

Your C.O.C. #: V012833

**Attention: Donna Michiel**

Mill Bay Water District  
PO Box 58  
875 Deloume Road  
Mill Bay, BC  
Canada V0R 2P0

**Report Date: 2015/04/13**

Report #: R1844040

Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B525962**

**Received: 2015/03/31, 15:30**

Sample Matrix: Water  
# Samples Received: 2

Analyses	Quantity	Date		Laboratory Method	Analytical Method
		Extracted	Analyzed		
Alkalinity - Water (1)	2	2015/04/07	2015/04/07	BBY6SOP-00026	SM2320B
Chloride by Automated Colourimetry	2	N/A	2015/04/06	BBY6SOP-00011	SM 22 4500-Cl- G m
True Colour (Single Wavelength) (1)	2	N/A	2015/04/02	VIC SOP-00010	Based on SM-2120 C
Conductance - water (1)	2	N/A	2015/04/07	BBY6SOP-00026	SM-2510B
Fluoride	2	N/A	2015/04/02	BBY6SOP-00048	SM 22 4500-F C m
Iron Bacteria (1)	2	N/A	2015/04/01	VIC SOP-00114	SM 22 9240 m
Hardness Total (calculated as CaCO3)	2	N/A	2015/04/06	BBY7SOP-00002	EPA 6020a R1 m
Mercury (Total) by CVAf	2	2015/04/08	2015/04/08	BBY7SOP-00015	BCMOE BCLM Oct2013 m
Heterotrophic Plate Count Water Mem. Filt (1)	2	N/A	2015/04/01	BBY4 SOP-00003	Based on SM-9215
Na, K, Ca, Mg, S by CRC ICPMS (total)	2	N/A	2015/04/06	BBY7SOP-00002	EPA 6020A R1 m
Elements by CRC ICPMS (total)	2	N/A	2015/04/06	BBY7SOP-00002	EPA 6020A R1 m
Nitrogen (Total)	2	2015/04/02	2015/04/06	BBY6SOP-00016	SM 22 4500-N C m
Ammonia-N (Preserved)	2	N/A	2015/04/06	BBY6SOP-00009	SM 22 4500-NH3- G m
Nitrate + Nitrite (N)	2	N/A	2015/04/02	BBY6SOP-00010	SM 22 4500-NO3- I m
Nitrite (N) by CFA	2	N/A	2015/04/02	BBY6SOP-00010	SM 22 4500-NO3- I m
Nitrogen - Nitrate (as N)	2	N/A	2015/04/02	BBY6SOP-00010	SM 22 4500-NO3 I m
Nitrogen (Organic) (Cal. TKN, NH4,N/N)	2	N/A	2015/04/06	BBY WI-00033	Auto Calc
pH Water (1, 2)	2	N/A	2015/04/07	BBY6SOP-00026	SM-4500H+B
Sat. pH and Langelier Index (@ 4.4C)	2	N/A	2015/04/09	BBY WI-00033	Auto Calc
Sat. pH and Langelier Index (@ 60C)	2	N/A	2015/04/09	BBY WI-00033	Auto Calc
Sulphate by Automated Colourimetry	2	N/A	2015/04/06	BBY6SOP-00017	SM 22 4500-SO42- E m
Sulphur Reducing Bacteria (1)	2	N/A	2015/04/01	VIC SOP-00114	SM 22 9240 m
Sulphide	2	N/A	2015/04/06	BBY6SOP-00006	SM 22 4500-S2- D m
Total Dissolved Solids (Filt. Residue)	2	2015/04/07	2015/04/08	BBY6SOP-00033	SM 22 2540 C m
Total coliform and E. by MF (Chromocult) (1)	2	N/A	2015/04/01	VIC SOP 00112	Based on SM-9222
Carbon (Total Organic) (3)	2	N/A	2015/04/06	BBY6SOP-00003	SM 22 5310 C m
Turbidity (1)	2	N/A	2015/04/02	VIC SOP-00011	Based on SM - 2130

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

\* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

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**CERTIFICATE OF ANALYSIS**

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- (1) This test was performed by Maxxam Victoria
- (2) The BC-MOE and APHA Standard Method require pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the BC-MOE/APHA Standard Method holding time.
- (3) TOC present in the sample should be considered as non-purgeable TOC.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Debbie Nordbruget, Project Manager

Email: DNordbruget@maxxam.ca

Phone# (250)385-6112

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This report has been generated and distributed using a secure automated process.

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

**VIHA POTABILITY WITH MICRO AND CV HG (WATER)**

Maxxam ID					LZ1177	LZ1178		
Sampling Date					2015/03/31 08:20	2015/03/31 09:00		
COC Number					V012833	V012833		
	Units	MAC	AO	OG	1-WS-10 DISTRIBUTION	WELL #778	RDL	QC Batch
<b>Calculated Parameters</b>								
Total Hardness (CaCO3)	mg/L	-	-	-	104	69.8	0.50	7853366
<b>Misc. Inorganics</b>								
Alkalinity (Total as CaCO3)	mg/L	-	-	-	106	68.9	0.5	7856983
Total Organic Carbon (C)	mg/L	-	-	-	1.70	0.84	0.50	7856593
Alkalinity (PP as CaCO3)	mg/L	-	-	-	<0.5	<0.5	0.5	7856983
Bicarbonate (HCO3)	mg/L	-	-	-	129	84.0	0.5	7856983
Carbonate (CO3)	mg/L	-	-	-	<0.5	<0.5	0.5	7856983
Hydroxide (OH)	mg/L	-	-	-	<0.5	<0.5	0.5	7856983
<b>MISCELLANEOUS</b>								
True Colour	Col. Unit	-	15	-	<5	<5	5	7854421
<b>Nutrients</b>								
Total Ammonia (N)	mg/L	-	-	-	0.088	0.032	0.0050	7856528
Total Organic Nitrogen (N)	mg/L	-	-	-	0.021	<0.020	0.020	7853369
Total Nitrogen (N)	mg/L	-	-	-	0.925	0.141	0.020	7855972
<b>Physical Properties</b>								
Conductivity	uS/cm	-	-	-	271	161	1	7856982
pH	pH	-	6.5:8.5	-	7.9	7.8	N/A	7856981
<b>Physical Properties</b>								
Turbidity	NTU	see remark	see remark	see remark	0.3	0.5	0.1	7854520
<b>Elements</b>								
Total Mercury (Hg)	ug/L	1	-	-	<0.010	<0.010	0.010	7858415
<b>Total Metals by ICPMS</b>								
Total Aluminum (Al)	ug/L	-	-	100	<3.0	5.0	3.0	7856495
Total Antimony (Sb)	ug/L	6	-	-	<0.50	<0.50	0.50	7856495
Total Arsenic (As)	ug/L	10	-	-	0.32	0.30	0.10	7856495
Total Barium (Ba)	ug/L	1000	-	-	9.8	3.0	1.0	7856495
Total Beryllium (Be)	ug/L	-	-	-	<0.10	<0.10	0.10	7856495
Total Bismuth (Bi)	ug/L	-	-	-	<1.0	<1.0	1.0	7856495
Total Boron (B)	ug/L	5000	-	-	<50	<50	50	7856495
Total Cadmium (Cd)	ug/L	5	-	-	<0.010	<0.010	0.010	7856495
Total Chromium (Cr)	ug/L	50	-	-	<1.0	<1.0	1.0	7856495
Total Cobalt (Co)	ug/L	-	-	-	<0.50	<0.50	0.50	7856495
Total Copper (Cu)	ug/L	-	1000	-	20.9	0.25	0.20	7856495
Total Iron (Fe)	ug/L	-	300	-	33.0	10.4	5.0	7856495
Total Lead (Pb)	ug/L	10	-	-	0.56	<0.20	0.20	7856495
Total Manganese (Mn)	ug/L	-	50	-	35.7	<1.0	1.0	7856495
RDL = Reportable Detection Limit N/A = Not Applicable								

**VIHA POTABILITY WITH MICRO AND CV HG (WATER)**

Maxxam ID					LZ1177	LZ1178		
Sampling Date					2015/03/31 08:20	2015/03/31 09:00		
COC Number					V012833	V012833		
	Units	MAC	AO	OG	1-WS-10 DISTRIBUTION	WELL #778	RDL	QC Batch
Total Molybdenum (Mo)	ug/L	-	-	-	<1.0	1.2	1.0	7856495
Total Nickel (Ni)	ug/L	-	-	-	<1.0	<1.0	1.0	7856495
Total Selenium (Se)	ug/L	<b>50</b>	-	-	<0.10	<0.10	0.10	7856495
Total Silicon (Si)	ug/L	-	-	-	9900	9360	100	7856495
Total Silver (Ag)	ug/L	-	-	-	<0.020	<0.020	0.020	7856495
Total Strontium (Sr)	ug/L	-	-	-	233	80.5	1.0	7856495
Total Thallium (Tl)	ug/L	-	-	-	<0.050	<0.050	0.050	7856495
Total Tin (Sn)	ug/L	-	-	-	<5.0	<5.0	5.0	7856495
Total Titanium (Ti)	ug/L	-	-	-	<5.0	<5.0	5.0	7856495
Total Uranium (U)	ug/L	<b>20</b>	-	-	0.39	0.63	0.10	7856495
Total Vanadium (V)	ug/L	-	-	-	<5.0	<5.0	5.0	7856495
Total Zinc (Zn)	ug/L	-	5000	-	13.9	<5.0	5.0	7856495
Total Zirconium (Zr)	ug/L	-	-	-	<0.50	<0.50	0.50	7856495
Total Calcium (Ca)	mg/L	-	-	-	29.4	18.5	0.050	7853367
Total Magnesium (Mg)	mg/L	-	-	-	7.37	5.70	0.050	7853367
Total Potassium (K)	mg/L	-	-	-	0.599	0.371	0.050	7853367
Total Sodium (Na)	mg/L	-	200	-	16.2	5.60	0.050	7853367
Total Sulphur (S)	mg/L	-	-	-	<3.0	<3.0	3.0	7853367
<b>Parameter</b>								
Iron Bacteria	CFU/mL	-	-	-	<25	<25	25	7861486
Sulphate reducing bacteria	CFU/mL	-	-	-	<200	<200	200	7861497
<b>Microbiological Param.</b>								
Heterotrophic Plate Count	CFU/mL	-	-	-	<1	1	1	7857463
Total Coliforms	CFU/100mL	<1	-	-	<1	<1	1	7855192
E. coli	CFU/100mL	<1	-	-	<1	<1	1	7855192
<b>Parameter</b>								
Langelier Index (@ 4.4C)	N/A	-	-	-	-0.537	-0.954	N/A	7853371
Langelier Index (@ 60C)	N/A	-	-	-	0.504	0.0870	N/A	7853372
Saturation pH (@ 4.4C)	N/A	-	-	-	8.43	8.79	N/A	7853371
Saturation pH (@ 60C)	N/A	-	-	-	7.39	7.75	N/A	7853372
<b>MISCELLANEOUS</b>								
Sulphide	mg/L	-	0.05	-	0.0059	0.0064	0.0050	7856138
RDL = Reportable Detection Limit N/A = Not Applicable								

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**RESULTS OF CHEMICAL ANALYSES OF WATER**

Maxxam ID				LZ1177	LZ1178		
Sampling Date				2015/03/31 08:20	2015/03/31 09:00		
COC Number				V012833	V012833		
	Units	MAC	AO	1-WS-10 DISTRIBUTION	WELL #778	RDL	QC Batch
<b>ANIONS</b>							
Nitrite (N)	mg/L	1	-	<0.0050	<0.0050	0.0050	7855097
<b>Calculated Parameters</b>							
Nitrate (N)	mg/L	10	-	0.817	0.127	0.020	7853368
<b>Misc. Inorganics</b>							
Fluoride (F)	mg/L	1.5	-	0.076	0.065	0.010	7856413
<b>Anions</b>							
Dissolved Sulphate (SO4)	mg/L	-	500	8.67	5.00	0.50	7856629
Dissolved Chloride (Cl)	mg/L	-	250	10	3.0	0.50	7856625
<b>Nutrients</b>							
Nitrate plus Nitrite (N)	mg/L	-	-	0.817	0.127	0.020	7855093
<b>Physical Properties</b>							
Total Dissolved Solids	mg/L	-	500	160	102	10	7857154
RDL = Reportable Detection Limit							

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### GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	6.3°C
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MAC,AO,OG: The guidelines that have been included in this report have been taken from the Canadian Drinking Water Quality Summary Table, October 2014.

Criteria A = Maximum Acceptable Concentration (MAC) / Criteria B = Aesthetic Objectives (AO) / Criteria C = Operational Guidance Values (OG)  
It is recommended to consult these guidelines when interpreting your data since there are non-numerical guidelines that are not included on this report.

**Turbidity Guidelines:**

1. Chemically assisted filtration: less than or equal to 0.3 NTU in 95% of the measurements or 95% of the time each month. Shall not exceed 1.0 NTU at any time.
2. Slow sand / diatomaceous earth filtration: less than or equal to 1.0 NTU in 95% of the measurements or 95% of the time each month. Shall not exceed 3.0 NTU at any time.
3. Membrane filtration: less than or equal to 0.1 NTU in 99% of the measurements made or at least 99% of the time each calendar month. Shall not exceed 0.3 NTU at any time.

**Results relate only to the items tested.**

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**QUALITY ASSURANCE REPORT**

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
7854421	True Colour	2015/04/02			104	80 - 120	<5	Col. Unit	NC	10
7854520	Turbidity	2015/04/02			102	80 - 120	<0.1	NTU	NC	20
7855093	Nitrate plus Nitrite (N)	2015/04/02			104	80 - 120	<0.020	mg/L		
7855097	Nitrite (N)	2015/04/02			99	80 - 120	<0.0050	mg/L		
7855192	E. coli	2015/04/01							NC	N/A
7855192	Total Coliforms	2015/04/01							NC	N/A
7855972	Total Nitrogen (N)	2015/04/06	NC	80 - 120	89	80 - 120	<0.020	mg/L	2.8	20
7856138	Sulphide	2015/04/06	107	80 - 120	97	80 - 120	0.0068, RDL=0.0050	mg/L	NC	20
7856413	Fluoride (F)	2015/04/02	98	80 - 120	96	80 - 120	<0.010	mg/L	0	20
7856495	Total Aluminum (Al)	2015/04/06	110	80 - 120	104	80 - 120	<3.0	ug/L	NC	20
7856495	Total Antimony (Sb)	2015/04/06	107	80 - 120	103	80 - 120	<0.50	ug/L	NC	20
7856495	Total Arsenic (As)	2015/04/06	102	80 - 120	96	80 - 120	<0.10	ug/L	NC	20
7856495	Total Barium (Ba)	2015/04/06	NC	80 - 120	97	80 - 120	<1.0	ug/L	1.2	20
7856495	Total Beryllium (Be)	2015/04/06	103	80 - 120	91	80 - 120	<0.10	ug/L	NC	20
7856495	Total Bismuth (Bi)	2015/04/06	107	80 - 120	102	80 - 120	<1.0	ug/L	NC	20
7856495	Total Boron (B)	2015/04/06					<50	ug/L	NC	20
7856495	Total Cadmium (Cd)	2015/04/06	102	80 - 120	96	80 - 120	<0.010	ug/L	NC	20
7856495	Total Chromium (Cr)	2015/04/06	102	80 - 120	98	80 - 120	<1.0	ug/L	NC	20
7856495	Total Cobalt (Co)	2015/04/06	99	80 - 120	98	80 - 120	<0.50	ug/L	NC	20
7856495	Total Copper (Cu)	2015/04/06	NC	80 - 120	96	80 - 120	<0.20	ug/L	5.8	20
7856495	Total Iron (Fe)	2015/04/06	109	80 - 120	106	80 - 120	<5.0	ug/L	2.1	20
7856495	Total Lead (Pb)	2015/04/06	104	80 - 120	98	80 - 120	<0.20	ug/L	NC	20
7856495	Total Manganese (Mn)	2015/04/06	NC	80 - 120	97	80 - 120	<1.0	ug/L	1.9	20
7856495	Total Molybdenum (Mo)	2015/04/06	NC	80 - 120	95	80 - 120	<1.0	ug/L	NC	20
7856495	Total Nickel (Ni)	2015/04/06	102	80 - 120	99	80 - 120	<1.0	ug/L	NC	20
7856495	Total Selenium (Se)	2015/04/06	101	80 - 120	97	80 - 120	<0.10	ug/L	NC	20
7856495	Total Silicon (Si)	2015/04/06					<100	ug/L	5.3	20
7856495	Total Silver (Ag)	2015/04/06	104	80 - 120	93	80 - 120	<0.020	ug/L	NC	20
7856495	Total Strontium (Sr)	2015/04/06	NC	80 - 120	99	80 - 120	<1.0	ug/L	0.46	20
7856495	Total Thallium (Tl)	2015/04/06	106	80 - 120	98	80 - 120	<0.050	ug/L	NC	20
7856495	Total Tin (Sn)	2015/04/06	99	80 - 120	94	80 - 120	<5.0	ug/L	NC	20
7856495	Total Titanium (Ti)	2015/04/06	101	80 - 120	92	80 - 120	<5.0	ug/L	NC	20

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**QUALITY ASSURANCE REPORT(CONT'D)**

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
7856495	Total Uranium (U)	2015/04/06	104	80 - 120	95	80 - 120	<0.10	ug/L	NC	20
7856495	Total Vanadium (V)	2015/04/06	108	80 - 120	100	80 - 120	<5.0	ug/L	NC	20
7856495	Total Zinc (Zn)	2015/04/06	NC	80 - 120	96	80 - 120	<5.0	ug/L	NC	20
7856495	Total Zirconium (Zr)	2015/04/06					<0.50	ug/L	NC	20
7856528	Total Ammonia (N)	2015/04/06	100	80 - 120	91	80 - 120	<0.0050	mg/L	0.86	20
7856593	Total Organic Carbon (C)	2015/04/06	97	80 - 120	109	80 - 120	<0.50	mg/L	NC	20
7856625	Dissolved Chloride (Cl)	2015/04/06	NC	80 - 120	105	80 - 120	<0.50	mg/L	0.69	20
7856629	Dissolved Sulphate (SO4)	2015/04/06	NC	80 - 120	96	80 - 120	<0.50	mg/L	0.84	20
7856981	pH	2015/04/07			101	96 - 104			0	N/A
7856982	Conductivity	2015/04/07			103	90 - 110	1,RDL=1	uS/cm	0.068	20
7856983	Alkalinity (PP as CaCO3)	2015/04/07					<0.5	mg/L	NC	20
7856983	Alkalinity (Total as CaCO3)	2015/04/07	86	80 - 120	86	80 - 120	<0.5	mg/L	3.0	20
7856983	Bicarbonate (HCO3)	2015/04/07					<0.5	mg/L	3.0	20
7856983	Carbonate (CO3)	2015/04/07					<0.5	mg/L	NC	20
7856983	Hydroxide (OH)	2015/04/07					<0.5	mg/L	NC	20
7857154	Total Dissolved Solids	2015/04/08	100	80 - 120	102	80 - 120	<10	mg/L	3.7	20
7857463	Heterotrophic Plate Count	2015/04/01							NC	N/A
7858415	Total Mercury (Hg)	2015/04/08	85	80 - 120	91	80 - 120	<0.010	ug/L	NC	20
7861497	Sulphate reducing bacteria	2015/04/01							NC	N/A

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).



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Mill Bay Water District

### VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Andy Lu, Data Validation Coordinator



David Nadler, AASc, Victoria Operations Manager

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