VILLAGE OF LIONS BAY
DRINKING WATER QUALITY ANNUAL REPORT

FY 2014

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INTRODUCTION

This report comprises the 2014 Drinking Water Quality Annual Report prepared by the Village of Lions Bay. It provides pertinent information about the Village's drinking water to support the Village's application for its annual Operating Permit, issued by the Medical Health Officer. The purpose of the report is to provide Village water consumers with drinking water sampling test results for 2014, as well as to present background information on Village-specific issues concerning water supply, treatment, and measures being taken to protect and enhance drinking water quality as per requirements under the *Drinking Water Protection Regulation* and the *Drinking Water Protection Act*.

Although the Village is a member of Metro Vancouver, its water supply is not sourced from the Greater Vancouver Water District (GVWD). The Village of Lions Bay owns and operates its own water supply, treatment, and distribution system, and has the water from its system analyzed for the presence of microbiological pathogens (and other indicator organisms), metals, and chlorine residuals by laboratories approved by the Medical Health Officer.

GENERAL DESCRIPTION

The Village of Lions Bay supplies potable water to its customers via a waterworks system comprised of 2 intakes located on Harvey and Magnesia Creeks, 2 water treatment plants (which provide UV disinfection and chlorination) located downstream from the respective intakes, 5 storage tanks, 13 PRV stations, and 13 kilometers of water mains. A population of approximately 1,348 is served through 591 service connections.

LICENSES

The Village of Lions Bay held 6 water licenses (5 utilized) in 2014, issued by the Ministry of Environment. Table 1 lists the licenses and quantity of water associated with each.

Table 1. Village Water Licenses

License No	Imperial Quantity	Metric Quantity	Stream Name
C059405	10,000,000.00 gal/year	45,460.90000 m3/year	Magnesia Creek
C065267	4,380,000.00 gal/year	19,911.87420 m3/year	Magnesia Creek
C065316	7,300,000.00 gal/year	33,186.45700 m3/year	Magnesia Creek
C042330	18,250,000.00 gal/year	82,966.14250 m3/year	Alberta Creek *
C119916	9,125,000.00 gal/year	41,483.07125 m3/year	Harvey Creek
C119917	54,750,000.00 gal/year	248,898.42750 m3/year	Harvey Creek

*Alberta Creek is not utilized by the Village

In 2014, 772,300.85 m3 of water was supplied to residents from Magnesia and Harvey creeks. As such, the Village's annual water consumption far exceeded its licenses.

SOURCE WATER

The Village of Lions Bay's watershed areas include Magnesia Creek drainage (421 hectares), Harvey Creek drainage (635 hectares), Alberta Creek drainage (51 hectares), and Rundle Creek drainage (20 hectares). All Village water is drawn from 2 intakes located on Magnesia and Harvey Creeks, and the Village is responsible for water acquisition, supply, treatment, and distribution to its residents.

The Village is systematically working toward a "4-barrier" approach to mitigate source water quality issues that include the potential for waterborne disease, seasonal raw water turbidity fluctuations, and bacterial regrowth in its distribution system. The barriers are as follows: primary (UV) and secondary (chlorine) treatment, water quality monitoring (daily, weekly, and monthly), water main cleaning/flushing (bi-annually), and watershed protection (in progress).

ISSUES

Adequate supply for both residential consumption and fire protection is the primary issue for the Village, as both creek flow levels vary throughout the year. Harvey Creek flow levels are the more volatile of the two, ranging from 1564.5 gallons per minute (January 13 to 323.2 gallons per minute (September 16) in 2014. Conversely, Magnesia Creek flow levels averaged around 218 gallons per minute virtually year-round.

CHALLENGES

The Village draws all of its water from surface sources that are subject to fluctuating turbidity levels, and are designated as unstable terrain upslope. This fluctuation in raw water turbidity presents many challenges for the treatment of the water to ensure that turbidity and chlorine residuals throughout the entire supply system are not adversely affected. The water treatment plants are monitored remotely via a SCADA system, and are checked daily (work days) by crews; each intake is checked at least weekly.

The watershed areas for the intakes are contained by steep, rocky, unstable terrain upslope on one side, and steep flowing creeks subject to debris torrents on the other. Access to the intakes is via narrow gravel roads which are subject to rock fall and tree throw hazards from above. Strict safe working guidelines for unstable terrain upslope prohibit crews from entering the watershed areas and water intakes if rainfall parameters are exceeded. This

prevents crews from being able to investigate decreased water flow or increased raw water turbidity levels during periods of heavy rain – the exact times most likely to cause either event.

Considerable rainfall and windstorm events have created further challenges for the Village. In late 2014, two separate debris slides in October (affecting Harvey) and December (affecting Magnesia) effectively shut down the respective intakes completely, necessitating boil water advisories to be issued, and strict conservation measures to be undertaken in an effort to ensure the Village did not run out of water completely in December.

TESTING & RESULTS

The Village tests raw source water for turbidity from both creeks daily (work days). More extensive testing is undertaken bi-annually for general water chemistry, hardness, metals, and other contaminants including organic compounds. Table 2 presents the Village's raw water turbidity test results for 2014.

Table 2. 2014 Raw Water Turbidity Results

	Harvey Creek	Magnesia Creek
Count	231	239
Maximum result (NTU)	2.70	9.64
Minimum result (NTU)	0.13	0.15
Average (NTU)	0.54	0.49
Number >5 NTU	0	2
Percentage > 5 NTU	0%	0.84%

Section 3.3 of the 2003 Guidelines for Canadian Drinking Water Quality Supporting Documentation titled "Turbidity, Criteria for Exclusion of Filtration in Waterworks Systems" contains a provision for exemption from its recommendation of filtration for all surface water supplies if the system's average daily source water turbidity levels measured immediately prior to where disinfection is applied, are around 1.0 NTU but do not exceed 5.0 NTU for more than 2 days in a 12-month period. As indicated in Table 1, raw water

turbidity did not exceed 5 NTUs from Harvey Creek during the year, and exceeded 5 NTUs twice from Magnesia.

Elevated turbidity levels caused by debris slides and stream scouring upslope of the Village's intakes resulted in 3 separate boil water advisories issued by Vancouver Coastal Health in 2014. Boil water advisories were in effect for the following timeframes:

- Issued March 6; lifted March 13
- Issued October 22; lifted November 13
- Issued December 11; lifted December 29

Appendix B contains all source raw water test results for 2014, and Appendix E contains copies of all boil water advisories issued in 2014.

The Village further tests twice a year for metals and general chemistry of its treated and raw water, including hardness, pH, total suspended solids, turbidity, alkalinity, organic carbon, biochemical oxygen demand (BOD), and trihalomethanes. Appendix D contains the 2014 raw water metals and general chemistry test results.

WATER TREATMENT

The Village of Lions bay does not have a filtration system. Raw water from Harvey and Magnesia Creek intakes is treated via a 2-stage process within their respective treatment plants – the primary stage is disinfection utilizing ultraviolet radiation (UV), and the secondary stage is chlorine injection. This 2-stage process is required because although UV is very effective at inactivating *Giardia* and *Cryptosporidium*, it does not introduce any disinfectant residual to the water, rendering it incapable of protecting the distribution system against contamination. Therefore, chlorination is used as the secondary stage of disinfection in order to establish a residual throughout the system.

The Village tests samples which are taken daily (workdays) for turbidity and chlorine residuals from 6 sampling stations located in the middle and ends of the distribution system, in addition to those taken from the 2 reservoir tanks located at the treatment plants. Once a week, further samples are taken from the 2 reservoir tanks and sent to a Vancouver Coastal Health approved testing laboratory and tested for E. coli and total coliforms.

The *Drinking Water Protection Regulation*'s water quality standards for potable water indicate that there can be no detectable E. coli per 100ml; and that total coliform bacteria samples (for more than 1 sample taken per month) must have at least 90% of samples with no detectable total coliform bacteria per 100ml and no 1 sample can have more than 10 total coliform bacteria per 100ml. No test samples taken weekly from the Village's 2 reservoir tanks exceeded these parameters in 2014.

CHALLENGES & TURBIDITY EVENT RESPONSE

The challenges outlined in the Source Water Section of this report also impact the Village's water treatment plants. The performance of the primary UV treatment is affected by increased turbidity because water that that has higher turbidity absorbs a significant amount of UV light, and will therefore have a correspondingly low UV transmittance (UVT) rate. The UV system automatically increases lamp intensity to counter the lower UVT. If turbidity exceeds 5 NTUs entering the plants, the UV system will send an alarm through SCADA to notify the Water Operator, and the UV reactor shuts down. During turbidity events in excess of 5 NTU, microbiological sampling and testing is increased at all sampling locations; chlorine residual sampling and testing is likewise increased; and the Village will

contact Vancouver Coastal Heath, who may issue a Boil Water Advisory. Appendix F contains the Village's Emergency Response Plan.

In times of severe weather, the Water Operator increases the frequency of testing and adjusts chlorine injection rates to compensate for any fluctuating chlorine demand caused by varying turbidity levels. As chlorine residual levels increase, so do resident complaints about taste and/or odor, especially at the beginning of the distribution system. The generally agreed minimum acceptable residual chlorine level for treated drinking water at all points in the distribution system is 0.2ppm; and the maximum is 4ppm.

TESTING & RESULTS

Table 3 presents an overview of the Village's treated water turbidity results at Harvey and Magnesia reservoir storage tanks located directly downstream of their respective treatment plants. Table 4 presents an overview of the chlorine residuals at the same reservoir storage tanks. Appendix C contains 3-year comparison graphs of turbidity and chlorine residual test results.

Table 3. 2014 Village Treated Water Turbidity at Reservoir Tanks

	Harvey reservoir tank	Magnesia reservoir tank
Count	253	250
Maximum NTU	3.71	3.95
Minimum NTU	0.10	0.13
Average NTU	0.57	0.52
Number >5 NTU	0	0
Percentage >5 NTU	0%	0%

Table 4. 2014 Village Chlorine Residuals at Reservoir Tanks

	Harvey reservoir tank	Magnesia reservoir tank
Count	253	251
Maximum ppm	1.38	1.75
Minimum ppm	0.13	0.03
Average ppm	0.83	0.91
Number <0.2 ppm	2	1
Percentage <0.2 ppm	0.79%	0.40%

DISTRIBUTION SYSTEM

The Village of Lions Bay's distribution system serves a population of approximately 1,348 residents accounting for essentially 100% of the Village's annual water consumption. As the Village is located on a mountainside, water pressure within the Village's 13km of water mains is controlled by 13 PRV stations; 7 of which are located on the Harvey Creek supplied system, and 6 on the Magnesia Creek supplied system. These mains are constructed primarily of ductile iron (DI), however a variety of materials, including asbestos cement (AC), cast iron (CI), and PVC also exist within the Village. The oldest pipes in the Village's distribution system were installed between 1970 and 1971.

There are 8 storage tanks located on the system, 5 of which were in use in 2014. The 5 in use were Harvey reservoir tank (400,000 imperial gallon), Magnesia reservoir tank (100,000 imperial gallon), Phase 4 tank (20,000 imperial gallon), Phase 5 tank (25,000 imperial gallon), and the Highway tank (21,000 imperial gallon).

In 2014, 772,300.85 m3 of water was supplied to the Village from Magnesia and Harvey creeks through 591 service connections. This equates to a rough average of 465,400 imperial gallons consumed by the Village per day.

TESTING & RESULTS

The Village tests samples which are taken daily (workdays) for turbidity and chlorine residuals from 6 sampling stations located in the middle and ends of the distribution system, in addition to those taken from the 2 reservoir tanks located at the treatment plants, to ensure all meet the generally accepted minimum residual of 0.2ppm for chlorine residual and are less than 5 NTU for turbidity. Once a week, further samples are sent to a Vancouver Coastal Health approved testing laboratory and tested for E. coli and total coliforms.

The *Drinking Water Protection Regulation*'s water quality standards for potable water indicate that there can be no detectable E. coli per 100ml; and that total coliform bacteria samples (for more than 1 sample taken per month) must have at least 90% of samples with no detectable total coliform bacteria per 100ml and no 1 sample can have more than 10 total coliform bacteria per 100ml. No test sample results taken weekly from the Village's distribution and storage system exceeded these parameters in 2014.

DISTRIBUTION SYSTEM

Table 5 presents an overview of the Village's treated water turbidity results on the Harvey system and Table 6 presents the same overview on the Magnesia system. Tables 7 and 8 present an overview of the Village's chlorine residual results on the Harvey and Magnesia distribution systems respectively. Appendix A lists all sample site locations, the tests performed, and the frequency of testing at each. Appendix B contains all Village treated water test results for 2014.

Table 5. 2014 Turbidity Results in Harvey Distribution System

	PRV-3	CAFÉ	LIONS BAY AVE	KELVIN GROVE
Count	253	252	252	253
Maximum NTU	2.99	8.84	5.49	4.94
Minimum NTU	0.11	0.10	0.10	0.10
Average NTU	0.47	0.40	0.30	0.32
Number >5 NTU	0	2	1	0
Percentage >5 NTU	0%	0.79%	0.40%	0%

Table 6. 2014 Turbidity Results in Magnesia Distribution System

	PRV-5	BRUNSWICK BEACH
Count	253	253
Maximum NTU	5.34	4.23
Minimum NTU	0.12	0.13
Average NTU	0.49	0.35
Number >5 NTU	1	0
Percentage >5 NTU	0.40%	0%

As indicated in Tables 5 and 6 above, the Village's treated water turbidity on both distribution systems was on average less than ½ of 1 NTU; and was in excess of 5 NTU in less than 1% of any samples taken in 2014.

Table 7. 2014 Chlorine Residual Results in Harvey Distribution System

	PRV-3	CAFÉ	LIONS BAY AVE	KELVIN GROVE
Count	253	252	252	253
Maximum ppm	1.72	1.41	1.15	1.23

Minimum ppm	0.31	0.23	0.18	0.08
Average ppm	0.87	0.75	0.68	0.63
Number >0.2 ppm	0	0	1	1
Percentage >0.2 ppm	0%	0%	0.40%	0.40%

Table 8. 2014 Chlorine Residual Results in Magnesia Distribution System

	PRV-5	BRUNSWICK BEACH
Count	253	253
Maximum ppm	1.71	1.47
Minimum ppm	0.35	0.01
Average ppm	0.93	0.61
Number >0.2 ppm	0	2
Percentage >0.2 ppm	0%	0.79%

As indicated in Tables 7 and 8 above, the Village's treated water chlorine residuals on both distribution systems was on average less than 1 ppm; and was below 0.2 ppm in less than 1% of any samples taken in 2014. As indicated in the Water Treatment Section of this report, the Water Operator adjusts chlorine injection rates to compensate for any fluctuating chlorine demand caused by varying turbidity levels, and must ensure that all points in the system show minimum residuals. The generally agreed minimum acceptable residual chlorine level for treated drinking water at all points in the distribution system is 0.2ppm; the maximum is 4ppm.

Appendix C contains 3-year comparison graphs of turbidity and chlorine residual test results.

The Village further tests 10 locations twice a year for metals and general chemistry of its treated and raw water, including hardness, pH, total suspended solids, turbidity, alkalinity, organic carbon, biochemical oxygen demand (BOD), and trihalomethanes. First draw test results from samples taken in March for lead exceeded the limits set in the *Guidelines for Canadian Drinking Water Quality* of a maximum acceptable concentration of 0.010 mg/L measured at the tap in 3 locations – at the Works Yard, at the elementary school, and at the Village Community Centre. Given that lead test results have been consistently low in the distribution system, the most likely sources of lead found in these locations would be from lead in the private-side service lines, lead solder in plumbing, or brass fittings such as

faucets. All 3 locations tested well below the acceptable limit after flushing. In October, the Works Yard location's first draw test was above the acceptable limit; it again tested well below the acceptable limit after flushing. Appendix D contains metals and general chemistry test results for 2014.

WORK PROGRAM - 2014

The Village performed a Village-wide soft water main flush in 2014; however the scheduled hard water main flush scheduled for October did not take place due to a combination of low creek flows and debris slides that impacted critical infrastructure at first one, then the other water intake. No capital water main replacement work was scheduled for 2014. Several capital projects scheduled for 2014 were put forward for potential grant funding, and are now itemized in 2015's work program below.

WORK PROGRAM - 2015

Village-wide hard water main flushing programs are scheduled for April and October of 2015. The Village will also commission an overall Infrastructure Master Plan, of which the Village's water infrastructure is a key component, in 2015. It is anticipated that this plan will identify and recommend future required capital improvements and policies, ranked by priority, to ensure that the water system as a whole is efficiently managed and responsibly operated.

The Village has applied for improvements to both Harvey and Magnesia water intakes via the New Build Canada Fund: Small Communities Fund (NBCF-SCF). These improvements include the following: an new infiltration intake design to be retrofitted to the existing Magnesia and Harvey Creek intakes to mitigate the impact of sediment debris that enters the system and reduces the amount of time staff must spend at the intake itself to manually clean out debris; installation of a PRV upstream of the Magnesia water treatment plant to mitigate infrastructure and safety concerns for staff working on or near this main and in the treatment plant; and the installation of a bypass at the Magnesia water treatment plant to ensure that regular maintenance or emergency work to the water plant can be undertaken without shutting down the entire supply system.

OPERATOR TRAINING

The *BC Drinking Water Protection Regulation* outlines water system operator qualification standards. Water systems are classified by the Environmental Operators Certification Program (EOCP), based on the population served and the complexity of the system. The chief "operator(s)" of the system must, in turn, be certified by the EOCP at the matching classification level of the system. The Village's water treatment and distribution system has been evaluated as a "Level 2" classification. The Village currently has one water distribution system operator (Alberto Urrutia) with Level 2 certification from the EOCP.

The Village recognizes the inherent value that operator education training and education provides; and ensures that its operator participates annually in a variety of product orientation, workshops, and technical courses that become available annually. In 2014, the courses undertaken to maintain the year's mandatory Continuing Education Units (CEUs) were Reservoir Maintenance, Unidirectional Flushing, Transportation of Dangerous Goods, and Confined Space Awareness Entrant Training.

Appendices H and I respectively contain the Village's EOCP facility classification and operator certification.

APPENDIX A: WATER QUALITY SAMPLING SITE LOCATIONS AND TEST FREQUENCY

SAMPLE STATIONS AND TESTS

SAMPLE STATIONS AND TESTS

Tests	Location	Source	Frequency
Chlorine Residual & Turbidity (Treated Water)	PRV-3	Harvey Creek	Daily (workdays)
	Harvey Reservoir Tank	Harvey Creek	Daily (workdays
	Lions Bay Café	Harvey Creek	Daily (workdays)
	Lions Bay Avenue	Harvey Creek	Daily (workdays
	Kelvin Grove	Harvey Creek	Daily (workdays)
	PRV-5	Magnesia Creek	Daily (workdays
	Magnesia Reservoir Tank	Magnesia Creek	Daily (workdays)
	Brunswick Beach	Magnesia Creek	Daily (workdays)

Test	Location	Source	Frequency
Raw Water Turbidity	Harvey Intake	Harvey Creek	Daily (workdays)
	Magnesia Intake	Magnesia Creek	Daily (workdays

Tests	Location	Source	Frequency
Treated Water Bacteriological (E. coli & total coliforms)	PRV-3	Harvey Creek	weekly
	Harvey Reservoir Tank	Harvey Creek	weekly
	Lions Bay Café	Harvey Creek	weekly
	Lions Bay Avenue	Harvey Creek	weekly
	Kelvin Grove	Harvey Creek	weekly
	PRV-5	Magnesia Creek	weekly
	Magnesia Reservoir Tank	Magnesia Creek	weekly
	Brunswick Beach	Magnesia Creek	weekly

Test	Location	Source	Frequency
Raw Water Turbidity	Harvey Intake	Harvey Creek	Daily (workdays)
	Magnesia Intake	Magnesia Creek	Daily (workdays

SAMPLE STATIONS AND TESTS

Tests	Location	Source	Frequency
Treated Water Metals & Chemical Composition	PRV-3	Harvey Creek	2x annually
	Harvey Reservoir Tank	Harvey Creek	2x annually
	Lions Bay Café	Harvey Creek	2x annually
	Lions Bay Avenue	Harvey Creek	2x annually
	Kelvin Grove	Harvey Creek	2x annually
	Community Centre	Harvey Creek	2x annually
	Magnesia Reservoir Tank	Magnesia Creek	2x annually
	Brunswick Beach	Magnesia Creek	2x annually
	Elementary School	Magnesia Creek	2x annually
	PRV-5	Magnesia Creek	2x annually

Test	Location	Source	Frequency
Raw Water Metals & Chemical Composition	Harvey Intake	Harvey Creek	2x annually
	Magnesia Intake	Magnesia Creek	2x annually

APPENDIX B: SOURCE & DISTRIBUTION WATER TESTING RESULTS

	RAW WATER JANUARY 2014					
	HARVEY CREEK			MAGNESIA CREEK		
Date	Time	24 Hr Flow	NTU	Time	24 Hr Flow	NTU
1						
2			0.76			0.24
3			0.24			0.36
4						
5						
6			0.28			0.20
7			0.25			0.21
8			0.23			0.34
9			0.21			0.28
10			0.13			0.21
11						
12						
13			0.21			0.21
14			0.20			0.28
15			0.28			0.31
16			0.25			0.53
17			0.25			0.18
18						
19						
20			0.79			0.23
21			0.27			0.29
22			0.18			0.35
23			0.27			0.29
24			0.20			0.25
25						
26						
27			0.42			0.19
28			0.32			0.17
29			0.20			0.18
30			0.35			0.26
31			0.25			0.21

	RAW WATER FEBRUARY 2014					
	HARVEY CREEK			MAGNESIA CREEK		
Date	Time	24 Hr Flow	NTU	Time	24 Hr Flow	NTU
1						
2						
3			0.46			0.17
4			0.32			0.20
5			0.27			0.24
6			0.15			0.20
7			0.28			0.16
8						
9						
10						
11			0.59			0.30
12			0.51			0.23
13			0.31			0.32
14			0.54			0.57
15						
16						
17			0.27			0.35
18			0.35			0.22
19			0.42			0.30
20			0.15			0.18
21			0.13			0.15
22						
23						
24			0.31			0.23
25			0.20			0.23
26			0.20			0.19
27			0.19			0.26
28			0.23			0.23
29						

	RAW WATER MARCH 2014					
	HARVEY CREEK			MAGNESIA CREEK		
Date	Time	24 Hr Flow	NTU	Time	24 Hr Flow	NTU
1						
2						
3			0.63			0.42
4			0.40			0.31
5			0.72			0.27
6			1.37			1.45
7			1.77			0.97
8						
9			0.55			0.77
10			0.34			0.52
11			0.46			0.44
12			0.38			0.28
13			0.35			0.23
14			0.54			0.35
15						
16						
17			0.17			0.28
18			0.24			0.45
19			0.28			0.37
20			0.21			0.48
21			0.29			0.31
22						
23						
24			0.44			0.20
25			0.74			0.44
26			0.25			1.60
27			0.47			0.34
28			0.53			0.47
29						
30						
31			0.41			0.98

	RAW WATER APRIL 2014					
	HARVEY CREEK			MAGNESIA CREEK		
Date	Time	24 Hr Flow	NTU	Time	24 Hr Flow	NTU
1			0.65			0.67
2			0.19			0.36
3			0.49			0.25
4			0.30			0.25
5						
6						
7			2.09			0.26
8			0.54			0.45
9			0.34			0.26
10			0.24			0.40
11			0.24			0.24
12						
13						
14			0.41			0.20
15			0.26			0.18
16			0.26			0.28
17			0.57			0.37
18						
19			0.66			0.30
20						
21						
22			0.22			0.62
23			0.23			0.63
24			0.31			0.23
25			0.27			0.37
26						
27						
28			0.39			0.31
29			0.19			0.20
30			0.29			0.75

	RAW WATER MAY 2014					
	HARVEY CREEK			MAGNESIA CREEK		
Date	Time	24 Hr Flow	NTU	Time	24 Hr Flow	NTU
1			0.31			0.43
2			0.40			0.64
3						
4						
5			0.43			0.44
6			0.34			0.35
7			0.45			0.46
8			0.58			0.62
9			0.46			0.71
10						
11						
12			0.22			0.31
13			0.24			0.35
14			1.17			0.76
15			0.37			0.57
16			0.66			0.87
17						
18						
19						
20			0.52			0.26
21			0.51			0.38
22			0.39			0.31
23			0.86			1.18
24						
25						
26			0.60			0.36
27			0.33			0.37
28			0.27			0.57
29			0.85			0.68
30			0.54			0.57
31						

RAW WATER JUNE 2014

	HARVEY CREEK			MAGNESIA CREEK		
Date	**Time**	**24 Hr Flow**	**NTU**	**Time**	**24 Hr Flow**	**NTU**
1						
2			0.93			0.46
3			0.36			0.80
4			0.27			0.33
5			0.27			0.42
6			0.68			0.66
7						
8						
9			0.58			0.27
10			0.87			0.33
11			0.35			0.46
12			0.40			0.43
13			0.24			0.49
14						
15						
16			0.28			0.22
17			0.40			0.24
18			0.29			0.27
19			0.28			0.34
20			0.47			0.49
21						
22						
23			0.16			0.22
24			0.19			0.18
25			0.15			0.31
26			0.18			0.28
27			0.29			0.24
28						
29						
30			0.14			0.22

	RAW WATER JULY 2014					
	HARVEY CREEK			MAGNESIA CREEK		
Date	Time	24 Hr Flow	NTU	Time	24 Hr Flow	NTU
1						
2			0.15			0.21
3			0.16			0.19
4			0.23			0.16
5						
6						
7			0.14			0.21
8			0.37			0.28
9			0.31			0.22
10			0.20			0.25
11			0.23			0.19
12						
13						
14			0.72			0.37
15			0.45			0.25
16			0.24			0.16
17			0.36			0.16
18			0.38			0.23
19						
20						
21			1.04			0.18
22			0.65			0.23
23			0.43			0.18
24			0.46			0.52
25			0.44			0.45
26						
27						
28			0.55			0.22
29			0.28			0.24
30			0.29			0.25
31			0.37			0.32

	RAW WATER AUGUST 2014					
	HARVEY CREEK			MAGNESIA CREEK		
Date	Time	24 Hr Flow	NTU	Time	24 Hr Flow	NTU
1			0.24			0.43
2						
3						
4						
5			1.16			0.16
6			0.39			0.24
7			0.30			0.36
8			0.38			0.41
9						
10						
11			1.25			0.20
12			0.64			0.21
13			0.40			0.33
14			0.45			0.23
15			0.45			0.30
16						
17						
18			1.19			0.23
19			0.64			0.21
20			0.58			0.29
21			0.51			0.20
22			0.64			0.15
23						
24						
25			1.63			0.26
26			0.38			0.32
27			0.77			0.84
28			0.62			0.19
29			0.81			0.19
30						
31						

	RAW WATER SEPTEMBER 2014					
	HARVEY CREEK			MAGNESIA CREEK		
Date	Time	24 Hr Flow	NTU	Time	24 Hr Flow	NTU
1						
2			1.44			0.21
3			0.70			0.21
4			0.61			0.33
5			0.58			0.43
6						
7						
8			1.24			0.20
9			0.65			0.21
10			0.63			0.15
11			0.55			2.33
12			0.71			0.48
13						
14						
15			1.18			0.30
16			0.81			0.19
17			1.06			0.39
18			0.97			0.24
19			0.80			0.22
20						
21						
22			1.86			0.21
23			0.71			0.29
24			1.22			4.84
25			0.23			0.67
26			2.38			5.37
27						
28						
29			0.23			0.26
30			0.25			0.23

	RAW WATER OCTOBER 2014					
	HARVEY CREEK			MAGNESIA CREEK		
Date	Time	24 Hr Flow	NTU	Time	24 Hr Flow	NTU
1			0.22			0.18
2			0.32			0.21
3			0.43			0.16
4						
5						
6			0.60			0.90
7			0.35			0.49
8			0.26			0.29
9			0.46			0.36
10			0.38			0.16
11						
12						
13						
14			1.36			0.51
15			0.90			0.28
16			0.95			0.45
17			0.45			0.36
18						
19						
20			0.67			0.34
21			0.49			0.39
22			N/A			9.64
23			N/A			1.90
24			N/A			1.28
25						
26						
27			N/A			0.77
28			N/A			1.72
29			N/A			1.53
30			N/A			0.52
31			N/A			0.82

	RAW WATER NOVEMBER 2014					
	HARVEY CREEK			MAGNESIA CREEK		
Date	Time	24 Hr Flow	NTU	Time	24 Hr Flow	NTU
1						
2						
3			N/A			0.54
4			N/A			0.73
5			N/A			0.39
6			N/A			2.19
7			N/A			1.03
8						
9						
10			N/A			0.26
11			N/A			0.40
12			N/A			0.23
13			N/A			0.17
14			N/A			0.17
15						
16						
17			N/A			0.16
18			N/A			0.30
19			N/A			0.19
20			2.05			0.36
21			0.72			0.17
22						
23						
24			1.20			0.21
25			0.41			0.33
26			0.63			0.46
27			1.41			0.59
28			0.57			0.60
29						
30						

	RAW WATER DECEMBER 2014					
	HARVEY CREEK			MAGNESIA CREEK		
Date	Time	24 Hr Flow	NTU	Time	24 Hr Flow	NTU
1			0.29			0.27
2			0.52			0.24
3			0.70			0.23
4			0.80			0.31
5			0.71			0.28
6						
7						
8			1.47			0.21
9			2.70			3.00
10			2.20			2.30
11			N/A			N/A
12			1.10			N/A
13						
14						
15			0.88			N/A
16			0.47			N/A
17			1.07			N/A
18			0.62			N/A
19			0.61			N/A
20						
21						
22			0.58			N/A
23			0.42			N/A
24			0.35			N/A
25						
26						
27			0.55			N/A
28						
29			0.71			N/A
30			0.15			N/A
31			0.16			N/A

TREATED WATER JANUARY 2014

DATE	HARVEY										MAGNESIA					
	400 HAR. TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		100 MAG. TANK		PRV-5		BRUNSWICK B.	
	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)
1																
2	0.14	0.92	0.32	0.90	0.18	0.69	0.30	0.78	0.18	0.57	0.25	0.91	0.22	0.88	0.30	0.55
3	0.37	0.79	0.51	0.76	0.31	0.57	0.37	0.69	0.26	0.60	0.54	0.78	0.52	0.78	0.30	0.66
4																
5																
6	0.21	0.92	0.15	0.90	0.25	0.72	0.19	0.73	0.37	0.69	0.30	0.90	0.55	0.85	0.40	0.46
7	0.21	0.95	0.53	0.94	0.24	0.75	0.15	0.80	0.14	0.65	0.21	0.90	0.33	0.88	0.27	0.48
8	0.17	0.90	0.34	0.88	0.23	0.77	0.33	0.81	0.40	0.68	0.17	0.93	0.47	0.91	0.36	0.56
9	0.36	0.63	0.28	0.60	0.36	0.56	0.27	0.69	0.19	0.66	0.57	0.78	0.56	0.75	0.37	0.62
10	0.21	0.67	0.23	0.64	0.36	0.49	0.23	0.46	0.15	0.25	0.30	0.91	0.43	0.81	0.20	0.66
11																
12																
13	0.31	0.95	0.27	0.93	0.29	0.80	0.24	0.71	0.34	0.53	0.45	0.87	0.72	0.86	0.28	0.53
14	0.46	1.04	0.51	1.01	0.42	0.80	0.38	0.82	0.16	0.58	0.38	0.92	0.29	0.89	0.71	0.39
15	0.34	0.95	0.91	0.93	0.38	0.76	0.51	0.86	0.35	0.61	0.33	0.92	0.46	0.89	0.61	0.47
16	0.68	1.00	0.40	0.98	0.26	0.81	0.32	0.86	0.46	0.84	1.35	0.95	0.33	0.92	0.42	0.52
17	0.28	0.95	0.40	0.92	0.52	0.77	0.19	0.86	0.26	0.69	0.38	0.82	0.31	0.87	0.34	0.55
18																
19																
20	0.23	0.92	0.41	0.90	0.25	0.72	0.18	0.79	0.51	0.62	0.20	0.85	0.22	0.84	0.31	0.57
21	0.75	0.95	0.39	0.93	0.71	0.77	0.34	0.84	0.30	0.82	0.17	0.95	0.27	0.81	0.30	0.61
22	0.81	0.96	0.22	0.94	0.36	0.74	0.22	0.82	0.13	0.83	0.33	0.85	0.23	0.81	0.20	0.60
23	0.27	1.02	0.91	0.99	0.30	0.76	0.32	0.86	0.35	0.69	0.29	0.85	0.44	0.86	0.39	0.53
24	0.36	0.94	0.49	0.91	0.32	0.77	0.25	0.83	0.37	0.66	0.25	0.82	0.23	0.81	0.28	0.54
25																
26																
27	0.42	0.83	0.30	0.80	0.23	0.64	0.25	0.63	0.18	0.56	0.25	0.79	0.27	0.76	0.29	0.56
28	0.39	0.81	0.27	0.79	0.22	0.68	0.16	0.60	0.14	0.56	0.30	0.84	0.19	0.80	0.22	0.52
29	0.54	0.81	0.39	0.79	0.34	0.66	0.30	0.62	0.19	0.55	0.38	0.83	0.19	0.83	0.30	0.52
30	0.40	0.76	0.25	0.74	0.27	0.62	0.23	0.62	0.13	0.55	0.66	0.81	0.49	0.79	0.30	0.53
31	0.53	0.80	0.40	0.79	0.31	0.63	0.21	0.60	0.28	0.48	0.29	0.82	0.35	0.84	0.49	0.51

TREATED WATER FEBRUARY 2014

DATE	HARVEY										MAGNESIA					
	400 HAR. TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		100 MAG. TANK		PRV-5		BRUNSWICK B.	
	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)
1																
2																
3	0.30	0.82	0.24	0.79	0.17	0.68	0.14	0.68	0.17	0.57	0.19	0.90	0.18	0.87	0.37	0.67
4	0.49	0.95	0.53	0.93	0.25	0.67	0.19	0.66	0.15	0.61	0.33	0.88	0.15	0.86	0.42	0.69
5	0.30	0.88	0.39	0.86	0.33	0.88	0.36	0.67	0.37	0.73	0.45	0.87	0.58	0.90	0.31	0.67
6	0.28	0.94	0.37	0.92	0.23	0.71	0.16	0.67	0.16	0.65	0.33	1.06	0.46	0.96	0.28	0.67
7	0.28	0.91	0.47	0.87	0.35	0.71	0.21	0.73	0.31	0.74	0.18	1.11	0.45	0.99	0.43	0.69
8																
9																
10																
11	0.51	1.11	0.26	1.08	0.82	0.93	N/A	N/A	0.30	0.83	N/A	N/A	0.20	1.05	0.43	0.86
12	0.68	0.90	0.86	0.87	0.21	0.85	0.70	0.95	0.46	0.90	N/A	N/A	0.35	1.01	0.22	0.88
13	0.53	0.65	0.54	0.62	0.70	0.67	0.21	0.85	0.21	0.71	0.81	1.00	0.33	0.95	0.27	0.85
14	0.31	0.68	0.37	0.67	0.26	0.59	0.29	0.56	0.49	0.49	0.56	1.03	0.24	0.99	0.53	0.78
15																
16																
17	0.49	0.73	0.51	0.71	0.43	0.49	0.28	0.43	0.27	0.27	0.52	0.86	0.33	0.89	0.35	0.62
18	0.75	0.81	0.40	0.79	0.34	0.62	0.32	0.38	0.27	0.46	0.28	0.81	0.31	0.80	0.34	0.58
19	0.50	0.87	0.54	0.84	0.31	0.65	0.27	0.46	0.15	0.69	0.26	0.90	0.31	0.81	0.32	0.63
20	0.21	1.02	0.58	1.00	0.67	0.64	0.58	0.58	0.94	0.48	0.33	0.85	0.21	0.83	0.24	0.53
21	0.39	1.06	0.19	1.03	0.16	0.77	0.24	0.73	0.20	0.49	0.28	0.89	0.22	0.88	0.19	0.56
22																
23																
24	0.27	1.16	0.16	1.13	0.48	0.97	0.19	0.88	0.69	0.85	0.17	0.94	0.29	0.95	0.34	0.73
25	0.41	1.09	0.55	1.07	0.26	0.95	0.54	0.82	0.46	0.85	0.22	1.02	0.19	1.00	0.20	0.76
26	0.43	1.09	0.39	1.07	0.41	0.95	0.20	0.94	0.19	0.84	0.31	0.97	0.39	0.93	0.22	0.75
27	0.57	0.90	0.33	0.88	0.48	0.83	0.51	0.87	0.75	0.91	0.46	1.01	0.75	0.91	0.20	0.76
28	0.60	0.71	0.31	0.69	0.25	0.63	0.17	0.78	0.18	0.67	0.27	0.97	0.20	0.94	0.27	0.75

TREATED WATER MARCH 2014

DATE	HARVEY										MAGNESIA					
	400 HAR. TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		100 MAG. TANK		PRV-5		BRUNSWICK B.	
	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)
1																
2																
3	0.57	0.92	0.39	0.90	0.31	0.72	0.15	0.55	0.40	0.68	0.36	0.97	0.17	0.97	0.47	0.70
4	0.40	0.84	0.93	0.82	0.43	0.68	0.38	0.64	0.26	0.67	0.23	0.88	0.32	0.91	0.29	0.75
5	0.36	0.85	0.31	0.82	0.34	0.64	0.29	0.64	0.26	0.53	0.26	0.89	0.29	0.87	0.20	0.72
6	0.64	0.69	0.59	0.68	0.26	0.59	0.21	0.58	0.28	0.57	0.58	0.77	0.54	0.72	0.38	0.70
7	1.01	0.67	1.39	0.71	0.75	0.50	0.23	0.49	0.40	0.28	1.75	1.23	1.74	1.20	0.82	0.62
8																
9	0.78	0.84	1.01	0.81	0.81	0.60	0.74	0.40	1.00	0.35	1.24	0.86	1.25	0.74	1.17	0.35
10	0.92	0.97	0.93	0.95	0.61	0.77	0.58	0.50	0.67	0.53	0.85	0.99	0.94	1.00	0.55	0.74
11	0.85	1.06	1.28	1.04	0.81	0.73	0.47	0.53	0.43	0.63	0.33	1.14	0.39	1.12	0.60	0.50
12	0.51	0.96	0.84	0.99	0.96	0.88	0.37	0.66	0.37	0.71	0.58	1.00	0.57	0.97	0.48	0.51
13	0.70	1.04	0.53	1.02	0.37	0.91	0.36	0.71	0.26	0.80	0.31	0.92	0.29	0.94	0.26	0.76
14	0.61	0.96	0.66	0.94	0.56	0.83	0.43	0.74	0.76	0.84	0.44	0.90	0.48	0.84	0.48	0.69
15																
16																
17	0.16	0.69	0.21	0.65	0.28	0.51	0.15	0.43	0.21	0.43	0.28	0.77	0.21	0.74	0.22	0.53
18	0.73	0.82	0.26	0.79	0.31	0.59	0.25	0.35	0.18	0.43	0.39	0.78	0.22	0.73	0.43	0.49
19	0.75	0.87	0.31	0.84	0.23	0.74	0.42	0.63	0.24	0.70	0.73	0.90	0.28	0.87	0.48	0.47
20	0.23	0.89	0.47	0.86	0.19	0.70	0.21	0.55	0.18	0.57	0.60	0.89	0.24	0.89	0.25	0.47
21	0.26	0.93	0.36	0.90	0.37	0.71	0.25	0.57	0.16	0.69	0.71	0.88	0.72	0.81	0.28	0.51
22																
23																
24	0.33	1.05	0.25	1.00	0.20	0.82	0.16	0.70	0.24	0.82	0.25	1.02	0.44	1.02	0.20	0.60
25	0.42	0.99	0.34	0.96	0.19	0.85	0.17	0.79	0.42	0.92	0.34	0.98	0.22	0.96	0.25	0.72
26	0.56	0.56	0.62	0.58	0.33	0.50	0.21	0.77	0.56	0.70	0.93	0.63	0.71	0.69	0.42	0.79
27	0.92	0.83	0.35	0.80	0.36	0.50	0.32	0.55	0.36	0.41	0.59	0.79	0.47	0.78	0.25	0.70
28	0.99	1.02	0.36	1.00	0.24	0.60	0.36	0.36	0.46	0.56	0.58	0.98	0.85	0.89	0.47	0.43
29																
30																
31	0.46	0.92	0.75	0.88	0.23	0.68	0.24	0.44	0.18	0.51	0.24	0.95	0.30	0.93	0.26	0.56

TREATED WATER APRIL 2014

DATE	HARVEY										MAGNESIA					
	400 HAR. TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		100 MAG. TANK		PRV-5		BRUNSWICK B.	
	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)
1	0.23	0.89	0.25	0.90	0.23	0.71	0.18	0.46	0.29	0.79	0.30	0.97	0.63	0.94	0.33	0.73
2	0.57	1.03	0.36	1.01	0.27	0.90	0.19	0.63	0.27	1.03	0.59	0.98	4.98	0.91	0.42	0.75
3	0.88	1.07	0.43	1.05	0.38	0.80	0.22	0.76	0.23	0.92	0.28	0.99	0.30	0.99	0.22	0.71
4	0.59	0.94	0.47	0.90	0.39	0.78	0.32	0.75	0.37	0.82	0.47	0.89	0.45	0.92	0.37	0.73
5																
6																
7	0.39	0.85	0.41	0.82	0.27	0.66	0.18	0.50	0.30	0.47	0.42	0.87	0.27	0.85	0.19	0.59
8	0.67	0.81	0.82	0.79	0.42	0.68	0.32	0.52	0.43	0.76	0.39	0.87	0.46	0.84	0.46	0.62
9	0.37	0.84	0.49	0.81	0.32	0.58	0.18	0.50	0.67	0.57	0.40	0.84	0.45	0.78	0.25	0.63
10	0.49	0.91	0.36	0.88	0.20	0.63	0.20	0.45	0.18	0.57	0.48	0.89	0.28	0.89	0.27	0.56
11	0.41	0.96	0.63	0.95	0.34	0.70	0.24	0.49	0.26	0.73	0.29	0.93	0.34	0.89	0.30	0.58
12																
13																
14	0.24	0.93	0.47	0.91	0.43	0.79	0.20	0.74	0.37	0.77	0.19	0.92	0.25	0.92	0.22	0.67
15	0.19	0.90	0.24	0.88	0.21	0.72	0.18	0.75	0.22	0.80	0.35	0.88	0.46	0.91	0.20	0.69
16	0.21	0.91	0.68	0.89	0.31	0.72	0.22	0.73	0.18	0.62	0.39	0.93	0.25	0.86	0.41	0.62
17	0.86	0.90	0.61	0.87	0.40	0.68	0.31	0.71	0.34	0.74	0.36	0.83	0.29	0.79	0.35	0.62
18																
19	0.87	0.82	0.48	0.78	0.37	0.52	0.46	0.46	0.41	0.37	0.78	0.78	0.51	0.72	0.42	0.54
20																
21																
22	0.79	0.88	0.19	0.86	0.29	0.63	0.22	0.66	0.16	0.60	0.29	0.84	0.29	0.79	0.31	0.44
23	0.39	0.87	0.21	0.84	0.20	0.67	0.17	0.67	0.23	0.54	0.47	0.93	0.30	0.94	0.27	0.49
24	0.28	0.92	0.41	0.89	0.23	0.72	0.18	0.76	0.47	0.72	0.26	0.91	0.21	0.91	0.30	0.57
25	0.16	0.91	0.24	0.78	0.17	0.69	0.22	0.73	0.31	0.59	0.32	0.97	0.30	1.00	0.21	0.59
26																
27																
28	0.25	0.91	0.17	0.89	0.26	0.74	0.21	0.79	0.21	0.73	0.24	0.92	0.26	0.88	0.28	0.63
29	0.20	0.93	0.23	0.91	0.18	0.77	0.17	0.72	0.19	0.76	0.41	0.88	0.23	0.90	0.49	0.71
30	0.24	0.88	0.24	0.87	0.20	0.75	0.25	0.80	0.18	0.83	0.94	0.97	0.30	0.90	0.24	0.65

TREATED WATER MAY 2014

DATE	HARVEY										MAGNESIA					
	400 HAR. TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		100 MAG. TANK		PRV-5		BRUNSWICK B.	
	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)
1	0.32	0.91	0.44	0.88	0.32	0.72	0.21	0.72	0.36	0.72	0.49	0.49	0.35	0.35	0.23	0.23
2	0.83	0.85	0.74	0.84	0.41	0.64	0.25	0.68	0.29	0.68	0.60	0.74	0.71	0.73	0.48	0.62
3																
4																
5	0.42	0.76	0.36	0.75	0.32	0.64	0.27	0.60	0.34	0.55	0.34	0.74	0.37	0.78	0.50	0.31
6	0.31	0.96	0.47	0.95	0.28	0.76	0.25	0.55	0.35	0.73	0.41	0.99	0.31	0.91	0.32	0.32
7	0.25	1.09	0.49	1.06	0.34	0.80	0.26	0.72	0.24	0.81	0.42	1.04	0.52	1.04	0.48	0.38
8	0.94	1.00	0.24	0.98	0.29	0.85	0.23	0.79	0.30	0.83	0.43	0.95	0.28	1.07	0.25	0.61
9	0.75	0.84	0.96	0.82	0.52	0.76	0.23	0.75	0.23	0.78	0.83	0.87	0.61	0.86	0.33	0.68
10																
11																
12	0.15	0.76	0.14	0.83	0.15	0.76	0.17	0.62	0.17	0.58	0.25	0.88	0.20	0.87	0.27	0.38
13	0.21	0.85	0.25	0.87	0.19	0.87	0.17	0.66	0.18	0.64	0.17	0.66	0.27	0.85	0.26	0.53
14	0.71	0.90	0.33	0.87	0.25	0.64	0.28	0.69	0.30	0.76	0.67	0.90	0.39	0.84	0.21	0.54
15	0.28	0.80	0.32	0.79	0.38	0.67	0.51	0.68	0.19	0.70	0.60	0.77	0.56	0.74	0.26	0.53
16	1.39	0.82	0.22	0.80	0.23	0.61	0.37	0.59	0.23	0.54	1.26	0.77	0.50	0.76	0.31	0.46
17																
18																
19																
20	0.31	0.98	0.20	0.95	0.16	0.81	0.17	0.80	0.16	0.76	0.33	0.91	0.29	0.90	0.29	0.57
21	0.43	0.98	0.37	0.96	0.53	0.77	0.42	0.82	0.18	0.73	0.66	0.99	0.35	0.93	0.35	0.62
22	0.30	0.97	0.40	0.94	0.26	0.79	0.21	0.82	0.18	0.77	0.48	1.00	0.42	0.96	0.32	0.58
23	1.17	1.01	0.66	0.98	0.68	0.78	0.33	0.80	0.19	0.69	0.84	0.96	0.56	0.94	0.60	0.73
24																
25																
26	0.23	0.94	0.27	0.92	0.46	0.79	0.25	0.76	0.20	0.62	0.60	0.93	0.51	0.96	0.52	0.28
27	0.31	0.86	0.27	0.84	0.42	0.68	0.23	0.65	0.33	0.58	0.56	0.90	0.41	0.89	0.45	0.47
28	0.30	0.96	0.45	0.95	0.23	0.72	0.20	0.72	0.24	0.61	0.44	0.96	0.37	0.86	0.37	0.55
29	2.58	1.05	0.29	1.04	0.35	0.86	0.21	0.79	0.33	0.71	0.69	0.93	0.69	0.93	4.23	0.64
30	1.42	0.85	0.32	0.83	0.23	0.71	0.20	0.77	0.19	0.74	0.75	0.90	0.41	0.86	1.20	0.50
31																

TREATED WATER JUNE 2014

DATE	HARVEY										MAGNESIA					
	400 HAR. TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		100 MAG. TANK		PRV-5		BRUNSWICK B.	
	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)
1																
2	0.65	0.92	0.23	0.89	0.17	0.76	0.32	0.78	0.23	0.67	0.48	0.87	0.31	0.96	0.29	0.55
3	0.21	0.96	0.26	0.94	0.21	0.75	0.41	0.79	0.16	0.72	0.40	0.94	0.33	0.91	0.32	0.58
4	0.53	0.97	0.48	0.95	0.29	0.76	0.37	0.76	0.19	0.81	0.48	0.94	0.32	0.84	0.25	0.61
5	0.51	0.95	0.90	0.93	0.27	0.86	0.37	0.82	0.16	0.79	0.44	1.00	0.39	0.98	0.30	0.59
6	0.34	0.99	0.29	0.97	0.23	0.82	0.34	0.85	0.20	0.69	0.54	0.99	0.43	0.94	0.38	0.66
7																
8																
9	0.59	0.97	0.21	0.95	0.21	0.77	0.14	0.82	0.17	0.68	0.26	0.97	0.22	0.96	0.38	0.69
10	1.03	0.98	0.27	0.96	0.19	0.76	0.18	0.83	0.22	0.71	0.53	0.96	0.40	0.93	0.32	0.67
11	0.36	0.91	0.28	0.88	0.25	0.76	0.19	0.74	0.16	0.76	0.55	0.96	0.31	0.96	0.26	0.59
12	0.72	0.95	0.43	0.92	0.43	0.81	0.19	0.76	0.15	0.71	0.96	1.02	0.45	0.98	0.24	0.61
13	0.63	0.87	0.29	0.84	0.40	0.76	0.21	0.80	0.38	0.64	0.24	0.98	0.51	0.96	0.20	0.66
14																
15																
16	0.15	0.92	0.20	0.89	0.18	0.73	0.13	0.71	0.12	0.73	0.21	0.98	0.19	0.98	0.30	0.68
17	0.17	0.92	0.17	0.89	0.24	0.82	0.20	0.68	0.16	0.82	0.27	1.04	0.33	0.96	0.47	0.64
18	0.28	0.95	0.36	0.92	0.19	0.76	0.16	0.73	0.13	0.71	0.34	1.01	0.24	0.94	0.27	0.73
19	0.39	0.93	0.53	0.88	0.33	0.77	0.18	0.77	0.19	0.62	0.48	0.98	0.46	1.01	0.22	0.74
20	0.52	0.91	0.30	0.88	0.30	0.77	0.34	0.72	0.43	0.65	0.49	1.03	0.32	1.00	0.46	0.66
21																
22																
23	0.10	0.83	0.13	0.85	0.20	0.76	0.28	0.82	0.20	0.78	0.29	0.94	0.29	0.93	0.21	0.71
24	0.13	0.89	0.17	0.84	0.12	0.73	0.12	0.74	0.14	0.69	0.16	0.96	0.19	0.96	0.23	0.62
25	0.23	0.62	0.17	0.81	0.19	0.73	0.11	0.76	0.14	0.75	0.19	0.97	0.15	0.92	0.19	0.59
26	0.14	0.38	0.16	0.83	0.13	0.58	0.11	0.75	0.17	0.69	0.13	0.92	0.31	0.90	0.20	0.62
27	0.24	0.94	0.17	0.81	0.14	0.73	0.16	0.73	0.16	0.63	0.16	0.88	0.18	0.83	0.21	0.61
28																
29																
30	0.16	0.62	0.17	0.70	0.19	0.55	0.19	0.58	0.13	0.48	0.19	0.88	0.21	0.86	0.19	0.43

TREATED WATER JULY 2014

DATE	HARVEY										MAGNESIA					
	400 HAR. TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		100 MAG. TANK		PRV-5		BRUNSWICK B.	
	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)
1																
2	0.11	0.55	0.13	0.88	0.15	0.74	0.18	0.73	0.13	0.60	0.17	0.94	0.18	0.87	0.20	0.63
3	0.20	0.92	0.16	0.83	0.18	0.71	0.24	0.70	0.18	0.50	0.18	0.84	0.18	0.86	0.17	0.62
4	0.13	0.95	0.12	0.87	0.12	0.76	0.13	0.78	0.14	0.53	0.21	0.93	0.18	0.87	0.18	0.53
5																
6																
7	0.14	0.72	0.15	0.75	0.14	0.66	0.15	0.69	0.15	0.57	0.21	0.94	0.27	0.89	0.28	0.58
8	0.25	0.84	0.42	0.81	0.25	0.73	0.24	0.72	0.22	0.56	0.32	0.93	0.66	0.90	0.51	0.60
9	0.22	0.82	0.18	0.81	0.20	0.68	0.34	0.77	0.19	0.50	0.26	0.98	0.24	0.89	0.20	0.67
10	0.16	0.96	0.20	0.94	0.13	0.73	0.22	0.81	0.14	0.67	0.19	0.90	0.35	0.90	0.18	0.63
11	0.30	0.92	0.17	0.90	0.15	0.77	0.40	0.85	0.22	0.76	0.17	0.91	0.22	0.91	0.29	0.62
12																
13																
14	0.40	0.92	0.41	0.89	0.17	0.77	0.24	0.85	0.16	0.65	0.15	0.81	0.32	0.89	0.25	0.55
15	0.28	0.90	0.21	0.88	0.27	0.84	0.19	0.80	0.16	0.66	0.28	0.93	0.21	0.96	0.26	0.67
16	0.24	0.88	0.28	0.85	0.26	0.71	0.22	0.79	0.13	0.68	0.23	0.93	0.19	0.88	0.23	0.66
17	1.82	0.87	0.43	0.85	0.17	0.78	0.34	0.66	0.14	0.67	0.20	0.97	0.26	0.94	0.16	0.73
18	0.36	0.83	0.29	0.88	0.13	0.71	0.18	0.78	0.18	0.63	0.26	0.96	0.17	0.94	0.19	0.71
19																
20																
21	0.11	0.84	0.13	0.82	0.13	0.72	0.13	0.75	0.10	0.70	0.18	0.94	0.18	0.95	0.28	0.63
22	0.19	0.85	0.39	0.83	0.16	0.71	0.15	0.79	0.14	0.64	0.20	0.90	0.21	0.89	0.26	0.71
23	0.24	0.88	0.22	0.85	0.19	0.75	0.15	0.84	0.12	0.62	0.16	0.90	0.20	0.86	0.24	0.67
24	0.40	0.41	0.37	0.37	0.30	0.40	0.20	0.73	0.18	0.43	0.42	0.67	0.44	0.59	0.20	0.67
25	0.45	0.57	0.43	0.50	0.25	0.23	0.24	0.29	0.26	0.28	0.53	0.75	0.43	0.67	0.19	0.55
26																
27																
28	0.19	1.00	0.20	0.97	0.14	0.79	0.23	0.54	0.13	0.87	0.24	0.91	0.22	0.89	0.19	0.62
29	0.17	0.91	0.18	0.89	0.18	0.72	0.16	0.80	0.13	0.51	0.21	0.90	0.17	0.90	0.16	0.71
30	0.27	0.84	0.16	0.81	0.13	0.72	0.13	0.74	0.12	0.54	0.20	0.91	0.34	0.84	0.16	0.80
31	0.14	0.87	0.31	0.84	0.28	0.70	0.17	0.72	0.15	0.53	0.54	0.91	0.25	0.90	0.16	0.75

TREATED WATER AUGUST 2014

DATE	HARVEY										MAGNESIA					
	400 HAR. TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		100 MAG. TANK		PRV-5		BRUNSWICK B.	
	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)
1	0.22	0.87	0.19	0.84	0.19	0.69	0.14	0.75	0.11	0.48	0.37	0.97	0.34	0.90	0.14	0.71
2																
3																
4																
5	0.19	0.88	0.11	0.85	0.11	0.68	0.12	0.78	0.29	0.65	0.26	0.86	0.17	0.92	0.13	0.66
6	0.11	0.86	0.23	0.83	0.13	0.72	0.13	0.78	0.17	0.56	0.45	0.84	0.30	0.81	0.23	0.65
7	0.22	0.88	0.19	0.85	0.13	0.68	0.13	0.78	0.12	0.57	0.24	0.82	0.31	0.76	1.49	0.60
8	0.31	0.84	0.13	0.80	0.22	0.67	0.19	0.75	0.15	0.64	0.39	0.84	0.18	0.81	0.21	0.61
9																
10																
11	0.18	0.91	0.30	0.87	0.13	0.73	0.18	0.78	0.24	0.63	0.21	0.86	0.30	0.86	0.21	0.62
12	0.18	0.87	0.12	0.84	0.12	0.72	0.13	0.76	0.16	0.57	0.37	0.90	0.24	0.97	0.22	0.63
13	0.34	0.81	0.18	0.78	0.14	0.67	0.14	0.72	0.12	0.55	0.44	0.90	0.27	0.95	0.24	0.58
14	0.14	0.75	0.21	0.72	0.14	0.58	0.16	0.64	0.23	0.51	0.32	0.91	0.23	0.88	0.20	0.58
15	0.20	0.55	0.23	0.59	0.19	0.52	0.16	0.56	0.16	0.50	0.28	0.90	0.42	0.80	0.26	0.54
16																
17																
18	0.17	0.78	0.16	0.75	0.13	0.60	0.12	0.60	0.17	0.53	0.20	0.88	0.17	0.89	0.33	0.58
19	0.56	0.79	0.30	0.76	0.17	0.63	0.22	0.67	0.15	0.58	0.39	0.67	0.25	0.65	0.25	0.63
20	0.20	0.84	0.23	0.81	0.15	0.66	0.17	0.73	0.11	0.60	0.19	0.94	0.23	0.88	0.29	0.41
21	0.16	0.98	0.28	0.96	0.15	0.82	0.18	0.83	0.18	0.71	0.30	0.99	0.27	0.95	0.25	0.60
22	0.19	1.11	0.12	1.09	0.12	0.87	0.16	0.95	0.21	0.81	0.16	0.99	0.14	0.97	0.21	0.68
23																
24																
25	0.13	0.87	0.11	0.83	0.12	0.74	0.13	0.77	0.11	0.57	0.17	0.80	0.18	0.86	0.16	0.57
26	0.24	0.84	0.17	0.81	0.13	0.74	0.11	0.71	0.11	0.71	0.33	0.97	0.18	0.99	0.30	0.51
27	0.23	0.85	0.84	0.83	0.40	0.70	0.14	0.78	0.14	0.58	0.34	1.02	0.32	0.98	0.18	0.64
28	0.14	0.84	0.15	0.80	0.17	0.75	0.13	0.72	0.12	0.54	0.20	1.00	0.18	0.99	0.20	0.70
29	0.21	0.83	0.15	0.80	0.19	0.69	0.13	0.71	0.20	0.57	0.24	0.92	0.20	0.90	0.18	0.69
30																
31																

TREATED WATER SEPTEMBER 2014

DATE	HARVEY										MAGNESIA					
	400 HAR. TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		100 MAG. TANK		PRV-5		BRUNSWICK B.	
	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)
1																
2	0.14	0.75	0.15	0.73	0.10	0.68	0.13	0.69	0.16	0.54	0.14	0.94	0.12	0.91	0.24	0.66
3	0.15	0.64	0.25	0.60	0.13	0.52	0.15	0.57	0.14	0.56	0.25	0.64	0.21	0.58	0.18	0.64
4	0.20	0.71	0.16	0.67	0.13	0.51	0.17	0.49	0.16	0.45	0.36	0.76	0.25	0.76	0.20	0.44
5	0.16	0.84	0.18	0.81	0.24	0.60	0.16	0.57	0.13	0.55	0.55	0.85	0.20	0.81	0.24	0.33
6																
7																
8	0.13	0.84	0.13	0.80	0.15	0.67	0.12	0.69	0.15	0.54	0.13	0.68	0.12	0.69	0.19	0.41
9	0.24	0.85	0.14	0.82	0.13	0.67	0.12	0.68	0.10	0.55	0.13	0.93	0.18	0.96	0.19	0.45
10	0.20	0.85	0.17	0.83	0.18	0.73	0.13	0.76	0.16	0.58	0.14	1.00	0.16	0.92	0.15	0.62
11	0.19	0.88	0.17	0.85	0.20	0.71	0.13	0.74	0.12	0.59	0.13	0.93	0.15	0.93	0.15	0.72
12	1.03	0.92	0.28	0.88	0.18	0.75	0.13	0.76	0.14	0.71	0.25	0.83	2.02	0.75	0.24	0.61
13																
14																
15	0.23	0.87	0.43	0.83	0.17	0.79	0.15	0.83	0.15	0.68	0.19	0.82	0.18	0.80	0.18	0.60
16	0.21	0.84	0.13	0.82	0.16	0.72	0.12	0.77	0.16	0.66	0.17	0.68	0.18	0.67	0.15	0.60
17	0.16	0.85	0.13	0.82	0.13	0.62	0.15	0.71	0.12	0.60	0.30	0.75	0.17	0.78	0.20	0.44
18	0.20	0.81	0.23	0.78	0.19	0.68	0.12	0.68	0.13	0.57	0.31	0.77	0.20	0.75	0.24	0.39
19	0.16	0.75	0.26	0.72	0.17	0.60	0.17	0.72	0.13	0.56	0.29	0.72	0.28	0.54	0.40	0.45
20																
21																
22	0.12	0.80	0.43	0.76	0.20	0.62	0.13	0.62	0.11	0.60	0.14	0.81	0.19	0.81	0.20	0.53
23	0.15	0.76	0.15	0.73	0.12	0.66	0.18	0.67	0.14	0.56	0.52	0.91	0.25	0.57	0.51	0.50
24	0.78	0.37	0.81	0.33	0.38	0.35	0.20	0.64	0.22	0.43	1.00	0.71	0.66	0.71	0.30	0.50
25	0.73	0.33	0.66	0.53	0.48	0.26	0.63	0.37	0.38	0.34	0.73	0.89	0.88	0.65	0.48	0.25
26	0.55	0.33	0.49	0.40	0.31	0.30	0.37	0.32	0.35	0.33	0.27	0.77	1.37	0.86	1.21	0.30
27																
28																
29	2.11	0.83	0.64	0.80	0.54	0.65	0.27	0.69	0.24	0.45	0.32	0.87	0.35	0.88	0.52	0.36
30	0.42	0.59	0.53	0.55	0.28	0.49	0.24	0.56	0.16	0.34	0.28	0.67	0.28	0.64	0.31	0.46

TREATED WATER OCTOBER 2014

DATE	HARVEY										MAGNESIA					
	400 HAR. TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		100 MAG. TANK		PRV-5		BRUNSWICK B.	
	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)
1	0.24	0.70	0.33	0.71	0.25	0.49	0.17	0.38	0.22	0.24	0.22	0.79	0.26	0.76	0.25	0.28
2	0.17	0.84	0.32	0.79	0.23	0.59	0.17	0.49	0.15	0.43	0.18	1.00	0.20	0.83	0.22	0.23
3	0.69	0.93	0.28	0.89	0.18	0.71	0.15	0.64	0.40	0.54	0.27	0.87	0.22	0.86	0.53	0.28
4																
5																
6	0.21	0.81	0.31	0.76	0.36	0.64	0.19	0.65	0.21	0.51	0.34	0.79	0.41	0.76	0.16	0.44
7	1.20	0.83	0.97	0.79	0.18	0.69	0.23	0.63	0.12	0.38	0.79	1.00	0.39	0.93	0.17	0.37
8	0.17	0.84	0.20	0.80	0.16	0.70	0.16	0.65	0.13	0.49	0.15	1.01	0.22	0.98	0.16	0.52
9	0.42	0.87	0.36	0.83	0.19	0.72	0.13	0.69	0.13	0.54	0.36	0.92	0.21	0.88	0.19	0.58
10	0.15	0.88	0.14	0.83	0.18	0.72	0.18	0.70	0.13	0.51	0.31	0.87	0.18	0.85	0.16	0.63
11																
12																
13																
14	0.44	0.45	0.27	0.41	0.18	0.38	0.16	0.56	0.14	0.39	0.78	0.51	0.68	0.51	0.17	0.46
15	0.80	0.53	0.59	0.49	0.23	0.32	0.22	0.21	0.27	0.29	0.61	0.64	0.80	0.60	0.27	0.30
16	1.33	0.48	0.90	0.44	0.56	0.30	0.40	0.21	0.22	0.27	0.83	0.58	1.31	0.52	0.32	0.32
17	0.85	0.57	0.59	0.54	0.44	0.31	0.27	0.21	0.26	0.22	0.51	0.68	0.50	0.69	0.40	0.25
18																
19																
20	0.40	0.55	0.49	0.50	0.35	0.35	0.27	0.28	0.21	0.32	0.39	0.60	0.50	0.65	0.39	0.22
21	0.73	0.63	0.39	0.59	0.26	0.35	0.25	0.27	0.32	0.22	0.32	1.00	0.49	0.92	0.28	0.24
22	3.71	0.34	1.31	0.31	0.70	0.30	0.24	0.38	0.38	0.33	3.95	0.67	3.49	0.60	0.40	0.21
23	2.65	0.31	2.21	0.37	5.20	0.77	5.49	0.35	2.41	0.37	2.25	1.09	5.34	1.05	0.37	0.52
24	3.24	0.47	2.36	1.16	3.04	0.82	2.25	0.44	1.22	0.38	1.97	1.24	1.61	1.28	2.16	0.01
25																
26																
27	1.28	0.29	0.99	1.40	1.06	1.36	1.11	0.49	1.41	0.34	0.69	1.29	0.88	1.35	0.48	0.64
28	1.66	0.47	2.07	1.19	1.44	1.06	0.89	0.76	0.63	0.76	1.14	0.95	1.46	0.96	0.78	0.38
29	1.45	0.42	1.81	1.14	1.23	0.56	0.81	0.41	0.56	0.60	0.98	0.95	2.44	0.97	0.64	0.91
30	1.23	0.50	0.84	1.14	0.72	1.20	0.98	0.54	0.75	0.25	0.57	1.04	0.71	1.43	0.66	0.22
31	1.54	0.71	2.18	0.69	1.53	0.50	0.58	0.77	1.12	0.51	1.84	0.87	1.75	1.13	1.52	0.28

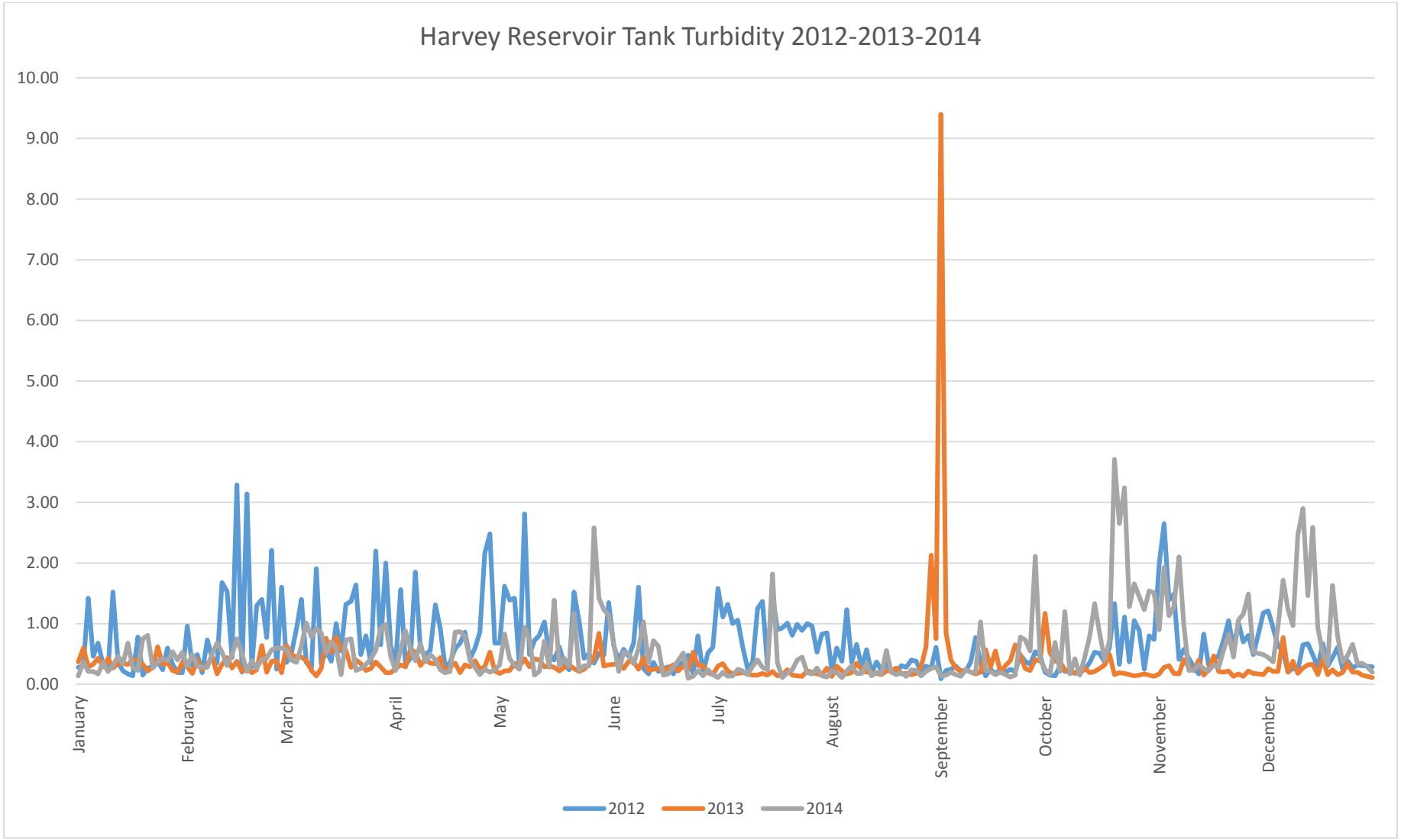
TREATED WATER NOVEMBER 2014

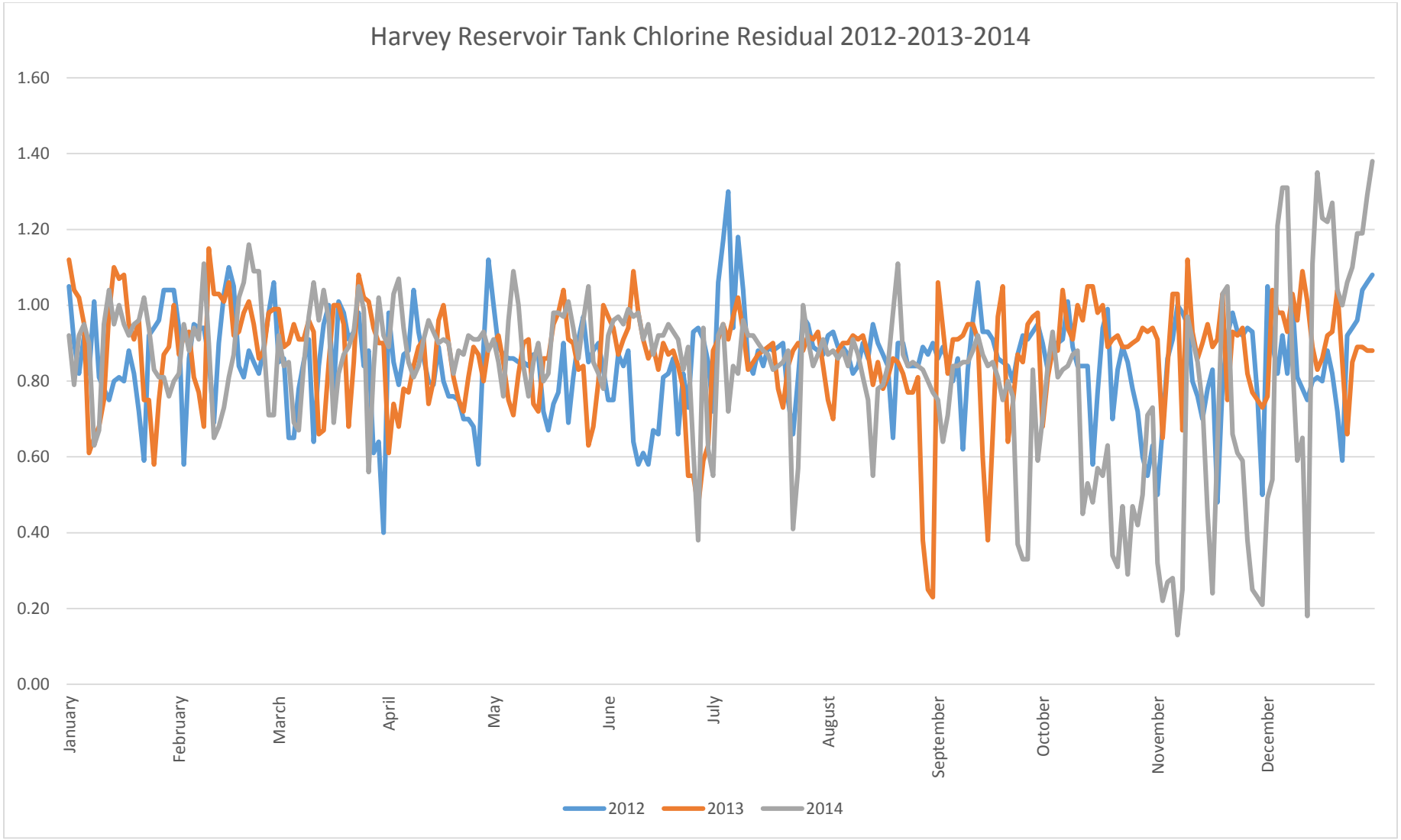
DATE	HARVEY										MAGNESIA					
	400 HAR. TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		100 MAG. TANK		PRV-5		BRUNSWICK B.	
	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)
1																
2																
3	0.90	0.32	0.62	1.37	0.76	0.97	0.41	0.75	0.53	0.69	0.34	1.22	0.51	1.59	0.35	0.48
4	1.93	0.22	2.38	1.23	1.63	1.32	0.42	0.88	0.37	0.94	1.45	1.03	1.85	1.29	0.39	0.68
5	1.13	0.27	0.73	1.72	0.54	1.15	0.60	0.66	0.78	0.54	0.41	1.38	0.43	1.68	0.23	0.76
6	1.27	0.28	0.83	0.32	0.69	1.11	0.58	0.76	0.48	0.47	0.60	1.25	1.11	1.38	0.41	0.55
7	2.10	0.13	2.99	0.92	1.89	0.71	0.58	0.37	0.84	0.48	2.37	1.00	2.43	1.10	0.36	0.78
8																
9																
10	0.97	0.25	0.64	1.39	0.42	1.41	0.32	0.94	0.34	0.52	0.79	1.53	0.49	1.56	0.46	0.77
11	0.23	0.97	0.21	1.26	N/A	N/A	0.24	1.04	0.21	0.91	0.31	1.35	0.23	1.35	0.39	0.82
12	0.24	0.91	0.23	0.96	0.41	0.94	0.21	0.87	0.22	0.78	0.34	1.13	0.34	1.10	0.24	0.96
13	0.32	0.85	0.41	1.14	0.39	0.98	0.21	0.89	0.55	1.23	0.24	1.17	0.32	1.29	0.29	0.85
14	0.26	0.74	0.25	1.00	0.30	1.04	0.24	0.98	0.27	0.93	0.20	1.17	0.95	1.43	0.19	0.75
15																
16																
17	0.22	0.45	0.29	1.22	0.23	1.32	0.17	0.69	0.19	1.02	0.27	1.21	0.37	1.48	0.52	0.83
18	0.32	0.24	0.37	1.32	0.70	1.35	0.17	0.76	0.17	0.84	0.29	1.40	0.30	1.58	0.23	0.86
19	0.28	0.63	0.32	1.05	0.40	1.27	0.19	0.89	0.28	0.59	0.19	1.39	0.29	1.41	0.21	0.90
20	0.56	1.03	0.30	1.00	0.68	1.23	0.24	0.67	0.16	0.84	0.37	1.35	0.30	1.35	0.18	1.12
21	0.83	1.05	0.43	1.10	0.30	1.22	0.17	0.71	0.18	0.98	0.24	1.32	0.49	1.34	0.27	1.03
22																
23																
24	0.45	0.66	0.48	0.70	0.28	1.03	0.33	0.61	0.42	0.42	0.29	1.16	0.27	1.16	0.46	0.22
25	1.06	0.61	0.74	0.73	0.37	0.87	0.40	0.57	0.39	0.60	0.25	1.19	0.30	1.16	0.25	0.66
26	1.16	0.59	0.92	0.55	0.56	0.98	0.48	0.51	0.27	0.42	0.64	1.28	0.52	1.20	0.21	0.82
27	1.49	0.38	0.87	0.52	0.71	0.75	0.43	0.39	0.55	0.37	0.83	1.15	0.95	1.15	0.50	0.82
28	0.53	0.25	0.74	0.52	0.59	0.71	0.33	0.31	0.24	0.21	0.71	1.45	0.72	1.13	0.29	0.77
29																
30																

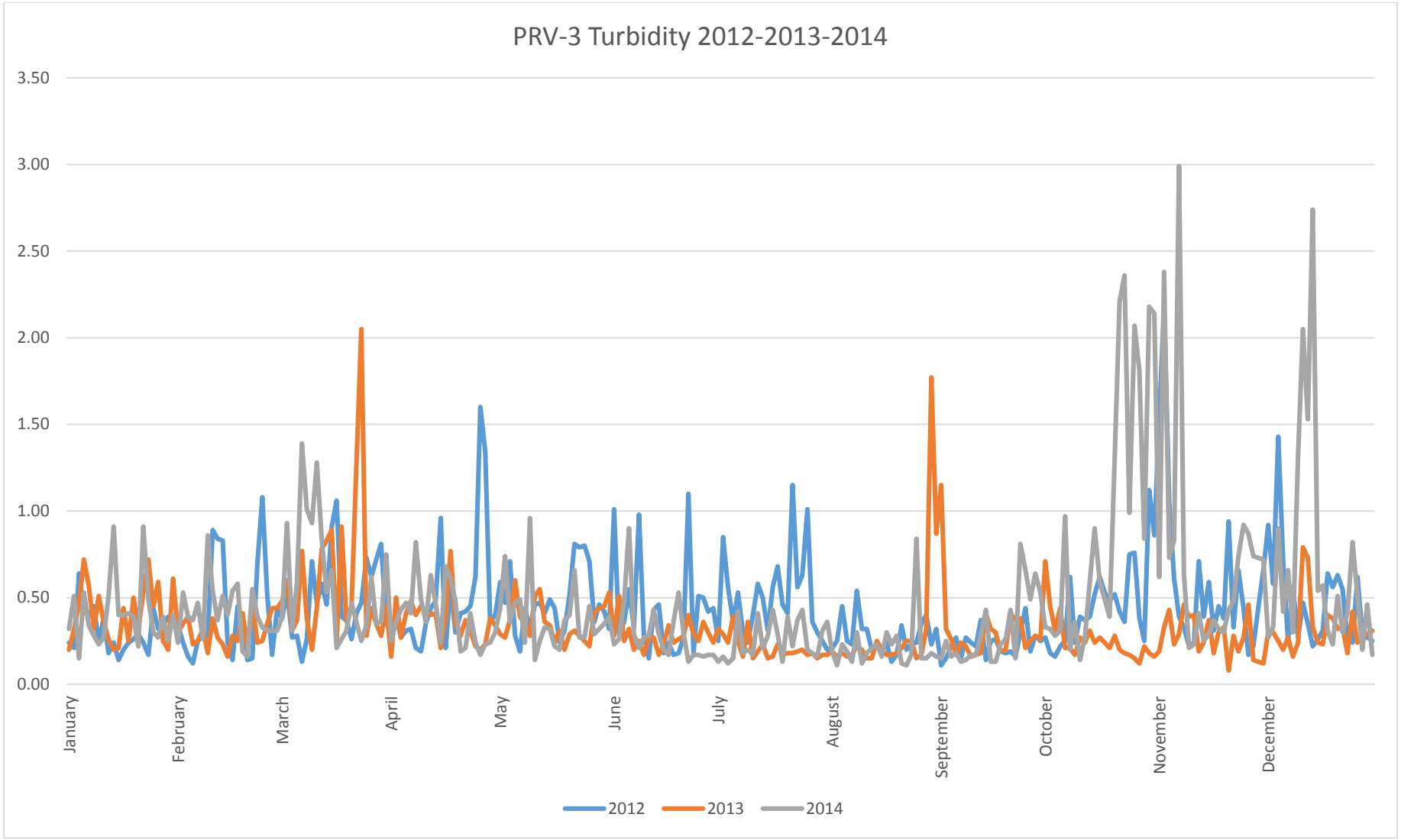
TREATED WATER DECEMBER 2014

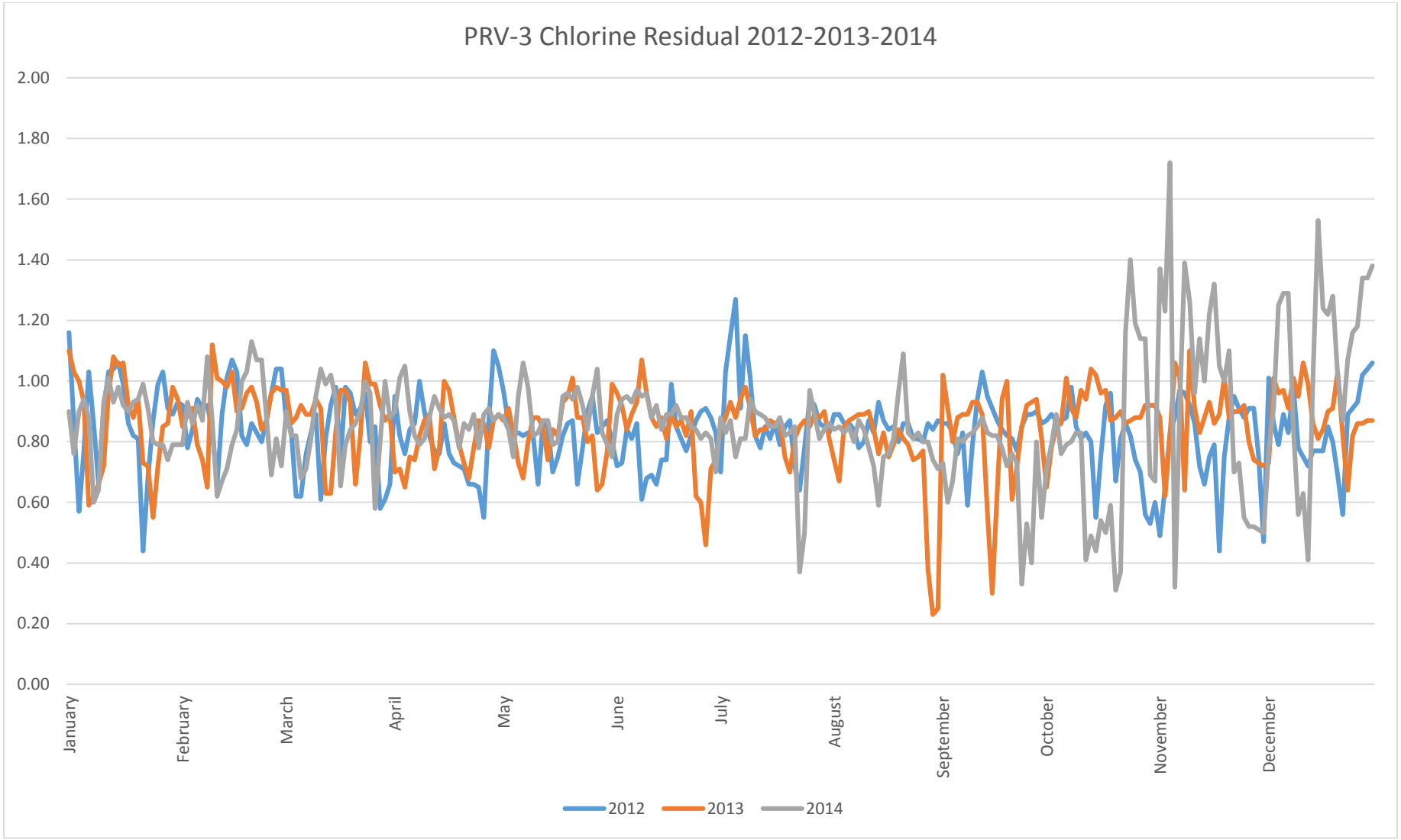
DATE	HARVEY										MAGNESIA					
	400 HAR. TANK		PRV-3		STORE/CAFÉ		LIONS BAY AVE.		KELVIN GROVE		100 MAG. TANK		PRV-5		BRUNSWICK B.	
	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)	Turbidity (NTU)	CL2 Res. (ppm)
1	0.44	0.49	0.27	0.77	0.28	1.24	0.19	0.43	0.19	0.36	0.46	1.68	0.24	1.71	0.24	1.11
2	0.37	0.54	0.33	0.91	0.55	1.16	0.16	0.52	0.28	0.50	0.18	1.75	0.41	1.70	0.23	1.37
3	0.96	1.21	0.90	1.25	0.29	1.00	0.17	0.62	0.19	0.93	0.18	1.53	0.25	1.50	0.21	1.44
4	1.72	1.31	0.42	1.29	0.54	1.20	0.20	1.03	0.17	1.01	0.44	1.29	0.55	1.30	0.20	1.47
5	1.23	1.31	0.66	1.29	0.31	1.13	0.17	1.15	0.22	1.19	0.40	1.11	0.67	1.09	0.26	1.34
6																
7																
8	0.97	0.85	0.30	0.84	0.29	0.72	0.30	0.62	0.51	0.68	0.22	0.80	0.23	0.86	0.30	0.64
9	2.46	0.59	1.32	0.56	0.79	0.62	0.45	0.58	1.62	0.59	3.50	0.86	2.46	0.86	0.33	0.39
10	2.90	0.65	2.05	0.63	1.44	0.43	0.78	0.49	0.66	0.27	2.52	0.73	1.54	0.55	0.34	0.39
11	1.46	0.18	1.53	0.41	0.78	0.27	0.83	0.31	4.94	0.26	2.30	0.48	1.15	0.40	0.86	0.34
12	2.59	1.11	2.74	1.01	8.84	0.86	1.14	0.18	1.08	0.08	N/A	N/A	1.82	1.02	1.21	0.15
13																
14																
15	0.93	1.35	0.54	1.53	0.42	1.23	0.50	0.68	0.27	1.13	1.57	0.87	0.99	1.48	0.78	0.30
16	0.52	1.23	0.57	1.24	0.35	1.13	0.45	0.84	1.48	1.15	3.34	0.82	0.33	1.29	0.33	0.96
17	0.32	1.22	0.31	1.22	0.44	1.06	0.32	0.90	0.38	0.96	1.38	0.75	0.44	1.21	0.39	1.01
18	1.63	1.27	0.23	1.28	0.34	1.11	0.24	0.90	0.28	0.97	1.32	0.58	0.25	1.17	0.20	0.90
19	0.79	1.04	0.51	1.02	0.41	0.95	0.23	0.79	0.29	0.90	1.15	0.03	0.27	1.10	0.24	0.78
20																
21																
22	0.37	1.00	0.30	0.87	0.43	0.77	0.21	0.56	0.29	0.39	1.03	0.39	0.34	0.79	0.26	0.49
23	0.47	1.06	0.41	1.07	0.46	0.90	0.26	0.42	0.41	0.43	1.11	0.33	0.35	0.95	0.32	0.37
24	0.66	1.10	0.82	1.16	0.33	0.89	0.27	0.48	0.23	0.71	1.07	0.30	0.28	1.00	0.24	0.33
25																
26																
27	0.34	1.19	0.51	1.18	0.29	1.02	0.15	0.81	0.43	0.95	0.95	0.44	0.22	1.26	0.19	0.73
28																
29	0.35	1.19	0.20	1.34	0.27	1.14	0.15	1.01	0.28	1.03	0.89	0.39	0.17	1.26	0.13	0.86
30	0.29	1.29	0.46	1.34	0.25	1.17	0.13	1.04	0.53	1.06	0.92	0.38	0.16	1.25	0.14	0.89
31	0.20	1.38	0.17	1.38	0.23	1.15	0.10	1.08	0.22	1.01	0.82	0.38	0.18	1.28	0.15	0.91

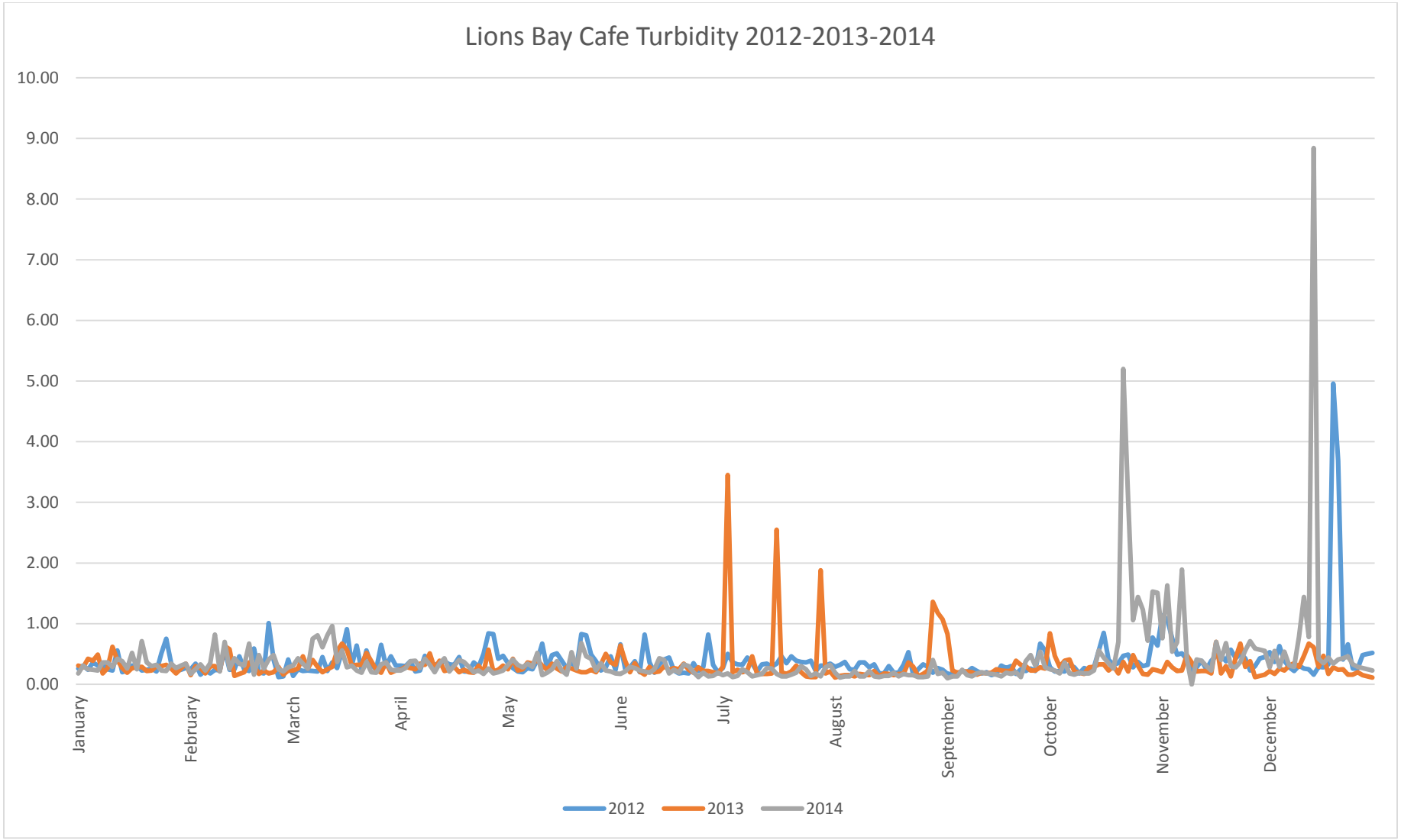
APPENDIX C: 3-YEAR COMPARISON GRAPHS – TURBIDITY AND CHLORINE RESIDUALS

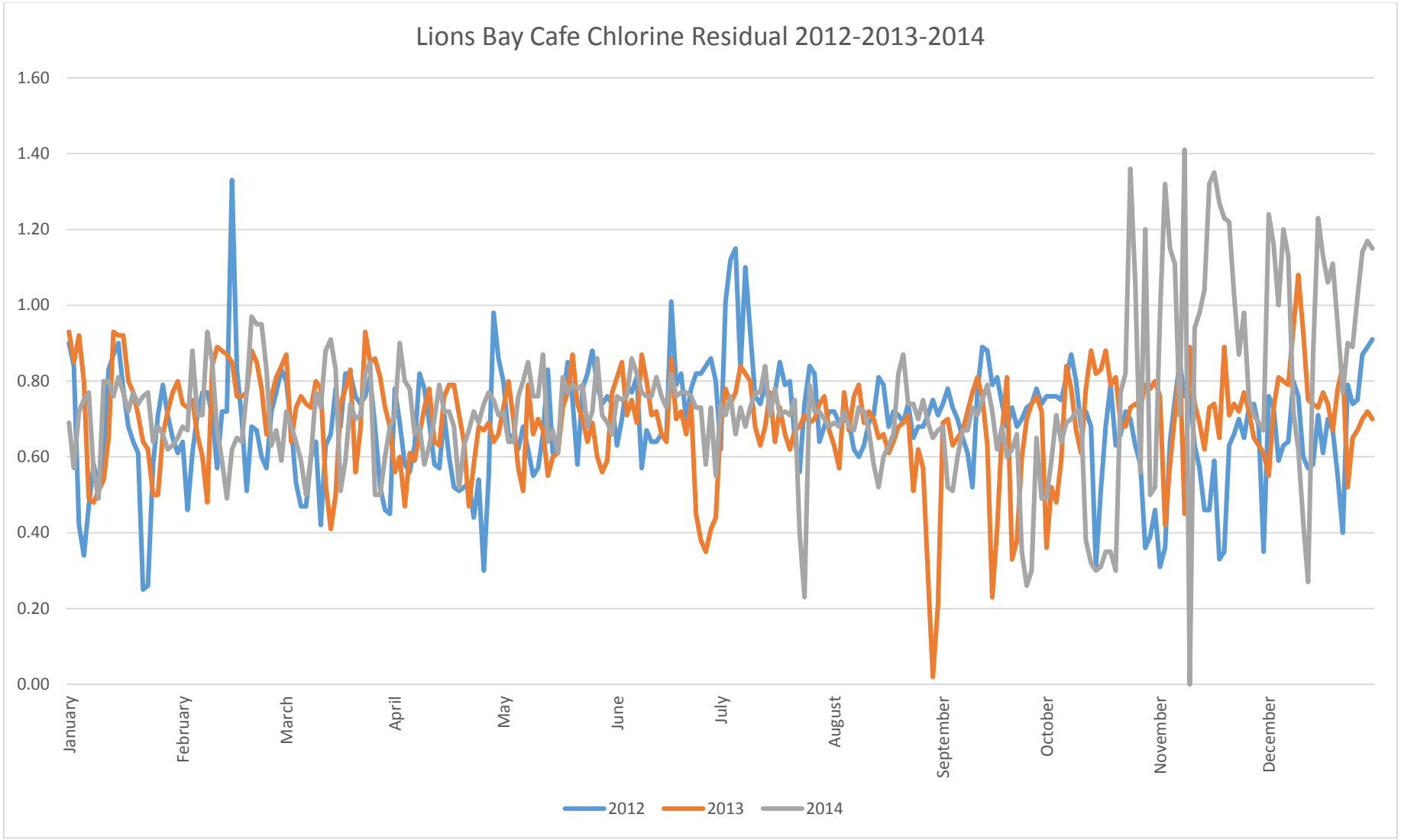

Harvey Reservoir Tank Turbidity 2012-2013-2014
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
January
February
March
April
May
June
July
August
September
October
November
December
2012
2013
2014

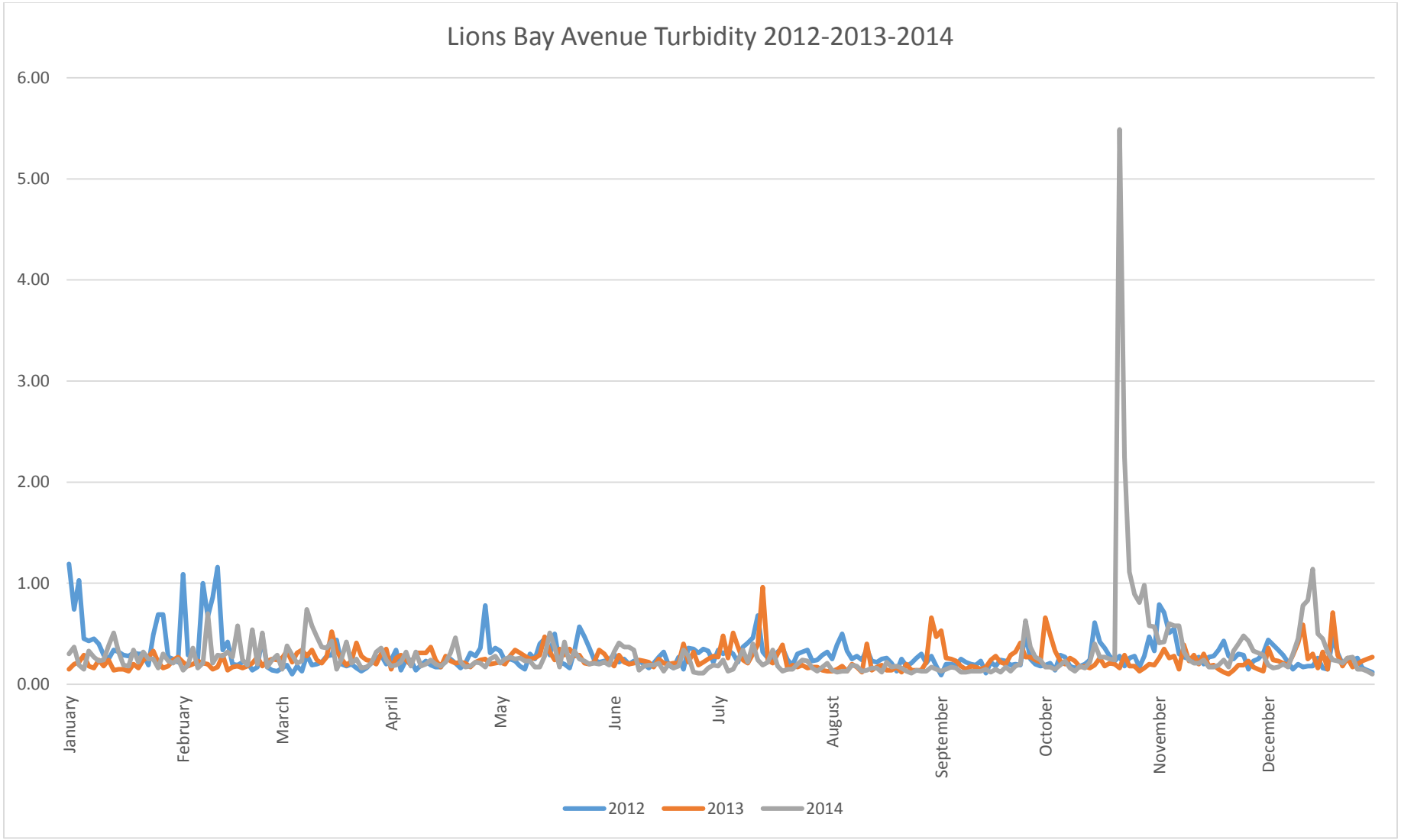

Harvey Reservoir Tank Chlorine Residual 2012-2013-2014
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
January
February
March
April
May
June
July
August
September
October
November
December
2012
2013
2014

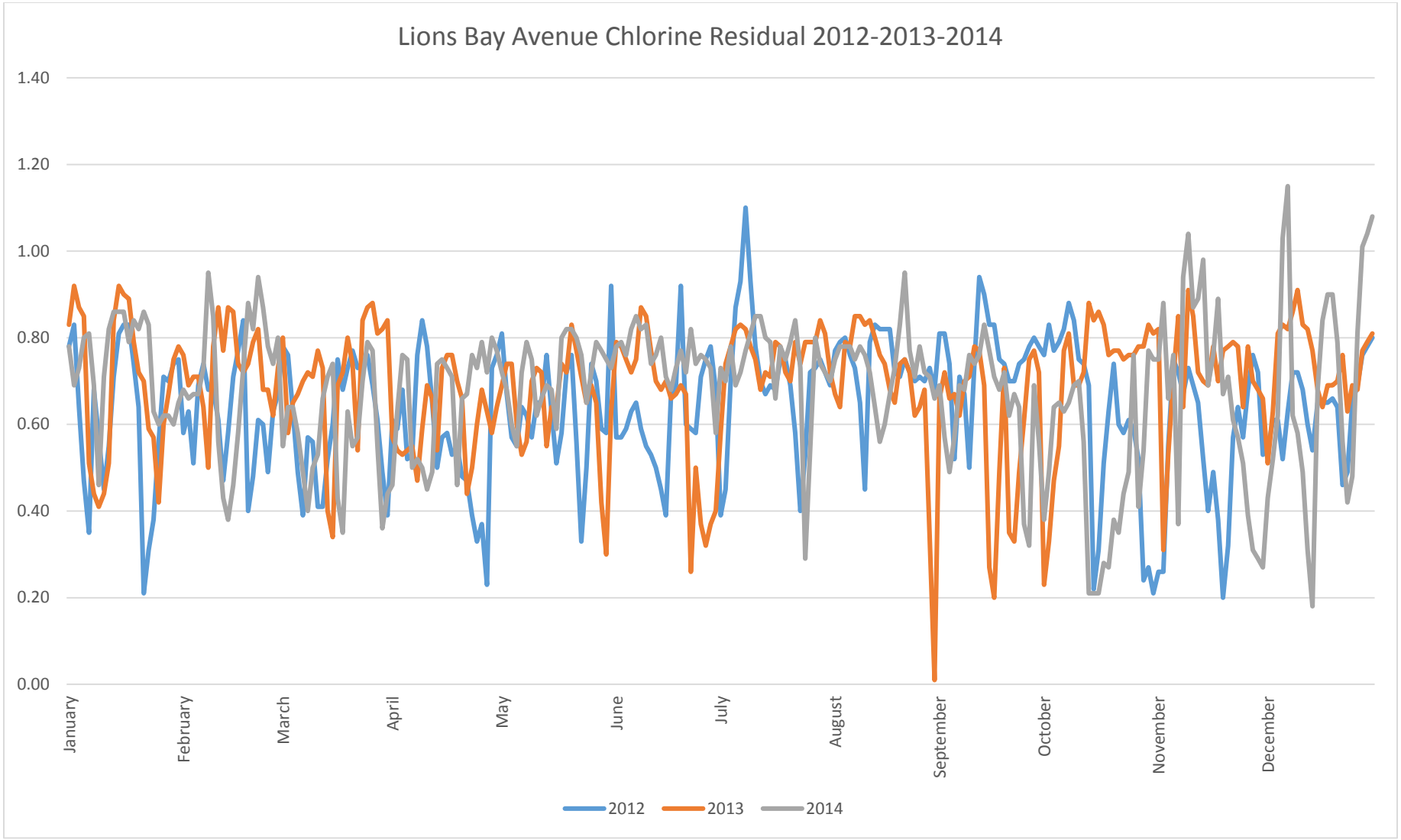

PRV-3 Turbidity 2012-2013-2014
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
January
February
March
April
May
June
July
August
September
October
November
December
2012
2013
2014

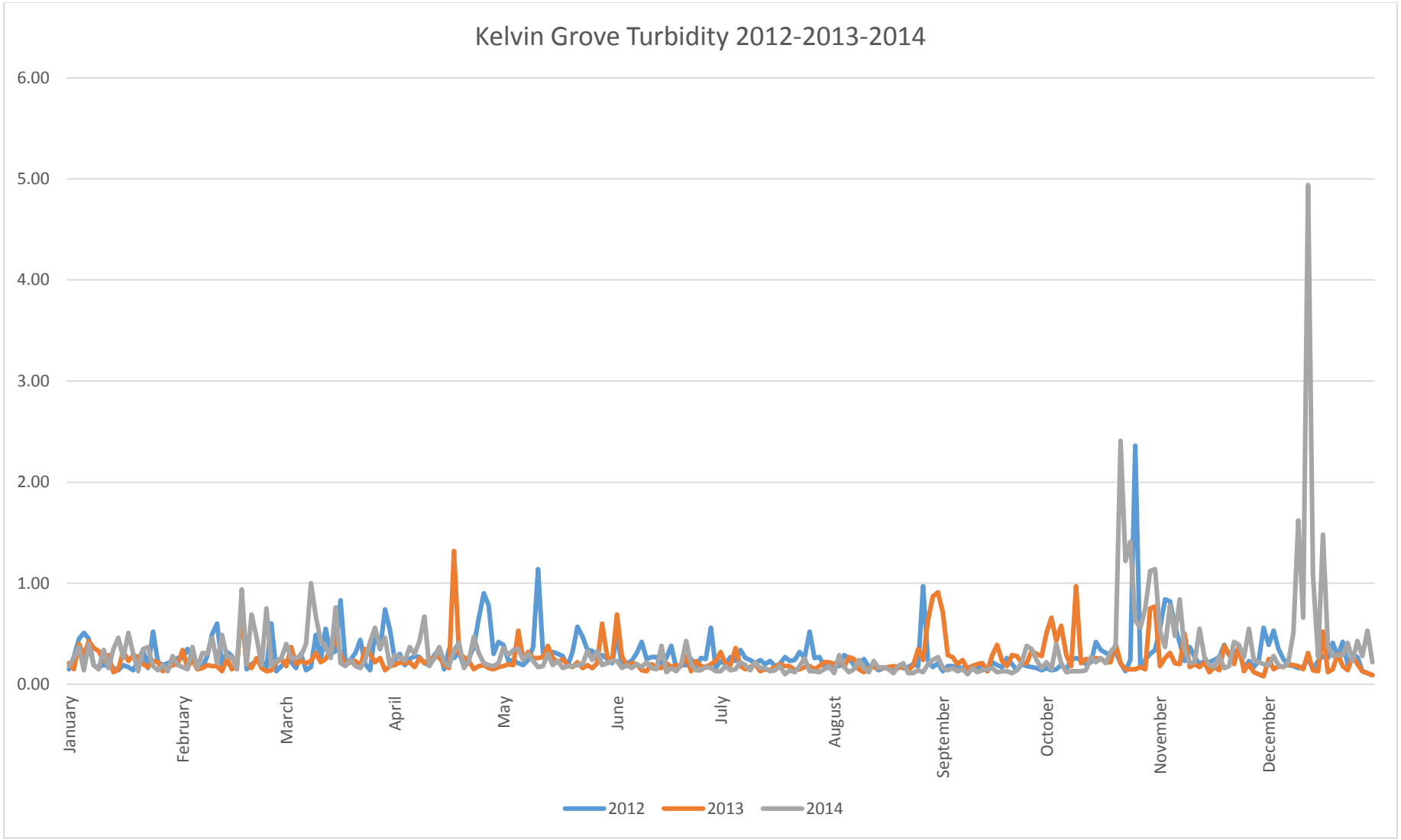

PRV-3 Chlorine Residual 2012-2013-2014
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
January
February
March
April
May
June
July
August
September
October
November
December
2012
2013
2014

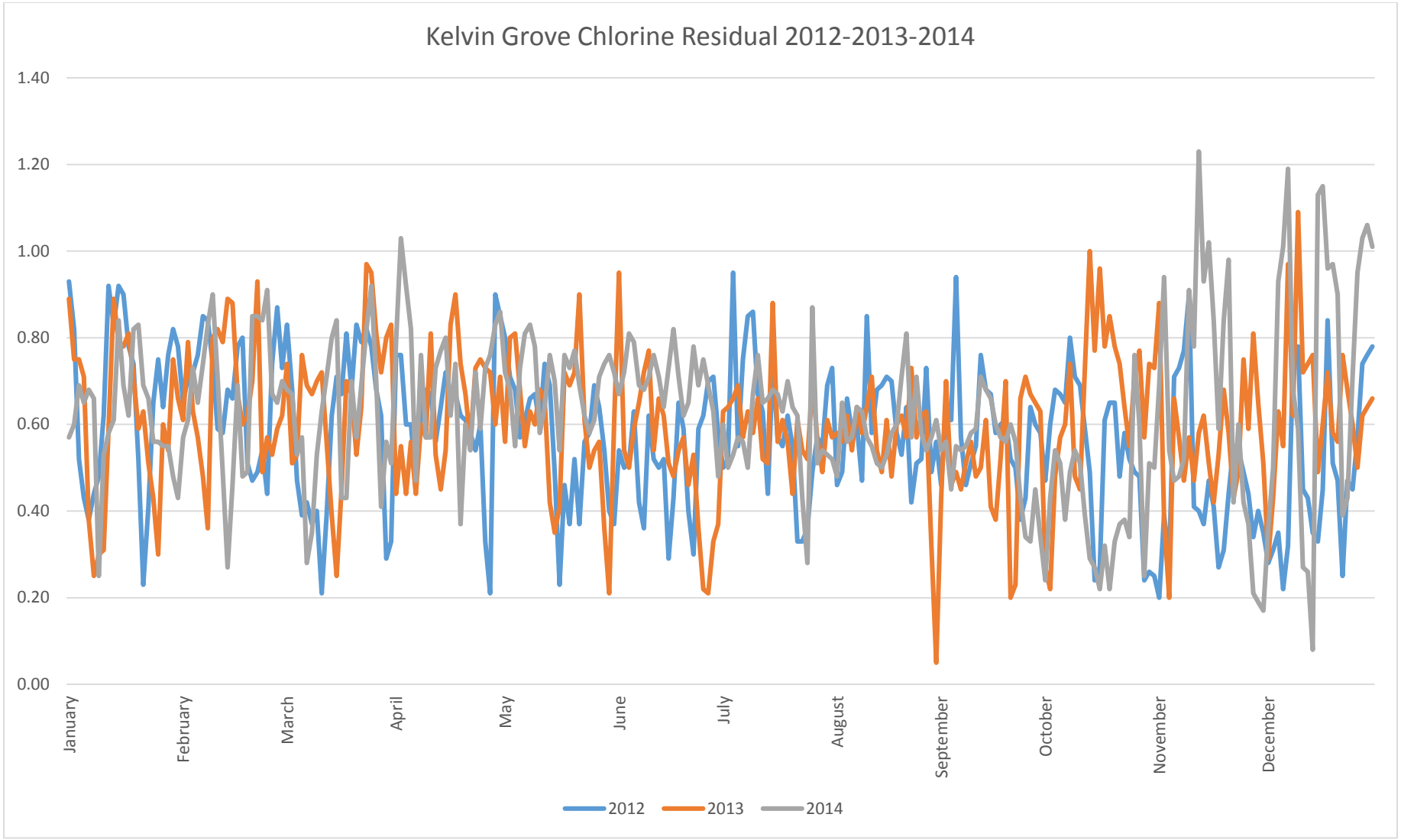

Lions Bay Cafe Turbidity 2012-2013-2014
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
January
February
March
April
May
June
July
August
September
October
November
December
2012
2013
2014

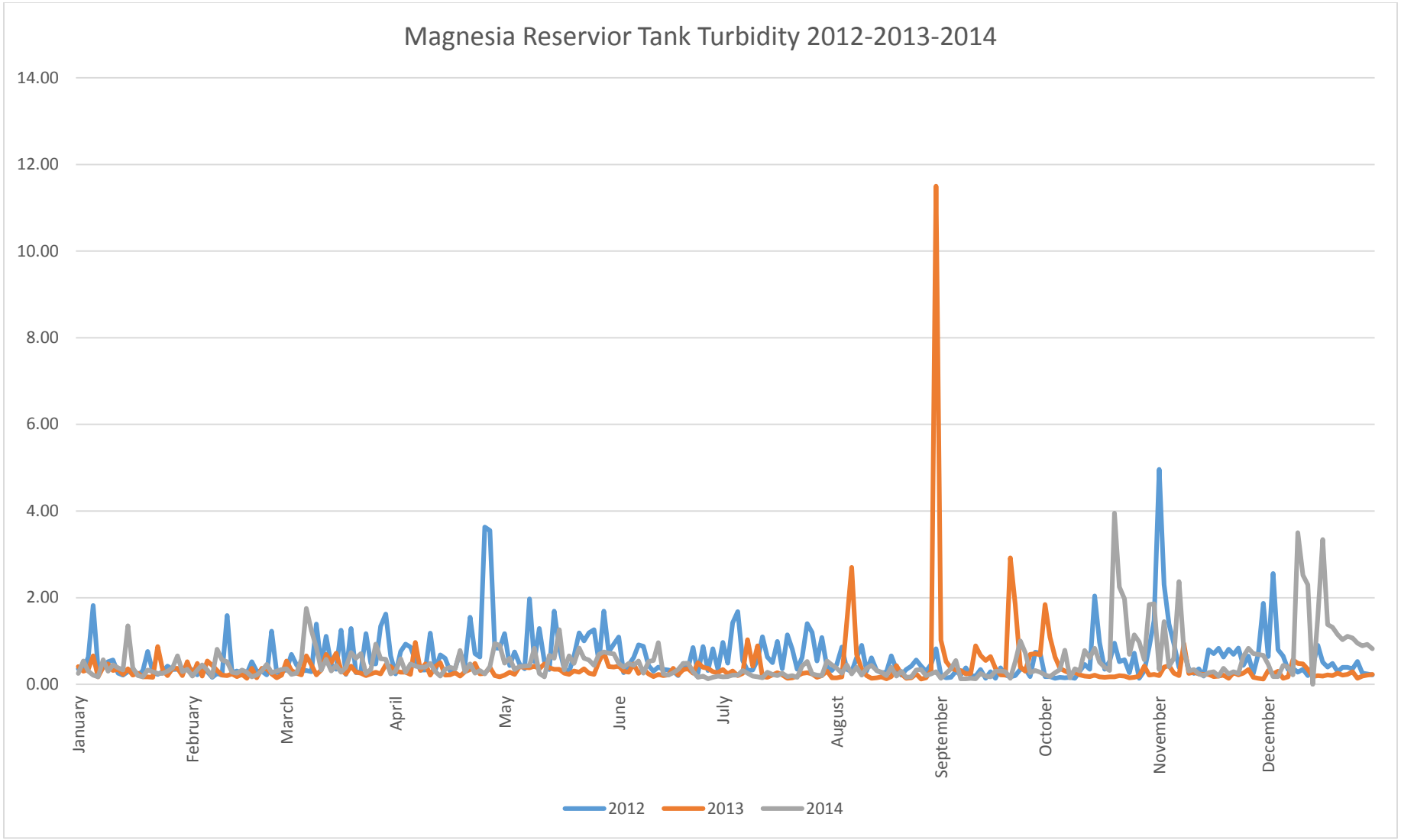

Lions Bay Cafe Chlorine Residual 2012-2013-2014
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
January
February
March
April
May
June
July
August
September
October
November
December
2012
2013
2014

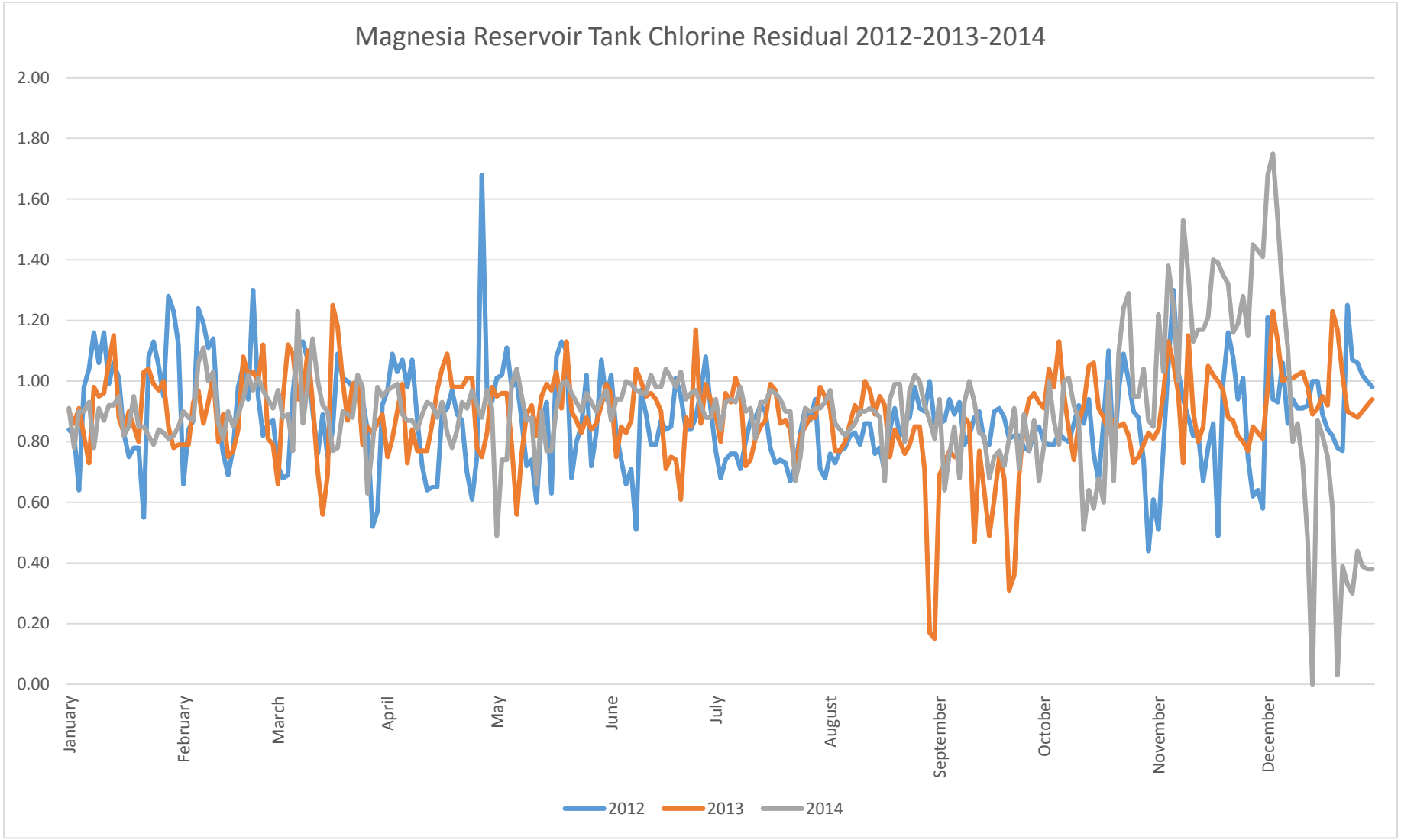

Lions Bay Avenue Turbidity 2012-2013-2014
6.00
5.00
4.00
3.00
2.00
1.00
0.00
January
February
March
April
May
June
July
August
September
October
November
December
2012
2013
2014

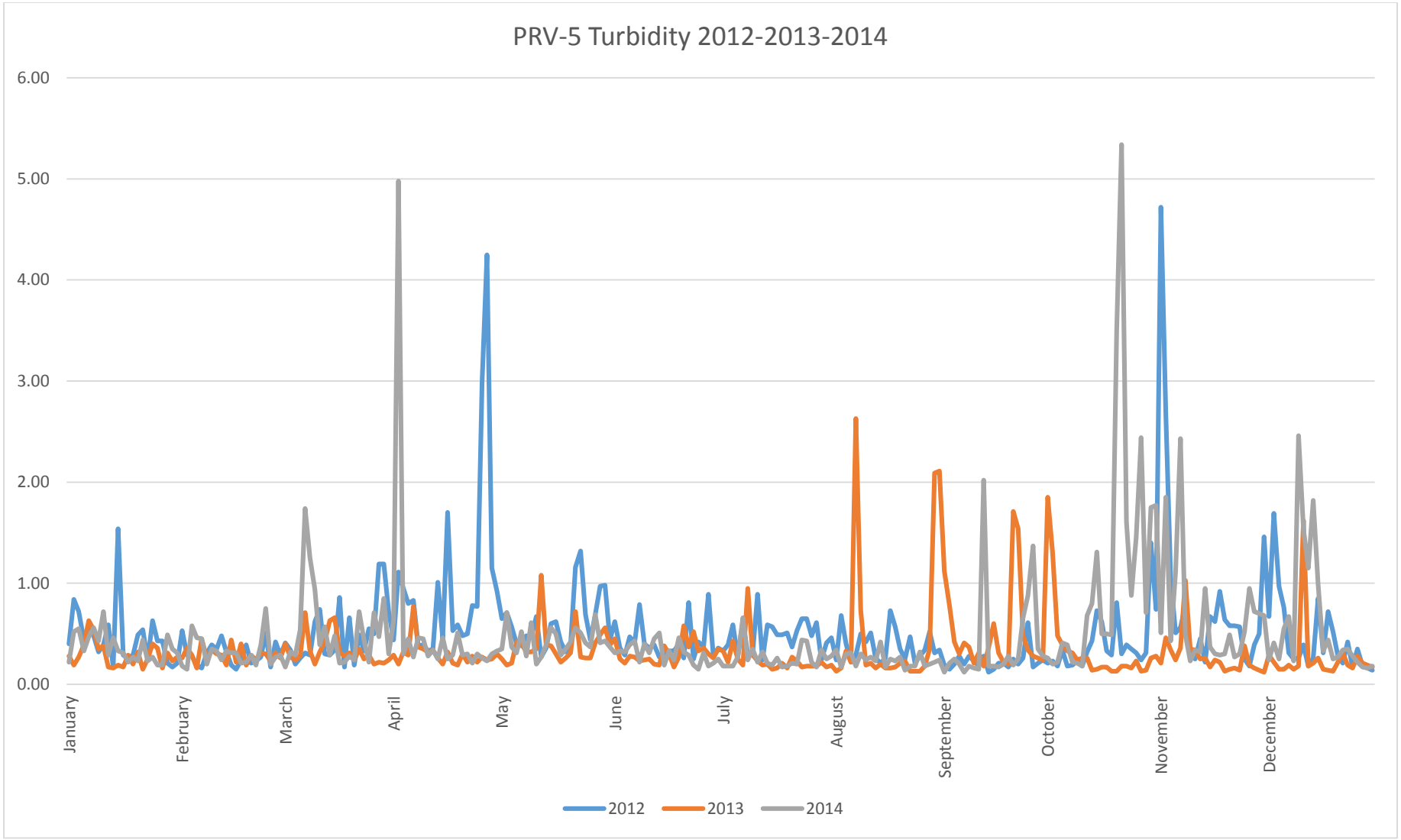

Lions Bay Avenue Chlorine Residual 2012-2013-2014
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
January
February
March
April
May
June
July
August
September
October
November
December
2012
2013
2014

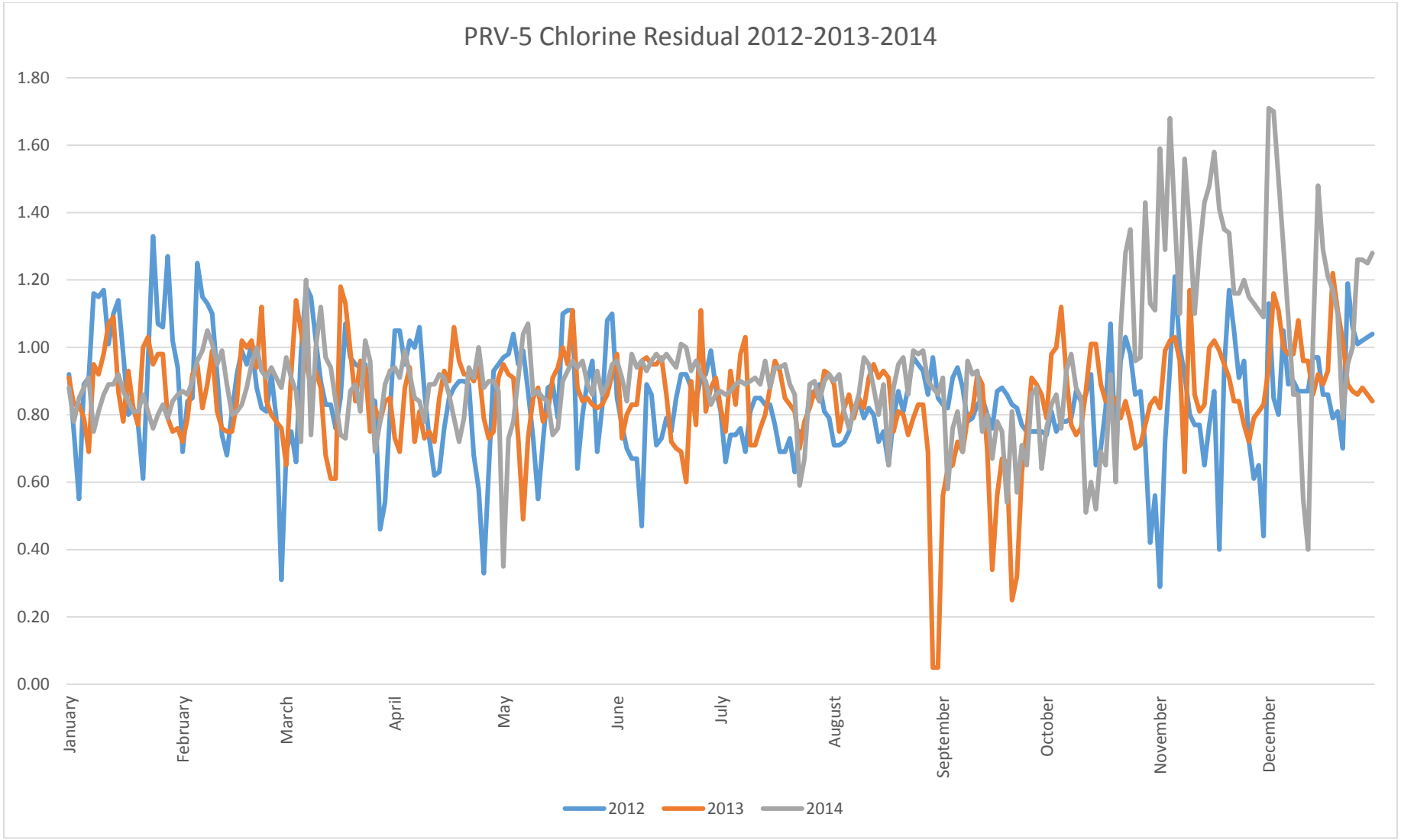

Kelvin Grove Turbidity 2012-2013-2014
6.00
5.00
4.00
3.00
2.00
1.00
0.00
January
February
March
April
May
June
July
August
September
October
November
December
2012
2013
2014

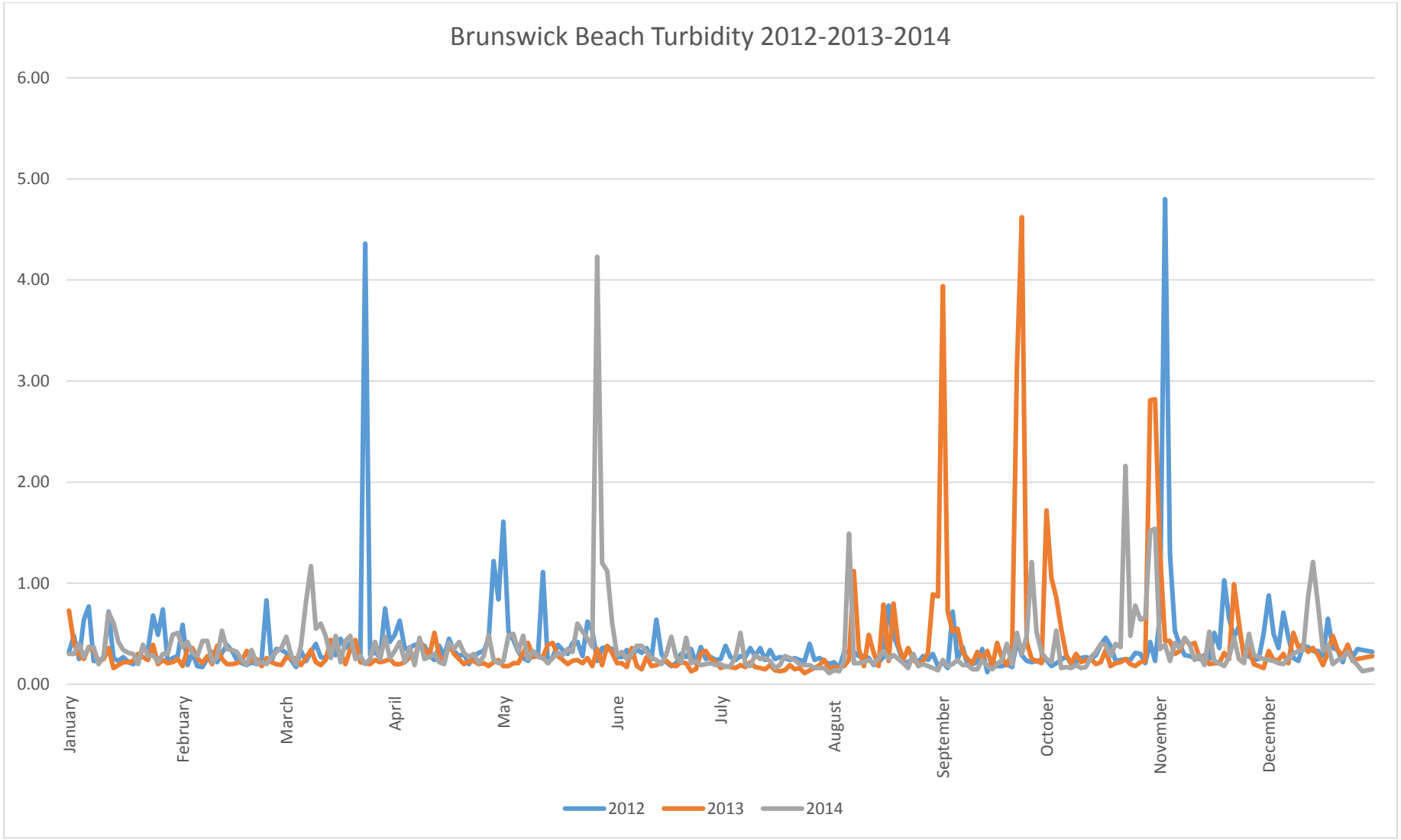

Kelvin Grove Chlorine Residual 2012-2013-2014
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
January
February
March
April
May
June
July
August
September
October
November
December
2012
2013
2014

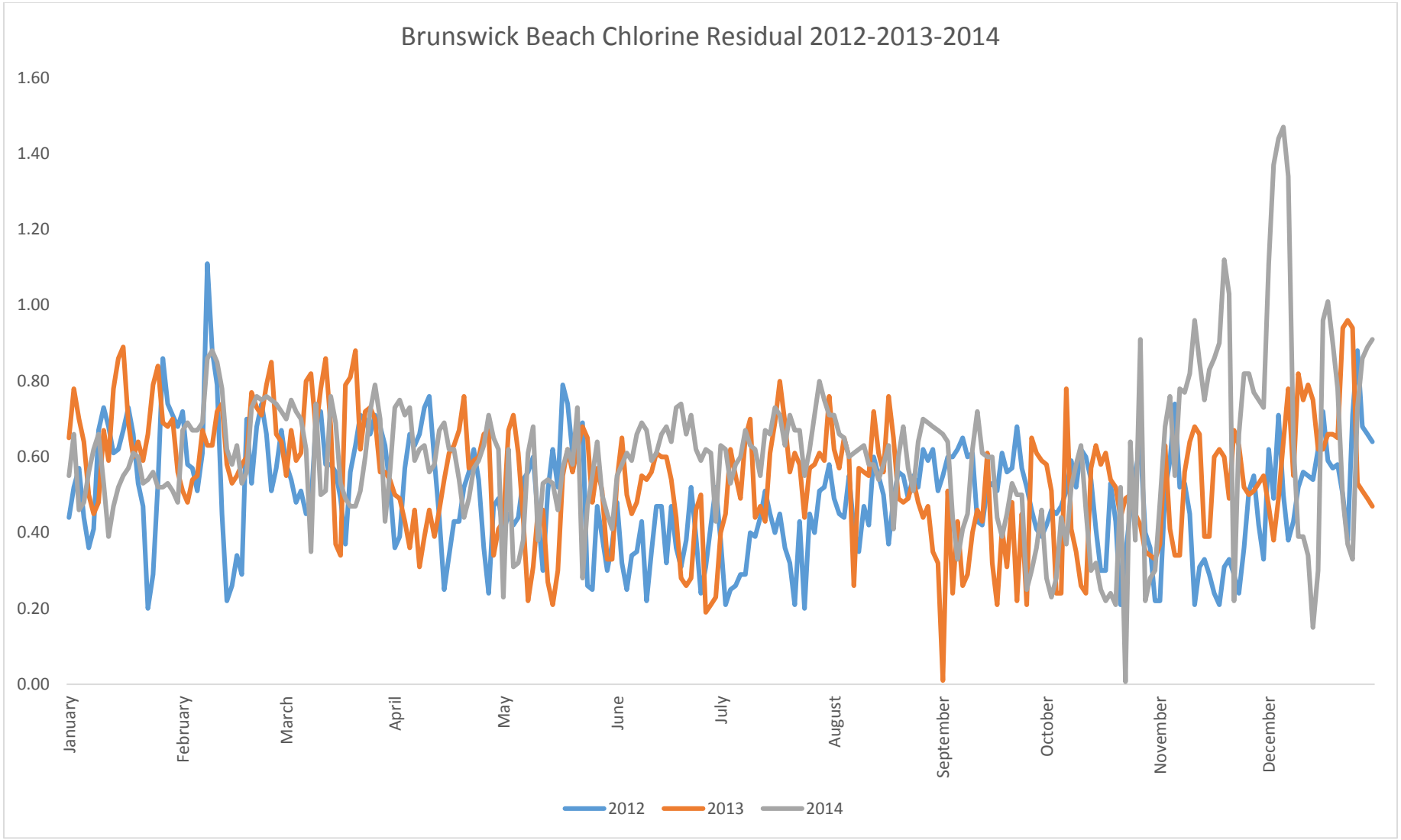

Magnesia Reservior Tank Turbidity 2012-2013-2014
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
January
February
March
April
May
June
July
August
September
October
November
December
2012
2013
2014

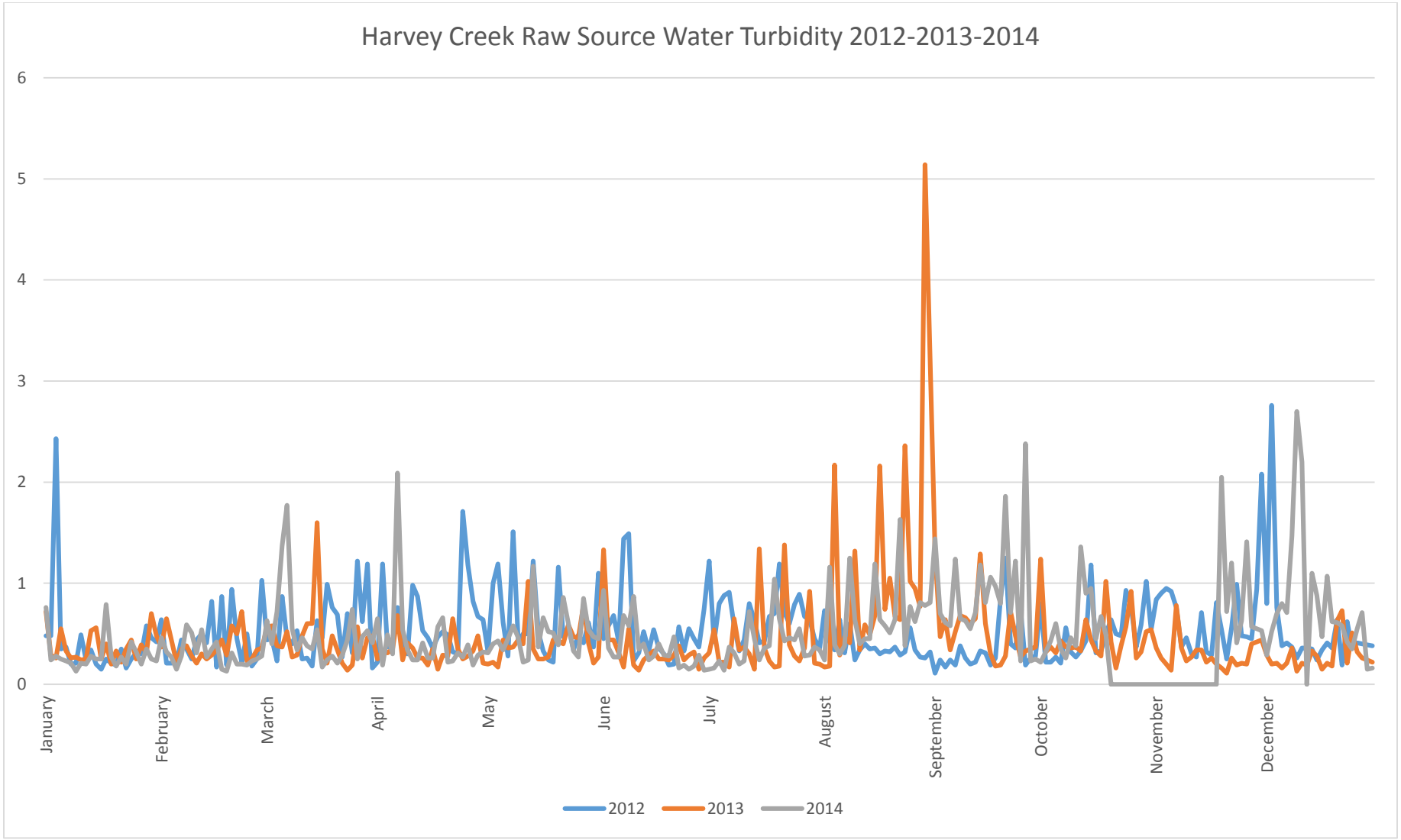

Magnesia Reservoir Tank Chlorine Residual 2012-2013-2014
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
January
February
March
April
May
June
July
August
September
October
November
December
2012
2013
2014

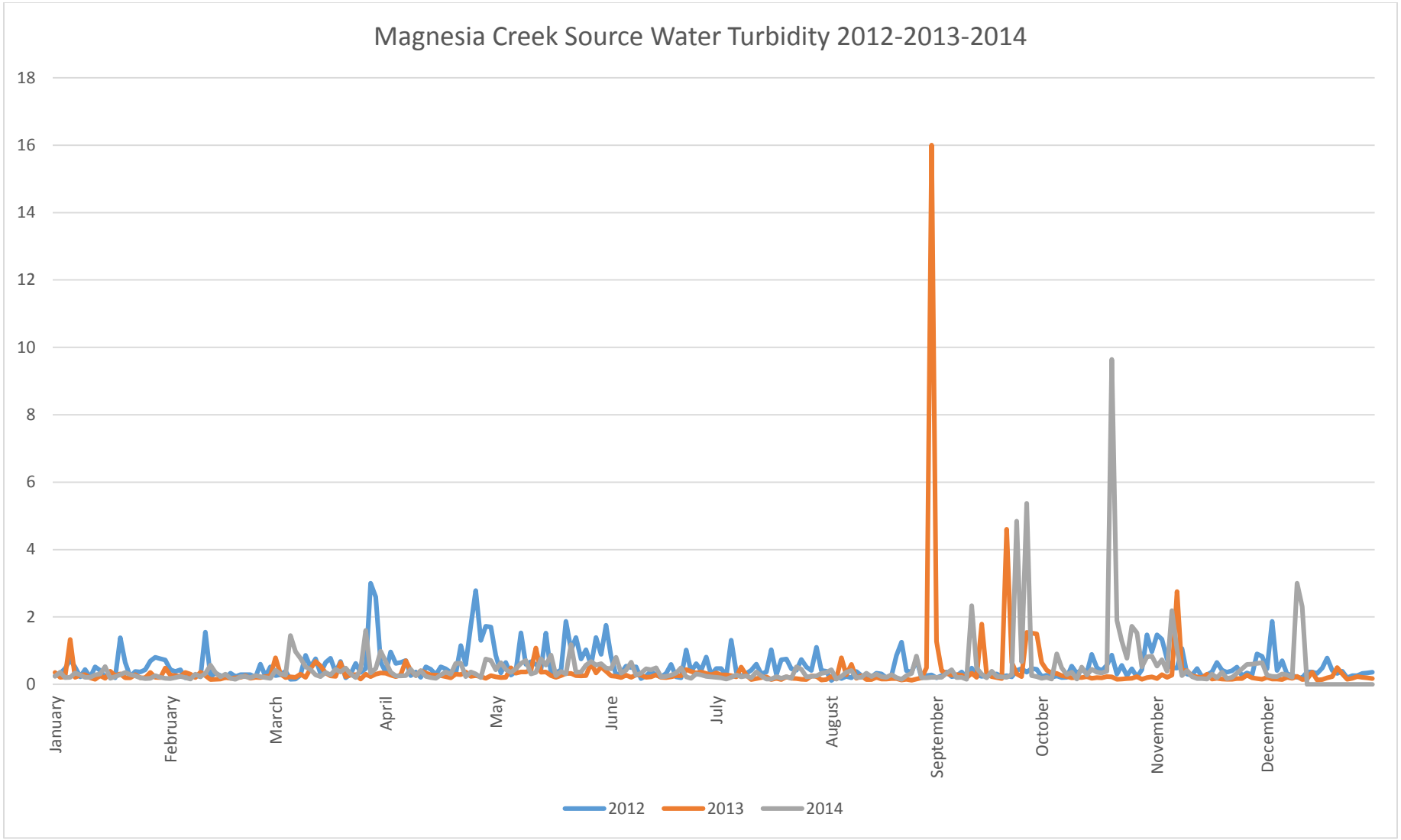

PRV-5 Turbidity 2012-2013-2014
6.00
5.00
4.00
3.00
2.00
1.00
0.00
January
February
March
April
May
June
July
August
September
October
November
December
2012
2013
2014


PRV-5 Chlorine Residual 2012-2013-2014
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
January
February
March
April
May
June
July
August
September
October
November
December
2012
2013
2014


Brunswick Beach Turbidity 2012-2013-2014
6.00
5.00
4.00
3.00
2.00
1.00
0.00
January
February
March
April
May
June
July
August
September
October
November
December
2012
2013
2014


Brunswick Beach Chlorine Residual 2012-2013-2014
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
January
February
March
April
May
June
July
August
September
October
November
December
2012
2013
2014


Harvey Creek Raw Source Water Turbidity 2012-2013-2014
6
5
4
3
2
1
0
January
February
March
April
May
June
July
August
September
October
November
December
2012
2013
2014


Magnesia Creek Source Water Turbidity 2012-2013-2014
18
16
14
12
10
8
6
4
2
0
January
February
March
April
May
June
July
August
September
October
November
December
2012
2013
2014

APPENDIX D: METALS & WATER CHEMISTRY TEST RESULTS

VILLAGE OF LIONS BAY
ATTN: Will Emo
PO Box 141, 400 Center Road
Lions Bay BC V0N 2E0

Date Received: 19-MAR-14
Report Date: 02-APR-14 15:11 (MT)
Version: FINAL

Client Phone: 604-921-9833

Certificate of Analysis

Lab Work Order #: L1434230

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers: 1
Legal Site Desc:

Selam Worku
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	Sample ID: L1434230-1 Description: Water Sampled Date: 19-MAR-14 Sampled Time: 10:10 Client ID: HARVEY TANK (FIRST DRAW)	Sample ID: L1434230-2 Description: Water Sampled Date: 19-MAR-14 Sampled Time: 10:10 Client ID: HARVEY TANK (AFTER FLUSH)	Sample ID: L1434230-3 Description: Water Sampled Date: 19-MAR-14 Sampled Time: 09:40 Client ID: PRV-3 (FIRST DRAW)	Sample ID: L1434230-4 Description: Water Sampled Date: 19-MAR-14 Sampled Time: 09:40 Client ID: PRV-3 (AFTER FLUSH)	Sample ID: L1434230-5 Description: Water Sampled Date: 19-MAR-14 Sampled Time: 07:50 Client ID: STORE/CAFE (FIRST DRAW)
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	5.17		4.87		4.99
	pH (pH)	6.88		6.94		6.93
	Total Suspended Solids (mg/L)	<3.0		<3.0		<3.0
	Turbidity (NTU)	0.13		0.12		0.13
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	5.8		5.8		4.9
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	1.28		1.25		1.32
Total Metals	Aluminum (Al)-Total (mg/L)	0.068	0.047	0.049	0.052	0.034
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	0.00010	<0.00010	<0.00010	0.00012	<0.00010
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	0.035	<0.020
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Calcium (Ca)-Total (mg/L)	1.72	1.56	1.61	1.63	1.67
	Chromium (Cr)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Copper (Cu)-Total (mg/L)	0.0082	0.0035	0.385	0.0031	0.226
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	0.051	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	0.00386	0.00488	0.00209
	Magnesium (Mg)-Total (mg/L)	0.21	0.20	0.21	0.21	0.20
	Manganese (Mn)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Mercury (Hg)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Potassium (K)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Uranium (U)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Zinc (Zn)-Total (mg/L)	<0.050	<0.050	0.089	<0.050	0.137
Aggregate Organics	BOD (mg/L)	<2.0		<2.0		<2.0
Trihalomethanes	Bromodichloromethane (mg/L)	<0.0010		<0.0010		<0.0010
	Bromoform (mg/L)	<0.0010		<0.0010		<0.0010
	Dibromochloromethane (mg/L)	<0.0010		<0.0010		<0.0010
	Chloroform (mg/L)	0.0337		0.0337		0.0406
	Total THMs (mg/L)	0.0337		0.0337		0.0406

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1434230-6 Water 19-MAR-14 07:50 STORE/CAFE (AFTER FLUSH)	L1434230-7 Water 19-MAR-14 09:20 LIONS BAY AVE. (FIRST DRAW)	L1434230-8 Water 19-MAR-14 09:20 LIONS BAY AVE. (AFTER FLUSH)	L1434230-9 Water 19-MAR-14 12:50 KELVIN GROVE (FRIST DRAW)	L1434230-10 Water 19-MAR-14 12:50 KELVIN GROVE (AFTER FLUSH)
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)		4.93		6.23	
	pH (pH)		6.94		7.03	
	Total Suspended Solids (mg/L)		<3.0		<3.0	
	Turbidity (NTU)		0.12		0.12	
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)		4.6		5.8	
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)		1.41		1.25	
Total Metals	Aluminum (Al)-Total (mg/L)	0.047	0.024	0.064	0.048	0.050
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00010	<0.00010	<0.00010	0.00011	<0.00010
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Calcium (Ca)-Total (mg/L)	1.61	1.66	1.66	2.19	1.93
	Chromium (Cr)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Copper (Cu)-Total (mg/L)	0.0164	0.946	0.0032	0.214	0.0055
	Iron (Fe)-Total (mg/L)	0.044	<0.030	<0.030	0.037	<0.030
	Lead (Pb)-Total (mg/L)	0.00069	0.00399	<0.00050	0.0289	0.00165
	Magnesium (Mg)-Total (mg/L)	0.19	0.19	0.19	0.19	0.19
	Manganese (Mn)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Mercury (Hg)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Potassium (K)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Uranium (U)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Zinc (Zn)-Total (mg/L)	<0.050	<0.050	<0.050	0.054	<0.050
Aggregate Organics	BOD (mg/L)		<2.0		<2.0	
Trihalomethanes	Bromodichloromethane (mg/L)		<0.0010		<0.0010	
	Bromoform (mg/L)		<0.0010		<0.0010	
	Dibromochloromethane (mg/L)		<0.0010		<0.0010	
	Chloroform (mg/L)		0.0573		0.0487	
	Total THMs (mg/L)		0.0573		0.0487	

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1434230-11 Water 19-MAR-14 12:05 MAGNESIA TANK (FIRST DRAW)	L1434230-12 Water 19-MAR-14 12:05 MAGNESIA TANK (AFTER FLUSH)	L1434230-13 Water 19-MAR-14 12:35 PRV-5 (FIRST DRAW)	L1434230-14 Water 19-MAR-14 12:35 PRV-5 (AFTER FLUSH)	L1434230-15 Water 19-MAR-14 11:20 BRUNSWICK BEACH (FIRST DRAW)
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	10.5		10.9		11.1
	pH (pH)	6.99		7.00		7.07
	Total Suspended Solids (mg/L)	<3.0		<3.0		<3.0
	Turbidity (NTU)	0.15		0.15		0.16
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	7.1		6.9		6.5
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	0.72		0.88		0.95
Total Metals	Aluminum (Al)-Total (mg/L)	0.014	0.029	0.027	0.027	0.030
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00010	0.00010	0.00012	<0.00010	0.00012
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Calcium (Ca)-Total (mg/L)	3.43	3.65	3.57	3.58	3.69
	Chromium (Cr)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Copper (Cu)-Total (mg/L)	0.578	0.0076	0.0130	0.0046	0.0159
	Iron (Fe)-Total (mg/L)	0.032	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	0.00110	<0.00050	<0.00050	<0.00050	0.00064
	Magnesium (Mg)-Total (mg/L)	0.47	0.50	0.49	0.49	0.46
	Manganese (Mn)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Mercury (Hg)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Potassium (K)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sodium (Na)-Total (mg/L)	2.4	2.5	2.5	2.5	2.4
	Uranium (U)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Zinc (Zn)-Total (mg/L)	0.075	<0.050	<0.050	<0.050	<0.050
Aggregate Organics	BOD (mg/L)	<2.0		<2.0		<2.0
Trihalomethanes	Bromodichloromethane (mg/L)	<0.0010		<0.0010		<0.0010
	Bromoform (mg/L)	<0.0010		<0.0010		<0.0010
	Dibromochloromethane (mg/L)	<0.0010		<0.0010		<0.0010
	Chloroform (mg/L)	0.0178		0.0195		0.0362
	Total THMs (mg/L)	0.0178		0.0195		0.0362

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1434230-16 Water 19-MAR-14 11:20 BRUNSWICK BEACH (AFTER FLUSH)	L1434230-17 Water 19-MAR-14 07:35 ELEMENTARY SCHOOL (FIRST DRAW)	L1434230-18 Water 19-MAR-14 07:35 ELEMENTARY SCHOOL (AFTER FLUSH)	L1434230-19 Water 19-MAR-14 08:15 COMMUNITY CENTRE (FIRST DRAW)	L1434230-20 Water 19-MAR-14 08:15 COMMUNITY CENTRE (AFTER FLUSH)
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)		15.7		9.61	
	pH (pH)		7.14		6.93	
	Total Suspended Solids (mg/L)		<3.0		<3.0	
	Turbidity (NTU)		0.56		0.13	
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)		6.4		4.5	
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)		0.74		1.29	
Total Metals	Aluminum (Al)-Total (mg/L)	0.030	0.011	0.049	<0.010	0.049
	Antimony (Sb)-Total (mg/L)	<0.00050	0.00078	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	0.00010	0.00054	0.00017	0.00020	<0.00010
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020	<0.00020	0.00098	<0.00020
	Calcium (Ca)-Total (mg/L)	3.60	5.37	4.18	3.31	1.65
	Chromium (Cr)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Copper (Cu)-Total (mg/L)	0.0057	0.108	0.0449	2.96	0.0757
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	0.341	<0.030	0.037
	Lead (Pb)-Total (mg/L)	0.00064	0.0337	0.00141	0.0188	0.00101
	Magnesium (Mg)-Total (mg/L)	0.45	0.56	0.45	0.33	0.19
	Manganese (Mn)-Total (mg/L)	<0.0020	<0.0020	0.0026	0.0031	<0.0020
	Mercury (Hg)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Potassium (K)-Total (mg/L)	<0.10	0.10	<0.10	0.13	<0.10
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sodium (Na)-Total (mg/L)	2.4	2.9	2.5	<2.0	<2.0
	Uranium (U)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Zinc (Zn)-Total (mg/L)	<0.050	<0.050	<0.050	0.757	<0.050
Aggregate Organics	BOD (mg/L)		<2.0		<2.0	
Trihalomethanes	Bromodichloromethane (mg/L)		<0.0010		<0.0010	
	Bromoform (mg/L)		<0.0010		<0.0010	
	Dibromochloromethane (mg/L)		<0.0010		<0.0010	
	Chloroform (mg/L)		0.0410		0.0435	
	Total THMs (mg/L)		0.0410		0.0435	

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	Sample ID: L1434230-21 Description: Surface Water Sampled Date: 19-MAR-14 Sampled Time: 10:15 Client ID: HARVEY RAW WATER (FIRST DRAW)	L1434230-22 Surface Water 19-MAR-14 10:15 HARVEY RAW WATER (AFTER FLUSH)	L1434230-23 Surface Water 19-MAR-14 12:10 MAGNESIA RAW WATER (FIRST DRAW)	L1434230-24 Surface Water 19-MAR-14 12:10 MAGNESIA RAW WATER (AFTER FLUSH)	
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	4.86		11.6		
	pH (pH)	6.83		6.94		
	Total Suspended Solids (mg/L)	<3.0		<3.0		
	Turbidity (NTU)	0.12		0.15		
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	4.2		4.6		
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	1.15		0.76		
Total Metals	Aluminum (Al)-Total (mg/L)	0.040	0.043	0.034	0.031	
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
	Arsenic (As)-Total (mg/L)	<0.00010	<0.00010	0.00011	0.00010	
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	
	Calcium (Ca)-Total (mg/L)	1.61	1.62	3.76	3.77	
	Chromium (Cr)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	
	Copper (Cu)-Total (mg/L)	0.0062	0.0063	0.0057	0.0050	
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
	Magnesium (Mg)-Total (mg/L)	0.20	0.21	0.53	0.53	
	Manganese (Mn)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	
	Mercury (Hg)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	
	Potassium (K)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	
	Uranium (U)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	
	Zinc (Zn)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	
Aggregate Organics	BOD (mg/L)	<2.0		<2.0		
Trihalomethanes	Bromodichloromethane (mg/L)					
	Bromoform (mg/L)					
	Dibromochloromethane (mg/L)					
	Chloroform (mg/L)					
	Total THMs (mg/L)					

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

Reference Information

Qualifiers for Sample Submission Listed:

Qualifier	Description
WSMT	Water sample(s) for total mercury analysis was not submitted in glass container with HCl preservative. Results may be biased low.

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Total Organic Carbon	MS-B	L1434230-1, -11, -13, -15, -17, -19, -21, -23, -3, -5, -7, -9

Qualifiers for Individual Parameters Listed:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-COL-VA	Water	Alkalinity by Colourimetric (Automated)	EPA 310.2

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

BOD5-VA Water Biochemical Oxygen Demand- 5 day APHA 5210 B- "BIOCHEMICAL OXYGEN DEMAND"

This analysis is carried out using procedures adapted from APHA Method 5210 B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.

BOD5-VA Water Biochemical Oxygen Demand- 5 day APHA 5210 B- BIOCHEMICAL OXYGEN DEMAND

This analysis is carried out using procedures adapted from APHA Method 5210 B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.

CARBONS-TOC-VA Water Total organic carbon by combustion APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-TOT-CVAFS-VA Water Total Mercury in Water by CVAFS EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

MET-TOT-ICP-VA Water Total Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-LOW-MS-VA Water Total Metals in Water by ICPMS(Low) EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

Reference Information

THM-HSMS-VA	Water	VOC (THM) by Headspace GCMS	EPA SW-846, METHOD 8260

This procedure is suitable for the analysis of trihalomethanes (chloroform, bromodichloromethane, dibromochloromethane, and bromoform) in chlorinated waters that have been treated to prevent the formation of trihalomethanes after sample collection. The analysis involves the headspace extraction of the sample prior to analysis by capillary column gas chromatography with mass spectrometric detection (GC/MS). The trihalomethanes analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 8260, published by the United States Environmental Protection Agency (EPA).

THM-SUM-CALC-VA	Water	Total Trihalomethane-THM	CALCULATION

Total Trihalomethanes (where not conducted as part of a formation potential analysis) is equal to the sum of the individual parameter concentrations with non-detect results treated as zero.

TSS-VA	Water	Total Suspended Solids by Gravimetric	APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

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

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
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

1

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
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.

L1434230-COFC

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC # _____

Page 1 of 1

Report To				Report Format / Distribution				Service Requested (Rush for routine analysis subject to availability)
Company:	Village of Lions Bay			☐ Standard ☐ Other				◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Will Emo			☑ PDF ☐ Excel ☐ Digital ☐ Fax				○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	400 Centre Rd			Email 1: aurrutia@lionsbay.ca				○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Lions Bay, BC V0N 2E0			Email 2:				○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	604 921 9833	Fax:		Email 3:				
Invoice To	Same as Report ?	☑ Yes	☐ No	Client / Project Information				Analysis Request
Hardcopy of Invoice with Report?		☐ Yes	☐ No	Job #:				Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:				PO / AFE:				
Contact:				LSD:				
Address:								
Phone:		Fax:		Quote #:				
Lab Work Order # (lab use only)				ALS Contact:	Selam Worku	Sampler:	Alberto Urrutia	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Hardness	pH	TSS	BOD	Turbidity	Alkalinity Total	Total Metals (First Draw)	Total Metals (After Flush)	Mercury	Total Organic Carbon	Trihalomethanes		Number of Containers
	Harvey Tank	19-Mar-14	10:10	Water	X	X	X	X	X	X	X	X	X	X	X		8
	PRV-3	19-Mar-14	9:40	Water	X	X	X	X	X	X	X	X	X	X	X		8
	Store / Café	19-Mar-14	7:50	Water	X	X	X	X	X	X	X	X	X	X	X		8
	Lions Bay Ave.	19-Mar-14	9:20	Water	X	X	X	X	X	X	X	X	X	X	X		8
	Kelvin Grove	19-Mar-14	12:50	Water	X	X	X	X	X	X	X	X	X	X	X		8
	Magnesia Tank	19-Mar-14	12:05	Water	X	X	X	X	X	X	X	X	X	X	X		8
	PRV-5	19-Mar-14	12:35	Water	X	X	X	X	X	X	X	X	X	X	X		8
	Brunswick Beach	19-Mar-14	11:20	Water	X	X	X	X	X	X	X	X	X	X	X		8
	Elementary School	19-Mar-14	7:35	Water	X	X	X	X	X	X	X	X	X	X	X		8
	Community Centre	19-Mar-14	8:15	Water	X	X	X	X	X	X	X	X	X	X	X		8
	Harvey Raw Water	19-Mar-14	10:15	Surface Water	X	X	X	X	X	X		X	X	X			4
	Magnesia Raw Water	19-Mar-14	12:10	Surface Water	X	X	X	X	X	X		X	X	X			4

Short Holding Time

Rush Processing

Special Instructions / Regulations ...h water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
			YC	Mar 19	15:15	4.9/7.2 °C				

GENF 18.01 Front

VILLAGE OF LIONS BAY
ATTN: Nikii Hoglund
400 Centre Road
Lions Bay BC V0N 2E0

Date Received: 07-OCT-14
Report Date: 21-OCT-14 15:09 (MT)
Version: FINAL

Client Phone: 604-921-9833

Certificate of Analysis

Lab Work Order #: L1529295

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers: 1
Legal Site Desc:

Courtney Duncan
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1529295-1 HARVEY TANK (FIRST DRAW)							
Sampled By: Alberto Urrutia on 07-OCT-14 @ 11:00							
Matrix: Water							
Total Metals in Water (DW)							
Total Mercury in Water by CVAFS							
Mercury (Hg)-Total	<0.00020		0.00020	mg/L		08-OCT-14	R2977449
Total Metals in Water by ICPMS(Low)							
Aluminum (Al)-Total	0.036		0.010	mg/L		18-OCT-14	R3005149
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		18-OCT-14	R3005149
Arsenic (As)-Total	0.00010		0.00010	mg/L		18-OCT-14	R3005149
Cadmium (Cd)-Total	<0.00020		0.00020	mg/L		18-OCT-14	R3005149
Chromium (Cr)-Total	<0.0020		0.0020	mg/L		18-OCT-14	R3005149
Copper (Cu)-Total	0.0631		0.0010	mg/L		18-OCT-14	R3005149
Lead (Pb)-Total	0.00101		0.00050	mg/L		18-OCT-14	R3005149
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		18-OCT-14	R3005149
Potassium (K)-Total	0.13		0.10	mg/L		18-OCT-14	R3005149
Selenium (Se)-Total	<0.0010		0.0010	mg/L		18-OCT-14	R3005149
Uranium (U)-Total	<0.00010		0.00010	mg/L		18-OCT-14	R3005149
Total Metals in Water by ICPOES							
Barium (Ba)-Total	<0.020		0.020	mg/L		16-OCT-14	R2998460
Boron (B)-Total	<0.10		0.10	mg/L		16-OCT-14	R2998460
Calcium (Ca)-Total	2.16		0.10	mg/L		16-OCT-14	R2998460
Iron (Fe)-Total	<0.030		0.030	mg/L		16-OCT-14	R2998460
Magnesium (Mg)-Total	0.24		0.10	mg/L		16-OCT-14	R2998460
Sodium (Na)-Total	2.2		2.0	mg/L		16-OCT-14	R2998460
Zinc (Zn)-Total	<0.050		0.050	mg/L		16-OCT-14	R2998460
Miscellaneous Parameters							
Alkalinity, Total (as CaCO3)	7.8		2.0	mg/L		10-OCT-14	R2981805
BOD	<2.0		2.0	mg/L		08-OCT-14	R2983253
Hardness (as CaCO3)	6.38		0.50	mg/L		20-OCT-14	
Total Suspended Solids	<3.0		3.0	mg/L		11-OCT-14	R2984125
Total Organic Carbon	1.03		0.50	mg/L		17-OCT-14	R3001214
Turbidity	0.14		0.10	NTU		08-OCT-14	R2977640
pH	6.67		0.10	pH		15-OCT-14	R2989733
THM by Headspace GCMS							
Total Trihalomethane-THM							
Total THMs	0.0304		0.0020	mg/L		20-OCT-14	
VOC (THM) by Headspace GCMS							
Chloroform	0.0304		0.0010	mg/L	19-OCT-14	19-OCT-14	R3003109
Bromodichloromethane	<0.0010		0.0010	mg/L	19-OCT-14	19-OCT-14	R3003109
Bromoform	<0.0010		0.0010	mg/L	19-OCT-14	19-OCT-14	R3003109
Dibromochloromethane	<0.0010		0.0010	mg/L	19-OCT-14	19-OCT-14	R3003109
L1529295-2 HARVEY TANK (AFTER FLUSH)							
Sampled By: Alberto Urrutia on 07-OCT-14 @ 11:00							
Matrix: Water							
Total Metals in Water (DW)							
Total Metals in Water by ICPMS(Low)							
Aluminum (Al)-Total	0.037		0.010	mg/L		18-OCT-14	R3005149
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		18-OCT-14	R3005149
Arsenic (As)-Total	0.00012		0.00010	mg/L		18-OCT-14	R3005149
Cadmium (Cd)-Total	<0.00020		0.00020	mg/L		18-OCT-14	R3005149
Chromium (Cr)-Total	<0.0020		0.0020	mg/L		18-OCT-14	R3005149
Copper (Cu)-Total	0.0037		0.0010	mg/L		18-OCT-14	R3005149
Lead (Pb)-Total	<0.00050		0.00050	mg/L		18-OCT-14	R3005149
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		18-OCT-14	R3005149

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1529295-2 HARVEY TANK (AFTER FLUSH)							
Sampled By: Alberto Urrutia on 07-OCT-14 @ 11:00							
Matrix: Water							
Total Metals in Water by ICPMS(Low)							
Potassium (K)-Total	0.14		0.10	mg/L		18-OCT-14	R3005149
Selenium (Se)-Total	<0.0010		0.0010	mg/L		18-OCT-14	R3005149
Uranium (U)-Total	<0.00010		0.00010	mg/L		18-OCT-14	R3005149
Total Metals in Water by ICPOES							
Barium (Ba)-Total	<0.020		0.020	mg/L		16-OCT-14	R2998460
Boron (B)-Total	<0.10		0.10	mg/L		16-OCT-14	R2998460
Calcium (Ca)-Total	2.21		0.10	mg/L		16-OCT-14	R2998460
Iron (Fe)-Total	<0.030		0.030	mg/L		16-OCT-14	R2998460
Magnesium (Mg)-Total	0.24		0.10	mg/L		16-OCT-14	R2998460
Sodium (Na)-Total	2.2		2.0	mg/L		16-OCT-14	R2998460
Zinc (Zn)-Total	<0.050		0.050	mg/L		16-OCT-14	R2998460
L1529295-3 STORE/CAFE (FIRST DRAW)							
Sampled By: Alberto Urrutia on 07-OCT-14 @ 07:40							
Matrix: Water							
Total Metals in Water (DW)							
Total Mercury in Water by CVAFS							
Mercury (Hg)-Total	<0.00020		0.00020	mg/L		08-OCT-14	R2977449
Total Metals in Water by ICPMS(Low)							
Aluminum (Al)-Total	0.022		0.010	mg/L		18-OCT-14	R3005149
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		18-OCT-14	R3005149
Arsenic (As)-Total	<0.00010		0.00010	mg/L		18-OCT-14	R3005149
Cadmium (Cd)-Total	<0.00020		0.00020	mg/L		18-OCT-14	R3005149
Chromium (Cr)-Total	<0.0020		0.0020	mg/L		18-OCT-14	R3005149
Copper (Cu)-Total	0.0964		0.0010	mg/L		18-OCT-14	R3005149
Lead (Pb)-Total	0.0109		0.00050	mg/L		18-OCT-14	R3005149
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		18-OCT-14	R3005149
Potassium (K)-Total	0.14		0.10	mg/L		18-OCT-14	R3005149
Selenium (Se)-Total	<0.0010		0.0010	mg/L		18-OCT-14	R3005149
Uranium (U)-Total	<0.00010		0.00010	mg/L		18-OCT-14	R3005149
Total Metals in Water by ICPOES							
Barium (Ba)-Total	<0.020		0.020	mg/L		16-OCT-14	R2998460
Boron (B)-Total	<0.10		0.10	mg/L		16-OCT-14	R2998460
Calcium (Ca)-Total	2.11		0.10	mg/L		16-OCT-14	R2998460
Iron (Fe)-Total	<0.030		0.030	mg/L		16-OCT-14	R2998460
Magnesium (Mg)-Total	0.24		0.10	mg/L		16-OCT-14	R2998460
Sodium (Na)-Total	2.1		2.0	mg/L		16-OCT-14	R2998460
Zinc (Zn)-Total	<0.050		0.050	mg/L		16-OCT-14	R2998460
Miscellaneous Parameters							
Alkalinity, Total (as CaCO3)	7.3		2.0	mg/L		10-OCT-14	R2981805
BOD	<2.0		2.0	mg/L		08-OCT-14	R2983253
Hardness (as CaCO3)	6.25		0.50	mg/L		20-OCT-14	
Total Suspended Solids	<3.0		3.0	mg/L		11-OCT-14	R2984125
Total Organic Carbon	1.11		0.50	mg/L		17-OCT-14	R3001214
Turbidity	0.18		0.10	NTU		08-OCT-14	R2977640
pH	6.68		0.10	pH		17-OCT-14	R2998403
THM by Headspace GCMS							
Total Trihalomethane-THM							
Total THMs	0.0332		0.0020	mg/L		20-OCT-14	
VOC (THM) by Headspace GCMS							
Chloroform	0.0332		0.0010	mg/L	19-OCT-14	19-OCT-14	R3003109

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1529295-3 STORE/CAFE (FIRST DRAW)							
Sampled By: Alberto Urrutia on 07-OCT-14 @ 07:40							
Matrix: Water							
VOC (THM) by Headspace GCMS							
Bromodichloromethane	<0.0010		0.0010	mg/L	19-OCT-14	19-OCT-14	R3003109
Bromoform	<0.0010		0.0010	mg/L	19-OCT-14	19-OCT-14	R3003109
Dibromochloromethane	<0.0010		0.0010	mg/L	19-OCT-14	19-OCT-14	R3003109
L1529295-4 STORE/CAFE (AFTER FLUSH)							
Sampled By: Alberto Urrutia on 07-OCT-14 @ 07:40							
Matrix: Water							
Total Metals in Water (DW)							
Total Metals in Water by ICPMS(Low)							
Aluminum (Al)-Total	0.030		0.010	mg/L		18-OCT-14	R3005149
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		18-OCT-14	R3005149
Arsenic (As)-Total	0.00011		0.00010	mg/L		18-OCT-14	R3005149
Cadmium (Cd)-Total	<0.00020		0.00020	mg/L		18-OCT-14	R3005149
Chromium (Cr)-Total	<0.0020		0.0020	mg/L		18-OCT-14	R3005149
Copper (Cu)-Total	0.0163		0.0010	mg/L		18-OCT-14	R3005149
Lead (Pb)-Total	<0.00050		0.00050	mg/L		18-OCT-14	R3005149
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		18-OCT-14	R3005149
Potassium (K)-Total	0.13		0.10	mg/L		18-OCT-14	R3005149
Selenium (Se)-Total	<0.0010		0.0010	mg/L		18-OCT-14	R3005149
Uranium (U)-Total	<0.00010		0.00010	mg/L		18-OCT-14	R3005149
Total Metals in Water by ICPOES							
Barium (Ba)-Total	<0.020		0.020	mg/L		16-OCT-14	R2998460
Boron (B)-Total	<0.10		0.10	mg/L		16-OCT-14	R2998460
Calcium (Ca)-Total	2.12		0.10	mg/L		16-OCT-14	R2998460
Iron (Fe)-Total	<0.030		0.030	mg/L		16-OCT-14	R2998460
Magnesium (Mg)-Total	0.23		0.10	mg/L		16-OCT-14	R2998460
Sodium (Na)-Total	2.2		2.0	mg/L		16-OCT-14	R2998460
Zinc (Zn)-Total	<0.050		0.050	mg/L		16-OCT-14	R2998460
L1529295-5 LIONS BAY AVE. (FIRST DRAW)							
Sampled By: Alberto Urrutia on 07-OCT-14 @ 12:10							
Matrix: Water							
Total Metals in Water (DW)							
Total Mercury in Water by CVAFS							
Mercury (Hg)-Total	<0.00020		0.00020	mg/L		08-OCT-14	R2977449
Total Metals in Water by ICPMS(Low)							
Aluminum (Al)-Total	0.017		0.010	mg/L		18-OCT-14	R3005149
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		18-OCT-14	R3005149
Arsenic (As)-Total	<0.00010		0.00010	mg/L		18-OCT-14	R3005149
Cadmium (Cd)-Total	<0.00020		0.00020	mg/L		18-OCT-14	R3005149
Chromium (Cr)-Total	<0.0020		0.0020	mg/L		18-OCT-14	R3005149
Copper (Cu)-Total	0.378		0.0010	mg/L		18-OCT-14	R3005149
Lead (Pb)-Total	0.00310		0.00050	mg/L		18-OCT-14	R3005149
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		18-OCT-14	R3005149
Potassium (K)-Total	0.14		0.10	mg/L		18-OCT-14	R3005149
Selenium (Se)-Total	<0.0010		0.0010	mg/L		18-OCT-14	R3005149
Uranium (U)-Total	<0.00010		0.00010	mg/L		18-OCT-14	R3005149
Total Metals in Water by ICPOES							
Barium (Ba)-Total	<0.020		0.020	mg/L		16-OCT-14	R2998460
Boron (B)-Total	<0.10		0.10	mg/L		16-OCT-14	R2998460
Calcium (Ca)-Total	2.10		0.10	mg/L		16-OCT-14	R2998460
Iron (Fe)-Total	<0.030		0.030	mg/L		16-OCT-14	R2998460

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1529295-5 LIONS BAY AVE. (FIRST DRAW)							
Sampled By: Alberto Urrutia on 07-OCT-14 @ 12:10							
Matrix: Water							
Total Metals in Water by ICPOES							
Magnesium (Mg)-Total	0.22		0.10	mg/L		16-OCT-14	R2998460
Sodium (Na)-Total	2.1		2.0	mg/L		16-OCT-14	R2998460
Zinc (Zn)-Total	<0.050		0.050	mg/L		16-OCT-14	R2998460
Miscellaneous Parameters							
Alkalinity, Total (as CaCO3)	7.0		2.0	mg/L		10-OCT-14	R2981805
BOD	<2.0		2.0	mg/L		08-OCT-14	R2983253
Hardness (as CaCO3)	6.18		0.50	mg/L		20-OCT-14	
Total Suspended Solids	<3.0		3.0	mg/L		11-OCT-14	R2984125
Total Organic Carbon	1.11		0.50	mg/L		17-OCT-14	R3001214
Turbidity	<0.10		0.10	NTU		08-OCT-14	R2977640
pH	6.82		0.10	pH		17-OCT-14	R2998403
THM by Headspace GCMS							
Total Trihalomethane-THM							
Total THMs	0.0314		0.0020	mg/L		20-OCT-14	
VOC (THM) by Headspace GCMS							
Chloroform	0.0314		0.0010	mg/L	19-OCT-14	19-OCT-14	R3003109
Bromodichloromethane	<0.0010		0.0010	mg/L	19-OCT-14	19-OCT-14	R3003109
Bromoform	<0.0010		0.0010	mg/L	19-OCT-14	19-OCT-14	R3003109
Dibromochloromethane	<0.0010		0.0010	mg/L	19-OCT-14	19-OCT-14	R3003109
L1529295-6 LIONS BAY AVE. (AFTER FLUSH)							
Sampled By: Alberto Urrutia on 07-OCT-14 @ 12:10							
Matrix: Water							
Total Metals in Water (DW)							
Total Metals in Water by ICPMS(Low)							
Aluminum (Al)-Total	0.032		0.010	mg/L		18-OCT-14	R3005149
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		18-OCT-14	R3005149
Arsenic (As)-Total	0.00013		0.00010	mg/L		18-OCT-14	R3005149
Cadmium (Cd)-Total	<0.00020		0.00020	mg/L		18-OCT-14	R3005149
Chromium (Cr)-Total	<0.0020		0.0020	mg/L		18-OCT-14	R3005149
Copper (Cu)-Total	0.0023		0.0010	mg/L		18-OCT-14	R3005149
Lead (Pb)-Total	<0.00050		0.00050	mg/L		18-OCT-14	R3005149
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		18-OCT-14	R3005149
Potassium (K)-Total	0.14		0.10	mg/L		18-OCT-14	R3005149
Selenium (Se)-Total	<0.0010		0.0010	mg/L		18-OCT-14	R3005149
Uranium (U)-Total	<0.00010		0.00010	mg/L		18-OCT-14	R3005149
Total Metals in Water by ICPOES							
Barium (Ba)-Total	<0.020		0.020	mg/L		16-OCT-14	R2998460
Boron (B)-Total	<0.10		0.10	mg/L		16-OCT-14	R2998460
Calcium (Ca)-Total	2.15		0.10	mg/L		16-OCT-14	R2998460
Iron (Fe)-Total	<0.030		0.030	mg/L		16-OCT-14	R2998460
Magnesium (Mg)-Total	0.23		0.10	mg/L		16-OCT-14	R2998460
Sodium (Na)-Total	2.1		2.0	mg/L		16-OCT-14	R2998460
Zinc (Zn)-Total	<0.050		0.050	mg/L		16-OCT-14	R2998460
L1529295-7 KELVIN GROVE (FIRST DRAW)							
Sampled By: Alberto Urrutia on 07-OCT-14 @ 08:15							
Matrix: Water							
Total Metals in Water (DW)							
Total Mercury in Water by CVAFS							
Mercury (Hg)-Total	<0.00020		0.00020	mg/L		08-OCT-14	R2977449

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1529295-7 KELVIN GROVE (FIRST DRAW)							
Sampled By: Alberto Urrutia on 07-OCT-14 @ 08:15							
Matrix: Water							
Total Metals in Water by ICPMS(Low)							
Aluminum (Al)-Total	0.039		0.010	mg/L		18-OCT-14	R3005149
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		18-OCT-14	R3005149
Arsenic (As)-Total	0.00012		0.00010	mg/L		18-OCT-14	R3005149
Cadmium (Cd)-Total	<0.00020		0.00020	mg/L		18-OCT-14	R3005149
Chromium (Cr)-Total	<0.0020		0.0020	mg/L		18-OCT-14	R3005149
Copper (Cu)-Total	0.0608		0.0010	mg/L		18-OCT-14	R3005149
Lead (Pb)-Total	0.0124		0.00050	mg/L		18-OCT-14	R3005149
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		18-OCT-14	R3005149
Potassium (K)-Total	0.12		0.10	mg/L		18-OCT-14	R3005149
Selenium (Se)-Total	<0.0010		0.0010	mg/L		18-OCT-14	R3005149
Uranium (U)-Total	<0.00010		0.00010	mg/L		18-OCT-14	R3005149
Total Metals in Water by ICPOES							
Barium (Ba)-Total	<0.020		0.020	mg/L		16-OCT-14	R2998460
Boron (B)-Total	<0.10		0.10	mg/L		16-OCT-14	R2998460
Calcium (Ca)-Total	2.76		0.10	mg/L		16-OCT-14	R2998460
Iron (Fe)-Total	0.035		0.030	mg/L		16-OCT-14	R2998460
Magnesium (Mg)-Total	0.20		0.10	mg/L		16-OCT-14	R2998460
Sodium (Na)-Total	2.1		2.0	mg/L		16-OCT-14	R2998460
Zinc (Zn)-Total	<0.050		0.050	mg/L		16-OCT-14	R2998460
Miscellaneous Parameters							
Alkalinity, Total (as CaCO3)	8.0		2.0	mg/L		10-OCT-14	R2981805
BOD	<2.0		2.0	mg/L		08-OCT-14	R2983253
Hardness (as CaCO3)	7.71		0.50	mg/L		20-OCT-14	
Total Suspended Solids	<3.0		3.0	mg/L		11-OCT-14	R2984125
Total Organic Carbon	0.96		0.50	mg/L		17-OCT-14	R3001214
Turbidity	<0.10		0.10	NTU		08-OCT-14	R2977640
pH	6.94		0.10	pH		17-OCT-14	R2998403
THM by Headspace GCMS							
Total Trihalomethane-THM							
Total THMs	0.0496		0.0020	mg/L		20-OCT-14	
VOC (THM) by Headspace GCMS							
Chloroform	0.0496		0.0010	mg/L	19-OCT-14	19-OCT-14	R3003109
Bromodichloromethane	<0.0010		0.0010	mg/L	19-OCT-14	19-OCT-14	R3003109
Bromoform	<0.0010		0.0010	mg/L	19-OCT-14	19-OCT-14	R3003109
Dibromochloromethane	<0.0010		0.0010	mg/L	19-OCT-14	19-OCT-14	R3003109
L1529295-8 KELVIN GROVE (AFTER FLUSH)							
Sampled By: Alberto Urrutia on 07-OCT-14 @ 08:15							
Matrix: Water							
Total Metals in Water (DW)							
Total Metals in Water by ICPMS(Low)							
Aluminum (Al)-Total	0.042		0.010	mg/L		18-OCT-14	R3005149
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		18-OCT-14	R3005149
Arsenic (As)-Total	0.00012		0.00010	mg/L		18-OCT-14	R3005149
Cadmium (Cd)-Total	<0.00020		0.00020	mg/L		18-OCT-14	R3005149
Chromium (Cr)-Total	<0.0020		0.0020	mg/L		18-OCT-14	R3005149
Copper (Cu)-Total	0.0021		0.0010	mg/L		18-OCT-14	R3005149
Lead (Pb)-Total	0.00102		0.00050	mg/L		18-OCT-14	R3005149
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		18-OCT-14	R3005149
Potassium (K)-Total	0.13		0.10	mg/L		18-OCT-14	R3005149
Selenium (Se)-Total	<0.0010		0.0010	mg/L		18-OCT-14	R3005149
Uranium (U)-Total	<0.00010		0.00010	mg/L		18-OCT-14	R3005149

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1529295-8 KELVIN GROVE (AFTER FLUSH)							
Sampled By: Alberto Urrutia on 07-OCT-14 @ 08:15							
Matrix: Water							
Total Metals in Water by ICPOES							
Barium (Ba)-Total	<0.020		0.020	mg/L		16-OCT-14	R2998460
Boron (B)-Total	<0.10		0.10	mg/L		16-OCT-14	R2998460
Calcium (Ca)-Total	2.81		0.10	mg/L		16-OCT-14	R2998460
Iron (Fe)-Total	0.035		0.030	mg/L		16-OCT-14	R2998460
Magnesium (Mg)-Total	0.20		0.10	mg/L		16-OCT-14	R2998460
Sodium (Na)-Total	2.2		2.0	mg/L		16-OCT-14	R2998460
Zinc (Zn)-Total	<0.050		0.050	mg/L		16-OCT-14	R2998460
L1529295-9 MAGNESIA TANK (FIRST DRAW)							
Sampled By: Alberto Urrutia on 07-OCT-14 @ 09:15							
Matrix: Water							
Total Metals in Water (DW)							
Total Mercury in Water by CVAFS							
Mercury (Hg)-Total	<0.00020		0.00020	mg/L		08-OCT-14	R2977449
Total Metals in Water by ICPMS(Low)							
Aluminum (Al)-Total	<0.010		0.010	mg/L		18-OCT-14	R3005149
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		18-OCT-14	R3005149
Arsenic (As)-Total	<0.00010		0.00010	mg/L		18-OCT-14	R3005149
Cadmium (Cd)-Total	<0.00020		0.00020	mg/L		18-OCT-14	R3005149
Chromium (Cr)-Total	<0.0020		0.0020	mg/L		18-OCT-14	R3005149
Copper (Cu)-Total	0.519		0.0010	mg/L		18-OCT-14	R3005149
Lead (Pb)-Total	0.00349		0.00050	mg/L		18-OCT-14	R3005149
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		18-OCT-14	R3005149
Potassium (K)-Total	<0.10		0.10	mg/L		18-OCT-14	R3005149
Selenium (Se)-Total	<0.0010		0.0010	mg/L		18-OCT-14	R3005149
Uranium (U)-Total	<0.00010		0.00010	mg/L		18-OCT-14	R3005149
Total Metals in Water by ICPOES							
Barium (Ba)-Total	<0.020		0.020	mg/L		16-OCT-14	R2998460
Boron (B)-Total	<0.10		0.10	mg/L		16-OCT-14	R2998460
Calcium (Ca)-Total	4.58		0.10	mg/L		16-OCT-14	R2998460
Iron (Fe)-Total	0.112		0.030	mg/L		16-OCT-14	R2998460
Magnesium (Mg)-Total	0.48		0.10	mg/L		16-OCT-14	R2998460
Sodium (Na)-Total	2.5		2.0	mg/L		16-OCT-14	R2998460
Zinc (Zn)-Total	0.261		0.050	mg/L		16-OCT-14	R2998460
Miscellaneous Parameters							
Alkalinity, Total (as CaCO3)	8.0		2.0	mg/L		10-OCT-14	R2981805
BOD	<2.0		2.0	mg/L		08-OCT-14	R2983253
Hardness (as CaCO3)	13.4		0.50	mg/L		20-OCT-14	
Total Suspended Solids	<3.0		3.0	mg/L		11-OCT-14	R2984125
Total Organic Carbon	0.73		0.50	mg/L		17-OCT-14	R3001214
Turbidity	0.11		0.10	NTU		08-OCT-14	R2977640
pH	7.34		0.10	pH		15-OCT-14	R2989733
THM by Headspace GCMS							
Total Trihalomethane-THM							
Total THMs	0.0196		0.0020	mg/L		20-OCT-14	
VOC (THM) by Headspace GCMS							
Chloroform	0.0196		0.0010	mg/L	19-OCT-14	19-OCT-14	R3003109
Bromodichloromethane	<0.0010		0.0010	mg/L	19-OCT-14	19-OCT-14	R3003109
Bromoform	<0.0010		0.0010	mg/L	19-OCT-14	19-OCT-14	R3003109
Dibromochloromethane	<0.0010		0.0010	mg/L	19-OCT-14	19-OCT-14	R3003109

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1529295-10 MAGNESIA TANK (AFTER FLUSH)							
Sampled By: Alberto Urrutia on 07-OCT-14 @ 09:15							
Matrix: Water							
Total Metals in Water (DW)							
Total Metals in Water by ICPMS(Low)							
Aluminum (Al)-Total	0.020		0.010	mg/L		18-OCT-14	R3005149
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		18-OCT-14	R3005149
Arsenic (As)-Total	0.00012		0.00010	mg/L		18-OCT-14	R3005149
Cadmium (Cd)-Total	<0.00020		0.00020	mg/L		18-OCT-14	R3005149
Chromium (Cr)-Total	<0.0020		0.0020	mg/L		18-OCT-14	R3005149
Copper (Cu)-Total	0.0086		0.0010	mg/L		18-OCT-14	R3005149
Lead (Pb)-Total	<0.00050		0.00050	mg/L		18-OCT-14	R3005149
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		18-OCT-14	R3005149
Potassium (K)-Total	<0.10		0.10	mg/L		18-OCT-14	R3005149
Selenium (Se)-Total	<0.0010		0.0010	mg/L		18-OCT-14	R3005149
Uranium (U)-Total	<0.00010		0.00010	mg/L		18-OCT-14	R3005149
Total Metals in Water by ICPOES							
Barium (Ba)-Total	<0.020		0.020	mg/L		16-OCT-14	R2998460
Boron (B)-Total	<0.10		0.10	mg/L		16-OCT-14	R2998460
Calcium (Ca)-Total	4.72		0.10	mg/L		16-OCT-14	R2998460
Iron (Fe)-Total	<0.030		0.030	mg/L		16-OCT-14	R2998460
Magnesium (Mg)-Total	0.50		0.10	mg/L		16-OCT-14	R2998460
Sodium (Na)-Total	2.7		2.0	mg/L		16-OCT-14	R2998460
Zinc (Zn)-Total	<0.050		0.050	mg/L		16-OCT-14	R2998460
L1529295-11 BRUNSWICK BEACH (FIRST DRAW)							
Sampled By: Alberto Urrutia on 07-OCT-14 @ 12:40							
Matrix: Water							
Total Metals in Water (DW)							
Total Mercury in Water by CVAFS							
Mercury (Hg)-Total	<0.00020		0.00020	mg/L		08-OCT-14	R2977449
Total Metals in Water by ICPMS(Low)							
Aluminum (Al)-Total	0.021		0.010	mg/L		18-OCT-14	R3005149
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		18-OCT-14	R3005149
Arsenic (As)-Total	0.00013		0.00010	mg/L		18-OCT-14	R3005149
Cadmium (Cd)-Total	<0.00020		0.00020	mg/L		18-OCT-14	R3005149
Chromium (Cr)-Total	<0.0020		0.0020	mg/L		18-OCT-14	R3005149
Copper (Cu)-Total	0.0086		0.0010	mg/L		18-OCT-14	R3005149
Lead (Pb)-Total	<0.00050		0.00050	mg/L		18-OCT-14	R3005149
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		18-OCT-14	R3005149
Potassium (K)-Total	0.11		0.10	mg/L		18-OCT-14	R3005149
Selenium (Se)-Total	<0.0010		0.0010	mg/L		18-OCT-14	R3005149
Uranium (U)-Total	<0.00010		0.00010	mg/L		18-OCT-14	R3005149
Total Metals in Water by ICPOES							
Barium (Ba)-Total	<0.020		0.020	mg/L		16-OCT-14	R2998460
Boron (B)-Total	<0.10		0.10	mg/L		16-OCT-14	R2998460
Calcium (Ca)-Total	4.75		0.10	mg/L		16-OCT-14	R2998460
Iron (Fe)-Total	0.046		0.030	mg/L		16-OCT-14	R2998460
Magnesium (Mg)-Total	0.47		0.10	mg/L		16-OCT-14	R2998460
Sodium (Na)-Total	2.5		2.0	mg/L		16-OCT-14	R2998460
Zinc (Zn)-Total	<0.050		0.050	mg/L		16-OCT-14	R2998460
Miscellaneous Parameters							
Alkalinity, Total (as CaCO3)	6.6		2.0	mg/L		10-OCT-14	R2981805
BOD	<2.0		2.0	mg/L		08-OCT-14	R2983253
Hardness (as CaCO3)	13.8		0.50	mg/L		20-OCT-14	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1529295-11 BRUNSWICK BEACH (FIRST DRAW)							
Sampled By: Alberto Urrutia on 07-OCT-14 @ 12:40							
Matrix: Water							
Total Suspended Solids	<3.0		3.0	mg/L		11-OCT-14	R2984125
Total Organic Carbon	0.84		0.50	mg/L		17-OCT-14	R3001214
Turbidity	0.13		0.10	NTU		08-OCT-14	R2977640
pH	7.50		0.10	pH		15-OCT-14	R2989733
THM by Headspace GCMS							
Total Trihalomethane-THM							
Total THMs	0.0253		0.0020	mg/L		20-OCT-14	
VOC (THM) by Headspace GCMS							
Chloroform	0.0253		0.0010	mg/L	19-OCT-14	19-OCT-14	R3003109
Bromodichloromethane	<0.0010		0.0010	mg/L	19-OCT-14	19-OCT-14	R3003109
Bromoform	<0.0010		0.0010	mg/L	19-OCT-14	19-OCT-14	R3003109
Dibromochloromethane	<0.0010		0.0010	mg/L	19-OCT-14	19-OCT-14	R3003109
L1529295-12 BRUNSWICK BEACH (AFTER FLUSH)							
Sampled By: Alberto Urrutia on 07-OCT-14 @ 12:40							
Matrix: Water							
Total Metals in Water (DW)							
Total Metals in Water by ICPMS(Low)							
Aluminum (Al)-Total	0.021		0.010	mg/L		18-OCT-14	R3005149
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		18-OCT-14	R3005149
Arsenic (As)-Total	0.00013		0.00010	mg/L		18-OCT-14	R3005149
Cadmium (Cd)-Total	<0.00020		0.00020	mg/L		18-OCT-14	R3005149
Chromium (Cr)-Total	<0.0020		0.0020	mg/L		18-OCT-14	R3005149
Copper (Cu)-Total	0.0073		0.0010	mg/L		18-OCT-14	R3005149
Lead (Pb)-Total	<0.00050		0.00050	mg/L		18-OCT-14	R3005149
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		18-OCT-14	R3005149
Potassium (K)-Total	0.11		0.10	mg/L		18-OCT-14	R3005149
Selenium (Se)-Total	<0.0010		0.0010	mg/L		18-OCT-14	R3005149
Uranium (U)-Total	<0.00010		0.00010	mg/L		18-OCT-14	R3005149
Total Metals in Water by ICPOES							
Barium (Ba)-Total	<0.020		0.020	mg/L		16-OCT-14	R2998460
Boron (B)-Total	<0.10		0.10	mg/L		16-OCT-14	R2998460
Calcium (Ca)-Total	4.90		0.10	mg/L		16-OCT-14	R2998460
Iron (Fe)-Total	0.049		0.030	mg/L		16-OCT-14	R2998460
Magnesium (Mg)-Total	0.48		0.10	mg/L		16-OCT-14	R2998460
Sodium (Na)-Total	2.6		2.0	mg/L		16-OCT-14	R2998460
Zinc (Zn)-Total	<0.050		0.050	mg/L		16-OCT-14	R2998460
L1529295-13 ELEMENTARY SCHOOL (FIRST DRAW)							
Sampled By: Alberto Urrutia on 07-OCT-14 @ 07:20							
Matrix: Water							
Total Metals in Water (DW)							
Total Mercury in Water by CVAFS							
Mercury (Hg)-Total	<0.00020		0.00020	mg/L		08-OCT-14	R2977449
Total Metals in Water by ICPMS(Low)							
Aluminum (Al)-Total	0.019		0.010	mg/L		18-OCT-14	R3005149
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		18-OCT-14	R3005149
Arsenic (As)-Total	0.00017		0.00010	mg/L		18-OCT-14	R3005149
Cadmium (Cd)-Total	<0.00020		0.00020	mg/L		18-OCT-14	R3005149
Chromium (Cr)-Total	<0.0020		0.0020	mg/L		18-OCT-14	R3005149
Copper (Cu)-Total	0.0066		0.0010	mg/L		18-OCT-14	R3005149
Lead (Pb)-Total	0.00748		0.00050	mg/L		18-OCT-14	R3005149
Manganese (Mn)-Total	0.0024		0.0020	mg/L		18-OCT-14	R3005149

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1529295-13 ELEMENTARY SCHOOL (FIRST DRAW)							
Sampled By: Alberto Urrutia on 07-OCT-14 @ 07:20							
Matrix: Water							
Total Metals in Water by ICPMS(Low)							
Potassium (K)-Total	<0.10		0.10	mg/L		18-OCT-14	R3005149
Selenium (Se)-Total	<0.0010		0.0010	mg/L		18-OCT-14	R3005149
Uranium (U)-Total	<0.00010		0.00010	mg/L		18-OCT-14	R3005149
Total Metals in Water by ICPOES							
Barium (Ba)-Total	<0.020		0.020	mg/L		16-OCT-14	R2998460
Boron (B)-Total	<0.10		0.10	mg/L		16-OCT-14	R2998460
Calcium (Ca)-Total	4.60		0.10	mg/L		16-OCT-14	R2998460
Iron (Fe)-Total	<0.030		0.030	mg/L		16-OCT-14	R2998460
Magnesium (Mg)-Total	0.54		0.10	mg/L		16-OCT-14	R2998460
Sodium (Na)-Total	3.0		2.0	mg/L		16-OCT-14	R2998460
Zinc (Zn)-Total	0.085		0.050	mg/L		16-OCT-14	R2998460
Miscellaneous Parameters							
Alkalinity, Total (as CaCO3)	6.3		2.0	mg/L		10-OCT-14	R2981805
BOD	<2.0		2.0	mg/L		08-OCT-14	R2983253
Hardness (as CaCO3)	13.7		0.50	mg/L		20-OCT-14	
Total Suspended Solids	<3.0		3.0	mg/L		11-OCT-14	R2984125
Total Organic Carbon	0.72		0.50	mg/L		17-OCT-14	R3001214
Turbidity	0.17		0.10	NTU		08-OCT-14	R2977640
pH	7.47		0.10	pH		15-OCT-14	R2989733
THM by Headspace GCMS							
Total Trihalomethane-THM							
Total THMs	0.0264		0.0020	mg/L		20-OCT-14	
VOC (THM) by Headspace GCMS							
Chloroform	0.0264		0.0010	mg/L	19-OCT-14	19-OCT-14	R3003109
Bromodichloromethane	<0.0010		0.0010	mg/L	19-OCT-14	19-OCT-14	R3003109
Bromoform	<0.0010		0.0010	mg/L	19-OCT-14	19-OCT-14	R3003109
Dibromochloromethane	<0.0010		0.0010	mg/L	19-OCT-14	19-OCT-14	R3003109
L1529295-14 ELEMENTARY SCHOOL (AFTER FLUSH)							
Sampled By: Alberto Urrutia on 07-OCT-14 @ 07:20							
Matrix: Water							
Total Metals in Water (DW)							
Total Metals in Water by ICPMS(Low)							
Aluminum (Al)-Total	0.013		0.010	mg/L		18-OCT-14	R3005149
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		18-OCT-14	R3005149
Arsenic (As)-Total	0.00012		0.00010	mg/L		18-OCT-14	R3005149
Cadmium (Cd)-Total	<0.00020		0.00020	mg/L		18-OCT-14	R3005149
Chromium (Cr)-Total	<0.0020		0.0020	mg/L		18-OCT-14	R3005149
Copper (Cu)-Total	0.0026		0.0010	mg/L		18-OCT-14	R3005149
Lead (Pb)-Total	<0.00050		0.00050	mg/L		18-OCT-14	R3005149
Manganese (Mn)-Total	0.0023		0.0020	mg/L		18-OCT-14	R3005149
Potassium (K)-Total	<0.10		0.10	mg/L		18-OCT-14	R3005149
Selenium (Se)-Total	<0.0010		0.0010	mg/L		18-OCT-14	R3005149
Uranium (U)-Total	<0.00010		0.00010	mg/L		18-OCT-14	R3005149
Total Metals in Water by ICPOES							
Barium (Ba)-Total	<0.020		0.020	mg/L		16-OCT-14	R2998460
Boron (B)-Total	<0.10		0.10	mg/L		16-OCT-14	R2998460
Calcium (Ca)-Total	4.78		0.10	mg/L		16-OCT-14	R2998460
Iron (Fe)-Total	0.030		0.030	mg/L		16-OCT-14	R2998460
Magnesium (Mg)-Total	0.53		0.10	mg/L		16-OCT-14	R2998460
Sodium (Na)-Total	2.6		2.0	mg/L		16-OCT-14	R2998460
Zinc (Zn)-Total	<0.050		0.050	mg/L		16-OCT-14	R2998460

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1529295-14 ELEMENTARY SCHOOL (AFTER FLUSH)							
Sampled By: Alberto Urrutia on 07-OCT-14 @ 07:20							
Matrix: Water							
L1529295-15 HARVEY RAW WATER (AFTER FLUSH)							
Sampled By: Alberto Urrutia on 07-OCT-14 @ 11:05							
Matrix: Surface Water							
Total Metals in Water (DW)							
Total Mercury in Water by CVAFS							
Mercury (Hg)-Total	<0.00020		0.00020	mg/L		08-OCT-14	R2977449
Total Metals in Water by ICPMS(Low)							
Aluminum (Al)-Total	0.033		0.010	mg/L		18-OCT-14	R3005149
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		18-OCT-14	R3005149
Arsenic (As)-Total	0.00012		0.00010	mg/L		18-OCT-14	R3005149
Cadmium (Cd)-Total	<0.00020		0.00020	mg/L		18-OCT-14	R3005149
Chromium (Cr)-Total	<0.0020		0.0020	mg/L		18-OCT-14	R3005149
Copper (Cu)-Total	0.0060		0.0010	mg/L		18-OCT-14	R3005149
Lead (Pb)-Total	<0.00050		0.00050	mg/L		18-OCT-14	R3005149
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		18-OCT-14	R3005149
Potassium (K)-Total	0.14		0.10	mg/L		18-OCT-14	R3005149
Selenium (Se)-Total	<0.0010		0.0010	mg/L		18-OCT-14	R3005149
Uranium (U)-Total	<0.00010		0.00010	mg/L		18-OCT-14	R3005149
Total Metals in Water by ICPOES							
Barium (Ba)-Total	<0.020		0.020	mg/L		16-OCT-14	R2998460
Boron (B)-Total	<0.10		0.10	mg/L		16-OCT-14	R2998460
Calcium (Ca)-Total	2.12		0.10	mg/L		16-OCT-14	R2998460
Iron (Fe)-Total	<0.030		0.030	mg/L		16-OCT-14	R2998460
Magnesium (Mg)-Total	0.25		0.10	mg/L		16-OCT-14	R2998460
Sodium (Na)-Total	<2.0		2.0	mg/L		16-OCT-14	R2998460
Zinc (Zn)-Total	<0.050		0.050	mg/L		16-OCT-14	R2998460
Miscellaneous Parameters							
Alkalinity, Total (as CaCO3)	5.7		2.0	mg/L		10-OCT-14	R2981805
BOD	<2.0		2.0	mg/L		08-OCT-14	R2983253
Hardness (as CaCO3)	6.34		0.50	mg/L		20-OCT-14	
Total Suspended Solids	<3.0		3.0	mg/L		11-OCT-14	R2984125
Total Organic Carbon	0.92		0.50	mg/L		17-OCT-14	R3001214
Turbidity	<0.10		0.10	NTU		08-OCT-14	R2977640
pH	6.48		0.10	pH		17-OCT-14	R2998403
L1529295-16 MAGNESIA RAW WATER (AFTER FLUSH)							
Sampled By: Alberto Urrutia on 07-OCT-14 @ 09:20							
Matrix: Surface Water							
Total Metals in Water (DW)							
Total Mercury in Water by CVAFS							
Mercury (Hg)-Total	<0.00020		0.00020	mg/L		08-OCT-14	R2977449
Total Metals in Water by ICPMS(Low)							
Aluminum (Al)-Total	0.021		0.010	mg/L		18-OCT-14	R3005149
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		18-OCT-14	R3005149
Arsenic (As)-Total	0.00013		0.00010	mg/L		18-OCT-14	R3005149
Cadmium (Cd)-Total	<0.00020		0.00020	mg/L		18-OCT-14	R3005149
Chromium (Cr)-Total	<0.0020		0.0020	mg/L		18-OCT-14	R3005149
Copper (Cu)-Total	0.0043		0.0010	mg/L		18-OCT-14	R3005149
Lead (Pb)-Total	<0.00050		0.00050	mg/L		18-OCT-14	R3005149
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		18-OCT-14	R3005149
Potassium (K)-Total	0.10		0.10	mg/L		18-OCT-14	R3005149

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1529295-16 MAGNESIA RAW WATER (AFTER FLUSH)							
Sampled By: Alberto Urrutia on 07-OCT-14 @ 09:20							
Matrix: Surface Water							
Total Metals in Water by ICPMS(Low)							
Selenium (Se)-Total	<0.0010		0.0010	mg/L		18-OCT-14	R3005149
Uranium (U)-Total	<0.00010		0.00010	mg/L		18-OCT-14	R3005149
Total Metals in Water by ICPOES							
Barium (Ba)-Total	<0.020		0.020	mg/L		16-OCT-14	R2998460
Boron (B)-Total	<0.10		0.10	mg/L		16-OCT-14	R2998460
Calcium (Ca)-Total	5.06		0.10	mg/L		16-OCT-14	R2998460
Iron (Fe)-Total	<0.030		0.030	mg/L		16-OCT-14	R2998460
Magnesium (Mg)-Total	0.54		0.10	mg/L		16-OCT-14	R2998460
Sodium (Na)-Total	<2.0		2.0	mg/L		16-OCT-14	R2998460
Zinc (Zn)-Total	<0.050		0.050	mg/L		16-OCT-14	R2998460
Miscellaneous Parameters							
Alkalinity, Total (as CaCO3)	5.3		2.0	mg/L		10-OCT-14	R2981805
BOD	<2.0		2.0	mg/L		08-OCT-14	R2983253
Hardness (as CaCO3)	14.9		0.50	mg/L		20-OCT-14	
Total Suspended Solids	<3.0		3.0	mg/L		11-OCT-14	R2984125
Total Organic Carbon	0.75		0.50	mg/L		17-OCT-14	R3001214
Turbidity	0.11		0.10	NTU		08-OCT-14	R2977640
pH	7.42		0.10	pH		15-OCT-14	R2989733

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-COL-VA	Water	Alkalinity by Colourimetric (Automated)	EPA 310.2

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

BOD5-VA	Water	Biochemical Oxygen Demand- 5 day	APHA 5210 B- "BIOCHEMICAL OXYGEN DEMAND"

This analysis is carried out using procedures adapted from APHA Method 5210 B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.

BOD5-VA	Water	Biochemical Oxygen Demand- 5 day	APHA 5210 B- BIOCHEMICAL OXYGEN DEMAND

This analysis is carried out using procedures adapted from APHA Method 5210 B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.

CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

HARDNESS-CALC-VA	Water	Hardness	APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-TOT-CVAFS-VA	Water	Total Mercury in Water by CVAFS	EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

MET-TOT-ICP-VA	Water	Total Metals in Water by ICPOES	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-LOW-MS-VA	Water	Total Metals in Water by ICPMS(Low)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

THM-HSMS-VA	Water	VOC (THM) by Headspace GCMS	EPA SW-846, METHOD 8260

This procedure is suitable for the analysis of trihalomethanes (chloroform, bromodichloromethane, dibromochloromethane, and bromoform) in chlorinated waters that have been treated to prevent the formation of trihalomethanes after sample collection. The analysis involves the headspace extraction of the sample prior to analysis by capillary column gas chromatography with mass spectrometric detection (GC/MS). The trihalomethanes analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 8260, published by the United States Environmental Protection Agency (EPA).

THM-SUM-CALC-VA	Water	Total Trihalomethane-THM	CALCULATION

Total Trihalomethanes (where not conducted as part of a formation potential analysis) is equal to the sum of the individual parameter concentrations with non-detect results treated as zero.

TSS-VA	Water	Total Suspended Solids by Gravimetric	APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
(TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.			
TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"
This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.			
TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity
This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.			

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

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
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

1

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 wwt - 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.

ALS E

L1529295-COFC

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC # _____

Page 1 of 1

Report To		Report Format / Distribution	Service Requested (Rush for routine analysis subject to availability)
Company:	Village of Lions Bay	☐ Standard ☐ Other	◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Nikii Hoglund	☑ PDF ☐ Excel ☐ Digital ☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	400 Centre Rd	Email 1: aurrutia@lionsbay.ca	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Lions Bay, BC V0N 2E0	Email 2: works@lionsbay.ca	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	604 921 9833 Fax:	Email 3:	
Invoice To	Same as Report ? ☑ Yes ☐ No	Client / Project Information	Analysis Request
Hardcopy of Invoice with Report?	☐ Yes ☐ No	Job #:	Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:		PO / AFE:	
Contact:		LSD:	
Address:			
Phone:	Fax:	Quote #:	

Lab Work Order # (lab use only): _____ | ALS Contact: Selam Worku | Sampler: Alberto Urrutia

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Hardness	pH	TSS	BOD	Turbidity	Alkalinity Total	Total Metals (First Draw)	Total Metals (After Flush)	Mercury	Total Organic Carbon	Trihalomethanes		Number of Containers
	Harvey Tank	07-Oct-14	11:00	Water	X	X	X	X	X	X	X	X	X	X	X		8
	Store / Café	07-Oct-14	7:40	Water	X	X	X	X	X	X	X	X	X	X	X		8
	Lions Bay Ave.	07-Oct-14	12:10	Water	X	X	X	X	X	X	X	X	X	X	X		8
	Kelvin Grove	07-Oct-14	8:15	Water	X	X	X	X	X	X	X	X	X	X	X		8
	Magnesia Tank	07-Oct-14	9:15	Water	X	X	X	X	X	X	X	X	X	X	X		8
	Brunswick Beach	07-Oct-14	12:40	Water	X	X	X	X	X	X	X	X	X	X	X		8
	Elementary School	07-Oct-14	7:20	Water	X	X	X	X	X	X	X	X	X	X	X		8
	Harvey Raw Water	07-Oct-14	11:05	Surface Water	X	X	X	X	X	X		X	X	X			4
	Magnesia Raw Water	07-Oct-14	9:20	Surface Water	X	X	X	X	X	X		X	X	X			4

Short Holding Time

Rush Processing

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by: Dacosta	Date: OCT 7	Time: 15:20 pm	Temperature: 10.1 °C	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF

GENF 18.01 Front

APPENDIX E: BOIL WATER ADVISORIES ISSUED

BOIL WATER NOTICE

Issued pursuant to Order of a Drinking Water Officer
under Section 14 of the *Drinking Water Protection Act*

WATER SUPPLY SYSTEM COVERED BY THIS NOTICE

This Boil Water Notice issued **March 6, 2014** by Drinking Water Officer **Nader Massoud** applies to the following water supply system:

> **Lions Bay Water System** located at **400 Centre Street, Lions Bay, V0N 2E0**
> For **Harvey Creek** and **Magnesia Creek** Water systems, and should be followed by all persons using water from the system.

REASON FOR THIS NOTICE

This Notice is being issued because:

- **Elevated turbidity levels on March 6, 2014**

REQUIREMENTS

The Drinking Water Officer, in consultation with the Medical Health Officer, requires the following steps be taken to minimize the risks associated with this water system.

1. **Water from the water system must not be used for DRINKING, WASHING READY TO EAT FOODS, MAKING ICE FOR CONSUMPTION OR BRUSHING TEETH. Must use either bottled water or water that has been otherwise fully disinfected as per instructions on the HealthLinkBC #49b – How to Disinfect Drinking Water document.**

2. **Water can be used as is for flushing toilets, laundry and the washing of non-food preparation surfaces.**

3. **Contact the issuing Vancouver Coastal Health Drinking Water Officer at 604-983-6758 when the water treatment system is back in operation to discuss the procedures to properly disinfect the water distribution system and the water testing necessary before this notice will be rescinded.**

OBLIGATION OF OWNERS OF PUBLIC PREMISES

Owners of public premises served by this water system must:

(a) notify the public that the water is not potable water by posting a sign at every sink or drinking water fountain accessible to the public;

(b) if normal business practices provide an opportunity, verbally advise any person who may use the domestic water system for a domestic purpose that the water is not potable water.

(See Drinking Water Protection Regulation, section 10)

DURATION OF THIS NOTICE

This Notice remains in effect unless and until another public notice is issued upon the Order of a Drinking Water Officer advising that the Notice has been amended or may be rescinded.

CONSEQUENCES OF FAILURE TO COMPLY

It is an offence under the *Drinking Water Protection Act* to fail to comply with an Order under Section 14 of this Act. Failure to provide public notice of a drinking water threat issued is subject to a Violation Ticket with a monetary penalty of $575 for each day of non-compliance.

QUESTIONS

If you have any questions concerning this notice, please contact:

Will Emo, Village of Lions Bay at **604-968-7309**

Or:

Nader Massoud, Drinking Water Officer, Vancouver Coastal Health at **604-983-6758**

BOIL WATER NOTICE

Issued pursuant to Order of a Drinking Water Officer
under Section 14 of the *Drinking Water Protection Act*

WATER SUPPLY SYSTEM COVERED BY THIS NOTICE

This Boil Water Notice issued **October 22, 2014** by Drinking Water Officer Mark Lysyshyn applies to the following water supply system:

> **Lions Bay Water System** located at **400 Centre Street, Lions Bay, V0N 2E0**
> For **Harvey Creek** and **Magnesia Creek** Water systems, and should be followed by all persons using water from the system.

REASON FOR THIS NOTICE

This Notice is being issued because:

- **Elevated turbidity levels on October 22, 2014**
- **Low chlorine residuals on October 22, 2014**

REQUIREMENTS

The Drinking Water Officer, in consultation with the Medical Health Officer, requires the following steps be taken to minimize the risks associated with this water system.

1. **Water from the water system must not be used for DRINKING, WASHING READY TO EAT FOODS, MAKING ICE FOR CONSUMPTION OR BRUSHING TEETH. Must use either bottled water or water that has been otherwise fully disinfected as per instructions on the HealthLinkBC #49b – How to Disinfect Drinking Water document.**

2. **Water can be used as is for flushing toilets, laundry and the washing of non food preparation surfaces.**

3. **Contact the issuing Vancouver Coastal Health Drinking Water Officer at 604-983-6758 when the water treatment system is back in operation to discuss the procedures to properly disinfect the water distribution system and the water testing necessary before this notice will be rescinded.**

OBLIGATION OF OWNERS OF PUBLIC PREMISES

Owners of public premises served by this water system must:

(a) notify the public that the water is not potable water by posting a sign at every sink or drinking water fountain accessible to the public;

(b) if normal business practices provide an opportunity, verbally advise any person who may use the domestic water system for a domestic purpose that the water is not potable water.

(See Drinking Water Protection Regulation, section 10)

DURATION OF THIS NOTICE

This Notice remains in effect unless and until another public notice is issued upon the Order of a Drinking Water Officer advising that the Notice has been amended or may be rescinded.

CONSEQUENCES OF FAILURE TO COMPLY

It is an offence under the *Drinking Water Protection Act* to fail to comply with an Order under Section 14 of this Act. Failure to provide public notice of a drinking water threat issued is subject to a Violation Ticket with a monetary penalty of $575 for each day of non-compliance.

QUESTIONS

If you have any questions concerning this notice, please contact:

Nikii Hoglund, Village of Lions Bay at **604-921-9833**

Or:

Nader Massoud, Drinking Water Officer, Vancouver Coastal Health at **604-983-6758**

BOIL WATER NOTICE

Issued pursuant to Order of a Drinking Water Officer
under Section 14 of the *Drinking Water Protection Act*

WATER SUPPLY SYSTEM COVERED BY THIS NOTICE

This Boil Water Notice issued **December 11, 2014** by Drinking Water Officer **Nader Massoud** applies to the following water supply system:

> **Harvey Creek and Magnesia Creek Water System (Village of Lions Bay)** located at **400 Centre Road, Lions Bay, V0N 2E0**

and should be followed by all persons using water from the system.

REASON FOR THIS NOTICE

This Notice is being issued because:

- **Elevated turbidity and lose of water sources.**

REQUIREMENTS

The Drinking Water Officer, in consultation with the Medical Health Officer, requires the following steps be taken to minimize the risks associated with this water system.

1. **Water from the water system must not be used for DRINKING, WASHING READY TO EAT FOODS, MAKING ICE FOR CONSUMPTION OR BRUSHING TEETH. Must use either bottled water or water that has been otherwise fully disinfected as per instructions on the HealthLinkBC #49b – How to Disinfect Drinking Water document.**

2. **Water can be used as is for flushing toilets, laundry and the washing of non food preparation surfaces.**

3. **Need to contact the issuing Vancouver Coastal Health Drinking Water Officer at 604-983-6700 when the water treatment system is back in operation to discuss the procedures to properly disinfect the water distribution system and the water testing necessary before this notice will be rescinded.**

4. **Operator is to undertake water conservation measures.**

OBLIGATION OF OWNERS OF PUBLIC PREMISES

Owners of public premises served by this water system must:

(a) notify the public that the water is not potable water by posting a sign at every sink or drinking water fountain accessible to the public;

(b) if normal business practices provide an opportunity, verbally advise any person who may use the domestic water system for a domestic purpose that the water is not potable water.

(See Drinking Water Protection Regulation, section 10)

DURATION OF THIS NOTICE

This Notice remains in effect unless and until another public notice is issued upon the Order of a Drinking Water Officer advising that the Notice has been amended or may be rescinded.

CONSEQUENCES OF FAILURE TO COMPLY

It is an offence under the *Drinking Water Protection Act* to fail to comply with an Order under Section 14 of this Act. Failure to provide public notice of a drinking water threat issued is subject to a Violation Ticket with a monetary penalty of $575 for each day of non-compliance.

QUESTIONS

If you have any questions concerning this notice, please contact:

Nader Massoud, Drinking Water Officer, Vancouver Coastal Health at **604-983-6758**

APPENDIX F: EMERGENCY RESPONSE PLAN

EMERGENCY RESPONSE PLAN

Table 1 below outlines the notification process for unusual situations that could potentially affect the Village's potable water system.

Table 1. Notification of Unusual Situations Potentially Affecting Water Quality

Situation	Notifying Agency	Agency Notified	Notification Time Frame
E. coli – positive sample	VCH/Lab	VoLB and VCH	Immediate
Total coliform >10/100ml & low chlorine residual	VoLB	VCH	Immediate
Chemical contamination	VoLB	VCH	Immediate
Turbidity events >5 NTU	VoLB	VCH	Immediate
Disinfection failures/continued loss of residual	VoLB	VCH	Immediate for continued loss of residual
Loss of pressure due to high demand	VoLB	VCH	Immediate
Water main breaks	VoLB	VCH	Immediate

E. COLI POSITIVE SAMPLES

1. Any interim samples (samples that have been taken in the period between the time the E. coli sample was first drawn and when the laboratory determined it to be positive) that have been taken from the same sampling station will be immediately examined by the laboratory.
2. The chlorine residual noted on the Water Operator's field sheet will be reviewed by the laboratory and compared to previous test results to determine if there is any localized loss of disinfectant residual.
3. The Public Works Manager (or designate) and VCH will be notified immediately by the laboratory.
4. Arrangements will be made for the immediate collection of a repeat sample, and, where possible, both upstream and downstream of the E. coli positive sample location.
5. VCH and the Public Works Manager (or designate) will liaise and determine the need for a Boil Water Advisory (BWA) to be issued. If it is determined to be warranted, VCH will issue the BWA.

6. The laboratory will continue to test the subsequent samples. Once consecutive negative sample results are returned, the Public Works Manager (or designate) will liaise again with VCH and determine whether the BWA can be lifted.

CHEMICAL CONTAMINATION

In the event of chemical contamination of the Village's water supply or distribution system, VCH will immediately be notified, and steps will commence to isolate the contaminated area. The level of contamination will be determined through water sampling and testing; identified; and any public health risk factors associated with the chemical presence and level will be determined. A public advisory will be issued and carried out by the Public Works Manager (or designate) under the guidance of VCH. Once the contamination is remedied and consecutive negative sample results are returned from the laboratory, the Public Works Manager (or designate) will again liaise with VCH and determine whether the public advisory can be lifted.

TURBIDITY EVENTS

Turbidity in the Village's treated water system is monitored on a regular basis through the water sampling and testing program. Water sample turbidity results that register >1 - 3 NTU are scrutinized, along with corresponding chlorine residual levels, and actively monitored. Any sections of the water system generating high turbidity results are field-checked and flushed if required.

Turbidity events in the raw source water impact the Village's water treatment plants. The performance of the primary UV treatment is affected by increased turbidity because water that that has higher turbidity absorbs a significant amount of UV light, and will therefore have a correspondingly low UV transmittance (UVT) rate. The UV system automatically increases lamp intensity to counter the lower UVT. If turbidity exceeds 5 NTUs entering the plants, the UV system will send an alarm through SCADA to notify the Water Operator, and the UV reactors will shut down. The Water Operator will immediately inform the Public Works Manager (or designate) and investigate the alarm at the plant.

During turbidity events in excess of 5 NTU, microbiological sampling and testing is increased at all sampling locations; chlorine residual sampling and testing is likewise increased; and the Village will contact VCH, who may issue a Boil Water Advisory.

DISINFECTION FAILURES

Chlorine residuals in the Village's treated water system are monitored on a regular basis through the water sampling and testing program. If a daily sample registers below the generally accepted minimum chlorine residual of 0.2ppm, the Water Operator will first flush water through the system to attempt to bring the chlorine residual up to the minimum required. Should the results continue to not meet the minimum, the Village will immediately

commence increased monitoring of all chlorine residuals in the system, including the reservoir tank, and determine the root cause of the problem. Chlorine will be added manually to the reservoir tank if required; and residuals checked frequently at all locations. The Public Works Manager (or designate) will contact VCH, who may issue a Boil Water Advisory if continued loss of residual is observed.

LOSS OF PRESSURE DUE TO HIGH DEMAND

In the event of adverse pressure loss due to high demand, Village crews will make adjustments to the system to isolate the affected section, and then take measures to supplement pressure in the affected area. The Public Works Manager (or designate) will immediately consult with VCH regarding further actions; and all water quality complaints from the public will be immediately and thoroughly investigated for potential contamination.

WATER MAIN BREAKS

In the event of a water main break where chemical or microbiological contamination of the system is suspected, Village crews will make adjustments to the system to isolate the contaminated section from the rest of the distribution system. The Public Works Manager (or designate) will immediately consult with VCH regarding further actions; and all water quality complaints from the public will be immediately and thoroughly investigated for potential contamination. Water samples will be taken from the vicinity and downstream of the break if possible, and tested for the suspected contamination. The same procedures as noted under E. coli positive samples above will be implemented if required.

APPENDIX G: VANCOUVER COASTAL HEALTH PERMIT TO OPERATE

Vancouver Coastal Health

Promoting wellness. Ensuring care.

Vancouver Coastal Health

PERMIT

TO OPERATE

Drinking Water System 301-10,000 Connections

Facility Number:	3317552348
Name of Facility:	Lions Bay Harvey Creek Water System
Address:	Upper Oceanview Road Lions Bay, BC
Owner:	Municipality of The Village of Lions Bay

Conditions:

1. Submit weekly water samples for bacteriological testing at sites approved by VCH.
2. Chlorine residuals must be recorded daily at locations approved by VCH.
3. Biannual flushing on the entire distribution system.
4. Daily turbidity testing.
5. Annual chemical testing of source
6. Submit annual updated ERP to VCH.

September 29, 2010

Effective Date

Rod Schluter
Environmental Health Officer

This permit must be displayed in a conspicuous place and is nontransferable.

Vancouver Coastal Health
Expires March 2015
7184

Vancouver Coastal Health

Promoting wellness. Ensuring care.

Vancouver Coastal Health

PERMIT

TO OPERATE

Drinking Water System 301-10,000 Connections

Facility Number:	3317552347
Name of Facility:	Lions Bay Magnesia Creek Water System
Address:	Upper Sunset Road Lions Bay, BC
Owner:	Municipality of The Village of Lions Bay

Conditions:

1. Submit weekly water samples for bacteriological testing at sites approved by VCH.
2. Chlorine residuals must be recorded daily at locations approved by VCH.
3. Biannual flushing on the entire distribution system.
4. Daily turbidity testing.
5. Annual chemical testing of source
6. Submit annual updated ERP to VCH.

September 29, 2010

Effective Date

Rod Schluter
Environmental Health Officer

This permit must be displayed in a conspicuous place and is nontransferable.

Vancouver Coastal Health
Expires March 2015
7185

ENV20 - 08/03

APPENDIX H: EOCP FACILITY CLASSIFICATION

ENVIRONMENTAL OPERATORS CERTIFICATION PROGRAM

Facility Classification

THIS IS TO CERTIFY THAT

Village of Lions Bay Water System

has been classified by the Environmental Operators Certification Program in accordance with the guidelines established in co-operation with the Association of Boards of Certification (A.B.C.) as

Class II

Dated at Burnaby, B.C.on July 28, 2003

Secretary - Certification Board

Chairman - Certification Board

CERTIFICATE NO.675

eocp

MEMBER OF ASSOCIATION OF BOARDS OF CERTIFICATION
AFFILIATE OF B.C. WATER AND WASTE ASSOCIATION
A Society Incorporated under the Society Act, S.B.C. S-28724

APPENDIX I: EOCP OPERATOR CERTIFICATES

ENVIRONMENTAL OPERATORS CERTIFICATION PROGRAM

Certificate of Qualification

This is to certify that:

Alberto Urrutia

By Examination Has Qualified As A

Water Distribution System Operator

and certifies that he/she has met the established qualifications and has the ability to efficiently operate and maintain a specified maximum size and type of water distribution system designated as follows:

Level II

Secretary - Certification Board

Chairman - Certification Board

July 12, 2006

Certificate No: 4766

eocp

Member of Association of Boards of Certification
Affiliate of B.C. Water and Waste Association

This certificate shall be in full force and effect when accompanied by an annual renewal seal

A Society Incorporated under the Society Act, S.B.C. S-28724

ENVIRONMENTAL OPERATORS CERTIFICATION PROGRAM

Course Completion Certificate

This is to certify that

Alberto Urrutia

By Examination Has Qualified As A

Chlorine Handler

Secretary - Certification Board

Chairman - Certification Board

May 6, 2005

Certificate No. CH-4766

eocp