



RM of Brokenhead - Water Treatment Plant
ATTN: GRANT PLISCHKE
Brokenhead, RM of
Box 490
Beauseiour MB R0E 0C0

Date Received: 13-FEB-18
Report Date: 23-FEB-18 14:41 (MT)
Version: FINAL

Client Phone: 204-266-2021

Certificate of Analysis

Lab Work Order #: L2055728

Project P.O. #: NOT SUBMITTED

Job Reference: RM OF BROKENHEAD - PWS 29.31

C of C Numbers:

Legal Site Desc: 36330

Hua Wo
Chemistry Laboratory Manager

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ADDRESS: 1329 Niakwa Road East, Unit 12, Winnipeg, MB R2J 3T4 Canada | Phone: +1 204 255 9720 | Fax: +1 204 255 9721
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Physical Tests (WATER)

		ALS ID		L2055728-1	L2055728-2	L2055728-3
		Sampled Date		13-FEB-18	13-FEB-18	13-FEB-18
		Sampled Time		10:00	10:00	10:00
		Sample ID				
Analyte	Unit	Guide Limit #1	Guide Limit #2	RM OF BROKENHEAD 1 - RAW WELL 1	RM OF BROKENHEAD 1 - RAW WELL 2	RM OF BROKENHEAD 2 - TREATED
Colour, True	CU	15	-	<5.0	<5.0	<5.0
Conductivity	umhos/cm	-	-	911	908	114
Hardness (as CaCO ₃)	mg/L	-	-	444 HTC	455 HTC	2.45 HTC
Langelier Index (4 C)	No Unit	-	-	0.16	0.29	-2.3
Langelier Index (60 C)	No Unit	-	-	0.92	1.1	-1.5
pH	pH units	7.00-10.5	-	7.46	7.61	7.75
Total Dissolved Solids	mg/L	500	-	558	573	68
Transmittance, UV (254 nm)	%T/cm	-	-	95.3	95.3	98.6
Turbidity	NTU	-	-	1.02	1.09	<0.10

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2015)

#1: GCDWQ - Aesthetic Objective/Other Value

#2: GCDWQ - Maximum Acceptable Concentrations (MACs)

Anions and Nutrients (WATER)

		ALS ID		L2055728-1	L2055728-2	L2055728-3
		Sampled Date		13-FEB-18	13-FEB-18	13-FEB-18
		Sampled Time		10:00	10:00	10:00
		Sample ID				
Analyte	Unit	Guide Limit #1	Guide Limit #2	RM OF BROKENHEAD 1 - RAW WELL 1	RM OF BROKENHEAD 1 - RAW WELL 2	RM OF BROKENHEAD 2 - TREATED
Alkalinity, Total (as CaCO ₃)	mg/L	-	-	433	422	58.7
Ammonia, Total (as N)	mg/L	-	-	0.140	0.075	0.026
Bicarbonate (HCO ₃)	mg/L	-	-	528	515	71.6
Bromide (Br)	mg/L	-	-	0.087	0.121	<0.010
Carbonate (CO ₃)	mg/L	-	-	<0.60	<0.60	<0.60
Chloride (Cl)	mg/L	250	-	65.1	67.4	2.91
Fluoride (F)	mg/L	-	1.5	0.391	0.357	<0.020
Hydroxide (OH)	mg/L	-	-	<0.34	<0.34	<0.34
Nitrate (as N)	mg/L	-	10	<0.0050	0.0163	<0.0050
Nitrite (as N)	mg/L	-	1	<0.0010	<0.0010	<0.0010
Sulfate (SO ₄)	mg/L	500	-	54.4	54.7	<0.30

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2015)

#1: GCDWQ - Aesthetic Objective/Other Value

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Organic / Inorganic Carbon (WATER)

		ALS ID		L2055728-1	L2055728-2	L2055728-3
		Sampled Date		13-FEB-18	13-FEB-18	13-FEB-18
		Sampled Time		10:00	10:00	10:00
		Sample ID				
Analyte	Unit	Guide Limit #1	Guide Limit #2	RM OF BROKENHEAD 1 - RAW WELL 1	RM OF BROKENHEAD 1 - RAW WELL 2	RM OF BROKENHEAD 2 - TREATED
Dissolved Organic Carbon	mg/L	-	-	1.31	1.22	<0.50
Total Organic Carbon	mg/L	-	-	1.21	1.19	<0.50

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2015)

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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.

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

ANALYTICAL REPORT

Total Metals (WATER)

		ALS ID		L2055728-1	L2055728-2	L2055728-3
		Sampled Date		13-FEB-18	13-FEB-18	13-FEB-18
		Sampled Time		10:00	10:00	10:00
		Sample ID				
Analyte	Unit	Guide Limit #1	Guide Limit #2	RM OF BROKENHEAD 1 - RAW WELL 1	RM OF BROKENHEAD 1 - RAW WELL 2	RM OF BROKENHEAD 2 - TREATED
Aluminum (Al)-Total	mg/L	0.1	-	<0.0030	<0.0030	0.0047
Antimony (Sb)-Total	mg/L	-	0.006	<0.00010	<0.00010	<0.00010
Arsenic (As)-Total	mg/L	-	0.01	0.00032	0.00014	0.00014
Barium (Ba)-Total	mg/L	-	1	0.0418	0.0443	0.000513
Beryllium (Be)-Total	mg/L	-	-	<0.00010	<0.00010	<0.00010
Bismuth (Bi)-Total	mg/L	-	-	<0.000050	<0.000050	<0.000050
Boron (B)-Total	mg/L	-	5	0.295	0.262	0.198
Cadmium (Cd)-Total	mg/L	-	0.005	<0.0000050	<0.0000050	<0.0000050
Calcium (Ca)-Total	mg/L	-	-	65.5	63.8	0.525
Cesium (Cs)-Total	mg/L	-	-	0.000022	0.000021	<0.000010
Chromium (Cr)-Total	mg/L	-	0.05	<0.00010	<0.00010	0.00030
Cobalt (Co)-Total	mg/L	-	-	<0.00010	<0.00010	<0.00010
Copper (Cu)-Total	mg/L	1	-	0.00219	0.00191	0.00830
Iron (Fe)-Total	mg/L	0.3	-	0.361	0.131	<0.010
Lead (Pb)-Total	mg/L	-	0.01	0.000228	0.000257	0.000113
Lithium (Li)-Total	mg/L	-	-	0.0372	0.0348	0.0025
Magnesium (Mg)-Total	mg/L	-	-	68.1	71.7	0.276
Manganese (Mn)-Total	mg/L	0.05	-	0.00624	0.00576	0.00013
Molybdenum (Mo)-Total	mg/L	-	-	0.000582	0.000654	<0.000050
Nickel (Ni)-Total	mg/L	-	-	<0.00050	<0.00050	<0.00050
Phosphorus (P)-Total	mg/L	-	-	<0.050	<0.050	0.359
Potassium (K)-Total	mg/L	-	-	7.25	6.73	0.413
Rubidium (Rb)-Total	mg/L	-	-	0.00414	0.00386	0.00028
Selenium (Se)-Total	mg/L	-	0.05	<0.000050	0.000169	<0.000050
Silicon (Si)-Total	mg/L	-	-	4.94	4.63	0.22
Silver (Ag)-Total	mg/L	-	-	<0.000010	<0.000010	<0.000010
Sodium (Na)-Total	mg/L	200	-	63.4	60.2	27.3
Strontium (Sr)-Total	mg/L	-	-	0.503	0.454	0.00234
Sulfur (S)-Total	mg/L	-	-	21.4	21.1	<0.50
Tellurium (Te)-Total	mg/L	-	-	<0.00020	<0.00020	<0.00020
Thallium (Tl)-Total	mg/L	-	-	<0.000010	<0.000010	<0.000010
Thorium (Th)-Total	mg/L	-	-	<0.00010	<0.00010	<0.00010
Tin (Sn)-Total	mg/L	-	-	<0.00010	<0.00010	<0.00010

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2015)

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ANALYTICAL REPORT

Total Metals (WATER)

		ALS ID		L2055728-1	L2055728-2	L2055728-3
		Sampled Date		13-FEB-18	13-FEB-18	13-FEB-18
		Sampled Time		10:00	10:00	10:00
		Sample ID				
Analyte	Unit	Guide Limit #1	Guide Limit #2	RM OF BROKENHEAD 1 - RAW WELL 1	RM OF BROKENHEAD 1 - RAW WELL 2	RM OF BROKENHEAD 2 - TREATED
Titanium (Ti)-Total	mg/L	-	-	<0.00030	<0.00030	<0.00030
Tungsten (W)-Total	mg/L	-	-	<0.00010	<0.00010	<0.00010
Uranium (U)-Total	mg/L	-	0.02	0.000349	0.000519	<0.000010
Vanadium (V)-Total	mg/L	-	-	<0.00050	<0.00050	<0.00050
Zinc (Zn)-Total	mg/L	5	-	0.0031	0.0051	<0.0030
Zirconium (Zr)-Total	mg/L	-	-	<0.000060	<0.000060	<0.000060

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2015)

#1: GCDWQ - Aesthetic Objective/Other Value

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Volatile Organic Compounds (WATER)

		ALS ID		L2055728-1	L2055728-2
		Sampled Date		13-FEB-18	13-FEB-18
		Sampled Time		10:00	10:00
		Sample ID			
Analyte	Unit	Guide Limit #1	Guide Limit #2	RM OF BROKENHEAD 1 - RAW WELL 1	RM OF BROKENHEAD 1 - RAW WELL 2
Benzene	mg/L	-	0.005	<0.00050	<0.00050
1,1-dichloroethene	mg/L	-	0.014	<0.00050	<0.00050
Dichloromethane	mg/L	-	0.05	<0.00050	<0.00050
Ethylbenzene	mg/L	0.0016	0.14	<0.00050	<0.00050
MTBE	mg/L	0.015	-	<0.00050	<0.00050
Tetrachloroethene	mg/L	-	0.01	<0.00050	<0.00050
Toluene	mg/L	0.024	0.06	<0.00050	<0.00050
Trichloroethene	mg/L	-	0.005	<0.00050	<0.00050
o-Xylene	mg/L	-	-	<0.00050	<0.00050
M+P-Xylenes	mg/L	-	-	<0.00040	<0.00040
Xylenes (Total)	mg/L	0.02	0.09	<0.00064	<0.00064
Surrogate: 4-Bromofluorobenzene (SS)	%	-	-	94.0	92.1
Surrogate: 1,4-Difluorobenzene (SS) %		-	-	98.8	99.1

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2015)

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 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.

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Description
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-CO3CO3-CALC-WP	Water	Alkalinity, Carbonate	CALCULATION
The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by carbonate is calculated and reported as mg CO ₃ 2-/L.			
ALK-HCO3HCO3-CALC-WP	Water	Alkalinity, Bicarbonate	CALCULATION
The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by bicarbonate is calculated and reported as mg HCO ₃ -/L.			
ALK-OH-OH-CALC-WP	Water	Alkalinity, Hydroxide	CALCULATION
The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by hydroxide is calculated and reported as mg OH-/L.			
ALK-TITR-WP	Water	Alkalinity, Total (as CaCO ₃)	APHA 2320B
The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. Total alkalinity is determined by titration with a strong standard mineral acid to the successive HCO ₃ - and H ₂ CO ₃ endpoints indicated electrometrically.			
BR-L-IC-N-WP	Water	Bromide in Water by IC (Low Level)	EPA 300.1 (mod)-LR
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
C-DOC-HTC-WP	Water	Dissolved Organic Carbon by Combustion	APHA 5310 B-WP
Filtered (0.45 um) sample is acidified and purged to remove inorganic carbon, then injected into a heated reaction chamber where organic carbon is oxidized to CO ₂ which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer.			
C-TOC-HTC-WP	Water	Total Organic Carbon by Combustion	APHA 5310 B-WP
Sample is acidified and purged to remove inorganic carbon, then injected into a heated reaction chamber where organic carbon is oxidized to CO ₂ which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer.			
CL-L-IC-N-WP	Water	Chloride in Water by IC (Low Level)	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
COLOUR-TRUE-WP	Water	Colour, True	APHA 2120C
True Colour is measured spectrophotometrically by comparison to platinum-cobalt standards using the single wavelength method (450 - 465 nm) after filtration of sample through a 0.45 um filter. Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment. Concurrent measurement of sample pH is recommended.			
EC-WP	Water	Conductivity	APHA 2510B
Conductivity of an aqueous solution refers to its ability to carry an electric current. Conductance of a solution is measured between two spatially fixed and chemically inert electrodes.			
ETL-LANGELIER-4-WP	Water	Langelier Index 4C	Calculated
ETL-LANGELIER-60-WP	Water	Langelier Index 60C	Calculated
F-IC-N-WP	Water	Fluoride in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
HARDNESS-CALC-WP	Water	Hardness Calculated	APHA 2340B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
IONBALANCE-CALC-WP	Water	Ion Balance Calculation	APHA 1030E
Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.			

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
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Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance (as % difference) cannot be calculated accurately for waters with very low electrical conductivity (EC), and is reported as "Low EC" where EC < 100 uS/cm (umhos/cm). Ion Balance is calculated as:

$$\text{Ion Balance (\%)} = [\text{Cation Sum} - \text{Anion Sum}] / [\text{Cation Sum} + \text{Anion Sum}]$$

MET-T-CCMS-WP Water Total Metals in Water by CRC ICPMS EPA 200.2/6020A (mod.)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

NH3-COL-WP Water Ammonia by colour APHA 4500 NH3 F

Ammonia in water samples forms indophenol when reacted with hypochlorite and phenol. The intensity is amplified by the addition of sodium nitroprusside and measured colourmetrically.

NO2-L-IC-N-WP Water Nitrite in Water by IC (Low Level) EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-L-IC-N-WP Water Nitrate in Water by IC (Low Level) EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

PH-WP Water pH APHA 4500H

The pH of a sample is the determination of the activity of the hydrogen ions by potentiometric measurement using a standard hydrogen electrode and a reference electrode.

SO4-IC-N-WP Water Sulfate in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

TDS-WP Water Total Dissolved Solids (TDS) APHA 2540 SOLIDS C,E

A well-mixed sample is filtered through a glass fiber filter paper. The filtrate is then evaporated to dryness in a pre-weighed vial and dried at 180 – 2C. The increase in vial weight represents the total dissolved solids.

TURBIDITY-WP Water Turbidity APHA 2130B (modified)

Turbidity in aqueous matrices is determined by the nephelometric method.

UV-%TRANS-WP Water UV Transmittance (Calculated) APHA 5910B

Test method is adapted from APHA Method 5910B. A sample is filtered through a 0.45 um polyethersulfone (PES) filter and its UV Absorbance is measured in a quartz cell at 254 nm. UV Transmittance is calculated from the UV Absorbance result and reported as UV Transmittance per cm. The analysis is carried out without pH adjustment.

VOC+F1-HSMS-WP Water VOC plus F1 by GCMS EPA 8260C / EPA 5021A

In this method samples are analyzed using a headspace autosampler interfaced to a dual column gas chromatograph with MS and Flame Ionization detectors.

XYLENES-SUM-CALC-WP Water Sum of Xylene Isomer Concentrations CALCULATED RESULT

Total xylenes represents the sum of o-xylene and m&p-xylene.

**ALS test methods may incorporate modifications from specified reference methods to improve performance.

Chain of Custody Numbers:

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

Reference Information

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg ww - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information.

CL-L-IC-N-WP Water



Quality Control Report

Workorder: L2055728

Report Date: 23-FEB-18

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Client: RM of Brokenhead - Water Treatment Plant
Brokenhead, RM of Box 490
Beausejour MB R0E 0C0

Contact: GRANT PLISCHKE

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F-IC-N-WP		Water						
Batch	R3961143							
WG2715428-5 MB								
Fluoride (F)			<0.020		mg/L		0.02	13-FEB-18
WG2715428-9 MB								
Fluoride (F)			<0.020		mg/L		0.02	13-FEB-18
WG2715428-12 MS		L2055713-1						
Fluoride (F)			106.5		%		75-125	13-FEB-18
MET-T-CCMS-WP		Water						
Batch	R3962003							
WG2717007-4 DUP		WG2717007-3						
Aluminum (Al)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	15-FEB-18
Antimony (Sb)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	15-FEB-18
Arsenic (As)-Total		0.00010	0.00011		mg/L	10	20	15-FEB-18
Barium (Ba)-Total		0.0109	0.0112		mg/L	2.0	20	15-FEB-18
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	15-FEB-18
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	15-FEB-18
Boron (B)-Total		0.012	0.012		mg/L	0.5	20	15-FEB-18
Cadmium (Cd)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	15-FEB-18
Calcium (Ca)-Total		18.2	18.4		mg/L	1.1	20	15-FEB-18
Cesium (Cs)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	15-FEB-18
Chromium (Cr)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	15-FEB-18
Cobalt (Co)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	15-FEB-18
Copper (Cu)-Total		0.00065	0.00064		mg/L	0.5	20	15-FEB-18
Iron (Fe)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	15-FEB-18
Lead (Pb)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	15-FEB-18
Lithium (Li)-Total		0.0117	0.0116		mg/L	1.4	20	15-FEB-18
Magnesium (Mg)-Total		9.39	9.31		mg/L	0.8	20	15-FEB-18
Manganese (Mn)-Total		0.0175	0.0174		mg/L	0.5	20	15-FEB-18
Molybdenum (Mo)-Total		0.000062	0.000072		mg/L	14	20	15-FEB-18
Nickel (Ni)-Total		0.00061	0.00055		mg/L	12	20	15-FEB-18
Potassium (K)-Total		0.457	0.448		mg/L	1.9	20	15-FEB-18
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	15-FEB-18
Rubidium (Rb)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	15-FEB-18
Selenium (Se)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	15-FEB-18
Silicon (Si)-Total		1.21	1.20		mg/L	0.7	20	15-FEB-18



Quality Control Report

Workorder: L2055728

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Client: RM of Brokenhead - Water Treatment Plant
 Brokenhead, RM of Box 490
 Beausejour MB R0E 0C0
 Contact: GRANT PLISCHKE

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP		Water						
Batch	R3962003							
WG2717007-4	DUP	WG2717007-3						
Silver (Ag)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	15-FEB-18
Sodium (Na)-Total		5.86	5.84		mg/L	0.3	20	15-FEB-18
Strontium (Sr)-Total		0.0703	0.0706		mg/L	0.5	20	15-FEB-18
Sulfur (S)-Total		5.93	5.92		mg/L	0.1	20	15-FEB-18
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	15-FEB-18
Thallium (Tl)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	15-FEB-18
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	15-FEB-18
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	15-FEB-18
Titanium (Ti)-Total		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	15-FEB-18
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	15-FEB-18
Uranium (U)-Total		0.000617	0.000614		mg/L	0.3	20	15-FEB-18
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	15-FEB-18
Zinc (Zn)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	15-FEB-18
Zirconium (Zr)-Total		<0.000060	<0.000060	RPD-NA	mg/L	N/A	20	15-FEB-18
WG2717007-2		LCS						
Aluminum (Al)-Total			101.8		%		80-120	15-FEB-18
Antimony (Sb)-Total			103.0		%		80-120	15-FEB-18
Arsenic (As)-Total			99.6		%		80-120	15-FEB-18
Barium (Ba)-Total			106.8		%		80-120	15-FEB-18
Beryllium (Be)-Total			100.7		%		80-120	15-FEB-18
Bismuth (Bi)-Total			98.8		%		80-120	15-FEB-18
Boron (B)-Total			98.9		%		80-120	15-FEB-18
Cadmium (Cd)-Total			103.6		%		80-120	15-FEB-18
Calcium (Ca)-Total			99.7		%		80-120	15-FEB-18
Cesium (Cs)-Total			104.4		%		80-120	15-FEB-18
Chromium (Cr)-Total			97.4		%		80-120	15-FEB-18
Cobalt (Co)-Total			101.1		%		80-120	15-FEB-18
Copper (Cu)-Total			101.8		%		80-120	15-FEB-18
Iron (Fe)-Total			100.4		%		80-120	15-FEB-18
Lead (Pb)-Total			98.2		%		80-120	15-FEB-18
Lithium (Li)-Total			102.4		%		80-120	15-FEB-18
Magnesium (Mg)-Total			105.7		%		80-120	15-FEB-18
Manganese (Mn)-Total			101.5		%		80-120	15-FEB-18



Quality Control Report

Workorder: L2055728

Report Date: 23-FEB-18

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Client:

RM of Brokenhead - Water Treatment Plant

Brokenhead, RM of Box 490

Beausejour MB R0E 0C0

Contact:

GRANT PLISCHKE

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP		Water						
Batch	R3962003							
WG2717007-2 LCS								
Molybdenum (Mo)-Total			102.7		%		80-120	15-FEB-18
Nickel (Ni)-Total			100.4		%		80-120	15-FEB-18
Potassium (K)-Total			101.3		%		80-120	15-FEB-18
Phosphorus (P)-Total			100.3		%		80-120	15-FEB-18
Rubidium (Rb)-Total			100.7		%		80-120	15-FEB-18
Selenium (Se)-Total			99.97		%		80-120	15-FEB-18
Silicon (Si)-Total			100.6		%		80-120	15-FEB-18
Silver (Ag)-Total			97.9		%		80-120	15-FEB-18
Sodium (Na)-Total			102.1		%		80-120	15-FEB-18
Strontium (Sr)-Total			103.2		%		80-120	15-FEB-18
Sulfur (S)-Total			88.6		%		80-120	15-FEB-18
Tellurium (Te)-Total			102.4		%		80-120	15-FEB-18
Thallium (Tl)-Total			97.5		%		80-120	15-FEB-18
Thorium (Th)-Total			97.3		%		80-120	15-FEB-18
Tin (Sn)-Total			101.5		%		80-120	15-FEB-18
Titanium (Ti)-Total			104.2		%		80-120	15-FEB-18
Tungsten (W)-Total			99.8		%		80-120	15-FEB-18
Uranium (U)-Total			97.5		%		80-120	15-FEB-18
Vanadium (V)-Total			102.1		%		80-120	15-FEB-18
Zinc (Zn)-Total			99.6		%		80-120	15-FEB-18
Zirconium (Zr)-Total			101.9		%		80-120	15-FEB-18
WG2717007-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	15-FEB-18
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	15-FEB-18
Arsenic (As)-Total			<0.00010		mg/L		0.0001	15-FEB-18
Barium (Ba)-Total			<0.000050		mg/L		0.00005	15-FEB-18
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	15-FEB-18
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	15-FEB-18
Boron (B)-Total			<0.010		mg/L		0.01	15-FEB-18
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	15-FEB-18
Calcium (Ca)-Total			<0.050		mg/L		0.05	15-FEB-18
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	15-FEB-18
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	15-FEB-18
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	15-FEB-18



Quality Control Report

Workorder: L2055728

Report Date: 23-FEB-18

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Client:

RM of Brokenhead - Water Treatment Plant
Brokenhead, RM of Box 490
Beausejour MB R0E 0C0
Contact: GRANT PLISCHKE

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP		Water						
Batch	R3962003							
WG2717007-1 MB								
Copper (Cu)-Total			<0.00050		mg/L		0.0005	15-FEB-18
Iron (Fe)-Total			<0.010		mg/L		0.01	15-FEB-18
Lead (Pb)-Total			<0.000050		mg/L		0.00005	15-FEB-18
Lithium (Li)-Total			<0.0010		mg/L		0.001	15-FEB-18
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	15-FEB-18
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	15-FEB-18
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	15-FEB-18
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	15-FEB-18
Potassium (K)-Total			<0.050		mg/L		0.05	15-FEB-18
Phosphorus (P)-Total			<0.050		mg/L		0.05	15-FEB-18
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	15-FEB-18
Selenium (Se)-Total			<0.000050		mg/L		0.00005	15-FEB-18
Silicon (Si)-Total			<0.10		mg/L		0.1	15-FEB-18
Silver (Ag)-Total			<0.000010		mg/L		0.00001	15-FEB-18
Sodium (Na)-Total			<0.050		mg/L		0.05	15-FEB-18
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	15-FEB-18
Sulfur (S)-Total			<0.50		mg/L		0.5	15-FEB-18
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	15-FEB-18
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	15-FEB-18
Thorium (Th)-Total			<0.00010		mg/L		0.0001	15-FEB-18
Tin (Sn)-Total			<0.00010		mg/L		0.0001	15-FEB-18
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	15-FEB-18
Tungsten (W)-Total			<0.00010		mg/L		0.0001	15-FEB-18
Uranium (U)-Total			<0.000010		mg/L		0.00001	15-FEB-18
Vanadium (V)-Total			<0.00050		mg/L		0.0005	15-FEB-18
Zinc (Zn)-Total			<0.0030		mg/L		0.003	15-FEB-18
Zirconium (Zr)-Total			<0.000060		mg/L		0.00006	15-FEB-18
WG2717007-5 MS			WG2717007-3					
Aluminum (Al)-Total				100.8		%		70-130
Antimony (Sb)-Total			108.3		%		70-130	15-FEB-18
Arsenic (As)-Total			99.1		%		70-130	15-FEB-18
Barium (Ba)-Total			101.1		%		70-130	15-FEB-18
Beryllium (Be)-Total			102.6		%		70-130	15-FEB-18
Bismuth (Bi)-Total			101.8		%		70-130	15-FEB-18



Quality Control Report

Workorder: L2055728

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Client:

RM of Brokenhead - Water Treatment Plant
Brokenhead, RM of Box 490
Beausejour MB R0E 0C0
Contact: GRANT PLISCHKE

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP		Water						
Batch	R3962003							
WG2717007-5	MS	WG2717007-3						
Boron (B)-Total			107.9		%		70-130	15-FEB-18
Cadmium (Cd)-Total			102.2		%		70-130	15-FEB-18
Calcium (Ca)-Total			N/A	MS-B	%		-	15-FEB-18
Cesium (Cs)-Total			106.9		%		70-130	15-FEB-18
Chromium (Cr)-Total			99.99		%		70-130	15-FEB-18
Cobalt (Co)-Total			99.5		%		70-130	15-FEB-18
Copper (Cu)-Total			99.5		%		70-130	15-FEB-18
Iron (Fe)-Total			100.0		%		70-130	15-FEB-18
Lead (Pb)-Total			98.2		%		70-130	15-FEB-18
Lithium (Li)-Total			104.6		%		70-130	15-FEB-18
Magnesium (Mg)-Total			N/A	MS-B	%		-	15-FEB-18
Manganese (Mn)-Total			98.1		%		70-130	15-FEB-18
Molybdenum (Mo)-Total			107.4		%		70-130	15-FEB-18
Nickel (Ni)-Total			98.3		%		70-130	15-FEB-18
Potassium (K)-Total			99.5		%		70-130	15-FEB-18
Phosphorus (P)-Total			101.2		%		70-130	15-FEB-18
Rubidium (Rb)-Total			98.7		%		70-130	15-FEB-18
Selenium (Se)-Total			101.9		%		70-130	15-FEB-18
Silicon (Si)-Total			97.6		%		70-130	15-FEB-18
Silver (Ag)-Total			106.7		%		70-130	15-FEB-18
Sodium (Na)-Total			N/A	MS-B	%		-	15-FEB-18
Strontium (Sr)-Total			N/A	MS-B	%		-	15-FEB-18
Sulfur (S)-Total			101.8		%		70-130	15-FEB-18
Tellurium (Te)-Total			105.5		%		70-130	15-FEB-18
Thallium (Tl)-Total			98.8		%		70-130	15-FEB-18
Thorium (Th)-Total			103.6		%		70-130	15-FEB-18
Tin (Sn)-Total			104.6		%		70-130	15-FEB-18
Titanium (Ti)-Total			99.9		%		70-130	15-FEB-18
Tungsten (W)-Total			104.9		%		70-130	15-FEB-18
Uranium (U)-Total			102.6		%		70-130	15-FEB-18
Vanadium (V)-Total			102.1		%		70-130	15-FEB-18
Zinc (Zn)-Total			95.1		%		70-130	15-FEB-18
Zirconium (Zr)-Total			109.6		%		70-130	15-FEB-18



Quality Control Report

Workorder: L2055728

Report Date: 23-FEB-18

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Client: RM of Brokenhead - Water Treatment Plant
Brokenhead, RM of Box 490
Beausejour MB R0E 0C0

Contact: GRANT PLISCHKE

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TURBIDITY-WP								
Water								
Batch	R3962162							
WG2716932-2	LCS							
Turbidity			101.0		%		85-115	15-FEB-18
WG2716932-1	MB							
Turbidity			<0.10		NTU		0.1	15-FEB-18
UV-%TRANS-WP								
Water								
Batch	R3961369							
WG2716705-3	DUP	L2055713-1						
Transmittance, UV (254 nm)		91.0	91.0		%T/cm	0.0	20	14-FEB-18
WG2716705-1	IRM	BLANK						
Transmittance, UV (254 nm)			100.0		%		99.5-100.5	14-FEB-18
WG2716705-2	LCS							
Transmittance, UV (254 nm)			99.7		%		85-115	14-FEB-18
VOC+F1-HSMS-WP								
Water								
Batch	R3968335							
WG2717989-2	LCS							
Benzene			94.6		%		70-130	21-FEB-18
1,1-dichloroethene			92.4		%		70-130	21-FEB-18
Dichloromethane			95.2		%		70-130	21-FEB-18
Ethylbenzene			96.4		%		70-130	21-FEB-18
MTBE			96.3		%		70-130	21-FEB-18
Tetrachloroethene			93.7		%		70-130	21-FEB-18
Toluene			95.8		%		70-130	21-FEB-18
Trichloroethene			93.4		%		70-130	21-FEB-18
M+P-Xylenes			96.2		%		70-130	21-FEB-18
o-Xylene			96.9		%		70-130	21-FEB-18
WG2717989-1	MB							
Benzene			<0.00050		mg/L		0.0005	21-FEB-18
1,1-dichloroethene			<0.00050		mg/L		0.0005	21-FEB-18
Dichloromethane			<0.00050		mg/L		0.0005	21-FEB-18
Ethylbenzene			<0.00050		mg/L		0.0005	21-FEB-18
MTBE			<0.00050		mg/L		0.0005	21-FEB-18
Tetrachloroethene			<0.00050		mg/L		0.0005	21-FEB-18
Toluene			<0.00050		mg/L		0.0005	21-FEB-18
Trichloroethene			<0.00050		mg/L		0.0005	21-FEB-18
M+P-Xylenes			<0.00040		mg/L		0.0004	21-FEB-18
o-Xylene			<0.00030		mg/L		0.0003	21-FEB-18



Quality Control Report

Workorder: L2055728 Report Date: 23-FEB-18 Page 11 of 13

Client: RM of Brokenhead - Water Treatment Plant
Brokenhead, RM of Box 490
Beausejour MB R0E 0C0
Contact: GRANT PLISCHKE

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	Water							
Batch	R3968335							
WG2717989-1	MB							
Surrogate: 4-Bromofluorobenzene (SS)			96.7		%		70-130	21-FEB-18
Surrogate: 1,4-Difluorobenzene (SS)			100.2		%		70-130	21-FEB-18

Quality Control Report

Workorder: L2055728

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Client: RM of Brokenhead - Water Treatment Plant
Brokenhead, RM of Box 490
Beausejour MB R0E 0C0
Contact: GRANT PLISCHKE

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Quality Control Report

Workorder: L2055728

Report Date: 23-FEB-18

Client: RM of Brokenhead - Water Treatment Plant
Brokenhead, RM of Box 490
Beausejour MB R0E 0C0
Contact: GRANT PLISCHKE

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Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH	1	13-FEB-18 10:00	14-FEB-18 12:00	0.25	26	hours	EHTR-FM
	2	13-FEB-18 10:00	14-FEB-18 12:00	0.25	26	hours	EHTR-FM
	3	13-FEB-18 10:00	14-FEB-18 12:00	0.25	26	hours	EHTR-FM

Legend & Qualifier Definitions:

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR: Exceeded ALS recommended hold time prior to sample receipt.
EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT: Exceeded ALS recommended hold time prior to analysis.
Rec. HT: ALS recommended hold time (see units).

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2055728 were received on 13-FEB-18 11:15.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Manitoba Conservation Water Stewardship
Office of Drinking Water
1007 Century Street, Winnipeg, Manitoba,
Canada R3H 0W4



ON

L2055728-COFC

& VOC Samples

L2055728

Report to Operator (email pdf):				Owner billing (Email):				Regular Service (default):		Regular Service (is 5-7 Days):	
Contact:	Grant Plischke			Contact:	Sue Sutherland			Unless otherwise requested:		☐ 1 Day, rush / priority ☐ 2 Day, rush / priority ☐ 3 Day, rush / priority	
Address:	Box 490 Beausejour MB R0E 0C0			Address:	Box 490 Beausejour MB R0E 0C0						
Phone:	204-266-2021			Phone:	204-268-6700						
Email:	gtwater@mymts.net			Email:	cao@rmofbrokenhead.ca						
Operator contact update (if different then above):				Owner contact update (if different then above):				Email pdf copy to:			
Contact:				Contact:				DWO:	Sarah Belisle		
Address:				Address:				DWO Address:	Unit B - 284 Reimer Ave, Steinbach MB R5G 0R5		
Phone:				Phone:				DWO Phone:	204-371-5065		
Email:				Email:				DWO Email:	sarah.belisle@gov.mb.ca		
Account:		ODW Report type:		EMS (Lab-MWS)		Client / Project Information:				Analysis Request	
Agency Code: 382		Project: DWQ-C		Operation Name:		RM of Brokenhead - PWS				MB-CH-PWS-V2013 MB-VOC-PWS-V2013 Number of Containers	
Lab:		Lab Work Order # / Job # (lab use only)		Operation Code (com code):		29.31					
				Operation Id:		36330					
				Sampled by:		GRANT PLISCHE <i>[Signature]</i>					
Lab Sample # (lab use only)	Sample Number (YYMMII9999)	Station Number (MB99XXD999) / (MB99XXY999)	Sample Identification		Date dd-mmm-yyyy	Time hh:mm	Sample Matrix	Sample Type			
	1501SB0001	MB05SAD081	RM of Brokenhead 1 - Raw well 1		13/02/2018	10:00 AM	6	1	X	X	7
	1501SB0002	MB05SAD081	RM of Brokenhead 1 - Raw well 2		13/02/2018	10:00 AM	6	1	X	X	7
	1501SB0003	MB05SAD082	RM of Brokenhead 2 - Treated		13/02/2018	10:00 AM	10	1	X		4
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.								Sample Matrix: 6-Raw Water, 10-Treated Water		Sample Type: 1-Grab Sample	
By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified by the Laboratory. For ALL other testing, please use Laboratory specific forms. DO NOT COPY or RE-USE this form. Sample Numbers are unique to the Office of Drinking Water and provided by DWO.											
Relinquished By:		Date & Time:		Received By: (lab use only)	AAL	Date & Time: (lab use only)	13/02/18 11:15	Sample Condition (lab use only)			
Relinquished By:		Date & Time:		Received By: (lab use only)		Date & Time: (lab use only)		Temperature	Samples Received in Good Condition? Y / N (if no provide details)		
								11.3			

Operator mandatory

Operator optional

Operator to fill, if information above has changed

Opr to fill, Lab specific

pre-filled by DWO

Note: Cyanide and Mercury are not required and have been removed from the list.

Please use the Rev. July 29, 2013 Water System Chemistry List.