

Appendix E

Water Quality Results



Office of Drinking Water
ATTN: JARED MCNABB
25 Tupper Street N
Portage la Prairie MB R1N 3K1

Date Received: 05-JUL-12
Report Date: 26-JUL-12 14:17 (MT)
Version: FINAL

Client Phone: 204-239-3880

Certificate of Analysis

Lab Work Order #: L1173104
Project P.O. #: NOT SUBMITTED
Job Reference: MORRIS REGIONAL - PWS [145.75]
C of C Numbers:
Legal Site Desc:

Paul Nicolas

Paul Nicolas
Account Manager

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ANALYTICAL REPORT

L1173104 CONTD....
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Physical Tests (WATER)

Analyte	Unit	ALS ID		L1173104-1	L1173104-2
		Guide Limit #1	Guide Limit #2	MORRIS REGIONAL 1 - RAW	MORRIS REGIONAL 2 - TREATED
Colour, True	CU	15	-	8.5	<5.0
Conductivity	umhos/cm	-	-	773	241
Langelier Index (4 C)	No Unit	-	-	1.0	-0.96
Langelier Index (60 C)	No Unit	-	-	1.8	-0.19
pH	pH units	6.5-8.5	-	8.53	7.64
Total Dissolved Solids	mg/L	500	-	410	132
Transmittance, UV (254 nm)	% T	-	-	61.2	92.3
Turbidity	NTU	-	-	7.32	0.12

Federal Guidelines for Canadian Drinking Water Quality (JAN, 2011)

#1: GCDWQ - Aesthetic Objective

#2: GCDWQ - Maximum and Interim Maximum Acceptable Concentrations

Anions and Nutrients (WATER)

Analyte	Unit	ALS ID		L1173104-1	L1173104-2
		Guide Limit #1	Guide Limit #2	MORRIS REGIONAL 1 - RAW	MORRIS REGIONAL 2 - TREATED
Alkalinity, Total (as CaCO3)	mg/L	-	-	235	62
Ammonia, Total (as N)	mg/L	-	-	0.025	<0.010
Bicarbonate (HCO3)	mg/L	-	-	267	76
Carbonate (CO3)	mg/L	-	-	<12	<12
Chloride	mg/L	250	-	33.5	12.4
Fluoride	mg/L	-	1.5	0.159	0.418
Hardness (as CaCO3)	mg/L	-	-	342	90.5
Hydroxide (OH)	mg/L	-	-	<6.8	<6.8
Ion Balance	%	-	-	106	106
Nitrate and Nitrite as N	mg/L	-	10	0.0150	0.0129
Nitrate-N	mg/L	-	10	0.0150	0.0129
Nitrite-N	mg/L	-	1	<0.0010	<0.0010
Total Kjeldahl Nitrogen	mg/L	-	-	0.65	<0.20
TDS (Calculated)	mg/L	500	-	490	137
Sulfate	mg/L	500	-	153	39.3

Federal Guidelines for Canadian Drinking Water Quality (JAN, 2011)

#1: GCDWQ - Aesthetic Objective

#2: GCDWQ - Maximum and Interim Maximum Acceptable Concentrations

Detection Limit for result exceeds Guide Limit. Assessment against Guide Limit cannot be made.

Analytical result for this parameter exceeds Guide Limit listed on this report.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.



ANALYTICAL REPORT

L1173104 CONTD....
 PAGE 3 of 7
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Organic / Inorganic Carbon (WATER)

Analyte	Unit	Guide Limit		L1173104-1	L1173104-2
		#1	#2	MORRIS REGIONAL 1 - RAW	MORRIS REGIONAL 2 - TREATED
Total Carbon	mg/L	-	-	61.8	17.7
Total Inorganic Carbon	mg/L	-	-	53.4	15.4
Total Organic Carbon	mg/L	-	-	8.4	2.3

Federal Guidelines for Canadian Drinking Water Quality (JAN, 2011)
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ANALYTICAL REPORT

L1173104 CONTD....
PAGE 4 of 7
26-JUL-12 14:17 (MT)

Total Metals (WATER)

Analyte	Unit	ALS ID		L1173104-1	L1173104-2
		Guide Limit #1	Guide Limit #2	Sampled Date Sampled Time Sample ID	Sampled Date Sampled Time Sample ID
				MORRIS REGIONAL 1 - RAW	MORRIS REGIONAL 2 - TREATED
Aluminum (Al)-Total	mg/L	0.1	-	0.076 DLM	<0.0050
Antimony (Sb)-Total	mg/L	-	0.006	<0.0020 DLM	<0.00020
Arsenic (As)-Total	mg/L	-	0.01	0.0053 DLM	0.00139
Barium (Ba)-Total	mg/L	-	1	0.0528 DLM	0.0124
Beryllium (Be)-Total	mg/L	-	-	<0.0020 DLM	<0.00020
Bismuth (Bi)-Total	mg/L	-	-	<0.0020 DLM	<0.00020
Boron (B)-Total	mg/L	-	5	<0.10 DLM	0.068
Cadmium (Cd)-Total	mg/L	-	0.005	<0.00010 DLM	<0.000010
Calcium (Ca)-Total	mg/L	-	-	68.0 DLM	16.8
Cesium (Cs)-Total	mg/L	-	-	<0.0010 DLM	<0.00010
Chromium (Cr)-Total	mg/L	-	0.05	<0.010 DLM	<0.0010
Cobalt (Co)-Total	mg/L	-	-	<0.0020 DLM	<0.00020
Copper (Cu)-Total	mg/L	1	-	0.0033 DLM	0.0273
Iron (Fe)-Total	mg/L	0.3	-	0.286 <1.0 DLM	<0.10 0.012
Lead (Pb)-Total	mg/L	-	0.01	<0.00090 DLM	0.000121
Lithium (Li)-Total	mg/L	-	-	0.044 DLM	0.0138
Magnesium (Mg)-Total	mg/L	-	-	41.8 DLM	11.8
Manganese (Mn)-Total	mg/L	0.05	-	0.133 DLM	0.0190
Molybdenum (Mo)-Total	mg/L	-	-	0.0029 DLM	0.00079
Nickel (Ni)-Total	mg/L	-	-	<0.020 DLM	<0.0020
Phosphorus (P)-Total	mg/L	-	-	<2.0 DLM	0.51
Potassium (K)-Total	mg/L	-	-	6.55 DLM	2.22
Rubidium (Rb)-Total	mg/L	-	-	<0.0020 DLM	0.00053
Selenium (Se)-Total	mg/L	-	0.01	<0.010 DLM	<0.0010
Silicon (Si)-Total	mg/L	-	-	7.68 DLM	2.59
Silver (Ag)-Total	mg/L	-	-	<0.0010 DLM	<0.00010
Sodium (Na)-Total	mg/L	200	-	45.6 DLM	16.6
Strontium (Sr)-Total	mg/L	-	-	0.310 DLM	0.0760
Tellurium (Te)-Total	mg/L	-	-	<0.0020 DLM	<0.00020
Thallium (Tl)-Total	mg/L	-	-	<0.0010 DLM	<0.00010
Thorium (Th)-Total	mg/L	-	-	<0.0010 DLM	<0.00010
Tin (Sn)-Total	mg/L	-	-	<0.0020 DLM	<0.00020
Titanium (Ti)-Total	mg/L	-	-	0.0039 DLM	0.00058

Federal Guidelines for Canadian Drinking Water Quality (JAN, 2011)

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ANALYTICAL REPORT

L1173104 CONTD....
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Total Metals (WATER)

Analyte	Unit	ALS ID		Sampled Date		Sampled Time		Sample ID	
		Guide Limit #1	Guide Limit #2	MORRIS REGIONAL 1 - RAW	MORRIS REGIONAL 2 - TREATED				
Tungsten (W)-Total	mg/L	-	-	<0.010	DLM	<0.0010			
Uranium (U)-Total	mg/L	-	0.02	0.0029	DLM	0.00074			
Vanadium (V)-Total	mg/L	-	-	0.0043	DLM	0.00105			
Zinc (Zn)-Total	mg/L	5	-	<0.050	DLM	0.0057			
Zirconium (Zr)-Total	mg/L	-	-	<0.0040	DLM	<0.00040			

Federal Guidelines for Canadian Drinking Water Quality (JAN, 2011)

#1: GCDWQ - Aesthetic Objective

#2: GCDWQ - Maximum and Interim Maximum Acceptable Concentrations

Trihalomethanes (WATER)

Analyte	Unit	ALS ID		Sampled Date		Sampled Time		Sample ID	
		Guide Limit #1	Guide Limit #2	MORRIS REGIONAL 3 - DIST (END)					
Bromodichloromethane	mg/L	-	-	0.0125					
Bromoform	mg/L	-	-	<0.00050					
Chlorodibromomethane	mg/L	-	-	0.00267					
Chloroform	mg/L	-	-	0.0355					
Surrogate: Toluene-d8 (SURR)	%	-	-	106.1					

Federal Guidelines for Canadian Drinking Water Quality (JAN, 2011)

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Detection Limit for result exceeds Guide Limit. Assessment against Guide Limit cannot be made.

Analytical result for this parameter exceeds Guide Limit listed on this report.

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Office of Drinking Water
ATTN: Jared McNabb
25 Tupper Street N
Portage La Prairie MB R1N 3K1

Date Received: 15-JUL-11
Report Date: 29-JUL-11 13:20 (MT)
Version: FINAL

Client Phone: 204-239-3880

Certificate of Analysis

Lab Work Order #: L1031939
Project P.O. #: 28002
Job Reference: MORRIS REGIONAL - PWS [145.75]
Legal Site Desc:
C of C Numbers:

A handwritten signature in cursive script that reads "Paul Nicolas".

Paul Nicolas
Account Manager

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ANALYTICAL REPORT

L1031939 CONTD....
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Physical Tests (WATER)

Analyte	Unit	Guide Limit		L1031939-1	L1031939-2
		#1	#2	MORRIS REGIONAL 1 - RAW	MORRIS REGIONAL 2 - TREATED
Colour, True	CU	15	-	10.4	<5.0
Conductivity	umhos/cm	-	-	701	217
Langelier Index (4 C)	No Unit	-	-	1.1	-0.97
Langelier Index (60 C)	No Unit	-	-	1.8	-0.20
pH	pH units	6.5-8.5	-	8.60	7.58
Total Dissolved Solids	mg/L	500	-	522	136
Turbidity	NTU	-	-	12.3	<0.10

Federal Guidelines for Canadian Drinking Water Quality (JUN, 2008)

#1: GCDWQ - Aesthetic Objective

#2: GCDWQ - Maximum and Interim Maximum Acceptable Concentrations

Anions and Nutrients (WATER)

Analyte	Unit	Guide Limit		L1031939-1	L1031939-2
		#1	#2	MORRIS REGIONAL 1 - RAW	MORRIS REGIONAL 2 - TREATED
Alkalinity, Total (as CaCO3)	mg/L	-	-	231	60.4
Ammonia as N	mg/L	-	-	<0.010	<0.010
Bicarbonate (HCO3)	mg/L	-	-	258	73.7
Carbonate (CO3)	mg/L	-	-	10.9	<0.60
Chloride	mg/L	250	-	26.6	10.4
Fluoride	mg/L	-	1.5	0.162	0.621
Hardness (as CaCO3)	mg/L	-	-	341	93.7
Hydroxide (OH)	mg/L	-	-	<0.40	<0.40
Ion Balance	%	-	-	99.6	104
Nitrate and Nitrite as N	mg/L	-	10	<0.050	<0.050
Total Kjeldahl Nitrogen	mg/L	-	-	0.85	<0.20
TDS (Calculated)	mg/L	500	-	473	132
Sulfate	mg/L	500	-	155	40.1

Federal Guidelines for Canadian Drinking Water Quality (JUN, 2008)

#1: GCDWQ - Aesthetic Objective

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Organic / Inorganic Carbon (WATER)

Analyte	Unit	Guide Limit		L1031939-1	L1031939-2
		#1	#2	MORRIS REGIONAL 1 - RAW	MORRIS REGIONAL 2 - TREATED
Total Carbon	mg/L	-	-	61.4	17.8
Total Inorganic Carbon	mg/L	-	-	51.3	15.0
Total Organic Carbon	mg/L	-	-	10.1	2.8

Federal Guidelines for Canadian Drinking Water Quality (JUN, 2008)

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Yellow box: Detection Limit for result exceeds Guide Limit. Assessment against Guide Limit cannot be made.
Red box: Analytical result for this parameter exceeds Guide Limit listed on this report.



ANALYTICAL REPORT

L1031939 CONTD...
 PAGE 3 of 6
 29-JUL-11 13:20 (MT)

Total Metals (WATER)

Analyte	Unit	ALS ID		L1031939-1	L1031939-2
		Guide Limit #1	Guide Limit #2	MORRIS REGIONAL 1 - RAW	MORRIS REGIONAL 2 - TREATED
Aluminum (Al)-Total	mg/L	0.1	-	0.386	<0.0050
Antimony (Sb)-Total	mg/L	-	0.006	0.00027	<0.00020
Arsenic (As)-Total	mg/L	-	0.01	0.00422	0.00106
Barium (Ba)-Total	mg/L	-	1	0.0513	0.0125
Beryllium (Be)-Total	mg/L	-	-	<0.00020	<0.00020
Bismuth (Bi)-Total	mg/L	-	-	<0.00020	<0.00020
Boron (B)-Total	mg/L	-	5	0.076	0.066
Cadmium (Cd)-Total	mg/L	-	0.005	0.000033	<0.000010
Calcium (Ca)-Total	mg/L	-	-	68.6	19.4
Cesium (Cs)-Total	mg/L	-	-	<0.00010	<0.00010
Chromium (Cr)-Total	mg/L	-	0.05	<0.0010	<0.0010
Cobalt (Co)-Total	mg/L	-	-	0.00030	<0.00020
Copper (Cu)-Total	mg/L	1	-	0.00300	0.0282
Iron (Fe)-Total	mg/L	0.3	-	0.49	<0.10
Lead (Pb)-Total	mg/L	-	0.01	0.000269	0.000146
Lithium (Li)-Total	mg/L	-	-	0.0416	0.0139
Magnesium (Mg)-Total	mg/L	-	-	41.2	11.0
Manganese (Mn)-Total	mg/L	0.05	-	0.0939	0.00236
Molybdenum (Mo)-Total	mg/L	-	-	0.00315	0.00071
Nickel (Ni)-Total	mg/L	-	-	0.0040	<0.0020
Phosphorus (P)-Total	mg/L	-	-	<0.20	0.50
Potassium (K)-Total	mg/L	-	-	6.68	2.18
Rubidium (Rb)-Total	mg/L	-	-	0.00215	0.00048
Selenium (Se)-Total	mg/L	-	0.01	<0.0010	<0.0010
Silicon (Si)-Total	mg/L	-	-	8.31	2.41
Silver (Ag)-Total	mg/L	-	-	<0.00010	<0.00010
Sodium (Na)-Total	mg/L	200	-	35.8	12.4
Strontium (Sr)-Total	mg/L	-	-	0.286	0.0723
Tellurium (Te)-Total	mg/L	-	-	<0.00020	<0.00020
Thallium (Tl)-Total	mg/L	-	-	<0.00010	<0.00010
Thorium (Th)-Total	mg/L	-	-	0.00011	<0.00010
Tin (Sn)-Total	mg/L	-	-	0.00020	<0.00020
Titanium (Ti)-Total	mg/L	-	-	0.0121	<0.00020

Federal Guidelines for Canadian Drinking Water Quality (JUN, 2008)

#1: GCDWQ - Aesthetic Objective

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ANALYTICAL REPORT

L1031939 CONTD....
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Total Metals (WATER)

Analyte	Unit	Guide Limit #1	Guide Limit #2	ALS ID	L1031939-1	L1031939-2
				Sampled Date	15-JUL-11	15-JUL-11
				Sampled Time	10:00	10:00
				Sample ID	MORRIS REGIONAL 1 - RAW	MORRIS REGIONAL 2 - TREATED
Tungsten (W)-Total	mg/L	-	-		<0.0010	<0.0010
Uranium (U)-Total	mg/L	-	0.02		0.00412	0.00103
Vanadium (V)-Total	mg/L	-	-		0.00532	0.00107
Zinc (Zn)-Total	mg/L	5	-		<0.0050	<0.0050
Zirconium (Zr)-Total	mg/L	-	-		0.00056	<0.00040

Federal Guidelines for Canadian Drinking Water Quality (JUN, 2008)

#1: GCDWQ - Aesthetic Objective

#2: GCDWQ - Maximum and Interim Maximum Acceptable Concentrations

Trihalomethanes (WATER)

Analyte	Unit	Guide Limit #1	Guide Limit #2	ALS ID	L1031939-4
				Sampled Date	15-JUL-11
				Sampled Time	11:00
				Sample ID	MORRIS REGIONAL 4 - DIST (END)
Bromodichloromethane	mg/L	-	-		0.00959
Bromoform	mg/L	-	-		<0.00050
Chlorodibromomethane	mg/L	-	-		0.00138
Chloroform	mg/L	-	-		0.0441
Total THMs	mg/L	-	0.1		0.0550
Surrogate: Toluene-d8 (SURR)	%	-	-		77

Federal Guidelines for Canadian Drinking Water Quality (JUN, 2008)

#1: GCDWQ - Aesthetic Objective

#2: GCDWQ - Maximum and Interim Maximum Acceptable Concentrations

Haloacetic Acids (WATER)

Analyte	Unit	Guide Limit #1	Guide Limit #2	ALS ID	L1031939-2	L1031939-3	L1031939-4
				Sampled Date	15-JUL-11	15-JUL-11	15-JUL-11
				Sampled Time	10:00	10:30	11:00
				Sample ID	MORRIS REGIONAL 2 - TREATED	MORRIS REGIONAL 3 - DIST (MID)	MORRIS REGIONAL 4 - DIST (END)
Dibromoacetic Acid	mg/L	-	-		<0.0010	<0.0010	<0.0010
Dichloroacetic Acid	mg/L	-	-		0.0235	0.0305	0.0330
Total Haloacetic Acids 5	mg/L	-	0.08		0.0482	0.0602	0.0650
Monobromoacetic Acid	mg/L	-	-		<0.0010	<0.0010	<0.0010
Monochloroacetic Acid	mg/L	-	-		<0.0050	<0.0050	<0.0050
Trichloroacetic Acid	mg/L	-	-		0.0247	0.0297	0.0320

Federal Guidelines for Canadian Drinking Water Quality (JUN, 2008)

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 Analytical result for this parameter exceeds Guide Limit listed on this report.