Village of Lions Bay

2023 ANNUAL REPORT:
Wastewater Discharge Permit 5188
(Lot 45 Tidewater Way, Kelvin Grove, Lions Bay)

29 July 2024

CONTENTS

INTRODUCTION

Domestic wastewater produced by 95 residences in Lions Bay's Kelvin Grove neighbourhood is directed through 2,173 meters of 200 mm (8") PVC sanitary-sewer pipe to treatment at the municipality's wastewater treatment plant (WWTP) located at the Kelvin Grove Beach & Marine Park.

2023 operating cost of the municipality's wastewater function was budgeted at $119,312 including amortisation. No capital expenditures were undertaken in 2023

A description of the wastewater treatment process is provided in an Appendix.

PERMIT REQUIREMENTS

The municipality's authority to discharge wastewater to the environment is provided under the *Environmental Management Act* by BC Ministry of Environment (and Climate Change Strategy) Permit 5188 (shown in an Appendix). Permit requirements are:

Permit parameter	Permit value
Max. volume	340 m^3/day
5-day biological oxygen demand, BOD_5	45 mg/ℓ
Total suspended solids, TSS	60 mg/ℓ
Sampling	Daily for volume, quarterly for BOD, TSS
Reporting	Annually

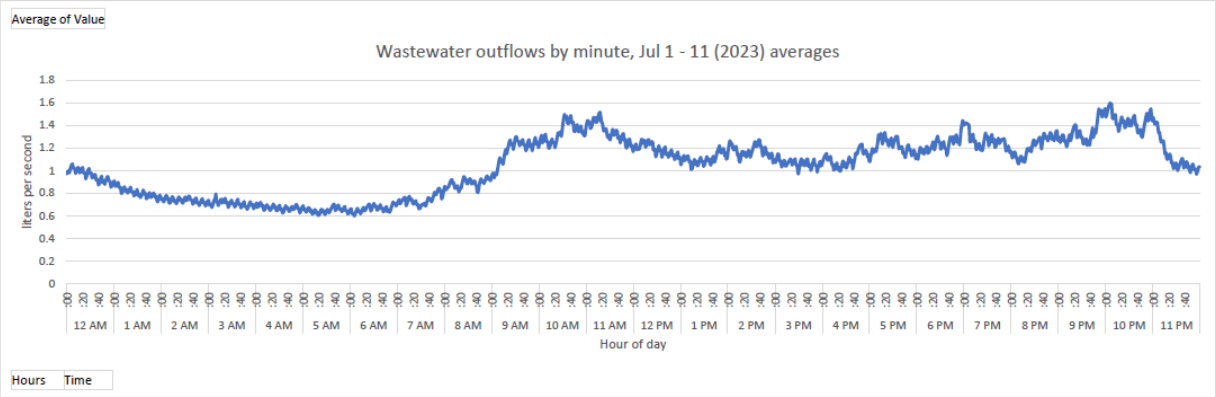
EFFLUENT PARAMETERS

Effluent is sampled quarterly. All samples were within permitted limits (detailed reports in an Appendix):

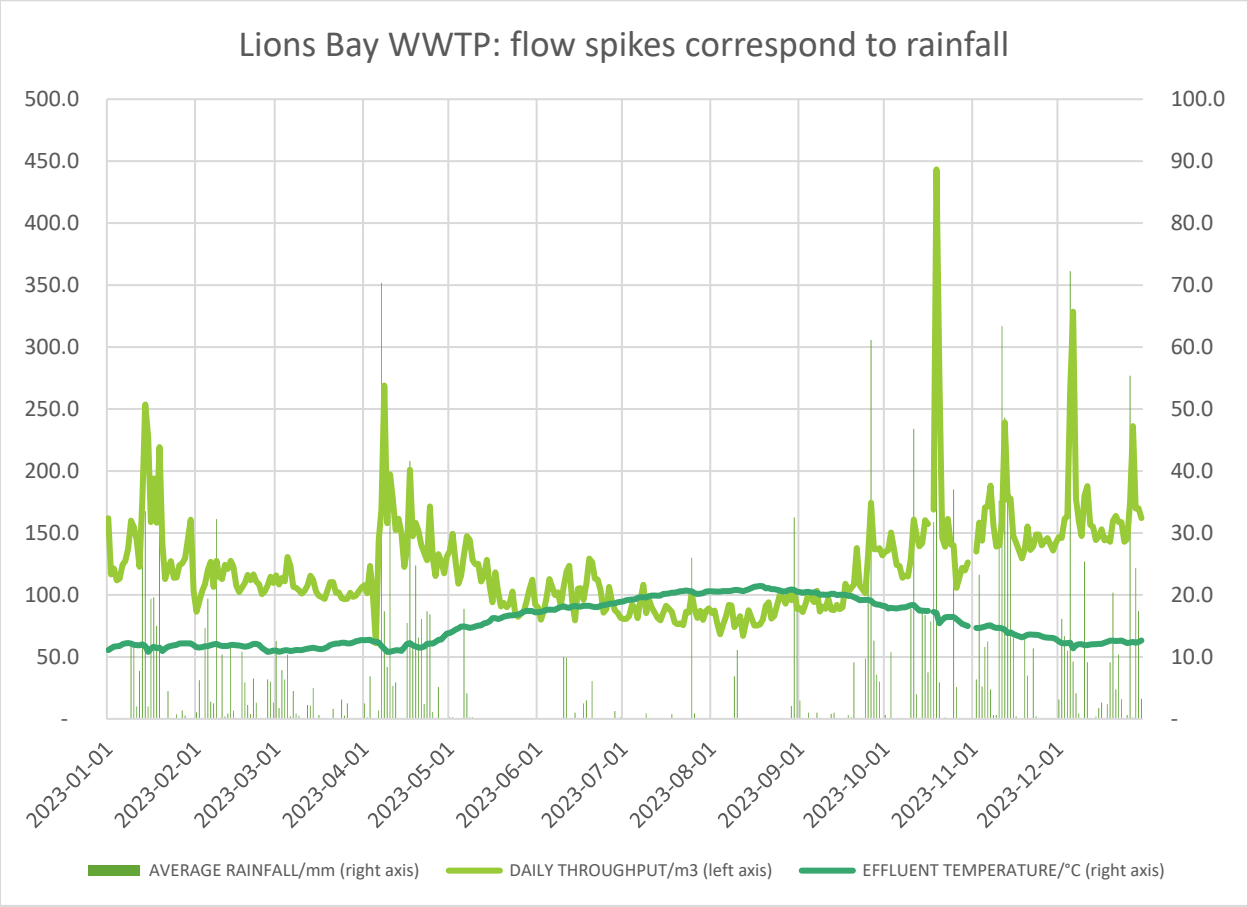
2023 sample date:	24 Mar.	16 Jun.	21 Sep.	15 Dec.
TSS, mg/ℓ (max. 60):	31.4	13.2	11.4	19.6
BOD_5, mg/ℓ (max. 45):	22.3	13.8	8.0	13.8

DISCHARGE VOLUMES

Daily flow data are provided in an Appendix. Flows exhibit a typical domestic diurnal cycle:



Although data is missing for three days due to control system outages, there was only one permit volume exceedance in 2023, corresponding to 239 mm of rain in the 10 preceding days:



95 residences have been connected to the system since at least the 1990s (three further residences commenced development in 2022 but were not yet connected in 2023). Despite no

change in the number of sewer connections, flows into the WWTP have been increasing year-on-year since 2021:

	2017	2018	2019	2020	2021[1]	2022	2023
Average daily flow (m^3/day)	92.4	80.4	72.2	81.3	100.5	116.6	122.2
Max. daily flow (m^3/day)	269.9	199.8	204.6	203.0	525.0	455.0[2]	443.4
Exceedances of 340 m^3/day	0	0	0	0	6	1	1

- Some of this increase may be explained by known use of residences in this neighbourhood as short-term rentals and secondary suites, with a likely a higher number of occupants per residence than average.
- The RBC was rebuilt in 2020 and early 2021, and flowmeter calibration may have changed, to be investigated in 2024.
- Notwithstanding changed usage, flow into the WWTP is known to increase soon after rainfall, implying stormwater or groundwater infiltration into the system.
    - Manhole barrels are observed spurting water from seams. A re-grouting program is being scoped, and cross-connections of stormwater and drainage to the sanitary sewer are being sought.
    - It is not only deterioration of the sewer network, but of private plumbing that is adding demand. Post-2023, for example, sewer inspections located four failed toilets adding about 0.5 liters per second, 43 m^3/day, to demand. A further 1.0 liters per second of constant demand, as revealed by flow between 2 and 4 am in summer (when water tables are assumed to be lower than the sewers), is being tracked down.

MAINTENANCE

ROUTINE

In accordance with the Permit, regular inspection and maintenance activities are conducted to keep the facility in good working order.

- Daily inspections check for vandalism, damage to media disks, shaft misalignment or deflection, motor and gearbox noise, sludge levels, smell and blockage of weirs and orifices.
- Gearbox oil is sampled, and fittings and bearings are lubricated monthly.

[1] The WWTP's RBC renovation was commissioned in Jan. 2021, but data logging was not available until March. Flows were estimated for Jan. and Feb. Atmospheric river events occurred in Oct. and Nov.

[2] A major storm event occurred in Dec. 2022

- Sludge pump out occurs based on sludge level in the primary and secondary clarifiers. In 2023, the WWTP was pumped on April 4 and October 25, both times removing about 30 m^3 of sludge.

NON-ROUTINE

In August 2022, the sewer network had been smoke tested, revealing several small leaks in sewer laterals and manholes. Letters were sent to property owners advising of private-side leaks and requiring their repair. Municipal staff are still addressing identified public-side defects.

In 2024, an in-house CCTV unit will be used to track down constant overnight flows into the WWTP, seemingly independent of recent precipitation. An outside provider with remotely operated crawler will be used where the in-house unit cannot make the bend. Smoke test results will be revisited. Motor and gearbox health temperature sensors will be connected to the municipality's SCADA process control system.

The outfall is inspected by diver every six years, with the last inspection in 2019.

FACILITY CLASSIFICATION

The Environmental Operators Certification Program Society (EOCP) classifies Lions Bay as a Small Wastewater System, valid until Feb. 28, 2026:

OPERATOR CERTIFICATIONS

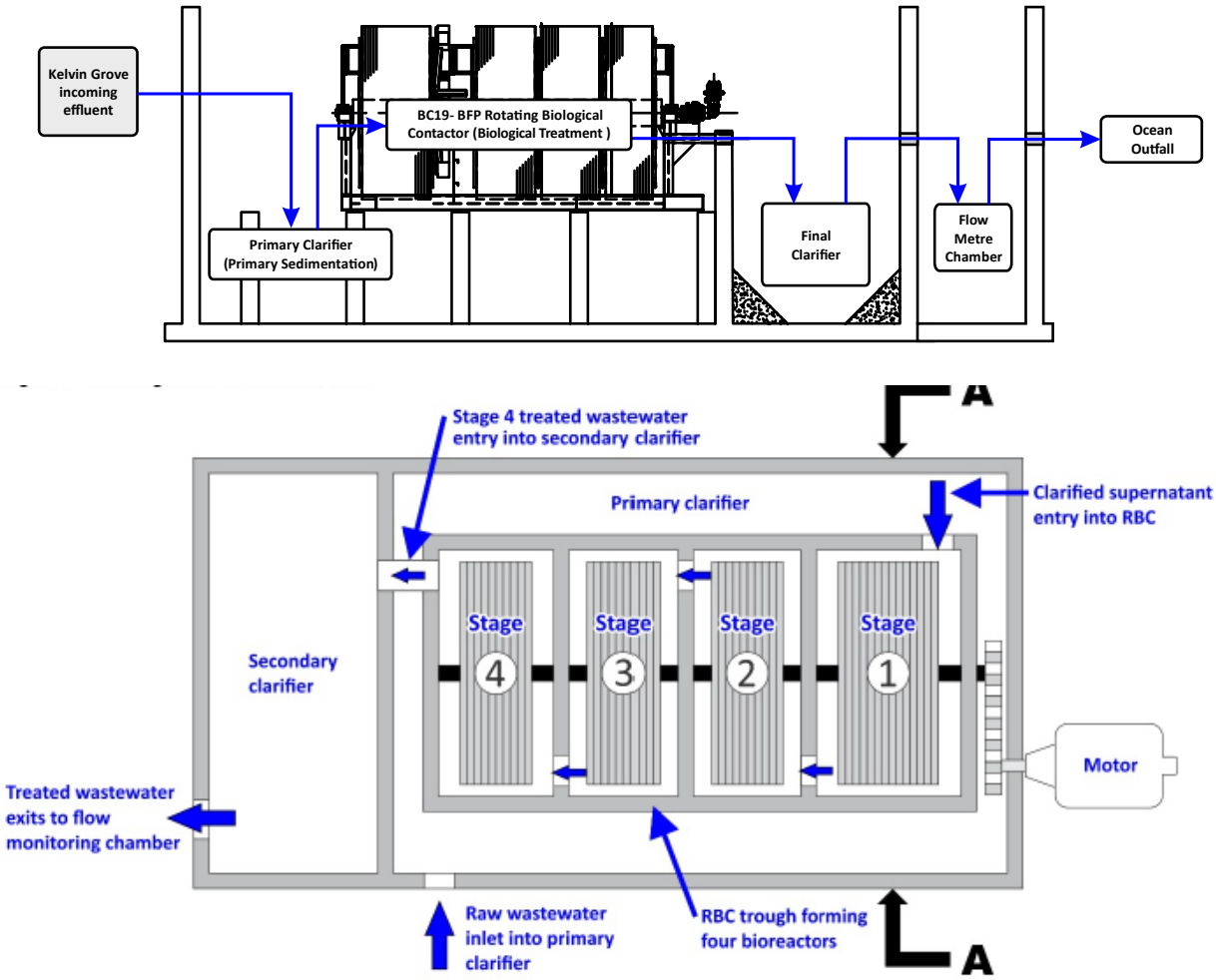
In 2023 the municipality fielded two EOCP-certified operators:

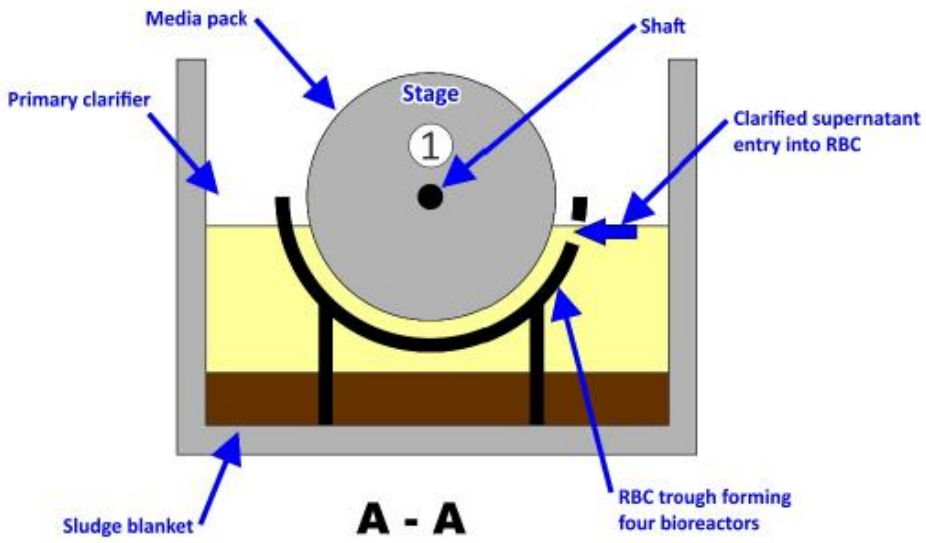
OPERATOR	**EOCP CERTIFICATIONS**
Foreman 1 AY	Small Wastewater Systems, Wastewater Collection 2
Technician 1 GS (from Dec. 23)	Small Wastewater Systems

APPENDIX 1 – WASTEWATER TREATMENT

The Kelvin Grove WWTP utilises the rotating biological contactor (RBC) process to treat wastewater in three stages: primary clarification, biological treatment and secondary clarification, before release to the ocean, through an outfall pipe 185 meters beyond and 60 metres below the low water mark.

Figure 1 - Treatment Process





PRIMARY CLARIFICATION

Mixed wastewater flows through the sewer network solely by gravity. Entering the WWTP, solids, fats, oils and suspended solids partially settle and form a sludge blanket at the bottom of the plant's primary clarifier.

Sludge depth over about 30 cm decreases treatment efficiency due to depletion of oxygen available for biological activity. Sludge is removed by vactor truck several times a year for transfer to Metro Vancouver's Iona Island wastewater facility in Richmond.

BIOLOGICAL TREATMENT

Biological wastewater treatment relies on naturally occurring bacteria and protozoa consuming the organic content of wastewater as fuel for their respiration and growth. From the primary clarifier, wastewater containing suspended and dissolved organic matter passes to the RBC chamber. RBCs comprise large plastic disks (approx. 3 m in diameter in Lions Bay's[3] case), mounted on a shaft rotating at about 1.5 revolutions per minute to alternately expose them to wastewater and air. The disk surface is corrugated to provide extra surface area for a film of microorganisms to grow on.

The first disks see the highest organic loadings and are where the highest biological activity occurs. Microorganism species are simple ciliates and filamentous and non-filamentous bacteria. As wastewater progresses down the chamber, decreasing organic loading gives preference to higher life forms including bacteria, protozoa and rotifers.

[3] The WWTP's RBC was replaced using a like-for-like design to not trigger a new permitting requirement.

Splashing produced by disk rotation provides oxygen to the process, plus keeps material in suspension rather than allowing it to settle to the floor of the chamber.

In a well-functioning unit with appropriate feed rate, nutrient loading, micro-organism and disk rotation rates, the RBC will produce an earthy, humus-like musty smell; sour sewage smell is indicative of suboptimal conditions. Recirculation pumps run every 45 minutes to return some effluent to the front of the RBC chamber for another pass.

SECONDARY CLARIFICATION

Past the RBC, the wastewater stream enters a secondary clarifier, where dense biomass flocculates and settles out, leaving liquid effluent that is relatively clear of suspended material.

Settled sludge is removed by vactor truck.

APPENDIX 2 – SEWER LAYOUT

APPENDIX 3 – DAILY LOGS

DATE	DAILY THROUGHPUT/ m3	MAX. FLOWRATE/ℓ/s	MAX. EFFLUENT TEMPERATURE/ °C	MIN. FLOWRATE/ℓ/s	AVERAGE RAINFALL/mm
01/01/2023	161.9	3.2	11.1	0.5	-
01/02/2023	116.6	1.8	11.4	0.2	-
01/03/2023	121.4	2.5	11.7	0.2	-
01/04/2023	111.8	2.0	11.7	0.3	-
01/05/2023	113.3	1.8	11.8	0.3	-
01/06/2023	124.4	2.3	12.1	0.1	-
01/07/2023	127.3	2.0	12.2	0.4	-
01/08/2023	137.3	2.3	12.2	0.5	-
01/09/2023	159.9	3.2	12.2	0.5	12.3
01/10/2023	154.7	3.2	12.0	0.4	12.3
01/11/2023	144.6	2.6	11.9	0.5	2.0
01/12/2023	122.8	2.2	11.9	0.1	7.8
01/13/2023	178.1	4.5	12.0	0.1	49.6
01/14/2023	253.7	4.3	11.8	1.2	33.5
01/15/2023	227.6	4.2	10.8	0.8	2.0
01/16/2023	158.8	3.1	11.3	0.1	19.4
01/17/2023	194.0	10.3	11.6	0.6	19.6
01/18/2023	158.2	3.2	11.4	0.5	15.0
01/19/2023	219.4	4.8	11.5	0.5	32.6
01/20/2023	141.2	2.5	10.9	0.5	0.1
01/21/2023	112.8	1.7	11.3	0.3	-
01/22/2023	121.1	4.7	11.6	0.1	4.5
01/23/2023	127.3	3.3	11.8	0.3	0.1
01/24/2023	113.8	2.1	11.9	0.3	0.1
01/25/2023	114.1	1.8	12.0	0.3	0.8
01/26/2023	123.9	2.0	12.2	0.3	-
01/27/2023	125.4	9.6	12.2	0.4	1.4
01/28/2023	129.7	2.0	12.2	0.4	0.5
01/29/2023	145.7	2.2	12.2	0.3	-
01/30/2023	160.8	2.6	12.2	0.6	-
01/31/2023	103.3	2.3	11.9	0.2	-
02/01/2023	86.5	2.7	11.6	0.0	1.0
02/02/2023	94.8	1.6	11.5	0.0	6.3
02/03/2023	103.3	10.6	11.6	0.1	-
02/04/2023	108.5	2.0	11.7	0.3	14.6
02/05/2023	120.1	2.5	11.7	0.3	19.4
02/06/2023	126.8	3.0	11.9	0.3	2.8
02/07/2023	106.5	1.7	12.0	0.1	2.5
02/08/2023	127.5	2.3	12.1	0.3	32.3
02/09/2023	114.9	1.9	11.9	0.3	-
02/10/2023	112.8	2.0	11.8	0.3	10.4
02/11/2023	124.3	2.2	11.8	0.3	0.4
02/12/2023	121.0	2.8	11.8	0.3	0.9
02/13/2023	127.6	2.5	11.9	0.3	11.6

DATE	DAILY THROUGHPUT/ m3	MAX. FLOWRATE/ℓ/s	MAX. EFFLUENT TEMPERATURE/ °C	MIN. FLOWRATE/ℓ/s	AVERAGE RAINFALL/mm
02/14/2023	122.8	2.4	12.0	0.3	1.3
02/15/2023	107.4	1.8	11.9	0.3	-
02/16/2023	102.4	1.8	11.8	0.0	-
02/17/2023	106.1	1.8	11.8	0.3	10.9
02/18/2023	109.6	1.9	11.6	0.3	5.9
02/19/2023	116.2	3.0	11.7	0.3	2.3
02/20/2023	112.0	4.0	11.9	0.2	0.8
02/21/2023	116.5	2.2	12.1	0.1	6.5
02/22/2023	110.7	2.0	12.1	0.3	2.6
02/23/2023	108.7	2.6	12.0	0.2	-
02/24/2023	100.7	1.7	11.5	0.2	-
02/25/2023	102.9	1.6	11.1	0.2	-
02/26/2023	107.8	1.9	10.8	0.2	6.4
02/27/2023	114.7	2.6	10.9	0.3	6.0
02/28/2023	109.8	1.8	11.0	0.3	2.6
03/01/2023	115.7	2.8	11.0	0.3	12.5
03/02/2023	108.4	2.3	10.8	0.1	1.8
03/03/2023	113.7	2.0	10.9	0.1	7.9
03/04/2023	111.0	6.6	11.1	0.3	6.4
03/05/2023	130.6	2.7	11.1	0.3	10.4
03/06/2023	123.8	3.2	10.9	0.3	0.4
03/07/2023	106.7	1.6	11.0	0.3	4.5
03/08/2023	105.7	1.7	11.1	0.1	0.9
03/09/2023	103.8	2.4	11.1	0.3	0.5
03/10/2023	101.0	1.6	11.1	0.3	-
03/11/2023	103.4	1.9	11.2	0.3	0.1
03/12/2023	107.6	10.4	11.3	0.2	2.3
03/13/2023	115.6	1.9	11.4	0.3	2.1
03/14/2023	112.2	5.8	11.5	0.3	5.0
03/15/2023	102.8	1.9	11.4	0.3	0.1
03/16/2023	99.3	1.6	11.3	0.3	0.6
03/17/2023	98.2	8.0	11.2	0.3	-
03/18/2023	96.8	1.5	11.4	0.3	-
03/19/2023	103.4	9.4	11.6	0.3	-
03/20/2023	110.4	1.9	11.9	0.3	-
03/21/2023	110.3	1.7	12.1	0.3	1.6
03/22/2023	101.8	1.5	12.2	0.4	-
03/23/2023	102.1	1.5	12.2	0.3	-
03/24/2023	97.4	1.5	12.3	0.1	3.1
03/25/2023	96.5	1.9	12.3	0.2	0.5
03/26/2023	96.9	1.5	12.2	0.2	2.5
03/27/2023	101.7	1.9	12.2	0.1	-
03/28/2023	98.5	9.7	12.3	0.1	-
03/29/2023	99.4	10.2	12.5	0.0	-
03/30/2023	102.9	1.6	12.6	0.3	-
03/31/2023	106.0	1.6	12.7	0.3	-
04/01/2023	107.9	1.7	12.7	0.2	2.5

DATE	DAILY THROUGHPUT/ m3	MAX. FLOWRATE/ℓ/s	MAX. EFFLUENT TEMPERATURE/ °C	MIN. FLOWRATE/ℓ/s	AVERAGE RAINFALL/mm
04/02/2023	101.3	3.2	12.7	0.2	0.3
04/03/2023	123.4	6.5	12.8	0.3	6.9
04/04/2023	99.6	1.6	12.5	0.2	0.1
04/05/2023	61.0	1.5	12.5	0.0	-
04/06/2023	144.0	3.1	12.3	-	1.4
04/07/2023	169.1	3.7	11.8	0.0	70.4
04/08/2023	269.1	4.3	11.3	0.1	17.4
04/09/2023	157.8	3.0	10.8	0.1	8.4
04/10/2023	197.2	3.7	10.8	0.4	32.8
04/11/2023	177.3	3.2	10.9	0.6	5.3
04/12/2023	152.3	3.7	11.1	0.3	5.9
04/13/2023	161.4	3.3	11.1	0.5	-
04/14/2023	149.6	3.1	11.0	0.5	-
04/15/2023	122.6	2.2	11.5	0.1	-
04/16/2023	136.8	2.8	12.1	0.4	15.5
04/17/2023	201.0	9.4	12.2	0.1	41.6
04/18/2023	147.4	2.9	11.9	0.2	11.8
04/19/2023	158.2	3.4	11.7	0.4	24.8
04/20/2023	151.4	2.7	11.5	0.4	13.1
04/21/2023	140.4	2.7	11.5	0.3	16.1
04/22/2023	134.0	2.8	11.7	0.0	2.4
04/23/2023	128.1	3.5	12.1	0.2	17.4
04/24/2023	171.5	3.6	12.2	0.5	16.9
04/25/2023	129.7	2.9	12.2	0.1	1.1
04/26/2023	115.3	2.6	12.4	0.0	-
04/27/2023	132.9	4.2	12.7	0.3	5.1
04/28/2023	127.0	2.2	12.8	0.4	-
04/29/2023	117.4	10.8	13.3	0.3	-
04/30/2023	131.1	2.7	13.8	0.4	-
05/01/2023	135.4	2.8	13.9	0.3	0.3
05/02/2023	149.4	2.9	14.1	0.5	0.3
05/03/2023	127.2	2.4	14.4	0.5	-
05/04/2023	109.0	2.2	14.6	0.3	-
05/05/2023	115.3	2.9	14.9	0.1	-
05/06/2023	132.7	3.6	14.9	0.4	17.8
05/07/2023	147.4	2.6	14.8	0.4	4.1
05/08/2023	144.5	2.8	14.7	0.4	0.3
05/09/2023	128.0	3.6	14.8	0.1	0.3
05/10/2023	124.9	2.4	14.9	0.4	-
05/11/2023	125.1	2.6	15.0	0.4	-
05/12/2023	110.9	1.8	15.1	0.3	-
05/13/2023	115.4	2.1	15.4	0.0	-
05/14/2023	128.3	3.5	15.5	0.0	-
05/15/2023	107.5	2.6	15.8	0.0	-
05/16/2023	94.1	9.3	16.3	0.0	-
05/17/2023	118.3	10.2	16.3	-	-
05/18/2023	101.9	2.7	16.1	0.1	-

DATE	DAILY THROUGHPUT/ m3	MAX. FLOWRATE/ℓ/s	MAX. EFFLUENT TEMPERATURE/ °C	MIN. FLOWRATE/ℓ/s	AVERAGE RAINFALL/mm
05/19/2023	90.8	1.8	16.3	0.2	-
05/20/2023	93.6	10.4	16.5	0.0	-
05/21/2023	90.1	4.1	16.6	0.1	-
05/22/2023	93.1	2.3	16.7	0.0	-
05/23/2023	102.7	2.8	16.7	0.1	-
05/24/2023	84.9	2.2	16.8	0.0	-
05/25/2023	82.4	2.0	16.8	-	-
05/26/2023	84.8	8.7	17.0	0.0	-
05/27/2023	86.7	1.9	17.3	0.1	-
05/28/2023	95.2	2.3	17.4	0.0	-
05/29/2023	104.6	2.5	17.4	0.0	-
05/30/2023	112.3	3.2	17.4	0.0	-
05/31/2023	92.3	2.4	17.2	0.0	-
06/01/2023	89.9	2.2	17.2	0.0	-
06/02/2023	80.1	8.7	17.3	0.0	-
06/03/2023	86.6	2.0	17.4	0.0	-
06/04/2023	98.0	9.2	17.6	-	-
06/05/2023	112.8	8.6	17.6	-	-
06/07/2023	99.9	8.6	17.6	0.0	-
06/08/2023	102.0	10.2	17.9	0.0	-
06/09/2023	91.3	8.3	18.0	-	-
06/10/2023	106.7	9.3	18.2	-	10.0
06/11/2023	119.0	3.0	18.0	0.2	9.9
06/12/2023	123.5	2.9	17.9	0.2	-
06/13/2023	95.1	2.9	18.1	0.1	-
06/14/2023	79.5	2.4	18.3	0.1	1.0
06/15/2023	105.1	2.9	18.1	0.1	-
06/16/2023	105.5	2.3	18.1	-	-
06/17/2023	96.1	2.5	18.3	0.1	2.5
06/18/2023	109.1	2.8	18.3	0.1	3.0
06/19/2023	129.4	3.2	18.3	0.2	0.1
06/20/2023	126.4	2.6	18.1	0.3	6.1
06/21/2023	113.2	2.5	18.0	0.2	-
06/22/2023	112.3	2.7	18.0	0.2	-
06/23/2023	103.8	2.3	18.3	0.2	-
06/24/2023	85.7	2.2	18.4	0.1	-
06/25/2023	88.6	2.2	18.4	0.1	-
06/26/2023	106.5	3.3	18.6	0.1	-
06/27/2023	94.6	3.3	18.6	0.1	-
06/28/2023	87.7	2.7	18.6	0.0	1.3
06/29/2023	85.5	3.0	18.8	0.1	-
06/30/2023	81.4	1.9	18.9	0.1	0.3
07/01/2023	80.7	2.0	19.0	0.1	-
07/02/2023	80.7	2.9	19.2	0.1	-
07/03/2023	82.9	2.1	19.2	-	-
07/04/2023	92.0	2.5	19.3	0.1	-
07/05/2023	90.0	2.3	19.3	-	-

DATE	DAILY THROUGHPUT/ m3	MAX. FLOWRATE/ℓ/s	MAX. EFFLUENT TEMPERATURE/ °C	MIN. FLOWRATE/ℓ/s	AVERAGE RAINFALL/mm
07/06/2023	81.4	2.2	19.5	0.0	-
07/07/2023	96.1	3.6	19.6	0.0	-
07/08/2023	108.2	2.8	19.6	0.1	-
07/09/2023	85.3	8.7	19.6	0.0	0.9
07/10/2023	96.4	2.8	19.8	0.0	-
07/11/2023	89.7	2.0	19.9	0.1	-
07/12/2023	85.7	1.9	19.9	0.1	-
07/13/2023	81.5	2.3	19.9	0.1	-
07/14/2023	79.5	2.5	19.9	0.0	-
07/15/2023	85.5	2.5	20.2	-	-
07/16/2023	91.3	1.9	20.2	0.1	-
07/17/2023	89.0	2.5	20.2	-	-
07/18/2023	86.3	2.1	20.4	-	0.8
07/19/2023	77.8	1.9	20.4	-	-
07/20/2023	76.4	1.6	20.5	-	-
07/21/2023	77.0	1.5	20.6	0.1	-
07/22/2023	75.6	2.5	20.6	0.1	-
07/23/2023	86.4	1.7	20.7	0.1	-
07/24/2023	85.9	1.9	20.6	0.1	-
07/25/2023	101.5	3.4	20.6	0.1	26.0
07/26/2023	88.3	2.2	20.3	-	0.9
07/27/2023	81.5	1.9	20.2	0.1	-
07/28/2023	87.2	3.7	20.2	0.1	-
07/29/2023	79.9	2.3	20.3	0.1	-
07/30/2023	87.0	2.4	20.6	0.1	-
07/31/2023	89.1	2.1	20.6	0.1	-
08/01/2023	85.4	2.0	20.6	0.1	-
08/02/2023	87.4	2.1	20.6	0.1	-
08/03/2023	77.0	1.9	20.6	0.1	-
08/04/2023	68.3	1.5	20.6	0.1	-
08/05/2023	75.8	6.3	20.6	0.1	-
08/06/2023	82.4	2.4	20.6	0.1	-
08/07/2023	92.1	2.7	20.6	0.1	-
08/08/2023	91.6	2.5	20.7	0.2	-
08/09/2023	74.1	1.8	20.8	0.1	6.9
08/10/2023	78.4	2.2	20.8	0.1	11.1
08/11/2023	82.8	2.2	20.7	0.1	0.1
08/12/2023	67.0	1.4	20.6	0.1	-
08/13/2023	76.6	2.0	20.8	0.1	-
08/14/2023	87.6	6.3	20.9	0.1	-
08/16/2023	75.3	2.2	21.3	0.1	-
08/17/2023	75.4	1.9	21.4	0.1	-
08/18/2023	76.1	2.1	21.4	0.0	-
08/19/2023	80.2	1.9	21.4	0.1	-
08/20/2023	91.3	2.7	21.1	0.1	-
08/21/2023	94.1	2.1	21.1	0.2	-
08/22/2023	81.0	1.6	20.9	0.1	-

DATE	DAILY THROUGHPUT/ m3	MAX. FLOWRATE/ℓ/s	MAX. EFFLUENT TEMPERATURE/ °C	MIN. FLOWRATE/ℓ/s	AVERAGE RAINFALL/mm
08/23/2023	82.9	1.4	20.9	0.1	-
08/25/2023	100.7	2.4	20.7	0.2	-
08/26/2023	97.7	2.1	20.6	0.2	-
08/27/2023	92.9	2.6	20.6	0.2	-
08/28/2023	100.6	2.6	20.8	0.1	-
08/29/2023	95.8	2.3	20.9	0.1	2.1
08/30/2023	103.2	2.0	20.8	0.2	32.5
08/31/2023	88.6	1.7	20.5	0.2	20.4
09/01/2023	89.4	1.9	20.5	0.2	3.0
09/02/2023	86.3	1.6	20.4	0.1	-
09/03/2023	92.7	1.9	20.5	0.1	-
09/04/2023	101.6	3.0	20.5	0.2	1.0
09/05/2023	97.1	2.4	20.4	0.1	-
09/06/2023	94.2	3.5	20.4	0.1	-
09/07/2023	103.4	2.7	20.4	0.2	1.0
09/08/2023	86.6	1.9	20.0	0.1	-
09/09/2023	90.6	1.7	20.1	0.2	-
09/10/2023	88.9	1.7	20.0	0.1	-
09/11/2023	97.1	2.7	20.0	0.2	-
09/12/2023	88.2	1.5	20.2	0.0	0.8
09/13/2023	87.8	2.1	20.2	0.2	1.0
09/14/2023	92.0	1.9	20.0	0.2	-
09/15/2023	88.6	1.7	20.0	0.2	-
09/16/2023	90.0	1.7	20.0	0.1	-
09/17/2023	109.0	2.7	20.0	0.3	-
09/18/2023	102.8	2.9	19.9	0.1	0.6
09/19/2023	105.3	2.8	19.9	0.2	0.3
09/20/2023	108.5	2.9	19.6	0.2	9.1
09/21/2023	137.9	3.3	19.4	0.4	0.1
09/22/2023	107.8	2.6	19.2	0.3	-
09/24/2023	101.5	2.5	19.2	0.1	9.8
09/25/2023	133.1	3.6	19.2	0.3	24.5
09/26/2023	174.4	3.8	19.1	0.4	61.1
09/27/2023	137.0	2.6	18.6	0.1	12.6
09/28/2023	136.9	3.0	18.5	0.4	7.1
09/29/2023	137.7	3.3	18.4	0.3	6.0
09/30/2023	131.9	2.6	18.3	0.3	-
10/01/2023	134.9	2.9	18.2	0.3	0.6
10/02/2023	135.9	3.0	17.8	0.4	-
10/03/2023	150.4	3.2	17.9	0.4	10.8
10/04/2023	138.0	3.0	17.9	0.5	-
10/05/2023	124.1	3.6	17.8	0.3	-
10/06/2023	123.4	2.5	17.9	0.4	-
10/07/2023	113.8	2.3	18.0	0.3	-
10/08/2023	115.7	3.5	18.0	0.2	-
10/09/2023	115.0	3.7	18.2	0.2	-
10/10/2023	129.6	3.4	18.4	0.2	17.8

DATE	DAILY THROUGHPUT/ m3	MAX. FLOWRATE/ℓ/s	MAX. EFFLUENT TEMPERATURE/ °C	MIN. FLOWRATE/ℓ/s	AVERAGE RAINFALL/mm
10/11/2023	160.8	3.7	18.4	0.3	46.8
10/12/2023	147.8	3.5	17.9	0.5	4.0
10/13/2023	139.2	2.9	17.5	0.4	-
10/14/2023	141.7	3.2	17.5	0.4	17.6
10/15/2023	160.3	3.2	17.4	0.5	16.8
10/16/2023	157.2	3.5	17.4	0.5	7.5
10/17/2023	-	-	-	-	15.8
10/18/2023	168.8	3.8	17.3	0.5	31.8
10/19/2023	443.4	8.0	17.1	1.3	81.1
10/20/2023	278.4	5.3	15.4	0.9	5.9
10/21/2023	146.1	2.9	16.0	0.5	-
10/22/2023	138.9	3.2	16.4	0.4	0.3
10/23/2023	161.3	3.5	16.5	0.4	-
10/24/2023	140.8	3.3	16.5	0.4	-
10/25/2023	140.0	3.4	16.5	0.4	37.0
10/26/2023	105.8	11.8	16.1	-	5.1
10/28/2023	121.8	2.7	15.3	0.3	-
10/29/2023	119.8	3.4	15.2	0.3	-
10/30/2023	126.3	3.4	15.0	0.2	-
10/31/2023	-	-	-	-	-
11/01/2023	-	-	-	-	-
11/02/2023	135.0	2.9	14.7	0.3	6.4
11/03/2023	158.4	3.8	14.7	0.4	23.3
11/04/2023	143.7	2.6	14.8	0.4	5.3
11/05/2023	170.7	4.1	14.9	0.5	11.6
11/06/2023	171.4	4.0	15.1	0.5	12.5
11/07/2023	188.1	3.6	15.1	0.6	4.8
11/08/2023	156.1	3.3	14.8	0.5	0.6
11/09/2023	139.0	2.8	14.7	0.4	0.6
11/10/2023	139.9	2.9	14.7	0.4	35.3
11/11/2023	158.9	3.9	14.6	0.4	63.4
11/12/2023	239.2	6.3	14.4	0.9	48.6
11/13/2023	176.8	4.0	13.8	0.5	44.6
11/14/2023	177.7	4.1	14.0	0.6	36.3
11/15/2023	147.7	3.2	13.7	0.4	13.5
11/16/2023	142.1	3.3	13.5	0.4	0.4
11/18/2023	129.5	2.7	13.2	0.4	-
11/19/2023	137.2	3.0	13.3	0.3	13.9
11/20/2023	155.3	2.9	13.6	0.4	7.0
11/21/2023	136.4	3.0	13.6	0.4	-
11/22/2023	139.3	2.9	13.6	0.4	11.4
11/23/2023	148.8	3.0	13.6	0.5	0.4
11/24/2023	148.7	2.9	13.5	0.5	-
11/25/2023	140.1	2.9	13.3	0.5	-
11/26/2023	143.4	2.7	13.2	0.5	-
11/27/2023	145.8	2.9	13.1	0.4	-
11/29/2023	135.8	3.3	13.1	0.4	-

DATE	DAILY THROUGHPUT/ m3	MAX. FLOWRATE/ℓ/s	MAX. EFFLUENT TEMPERATURE/ °C	MIN. FLOWRATE/ℓ/s	AVERAGE RAINFALL/mm
11/30/2023	142.2	2.9	12.9	0.5	-
12/01/2023	146.8	2.9	12.5	0.5	3.1
12/02/2023	146.0	2.8	12.2	0.5	16.1
12/03/2023	161.4	3.1	12.2	0.6	13.4
12/04/2023	163.2	4.2	12.2	0.5	11.0
12/05/2023	266.4	8.2	12.3	0.5	72.3
12/06/2023	328.6	6.8	11.4	0.9	9.3
12/07/2023	177.5	3.5	11.9	0.7	4.1
12/08/2023	159.3	3.4	12.1	0.5	0.9
12/09/2023	147.6	2.6	12.0	0.5	-
12/10/2023	180.1	4.9	11.9	0.5	25.4
12/11/2023	187.8	3.6	11.9	0.7	9.1
12/12/2023	156.5	3.0	12.0	0.6	0.1
12/13/2023	154.9	2.8	12.1	0.5	-
12/14/2023	144.3	3.2	12.1	0.5	0.4
12/15/2023	146.9	2.6	12.1	0.5	1.8
12/16/2023	153.0	2.9	12.1	0.5	2.6
12/17/2023	144.1	3.0	12.3	0.5	-
12/18/2023	145.7	2.9	12.4	0.4	2.4
12/19/2023	142.9	2.8	12.6	0.2	9.1
12/20/2023	159.9	3.6	12.6	0.6	20.4
12/21/2023	163.8	3.0	12.6	0.6	4.8
12/22/2023	158.7	2.9	12.6	0.6	10.4
12/23/2023	158.8	2.9	12.6	0.5	3.2
12/24/2023	142.9	3.0	12.4	0.5	-
12/25/2023	145.0	3.0	12.2	0.5	0.6
12/26/2023	175.1	3.7	12.3	0.5	55.4
12/27/2023	236.3	4.1	12.4	1.0	0.3
12/28/2023	169.7	3.7	12.3	0.6	24.4
12/29/2023	169.9	3.6	12.4	0.6	17.4
12/30/2023	162.0	3.2	12.6	0.6	3.3

APPENDIX 4 – LAB RESULTS

ALS Canada Ltd.

CERTIFICATE OF ANALYSIS

Work Order	: VA23A6489	Page	: 1 of 2
Client	: Village of Lions Bay	Laboratory	: Vancouver - Environmental
Contact	: Naizam Jaffer	Account Manager	: Carla Fuginski
Address	: PO Box 141, 400 Center Road Lions Bay BC Canada V0N 2E0	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: ----	Date Samples Received	: 27-Mar-2023 12:00
PO	: ----	Date Analysis Commenced	: 27-Mar-2023
C-O-C number	: ----	Issue Date	: 28-Mar-2023 09:56
Sampler	: Alberto Urrutia		
Site	: ----		
Quote number	: Standing Offer		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	Position	Laboratory Department
Brieanna Allen	Production/Validation Manager	Microbiology, Burnaby, British Columbia

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	Description
MPN/100mL	most probable number per hundred millilitres

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior 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.

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

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Magnesia Tank	----	----	----	----
					Client sampling date / time	27-Mar-2023 08:30	---	---	---	---
Analyte	CAS Number	Method	LOR	Unit	VA23A6489-001	-------	-------	-------	-------	
					Result	---	---	---	---	
Microbiological Tests										
Coliforms, total	----	E010	1	MPN/100mL	<1	----	----	----	----	
Coliforms, Escherichia coli [E. coli]	----	E010	1	MPN/100mL	<1	----	----	----	----	

Please refer to the General Comments section for an explanation of any qualifiers detected.

ALS Canada Ltd.

right solutions. right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **VA23B3683**	Page	: 1 of 3
Client	: **Village of Lions Bay**	Laboratory	: Vancouver - Environmental
Contact	: Karl Buhr	Account Manager	: Thomas Chang
Address	: PO Box 141, 400 Center Road Lions Bay BC Canada V0N 2E0	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: ----	Date Samples Received	: 16-Jun-2023 12:05
PO	: ----	Date Analysis Commenced	: 18-Jun-2023
C-O-C number	: ----	Issue Date	: 23-Jun-2023 10:57
Sampler	: Alberto Urrutia		
Site	: Village of Lions Bay		
Quote number	: Standing Offer		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Kate Dimitrova	Analsyt	Inorganics, Burnaby, British Columbia

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	*Description*
mg/L	milligrams per litre

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior 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.

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

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical Results

Sub-Matrix: **Water** (Matrix: **Water**)				*Client sample ID*	**Sewer Treatment Plant (Treated Sewer)**	----	----	----	----
				Client sampling date / time	16-Jun-2023 11:30	----	----	----	----
Analyte	*CAS Number*	*Method/Lab*	*LOR*	*Unit*	**VA23B3683-001**	----------	----------	----------	----------
					Result	----	----	----	----
Physical Tests									
Solids, total suspended [TSS]	----	E160/VA	3.0	mg/L	13.2	----	----	----	----
Aggregate Organics									
Biochemical oxygen demand [BOD]	----	E550/VA	2.0	mg/L	13.8	----	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

CERTIFICATE OF ANALYSIS

Work Order	: **VA23C2411**	Page	: 1 of 3
Client	: **Village of Lions Bay**	Laboratory	: ALS Environmental - Vancouver
Contact	: Karl Buhr	Account Manager	: Thomas Chang
Address	: PO Box 141, 400 Center Road Lions Bay BC Canada V0N 2E0	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: ----	Date Samples Received	: 21-Sep-2023 12:50
PO	: ----	Date Analysis Commenced	: 21-Sep-2023
C-O-C number	: ----	Issue Date	: 28-Sep-2023 15:20
Sampler	: Alberto Urrutia		
Site	: Village of Lions Bay		
Quote number	: Standing Offer		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Microbiology, Burnaby, British Columbia

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

				Client sample ID	**Sewer Treatment Plant (Treated Sewer)**	**Tidewater Way (Possible Sewer Water)**	**----**	**----**	**----**
				Client sampling date / time	21-Sep-2023 11:30	21-Sep-2023 12:00	----	----	----
Analyte	*CAS Number*	*Method/Lab*	*LOR*	*Unit*	**VA23C2411-001**	**VA23C2411-002**	**--------**	**--------**	**--------**
					Result	Result	----	----	----
Physical Tests									
Solids, total suspended [TSS]	----	E160/VA	3.0	mg/L	11.4	----	----	----	----
Microbiological Tests									
Coliforms, total	----	E010/VA	1	MPN/100mL	----	>2420	----	----	----
Coliforms, Escherichia coli [E. coli]	----	E010/VA	1	MPN/100mL	----	17	----	----	----
Aggregate Organics									
Biochemical oxygen demand [BOD]	----	E550/VA	2.0	mg/L	8.0	----	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may

ALS Canada Ltd.

CERTIFICATE OF ANALYSIS

Work Order	: **VA23D0173**	Page	: 1 of 3
Client	: **Village of Lions Bay**	Laboratory	: ALS Environmental - Vancouver
Contact	: Karl Buhr	Account Manager	: Thomas Chang
Address	: PO Box 141, 400 Center Road Lions Bay BC Canada V0N 2E0	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: ----	Date Samples Received	: 15-Dec-2023 12:20
PO	: ----	Date Analysis Commenced	: 18-Dec-2023
C-O-C number	: ----	Issue Date	: 27-Dec-2023 10:02
Sampler	: Alberto Urrutia		
Site	: Village of Lions Bay		
Quote number	: Standing Offer		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Tracy Harley	Supervisor - Water Quality Instrumentation	Inorganics, Burnaby, British Columbia

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	*Description*
mg/L	milligrams per litre

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior 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.

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

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

					Client sample ID	**Sewer Treatment Plant (Treated Sewer)**	----	----	----	----
					Client sampling date / time	15-Dec-2023 11:30	----	----	----	----
Analyte	*CAS Number*	*Method/Lab*	*LOR*	*Unit*		**VA23D0173-001**	-------	-------	-------	-------
						Result	----	----	----	----
Physical Tests										
Solids, total suspended [TSS]	----	E160/VA	3.0	mg/L		19.6	----	----	----	----
Aggregate Organics										
Biochemical oxygen demand [BOD]	----	E550/VA	2.0	mg/L		13.8	----	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

APPENDIX 5 – OPERATING PERMIT

BRITISH COLUMBIA

MINISTRY OF ENVIRONMENT

PERMIT

5188

Under the Provisions of the Environmental Management Act

THE MUNICIPALITY OF THE VILLAGE OF LIONS BAY

Lot 45 Tidewater Way
Lion's Bay, British Columbia

is authorized to discharge effluent to Howe Sound from a residential development located on Tidewater Way, Lion's Bay, British Columbia, subject to the requirements listed below. Contravention of any of these requirements is a violation of the *Environmental Management Act* and may lead to prosecution.

This Permit supersedes and amends all previous versions of Permit 5188 issued under Section 14 of the *Environmental Management Act*.

Capitalized terms referred to in this authorization are defined in the attached Glossary. Other terms used in this authorization have the same meaning as those defined in the *Environmental Management Act* and applicable regulations.

Where this authorization provides that the Director may require an action to be carried out, the Permittee must carry out the action in accordance with the requirements of the Director.

1. **AUTHORIZED DISCHARGE**

1.1 This section applies to the discharge of effluent from a **residential development**. The site reference number for this discharge is E100978.

1.1.1 The maximum rate of discharge is 340 cubic metres per day.

Date issued: November 20, 1978
Date amended: May 31, 2017
(most recent)

Daniel P. Bings
for Director, *Environmental Management Act*
Authorizations - South

1.1.2 The characteristics of the discharge must not exceed the following parameters:

5-day biochemical oxygen demand	45 mg/L;
Total suspended solids (non-filterable residue)	60 mg/L.

1.1.3 The discharge is authorized from Authorized Works which are a rotating biological contactor secondary treatment plant, and an outfall extending 180 metres seaward of low water mark and 60 metres below low water level, and related appurtenances approximately located as shown on the attached Site Plan.

1.1.4 The Permittee must not discharge under this authorization unless the Authorized Works are complete and fully operational.

1.1.5 The location of the facilities from which the discharge is authorized to originate and the point where the discharge is authorized to occur is Block B, District Lot 1575, Group 1, New Westminster District.

2. GENERAL REQUIREMENTS

2.1 Maintenance of Works and Emergency Procedures

The Permittee must regularly inspect the authorized works and maintain them in good working order.

In the event of an emergency or condition beyond the control of the Permittee which prevents effective operation of the Authorized Works or leads to an unauthorized discharge, the Permittee must take remedial action to restore the effective operation of the Authorized Works and to prevent any unauthorized discharges. The Permittee must immediately report the emergency or condition and the remedial action that has and will be taken to the RAPP line (1-877-952-7277, #7272 from mobile phone) or electronically at this link: http://www.env.gov.bc.ca/cos/rapp/form.htm.

The Director may require the Permittee to reduce or suspend operations until the Authorized Works have been restored, and/or corrective steps have been taken to prevent unauthorized discharges.

2.2 **Bypasses**

The Permittee must not permit any discharge authorized by this authorization to bypass the authorized works, except with the prior written approval of the Director.

2.3 **Posting of Outfall**

The Permittee must erect and maintain a sign along the alignment of the outfall above the high water mark. The sign must identify the nature of the works. The Permittee must confirm whether the wording and size of the sign is acceptable to the Director prior to installing the sign.

2.4 **Treatment Plant Sludge Wasting and Disposal**

The Permittee must dispose of sludge wasted from the treatment plant at a site and in a manner approved by the Director, or as authorized by regulation under the *Environmental Management Act.*

2.5 **Facility Classification and Operator Certification**

The Permittee in a manner and on timelines specified by the Director must have the authorized works classified (and the classification must be maintained) by the Environmental Operators Certification Program Society (Society). The Permittee must cause the authorized works to be operated and maintained by:

a) persons certified within and according to the program provided by the Society to the satisfaction of the Director, or

b) persons who are qualified in the safe and proper operation of the facility for the protection of the environment, as demonstrated to the satisfaction of the Director.

The Permittee must notify the Director of the classification level of the facility and certification levels of the operators, and changes of operators and/or operator certification levels within 30 days of any change.

3. MONITORING REQUIREMENTS

3.1 Sampling Procedures

The Permittee is required to carry out sampling in accordance with the procedures described in the "British Columbia Field Sampling Manual for Continuous Monitoring and the Collection of Air, Air-Emission, Water, Wastewater, Soil, Sediment, and Biological Samples, 2013 Edition (Permittee)" or most recent edition, or by alternative procedures as authorized by the Director.

A copy of the above manual is available on the Ministry web page at www.env.gov.bc.ca/epd/wamr/labsys/lab_meth_manual.html.

3.2 Analytical Procedures

The Permittee must carry out analyses in accordance with procedures described in the "British Columbia Laboratory Manual (2015 Permittee Edition)", or the most recent edition or by alternative procedures as authorized by the Director. A copy of the above manual is available on the Ministry web page at www.env.gov.bc.ca/epd/wamr/labsys/lab_meth_manual.html.

3.3 Grab Sampling

The Permittee must install and maintain a sampling facility and obtain a grab sample of the effluent authorized by Section 1.1 once every three months. The Permittee must take due care in sampling, storing and transporting the samples to control temperature and avoid contamination, breakage, and any other factor or influence that may compromise the integrity of the samples.

3.4 Analysis

The Permittee must collect sample (s) on a quarterly basis and obtain analysis of the sample (s) for the following parameters:

a) total suspended solids (non-filterable residue), mg/L;
b) 5-day biochemical oxygen demand, mg/L.

3.5 Flow Measurement

The Permittee must install and maintain a suitable to the Director, flow measuring device, and record once per month the effluent volume discharged over a 24-hour period. The Permittee must retain the records for inspection by Ministry staff.

4. REPORTING REQUIREMENTS

4.1 Annual Report

The Permittee must collect and maintain data of analyses and flow measurements required under this authorization for inspection when requested by Ministry staff and submit the data for the previous year to the Director in a form satisfactory to the Director. The Permittee must make data submissions in respect of each subsequent year within 30 days of the end of the applicable year.

The Permittee must submit all data required to be submitted under this section by email to the Ministry's Routine Environmental Reporting Submission Mailbox (RERSM) at EnvAuthorizationsReporting@gov.bc.ca. For guidelines on how to properly name the files and email subject lines or for more information visit the Ministry website:

http://www2.gov.bc.ca/gov/content/environment/waste-management/waste-discharge-authorization/data-and-report-submissions/routine-environmental-reporting-submission-mailbox

4.2 Non-compliance Notification

The Permittee must immediately notify the Director or designate by email at EnvironmentalCompliance@gov.bc.ca of any non-compliance with the requirements of this authorization by the Permittee and take remedial action to remedy any effects of such non-compliance. The Permittee must provide the Director with written confirmation of all such non-compliance events, including available test results, within 24 hours of the original notification, unless otherwise directed by the Director.

4.3 Non-compliance Reporting

If the Permittee fails to comply with any of the requirements of this authorization, the Permittee must, within 30 days of such non-compliance,

submit to the Director a written report that is satisfactory to the Director and includes, but is not necessarily limited to, the following:

a. all relevant test results obtained by the Permittee related to the noncompliance,
b. an explanation of the most probable cause(s) of the noncompliance, and
c. a description of remedial action planned and/or taken by the Permittee to prevent similar noncompliance(s) in the future.

The Permittee must submit all non-compliance reporting required to be submitted under this section by email to the Ministry's Compliance Reporting Submission Mailbox (CRSM) at EnvironmentalCompliance@gov.bc.ca. For guidelines on how to report a non-compliance or for more information visit the Ministry website:

http://www2.gov.bc.ca/gov/content/environment/waste-management/waste-discharge-authorization/data-and-report-submissions/non-compliance-reporting-mailbox.

4.4 **Non-compliance Reporting and Exceedances**

The Permittee must cause each data submission required by this authorization to include a statement outlining the number of exceedances of permitted discharges that occurred during the reporting period, the dates of each such exceedance, an explanation as to the cause of the exceedances, and a description of the measures taken by the Permittee to rectify the cause of each such exceedance. If no exceedances occurred over the reporting period, the required statement may instead indicate that no exceedance of permitted discharges occurred during the reporting period.

4.5 **Spill Reporting**

The Permittee must immediately report all spills to the environment (as defined in the Spill Reporting Regulation) in accordance with the Spill Reporting Regulation, which among other things, requires notification to the Provincial Emergency Program at 1-800-663-3456.

4.6 **Licence to Publish Documents**

a. Subject to paragraph b, the Permittee authorizes the Province to publish on the Ministry of Environment website the entirety of any Regulatory

Document.

b. The Province will not publish any information that could not, if it were subject to a request under section 5 of the Freedom of Information and Protection of Privacy Act, be disclosed under that Act.

c. The Permittee will indemnify and save harmless the Province and the Province's employees and agents from any claim for infringement of copyright or other intellectual property rights that the Province or any of the Province's employees or agents may sustain, incur, suffer or be put to at any time that arise from the publication of a Regulatory Document.

GLOSSARY

"Authorized Works" means a rotating biological contactor secondary treatment plant, chlorination facilities, related appurtenances, and an outfall extending 180 metres seaward of low water mark and 60 metres below low water level, and related appurtenances approximately located as shown on Site Plan A as stated in Section 1.1.3.

"Facility" means a residential development located 0.4 km south of Lion's Bay, British Columbia.

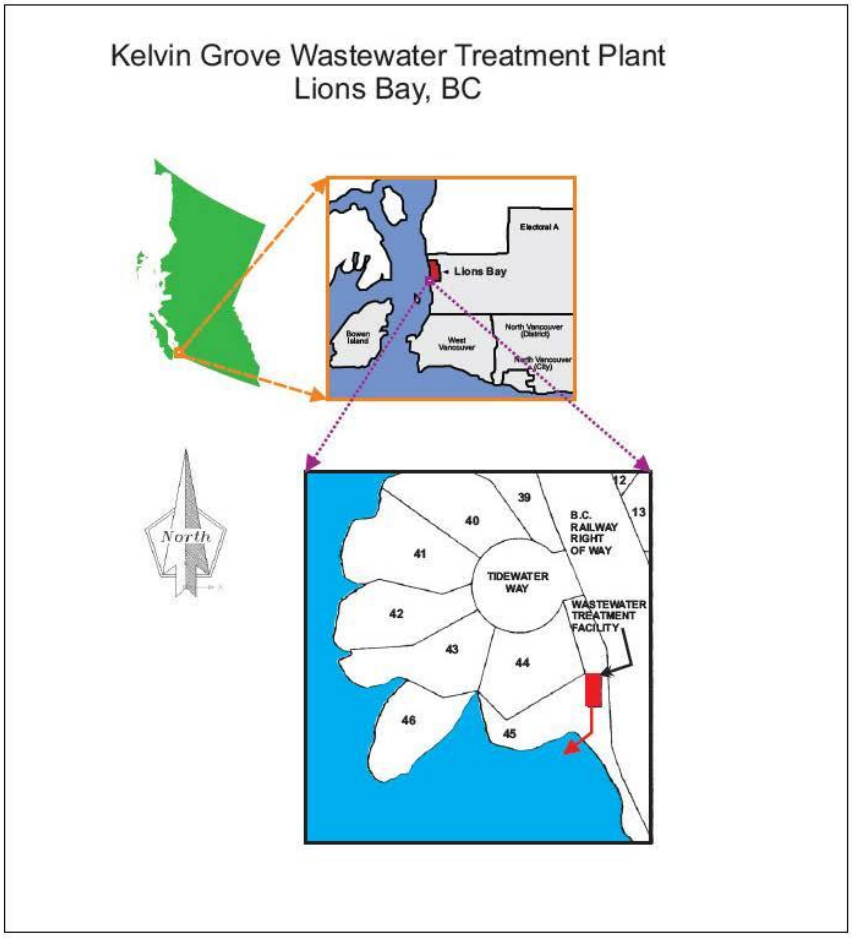
"Province" means Her Majesty the Queen in right of British Columbia;

"Regulatory Document" means any document that the Permittee is required to provide to the Director or the Province pursuant to: (i) this authorization; (ii) any regulation made under the Environmental Management Act that regulates the facility described in this authorization or the discharge of waste from that facility; or (iii) any order issued under the Environmental Management Act directed against the Permittee that is related to the facility described in this authorization or the discharge of waste from that facility;

Date issued: November 20, 1978
Date amended: May 31, 2017
(most recent)

Daniel P. Bings
for Director, *Environmental Management Act*
Authorizations - South

SITE PLAN



Date issued: November 20, 1978
Date amended: May 31, 2017
(most recent)

Daniel P. Bings
for Director, *Environmental Management Act*
Authorizations - South

Permit Number: 5188