

Appendix F – Laboratory Analytical Certificates



Report ID: 141857-MB
Report Date: 30-Aug-12
Date Received: 29-Aug-12

CERTIFICATE OF ANALYSIS

for
exp Services Inc
40 Henri Dunant Street
Moncton, NB E1E 1E5

rpc

150 Lutz St
Moncton NB
Canada E1C 5E9
Tel: 506.855.6472
Fax: 506.855.8294
www.rpc.ca

Attention: Annie Power

Project/Job #: MON-00203023-AO

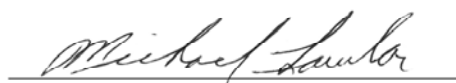
Location: Memramcook

Examination of Water

RPC Sample ID:				141857-1
Client Sample ID:				PW-01 21 hrs
Date Sampled:				28-Aug-12
Analytes	Method ID	Date Analyzed	Units	
Total Coliforms	MB02	29-Aug-12	cfu/100mL	0
E. coli	MB02	29-Aug-12	cfu/100mL	0

This report relates only to the sample(s) and information provided to the laboratory.

RL = Reporting Limit



Michael Lawlor
Lab Supervisor
Moncton Laboratory



Nadine Godin
Microbiology Technician
Moncton Laboratory

WATER ANALYSIS

Report ID: 141928-MB
Report Date: 31-Aug-12
Date Received: 30-Aug-12

CERTIFICATE OF ANALYSIS

for
exp Services Inc
40 Henri Dunant Street
Moncton, NB E1E 1E5

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Canada E1C 5E9
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Attention: Annie Power

Project/Job #: MON-00203023-AO

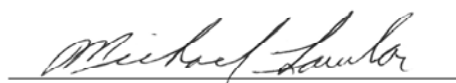
Location: Memramcook

Examination of Water

RPC Sample ID:				141928-1
Client Sample ID:				PW-01 48 hrs
Date Sampled:				29-Aug-12
Time Sampled:				4:30:00 PM
Analytes	Method ID	Date Analyzed	Units	
Total Coliforms	MB02	30-Aug-12	cfu/100mL	0
E. coli	MB02	30-Aug-12	cfu/100mL	0

This report relates only to the sample(s) and information provided to the laboratory.

RL = Reporting Limit



Michael Lawlor
Lab Supervisor
Moncton Laboratory



Nadine Godin
Microbiology Technician
Moncton Laboratory

WATER ANALYSIS

Report ID: 142030-MB
Report Date: 04-Sep-12
Date Received: 31-Aug-12

CERTIFICATE OF ANALYSIS

for
exp Services Inc
40 Henri Dunant Street
Moncton, NB E1E 1E5

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150 Lutz St
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Attention: Annie Power

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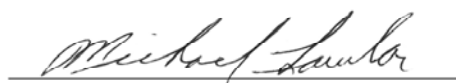
Location: Memramcook

Examination of Water

RPC Sample ID:				142030-1
Client Sample ID:				PW-01 72 hrs
Date Sampled:				30-Aug-12
Analytes	Method ID	Date Analyzed	Units	
Total Coliforms	MB02	31-Aug-12	cfu/100mL	2
E. coli	MB02	31-Aug-12	cfu/100mL	0

This report relates only to the sample(s) and information provided to the laboratory.

RL = Reporting Limit



Michael Lawlor
Lab Supervisor
Moncton Laboratory



Nadine Godin
Microbiology Technician
Moncton Laboratory

WATER ANALYSIS

Analytical Services Laboratory/Laboratoire des services analytiques
 12, rue McGloin Street, Fredericton, NB E3A 5T8

Microbiology Report / Rapport de microbiologie

OW 12-1D

Client information du Client:

Date Finalized/Finalisée: 2012/09/04

Name/Nom: VILLAGE OF MEMRAMCOOK
 Address/Adresse: 540 RUE CENTRAL
 MEMRAMCOOK NB E4K 3S6

Prop. No./No. de Projet: 0126

Lab No./No. de Lab. : **157866 - 201211143**

Authorization/Autorité: Fiona Deschênes
 Title/Titre: Acting Manager/Gérante intérimaire
 Reason/Raison: New Well Act
 Matrix/Matrice: Drilled well / Puits foré
 Drinking Water/Eau Potable

Field No./No. d'Échantillon:	1207128
Location of Sample/ Location d'échantillon:	EAST MEMRAMCOOK OW-01 65hrs MEMRAMCOOK
Health Region/ Région de santé publique:	01
Well I.D./Puits, identification	0048000
PID No./NID:	70001623
Date Collected/ Date de prélèvement:	2012/08/30
Date Received/reçu:	2012/08/31
Date Analyzed/analysé:	2012/08/31

Parameter/ Paramètre	Flag Description/	Results/ Résultats	Units/ Unités	L.O.Q./ L.D.Q.		
Total coliform		A				
E. coli		A				

- [A] Absence
- [P] Presence
- [MPN] Most Probable Number

- [CFU] Colony Forming Units
- [LOQ/LDQ] Limit of quantitation/Limite de quantification

Level of detection is one bacterium per test volume/

Results/Résultats

_____ Acceptable/acceptable.

_____ Coliforms (non-faecal) present. These bacteria are not by themselves considered harmful to human health. They do however, indicate a possible route of contamination of a water supply. Further sampling or investigation is necessary to better understand the drinking water supply.
 Coliformes (non fécaux) présents. Ces bactéries seules ne sont pas considérées comme nocives pour la santé des humains. Elles relèvent cependant un risque de contamination de la source d'approvisionnement en eau. Il faut prélever d'autres échantillons pour mieux comprendre la qualité de l'eau potable.

_____ Unacceptable/inacceptable.

_____ Authorization/Autorisation

Contact Date\ Date de contact: _____ Comments\ commentaires: _____

**Results reported refer only to the sample(s) as received.
 Les résultats fournis ne se rapportent qu'aux échantillons dans l'état où ils ont été reçus.**

For an interpretation of your results, please contact the regional public health office in your area.
 Pour une interprétation de vos résultats veuillez contacter le bureau de santé publique dans votre région.

Analytical Services Laboratory/Laboratoire des services analytiques
 12, rue McGloin Street, Fredericton, NB E3A 5T8

Microbiology Report / Rapport de microbiologie

OW 12-2D

Client information du Client:

Date Finalized/Finalisée: 2012/09/04

Name/Nom: VILLAGE OF MEMRAMCOOK
 Address/Adresse: 540 RUE CENTRAL
 MEMRAMCOOK NB E4K 3S6

Prop. No./No. de Projet: 0126

Lab No./No. de Lab. : **157867 - 201211144**

Authorization/Autorité: Fiona Deschênes
 Title/Titre: Acting Manager/Gérante intérimaire
 Reason/Raison: New Well Act
 Matrix/Matrice: Drilled well / Puits foré
 Drinking Water/Eau Potable

Field No./No. d'Échantillon:	1207127
Location of Sample/ Location d'échantillon:	EAST MEMRAMCOOK OW-02 65 HRS MEMRAMCOOK
Health Region/ Région de santé publique:	01
Well I.D./Puits, identification	0048002
PID No./NID:	70001623
Date Collected/ Date de prélèvement:	2012/08/30
Date Received/reçu:	2012/08/31
Date Analyzed/analysé:	2012/08/31

Parameter/ Paramètre	Flag Description/	Results/ Résultats	Units/ Unités	L.O.Q./ L.D.Q.		
Total coliform		P				
E. coli		A				

- [A] Absence
- [P] Presence
- [MPN] Most Probable Number

- [CFU] Colony Forming Units
- [LOQ/LDQ] Limit of quantitation/Limite de quantification

Level of detection is one bacterium per test volume/

Results/Résultats

_____ Acceptable/acceptable.

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_____ Authorization/Autorisation

Contact Date\ Date de contact: _____ Comments\ commentaires: _____

**Results reported refer only to the sample(s) as received.
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Analytical Services Laboratory/Laboratoire des services analytiques
 12, rue McGloin Street, Fredericton, NB E3A 5T8

Microbiology Report / Rapport de microbiologie

OW 12-1S

Client information du Client:

Date Finalized/Finalisée: 2012/09/04

Name/Nom: VILLAGE OF MEMRAMCOOK
 Address/Adresse: 540 RUE CENTRAL
 MEMRAMCOOK NB E4K 3S6

Prop. No./No. de Projet: 0126

Lab No./No. de Lab. : **157868 - 201211145**

Authorization/Autorité: Fiona Deschênes
 Title/Titre: Acting Manager/Gérante intérimaire
 Reason/Raison: New Well Act
 Matrix/Matrice: Drilled well / Puits foré
 Drinking Water/Eau Potable

Field No./No. d'Échantillon:	1207126
Location of Sample/ Location d'échantillon:	EAST MEMRAMCOOK OW-03 65 HRS MEMRAMCOOK
Health Region/ Région de santé publique:	01
Well I.D./Puits, identification	0048001
PID No./NID:	70001623
Date Collected/ Date de prélèvement:	2012/08/30
Date Received/reçu:	2012/08/31
Date Analyzed/analysé:	2012/08/31

Parameter/ Paramètre	Flag Description/	Results/ Résultats	Units/ Unités	L.O.Q./ L.D.Q.		
Total coliform		P				
E. coli		A				

[A] Absence
 [P] Presence
 [MPN] Most Probable Number

[CFU] Colony Forming Units
 [LOQ/LDQ] Limit of quantitation/Limite de quantification

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Results/Résultats

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_____ Unacceptable/inacceptable.

_____ Authorization/Autorisation

Contact Date\ Date de contact: _____ Comments\ commentaires: _____

Results reported refer only to the sample(s) as received.
 Les résultats fournis ne se rapportent qu'aux échantillons dans l'état où ils ont été reçus.

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 Pour une interprétation de vos résultats veuillez contacter le bureau de santé publique dans votre région.

Report ID: 141857-IAS
 Report Date: 07-Sep-12
 Date Received: 29-Aug-12

CERTIFICATE OF ANALYSIS

for
 exp Services Inc
 40 Henri Dunant Street
 Moncton, NB E1E 1E5



921 College Hill Rd
 Fredericton NB
 Canada E3B 6Z9
 Tel: 506.452.1212
 Fax: 506.452.0594
 www.rpc.ca

Attention: Annie Power

Project #: MON-00203023-AO

Location: Memramcook

Analysis of Water

RPC Sample ID:					141857-1
Client Sample ID:					PW-01 21 hrs
Date Sampled:					28-Aug-12
Analytes	Units	RL	MAC	AO	
Sodium	mg/L	0.05	-	200	10.0
Potassium	mg/L	0.02	-	-	1.38
Calcium	mg/L	0.05	-	-	37.5
Magnesium	mg/L	0.01	-	-	3.95
Iron	mg/L	0.02	-	0.3	0.03
Manganese	mg/L	0.001	-	0.05	0.115
Copper	mg/L	0.001	-	1.0	< 0.001
Zinc	mg/L	0.001	-	5.0	< 0.001
Ammonia (as N)	mg/L	0.05	-	-	< 0.05
pH	units	-	-	6.5 - 8.5	8.0
Alkalinity (as CaCO ₃)	mg/L	2	-	-	110
Chloride	mg/L	0.5	-	250	3.1
Sulfate	mg/L	1	-	500	16
Nitrate + Nitrite (as N)	mg/L	0.05	10	-	< 0.05
o-Phosphate (as P)	mg/L	0.01	-	-	< 0.01
r-Silica (as SiO ₂)	mg/L	0.1	-	-	9.9
Carbon - Total Organic	mg/L	0.5	-	-	< 0.5
Turbidity	NTU	0.1	-	-	0.6
Conductivity	µS/cm	1	-	-	260
Calculated Parameters					
Bicarbonate (as CaCO ₃)	mg/L	-	-	-	109.
Carbonate (as CaCO ₃)	mg/L	-	-	-	1.02
Hydroxide (as CaCO ₃)	mg/L	-	-	-	0.050
Cation Sum	meq/L	-	-	-	2.67
Anion Sum	meq/L	-	-	-	2.64
Percent Difference	%	-	-	-	0.60
Theoretical Conductivity	µS/cm	-	-	-	251
Hardness (as CaCO ₃)	mg/L	0.2	-	-	110
Ion Sum	mg/L	-	-	500	150
Saturation pH (5°C)	units	-	-	-	8.0
Langelier Index (5°C)		-	-	-	0.01

This report relates only to the sample(s) and information provided to the laboratory.

RL = Reporting Limit; MAC = Maximum Acceptable Concentration; AO = Aesthetic Objective

Guidelines are from Guidelines for Canadian Drinking Water Quality (Dec 2010).

A. Ross Kean, M.Sc.
 Department Head
 Inorganic Analytical Chemistry

Peter Crowhurst, B.Sc., C.Chem
 Analytical Chemist
 Inorganic Analytical Chemistry

Report ID: 141857-IAS
 Report Date: 07-Sep-12
 Date Received: 29-Aug-12

CERTIFICATE OF ANALYSIS

for
 exp Services Inc
 40 Henri Dunant Street
 Moncton, NB E1E 1E5



921 College Hill Rd
 Fredericton NB
 Canada E3B 6Z9
 Tel: 506.452.1212
 Fax: 506.452.0594
 www.rpc.ca

Attention: Annie Power

Project #: MON-00203023-AO

Location: Memramcook

Analysis of Metals in Water

RPC Sample ID:					141857-1
Client Sample ID:					PW-01 21 hrs
Date Sampled:					28-Aug-12
Analytes	Units	RL	MAC	AO	
Aluminum	µg/L	1	-	-	22
Antimony	µg/L	0.1	6	-	0.2
Arsenic	µg/L	1	10	-	2
Barium	µg/L	1	1000	-	82
Beryllium	µg/L	0.1	-	-	< 0.1
Bismuth	µg/L	1	-	-	< 1
Boron	µg/L	1	5000	-	45
Cadmium	µg/L	0.01	5	-	< 0.01
Calcium	µg/L	50	-	-	37500
Chromium	µg/L	1	50	-	< 1
Cobalt	µg/L	0.1	-	-	< 0.1
Copper	µg/L	1	-	1000	< 1
Iron	µg/L	20	-	300	30
Lead	µg/L	0.1	10	-	0.2
Lithium	µg/L	0.1	-	-	11.6
Magnesium	µg/L	10	-	-	3950
Manganese	µg/L	1	-	50	115
Molybdenum	µg/L	0.1	-	-	0.6
Nickel	µg/L	1	-	-	< 1
Potassium	µg/L	20	-	-	1380
Rubidium	µg/L	0.1	-	-	0.7
Selenium	µg/L	1	10	-	< 1
Silver	µg/L	0.1	-	-	< 0.1
Sodium	µg/L	50	-	200000	10000
Strontium	µg/L	1	-	-	568
Tellurium	µg/L	0.1	-	-	< 0.1
Thallium	µg/L	0.1	-	-	< 0.1
Tin	µg/L	0.1	-	-	< 0.1
Uranium	µg/L	0.1	20	-	0.1
Vanadium	µg/L	1	-	-	< 1
Zinc	µg/L	1	-	5000	< 1

Report ID: 141857-IAS
Report Date: 07-Sep-12
Date Received: 29-Aug-12

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Fredericton NB
Canada E3B 6Z9
Tel: 506.452.1212
Fax: 506.452.0594
www.rpc.ca

Methods

<u>Analyte</u>	<u>RPC SOP #</u>	<u>Method Reference</u>	<u>Method Principle</u>
Ammonia	4.M47	APHA 4500-NH ₃ G	"Phenate" Colourimetry
pH	4.M03	APHA 4500-H ⁺ B	pH Electrode - Electrometric
Alkalinity (as CaCO ₃)	4.M43	EPA 310.2	Methyl Orange Colourimetry
Chloride	4.M44	APHA 4500-CL E	Ferricyanide Colourimetry
Sulfate	4.M45	APHA 4500-SO ₄ E	Turbidimetry
Nitrate + Nitrite (as N)	4.M48	APHA 4500-NO ₃ H	Hydrazine Red., Derivatization, Colourimetry
o-Phosphate (as P)	4.M50	APHA 4500-P F	Molybdate/Ascorbic Acid Colourimetry
r-Silica (as SiO ₂)	4.M46	APHA 4500-SI F	Heteropoly Blue Colourimetry
Carbon - Total Organic	4.M38	APHA 5310 C	UV-Persulfate Digestion, NDIR Detection
Turbidity	4.M06	APHA 2130 B	Nephelometry
Conductivity	4.M04	APHA 2510 B	Conductivity Meter, Pt Electrode
Trace Metals	4.M01/4.M29	EPA 200.8/EPA 200.7	ICP-MS/ICP-ES

Report ID: 141928-IAS
 Report Date: 07-Sep-12
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 Tel: 506.452.1212
 Fax: 506.452.0594
 www.rpc.ca

Attention: Annie Power

Project #: MON-00203023-AO

Location: Memramcook

Analysis of Water

RPC Sample ID:					141928-1
Client Sample ID:					PW-01 48 hrs
Date Sampled:					29-Aug-12
Analytes	Units	RL	MAC	AO	
Sodium	mg/L	0.05	-	200	9.81
Potassium	mg/L	0.02	-	-	1.37
Calcium	mg/L	0.05	-	-	38.2
Magnesium	mg/L	0.01	-	-	4.07
Iron	mg/L	0.02	-	0.3	< 0.02
Manganese	mg/L	0.001	-	0.05	0.127
Copper	mg/L	0.001	-	1.0	< 0.001
Zinc	mg/L	0.001	-	5.0	< 0.001
Ammonia (as N)	mg/L	0.05	-	-	< 0.05
pH	units	-	-	6.5 - 8.5	8.0
Alkalinity (as CaCO ₃)	mg/L	2	-	-	100
Chloride	mg/L	0.5	-	250	3.1
Sulfate	mg/L	1	-	500	19
Nitrate + Nitrite (as N)	mg/L	0.05	10	-	< 0.05
o-Phosphate (as P)	mg/L	0.01	-	-	< 0.01
r-Silica (as SiO ₂)	mg/L	0.1	-	-	9.8
Carbon - Total Organic	mg/L	0.5	-	-	< 0.5
Turbidity	NTU	0.1	-	-	0.2
Conductivity	µS/cm	1	-	-	265
Calculated Parameters					
Bicarbonate (as CaCO ₃)	mg/L	-	-	-	99.0
Carbonate (as CaCO ₃)	mg/L	-	-	-	0.931
Hydroxide (as CaCO ₃)	mg/L	-	-	-	0.050
Cation Sum	meq/L	-	-	-	2.71
Anion Sum	meq/L	-	-	-	2.48
Percent Difference	%	-	-	-	4.37
Theoretical Conductivity	µS/cm	-	-	-	248
Hardness (as CaCO ₃)	mg/L	0.2	-	-	112
Ion Sum	mg/L	-	-	500	146
Saturation pH (5°C)	units	-	-	-	8.0
Langelier Index (5°C)		-	-	-	-0.02

This report relates only to the sample(s) and information provided to the laboratory.

RL = Reporting Limit; MAC = Maximum Acceptable Concentration; AO = Aesthetic Objective

Guidelines are from Guidelines for Canadian Drinking Water Quality (Dec 2010).

A. Ross Kean, M.Sc.
 Department Head
 Inorganic Analytical Chemistry

WATER CHEMISTRY

Page 1 of 3

Peter Crowhurst, B.Sc., C.Chem
 Analytical Chemist
 Inorganic Analytical Chemistry

Report ID: 141928-IAS
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CERTIFICATE OF ANALYSIS

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 Tel: 506.452.1212
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Attention: Annie Power

Project #: MON-00203023-AO

Location: Memramcook

Analysis of Metals in Water

RPC Sample ID:					141928-1
Client Sample ID:					PW-01 48 hrs
Date Sampled:					29-Aug-12
Analytes	Units	RL	MAC	AO	
Aluminum	µg/L	1	-	-	3
Antimony	µg/L	0.1	6	-	0.2
Arsenic	µg/L	1	10	-	2
Barium	µg/L	1	1000	-	82
Beryllium	µg/L	0.1	-	-	< 0.1
Bismuth	µg/L	1	-	-	< 1
Boron	µg/L	1	5000	-	46
Cadmium	µg/L	0.01	5	-	< 0.01
Calcium	µg/L	50	-	-	38200
Chromium	µg/L	1	50	-	< 1
Cobalt	µg/L	0.1	-	-	< 0.1
Copper	µg/L	1	-	1000	< 1
Iron	µg/L	20	-	300	< 20
Lead	µg/L	0.1	10	-	0.1
Lithium	µg/L	0.1	-	-	11.4
Magnesium	µg/L	10	-	-	4070
Manganese	µg/L	1	-	50	127
Molybdenum	µg/L	0.1	-	-	0.4
Nickel	µg/L	1	-	-	< 1
Potassium	µg/L	20	-	-	1370
Rubidium	µg/L	0.1	-	-	0.6
Selenium	µg/L	1	10	-	< 1
Silver	µg/L	0.1	-	-	< 0.1
Sodium	µg/L	50	-	200000	9810
Strontium	µg/L	1	-	-	584
Tellurium	µg/L	0.1	-	-	< 0.1
Thallium	µg/L	0.1	-	-	< 0.1
Tin	µg/L	0.1	-	-	< 0.1
Uranium	µg/L	0.1	20	-	0.1
Vanadium	µg/L	1	-	-	< 1
Zinc	µg/L	1	-	5000	< 1

Report ID: 141928-IAS
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Fax: 506.452.0594
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Methods

<u>Analyte</u>	<u>RPC SOP #</u>	<u>Method Reference</u>	<u>Method Principle</u>
Ammonia	4.M47	APHA 4500-NH ₃ G	"Phenate" Colourimetry
pH	4.M03	APHA 4500-H ⁺ B	pH Electrode - Electrometric
Alkalinity (as CaCO ₃)	4.M43	EPA 310.2	Methyl Orange Colourimetry
Chloride	4.M44	APHA 4500-CL E	Ferricyanide Colourimetry
Sulfate	4.M45	APHA 4500-SO ₄ E	Turbidimetry
Nitrate + Nitrite (as N)	4.M48	APHA 4500-NO ₃ H	Hydrazine Red., Derivatization, Colourimetry
o-Phosphate (as P)	4.M50	APHA 4500-P F	Molybdate/Ascorbic Acid Colourimetry
r-Silica (as SiO ₂)	4.M46	APHA 4500-SI F	Heteropoly Blue Colourimetry
Carbon - Total Organic	4.M38	APHA 5310 C	UV-Persulfate Digestion, NDIR Detection
Turbidity	4.M06	APHA 2130 B	Nephelometry
Conductivity	4.M04	APHA 2510 B	Conductivity Meter, Pt Electrode
Trace Metals	4.M01/4.M29	EPA 200.8/EPA 200.7	ICP-MS/ICP-ES

Report ID: 142030-IAS
 Report Date: 12-Sep-12
 Date Received: 31-Aug-12

CERTIFICATE OF ANALYSIS

for
 exp Services Inc
 40 Henri Dunant Street
 Moncton, NB E1E 1E5



921 College Hill Rd
 Fredericton NB
 Canada E3B 6Z9
 Tel: 506.452.1212
 Fax: 506.452.0594
 www.rpc.ca

Attention: Annie Power

Project #: MON-00203023-AO

Location: Memramcook

Analysis of Water

RPC Sample ID:					142030-1
Client Sample ID:					PW-01 72 hrs
Date Sampled:					30-Aug-12
Analytes	Units	RL	MAC	AO	
Sodium	mg/L	0.05	-	200	9.70
Potassium	mg/L	0.02	-	-	1.35
Calcium	mg/L	0.05	-	-	38.9
Magnesium	mg/L	0.01	-	-	4.15
Iron	mg/L	0.02	-	0.3	< 0.02
Manganese	mg/L	0.001	-	0.05	0.131
Copper	mg/L	0.001	-	1.0	< 0.001
Zinc	mg/L	0.001	-	5.0	< 0.001
Ammonia (as N)	mg/L	0.05	-	-	< 0.05
pH	units	-	-	6.5 - 8.5	8.0
Alkalinity (as CaCO ₃)	mg/L	2	-	-	110
Chloride	mg/L	0.5	-	250	3.1
Sulfate	mg/L	1	-	500	17
Nitrate + Nitrite (as N)	mg/L	0.05	10	-	< 0.05
o-Phosphate (as P)	mg/L	0.01	-	-	< 0.01
r-Silica (as SiO ₂)	mg/L	0.1	-	-	9.3
Carbon - Total Organic	mg/L	0.5	-	-	< 0.5
Turbidity	NTU	0.1	-	-	0.3
Conductivity	µS/cm	1	-	-	269
Calculated Parameters					
Bicarbonate (as CaCO ₃)	mg/L	-	-	-	119.
Carbonate (as CaCO ₃)	mg/L	-	-	-	1.12
Hydroxide (as CaCO ₃)	mg/L	-	-	-	0.050
Cation Sum	meq/L	-	-	-	2.74
Anion Sum	meq/L	-	-	-	2.86
Percent Difference	%	-	-	-	-2.12
Theoretical Conductivity	µS/cm	-	-	-	263
Hardness (as CaCO ₃)	mg/L	0.2	-	-	114
Ion Sum	mg/L	-	-	500	158
Saturation pH (5°C)	units	-	-	-	7.9
Langelier Index (5°C)		-	-	-	0.06

This report relates only to the sample(s) and information provided to the laboratory.

RL = Reporting Limit; MAC = Maximum Acceptable Concentration; AO = Aesthetic Objective

Guidelines are from Guidelines for Canadian Drinking Water Quality (Dec 2010).

Peter Crowhurst, B.Sc., C.Chem
 Analytical Chemist
 Inorganic Analytical Chemistry

Krista Skinner
 Chemical Technician
 Inorganic Analytical Chemistry

Report ID: 142030-IAS
 Report Date: 12-Sep-12
 Date Received: 31-Aug-12

CERTIFICATE OF ANALYSIS

for
 exp Services Inc
 40 Henri Dunant Street
 Moncton, NB E1E 1E5



921 College Hill Rd
 Fredericton NB
 Canada E3B 6Z9
 Tel: 506.452.1212
 Fax: 506.452.0594
 www.rpc.ca

Attention: Annie Power

Project #: MON-00203023-AO

Location: Memramcook

Analysis of Metals in Water

RPC Sample ID:					142030-1
Client Sample ID:					PW-01 72 hrs
Date Sampled:					30-Aug-12
Analytes	Units	RL	MAC	AO	
Aluminum	µg/L	1	-	-	6
Antimony	µg/L	0.1	6	-	0.1
Arsenic	µg/L	1	10	-	2
Barium	µg/L	1	1000	-	84
Beryllium	µg/L	0.1	-	-	< 0.1
Bismuth	µg/L	1	-	-	< 1
Boron	µg/L	1	5000	-	44
Cadmium	µg/L	0.01	5	-	< 0.01
Calcium	µg/L	50	-	-	38900
Chromium	µg/L	1	50	-	< 1
Cobalt	µg/L	0.1	-	-	< 0.1
Copper	µg/L	1	-	1000	< 1
Iron	µg/L	20	-	300	< 20
Lead	µg/L	0.1	10	-	0.1
Lithium	µg/L	0.1	-	-	11.3
Magnesium	µg/L	10	-	-	4150
Manganese	µg/L	1	-	50	131
Molybdenum	µg/L	0.1	-	-	0.8
Nickel	µg/L	1	-	-	< 1
Potassium	µg/L	20	-	-	1350
Rubidium	µg/L	0.1	-	-	0.6
Selenium	µg/L	1	10	-	< 1
Silver	µg/L	0.1	-	-	< 0.1
Sodium	µg/L	50	-	200000	9700
Strontium	µg/L	1	-	-	602
Tellurium	µg/L	0.1	-	-	< 0.1
Thallium	µg/L	0.1	-	-	< 0.1
Tin	µg/L	0.1	-	-	< 0.1
Uranium	µg/L	0.1	20	-	0.1
Vanadium	µg/L	1	-	-	< 1
Zinc	µg/L	1	-	5000	< 1

Report ID: 142030-IAS
Report Date: 12-Sep-12
Date Received: 31-Aug-12

CERTIFICATE OF ANALYSIS

for
exp Services Inc
40 Henri Dunant Street
Moncton, NB E1E 1E5



921 College Hill Rd
Fredericton NB
Canada E3B 6Z9
Tel: 506.452.1212
Fax: 506.452.0594
www.rpc.ca

Methods

<u>Analyte</u>	<u>RPC SOP #</u>	<u>Method Reference</u>	<u>Method Principle</u>
Ammonia	4.M47	APHA 4500-NH ₃ G	"Phenate" Colourimetry
pH	4.M03	APHA 4500-H ⁺ B	pH Electrode - Electrometric
Alkalinity (as CaCO ₃)	4.M43	EPA 310.2	Methyl Orange Colourimetry
Chloride	4.M44	APHA 4500-CL E	Ferricyanide Colourimetry
Sulfate	4.M45	APHA 4500-SO ₄ E	Turbidimetry
Nitrate + Nitrite (as N)	4.M48	APHA 4500-NO ₃ H	Hydrazine Red., Derivatization, Colourimetry
o-Phosphate (as P)	4.M50	APHA 4500-P F	Molybdate/Ascorbic Acid Colourimetry
r-Silica (as SiO ₂)	4.M46	APHA 4500-SI F	Heteropoly Blue Colourimetry
Carbon - Total Organic	4.M38	APHA 5310 C	UV-Persulfate Digestion, NDIR Detection
Turbidity	4.M06	APHA 2130 B	Nephelometry
Conductivity	4.M04	APHA 2510 B	Conductivity Meter, Pt Electrode
Trace Metals	4.M01/4.M29	EPA 200.8/EPA 200.7	ICP-MS/ICP-ES

Analytical Services Laboratory/Laboratoire des services analytiques
 12, rue McGloin Street, Fredericton, NB E3A 5T8

Inorganic Report / Rapport inorganique

OW 12-1D

Client information du Client:

Date Finalized/Finalisée: **2012/09/07**

Name/Nom: VILLAGE OF MEMRAMCOOK
 Address/Adresse: 540 RUE CENTRAL
 MEMRAMCOOK NB E4K 3S6

Field No./No. d'Échantillon: 1207128
 Location of Sample/ EAST MEMRAMCOOK
 Location d'échantillon: ~~OW-04~~ 65hrs
 MEMRAMCOOK

Prop. No./No. de Projet: 0126
 Lab No./No. de Lab. : **157866 - 201211143**
 Authorization/Autorité: Lori Lamey
 Title/Titre: Manager/Gérant
 Matrix/Matrice: Drilled well / Puits foré
 Drinking Water/Eau Potable

Health Region/ 01
 Région de santé publique:
 Well I.D./ 0048000
 Puits, identification du:
 PID No./NID: 70001623
 Date Collected/ 2012/08/30
 Date de prelevement:

Parameter/ Paramètre	Flag	Result/ Résultats	Units/ Unités	L.O.Q./ L.D.Q.	H.A.L./ L.A.S.
Alkalinity / Alcalinité		68.4	mg/l		
Aluminum / Aluminium	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.025	
Antimony / Antimoine	Less than L.O.Q. / Moins de L.D.Q.		µg/l	1.0	6.0
Arsenic	Less than L.O.Q. / Moins de L.D.Q.		µg/l	1.5	10.0
Barium / Baryum		0.063	mg/l	0.010	1.0
Boron / Bore		0.027	mg/l	0.010	5.0
Bromide / Bromure	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.100	
Cadmium	Less than L.O.Q. / Moins de L.D.Q.		µg/l	0.5	5.0
Calcium		20.2	mg/l	0.10	
Chloride / Chlorure		2.97	mg/l	0.050	250
Chromium / Chrome	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.010	0.050
Conductivity / Conductivité		169	µS/cr		
Copper / Cuivre	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.010	1.0
Fluoride / Florure		0.149	mg/l	0.100	1.5
Iron / Fer	*** Exceeds H.A.L. / Plus que L.A.S. ***	3.6	mg/l	0.010	0.300
Lead / Plomb		1.2	µg/l	1.0	10
Magnesium / Magnésium		3.60	mg/l	0.10	
Manganese / Manganèse	*** Exceeds H.A.L. / Plus que L.A.S. ***	0.17	mg/l	0.005	0.05

Calculated Parameters\Paramètres calculés				
Sum of Cations	1.978	Sum of Anions	1.770	% Difference -5.544
Saturation Index @ 25°C	0.718	CO3(as CaCO3)	4.2	HCO3(as CaCO3) 63.8

Results reported refer only to the sample(s) as received.

Les résultats fournis ne se rapportent qu'aux échantillons dans l'état où ils ont été reçus.

For an interpretation of your results, please contact the regional public health office in your area.

Pour une interprétation de vos résultats veuillez contacter le bureau de santé publique dans votre région.

[LOQ/LDQ] Limit of quantitation/Limite de quantification

[HAL/LAS] Health Advisory Level (Drinking water only)/Limites acceptables pour la santé (Eau potable seulement)

Analytical Services Laboratory/Laboratoire des services analytiques
 12, rue McGloin Street, Fredericton, NB E3A 5T8

Inorganic Report / Rapport inorganique

OW 12-1D

Client information du Client:

Date Finalized/Finalisée: **2012/09/07**

Name/Nom: VILLAGE OF MEMRAMCOOK
 Address/Adresse: 540 RUE CENTRAL
 MEMRAMCOOK NB E4K 3S6

Field No./No. d'échantillon:	1207128
Location of Sample/	EAST MEMRAMCOOK
Location d'échantillon:	OW-01 65hrs MEMRAMCOOK
Health Region/	01
Région de santé publique:	
Well I.D./	0048000
Puits, identification du:	
PID No./NID:	70001623
Date Collected/	2012/08/30
Date de prelevement:	

Prop. No./No. de Projet: 0126
 Lab No./No. de Lab. : **157866 - 201211143**
 Authorization/Autorité: Lori Lamey
 Title/Titre: Manager/Gérant
 Matrix/Matrice: Drilled well / Puits foré
 Drinking Water/Eau Potable

Parameter/ Paramètre	Flag	Result/ Résultats	Units/ Unités	L.O.Q./ L.D.Q.	H.A.L./ L.A.S.
Nitrate-nitrogen / Nitrate-azote	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.05	10.0
Nitrate/nitrite / Nitrates/nitrite	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.05	10.0
Nitrite	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.05	1.0
pH		8.85			
Potassium		1.6	mg/l	0.10	
Selenium / Sélénium	Less than L.O.Q. / Moins de L.D.Q.		µg/l	1.5	10
Sodium		9.89	mg/l	0.10	200
Sulfate		14.7	mg/l	0.050	500
Thallium	Less than L.O.Q. / Moins de L.D.Q.		µg/l	1.0	
Total Hardness / Dureté totale		65.2	mg/l	0.67	
Turbidity / Turbidité	*** Exceeds H.A.L. / Plus que L.A.S. ***	53	NTU	0.2	1.0
Uranium	Less than L.O.Q. / Moins de L.D.Q.		µg/l	0.5	20
Zinc	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.005	5.0

Comments:

Commentaires:

Incorrect type of bottle submitted for the test(s) requested. Quality of results may be affected.

Mauvais type de contenant pour les tests demandés. Qualité des résultats peut être affecté.

Calculated Parameters\Paramètres calculés					
Sum of Cations	1.978	Sum of Anions	1.770	% Difference	-5.544
Saturation Index @ 25°C	0.718	CO3(as CaCO3)	4.2	HCO3(as CaCO3)	63.8

Results reported refer only to the sample(s) as received.

Les résultats fournis ne se rapportent qu'aux échantillons dans l'état où ils ont été reçus.

For an interpretation of your results, please contact the regional public health office in your area.

Pour une interprétation de vos résultats veuillez contacter le bureau de santé publique dans votre région.

[LOQ/LDQ] Limit of quantitation/Limite de quantification

[HAL/LAS] Health Advisory Level (Drinking water only)/Limites acceptables pour la santé (Eau potable seulement)

Analytical Services Laboratory/Laboratoire des services analytiques
12, rue McGloin Street, Fredericton, NB E3A 5T8

Inorganic Report / Rapport inorganique

OW 12-2D

Client information du Client:

Date Finalized/Finalisée: 2012/09/07

Name/Nom: VILLAGE OF MEMRAMCOOK
Address/Adresse: 540 RUE CENTRAL
MEMRAMCOOK NB E4K 3S6

Prop. No./No. de Projet: 0126

Lab No./No. de Lab. : 157867 - 201211144

Authorization/Autorité: Lori Lamey

Title/Titre: Manager/Gérant

Matrix/Matrice: Drilled well / Puits foré
Drinking Water/Eau Potable

Field No./No. d'Échantillon: 1207127
Location of Sample/ EAST MEMRAMCOOK
Location d'échantillon: ~~OW-02~~ 65 HRS
MEMRAMCOOK

Health Region/ 01
Région de santé publique:
Well I.D./ 0048002
Puits, identification du:
PID No./NID: 70001623
Date Collected/ 2012/08/30
Date de prelevement:

Parameter/ Paramètre	Flag	Result/ Résultats	Units/ Unités	L.O.Q./ L.D.Q.	H.A.L./ L.A.S.
Alkalinity / Alcalinité	See comments. / Voir commentaires.	131	mg/l		
Aluminum / Aluminium		0.80	mg/l	0.025	
Antimony / Antimoine		4.2	µg/l	1.0	6.0
Arsenic		1.9	µg/l	1.5	10.0
Barium / Baryum		0.080	mg/l	0.010	1.0
Boron / Bore	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.010	5.0
Bromide / Bromure	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.100	
Cadmium	Less than L.O.Q. / Moins de L.D.Q.		µg/l	0.5	5.0
Calcium		45.2	mg/l	0.10	
Chloride / Chlorure		3.72	mg/l	0.050	250
Chromium / Chrome	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.010	0.050
Conductivity / Conductivité	See comments. / Voir commentaires.	268	µS/crr		
Copper / Cuivre	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.010	1.0
Fluoride / Florure	See comments. / Voir commentaires.	0.223	mg/l	0.100	1.5
Iron / Fer	*** Exceeds H.A.L. / Plus que L.A.S. ***	1.80	mg/l	0.010	0.300
Lead / Plomb	*** Exceeds H.A.L. / Plus que L.A.S. ***	15	µg/l	1.0	10
Magnesium / Magnésium		4.74	mg/l	0.10	
Manganese / Manganèse	*** Exceeds H.A.L. / Plus que L.A.S. ***	0.42	mg/l	0.005	0.05

Calculated Parameters\Paramètres calculés

Sum of Cations	3.195	Sum of Anions	2.937	% Difference	-4.201
Saturation Index @ 25°C	0.539	CO3(as CaCO3)	1.4	HCO3(as CaCO3)	129.5

Results reported refer only to the sample(s) as received.

Les résultats fournis ne se rapportent qu'aux échantillons dans l'état où ils ont été reçus.

For an interpretation of your results, please contact the regional public health office in your area.

Pour une interprétation de vos résultats veuillez contacter le bureau de santé publique dans votre région.

Analytical Services Laboratory/Laboratoire des services analytiques
12, rue McGloin Street, Fredericton, NB E3A 5T8

Inorganic Report / Rapport inorganique

OW 12-2D

Client information du Client:

Date Finalized/Finalisée: 2012/09/07

Name/Nom: VILLAGE OF MEMRAMCOOK
Address/Adresse: 540 RUE CENTRAL
MEMRAMCOOK NB E4K 3S6

Field No./No. d'échantillon: 1207127
Location of Sample/ EAST MEMRAMCOOK
Location d'échantillon: ~~OW-02~~ 65 HRS
MEMRAMCOOK

Prop. No./No. de Projet: 0126
Lab No./No. de Lab. : **157867 - 201211144**
Authorization/Autorité: Lori Lamey
Title/Titre: Manager/Gérant
Matrix/Matrice: Drilled well / Puits foré
Drinking Water/Eau Potable

Health Region/ 01
Région de santé publique:
Well I.D./ 0048002
Puits, identification du:
PID No./NID: 70001623
Date Collected/ 2012/08/30
Date de prelevement:

Parameter/ Paramètre	Flag	Result/ Résultats	Units/ Unités	L.O.Q./ L.D.Q.	H.A.L./ L.A.S.
Nitrate-nitrogen / Nitrate-azote	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.05	10.0
Nitrate/nitrite / Nitrates/nitrite	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.05	10.0
Nitrite	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.05	1.0
pH	See comments. / Voir commentaires.	8.07			
Potassium		1.7	mg/l	0.10	
Selenium / Sélénium	Less than L.O.Q. / Moins de L.D.Q.		µg/l	1.5	10
Sodium		6.99	mg/l	0.10	200
Sulfate		9.46	mg/l	0.050	500
Thallium	Less than L.O.Q. / Moins de L.D.Q.		µg/l	1.0	
Total Hardness / Dureté totale		132	mg/l	0.67	
Turbidity / Turbidité	*** Exceeds H.A.L. / Plus que L.A.S. ***	4600	NTU	0.2	1.0
Uranium		3.9	µg/l	0.5	20
Zinc	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.005	5.0

Calculated Parameters\Paramètres calculés					
Sum of Cations	3.195	Sum of Anions	2.937	% Difference	-4.201
Saturation Index @ 25°C	0.539	CO3(as CaCO3)	1.4	HCO3(as CaCO3)	129.5

Results reported refer only to the sample(s) as received.

Les résultats fournis ne se rapportent qu'aux échantillons dans l'état où ils ont été reçus.

For an interpretation of your results, please contact the regional public health office in your area.

Pour une interprétation de vos résultats veuillez contacter le bureau de santé publique dans votre région.

Analytical Services Laboratory/Laboratoire des services analytiques
 12, rue McGloin Street, Fredericton, NB E3A 5T8

Inorganic Report / Rapport inorganique

OW 12-2D

Client information du Client:

Date Finalized/Finalisée: **2012/09/07**

Name/Nom: VILLAGE OF MEMRAMCOOK
 Address/Adresse: 540 RUE CENTRAL
 MEMRAMCOOK NB E4K 3S6

Prop. No./No. de Projet: 0126
 Lab No./No. de Lab. : **157867 - 201211144**
 Authorization/Autorité: Lori Lamey
 Title/Titre: Manager/Gérant
 Matrix/Matrice: Drilled well / Puits foré
 Drinking Water/Eau Potable

Field No./No. d'échantillon:	1207127
Location of Sample/	EAST MEMRAMCOOK
Location d'échantillon:	OW-02 65 HRS MEMRAMCOOK
Health Region/	01
Région de santé publique:	
Well I.D./	0048002
Puits, identification du:	
PID No./NID:	70001623
Date Collected/	2012/08/30
Date de prelevement:	

Parameter/ Paramètre	Flag	Result/ Résultats	Units/ Unités	L.O.Q./ L.D.Q.	H.A.L./ L.A.S.
Comments: Incorrect type of bottle submitted for the test(s) requested. Quality of results may be affected. Major Ions sample centrifuged prior to analysis. Aqueous portion only analyzed. Metals aliquot centrifuged prior to acidification and analysis. Aqueous portion only analyzed.					
	Commentaires: Mauvais type de contenant pour les tests demandés. Qualité des résultats peut être affecté. L'échantillon de l'ion majeur a été centrifugé avant l'analyse. Seulement la partie aqueous a été analysée. Les métaux dans une partie de l'échantillon ont été centrifugés avant l'acidification et l'analyse. Seulement la partie aqueuse a été analysée.				

Calculated Parameters\Paramètres calculés					
Sum of Cations	3.195	Sum of Anions	2.937	% Difference	-4.201
Saturation Index @ 25°C	0.539	CO3(as CaCO3)	1.4	HCO3(as CaCO3)	129.5

Results reported refer only to the sample(s) as received.
 Les résultats fournis ne se rapportent qu'aux échantillons dans l'état où ils ont été reçus.
 For an interpretation of your results, please contact the regional public health office in your area.
 Pour une interprétation de vos résultats veuillez contacter le bureau de santé publique dans votre région.

[LOQ/LDQ] Limit of quantitation/Limite de quantification

[HAL/LAS] Health Advisory Level (Drinking water only)/Limites acceptables pour la santé (Eau potable seulement)

Analytical Services Laboratory/Laboratoire des services analytiques
 12, rue McGloin Street, Fredericton, NB E3A 5T8

Inorganic Report / Rapport inorganique

OW 12-1S

Client information du Client:

Date Finalized/Finalisée: **2012/09/10**

Name/Nom: VILLAGE OF MEMRAMCOOK
 Address/Adresse: 540 RUE CENTRAL
 MEMRAMCOOK NB E4K 3S6

Prop. No./No. de Projet: 0126
 Lab No./No. de Lab. : **157868 - 201211145**
 Authorization/Autorité: Lori Lamey
 Title/Titre: Manager/Gérant
 Matrix/Matrice: Drilled well / Puits foré
 Drinking Water/Eau Potable

Field No./No. d'Échantillon:	1207126
Location of Sample/	EAST MEMRAMCOOK
Location d'échantillon:	OW-03 65 HRS MEMRAMCOOK
Health Region/	01
Région de santé publique:	
Well I.D./	0048001
Puits, identification du:	
PID No./NID:	70001623
Date Collected/	2012/08/30
Date de prelevement:	

Parameter/ Paramètre	Flag	Result/ Résultats	Units/ Unités	L.O.Q./ L.D.Q.	H.A.L./ L.A.S.
Alkalinity / Alcalinité		9.34	mg/l		
Aluminum / Aluminium		0.092	mg/l	0.025	
Antimony / Antimoine	Less than L.O.Q. / Moins de L.D.Q.		µg/l	1.0	6.0
Arsenic	Less than L.O.Q. / Moins de L.D.Q.		µg/l	1.5	10.0
Barium / Baryum		0.193	mg/l	0.010	1.0
Boron / Bore		0.147	mg/l	0.010	5.0
Bromide / Bromure	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.100	
Cadmium	Less than L.O.Q. / Moins de L.D.Q.		µg/l	0.5	5.0
Calcium		2.96	mg/l	0.10	
Chloride / Chlorure		3.03	mg/l	0.050	250
Chromium / Chrome	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.010	0.050
Conductivity / Conductivité		18.1	µS/crr		
Copper / Cuivre	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.010	1.0
Fluoride / Florure	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.100	1.5
Iron / Fer	*** Exceeds H.A.L. / Plus que L.A.S. ***	1.90	mg/l	0.010	0.300
Lead / Plomb		4.2	µg/l	1.0	10
Magnesium / Magnésium		0.61	mg/l	0.10	
Manganese / Manganèse	*** Exceeds H.A.L. / Plus que L.A.S. ***	0.17	mg/l	0.005	0.05

Calculated Parameters\Paramètres calculés					
Sum of Cations	3.590	Sum of Anions	0.301	% Difference	-84.55
Saturation Index @ 25°C	-2.237	CO3(as CaCO3)	0.0	HCO3(as CaCO3)	9.3

Results reported refer only to the sample(s) as received.

Les résultats fournis ne se rapportent qu'aux échantillons dans l'état où ils ont été reçus.

For an interpretation of your results, please contact the regional public health office in your area.

Pour une interprétation de vos résultats veuillez contacter le bureau de santé publique dans votre région.

[LOQ/LDQ] Limit of quantitation/Limite de quantification

[HAL/LAS] Health Advisory Level (Drinking water only)/Limites acceptables pour la santé (Eau potable seulement)

Analytical Services Laboratory/Laboratoire des services analytiques
 12, rue McGloin Street, Fredericton, NB E3A 5T8

Inorganic Report / Rapport inorganique

OW 12-1S

Client information du Client:

Date Finalized/Finalisée: **2012/09/10**

Name/Nom: VILLAGE OF MEMRAMCOOK
 Address/Adresse: 540 RUE CENTRAL
 MEMRAMCOOK NB E4K 3S6

Prop. No./No. de Projet: 0126
 Lab No./No. de Lab. : **157868 - 201211145**
 Authorization/Autorité: Lori Lamey
 Title/Titre: Manager/Gérant
 Matrix/Matrice: Drilled well / Puits foré
 Drinking Water/Eau Potable

Field No./No. d'Échantillon:	1207126
Location of Sample/	EAST MEMRAMCOOK
Location d'échantillon:	OW-03 65 HRS MEMRAMCOOK
Health Region/	01
Région de santé publique:	
Well I.D./	0048001
Puits, identification du:	
PID No./NID:	70001623
Date Collected/	2012/08/30
Date de prelevement:	

Parameter/ Paramètre	Flag	Result/ Résultats	Units/ Unités	L.O.Q./ L.D.Q.	H.A.L./ L.A.S.
Nitrate-nitrogen / Nitrate-azote	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.05	10.0
Nitrate/nitrite / Nitrates/nitrite	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.05	10.0
Nitrite	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.05	1.0
pH		7.58			
Potassium		0.9	mg/l	0.10	
Selenium / Sélénium	Less than L.O.Q. / Moins de L.D.Q.		µg/l	1.5	10
Sodium		74.7	mg/l	0.10	200
Sulfate		0.825	mg/l	0.050	500
Thallium	Less than L.O.Q. / Moins de L.D.Q.		µg/l	1.0	
Total Hardness / Dureté totale		9.90	mg/l	0.67	
Turbidity / Turbidité	*** Exceeds H.A.L. / Plus que L.A.S. ***	1100	NTU	0.2	1.0
Uranium	Less than L.O.Q. / Moins de L.D.Q.		µg/l	0.5	20
Zinc		0.011	mg/l	0.005	5.0

Comments:

Commentaires:

Incorrect type of bottle submitted for the test(s) requested. Quality of results may be affected.
 Ion Balance : Unable to balance due to elevated iron and turbidity.

Mauvais type de contenant pour les tests demandés. Qualité des résultats peut être affecté.
 Bilan des ions : impossible d'établir le bilan en raison d'une turbidité et d'une quantité de fer élevées

Calculated Parameters\Paramètres calculés					
Sum of Cations	3.590	Sum of Anions	0.301	% Difference	-84.55
Saturation Index @ 25°C	-2.237	CO3(as CaCO3)	0.0	HCO3(as CaCO3)	9.3

Results reported refer only to the sample(s) as received.
 Les résultats fournis ne se rapportent qu'aux échantillons dans l'état où ils ont été reçus.
 For an interpretation of your results, please contact the regional public health office in your area.
 Pour une interprétation de vos résultats veuillez contacter le bureau de santé publique dans votre région.

[LOQ/LDQ] Limit of quantitation/Limite de quantification

[HAL/LAS] Health Advisory Level (Drinking water only)/Limites acceptables pour la santé (Eau potable seulement)



January 7, 2013

Emery Bourque, CAO
Village of Memramcook
540, rue Centrale
Memramcook, NB E4K 3S6

Re: **MON-00203023-A0 Additional Water Source Exploration on PID 70001623, Results for Test Wells TH12-01 and TH12-02, East Memramcook**

Dear Mr. Bourque:

Exp Services Inc. (**exp**) is pleased to submit the following letter report summarizing the results of the additional water source exploration program completed on the property identified by property identification number (PID) 70001623, located in Memramcook East, NB. Background information in addition to a summary of the methodology; presentation and discussion of the results; and closing statements are provided below.

BACKGROUND

During 2009, the Village of Memramcook registered a groundwater exploration program under the New Brunswick Department of the Environment (NBENV) Environmental Impact Assessment process. Under NBENV EIA approval to proceed (NBENV file 4561-3-1228), a series of test wells were drilled in various areas throughout the Village. Of the series of wells drilled, only one test well (TH10-01) drilled on the property PID 70001623 located in East Memramcook suggested yield suitable for the Village's municipal water source development objectives. During 2012, this well was subsequently further developed (TH10-01 drilled to larger diameter and renamed ME12-01) to allow for pump testing and assessment in accordance to the NBENV Step 2 Water Supply Source Assessment (WSSA) testing and approvals process. Results of the pump test were summarized and provided in a separate report (*Village of Memramcook Groundwater Exploration Program, Step 2 WSSA Report, ME12-01, November, 2012, exp file MON-00203023-AO*).

Results of the ME12-01 pump test program were interpreted to indicate promising long term safe yield (>200 l/gpm) for ME12-01, and that the well would be suitable for consideration as a municipal supply well pending the Village's infrastructure development plans and regulatory approval to proceed with commissioning. Given the promising yield of the well, additional water source exploration was proposed on the property which was the rationale for completion of TH12-01 and TH12-02 as summarized herein.

METHODOLOGY

In accordance to the New Brunswick Department of Environment (NBENV) Environmental Impact Assessment (EIA) information requirements, an application was prepared and submitted to NBENV for

permission to drill two exploratory boreholes on the property located in East Memramcook (PID 70001623). Following approval to proceed, two test wells (TH12-01 and TH12-02) were drilled during December 2012.

RESULTS

EIA Application - A copy of the submission to NBENV for request to drill the test wells, and the subsequent NBENV approval to proceed with drilling of TH12-01 and TH12-02 are provided in Attachment A.

Well Location and Yields – The two test wells (TH12-01, TH12-02) were drilled within the footprint of the property identified by PID 70001623. The wells were installed between December 3rd and December 10th, 2012 using an air rotary drilling rig supplied by Eastern Well Drillers of Shediac, NB. Global Positioning System (GPS) locations for each well was obtained by using a hand held Megellan GPS unit. The locations are given in the table below.

Global Positioning System (GPS) Locates for Test Holes TH12-01 and TH12-02

Test Hole ID	Zone	Northern	Eastern
TH12-01	20	384401	5094787
TH12-02	20	384548	5094814

The test wells were completed by setting a 203 mm diameter casing in each test hole to a depth of 6.1 m in TH12-01 (20 ft) and 42.1 m in TH12-02 (139 ft) and then drilling a 150 mm diameter open hole through the bedrock to a depth of 121.2 m for TH12-01 (400 ft), and 78.8 m for TH12-02 (260 ft). Bedrock was reported in the drilling logs to be encountered at a depth of 4.5 m for TH12-01, and 39.7 m for TH12-02. Well locations are indicated on the Figure 1, attached.

Following well completion, water samples were collected from each well on December 6th and December 10th, 2012. Each well was purged of potential chemically unrepresentative water using the air lift method for approximately 1 hour and groundwater samples were collected in laboratory supplied bottles and submitted to the New Brunswick Department of the Environment laboratory in Fredericton, NB for general chemistry, metals and bacteria (TH12-02 only; the required holding time for the bacteria sample from TH12-01 could not be accommodated due to lab schedule) analysis.

The total well yields estimated by the driller were 645 m³/day (100 lpgm) for TH12-01, and 1290 m³/day (200 lpgm) for TH12-02. The following table identifies the depth of each fracture encountered in each well, and the estimated water bearing capacity for that fracture based on short term air lift observations. Copies of the driller's logs are provided in Attachment B.

Summary of Test Well Yields

Well ID	Depth to Fracture (m/ft)	Water Bearing Capacity m ³ /day (lmpg)
TH12-01	21/ 70	129 (20)
	50/ 166	64.5 (10)

	58 / 191	64.5 (10)
	63 / 207	387 (60)
TH12-02	45 / 150	161 (25)
	55 / 180	129 (20)
	66 / 218	806 (125)
	68 / 226	194 (30)

Analytical Results- Groundwater analytical results are provided in Attachment C with Canadian Drinking Water Quality guidelines also included for comparative purposes. Laboratory Certificates are also presented in Appendix C.

General Chemistry and Trace Metals

For both test holes, concentrations of all general chemistry parameters were found to comply with their respective potable water criteria, where applicable, with the exception of turbidity. Elevated turbidity is attributed to natural sediment in the sample due to the fact that the sample from the well was collected shortly after being drilled. Often, when subjected to longer term development elevated levels of natural sediment will be significantly decreased.

For both test holes, concentrations of all trace metal parameters were found to comply with their respective potable water criteria, where applicable, with the exception of barium, iron, lead and manganese. Barium, iron and manganese are naturally occurring and common elements in the earth's crust. The elevated concentrations observed are attributed to the fact that the water sample was collected from a newly constructed well. Such wells often contain elevated amounts of sediment due to inadequate development. In the event the well is commissioned as a production well in the future, proper well development would be anticipated to result in lower suspended sediment and consequently lower barium, iron and manganese concentrations. However, elevated iron and manganese can be common even in developed wells and in this event plans for treatment should be included in planning for the commissioning of the well (the Village currently treats for manganese for its existing production wells).

Bacteria

One of the two test holes (TH12-02) was analyzed for bacteria. Analytical results returned no bacteria present in the sample.

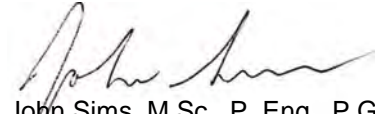
DISCUSSION AND CONCLUSIONS

Based on the results above, there appears to be good water quality and water quantity potential for each well. The next steps in the process for consideration/ feasibility assessment by the Village for possible commissioning of the test wells as long term municipal production wells is to upgrade the wells as warranted (e.g. drill to larger diameter), complete pump testing, and prepare and submit reports on the pump test results in accordance to the NBENV EIA Step 2 WSSA testing and reporting procedure.

CLOSING

We trust that this information satisfies your current requirements, if you should have any questions regarding this letter report, please contact the undersigned.

Sincerely,



John Sims, M.Sc., P. Eng., P.Geo
Senior Hydrogeologist
exp Services Inc.

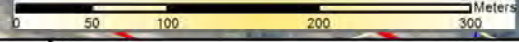
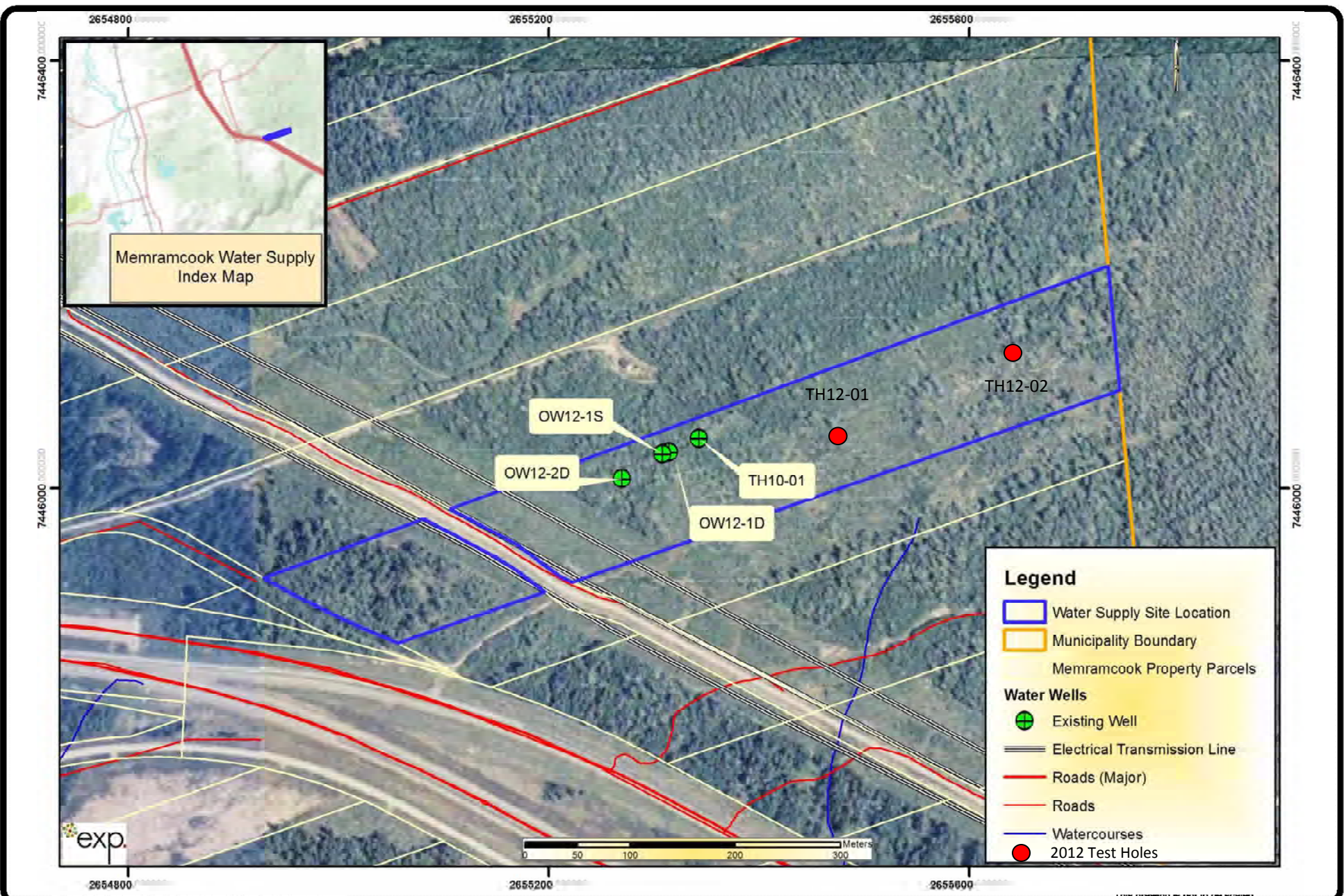
G:\ch\gis\memramcook\Bases_11.dgn

MODEL: exp_Memramcook

PLOTTED BY: Armand

DATE: 28/02/2012

10:25:04 AM



Legend

- Water Supply Site Location
- Municipality Boundary
- Memramcook Property Parcels

Water Wells

- ⊕ Existing Well
- Electrical Transmission Line
- Roads (Major)
- Roads
- Watercourses
- 2012 Test Holes

exp Services Inc.
 t: +1.506.857.8889 | f: +1.506.857.8315
 40 Henri Dunant Street,
 Moncton, NB E1E 1E5
 CANADA
 www.exp.com



BUILDINGS - EARTH & ENVIRONMENT - ENERGY - INDUSTRIAL - INFRASTRUCTURE - SUSTAINABILITY

Project Title
**ADDITIONAL WATER SOURCE
 EXPLORATION
 MEMRAMCOOK EAST, NB**

Dwg. Title:
TEST HOLE LOCATION PLAN

Drawn By: AMP	Project No. MON-00203023-A0	
Dwg. Standards Ckd. By:	Dwg. No. FIGURE 1.0	
Designed By:	Dwg. Design Ckd. By:	Rev. No.

ATTACHMENT A –

**EIA Registration Submission Letter and
NBENV Approval to Proceed**



October 23, 2012

MON-00203023-A0

New Brunswick Department of Environment
P.O. Box 6000
Fredericton, NB
E3B 5H1

Attention: Pierre Doucet, Project Assessment (EIA)

Re: Village of Memramcook Groundwater Exploration Program, Request for Additional Drilling Locations on PID70001623 (NBENV File 4561-3-1228)

Regarding the above referenced file, on behalf of the Village of Memramcook, **exp** Services Inc. (**exp**) requests permission from NBENV to proceed with additional test well drilling on the property identified by PID70001623. The purpose of the work is to complete additional exploratory wells on the property to supplement findings of a test well (TH10-01) which was approved for drilling by NBENV and subsequently drilled during January 2010. Results of the TH10-01 test well drilling were summarized in a letter report forwarded to your Department by Crandall Engineering on April 10, 2010.

For the purpose of this request, it is proposed that two additional test wells be drilled. The proposed wells (TH12-01 and TH12-02) would be located on the property in the general locations indicated on the attached figure. The Village has the permission of the property owner to drill on the property, and an option to purchase in the event suitable yields can be found, and NBENV approval is obtained to commission a well(s) as a municipal water source. It is intended that the work would be completed during November, 2012. If well yields were promising, if practical, a pump test would be completed.

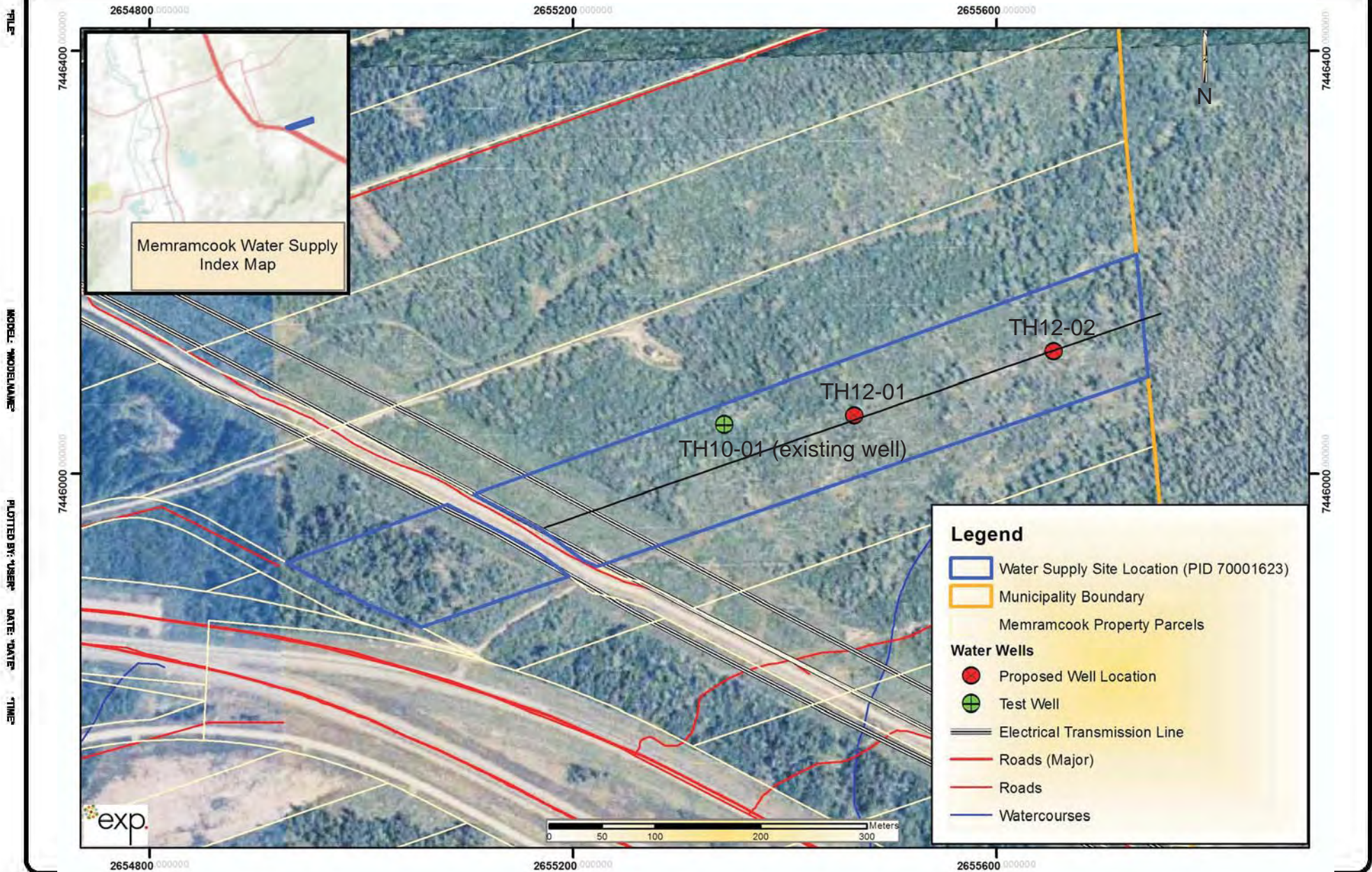
We appreciate your consideration and attention to this matter. If there are any questions, please contact the undersigned.

Yours very truly,

A handwritten signature in black ink, appearing to read 'John Sims', is written over a horizontal line.

John Sims, M.Sc., P. Eng., P.Geo.
Senior Hydrogeologist

cc. Emery Bourque – Village of Memramcook
Roland LeBlanc - **exp**



FILE
MODEL: MODELNAME
PLOTTED BY: USER
DATE: DATE
TIME

exp Services Inc.
 t +1 506.857.8889 | f +1 506.857.8315
 40 Henri Dunant Street,
 Moncton, NB E1E 1E5
 CANADA
 www.exp.com



Project Title
**VILLAGE OF MEMRAMCOOK
 GROUNDWATER EXPLORATION**

Dwg. Title:
**PROPOSED
 2012 TEST WELL LOCATIONS**

Drawn By: AMP	Project No. MON-00203023-AO
Dwg. Standards Ckd. By:	Dwg. No. FIGURE 1
Designed By:	Dwg. Design Ckd. By:
	Rev. No.

BUILDINGS • EARTH & ENVIRONMENT • ENERGY • INDUSTRIAL • INFRASTRUCTURE • SUSTAINABILITY

November 15, 2012
File 4561-3-1228

Emery Bourque
Chief Administrative Officer
Village of Memramcook
540 Centrale Street
Memramcook, NB
E4K 3S6

Dear Mr. Bourque,

RE: Memramcook Water System – 30-Year Projection – Village of Memramcook

The Technical Review Committee (TRC) has reviewed the recently submitted Request for Additional Drilling Locations on PID 70001623 (dated October 23, 2012) for the above-mentioned project. Approval is hereby granted to proceed with drilling and pumping tests on sites TH12-01 and TH12-02. Once pumping tests have been completed on approved wells, a final report must be prepared in accordance with the Water Supply Source Assessment Guidelines (available online at the following address: <http://www2.gnb.ca/content/dam/gnb/Departments/env/pdf/Water-Eau/WaterSupplyAssessmentGuidelines.pdf>) and submitted to the Department of Environment and Local Government (DELG) for review.

In addition, the following general questions and concerns must also be addressed in order to facilitate the continued review of this project.

Questions/Concerns:

1. When deciding at which of the two well sites to conduct a pumping test, the location of the well should be taken into consideration, especially given the potential future restrictions on the highway due to eventual Wellfield Protected Area Designation.
2. Regarding the timing of pumping tests, the weather and groundwater recharge season must also be taken into consideration.



3. It is preferable that drilling target sites be accessed by established roads when possible. Drilling can proceed immediately at the approved sites that will be using established roads. However, if new access roads are required, information should be submitted regarding their locations, their proximity to watercourses and/or crossings, including the name and location of the watercourse, the type of proposed crossing, the temporary or permanent nature of the structure, and the proposed measures to avoid impacts to fish and fish habitat. Please note that a Watercourse and Wetland Alteration Permit must be obtained for any activities within 30 m of a watercourse or wetland.
4. As part of the final report of the pumping tests, information must be provided regarding any potential impacts to nearby surface waters, fish, and fish habitat as a result of the construction and/or operation of any well. The final report must also identify whether any wells are potentially under the direct influence of surface waters.
5. If it is determined that in-water work is required to facilitate watercourse crossings, or that water levels in any watercourse may be affected by the operation of wells, there would be the potential for a harmful alteration, disruption, or destruction (HADD) of fish habitat, and thus a potential to impact Inner Bay of Fundy Atlantic Salmon, a species listed under the federal Species at Risk Act (SARA) that is potentially present in the Memramcook watershed, in addition to other fish species.
6. Hazardous materials (e.g. fuels, lubricants, hydraulic oil) and wastes (e.g. waste oil) should be managed so as to minimize the risk of chronic and/or accidental releases. For example, proponents are encouraged to undertake refueling and maintenance activities on level terrain, at a suitable distance from environmentally sensitive areas including watercourses, and on a prepared impermeable surface with a collection system. The proponent is encouraged to prepare contingency plans that reflect a consideration of potential accidents and malfunctions and that take into account site-specific conditions and sensitivities. The Canadian Standards Association publication, *Emergency Preparedness and Response*, CAN/CSA-Z731-03, is a useful reference. Furthermore, all spills or leaks, such as those from machinery or storage tanks, should be promptly contained and cleaned up (sorbents and booms should be available for quick containment and recovery), and reported to the 24-hour environmental emergencies reporting system (Maritime Provinces: 1-800-565-1633).
7. Please note that Subsection 36(3) of the *Fisheries Act* prohibits “anyone from depositing or permitting the deposit of a deleterious substance of any type in water frequented by fish, or in any place under any conditions where the deleterious substance, or any other deleterious substance that results from the deposit of the deleterious substance, may enter such water.” It is the proponent’s responsibility to ensure that activities are managed so as to prevent the release of substances deleterious to fish. In general, compliance is determined at the last point of control of the substance before it enters water frequented by fish, or in any place under any conditions where a substance may enter such waters.

8. Please note that under Section 6 of the *Migratory Birds Regulations* (MBR), it is forbidden to disturb, destroy or take a nest or egg of a migratory bird, or to be in possession of a live migratory bird or its carcass, skin, nest or egg, except under authority of a permit. It is important to note that under the current MBR, no permits can be issued for the incidental take of migratory birds caused by development projects or other economic activities. Furthermore, Section 5.1 of the *Migratory Birds Convention Act* (MBCA) describes prohibitions related to deposit of substances harmful to migratory birds:

“5.1 (1) No person or vessel shall deposit a substance that is harmful to migratory birds, or permit such a substance to be deposited, in waters or an area frequented by migratory birds or in a place from which the substance may enter such waters or such an area.

(2) No person or vessel shall deposit a substance or permit a substance to be deposited in any place if the substance, in combination with one or more substances, results in a substance – in waters or an area frequented by migratory birds or in a place from which it may enter such waters or such an area – that is harmful to migratory birds.”

It is the proponent’s responsibility to ensure that activities are managed so as to ensure compliance with the MBCA and its regulations. In fulfilling this responsibility, it should be taken into consideration that the breeding season for most birds within the project area occurs between May 1 and August 31, however some species protected under the MBCA nest outside this timeframe. Also, while most birds construct nests in trees and shrubs, a number of species of birds nest at ground level (e.g. Common Nighthawk, Killdeer), and some species may nest in burrows or stockpiles of soil or the banks of pits (e.g. Bank Swallows). One method frequently used to minimize the risk of destroying bird nests consists of avoiding certain activities, such as clearing, during the nesting period for migratory birds in the region. The risk of impacting active nests or birds caring for pre-fledged chicks discovered during project activities outside the May 1st to August 31st window can be minimized by measures such as the establishment of vegetated buffer zones around nests, and minimization of activities in the immediate area until nesting is complete and chicks have naturally migrated from the area. It is incumbent on the proponent to identify the best approach, based on the circumstances, to ensure compliance with the MBCA.

9. The proponent must ensure its activities are managed so as to comply with the *Species at Risk Act* (SARA). SARA is one of three elements of Canada’s Strategy for the Protection of Species at Risk. The other two are the federal-provincial/territorial *Accord for the Protection of Species at Risk* and the Habitat Stewardship Program for Species at Risk. In addition to SARA requirements, application of the precautionary principle and the consideration of potential impacts on all rare or imperiled species in Canada (e.g., species of conservation concern) is considered to be a best practice approach to fulfilling environmental assessment responsibilities.

10. The Canadian Environmental Assessment Agency has determined that the proposed activities to date are not a Designated Project under the *Canadian Environmental Assessment Act, 2012*, and therefore no federal environmental assessment is required at this time. However, for your information, please note that the following would be considered a Designated Project: "The construction, operation, decommissioning and abandonment of a facility for the extraction of 200 000 m³/year or more of groundwater or an expansion of a facility that would result in an increase in production capacity of more than 35%." The construction of such a facility would require the submission of a project description to the Canadian Environmental Assessment Agency.

If you have any questions, feel free to contact me at (506) 457-6757, by fax at (506) 453-2627, or by email at pierre.doucet@gnb.ca.

Sincerely,

A handwritten signature in black ink, appearing to read "Pierre Doucet", with a long horizontal stroke extending to the right.

Pierre Doucet
Project Manager

C: Technical Review Committee
John Sims M.Sc., P.Eng., P.Geo. – exp.

**ATTACHMENT B –
Driller's Well Logs**

OFFICE NUMBER

NEW

REPAIR

TEST

OTHER

REPAIR

TEST

OTHER

DRILLER'S REPORT

DATE

TESTING VOUCHER INFORMATION MANDATORY FOR WATER TEST

PID NO. 7000162310048327 WELL ID NO. 2226

WELL OWNED INFORMATION

WELL LOCATION: Village de Memramcook 540 Rue Centrale Memramcook NB E4K 3S6

DO YOU NEED A SAMPLE FOR YOUR MORTGAGE?

YES NO

IF YOU WISH THE RESULTS TO BE RELEASED TO YOUR MORTGAGE LENDER...

YES NO

ATTENTION OF:

DRILLER'S LOG

TELEPHONE:

DEPTH (FT) DIAMETER (IN) COLOR / DESCRIPTION

SIGNATURE OF WELL OWNER:

8 Browns

WAS THE COST OF THIS WELL FINANCED BY NB HOUSING?

67 Grey

WELL / WATER USE:

67 89 Grey

INDUSTRIAL DOMESTIC EXHAUSTION HEAT PUMP

89 96 Grey

TYPE OF WORK COMPLETED:

96 118 Grey

METHOD:

118 131 Grey

CABLE TOOL AIR DRILL

131 184 Grey

CASING INSTALLED:

184 195 Grey

LENGTH OF CASING ABOVE GROUND:

195 212 Brown

STEEL IN DIAMETER:

212 252 Grey

PVC IN DIAMETER:

252 260 Brown

SCREENS:

260 260 Brown

SETBACKS:

260 260 Brown

SEPTIC TANK:

260 260 Brown

RIGHT OF WAY:

260 260 Brown

CENTER OF ROAD:

260 260 Brown

SEPTIC MEASUREMENT:

260 260 Brown

APPROXIMATE SETBACKS:

260 260 Brown

FLOWING WELL?

260 260 Brown

AQUIFER TEST:

260 260 Brown

INITIAL WATER LEVEL:

260 260 Brown

PUMPING RATE:

260 260 Brown

FINAL WATER LEVEL:

260 260 Brown

ESTIMATED SAFE YIELD:

260 260 Brown

WELL GROUTED?

260 260 Brown

FROM:

260 260 Brown

DRILLING FLUIDS USED:

260 260 Brown

TYPE:

260 260 Brown

DRILLER'S COMMENTS:

260 260 Brown

DRILLING COMPANY:

260 260 Brown

COMPLETION DATE:

260 260 Brown

DRILLER'S SIGNATURE:

260 260 Brown

DRILLER'S COMMENTS:

260 260 Brown

TEST HOLE ONLY, WELL NOT COMPLETED

260 260 Brown

G.P.S. (OPTIONAL)

260 260 Brown

I CERTIFY THAT THE WELL HEREIN DESCRIBED HAS BEEN CONSTRUCTED IN ACCORDANCE WITH THE WATER WELL REGULATION UNDER THE NEW BRUNSWICK CLEAN WATER ACT

260 260 Brown

SIGNATURE OF DRILLER:

260 260 Brown

DRILLER'S SIGNATURE:

260 260 Brown

DRILLER'S SIGNATURE:

260 260 Brown

DRILLER'S SIGNATURE:

260 260 Brown

**ATTACHMENT C –
Laboratory Analytical Results**

Inorganic Report / Rapport inorganique

Client information du Client:

Date Finalized/Finalisée: 2012/12/21

Name/Nom: EXP SERVICES INC
 Address/Adresse: 40 HENTRI DUNANT ST
 MONCTON NB E1E 1E5

Tel. No./No. de tel.: (506) 857 8889

Prop. No./No. de Projet: 0126

Lab No./No. de Lab. : **161749 - 201214626**

Authorization/Autorité: Lori Lamey

Title/Titre: Manager/Gérant

Matrix/Matrice: Drilled well / Puits foré
 Drinking Water/Eau Potable

Location of Sample/ Location d'échantillon:	EAST MEMRAMCOOK TW 12 #5 MEMRAMCOOK TH12-01
Health Region/ Région de santé publique:	01
Well I.D./ Puits, identification du:	0048326
PID No./NID:	70001623
Date Collected/ Date de prelevement:	2012/12/05

Parameter/ Paramètre	Flag	Result/ Résultats	Units/ Unités	L.O.Q./ L.D.Q.	H.A.L./ L.A.S.
Alkalinity / Alcalinité	See comments. / Voir commentaires.	136	mg/l		
Aluminum / Aluminium		2.2	mg/l	0.025	
Antimony / Antimoine	Less than L.O.Q. / Moins de L.D.Q.		µg/l	1.0	6.0
Arsenic	Matrix interference / Intervention de matric		µg/l	1.5	10.0
Barium / Baryum	*** Exceeds H.A.L. / Plus que L.A.S. ***	3.2	mg/l	0.010	1.0
Boron / Bore		0.075	mg/l	0.010	5.0
Bromide / Bromure	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.100	
Cadmium	Less than L.O.Q. / Moins de L.D.Q.		µg/l	0.5	5.0
Calcium		45.0	mg/l	0.10	
Chloride / Chlorure	See comments. / Voir commentaires.	5.97	mg/l	0.050	250
Chromium / Chrome	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.1	0.050
Conductivity / Conductivité	See comments. / Voir commentaires.	276	µS/cm		
Copper / Cuivre	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.1	1.0
Fluoride / Florure	See comments. / Voir commentaires.	0.188	mg/l	0.100	1.5
Iron / Fer	*** Exceeds H.A.L. / Plus que L.A.S. ***	4.9	mg/l	0.010	0.300
Lead / Plomb	*** Exceeds H.A.L. / Plus que L.A.S. ***	53	µg/l	1.0	10
Magnesium / Magnésium		4.59	mg/l	0.10	
Manganese / Manganèse	*** Exceeds H.A.L. / Plus que L.A.S. ***	0.78	mg/l	0.005	0.05
Nitrate-nitrogen / Nitrate-azote	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.05	10.0
Nitrate/nitrite / Nitrates/nitrite	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.05	10.0

Calculated Parameters/Paramètres calculés					
Sum of Cations	4.591	Sum of Anions	3.025	% Difference	-20.562
Saturation Index @ 25°C	0.765	CO3(as CaCO3)	2.4	HCO3(as CaCO3)	133.5

Results reported refer only to the sample(s) as received.

Les résultats fournis ne se rapportent qu'aux échantillons dans l'état où ils ont été reçus.

For an interpretation of your results, please contact the regional public health office in your area.

Pour une interprétation de vos résultats veuillez contacter le bureau de santé publique dans votre région.

[LOQ/LDQ] Limit of quantitation/Limite de quantification

[HAL/LAS] Health Advisory Level (Drinking water only)/Limites acceptables pour la santé (Eau potable seulement)

Client information du Client:

Date Finalized/Finalisée: 2012/12/21

Name/Nom: EXP SERVICES INC
 Address/Adresse: 40 HENTRI DUNANT ST
 MONCTON NB E1E 1E5

Tel. No./No. de tel.: (506) 857 8889

Prop. No./No. de Projet: 0126

Lab No./No. de Lab. : **161749 - 201214626**

Authorization/Autorité: Lori Lamey

Title/Titre: Manager/Gérant

Matrix/Matrice: Drilled well / Puits foré
 Drinking Water/Eau Potable

Location of Sample/ Location d'échantillon:	EAST MEMRAMCOOK TW 12 #5 MEMRAMCOOK
Health Region/ Région de santé publique:	01 <i>TH12-01 cont'd.</i>
Well I.D./ Puits, identification du:	0048326
PID No./NID:	70001623
Date Collected/ Date de prelevement:	2012/12/05

Parameter/ Paramètre	Flag	Result/ Résultats	Units/ Unités	L.O.Q./ L.D.Q.	H.A.L./ L.A.S.
Nitrite	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.05	1.0
pH	See comments. / Voir commentaires.	8.29			
Potassium		2.2	mg/l	0.10	
Selenium / Sélénium	Less than L.O.Q. / Moins de L.D.Q.		µg/l	15	10
Sodium		31.5	mg/l	0.10	200
Sulfate	See comments. / Voir commentaires.	5.93	mg/l	0.050	500
Thallium	Less than L.O.Q. / Moins de L.D.Q.		µg/l	1.0	
Total Hardness / Dureté totale		131	mg/l	0.67	
Turbidity / Turbidité	*** Exceeds H.A.L. / Plus que L.A.S. ***	4300	NTU	0.2	1.0
Uranium		1.1	µg/l	0.5	20
Zinc	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.05	5.0

Comments:

Commentaires:

Ion Balance : Unable to balance due to elevated iron and turbidity. See Comments Sample centrifuged prior to analysis. Aqueous portion only analyzed for alkalinity, bromide, chloride, conductivity, fluoride, pH, and sulphate. Cr, Cu, Zn and Se LOQs changed due to sample dilution to overcome interference.

Bilan des ions : impossible d'établir le bilan en raison d'une turbidité et d'une quantité de fer élevées Voir commentaires. seuil de détection modifié en raison de la dilution de l'échantillon. L'échantillon a été centrifugé avant l'analyse. Seulement la partie aqueous a été analysée pour l'alcalinité, le bromure, le chlorure, la conductivité, le fluorure, le pH, et le sulfate.

Calculated Parameters/Paramètres calculés					
Sum of Cations	4.591	Sum of Anions	3.025	% Difference	-20.562
Saturation Index @ 25°C	0.765	CO3(as CaCO3)	2.4	HCO3(as CaCO3)	133.5

Results reported refer only to the sample(s) as received.

Les résultats fournis ne se rapportent qu'aux échantillons dans l'état où ils ont été reçus.

For an interpretation of your results, please contact the regional public health office in your area.

Pour une interprétation de vos résultats veuillez contacter le bureau de santé publique dans votre région.

[LOQ/LDQ] Limit of quantitation/Limite de quantification

[HAL/LAS] Health Advisory Level (Drinking water only)/Limites acceptables pour la santé (Eau potable seulement)

Analytical Services Laboratory/Laboratoire des services analytiques
 12, rue McGloin Street, Fredericton, NB E3A 5T8
Inorganic Report / Rapport inorganique

Client information du Client:

Date Finalized/Finalisée: **2012/12/21**

Name/Nom: EXP SERVICES INC
 Address/Adresse: 40 HENRI DUNANT ST
 MONCTON NB E1E 1E5
 Tel. No./No. de tel.: (506) 857 8889
 Prop. No./No. de Projet: 0126
 Lab No./No. de Lab. : 161750 - 201214627
 Authorization/Autorité: Lori Lamey
 Title/Titre: Manager/Gérant
 Matrix/Matrice: Drilled well / Puits foré
 Drinking Water/Eau Potable

RECEIVED
 OCT 22 2012
 EXP MONCTON

Location of Sample/ Location d'échantillon: East Memramcook TW
 12-#6 - Memramcook - Village of Memramcook
 Health Region/ Région de santé publique: 01
 Well I.D./ Puits, identification du: 0048327
 PID No./NID: 70001623
 Date Collected/ Date de prelevement: 2012/12/10
 TH12-02

Parameter/ Paramètre	Flag	Result/ Résultats	Units/ Unités	L.O.Q./ L.D.Q.	H.A.L./ L.A.S.
Alkalinity / Alcalinité		141	mg/l		
Aluminum / Aluminium		0.25	mg/l	0.025	
Antimony / Antimoine	Less than L.O.Q. / Moins de L.D.Q.		µg/l	1.0	6.0
Arsenic		2.6	µg/l	1.5	10.0
Barium / Baryum	*** Exceeds H.A.L. / Plus que L.A.S. ***	1.2	mg/l	0.010	1.0
Boron / Bore		0.158	mg/l	0.010	5.0
Bromide / Bromure	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.100	
Cadmium	Less than L.O.Q. / Moins de L.D.Q.		µg/l	0.5	5.0
Calcium		9.16	mg/l	0.10	
Chloride / Chlorure		5.12	mg/l	0.050	250
Chromium / Chrome	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.010	0.050
Conductivity / Conductivité		302	µS/cm		
Copper / Cuivre	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.010	1.0
Fluoride / Florure		0.227	mg/l	0.100	1.5
Iron / Fer	*** Exceeds H.A.L. / Plus que L.A.S. ***	0.480	mg/l	0.010	0.300
Lead / Plomb	*** Exceeds H.A.L. / Plus que L.A.S. ***	19	µg/l	1.0	10
Magnesium / Magnésium		1.16	mg/l	0.10	
Manganese / Manganèse	*** Exceeds H.A.L. / Plus que L.A.S. ***	0.065	mg/l	0.005	0.05

Calculated Parameters/Paramètres calculés				
Sum of Cations	3.335	Sum of Anions	3.069	% Difference -4.152
Saturation Index @ 25°C	0.243	CO3(as CaCO3)	3.4	HCO3(as CaCO3) 137.5

Results reported refer only to the sample(s) as received.
 Les résultats fournis ne se rapportent qu'aux échantillons dans l'état où ils ont été reçus.
 For an interpretation of your results, please contact the regional public health office in your area.
 Pour une interprétation de vos résultats veuillez contacter le bureau de santé publique dans votre région.

[LOQ/LDQ] Limit of quantitation/Limite de quantification

[HAL/LAS] Health Advisory Level (Drinking water only)/Limites acceptables pour la santé (Eau potable seulement)

Analytical Services Laboratory/Laboratoire des services analytiques
 12, rue McGloin Street, Fredericton, NB E3A 5T8
Inorganic Report / Rapport inorganique

Client information du Client:

Date Finalized/Finalisée: **2012/12/21**

Name/Nom: EXP SERVICES INC
 Address/Adresse: 40 HENRI DUNANT ST
 MONCTON NB E1E 1E5

 Tel. No./No. de tel.: (506) 857 8889
 Prop. No./No. de Projet: 0126

 Lab No./No. de Lab. : **161750 - 201214627**
 Authorization/Autorité: Lori Lamey
 Title/Titre: Manager/Gérant
 Matrix/Matrice: Drilled well / Puits foré
 Drinking Water/Eau Potable

Location of Sample/ Location d'échantillon:	East Memramcook TW 12-#6 - Memramcook - Village of Memramcook
Health Region/ Région de santé publique:	01 TH12-02 cont'd
Well I.D./ Puits, identification du:	0048327
PID No./NID:	70001623
Date Collected/ Date de prelevement:	2012/12/10

Parameter/ Paramètre	Flag	Result/ Résultats	Units/ Unités	L.O.Q./ L.D.Q.	H.A.L./ L.A.S.
Nitrate-nitrogen / Nitrate-azote	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.05	10.0
Nitrate/nitrite / Nitrates/nitrite	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.05	10.0
Nitrite	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.05	1.0
pH		8.42			
Potassium		1.3	mg/l	0.10	
Selenium / Sélénium	Less than L.O.Q. / Moins de L.D.Q.		µg/l	1.5	10
Sodium		61.9	mg/l	0.10	200
Sulfate		4.31	mg/l	0.050	500
Thallium	Less than L.O.Q. / Moins de L.D.Q.		µg/l	1.0	
Total Hardness / Dureté totale		27.6	mg/l	0.67	
Turbidity / Turbidité	*** Exceeds H.A.L. / Plus que L.A.S. ***	50	NTU	0.2	1.0
Uranium	Less than L.O.Q. / Moins de L.D.Q.		µg/l	0.5	20
Zinc		0.013	mg/l	0.005	5.0

Calculated Parameters/Paramètres calculés				
Sum of Cations	3.335	Sum of Anions	3.069	% Difference -4.152
Saturation Index @ 25°C	0.243	CO3(as CaCO3)	3.4	HCO3(as CaCO3) 137.5

Results reported refer only to the sample(s) as received.
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 For an interpretation of your results, please contact the regional public health office in your area.
 Pour une interprétation de vos résultats veuillez contacter le bureau de santé publique dans votre région.

[LOQ/LDQ] Limit of quantitation/Limite de quantification

[HAL/LAS] Health Advisory Level (Drinking water only)/Limites acceptables pour la santé (Eau potable seulement)

Analytical Services Laboratory/Laboratoire des services analytiques
12, rue McGloin Street, Fredericton, NB E3A 5T8

Microbiology Report / Rapport de microbiologie

RECEIVED

DEC 17 2012

EXP MONCTON

Date Finalized/Finalisée: 2012/12/12

Client information du Client:

Name/Nom: EXP SERVICES INC
Address/Adresse: 40 HENRI DUNANT ST
MONCTON NB E1E 1E5

Tel. No./No. de tel.: (506) 857 8889
Prop. No./No. de Projet: 0126

Lab No./No. de Lab. : 161750 - 201214627

Authorization/Autorité: Tracy Arsenault
Title/Titre: Manager/Gérante
Reason/Raison: New Well Act
Matrix/Matrice: Drilled well / Puits foré
Drinking Water/Eau Potable

Location of Sample/
Location d'échantillon: East Memramcook
TW 12-#6 -
Memramcook -
Village of
Memramcook

Health Region/
Région de santé publique: **TH12-02**
Well I.D./Puits, identification: 0048327
PID No./NID: 70001623
Date Collected/
Date de prélèvement: 2012/12/10
Date Received/reçu: 2012/12/11
Date Analyzed/analysé: 2012/12/11

Parameter/ Paramètre	Flag Description/ Description du drapeau	Results/ Résultats	Units/ Unités	L.O.Q./ L.D.Q.		
Total coliform		A				
E. coli		A				

[A] Absence [CFU] Colony Forming Units
[P] Presence [LOQ/LDQ] Limit of quantitation/Limite de quantification
[MPN] Most Probable Number

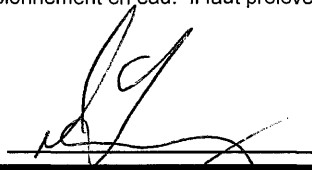
Level of detection is one bacterium per test volume/

Results/Résultats

Acceptable/acceptable.

Coliforms (non-faecal) present. These bacteria are not by themselves considered harmful to human health. They do however, indicate a possible route of contamination of a water supply. Further sampling or investigation is necessary to better understand the drinking water supply.
Coliformes (non fécaux) présents. Ces bacteries seules ne sont pas considérées comme nocives pour la santé des humains. Elles relèvent cependant un risque de contamination de la source d'approvisionnement en eau. Il faut prélever d'autres échantillons pour mieux comprendre la qualité de l'eau potable.

Unacceptable/inacceptable.


Authorization/Autorisation

Contact Date/ Date de contact: _____ Comments/ commentaires: _____

Results reported refer only to the sample(s) as received.
Les résultats fournis ne se rapportent qu'aux échantillons dans l'état où ils ont été reçus.

For an interpretation of your results, please contact the regional public health office in your area.
Pour une interprétation de vos résultats veuillez contacter le bureau de santé publique dans votre région.



January 31, 2013

Emery Bourque, CAO
Village of Memramcook
540, rue Centrale
Memramcook, NB
E4K 3S6

Re: **MON-00203023-A0 Water Source Exploration, Results for Test Well TH13-01 in Area of Existing Memramcook Well PW1**

Dear Mr. Bourque:

Exp Services Inc. (**exp**) is pleased to provide the following letter report summarizing the results of the test well drilled as part of the additional water source exploration program completed for the Village under the New Brunswick Department of Environment's (NBENV) EIA registration file 4561-3-1228. The subject well of this report was completed on the property identified by property identification number (PID) 70153572 and located off Michel Street in Memramcook, NB on which the Village's current production well PW1 is located. A summary of the methodology; presentation and discussion of the results; and closing statements are provided below.

METHODOLOGY

The test well was drilled on January 17, 2013 using an air rotary drilling rig supplied by Eastern Well Drillers of Shediac, NB. The well was placed approximately 6 meters south of the existing well PW1. The test well was completed by setting a 203 mm diameter casing in a pilot hole drilled to a depth of 6.1 m. Following this, the well was drilled at 150 mm diameter open hole through the bedrock to a depth of 65.5 m. Bedrock was encountered at 2.5 meters.

The well was purged of potential chemically unrepresentative water using the air lift method for approximately 1.5 hours and groundwater samples were collected in laboratory supplied bottles and submitted to the NBENV laboratory in Fredericton, NB for general chemistry and metals analysis.

RESULTS AND DISCUSSION

EIA Application - A copy of the submission to NBENV for request to drill the test well, and the subsequent NBENV approval to proceed are provided in Attachment A.

Estimated Well Yield – A copy of the driller's log for the TH13-01 test well is provided in Attachment B. The total well yield estimated by the driller by employing the air lift method following approximately 1 hour of air lift development was 327 m³/day (50 l/gpm). The following table identifies the depth of each fracture encountered in the well and the estimated water bearing yield for the respective fracture zone.

Well ID	Depth to Water Yielding Zone (m)	Water Bearing Capacity m3/day (Impg)
TH13-01	22.9	262 (40)
	40	65 (10)

Analytical Results - Groundwater analytical results are provided in the copy of the NBENV Laboratory Certificates in Appendix C. A summary of water quality results follows.

General Chemistry

For the test hole, concentrations of all general chemistry parameters were found to comply with their respective potable water criteria, (Health Advisory Limits (HAL)), where applicable, with the exception of turbidity.

Turbidity is attributed to the fact that the water sample was collected from a newly drilled well with minimal development. Samples from such wells can contain considerable amounts of sediment due to inadequate development. The elevated turbidity can often lead to elevated trace metal concentrations (see below) due to leaching of naturally occurring trace metals from the sediment during the sample preparation and analytical process.

Trace Metals

For the test hole, concentrations of all trace metal parameters were found to comply with their respective potable water criteria (Health Advisory Limits (HAL)), where applicable, with the exception of iron, lead and manganese.

Iron and manganese are metallic element present naturally in many types of rock, and are commonly found in groundwater from south eastern New Brunswick. Iron and manganese can collect and block pipes, fixtures and break off as rust (iron) and black (manganese) flakes or sediment, giving water an unpleasant appearance and taste. Health effects are not expected at levels normally found in drinking water. The main source of lead in drinking water is through corrosion of plumbing materials with lead components, such as pipes, solder, fittings and older galvanized well liners. Exposure to elevated lead concentrations in drinking water is a health concern. However, as noted above the elevated concentrations of trace metals reported for the test well sample are attributed to the high levels of turbidity (i.e. suspended sediment), and are not considered representative of what would be expected from a fully developed production well.

Hydrocarbons

For the test hole sample, concentrations of all hydrocarbon analytes reported were below detection levels.

DISCUSSION AND CONCLUSIONS

Based on the results above, there appears to be little to no increase in potable water yields between the newly drilled well (TH13-01) and the current production well (PW1) which is located on the same



property. Options regarding status of the test well include leaving in place and develop further as a possible backup (or replacement) well to the existing PW1, or fit up as a monitoring well to provide additional information on aquifer conditions (e.g. aquifer response to pumping cycles in PW1 and the nearby PW01-08). Either of these options would require discussion and submission of plans to NBENV for review and approval. If no further purpose for the well is determined, it should be decommissioned/ abandoned in accordance to NBENV well decommissioning guidelines.

CLOSING

We trust that this information satisfies your current requirements, if you should have any questions regarding this letter report, please contact the undersigned.

Sincerely,



John Sims, M.Sc., P. Eng., P.Geo
Senior Hydrogeologist
exp Services Inc.

ATTACHMENT A –

**EIA Registration Submission Letter and
NBENV Approval to Proceed**



November 9, 2012

MON-00203023-A0

New Brunswick Department of Environment
P.O. Box 6000
Fredericton, NB
E3B 5H1

Attention: Pierre Doucet, Project Assessment (EIA)

Re: Village of Memramcook Groundwater Exploration Program, Request for Test Well Drilling Location on PID70153572 (NBDENV File 4561-3-1228)

On behalf of the Village of Memramcook, **exp** Services Inc. (**exp**) requests permission from your Department to proceed with test well drilling on the property identified by PID70153572. A brief summary of the rationale for location and general approach for drilling of the proposed test well is provided below.

The Village is in the progress of completing a groundwater exploration program registered under NBDENV File 4561-3-1228. This work has led to a number of proposed test wells being drilled at various locations throughout the municipality (interim reports have been forwarded to NBDENV summarizing test wells results as the program has progressed). Only one test well to date under this program has indicated expectation of yield sufficient for possible use as a municipal supply well. However, this well is located in east Memramcook and is a significant distance away from the current central water system; therefore commissioning (subject to NBDENV permitting) in the immediate term is not anticipated due to financial constraints. Consequently the Village is interested in investigating further well development potential within the immediate area of their existing centralized system.

The Village's historical water source network has included two wells supply wells (PW1 and PW2) that were drilled in 1976. These wells are understood to have been drilled and cased to maximum depth on the order of 45 m with casing set at 15 m. During 2008 and 2009, groundwater exploration work approved by NBDENV indicated potential for better groundwater yield in an aquifer zone below the existing production zone in PW2 which is located on PID70153580, approximately 200 m from the location of PW1 located on PID70153572. This led to a new well, Well 08-1, being completed (subsequently approved by NBDENV and commissioned by the Village) in this deeper aquifer zone. The deeper aquifer zone has been suggested to be Hopewell Cape Formation as opposed to Boss Point Formation in which most of the Village's existing water sources including PW1 and PW2 were completed.

The purpose of this submission is to request NBDENV's approval to complete an exploratory test well in the immediate area of the Village's existing PW1 to determine if suitable well yields can be found below the depth of the existing well. The general approach would be to locate the proposed test well on the current property owned by the Village (PID70153572), and drill to an anticipated depth on the order of 65 m. If zones of suitable yield were found, the well would be pump tested. The property is of limited extent (e.g. approximately 10 m by 10 m, refer to red square on Figure attached), and it is expected that the proposed test well will be located within 10 m of the existing PW1, and be kept within

exp Services Inc.

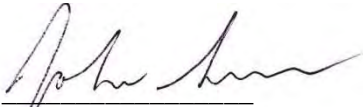
Village of Memramcook
Groundwater Exploration Re: NBDENV File 4561-3-1228
MON-00203023-A0
November 9, 2012

the limits of the property currently owned by the Village. Adjacent properties are privately held, and in the vicinity of the Village's PW1 property footprint are generally undeveloped and treed area.

The work is proposed to be completed as part of the Village's current groundwater exploration program scheduled for completion on December 31, 2012. It is the objective that the test well (and pump test, if warranted) be completed by the third week of December.

We appreciate your Department's consideration and attention to this matter. If there are any questions, please contact the undersigned.

Yours very truly,



John Sims, M.Sc., P. Eng., P.Geo.
Senior Hydrogeologist

cc. Emery Bourque – Village of Memramcook
Roland LeBlanc - **exp**

December 12, 2012
File 4561-3-1228

Emery Bourque
Chief Administrative Officer
Village of Memramcook
540 Centrale Street
Memramcook, NB
E4K 3S6

Dear Mr. Bourque,

RE: Memramcook Water System – 30-Year Projection – Village of Memramcook

The Technical Review Committee (TRC) has reviewed the recently submitted Request for Test Well Drilling Location on PID 70153572 (dated November 9, 2012) for the above-mentioned project. The following general questions and concerns must be addressed in order to facilitate the continued review of this project.

Questions/Concerns:

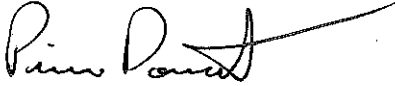
1. Approval is hereby given to proceed with drilling a test well at the requested location. However, the additional information requested in the following items will have to be submitted to the Department of Environment and Local Government (DELG) for review and a separate approval will have to be given before a pumping test can take place on this well, if warranted.
2. Is it proposed to replace PW1 and decommission the well if a larger water supply source is found, or is the intent to keep both wells?
3. Is there an aquitard or separation between the upper and lower aquifer zones?
4. Some literature indicates that the Hopewell Cape formation is considered a poor or bad aquifer. Please provide more details on this topic.



5. Please note that the general questions and concerns that have been raised in various correspondence from DELG related to this project (September 24, 2009; November 25, 2009; May 21, 2010; October 4, 2010; and November 15, 2012) also apply to this proposed test well.

If you have any questions, feel free to contact me at (506) 457-6757, by fax at (506) 453-2627, or by email at pierre.doucet@gnb.ca.

Sincerely,

A handwritten signature in black ink, appearing to read "Pierre Doucet", with a long horizontal flourish extending to the right.

Pierre Doucet
Project Manager

C: Technical Review Committee
John Sims M.Sc., P.Eng., P.Geo. – exp.

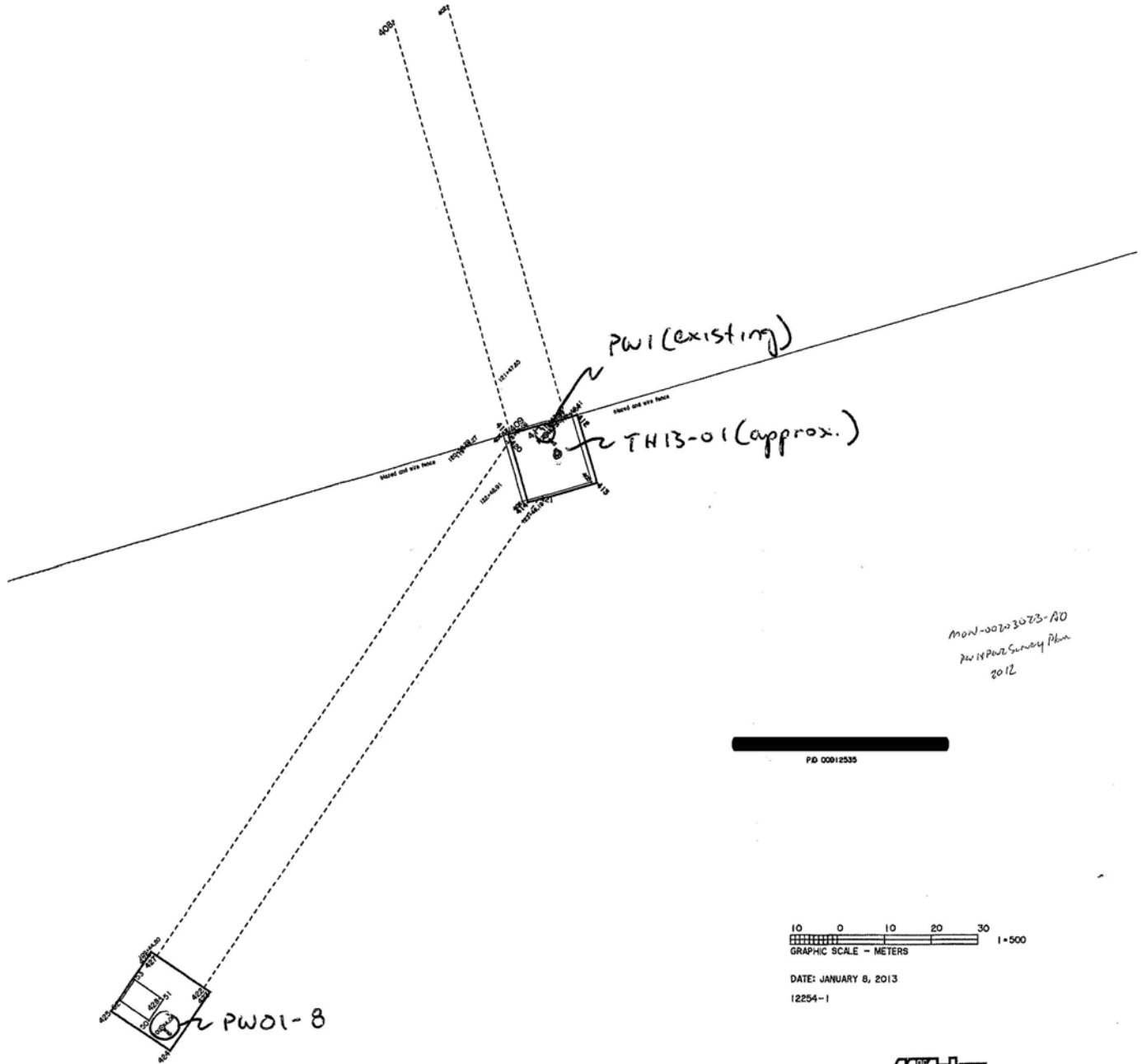
ATTACHMENT B –

Driller's Well Log and Well Location Schematic

OFFICE USE ONLY FIELD NO.		HEALTH CODE	LAB NO.	SAMPLE RECEIVED DATE		DRILLER'S REPORT	
		HEALTH OFFICE	EVENT NO.	YR	MO	DAY	SAMPLE RECEIVED BY:
TESTING VOUCHER INFORMATION SEE BACK FOR DETAILS PLEASE PRINT INFORMATION INCLUDED HEREIN SHOULD BE THE WELL OWNER AT TIME OF SAMPLING				MANDATORY FOR WATER TEST		P.I.D. NO.	WELL I.D. NO.
FIRST NAME <i>Exp Services</i>				LAST NAME		<i>7.0153572</i>	<i>0.048325</i>
ADDRESS (MAIL RESULTS TO) <i>40 Henri Dunant St.</i>				ADDRESS		FIRST NAME <i>Exp Services Inc</i>	
CITY/TOWN/VILLAGE <i>Moncton</i>		PROV. <i>NB</i>	POSTAL CODE <i>E1E1E5</i>		LAST NAME		
DAYTIME PHONE <i>857-8889</i>		FAX NO. <i>857 8315</i>		CITY/TOWN/VILLAGE <i>Moncton</i>		PROVINCE <i>NB</i>	POSTAL CODE <i>E1E1E5</i>
TEL. NO.		SAMPLE COLLECTED YR <i>2013</i> MO <i>01</i> DAY <i>17</i> HR <i>12</i> MIN <i>00</i> AM/PM <i>AM</i>		WELL LOCATION: SAME AS ABOVE OR CIVIC NUMBER STREET NAME <i>Memramcook West Hole Pudi-B-2013</i>		TH13-01	
DO YOU NEED A SAMPLE FOR YOUR MORTGAGE? IF YOU WISH THE RESULTS TO BE RELEASED TO A MORTGAGE INSTITUTION PLEASE INCLUDE THE FOLLOWING CONTACT INFORMATION:				SEE BACK FOR DETAILS		WELL PAID FOR BY PROVINCIAL DEPT.	
ATTENTION OF:				WELL ON RESERVE? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>		WELL ALREADY TAGGED? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	
TEL. NO.				FAX NO.		DRILLER'S LOG *	
SIGNATURE OF WELL OWNER				FROM (FT.)		TO (FT.)	COLOUR
WAS THE COST OF THIS WELL FINANCED BY NB HOUSING? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>				Ground Level		<i>8</i>	<i>Brown</i>
WELL / WATER USE: INDUSTRIAL <input type="checkbox"/> ABANDONED <input type="checkbox"/> DOMESTIC <input type="checkbox"/> EXPLORATORY <input checked="" type="checkbox"/> MUNICIPAL <input type="checkbox"/> MONITORING <input type="checkbox"/> HEAT PUMP <input type="checkbox"/> OBSERVATION <input type="checkbox"/> OTHER <input type="checkbox"/>				<i>8</i>		<i>22</i>	<i>Brown</i>
TYPE OF WORK COMPLETED: NEW WELL <input checked="" type="checkbox"/> DEEPENED <input type="checkbox"/>				<i>22</i>		<i>37</i>	<i>Brown</i>
OTHER:				<i>37</i>		<i>75</i>	<i>Grey</i>
METHOD:				<i>75</i>		<i>81</i>	<i>Grey</i>
CABLE TOOL <input type="checkbox"/> ROTARY <input checked="" type="checkbox"/> OTHER _____				<i>81</i>		<i>91</i>	<i>Grey</i>
CASING INSTALLED: LENGTH OF CASING ABOVE GROUND: <i>2</i> FT. <i>0</i> IN. STEEL: <i>8</i> IN DIAM. FROM <i>0</i> FT. TO <i>19</i> FT. PVC: _____ IN DIAM. FROM _____ FT. TO _____ FT. SLOTTED _____ IN DIAM. FROM _____ FT. TO _____ FT. SCREENS: TYPE: _____ SLOT SIZE _____ _____ IN DIAM. FROM _____ FT. TO _____ FT. DRIVE SHOE: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>				<i>91</i>		<i>105</i>	<i>Grey</i>
SETBACKS: SEE BACK FOR DETAILS SEPTIC TANK (1) <i>1</i> FT. FIELD (2) _____ FT. FIELD (1) <i>1</i> FT. *RIGHT OF WAY OF ANY PUBLIC ROAD <input checked="" type="checkbox"/> (1) _____ ROAD (2) _____ CENTER OF ROAD <input checked="" type="checkbox"/> (1) _____ (2) _____ SETBACKS MEASURED _____ (NEW CONSTRUCTION) APPROXIMATE SETBACKS AS INDICATED BY HOMEOWNER _____ (EXISTING CONST.)				<i>105</i>		<i>116</i>	<i>Grey</i>
FLOWING WELL? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> IF YES - RATE: _____ igpm (approx.)				<i>116</i>		<i>121</i>	<i>Grey</i>
AQUIFER TEST: METHOD: AIR <input checked="" type="checkbox"/> BAILER <input type="checkbox"/> PUMP <input type="checkbox"/> INITIAL WATER LEVEL: <i>59</i> FT. BELOW TOP OF CASING PUMPING RATE <i>50</i> igpm DURATION: <i>1</i> hrs. <i>00</i> min. FINAL WATER LEVEL: <i>59</i> FT. BELOW TOP OF CASING ESTIMATED SAFE YIELD: <i>50</i> igpm				<i>121</i>		<i>133</i>	<i>Brown</i>
WELL GROUTED? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> FROM _____ FT. TO _____ FT. GROUT TYPE: _____				<i>133</i>		<i>135</i>	<i>Grey</i>
DRILLING FLUIDS USED: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> TYPE: _____				<i>135</i>		<i>137</i>	<i>Brown</i>
DRILLER'S COMMENTS <i>*No septic on property</i>				<i>137</i>		<i>140</i>	<i>Grey</i>
DRILLING COMPANY: <i>Eastern Well Dr. Halls Ltd</i>				<i>140</i>		<i>159</i>	<i>Grey</i>
COMPLETION DATE: <i>1/31/11</i>				<i>159</i>		<i>215</i>	<i>Grey</i>
LICENSE NO. <i>67</i>				IF INSUFFICIENT SPACE PLEASE USE ADDITIONAL SHEETS			
G.P.S. (OPTIONAL)				TOTAL WELL DEPTH: <i>215</i> FT. DEPTH TO BEDROCK: _____ FT.			
I CERTIFY THAT THE WELL HEREIN DESCRIBED HAS BEEN CONSTRUCTED IN ACCORDANCE WITH THE WATER WELL REGULATION UNDER THE NEW BRUNSWICK CLEAN WATER ACT.				WATER BEARING 1' <i>40</i> igpm AT <i>75</i> FT. 2' <i>10</i> igpm AT <i>180</i> FT.			
Signature of Driller: <i>[Signature]</i>				FRACTURE ZONES: 3 _____ igpm AT _____ FT. 4 _____ igpm AT _____ FT.			
Signature of Helper: <i>[Signature]</i>				PUMP INSTALLATION: INSTALLED <input type="checkbox"/> NOT INSTALLED <input checked="" type="checkbox"/>			
				PUMP INTAKE SETTING: _____ FT. BELOW TOP OF CASING (Recommended)			
				PUMP TYPE: SUBMERSIBLE <input type="checkbox"/> JET <input type="checkbox"/> TURBINE <input type="checkbox"/>			
				OTHER _____			
				WELL DISINFECTED? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>			
				TYPE: <i>Chlorine Tablets</i>			
				WHITE - NB DENV. BLUE - Homeowner / Voucher YELLOW - Homeowner PINK - Drilling Company			
				KEEP THIS REPORT WITH YOUR IMPORTANT DOCUMENTS			

POINT	EASTING	NORTHING
412	2648600.908	7441723.877
413	2648673.143	7441848.893
414	2648695.514	7441894.877
415	2648661.243	7441894.796
420	2648681.818	7441884.223
421	2648697.778	7441883.317
422	2648664.241	7441543.203
423	2648687.313	7441578.438
424	2648674.928	7441767.245
425	2648695.355	7441578.432
426	2648674.923	7441594.219
427	2648674.190	7441547.333
428	2648674.190	7441578.288
MONL GPS 3749	2648624.376	7442451.872
112	2648659.214	7441689.179
411	2648654.304	7441701.436
100	2648677.201	7441572.043

NA83 (CSRS)-ADJUSTED COORDINATE SYSTEM



MON-00203023-AD
 PW 18 PAR Survey Plan
 2012

PD 00012535

PD 00012535

10 0 10 20 30
 GRAPHIC SCALE - METERS 1:500

DATE: JANUARY 8, 2013
 12254-1



**ATTACHMENT C –
Laboratory Analytical Results**

Analytical Services Laboratory/Laboratoire des services analytiques
12, rue McGloin Street, Fredericton, NB E3A 5T8
Inorganic Report / Rapport inorganique

MON-00203023-00

RECEIVED

Client information du Client:

Date Finalized/Finalisée: 2013/01/29

Name/Nom: EXP SERVICES INC
Address/Adresse: 40 HENRI DUNANT STREET
MONCTON NB E1E 1E5 EXP MONCTON
Tel. No./No. de tel.: (506) 857 8889
Prop. No./No. de Projet: 0126
Lab No./No. de Lab.: 162682 - 201300468
Authorization/Autorité: Lori Lamey
Title/Titre: Manager/Gérant
Matrix/Matrice: Drilled well / Puits foré
Drinking Water/Eau Potable

Location of Sample/
Location d'échantillon: TEST HOLE PW1 B 2013
MEMRAMCOOK
TH13-01
Health Region/
Région de santé publique: 01
Well I.D./
Puits, identification du: 0048325
PID No./NID: 70153572
Date Collected/
Date de prelevement: 2013/01/17

Parameter/ Paramètre	Flag	Result/ Résultats	Units/ Unités	L.O.Q./ L.D.Q.	H.A.L./ L.A.S.
Alkalinity / Alcalinité	See comments. / Voir commentaires.	122	mg/l		
Aluminum / Aluminium		0.68	mg/l	0.025	
Antimony / Antimoine	Less than L.O.Q. / Moins de L.D.Q.		µg/l	1.0	6.0
Arsenic		3.7	µg/l	1.5	10.0
Barium / Baryum		0.561	mg/l	0.010	1.0
Boron / Bore		0.034	mg/l	0.010	5.0
Bromide / Bromure	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.100	
Cadmium	Less than L.O.Q. / Moins de L.D.Q.		µg/l	0.5	5.0
Calcium		40.9	mg/l	0.10	
Chloride / Chlorure	See comments. / Voir commentaires.	14.8	mg/l	0.050	250
Chromium / Chrome	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.010	0.050
Conductivity / Conductivité	See comments. / Voir commentaires.	287	µS/cm		
Copper / Cuivre	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.010	1.0
Fluoride / Florure	See comments. / Voir commentaires.	0.120	mg/l	0.100	1.5
Iron / Fer	*** Exceeds H.A.L. / Plus que L.A.S. ***	7.2	mg/l	0.010	0.300
Lead / Plomb	*** Exceeds H.A.L. / Plus que L.A.S. ***	29	µg/l	1.0	10
Magnesium / Magnésium		7.42	mg/l	0.10	
Manganese / Manganèse	*** Exceeds H.A.L. / Plus que L.A.S. ***	0.90	mg/l	0.005	0.05

Calculated Parameters/Paramètres calculés				
Sum of Cations	3.792	Sum of Anions	3.080	% Difference -10.363
Saturation Index @ 25°C	0.631	CO3(as CaCO3)	2.0	HCO3(as CaCO3) 120.0

Results reported refer only to the sample(s) as received.
Les résultats fournis ne se rapportent qu'aux échantillons dans l'état où ils ont été reçus.
For an interpretation of your results, please contact the regional public health office in your area.
Pour une interprétation de vos résultats veuillez contacter le bureau de santé publique dans votre région.

[LOQ/LDQ] Limit of quantitation/Limite de quantification

[HAL/LAS] Health Advisory Level (Drinking water only)/Limites acceptables pour la santé (Eau potable seulement)

Analytical Services Laboratory/Laboratoire des services analytiques
12, rue McGloin Street, Fredericton, NB E3A 5T8
Inorganic Report / Rapport inorganique

Client information du Client:

Date Finalized/Finalisée: 2013/01/29

Name/Nom: EXP SERVICES INC
Address/Adresse: 40 HENRI DUNANT STREET
MONCTON NB E1E 1E5

Tel. No./No. de tel.: (506) 857 8889
Prop. No./No. de Projet: 0126

Lab No./No. de Lab.: 162682 - 201300468
Authorization/Autorité: Lori Lamey
Title/Titre: Manager/Gérant
Matrix/Matrice: Drilled well / Puits foré
Drinking Water/Eau Potable

Location of Sample/
Location d'échantillon: TEST HOLE PW1 B 2013
MEMRAMCOOK
TH13-01

Health Region/
Région de santé publique: 01
Well I.D./
Puits, identification du: 0048325
PID No./NID: 70153572
Date Collected/
Date de prelevement: 2013/01/17

Parameter/ Paramètre	Flag	Result/ Résultats	Units/ Unités	L.O.Q./ L.D.Q.	H.A.L./ L.A.S.
Nitrate-nitrogen / Nitrate-azote	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.05	10.0
Nitrate/nitrite / Nitrates/nitrite	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.05	10.0
Nitrite	Less than L.O.Q. / Moins de L.D.Q.		mg/l	0.05	1.0
pH	See comments. / Voir commentaires.	8.24			
Potassium		1.7	mg/l	0.10	
Selenium / Sélénium	Less than L.O.Q. / Moins de L.D.Q.		µg/l	1.5	10
Sodium		13.8	mg/l	0.10	200
Sulfate	See comments. / Voir commentaires.	10.2	mg/l	0.050	500
Thallium	Less than L.O.Q. / Moins de L.D.Q.		µg/l	1.0	
Total Hardness / Dureté totale		133	mg/l	0.67	
Turbidity / Turbidité	*** Exceeds H.A.L. / Plus que L.A.S. ***	274	NTU	0.2	1.0
Uranium		1.7	µg/l	0.5	20
Zinc		0.029	mg/l	0.005	5.0

Calculated Parameters/Paramètres calculés					
Sum of Cations	3.792	Sum of Anions	3.080	% Difference	-10.363
Saturation Index @ 25°C	0.631	CO ₃ (as CaCO ₃)	2.0	HCO ₃ (as CaCO ₃)	120.0

Results reported refer only to the sample(s) as received.

Les résultats fournis ne se rapportent qu'aux échantillons dans l'état où ils ont été reçus.

For an interpretation of your results, please contact the regional public health office in your area.

Pour une interprétation de vos résultats veuillez contacter le bureau de santé publique dans votre région.

[LOQ/LDQ] Limit of quantitation/Limite de quantification

[HAL/LAS] Health Advisory Level (Drinking water only)/Limites acceptables pour la santé (Eau potable seulement)

Analytical Services Laboratory/Laboratoire des services analytiques
 12, rue McGloin Street, Fredericton, NB E3A 5T8
Inorganic Report / Rapport inorganique

Client information du Client:

Date Finalized/Finalisée: 2013/01/29

Name/Nom: EXP SERVICES INC
 Address/Adresse: 40 HENRI DUNANT STREET
 MONCTON NB E1E 1E5

 Tel. No./No. de tel.: (506) 857 8889
 Prop. No./No. de Projet: 0126

 Lab No./No. de Lab. : 162682 - 201300468
 Authorization/Autorité: Lori Lamey
 Title/Titre: Manager/Gérant
 Matrix/Matrice: Drilled well / Puits foré
 Drinking Water/Eau Potable

Location of Sample/ Location d'échantillon: TEST HOLE PW1 B 2013
 MEMRAMCOOK
 TH13-01

 Health Region/ Région de santé publique: 01
 Well I.D./ Puits, identification du: 0048325
 PID No./NID: 70153572
 Date Collected/ Date de prelevement: 2013/01/17

Parameter/ Paramètre	Flag	Result/ Résultats	Units/ Unités	L.O.Q./ L.D.Q.	H.A.L./ L.A.S.
Comments: Sample centrifuged prior to analysis. Aqueous portion only analyzed for alkalinity, bromide, chloride, conductivity, fluoride, pH, and sulphate. See Comments Ion Balance : Unable to balance due to elevated iron and turbidity.	Commentaires: L'échantillon a été centrifugé avant l'analyse. Seulement la partie aqueuse a été analysée pour l'alcalinité, le bromure, le chlorure, la conductivité, le fluorure, le pH, et le sulphate. Voir commentaires. Bilan des ions : impossible d'établir le bilan en raison d'une turbidité et d'une quantité de fer élevées				

Calculated Parameters\Paramètres calculés					
Sum of Cations	3.792	Sum of Anions	3.080	% Difference	-10.363
Saturation Index @ 25°C	0.631	CO3(as CaCO3)	2.0	HCO3(as CaCO3)	120.0

Results reported refer only to the sample(s) as received.
 Les résultats fournis ne se rapportent qu'aux échantillons dans l'état où ils ont été reçus.
 For an interpretation of your results, please contact the regional public health office in your area.
 Pour une interprétation de vos résultats veuillez contacter le bureau de santé publique dans votre région.

[LOQ/LDQ] Limit of quantitation/Limite de quantification

[HAL/LAS] Health Advisory Level (Drinking water only)/Limites acceptables pour la santé (Eau potable seulement)

Analytical Services Laboratory/Laboratoire des services analytiques
12, rue McGloin Street, Fredericton, NB E3A 5T8

Organic Report / Rapport organique

Hydrocarbons by RBCA (Water) Tier 1 / Hydrocarbures (Eau) par RBCA 1er étage

Client information du Client:**Date Finalized/Finalisée:** 2013/01/30

Organization/Organisation: exp Services
Attention: Boris Allard
Prop. No./No. de Projet: 0331
Lab No./No. de Lab.: **162684 - 201300469**
Authorization/Autorité: Roland Gaudet
Title/Titre: Manager/Gérant
Matrix/Matrice: Groundwater / Eau Souterraine
Matrix/Matrice: Drinking Water/Eau Potable

Client Sample Identifier/ No. d'Échantillon du client EXP Monc	MEMRAMCOOK
Field No./No d'Echantillon:	PW1B TH13-01
Date Collected/Date prélevée:	2013/01/17

Parameter/ Paramètre	Flag	Results/ Résultats	Units/ Unités	L.O.Q./ L.D.Q.	H.A.L./ L.A.S.
Benzene / Benzène	Not Detected./Non détecté.		mg/L	0.0002	0.005
Toluene / Toluène	Not Detected./Non détecté.		mg/L	0.0002	0.024
Ethylbenzene / Éthylbenzène	Not Detected./Non détecté.		mg/L	0.0003	0.0024
Total Xylenes / Xylènes totaux	Not Detected./Non détecté.		mg/L	0.0004	0.300
C6-C10 Hydrocarbons / C6-C10 Hydrocarbures	Not Detected./Non détecté.		mg/L	0.005	
>C10-C16 Hydrocarbons / >C10-C16 Hydrocarbures	Less than L.O.Q./Moins de L.D.Q.		mg/L	0.015	
>C16-C21 Hydrocarbons / >C16-C21 Hydrocarbures	Less than L.O.Q./Moins de L.D.Q.		mg/L	0.015	
>C21-<C32 Hydrocarbons / >C21-<C32 Hydrocarbures	Less than L.O.Q./Moins de L.D.Q.		mg/L	0.020	
Modified TPH - Tier 1 / HPT Modifiés - 1er étage	Less than L.O.Q./Moins de L.D.Q.		mg/L		
Return to Baseline / Retour à la ligne de base		Yes/Oui			

Comments:

UNIDENTIFIED TRACE PEAKS DETECTED IN THE
MIDDLE AND HEAVY RANGES.

Commentaires:

POINTES TRACES NON-IDENTIFIÉES DÉTECTÉES DANS LES RÉGIONS
MOYENNE ET LOURDE.

Quality Control Parameters/Paramètres contrôles de qualité

Isobutylbenzene - volatile / Isobutylbenzène - volatile	104 %
Isobutylbenzene - extractable / Isobutylbenzène - extrait	102 %
Dotriacontane - extractable / Dotriacontane - extrait	84 %

[LOQ] Limit of quantitation
[HAL] Health Advisory Level (Drinking water only)

[LDQ] Limite de quantification
[LAS] Limites acceptables pour la santé (Eau potable seulement)

C6-C10 Hydrocarbons and Modified TPH - Tier 1 excludes Benzene,
Toluene, Ethylbenzene, and Total Xylenes.

Results reported refer only to the sample(s) as received.

C6-C10 Hydrocarbures et HPT Modifiés - 1er étage n'incluent pas Benzène, Toluène, Ethylbenzène et
Xylènes Totaux.

Les résultats fournis ne se rapportent qu'aux échantillons dans l'état où ils ont été reçus.

All results have been rounded to two significant figures or four decimal places. Tous résultats sont rapportés à deux chiffres significatifs ou quatre chiffres après le point décimal.