jan-10/M		112		
Turbidity	NTU	0.05	SM2130B	22-Jan-10/M	1.0	1.25		
Colour	TCU	2	SM 2120C	22-Jan-10/M	15	< 2		
Hydrogen Sulphide	mg/L	0.01	SM4500-S2	22-Jan-10/K	0.05	< 0.01		
o-Phosphate (PO4)	mg/L	0.03	SM 4500	22-Jan-10/M		0.03		
Total Kjeldahl Nitrogen	mg/L	0.05	EPA 351.2	25-Jan-10/O		< 0.05		
Phosphorus-Total	mg/L	0.01	EPA 365.4	25-Jan-10/O		< 0.01		
Fluoride	mg/L	0.1	EPA 300.0	21-Jan-10/O	1.5	0.2		
Nitrite (N)	mg/L	0.1	EPA 300.0	21-Jan-10/O	1	< 0.1		
Nitrate (N)	mg/L	0.1	EPA 300.0	21-Jan-10/O	10	< 0.1		
Bromide	mg/L	0.4	EPA 300.0	21-Jan-10/O		< 0.4		
Chloride	mg/L	0.5	EPA 300.0	21-Jan-10/O	250	2.8		
Sulphate	mg/L	1	EPA 300.0	21-Jan-10/O	500	18		
Hardness (as CaCO3)	mg/L	1	SM 3120	21-Jan-10/O	200	107		
Calcium	mg/L	0.02	SM 3120	21-Jan-10/O		36.1		
Magnesium	mg/L	0.01	SM 3120	21-Jan-10/O		4.11		
Sodium	mg/L	0.2	SM 3120	21-Jan-10/O	200	10.3		
Potassium	mg/L	0.1	SM 3120	21-Jan-10/O		1.4		
Aluminum	mg/L	0.01	SM 3120	21-Jan-10/O	0.1-0.2	0.04		
Barium	mg/L	0.001	SM 3120	21-Jan-10/O	1.0	0.066		
Boron	mg/L	0.005	SM 3120	21-Jan-10/O	5.0	0.030		
Chromium	mg/L	0.002	SM 3120	21-Jan-10/O	0.05	< 0.002		
Copper	mg/L	0.002	SM 3120	21-Jan-10/O	1.0	< 0.002		

CDWG = Canadian Drinking Water Guidelines



Michael Lawlor
 Lab Manager

M.D.L. = Method Detection Limit

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,P-Peterborough,M-Moncton

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

C.O.C.: M19629

REPORT No. B10-01782 (i)

Report To:

Eastern Well Drillers Ltd.
 814 Ohio Road P.O. Box 5102
 Shediac, NB, E4P 8T8

Attention: Val LeBlanc

Caduceon Environmental Laboratories

150 Lutz Street
 Moncton, New Brunswick, E1C 5E9
 Tel: 506-855-6472
 Fax: 506-855-8294

DATE RECEIVED: 20-Jan-10

JOB/PROJECT NO.: Village of Memramcook

DATE REPORTED: 26-Jan-10

P.O. NUMBER: NBP-TH-2010

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Client I.D.:	New Well
Sample I.D.:	B10-01782-1
Date Collected:	20-Jan-10

Parameter	Units	M.D.L.	Reference Method	Date/Site Analyzed	CDWG Guideline			
Iron	mg/L	0.005	SM 3120	21-Jan-10/O	0.3	0.033		
Manganese	mg/L	0.001	SM 3120	21-Jan-10/O	0.05	0.106		
Silica	mg/L	0.02	SM 3120	21-Jan-10/O		9.57		
Zinc	mg/L	0.005	SM 3120	21-Jan-10/O	5.0	< 0.005		
Mercury	mg/L	0.00002	SM 3112	22-Jan-10/O	0.001	0.00011		
Antimony	mg/L	0.0001	EPA 200.8	22-Jan-10/O	0.006	0.0020		
Arsenic	mg/L	0.0001	EPA 200.8	22-Jan-10/O	0.010	0.0065		
Cadmium	mg/L	0.00002	EPA 200.8	22-Jan-10/O	0.005	< 0.00002		
Lead	mg/L	0.00002	EPA 200.8	22-Jan-10/O	0.010	0.00025		
Selenium	mg/L	0.0002	EPA 200.8	22-Jan-10/O	0.01	0.0004		
Thallium	mg/L	0.00005	EPA 200.8	22-Jan-10/O		< 0.00005		
Uranium	mg/L	0.00005	EPA 200.8	22-Jan-10/O	0.02	0.00099		
Anion Sum	meq/L		Calc.	21-Jan-10/O		2.70		
Cation Sum	meq/L		Calc.	21-Jan-10/O		2.63		
% Difference	%		Calc.	21-Jan-10/O		1.39		
Ion Ratio	AS/CS		Calc.	21-Jan-10/O		1.03		
Sodium Adsorption Ratio	-		Calc.	21-Jan-10/O		0.432		
TDS(ion sum calc.)	mg/L		Calc.	21-Jan-10/O	500	140		
Conductivity (calc.)	µmho/cm		Calc.	21-Jan-10/O		260		
TDS(calc.)/EC(actual)	-		Calc.	21-Jan-10/O		0.519		
EC(calc.)/EC(actual)	-		Calc.	21-Jan-10/O		0.962		
Langelier Index(25°C)	S.I.		Calc.	21-Jan-10/O		0.264		

CDWG = Canadian Drinking Water Guidelines



Michael Lawlor
 Lab Manager

M.D.L. = Method Detection Limit
 Site Analyzed=K-Kingston, W-Windsor, O-Ottawa, P-Peterborough, M-Moncton

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

C.O.C.: M19629

REPORT No. B10-01782 (ii)

Report To:

Eastern Well Drillers Ltd.
 814 Ohio Road P.O. Box 5102
 Shediac, NB, E4P 8T8

Attention: Val LeBlanc

Caduceon Environmental Laboratories

150 Lutz Street
 Moncton, New Brunswick, E1C 5E9
 Tel: 506-855-6472
 Fax: 506-855-8294

DATE RECEIVED: 20-Jan-10

JOB/PROJECT NO.: Village of Memramcook

DATE REPORTED: 26-Jan-10

P.O. NUMBER: NBP-TH-2010

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Client I.D.:	New Well
Sample I.D.:	B10-01782-1
Date Collected:	20-Jan-10

Parameter	Units	M.D.L.	Reference Method	Date/Site Analyzed	CDWG Guideline			
Total Organic Carbon	mg/L	0.2	EPA 415.1	22-Jan-10/O		0.3		
Benzene	µg/L	0.5	EPA 8260	22-Jan-10/O	5	< 0.5		
Carbon Tetrachloride	µg/L	0.2	EPA 8260	22-Jan-10/O	5	< 0.2		
Dichlorobenzene, 1,2-	µg/L	0.1	EPA 8260	22-Jan-10/O	200	< 0.1		
Dichlorobenzene, 1,4-	µg/L	0.2	EPA 8260	22-Jan-10/O	5	< 0.2		
Dichloroethane, 1,2-	µg/L	0.1	EPA 8260	22-Jan-10/O	2	< 0.1		
Ethylbenzene	µg/L	0.5	EPA 8260	22-Jan-10/O	2.4	< 0.5		
Dichloromethane (Methylene Chloride)	µg/L	0.3	EPA 8260	22-Jan-10/O	50	< 0.3		
Tetrachloroethylene	µg/L	0.2	EPA 8260	22-Jan-10/O	30	< 0.2		
Xylene, m,p,o-	µg/L	2	EPA 8260	22-Jan-10/O	300	< 2		
Toluene	µg/L	0.5	EPA 8260	22-Jan-10/O	24	1.2		
Trichloroethylene	µg/L	0.1	EPA 8260	22-Jan-10/O	5	< 0.1		
Vinyl Chloride	µg/L	0.2	EPA 8260	22-Jan-10/O	2	< 0.2		
Chloroform	µg/L	0.3	EPA 8260	22-Jan-10/O		< 0.3		
Bromodichloromethane	µg/L	0.1	EPA 8260	22-Jan-10/O	16	< 0.1		
Dibromochloromethane	µg/L	0.1	EPA 8260	22-Jan-10/O		< 0.1		
Bromoform	µg/L	0.1	EPA 8260	22-Jan-10/O		< 0.1		
Benzo(a)pyrene	µg/L	0.005	EPA 8270	21-Jan-10/K	0.01	< 0.005		
Pentachlorophenol	µg/L	0.1	EPA 8270	21-Jan-10/K	60	< 0.1		
Toluene-d8 (SS)	%	10	EPA 8260	22-Jan-10/O		100		
Bromofluorobenzene,4(SS)	%	10	EPA 8260	22-Jan-10/O		103		
Dichloroethane-d4,1,2-(SS)	%	10	EPA 8260	22-Jan-10/O		108		

1 (SS) = Surrogate Spike Recovery

CDWG = Canadian Drinking Water Guidelines



Michael Lawlor
 Lab Manager

M.D.L. = Method Detection Limit
 Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,P-Peterborough,M-Moncton

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

C.O.C.: M19629

REPORT No. B10-01787

Report To:

Eastern Well Drillers Ltd.
 814 Ohio Road P.O. Box 5102
 Shediac, NB, E4P 8T8

Attention: Val LeBlanc

Caduceon Environmental Laboratories

150 Lutz Street
 Moncton, New Brunswick, E1C 5E9
 Tel: 506-855-6472
 Fax: 506-855-8294

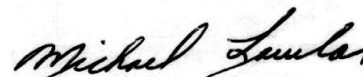
DATE RECEIVED: 20-Jan-10
 DATE REPORTED: 26-Jan-10
 SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Village of Memramcook
 P.O. NUMBER: NBP-TH-2010
 WATERWORKS NO.

Client I.D.:	New Well			
Sample I.D.:	B10-01787-1			
Date Collected:	20-Jan-10			

Parameter	Units	M.D.L.	Reference Method	Date/Site Analyzed				
Benzene	mg/L	0.0005	EPA 8260	22-Jan-10/O	< 0.0005			
Toluene	mg/L	0.0005	EPA 8260	22-Jan-10/O	0.0014			
Ethylbenzene	mg/L	0.0005	EPA 8260	22-Jan-10/O	< 0.0005			
Xylene, m,p,o-	mg/L	0.002	EPA 8260	22-Jan-10/O	< 0.002			
C6-C10 (less BTEX)	mg/L	0.05	RBCA Tier 1	22-Jan-10/M	< 0.05			
Comment-purgeable	-		-	22-Jan-10	-			
>C10-C21	mg/L	0.05	RBCA Tier 1	21-Jan-10/M	< 0.05			
>C21-C32	mg/L	0.1	RBCA Tier 1	21-Jan-10/M	< 0.1			
Comment-extractable	-		-	21-Jan-10	-			
M-TPH (Tier 1)	mg/L	0.1	RBCA Tier 1	26-Jan-10/M	< 0.1			
Dichloroethane-d4,1,2-(SS)	%	10	EPA 8260	22-Jan-10/O	106			
Toluene-d8 (SS)	%	10	EPA 8260	22-Jan-10/O	101			
Bromofluorobenzene,4(SS)	%	10	EPA 8260	22-Jan-10/O	104			

- (SS) = Surrogate Spike Recovery
- EPA 8260 method for BTEX conforms to RBCA Tier 1 requirements
- M-TPH = RBCA Tier 1 Modified TPH, Summation of C6-C10, C10-C21, C21-C32 (less BTEX)



Michael Lawlor
 Lab Manager

M.D.L. = Method Detection Limit
 Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,P-Peterborough,M-Moncton

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.



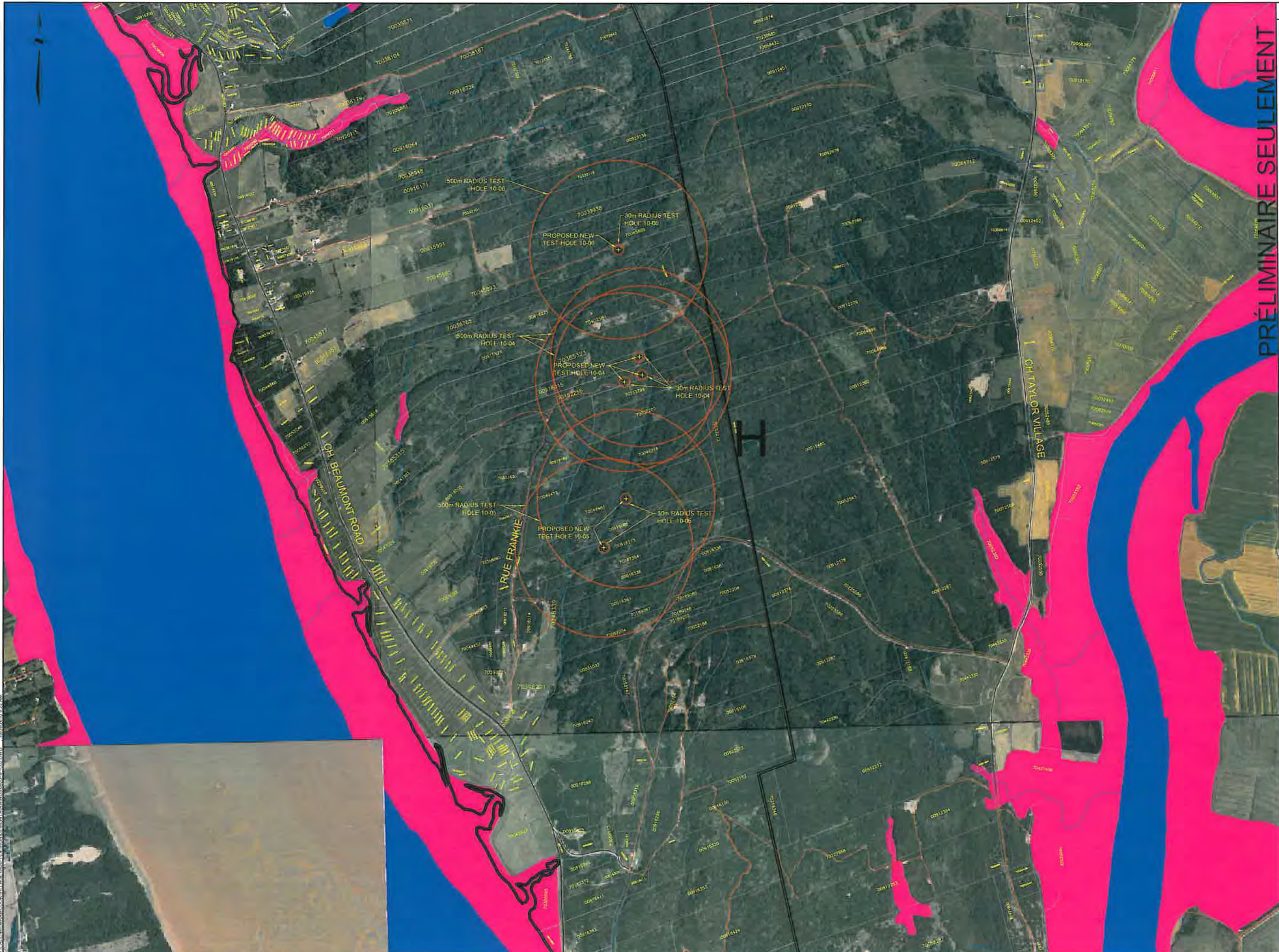
**Appendix B - Drawing 0820-1P-C09-C010 Crandall Engineering Ltd.
Progress Reports #6 - TerrAtlantic Engineering Ltd.**



Crandall Engineering Ltd.
1077 boul. St. George Blvd.
Suite 400
Moncton, NB Canada E1E 4C9
Tel: (506) 857-2777
Fax: (506) 857-2753

133 Prince William St.
Suite 703
Saint John, NB E2L 2B5
Tel: (506) 693-5893
Fax: (506) 693-3250

CRANDALLENGINEERING.CA



PRÉLIMINAIRE SEULEMENT

NOTES		
LÉGENDE GÉNÉRALE		
QUARTIERS		—
TUYAUTERIE EXISTANTE D'EAU POTABLE		—
ROUTES DU MDT		—
ROUTES DU MDE		—
VOIE FERRÉE		—
LIGNES DE PROPRIÉTÉ		—
LIGNES DE TRANSMISSION		—
MASSES D'EAU / COURS D'EAU		—
TERRAINS MARÉCAGEUX		—

02	04/19/2010	NOUVEAU SITE DE FORAGE	GMG
01	07/05/2009	POUR RAPPORT DE DESIGN	LDS
NO.	DATE	REVISIONS	BY



PROJECT TITLE

**SYSTÈME D'EAU POTABLE:
PROJECTION SUR 30 ANS**

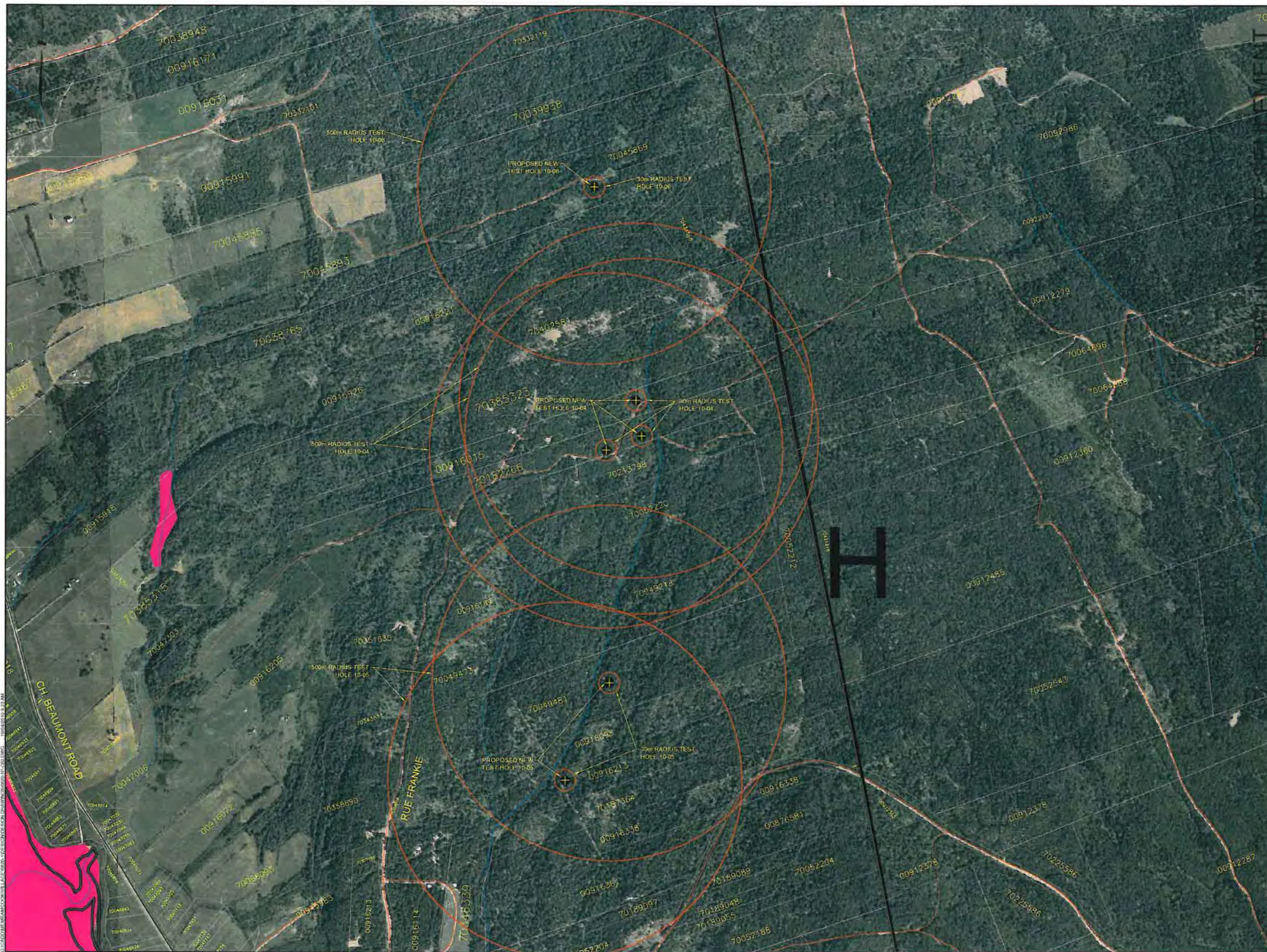
MEMRAMCOOK N-B.

DRAWING TITLE

**CIBLES DE FORAGE
H
(QUARTIER 1)**

Scale	100m 0 200m	Drawn By	GMG
Date	8 MARS 2009	Checked By	P.P.
Approved For Issue		File Name	0820-1P-C02.DWG
Drawing No.	0820-1P-C10	Sheet	10 of 10
		Rev.	02

C:\SAC\LOCAL\MEMRAMCOOK\0820-1P-C02.DWG - LITE SCREEN SHOT (RAW) 08/03/09 8:22 AM



NOTES

LÉGENDE GÉNÉRALE

- QUARTIERS
- TUYAUTERIE EXISTANTE D'EAU POTABLE
- ROUTES DU MDT
- ROUTES DU MDE
- VOIE FERRÉE
- LIGNES DE PROPRIÉTÉ
- LIGNES DE TRANSMISSION
- MASSES D'EAU / COURS D'EAU
- TERRAINS MARÉCAGEUX

02	04/19/2010	NOUVEAU SITE DE FORAGE	GMG
01	07/05/2009	POUR RAPPORT DE DESIGN	LDS
NO.	DATE	REVISIONS	BY



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PROJECT TITLE

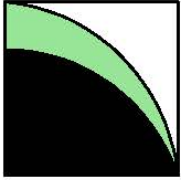
**SYSTÈME D'EAU POTABLE:
PROJECTION SUR 30 ANS**

MEMRAMCOOK N-B.

DRAWING TITLE

**CIBLES DE FORAGE
H
(QUARTIER 1)**

Scale 0 50m 100m	Drawn By GMG
Date 8 MARS 2009	Checked By P.P.
Approved For Issue	File Name 0820-1P-C02.DWG
Drawing No. 0820-1P-C09	Sheet 9 of 10 Rev. 02



February 23, 2010

File: 225.03

Mr. Pierre Plourde, P. Eng.
Crandall Engineering Ltd.
1077 St. George Blvd.
Moncton, NB, E1E 4C9:

Dear Mr. Plourde:

RE: WATER SUPPLY STUDY, TARGET AREA H, MEMRAMCOOK, PROGRESS REPORT #6

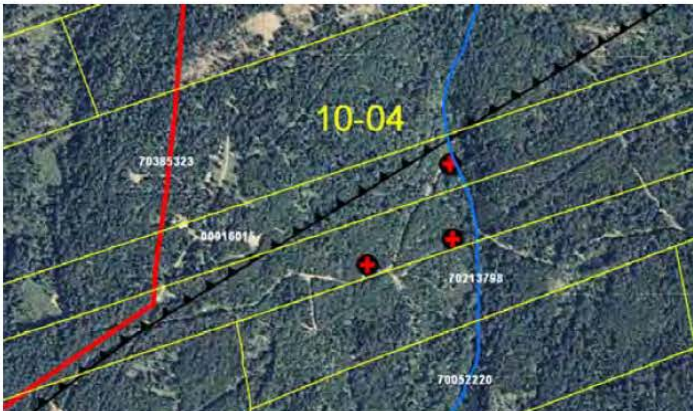
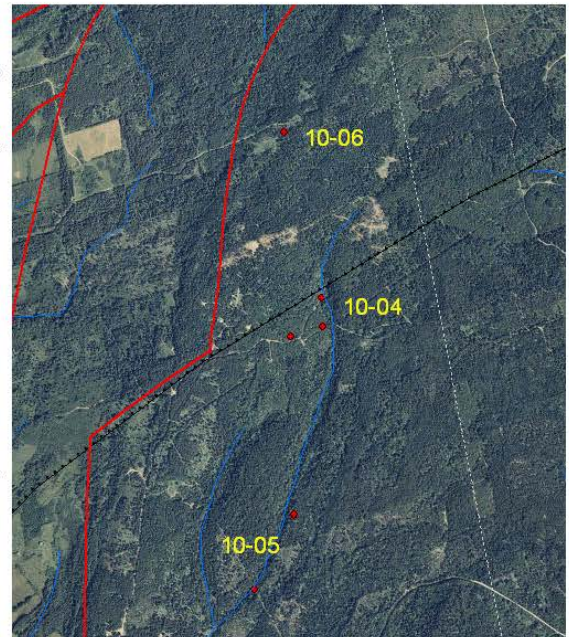
Introduction

As requested, we have looked at some alternative well sites for Ward 1. Since the alternate area is 12 kilometres away from the other Ward 1 target (Area B) we have renamed this one Area H.

Well sites in three sub-areas have been identified as follows:

Well 10-04 - Preferred

Three possible locations for Well 10-04 have been identified (red crosses on the sketches). This sub-area is located within Boss Point Formation rock at the intersection between north-northeastern trending stream-occupied lineations and the major (basement) thrust fault (see black graphic on the sketches).



Two properties are involved The northern one (PID 00916015) is a 10.65 hectare wood lot owned by [REDACTED]

The southern one, (PID 70182266) is an 11.27 hectare wood lot owned by [REDACTED]

Access seems to reasonable but this will have to be verified.

Well 10-05 - Less preferred

Two well sites are identified on the sketches, but Well 10-05 could be located at either of those locations or somewhere in between. The subarea has been selected within Boss Point Formation rock on one of

the previously noted north-northeastern trending stream-occupied lineations.

Three properties are involved. The northern one (PID 70049481) is a 19.6 hectare property owned by [REDACTED]. The middle one (PID 00916098) is a 11.33 hectare wood lot owned by [REDACTED]. The southern one, (PID 00916213) is a 15.36 hectare wood lot owned by [REDACTED].

Access may be relatively difficult but this will have to be verified.

Well 10-06 - Least preferred

A single well site is identified on the sketches, but Well 10-06 could be located on the neighbouring properties to the north or south. The subarea has been selected within Boss Point Formation rock in line with two north-northeastern trending lineations.

Three properties are involved. The northern one (PID 70045869) is a 3.24 hectare property owned by [REDACTED]. The middle one (PID 70045893) is a 29.14 hectare wood lot owned by [REDACTED]. The southern one, (PID 70038765) is a 19.51 property owned by [REDACTED].

Access appears to be reasonable but this will have to be verified.

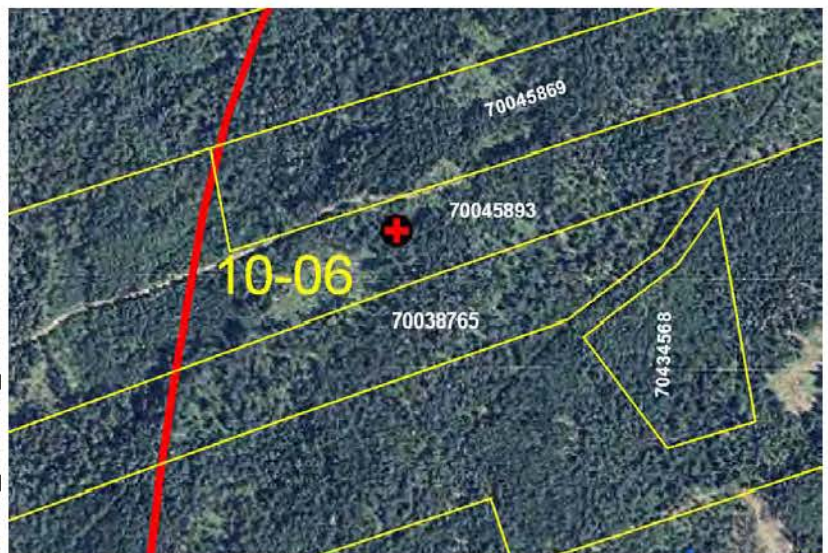
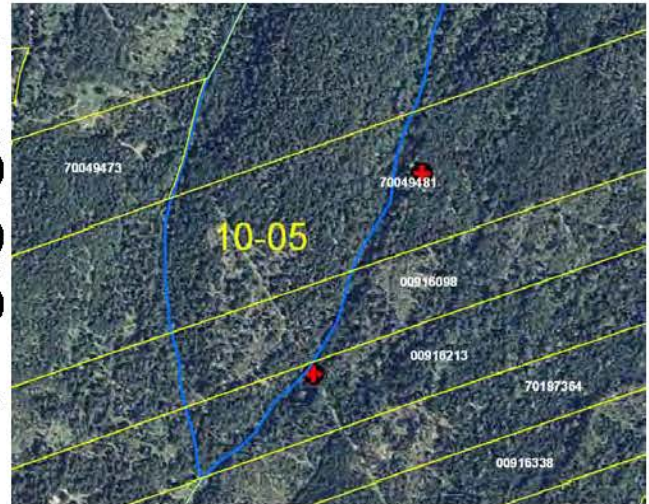
Closure

Please contact either of the undersigned if we can clarify the above. We will otherwise await your instructions.

Sincerely,



JOHN N. HART, B.Sc.
CONSULTANT HYDROGEOLOGIST



GEOFF R. E. DICKINSON, M. ENG., P. ENG.
PRINCIPAL HYDROGEOLOGIST