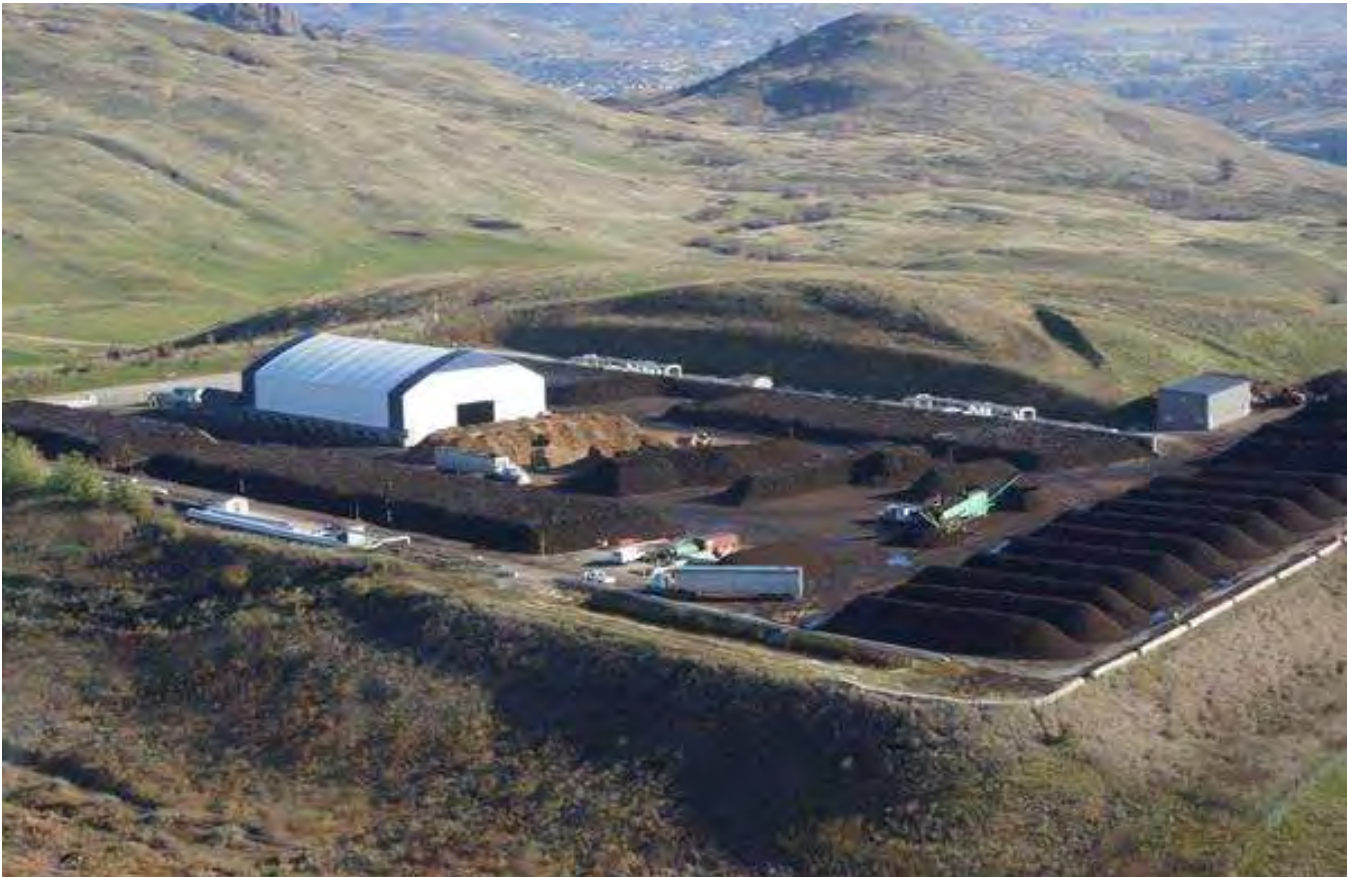


Regional Biosolids Compost Facility 2020 Annual Report



Prepared for: BC Ministry of Environment
Prepared by: City of Kelowna
Report Submitted: March 31, 2021

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Executive Summary

The Regional Biosolids Compost Facility (RBCF) is located at 551 Commonage Road (site reference #E307813) in Vernon, BC. The facility is jointly owned by the City of Kelowna (COK) and the City of Vernon (COV), but operated exclusively by COK staff. The facility receives stabilized sewage sludge (biosolids) from the Kelowna, Vernon, Silver Hawk Utilities (Silver Star Ski Hill), and Lake Country Wastewater Treatment Facilities (WWTF). Biosolids are mixed with wood chips (hog fuel) and clean ground dimensional lumber collected and ground at the Glenmore Landfill in Kelowna. The material mix is composted in an Extended Aerated Static Pile system to produce Class-A Compost as defined by the Organic Matter Recycling Regulation (OMRR).

The facility is operated under condition of compliance of Air Discharge Permit #108537 (the Permit), issued by the Ministry of Environment and Climate Change Strategy (ENV) under the provisions of the *Environmental Management Act*. This annual report covers the period between January 1 to December 31, 2020.

Received Biosolids

The total volume of biosolids received at the RBCF in 2020 was 33,205 wet metric tonnes, or 91 % of the maximum allowed by Permit (36,400 wet tonnes).

Finished Compost

Finished compost was continuously produced and tested throughout 2020, with off-site transportation and product sales peaking May through October. More than 50% of the finished product was removed from site in 2020 as required by Permit. Compost volumes produced, stored and transported off-site in 2020 are shown in Table 1 below.

Table 1. Compost volume produced and stored at the RBCF

Finished Compost	Volume (m ³)
Stored on-site as of Jan 1, 2020	8,577
Produced on-site between Jan 1-Dec 31, 2020	47,773
Transported off-site between Jan 1-Dec 31, 2019	49,139
Stored on-site as of Dec 31, 2020	7,211



Introduction

The RBCF operates under Permit 108537, which mandates under Section 5.5, that annual reports be submitted to ENV on or before March 31st of each year for the previous calendar year, and must include the following information at a minimum:

- The type and tonnage of compostable materials received for the preceding calendar year;
- The quantity of finished compost transported off-site, and the amount stored on site at the end of each calendar year;
- The results of monitoring programs as specified in the authorization. The Permittee must ensure that data interpretation and trend analysis, as well as an evaluation of the impacts of the discharges on the receiving environment in the previous calendar year must be carried out by a qualified professional;
- A summary and analysis of all complaints received in the previous calendar year; and
- Any improvements made to the facility or operations to reduce and control odour.

This report addresses the above-noted items and provides an overview of the facility, processing volumes, odour and air emissions management, residual management, leachate management, sampling procedures, analytical testing results, staffing, and operational maintenance.

This annual report applies to the 2020 calendar year from January 1st to December 31st.

Compost Facility Overview

The RBCF is situated in a rural area between Vernon and Kelowna and was officially opened in 2006 as a partnership between the two municipalities. The purpose of the facility is to process the biosolids produced at each of the respective wastewater treatment facilities, into a nutrient rich, high-quality Class-A Compost that is then sold under the OgoGrow™ brand.

The site underwent a significant upgrade in 2010 to increase the receiving capacity of biosolids, expand the processing area, and increase the on-site storage capacity of the finished product.



Site Plan

The site primarily consists of an administration building for staff, booster pump and drainage pump houses that manage water flows, enclosed mixing building, maintenance shop, leachate collection system, aeration fan system, and two E-nose odour sensors strategically placed on the perimeter (Figure 1).

Each of the buildings, monitors, and collection systems are designed to provide efficient management, measurement, and containment of each of the compost production stages. This consists of initial mixing of biosolids and woody biomass in the mixing building, primary and secondary aeration zones areas for processing and curing, and finished product storage area.



Figure 1. Regional Compost Facility Site Plan

Signage and Security

The compost facility has signage erected near the entrance that clearly identifies the site name, owner and operator, contact phone number for public, hours of operation, and prohibition of hazardous waste notification.

The operation runs seven days a week, and is secured by a perimeter fence and automated gate, which remains open during regular business hours on weekdays, closed on weekends (accessible by authorized staff and contractors), and is monitored 24-hours a day by a surveillance camera.



Contracted haulers have access to the site after hours through use of proximity tags that open and close the gate automatically. Communication on site is through radio system control that staff and haulers are equipped with.

Residual Management

Feedstocks are generally very clean and do not contain litter or plastic debris. Any litter found on-site is collected and disposed of throughout the year as noticed. In addition, a coordinated clean-up effort is made each spring that consists of staff walking the north perimeter berm and field north of the berm to pick up any plastic fragments or residuals, and disposing of them off-site. All retained residual on premise is limited to less than 15 m³.

Vehicles that make deliveries on and off-site drive on a dedicated paved surface that is frequently maintained and cleaned when needed. Biosolids are tipped into the mixing building, where they are mixed as soon as possible with the woody feedstocks, after which the mix is transported to the primary composting area. Transport vehicles that come on site travel around the perimeter of the site and do not travel across areas where raw biosolids are stored or mixed. The roadways are cleared and kept as clean as possible to minimize tracking of compost by tires or undercarriages, which could be transported off-site.

Operations

The COK operates the RBCF in accordance with the Operating and Design Plan (2019), which contains the design, operations, acceptable materials, leachate management, monitoring program, reporting requirements and performance requirements for the RBCF. No changes in operations occurred in 2020.

Compostable Material

Activated sewage sludge is extracted from wastewater through a series of clarifiers, bioreactors, fermenters, and settling basins to physically remove solids from the waste stream at the various wastewater treatment facilities. The thickened sludge is centrifuged and dewatered to a consistency of 15-20 % solids.

Bioxide®, a calcium nitrate solution, is also mixed into the solids to help control odours during transport to the RBCF.



The amount of biosolids received at the RBCF in 2020 was 33,205 wet tonnes, which is 91.2 % of the allowable permit limit of 36,400 wet tonnes. Over the past five years, the amount of biosolids received at the facility has increased by 16.3 %, generally proportional to the increased volume contributed by Kelowna WWTF over the same time period (Figure 2).

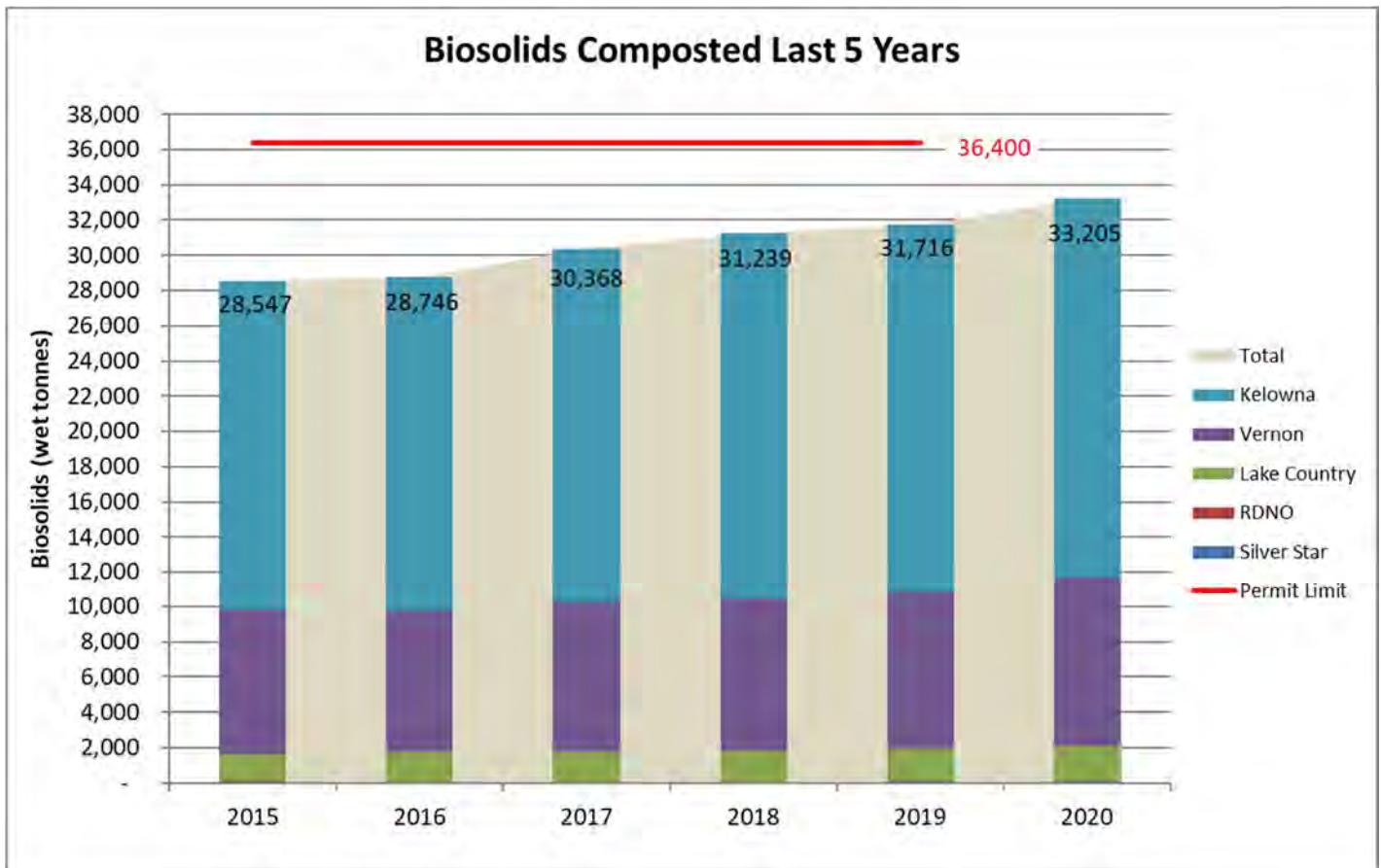


Figure 2. Volume of biosolids processed at the RBCF, year over year relative to permit

Table 2. Weight of Biosolids Processed (wet tonnes)

	Silver Star	RDNO	Lake Country	Vernon	Kelowna	Total	Permit Limit
2015	0	81	1,560	8,179	18,727	28,547	36,400
2016	0	55	1,698	7,981	19,012	28,746	
2017	0	63	1,703	8,449	20,153	30,368	
2018	38.3	19	1,770	8,645	20,767	31,239	
2019	88	11	1,847	8,887	20,883	31,716	
2020	80	0	2,056	9,581	21,488	33,205	

Table 3. Average Metal Concentrations in Biosolids Accepted by RBCF in 2020

Parameter dw mg/kg	Kelowna WWTF	Vernon Water Reclamation Centre	Lake Country WWTF	Silver Star Ski Hill WWTF	Schedule 4 OMRR
Arsenic	1.67	1.51	2.17	2.88	75
Cadmium	0.57	0.84	1.49	1.12	20
Chromium	11.6	8.94	15.38	13.9	1,060
Cobalt	1.15	1.7	2.06	3.49	150
Copper	420.67	245.75	395.13	274	2,200
Lead	8.12	6.64	12.47	4.48	500
Mercury	0.5	0.31	0.42	0.173	15
Molybdenum	5.07	5.87	11.24	5.1	20
Nickel	8.19	8.02	12.36	25.8	180
Selenium	2.53	4.6	4.32	12.7	14
Zinc	265.5	392.33	792.67	278	1,850

Table 4. Wood Feedstocks Processed 2020

Hog fuel – m ³	54,640
Ground dimensional lumber – m ³	26,400
Ground Prunings - m ³	7
Oversize compost from screening (recycle estimate) – m ³	31,850

Compost Blending Process

The raw materials used to blend with the biosolids include: wood chips (hog fuel), untreated and unprocessed ground dimensional lumber and oversized wood chips screened from previously composted material. The use of wood fly ash (carbon) was discontinued in 2019. Each of these materials are pre-mixed at a ratio of 3-parts hog fuel, 2-parts oversize screening, and 1-part ground dimensional lumber on-site. The pre-mix is then blended with the biosolids at a prescribed rate to optimize the nutrient balance of carbon to nitrogen to produce the OgoGrow mix (Table 5).



Table 5. Mixing ratio of material

OgoGrow mix
5000-5500 kg of pre-mix wood
3500 kg of biosolids

The RBCF uses an Extended Aerated Static Pile method to enhance the biodegradation of biosolids and feedstock materials into compost. Following mixing, the blended material is built into rows on a primary aeration cell area where air is blown from the atmosphere through each pile in a “positive” direction (up through the pile) or “negative” direction (down through the pile), to provide optimal aerobic and temperature conditions for biodegradation and reduction of pathogens and vectors.

The internal temperatures of each pile are monitored to determine whether Process to Further Reduce Pathogens (PFRP) and Vector Attraction Reduction (VAR) targets are met. These targets are typically met within 25-28 days, after which the material is torn down and re-built into a new pile in the secondary aeration cell area where the process is repeated. The material is then screened to 5/8-inch in size and arranged into windrows in the final curing area prior to testing and transportation.

The finished product is tested to ensure that it meets OMRR Class-A Compost criteria prior to approval for sale. In 2019 the City of Kelowna began participation in the Compost Council of Canada Compost Quality Alliance (CQA) Program and compost tests met CQA Class A results. A sample reports are attached in Appendix C.



More than 50% of the compost produced by the RBCF was removed from site in 2020. This was mainly due to a successful bulk purchase opportunity offered by the City of Kelowna, and sales to local landscapers.

Table 6. OgoGrow Average Analytical Results 2020

mg/kg	Result	OMRR
Arsenic (As)	2.28	13
Cadmium (Cd)	Not detected	3
Chromium (Cr)	11.25	100
Cobalt (Co)	1.75	34
Copper (Cu)	191.03	400
Lead (Pb)	6.77	150
Mercury	0.22	2
Molybdenum (Mo)	3.83	5
Nickel (Ni)	7.15	62
Selenium (Se)	1.67	2
Zinc (Zn)	241.92	500
PCB's	Not detected	2
Conductivity (EC)	2.92	
Foreign Matter	0	<1
Foreign Matter - Sharps	0	<1
Moisture %	51.9	35-60%
pH	6.83	
Organic Matter %	82.64	
Total Nitrogen by LECO %	2.6	
Phosphorus (Available P ₂ O ₅) %	1.18	
Potassium (Soluble K ₂ O) %	0.31	
Nitrate mg/kg	46.5	
Ammonia mg/kg	1199.9	
C:N Ratio	19.5	15-35

Fecal Coliform & Salmonella - Each 500 tonne (wet wt) batch of OgoGrow is individually tested for pathogens. Compost is only released for sale when it has met the OMMR requirements of <3 MPN/4g salmonella and <1000 MPN/g coliform. Averages are calculated based on the results of monthly composite tests. Results are reported on a dry weight basis.

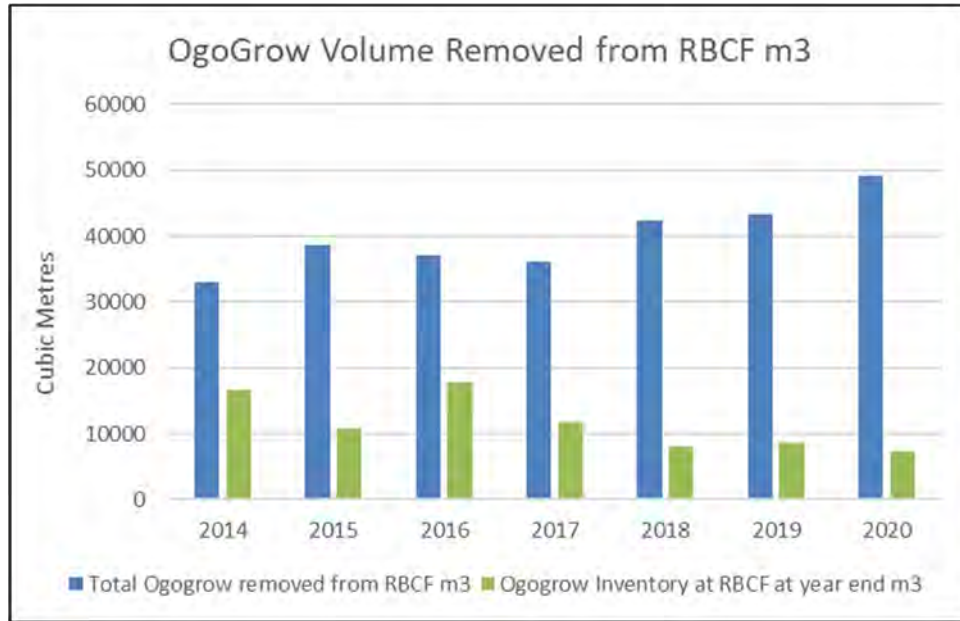


Figure 3. Volume of OgoGrow removed from site and inventory at year end

Odour Management

The RBCF operates the facility in accordance with an Odour Management Plan (OMP), which lays out best management practices to mitigate on-site odour generation and monitor off-site impacts. The original 2018 OMP was submitted to ENV on November 31, 2017 with an updated OMP completed in October 2020.

The RBCF previously used a customized odour monitoring system (OdoWatch™), which consisted of two odour detecting sensors (E-Noses) calibrated for the site, and a weather station. A separate hydrogen sulphide (H₂S) monitor continuously collects data on any detectable H₂S concentrations and calculates a rolling 2 hour average.

Technical issues were experienced with the OdoWatch system throughout 2020. Additionally, the manufacturer (OdoTech) was bought out by a larger company, which decided to discontinue support for the OdoWatch platform. Following the procurement process, the City has selected EnviroSuite’s odour monitoring system to replace OdoWatch. Installation of the new hardware is planned for spring 2021. Any changes to reporting thresholds resulting from this upgrade will be reflected in updates to the OMP.

H₂S threshold limits at the site boundary are set at 1 ppm for a 2-hour average. There were no exceedances of this limit in 2020.

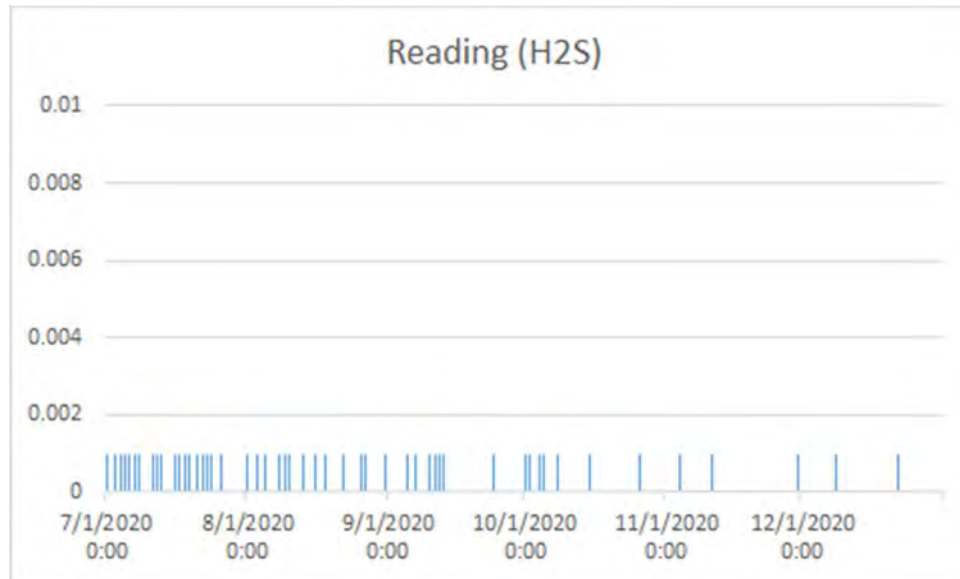


Figure 4. H₂S readings (ppm) from July 1st to December 31st, 2020.

Odour Control

To help control odours, an enclosed Coverall Building (mixing building) was erected in 2006 to receive and mix the biosolids and feedstocks. The structure allows heavy machinery to mix and transport the initial compost mix without direct wind exposure and helps reduce the migration of odours to surrounding areas. Front end loaders used at the site have pressurized cabins and cabin-air filtration systems to minimize equipment operators' exposure to dust and airborne material generated by the mixing process.



Once the compost is blended and transferred to the primary aeration cell area, odour is managed through the use of a 0.3-m thick biofiltration cover that consists of a mixture of oversized material from the screening process and finished (but unscreened) compost. This biocover absorbs much of the odour produced by the freshly-mixed piles, particularly when the system is set to positive aeration.

When the aeration fans are working in negative, air is pulled down through the piles and exhausted through one of seven biofilters (four filter air from primary composting and three filter air from secondary). Results of the 2018 RBCF Air Emissions Study supports the effectiveness of biofiltering as an odour control method.

Secondary Odour Treatment

Following a feasibility study conducted by WSP an odour-control misting system was selected as the secondary odour treatment process as required by Permit.

The misting system will cover the primary composting area and the mix building, and help neutralize odours by means of a non-toxic solution dispersed into the air. This misting system was installed in late October 2020, to be used for the first time between May and October 2021, and seasonally between these months in future years as required by Permit. The misting system will complement improvements to the aeration system, operating practices, and other infrastructure upgrades at the RBCF.

Odour Reports

The RBCF maintains records of odour reports from neighbours. The number of odour incidents reported against the facility peaked in 2014 with 130 reports, followed closely by 118 reports in 2015. In 2016, 2017, 2018 and 2019, the total number of odour complaints were 71, 65, 32 and 16 respectively.

The total number of odour reports received in 2020 were 18, a slight increase from the previous year. Figure 5 below shows the pronounced decrease in odour reports received over the past seven years.

Despite the odour reports received, the RBCF has never exceeded any of the odour threshold levels requiring reporting to ENV, as defined in its Odour Management Plan.

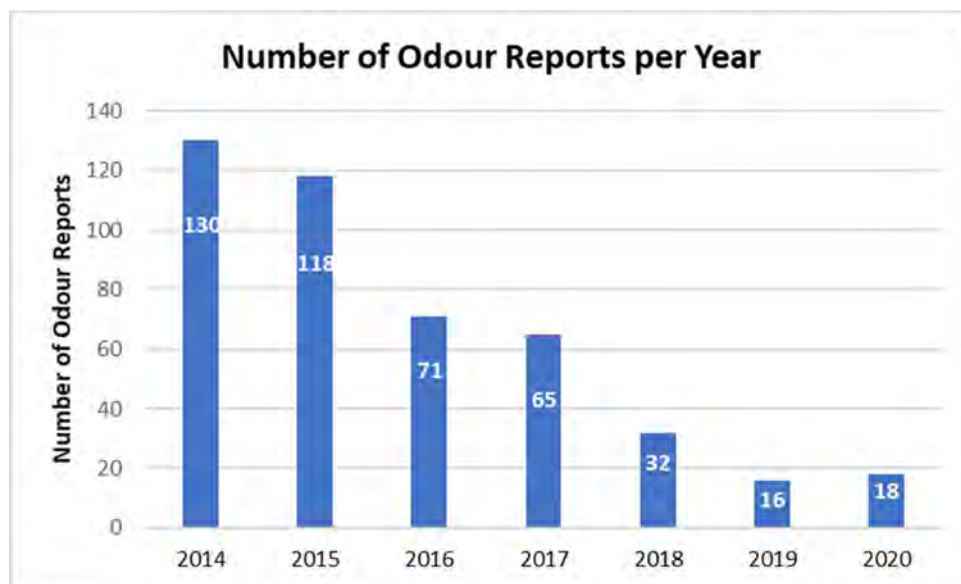


Figure 5. Number of Odour Reports Received by RBCF per Year

Leachate Management

The RBCF operates the facility in accordance with its 2018 Leachate Management Plan (LMP) that employs best management practices for the collection and treatment of all leachate collected on-site. The planned lining of the RBCF leachate drainage trench and pond, as required by Permit, was completed in the fall of 2019 by OK Excavating contractors, under supervision of WSP. The construction works to date are summarized in the 2020 Water Quality Monitoring Report enclosed in Appendix B.

Low-strength Leachate

All authorized works are carried out on an impervious surface. Runoff is directed to a drainage trench along the site's southwestern boundary and into the Drainage Pond (Figure 1). Water entering the drainage trench and pond consists primarily of stormwater runoff that may contain leachate from the compost, and (to a lesser extent) some irrigation water runoff that is applied regularly to the compost piles in the summer months. As per the 2018 LMP and as required by Section 3.4 of the Permit, the drainage trench and pond were re-built in the summer and autumn of 2019 and lined

with an impermeable membrane to decrease the potential for leachate infiltration into the environment.

Analytical testing is carried out on the drainage pond water and neighbouring ponds to assess for the potential infiltration of leachate and impacts to the surrounding area. As a condition on permit, Golder Associates were contracted to review, report, and make recommendations based on the water testing results from the 2020 calendar year (Appendix B).

High-strength Leachate

Higher-strength leachate (richer in organic content) from the primary and secondary aeration cells drains through the aeration channels and directed to holding tanks. These tanks are regularly emptied and the leachate hauled by truck off-site for treatment at Vernon Water Reclamation Facility. A summary of the leachate volume produced and hauled off-site is summarized in Figure 5.

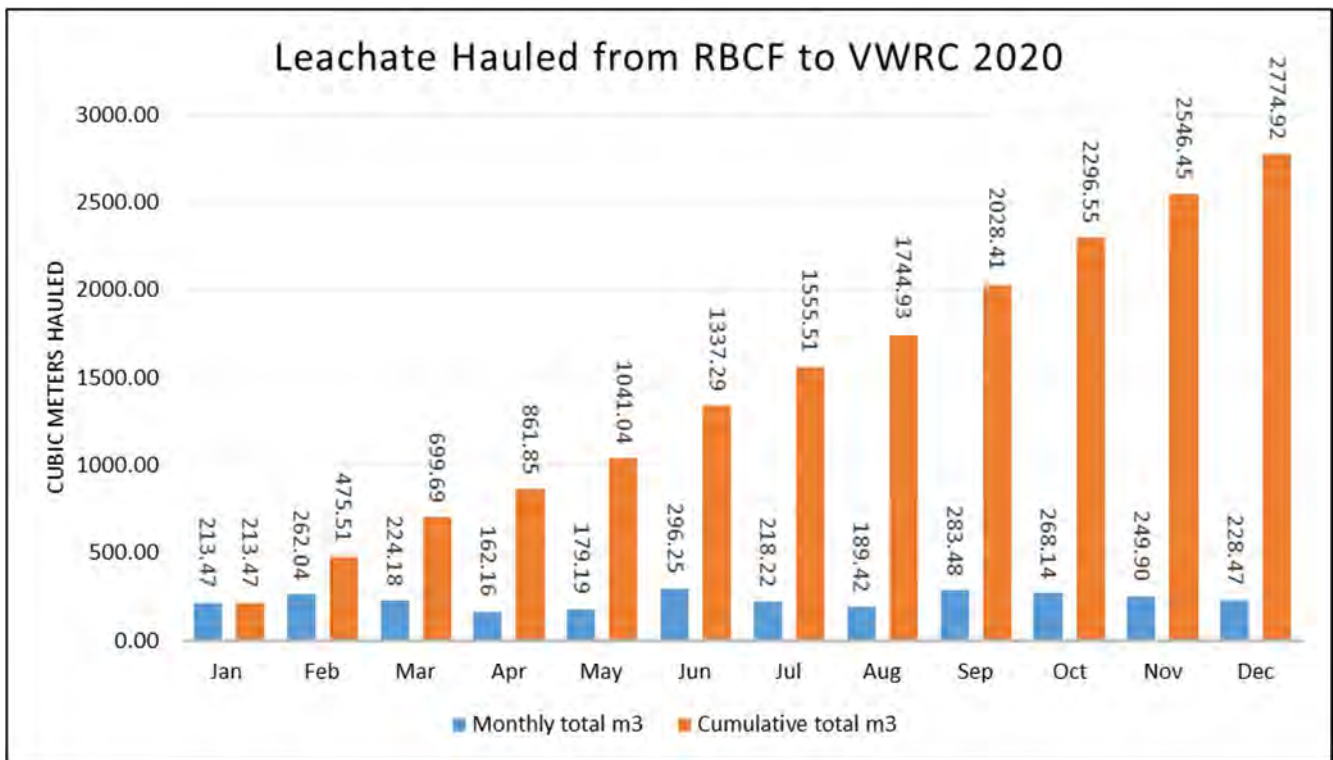


Figure 5. High-strength Leachate volume transported for treatment in 2020

Operational Maintenance

The COK regularly inspected all authorized works and equipment on-site and maintained them in good working order.

The biofilter media in all seven biofilters was replaced in April 2020 and they have continued to perform well.

All equipment was routinely serviced at the prescribed schedules or as needed at the on-site maintenance shop. All service records and activities are available upon request by ENV. During 2020, asphalt was repaired along a 700 sq. m. section at the south end of the site, along with a number of other smaller sections throughout the site as part of routine maintenance. In addition, lines indicating the zone boundaries within the secondary aeration area were repainted.



Staffing

The RBCF operates with experienced personnel that include; one Site Supervisor, one Equipment Level II Operator, five Equipment Level IV Operators, one Environmental Level I Technician, and one Environmental Level II Technician, for a total of nine staff. The RBCF staff is supported by a team of COK mechanics, millwrights and electricians, and external consultants and contractors as needed.

Monitoring and Testing

All sampling of compost, feedstock materials, water and air, conducted on-site is carried out in accordance with the British Columbia Field Sampling Manual for Continuous Monitoring and the Collection of Air, Air-Emission, Water, Wastewater, Soil, Sediment, and Biological Samples (2013).

Sample analysis is contracted to a third-party accredited laboratory that provides testing in accordance with OMRR and the BC Environmental Laboratory Manual (2015) analytical methods or equivalent. All reports are retained and available upon request by ENV.

Environmental Impact Study

An initial Environmental Impact Study (EIS) was completed by Golder Associates prior to the initial construction of the facility in 2006, and was further amended in 2010 by MMM Group to coincide with the operational expansion at that time. These two combined documents identify and address environmental impacts of the compost operation to the aquatic, terrestrial and atmospheric environments, and to vegetative and wildlife species in the surrounding area. The original and amended EIS provide recommendations as to biosolids diversion planning, best management practices, design capacity, leachate collection and treatment, and odour management to minimize environmental impacts.

The resulting recommendations were addressed in the design and operation plan, carried out through the planning and actions of management and staff, and works inspected on site periodically by ENV staff. Copies of the Environmental Impact Studies are kept on site and are available upon request by ENV. An updated Environmental Impact Study will be commissioned prior to the construction of any significant site upgrades.

Closure

This Annual Report has been prepared to comply with reporting requirements outlined in Section 5.5 of Air Discharge Permit #08537 for the City of Kelowna's Regional Biosolids Composting Facility located at 551 Commonage Road, Vernon, BC.

The City of Kelowna is committed to continual improvement of its practices and policies at the RBCF, to ensure the facility meets all permitting requirements, minimizes its impact on the natural environment and the surrounding community, and provides a safe and sustainable work environment for its workers as it conducts an essential service for the Okanagan communities it serves.

For further details on the content of this report, please contact Scott Hoekstra, Landfill and Compost Manager by phone at 250-469-8588 or by email at shoekstra@kelowna.ca.

Appendix A

Air Discharge Permit



July 12, 2017

Tracking Number: 352392
Authorization Number: 108537

REGISTERED MAIL

CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC
V1Y 1J4

Dear Permittee:

Enclosed is Permit 108537 issued under the provisions of the *Environmental Management Act*. Your attention is respectfully directed to the terms and conditions outlined in the permit. An annual fee will be determined according to the Permit Fees Regulation.

This permit does not authorize entry upon, crossing over, or use for any purpose of private or Crown lands or works, unless and except as authorized by the owner of such lands or works. The responsibility for obtaining such authority rests with the permittee. This permit is issued pursuant to the provisions of the *Environmental Management Act* to ensure compliance with Section 120(3) of that statute, which makes it an offence to discharge waste, from a prescribed industry or activity, without proper authorization. It is also the responsibility of the permittee to ensure that all activities conducted under this authorization are carried out with regard to the rights of third parties, and comply with other applicable legislation that may be in force.

This decision may be appealed to the Environmental Appeal Board in accordance with Part 8 of the *Environmental Management Act*. An appeal must be delivered within 30 days from the date that notice of this decision is given. For further information, please contact the Environmental Appeal Board at (250) 387-3464.

Administration of this permit will be carried out by staff from the Environmental Protection Division's Regional Operations Branch. Plans, data and reports pertinent to the permit are to be submitted by email or electronic transfer to the Director, designated Officer, or as further instructed.

Yours truly,

A handwritten signature in black ink, appearing to be 'Luc Lachance', written in a cursive style.

Luc Lachance, P.Eng
for Director, *Environmental Management Act*
Authorizations - South Region

Enclosure

cc: Environment Canada



**MINISTRY OF
ENVIRONMENT**

PERMIT

108537

Under the Provisions of the Environmental Management Act

**City of Kelowna
551 Commonage Road
Vernon, B.C. V1H 1G3**

is authorized to discharge contaminants to the air from a composting facility located at 551 Commonage Vernon, 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.

Unless otherwise defined in this authorization, terms used in this authorization have the same meaning as those defined in the *Environmental Management Act* and Organic Matter Recycling Regulation.

1. AUTHORIZED DISCHARGES

1.1. Authorized Source

This section applies to the discharge of air contaminants from various areas of the composting facility. The site reference number for this discharge is E307813.

1.1.1. The rate of the discharge is variable.

1.1.2. The authorized discharge period is continuous.

1.1.3. The characteristics of the discharge are that of typical emissions of a biosolids composting facility.

1.1.4. The authorized works are all paved surfaces, the aeration pads, one (1) primary receiving building, one (1) water supply pump house including the pumps, chlorination and filtration apparatus, one (1) drainage pump house, one (1) ECS Aerated Static Pile System comprised of 18 zones for primary composting and 18 zones for secondary composting, four (4) biofilters for primary composting area and

Date issued: July 12, 2017

A handwritten signature in black ink, appearing to read "L. Lachance".

L. Lachance, P. Eng.
For Director, *Environmental Management Act*
Authorizations – South Region
Permit Number: 108537

three (3) biofilters for secondary composting area, related sumps, pipes, holding tanks and related appurtenances.

1.1.5. The Permittee must not operate under this authorization unless the authorized works are complete and fully operational.

1.1.6. The location of the authorized works approximately located as shown on Site Plan attached.

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. The Permittee must maintain all asphalt surfaces and must repair cracks and significant damages to prevent and avoid leachate infiltration. Records of inspection and maintenance activities must be kept and made available upon request.

In the event of an emergency or condition beyond the control of the Permittee including, but not limited to, unauthorized fires arising from spontaneous combustion or other causes, or the detection of leachate migration outside of onsite confinement, the Permittee must take remedial action 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 corrective steps have been taken to prevent unauthorized discharges.

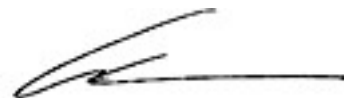
2.2. Bypasses

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

2.3. Signage

The Permittee must erect a sign at the main entrance to the site which identifies the following: site name, owner and operator, contact phone number and address, hours of operation, tipping fees (if applicable) and prohibition of hazardous wastes. The lettering on the sign must be such that it is clearly readable from a distance of 3 meters by the public when they approach the entrance of the site.

Date issued: July 12, 2017



L. Lachance, P. Eng.
For Director, *Environmental Management Act*
Authorizations – South Region
Permit Number: 108537

2.4. Access Security

The Permittee must provide adequate security for the facility and restrict access to authorized personnel.

2.5. Qualified Professionals

The Permittee must cause a qualified professional to certify that all new works are constructed in accordance with submitted plans and specifications. All documents submitted to the Director by a qualified professional must be signed by the author(s).

2.6. Litter Control

The Permittee must use the best practical means available to prevent the scatter of litter at the site. The Permittee must clean up any litter that may have escaped the site and scattered into the neighbouring property, along access roads, in drainage ditches, along fences, into surrounding trees or elsewhere on the site. The Director may require the Permittee to implement a specified frequency of clean-up and other additional requirements for litter control.

2.7. Vehicle Leaving Site

The Permittee must ensure, before any vehicle transporting compostable materials leaves the site, that the wheels of the vehicle do not contain compostable materials. If tracking of compostable material outside of the facility becomes a problem the Director may require that a wheel rinsing station be installed at the facility.

2.8. Air Quality

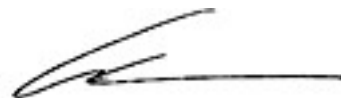
The Permittee must suppress odours created within the compost area to the satisfaction of the Director. If air quality becomes a concern, the Director may require the Permittee to implement additional control measures on emission sources.

3. OPERATIONAL REQUIREMENTS

3.1. Compostable Materials

3.1.1. The Permittee is only authorized to process the stabilized municipal sewage sludge, unprocessed and untreated wood residuals and yard waste.

Date issued: July 12, 2017



L. Lachance, P. Eng.
For Director, *Environmental Management Act*
Authorizations – South Region
Permit Number: 108537

3.1.2. The Permittee must not receive or process more than 36,400 wet tonnes of stabilized sewage sludge per year.

3.1.3. Primary Composting Area

The Permittee must select and implement a secondary odour treatment for all primary composting piles to complement the biofilters for the period of May to October of each year. The Permittee must select a secondary odour treatment by October 31, 2018 and submit to the Director for approval. If the selected and approved secondary odour treatment is not implemented by June 30th, 2019, the Permittee will have to use a cover for all primary composting piles from May to October each year.

3.2. Biofiltration Cover

The Permittee must maintain at all times, for the purpose of odour control, a biofiltration cover for all compost piles located in the primary and secondary compost areas, consisting of:

- 0.3 m secondary teardown, or
- 0.3 m oversized material (overs), or
- A blend of secondary teardown and overs, or
- Another covering layer of a type and thickness that is acceptable to the Director.

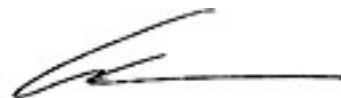
The Permittee must account for the biofiltration cover when calculating the carbon to nitrogen ratio to ensure that optimal composting conditions are maintained throughout the process. In order for the biofiltration cover to be effective, the Permittee must maintain optimal moisture content in the biofiltration material.

3.3. Design and Operating Plan

The Permittee must submit an updated design and operating plan by May 31, 2019. The plan must be prepared by a qualified professional. The plan must describe, but not be limited to, the design, operations, acceptable materials, leachate management, monitoring programs, reporting requirements and performance requirements. In addition, the operating plan must:

- 3.3.1. Demonstrate that the biofilters are of adequate size and capacity for the facility's design;
- 3.3.2. Establish a schedule of site-specific maintenance activities for the biofilters;
- 3.3.3. Describe how records are kept for all maintenance activities performed on site;

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3.3.4. Explain how the biofiltration cover is integrated in the C:N ratio;

3.3.5. Include contingency plans in case of supply shortage (hog, ash) ; and,

3.3.6. Include an asphalt maintenance program, which describes inspection protocols and maintenance activities.

The Permittee must operate the facility in accordance with the design and operating plan. The Director may request additional information with respect to the design and operating plan and specifications that he or she considers necessary for the protection of human health and the environment, and may specify particular concerns or questions that the plans and specifications must address.

3.4. Leachate Management

The Permittee must ensure that all leachate generated from the composting operation, buildings, paved open surface areas, outdoor curing areas, finished compost storage areas, and truck marshalling area is collected and directed to the leachate collection system. The Permittee must maintain all collection channels and catch basins to ensure proper drainage.

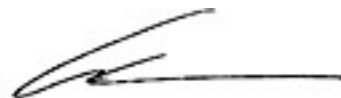
The Permittee must select an impermeable containment system to store leachate, or the contact water from the curing areas or other water that may have come in contact with the organic waste or compost. The Permittee must submit the new Leachate Management System Plan to the Director for approval before November 30, 2017. The Permittee must cease to use the drainage trench or the drainage pond after October 31, 2018 to store leachate, or the contact water from the curing areas or other water that may have come in contact with the organic waste unless the drainage trench and the drainage pond are lined with an impermeable liner.

3.5. Odour Management

The Permittee must submit to the Director for approval an updated odour management plan by November 30, 2017. The plan must be prepared by a qualified professional and must do the following:

3.5.1. Identify all odour generating areas including, but not limited to: receiving, mixing, primary composting, curing or secondary composting, screening, leachate collection system, aeration systems, biofilters, grinding and storage.

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- 3.5.2. Identify appropriate mitigating strategies employed for each area and provide a summary table in the plan.
- 3.5.3. Identify all parameters and optimal ranges in the compost process needed to limit odour generation. Compost process parameters to be identified include, but are not limited to, feedstock type, bulking materials, bulk density, particle size, carbon to nitrogen ratios, moisture, temperature, oxygen, peak odour times (i.e. Day 3 or 7), pile turning schedules.
- 3.5.4. Outline all best management practices and emission control technologies aimed at reducing odour generation being employed at the facility.
- 3.5.5. Identify other best management practices and emission control technologies that could potentially be used on site to further reduce and control odour.
- 3.5.6. Include an odour monitoring program. The program must describe how odours are monitored on-site and off-site.
- 3.5.7. Include a complaint management process which includes a complaint form, any investigative actions to be taken and any mitigation actions to be taken.

The Permittee must operate the facility in accordance with the approved odour management plan, and any requirements which the Director may attach to the odour management plan as a condition of approval.

3.6. Change to Plans

The Permittee must keep the design and operating plan up to date and must notify the Director of any changes to the plan within 30 days of the change.

3.7. Closure of the Facility

Before closure of the facility, the Permittee must apply or distribute all compost in accordance with the Organic Matter Recycling Regulation, and all unprocessed organic matter must be removed from the facility and dealt with in accordance with the *Environmental Management Act*.

A final closure plan must be submitted 90 days prior to deactivation of the site to the Director for review and approval. The final closure plan and associated engineered closure works must be compatible with the planned end-use of the compost facility.

3.8. Additional Requirements

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The Permittee must ensure the following requirements are met:

- 3.8.1. Class A compost must meet the requirements of pathogen reduction processes, vector attraction reduction, pathogen reduction limits, quality criteria, sampling and analysis – protocols and frequency, and record keeping as outlined in the Organic Matter Recycling Regulation.
- 3.8.2. Biosolids used as feedstock for the production of Class A compost must not exceed the standards for Class B biosolids set out in Column 3 of Schedule 4.
- 3.8.3. At least half of the compost stored at 551 Commonage Road, Vernon, BC must be removed annually from the facility.
- 3.8.4. The receiving, storage, processing and curing areas of the composting facility must be located on asphalt, concrete or another similar impermeable surface that is capable of withstanding wear and tear from normal operations and that will prevent the release of leachate into the environment.
- 3.8.5. Residuals from the composting process must be stored so as to prevent vector attraction, and be disposed of on a regular basis in accordance with the *Environmental Management Act*.
- 3.8.6. Residuals that are stored at a composting facility must not at any time exceed 15 cubic meters in total.

4. MONITORING REQUIREMENTS

4.1. Odour emissions

The Permittee must continue to monitor air emissions at the facility and in the surrounding areas using existing e-noses and H₂S monitors. The Permittee must monitor odour emissions in accordance with the approved odour management plan and results must be presented and interpreted in the annual report.

4.2. Surface Water Monitoring

The Permittee must continue to implement a surface water monitor program as required in writing by the Director and in accordance with recommendations from a Qualified Professional. The Director may request additional information or changes with respect to the monitoring program based on monitoring results and upon submission and review of the Leachate Management System Plan, required under Section 3.5.

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4.3. Environmental Impact Study

The Permittee must retain on site a copy of the most recently submitted environmental impact study for inspection. The Director may request additional information with respect to the environmental impact study that he or she considers necessary for the protection of human health and the environment, and may specify particular concerns or questions that the impact study must address.

4.4. Air Emissions Review Study

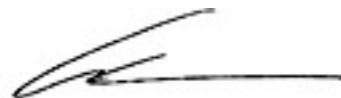
The Permittee must retain the services of a qualified professional to review and analyze all emissions data collected at the facility with e-noses, H₂S monitors and odorous gas measurements. The report must be submitted by March 31, 2018 and must:

- 4.4.1. Describe odour emissions on-site for each odour generating area;
- 4.4.2. Describe how odours are migrating off-site and identify all affected areas;
- 4.4.3. Use quantitative and qualitative units for descriptions;
- 4.4.4. Include daily, seasonal and annual trends;
- 4.4.5. Discuss how meteorological conditions effect odour generation and dispersion;
- 4.4.6. Provide a qualitative assessment of how odours have improved since 2010;
- 4.4.7. Report on the effectiveness of odour mitigation strategies used at the facility;
- 4.4.8. Discuss calibration schedule/requirements of the OdoWatch system; and
- 4.4.9. Make recommendations on how the facility could further reduce its odour emissions.

4.5. Foul Air Study

The Director may request the Permittee to conduct a foul air study or similar study to measure the effectiveness of the facility's odour management plan and to quantify the odours migrating off-site.

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4.6. Sampling Procedures

The Permittee must 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", 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: <http://www2.gov.bc.ca/gov/content/environment/research-monitoring-reporting/monitoring/sampling-methods-quality-assurance/bc-field-sampling-manual>

4.7. Analytical Procedures

The Permittee must carry out analyses in accordance with the procedures described in the "British Columbia Laboratory Manual, 2015 ", or the most current edition, or by suitable alternative procedures as authorized by the Director.

A copy of the above manual is available on the Ministry web page at: <http://www2.gov.bc.ca/gov/content/environment/research-monitoring-reporting/monitoring/sampling-methods-quality-assurance/bc-environmental-laboratory-manual>

5. REPORTING REQUIREMENTS

5.1. Maintenance of Records

The Permittee must maintain all records and plans required by this authorization and produce them for inspection by an officer when requested.

5.2. Electronic Submission

The Permittee must submit all data required to be submitted under this permit 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>

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5.3. 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.

5.4. Non-Compliance

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 immediately notify the Director or designate of any non-compliance with the requirements of this Permit and take appropriate remedial action. Written confirmation of all non-compliance events, including available test results is required within 24 hours of the original notification unless otherwise directed by the Director, Environmental Protection.

Within 30 days of the non-compliant event, the Permittee must submit to the Director, Environmental Protection, a written report including, but not necessarily limited to, the following:

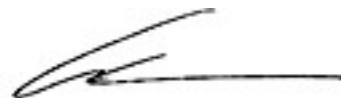
- (a) all relevant test results related to the noncompliance;
- (b) an explanation of the most probable cause(s) of the noncompliance; and
- (c) remedial action planned and/or taken to prevent similar noncompliance(s) in the future.

5.5. Annual Reporting

The Permittee must submit a comprehensive annual report to the Director, on or before March 31st of each year for the previous calendar year. The annual report must include but not be limited to:

- 5.5.1. The type and tonnage of compostable materials received for the preceding calendar year;
- 5.5.2. The quantity of finished compost transported off site and the amount stored on site at the end of each calendar year;
- 5.5.3. The results of all monitoring programs as specified in this authorization. The Permittee must ensure that data interpretation and trend analysis, as well as an

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evaluation of the impacts of the discharges on the receiving environment in the previous calendar year must be carried out by a qualified professional;

5.5.4. A summary and analysis of all complaints received in the previous calendar year; and

5.5.5. Any improvements made to the facility or operations to reduce and control odour.

6. LICENCE TO PUBLISH DOCUMENTS

6.1. Subject to 6.2, the Permittee authorizes the Province to publish on the Ministry of Environment website the entirety of any Regulatory Document.

6.2. 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.

6.3. 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

“Foreign matter” means a contaminant that is not readily decomposed during the composting process, and includes demolition waste, metal, glass, plastic, rubber and leather, but does not include silt, sand, rocks or stones, or gravel less than 2.5 centimeters in diameter, or other similar mineral materials naturally found in soil;

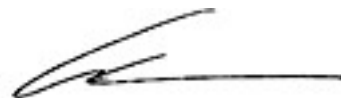
“Oversized material” or “overs” means the product resulting from secondary teardown screening which removes the compost particles smaller than 19 mm.

“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;

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- (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;

“Residuals” means material that can’t be used in the composting process and includes organic material that can’t be composted because it is unauthorized, or fails to meet OMRR standards, or is defined as foreign matter;

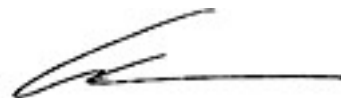
“Secondary teardown” means unscreened compost that has been processed for 24 to 28 days on the primary zone to achieve process to further reduce pathogens (PFRP) and vector attraction reduction (VAR) requirements, then moved to the secondary composting zone where aeration is continued for an additional 24 to 30 days of curing. The secondary teardown at the end of this process is approximately 56 days old and has met OMRR requirements;

“Stabilized municipal sewage sludge” means sludge resulting from a municipal waste water treatment process or septage treatment process which has been sufficiently treated through biological, thermal or chemical stabilization to allow the sludge to be beneficially recycled.

“Untreated and unprocessed wood residuals” means clean (non-contaminated and untreated) wood from lumber manufacture, including: shavings, sawdust, chips, hog fuel, ground mill ends and land clearing waste which has been ground with the majority of the greenery removed and no soil present but does not include construction and demolition debris;

“Yard waste” means clean and untreated wood waste or non-food vegetative matter resulting from gardening operations, landscaping, and land clearing; yard waste does not include wood waste derived from construction or demolition. Neither human or animal food waste that is diverted from residential, commercial or institutional sources, nor manure, is yard waste.

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SITE PLAN



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Appendix B

Water Quality Report 2020



REPORT

2020 Water Quality Monitoring Report

Regional Biosolids Composting Facility, 551 Commonage Road, Vernon, BC

Submitted to:

City of Kelowna

1435 Water Street
Kelowna, BC
V1Y 1J4

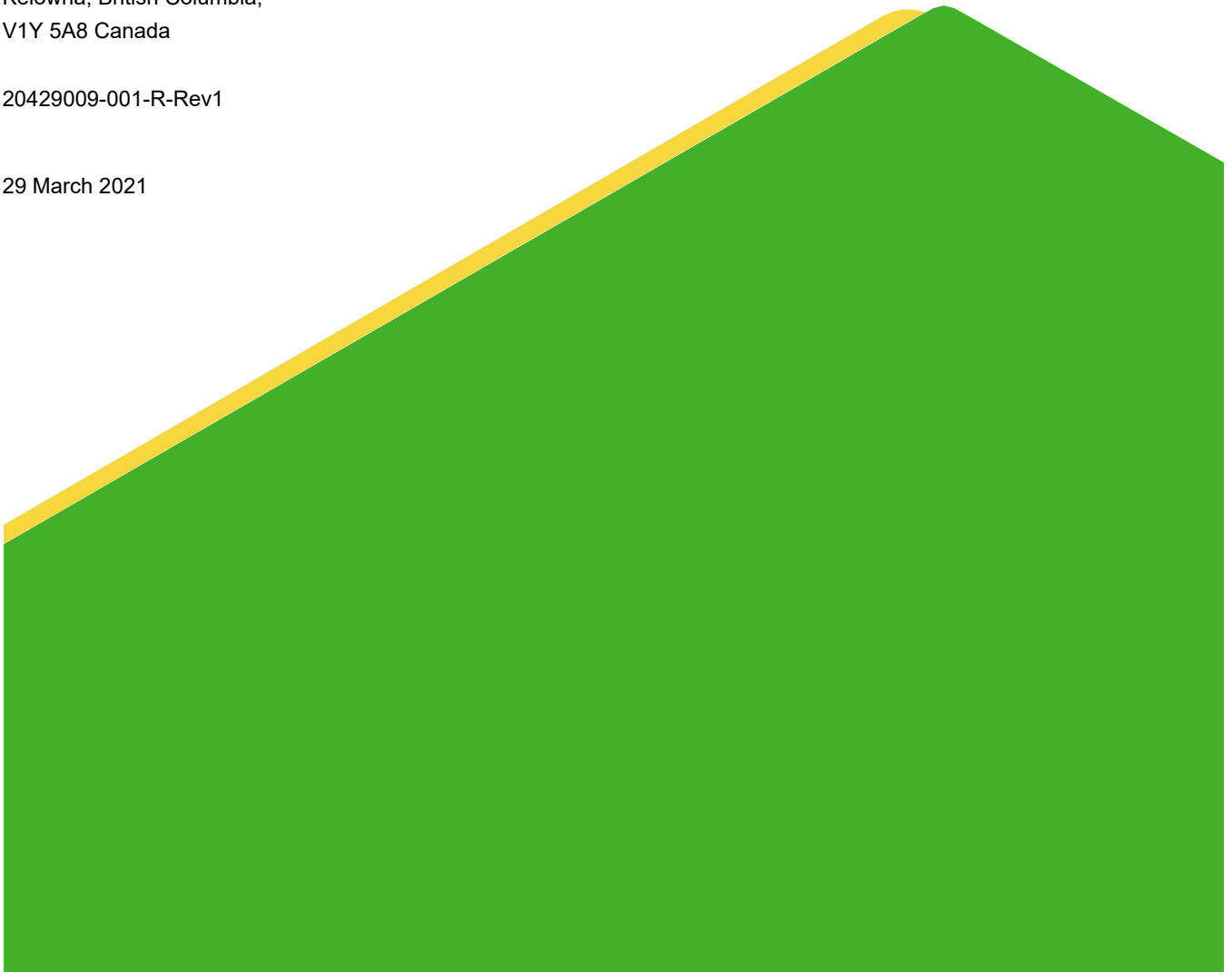
Submitted by:

Golder

590 McKay Avenue, Suite 300
Kelowna, British Columbia,
V1Y 5A8 Canada

20429009-001-R-Rev1

29 March 2021



Distribution List

1 eCopy - City of Kelowna

1 eCopy - Golder Associates Ltd.

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Table 2: 2014 – 2020 Results of Water Analyses – Davidson Pond and Rose’s Pond

FIGURES (WITHIN TEXT)

Figure A: Ammonia (as N) and Chloride Concentration Trends in Water at the Drainage Pond (2014-2020 data) 8

Figure B: Ammonia (as N), Chloride and Total Sodium Concentration Trends in Water at Davidson's Pond and Rose’s Pond (2014-2020 data) 10

FIGURES (AFTER TEXT)

Figure 1: Key Plan

Figure 2: Site Plan

APPENDICES

APPENDIX A

CARO Analytical Services, Laboratory Certificates of Analysis (2020)

1.0 INTRODUCTION

Golder Associates Ltd. (Golder) is pleased to provide the City of Kelowna (CoK) with this monitoring report that documents the results of a water quality monitoring program completed in 2020 at the Regional Biosolids Composting Facility (RBCF) located at 551 Commonage Road in Vernon, BC (hereafter referred to as the Site). The monitoring data were collected by CoK personnel and provided to Golder for compiling this report.

It is our understanding that the purpose of the monitoring program is to assess potential leachate infiltration of stormwater runoff and leachate that is generated at the Site. The monitoring program satisfies the requirements of the Ministry of Environment and Climate Change Strategy (MoE) discharge Permit 108537, issued by the MoE to the CoK on 12 July 2017, with regards to implementing a surface water monitoring program at the Site (Section 4.2 of Permit). The monitoring program also addresses recommendations made by the MoE in a letter to the CoK entitled "Response to the Notice of Proposed Expansion of Biosolid Composting Facility", dated 27 April 2010; and by Golder in subsequent letters and annual monitoring reports prepared for the CoK for submission to the MoE.

This report satisfies the reporting requirements of Permit 108537, including data interpretation and trend analysis and an evaluation of the impacts of discharges on the receiving environment (Section 5.5.3 of Permit).

2.0 BACKGROUND

2.1 Current Site Conditions and Operations

2.1.1 Site Conditions

The RBCF was constructed in 2006 and is located on Commonage Road in Vernon, BC (Figures 1 and 2). The Site composts wastewater treatment plant biosolid material and currently consists of an administration building, biosolids receiving and mixing building, maintenance shop, primary and secondary aeration cells, and a compost curing area. An expansion of the facility and facility upgrades were completed in 2010, at which time the entire composting curing area was paved. Prior to the construction of the RBCF, a septage disposal facility was operated at the Site by the City of Vernon (CoV) and the Regional District of North Okanagan (RDNO).

The Site is surrounded primarily by undeveloped and agricultural land. Surface water bodies in close proximity to the Site include the following (refer to Figures 1 and 2):

- Drainage Pond: located approximately 100 m west of the RBCF, between the Site and Commonage Road, and used to store stormwater runoff generated at the Site.
- Rose's Pond: located approximately 200 m northwest of the RBCF (and approximately 100 m northwest of the Drainage Pond), on the northwest side of Commonage Road.
- Davidson Pond: a privately-owned pond on the Davidson Property, located approximately 100 m south of the RBCF (and approximately 200 m south and southwest of the Drainage Pond).

2.1.2 Site Operations

Our understanding of the Site operations is as follows: stormwater runoff generated at the Site is directed towards a drainage trench along the Site's south-western boundary, and then gravity-fed into the Drainage Pond (Figure 2). Water entering the drainage trench and Drainage Pond consists primarily of stormwater that may contain leachate from the compost material stored on the curing pads; and potentially irrigation water runoff, as

water is regularly added to the compost material, particularly in the hot summer months. Leachate from the primary and secondary aeration cells at the Site is directed to a holding tank and then truck-hauled for treatment at the Vernon Water Reclamation Centre located at 2100 43rd Street, Vernon BC. It is noted that prior to October 2019 (prior to closure of the RDNO's septage facility), leachate was truck-hauled to RDNO's septage facility located at 1700 Polson Drive, Vernon BC.

In the summer months, treated (chlorinated) effluent from the CoV's MacKay Reservoir (located approximately 2 km west-southwest of the Site) is periodically used to flush the drainage trench; in the winter months, effluent on route to the MacKay Reservoir from the Vernon Water Reclamation Centre is diverted and treated (filtered and/or chlorinated) at the Site, then used to flush the drainage trench. When the water level at the Drainage Pond is near capacity, water is pumped to the MacKay Reservoir. In 2020, water from the Drainage Pond was pumped to the MacKay Reservoir from March to December 2020; the total volume of water discharged was 91,600 m³.

2.2 Chronological History of Key Site Events

In 2009, the CoK retained Golder to complete an initial review of the Site, which was documented in the report titled "*Interim Report on Leachate Drainage Pond, Kelowna – Vernon Compost Facility*", dated 17 February 2010. The purpose of the report was to compile local and regional data on the hydrogeology in the area, monitor water quality, and monitor drainage and pond water levels to assess potential infiltration of leachate. The 2010 report indicated that the RBCF and the Drainage Pond are located on dense glacial tills that inhibit water infiltration into the groundwater aquifer located within the underlying bedrock. It was inferred that water infiltrating into the ground could migrate along the top of the glacial till and may eventually discharge into local ponds (i.e., Davidson Pond and Rose's Pond), with a small component of infiltration migrating vertically through the till into deeper bedrock fractures.

Between 2010 and 2020, the CoK conducted monitoring programs at the Drainage Pond, Davidson Pond and Rose's Pond (except in 2013 and 2016) to assess whether water at the Drainage Pond may be infiltrating into the ground and discharging into Rose's Pond and/or Davidson Pond. The results of these monitoring programs have been documented in various reports prepared by Golder and submitted to the CoK.

Pursuant to the 9 June 2016 amendments to the Organic Matter Recycling Regulation, Permit 108537 was issued by the MoE to the CoK on 12 July 2017 authorizing the discharge of contaminants to the air from the Site, specifying surface water monitoring and reporting requirements at the Site, and requiring that, at minimum, the Drainage Pond and drainage trench be lined by 31 October 2019.

In early 2018, the CoK installed silt fencing around the Drainage Pond to support future construction works. In accordance with a wildlife permit issued to the CoK for the future construction works, the silt fencing was installed to prevent entry of turtles into the pond so that no additional turtles would be present in the pond when drained and re-lined later in 2019 (personnel communication, M. Browne; 12 February 2019). Between May and July 2019, the CoK implemented a turtle and wildlife removal program from the Drainage Pond in preparation for the construction works. The turtle and wildlife removal program was completed by Associated Environmental Consultants Inc. of Vernon BC; and an associated report was submitted separately to the Ministry of Forests, Lands and Natural Resource Operations.

In August of 2019, construction works commenced at the Site under the supervision of WSP and included re-lining of the Drainage Pond and the drainage trench along the Site's south-western boundary. The construction works were summarized by WSP and the CoK, as follows:

- The Drainage Pond was dewatered, and accumulated sludge excavated and removed until native material (clay) was exposed. The COK noted that the native material at the excavated base of the Drainage Pond consisted primarily of homogeneous clay with rounded cobbles. The initial construction plan was to place imported sand on top of the excavated base of the Drainage Pond prior to installation of the liner; however, given the native materials that were encountered, the use of imported sand was reportedly not warranted. During the excavation activities, groundwater was observed to seep into the excavation from the southeast (at an unknown depth). A french drain was installed to aid in the drainage of groundwater from the base of the excavation. A total of 4,260 m² of non-woven geotextile underneath an LDPE liner was then installed at the base of the excavation (with the french drain remaining in place). The liner was an Enviroliner 6040X liner manufactured by Layfield Group Limited. The liner covered the entire area of the Drainage Pond up to the top of bank on all four sides.
- The drainage trench was dewatered, and accumulated sludge excavated and removed until the existing concrete base was exposed. All concrete was removed and vegetation on the slopes around the drainage trench stripped and disposed of at an off-Site location. The native material beneath the concrete was inferred to be glacial till, and consisted of a combination of sand, gravels, cobbles and clay. A total of 640 m² of non-woven geotextile underneath an LDPE liner was then installed. The liner was an Enviroliner 6040X liner manufactured by Layfield Group Limited. The liner covered the entire area of the Drainage Trench up to the top of bank on all four sides.
- Integrity testing of all seams, joints, and protrusion welds within both the Drainage Pond and drainage trench was completed by the liner supplier and installer prior to reintroducing water into the pond/trench. WSP reported that all testing passed.
- Since construction commenced in mid-2019 and continued until the end of 2019, minimal water was used so as to minimize run-off. Stormwater was routed into a temporary holding tank that was pumped out for disposal at the Vernon Water Reclamation Centre.

Following the construction works in 2019, the newly-lined Drainage Pond and drainage trench operated as intended in 2020. Minor repair of the liners at the Drainage Pond and the drainage trench was conducted on 22 September 2020, as the liners had been slightly compromised by marmots. In the spring of 2020, after the ice surface on the Drainage Pond had melted, a strong organic odour was noted at the pond for a short period of time. In the fall of 2020, strong organic odours were noted by City personnel at the Drainage Pond. The City subsequently installed an aerator in the pond on 16 October 2020, and City personnel reported that aeration was successful in eliminating the odours from the Drainage Pond.

3.0 2020 SCOPE OF WORK

The scope of work for the 2020 annual water quality monitoring program is provided below. The scope of work was based on Golder's recommendations outlined in our report entitled "2019 Water Quality Monitoring Report, Regional Biosolids Composting Facility, 551 Commonage Road, Vernon, BC", dated 26 March 2019. The field portion of the scope of work was completed by CoK personnel:

- Collect monthly samples at the Drainage Pond and at the neighbouring Davidson Pond and Rose's Pond between May and November of 2020 (i.e., during months when the ponds are not frozen) for analysis of potential indicators of biosolids (i.e., septage) contaminants including:

- Phosphorous (including ortho-phosphate), chloride, ammonia, nitrate, nitrite, total kjeldahl nitrogen and total nitrogen.
- Biological oxygen demand (BOD) and chemical oxygen demand (COD).
- Metals (total and dissolved).
- pH, total dissolved solids (TDS), total suspended solids (TSS) and hardness.
- Microbiological parameters (total coliforms and Escherichia coli [E. coli]).
- Review of analytical results.

It is noted that samples were collected between September and December 2020 (only) at the Drainage Pond and between September and November 2020 (only) at Davidson Pond and Rose's Pond due to staffing changes at the facility. Additionally, the recommendations for 2020 included field measurements of the pH and temperature of the water samples during sample collection and collection of duplicate water samples for quality assurance and quality control purposes; however, as a result of staffing changes at the facility, these tasks were not completed. The collection of monthly samples, measurement of field parameters and collection of duplicate water samples during each sampling program will resume in 2021.

Based on the above scope of work, Golder has prepared this monitoring report for submission to the MoE by the CoK. The monitoring report provides discussions on:

- Water quality results for the Drainage Pond.
- Water quality results for Davidson Pond and Rose's Pond, including potential impacts from the Drainage Pond, if any.
- Monitoring and sampling recommendations for the 2021 monitoring program.

4.0 SURFACE WATER ASSESSMENT CRITERIA

Pond water quality data were tabulated by Golder and compared to the following standards and/or criteria:

- Freshwater aquatic life (AW) and Drinking water (DW) standards in the BC Contaminated Sites Regulation (CSR) (B.C. Reg. 375/96; last amended 1 February 2021 by B.C. Reg. 161/2020).
- "*British Columbia Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture, Summary Report*", dated August 2019 (BCWQG) for freshwater aquatic life (AW) criteria. Where applicable, the most conservative of the long-term average and short-term maximum guidelines are referenced.
- "*British Columbia Working Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture (July 2020)*" for freshwater aquatic life (AW) criteria.

According to BC Technical Guidance Document 15: Concentration Limits for the Protection of Aquatic Receiving Environments (Version 2.0; 1 November 2017):

- For maintained watercourses, the CSR AW standards are applicable to surface water, porewater, and groundwater.
- Surface water in aquatic receiving environments other than maintained watercourses should be evaluated against the BCWQG.

For the purposes of this assessment, the Drainage Pond is considered to be a maintained watercourse; and as there is no overland flow from the Drainage Pond, and potential contaminants can only migrate through groundwater to other surface water bodies or drinking water wells, the water quality data from the Drainage Pond has been compared to the CSR AW and DW standards. Davidson Pond and Rose's Pond are considered to be aquatic receiving environments, and water quality data for these two ponds have been compared to the BCWQG, and conservatively against the CSR AW and DW standards.

For the comparison of ammonia concentrations, the BCWQG AW guideline for ammonia is pH and temperature dependent and is typically derived using the pH and temperature measured in the field during collection of each water sample. The CSR AW standard for ammonia is pH dependent and assumes a temperature of 10 degrees Celsius; the CSR AW standard for ammonia and is typically derived using the field pH. It is noted that since pH values were not measured during sampling collection in 2020, the lab pH value was used instead to allow for a relative comparison of the ammonia concentrations in 2020.

For the comparison of metals concentrations, the total metals (unfiltered) concentrations in the samples were used for comparison to the CSR standards and the BCWQG AW guidelines, in accordance with standard practice for surface water samples. Total metals parameter exceedances of the applicable criteria are shown in tables and discussed in the body of this report. For inclusiveness, the dissolved metals (filtered) concentrations were also compared to the CSR standards and the BCWQG AW guidelines; however, while dissolved metals parameter exceedances are shown in the applicable tables, they are not further discussed in the body of this report.

In late 2019, the BCWQG AW guideline for copper changed from a total copper guideline that was hardness dependent to long-term chronic and short-term acute dissolved copper guidelines that are dependent on the specific chemistry of the water (including, temperature, dissolved organ carbon [DOC], pH and hardness) and are calculated using the Biotic Ligand Model (BLM) software program (MoE, 2019¹). It is noted that one of the required parameters for calculating the guidelines (i.e., DOC) was not included as an analytical parameter in water samples collected at Davidson and Rose's Ponds in 2020. Therefore, site-specific BCWQG AW guidelines for dissolved copper cannot be calculated for the Davidson and Rose's Pond samples. It is recommended that in 2021, DOC be added to the list of analytical parameters for the samples at Davidson Pond and Rose's Pond.

¹ B.C. Ministry of Environment and Climate Change Strategy (MoE), 2019. Copper Water Quality Guideline for the Protection of Freshwater Aquatic Life – Technical Report. Water Quality Guideline Series No. WQG-03-1. Prov. B.C., Victoria B.C.

4.1 Regional Background Concentrations

BC MoE issued Technical Bulletin #3 “*Regional Background Concentrations for Select Inorganic Substances in Groundwater*” (24 September 2018) which establishes regional background concentration estimates for arsenic, lithium, selenium, vanadium, and uranium in groundwater for several regions in British Columbia, including the Thompson-Okanagan. Under Technical Bulletin #3, groundwater substances at concentrations exceeding the applicable DW and/or AW standard, but less than the local regional background concentrations, would not be considered “contaminated” under Section 11 (3) of the BC Contaminated Sites Regulation (CSR).

As per Technical Bulletin #3, the Site and surrounding area fall outside of the geographic boundaries of the Thompson-Okanagan region. Furthermore, regional background concentrations can only be applied to groundwater obtained from a non-consolidated overburden aquifer, not a bedrock aquifer; and regional background concentrations must only be applied to groundwater, not surface water. Thus, without further assessment, the regional background concentration estimates may not be applicable to water quality at the Drainage Pond, Davidson Pond and Rose’s Pond.

As discussed below, arsenic, selenium, vanadium, and uranium concentrations measured at the Drainage Pond, Davidson Pond and Rose’s Pond in 2020 did not exceed the applicable CSR DW or AW standards; however, lithium concentrations measured at the Drainage Pond, Davidson Pond and Rose’s Pond in 2020 exceeded the applicable CSR DW standard. Based on our experience, elevated lithium concentrations in groundwater are widespread in the Okanagan Valley and the elevated lithium concentrations at the Site and surrounding area may be related to regional background conditions. Thus, for the 2020 annual water quality monitoring report, lithium concentrations at the Drainage Pond, Davidson Pond and Rose’s Pond have been compared to the BC CSR DW and AW standard, and for comparison, to the regional background concentration for lithium.

Technical Bulletin #3 also states that a cobalt interim background groundwater estimate of 20 µg/L (or, 0.020 mg/L) may be used at all sites in British Columbia. The cobalt interim background groundwater estimate has been applied to the water quality data.

5.0 FIELD MONITORING

5.1 Field Monitoring

Field monitoring in 2020 was conducted between September and December 2020 and included the following tasks:

- Sampling of the Drainage Pond in September, October, November, and December 2020 (for a total of four samples) and analysis of samples for septage contaminants listed under Section 3.0.
- Sampling of Davidson Pond and Rose’s Pond monthly in September through November 2020 (for a total of three samples from each location) and analysis of samples for septage contaminants listed under Section 3.0. Samples were not collected from Davidson’s Pond or Rose’s Pond in December 2020 because the ponds were frozen and could not be sampled.

5.2 Field Sampling Methods

CoK staff collected all water samples described in this report. Grab samples were collected from below the water surface near the shoreline of each pond and placed in bottles supplied by CARO Analytical Services (CARO) of Kelowna, BC. The collected samples were delivered to CARO for analysis. The CARO analytical reports were provided to Golder by the CoK.

Golder tabulated the 2020 data to allow for an assessment of the water quality results; tabulated data are provided in this report along with the data from 2014 through 2019.

6.0 RESULTS

6.1 Drainage Pond Quality

A summary of the analytical results for water samples collected from the Drainage Pond in 2020 is presented in Table 1, attached. The CARO analytical reports (laboratory report numbers 0092295-02, 20J3022-02, 20K2112-02 and 20L1364-01) are included in Appendix A. The following is a summary of the 2020 analytical results. Results were compared to the CSR AW and DW standards, where applicable.

- Ammonia (as N) concentrations exceeded the applicable CSR AW standard during the September, October, November, and December sampling events (there is no CSR DW standard for ammonia as N). The ammonia (as N) concentration measured in October (24.7 mg/L) was the highest concentration measured at the Drainage Pond between 2014 and 2020.
- Total cobalt concentrations exceeded the CSR DW standard of 0.001 mg/L during the October and November sampling events; however, total cobalt concentrations were below the regional background concentration of 0.020 mg/L.
- Total lithium concentrations exceeded the CSR DW standard of 0.008 mg/L during the September through November sampling events (there is no CSR AW standard for lithium). Dissolved lithium concentrations exceeded the CSR DW standard of 0.008 mg/L during the September through December sampling events. Should the regional background concentration for lithium of 0.096 mg/L apply at the Site, lithium concentrations at the Drainage Pond would be below the regional background concentration for lithium.
- Concentrations of total coliforms in the samples collected from the Drainage Pond were the lowest in September as most probable number (mpn) per 100 mL of >11,000 for total coliforms. Concentrations of E. coli were the lowest in December as 174 mpn / 100 mL for E. coli. The highest concentration of total coliforms was measured in November as 199,000 mpn / 100 mL; and the highest concentration of E. coli was measured in September as 11,000 mpn / 100 mL.
- The other concentrations of nutrients parameters, chloride, and total metals in the Drainage Pond were below the applicable CSR AW and DW standards.

The following is a summary of notable trends observed between 2014 and 2020 at the Drainage Pond.

- Concentrations of ammonia (as N), BOD, COD and most total and dissolved metal parameters measured in 2020 (i.e., arsenic, cobalt, copper, phosphorus, selenium) were generally similar to concentrations measured in 2019, and generally higher than concentrations measured in 2014 through 2018.
- Ammonia (as N) has exhibited an increasing trend since 2016. Ammonia (as N) concentration trends at the Drainage Pond are shown in Figure A below.
- Chloride concentrations measured in 2020 were generally within the range of concentrations measured between 2014 and 2019. Chloride concentration trends at the Drainage Pond are shown in Figure A below.

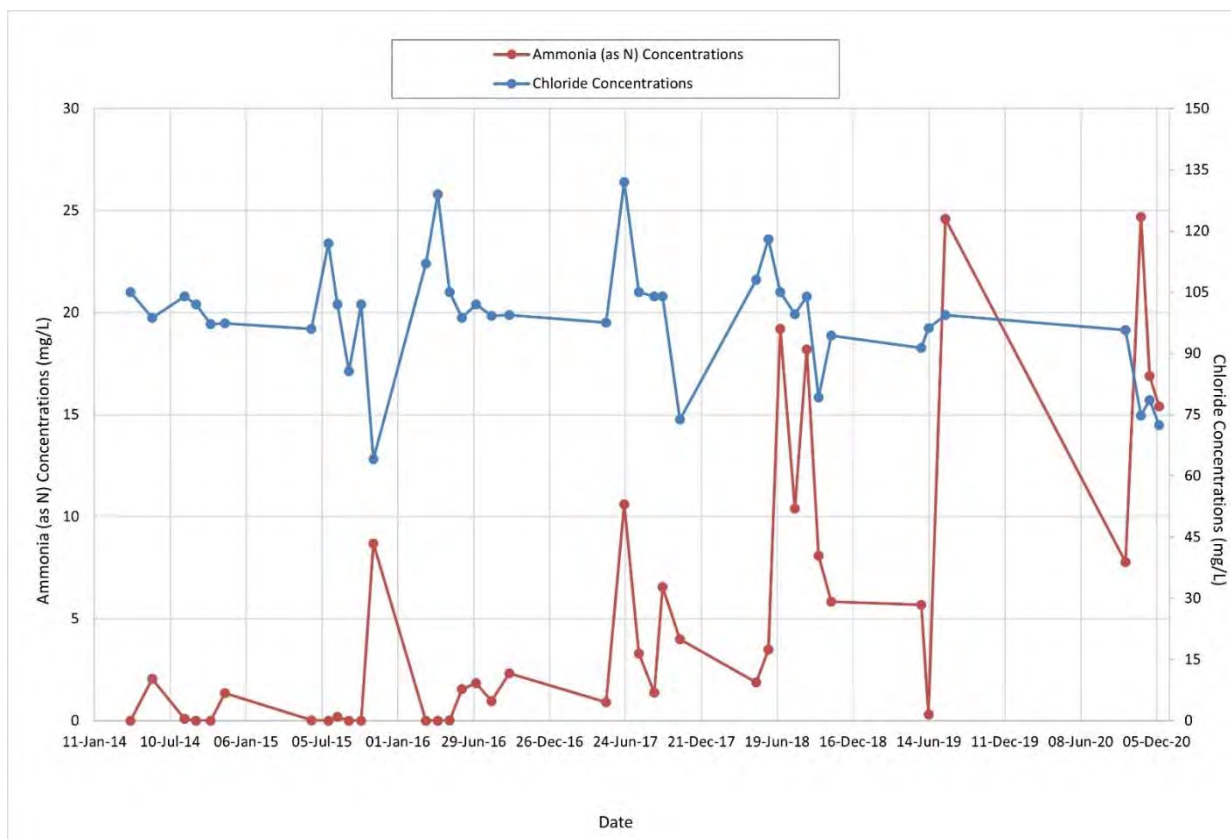


Figure A: Ammonia (as N) and Chloride Concentration Trends in Water at the Drainage Pond (2014-2020 data)

6.2 Davidson Pond and Rose’s Pond Quality

A summary of the analytical results for water samples collected from the neighboring Davidson and Rose’s Ponds in 2020 is presented in Table 2, attached. The CARO analytical reports (laboratory report numbers for Davidson Pond: 0092295-03, 20J3022-03 and 20K2112-03; and for Rose’s Pond: 0092295-01, 20J3022-01 and 20K2112-01) are included in Appendix A.

The following is a summary of the 2020 analytical results. Results were compared to the BCWQG AW guidelines, CSR AW, and CSR DW standards, where applicable.

6.2.1 Davidson Pond

Concentrations of most parameters were less than the BCWQG AW guidelines and CSR AW and DW standards during the three sampling events in 2020, except for the following parameters:

- Chloride concentrations exceeded the long-term average BCWQG AW guideline and the CSR DW standard, but were less than the short-term maximum BCWQG AW guideline and the CSR AW standard, during the three sampling events.
- Total lithium concentrations exceeded the CSR DW standard during the three sampling events. Should the regional background concentration for lithium of 0.096 mg/L apply at the Site, lithium concentrations at Davidson Pond would be below the regional background concentration for lithium.
- Total sodium concentrations exceeded the CSR DW standard of 200 mg/L during the three sampling events. There are no BCWQG AW or CSR AW criteria for sodium.

The following is a summary of notable trends observed between 2014 and 2020 at Davidson Pond.

- Ammonia (as N) concentrations measured in September through November 2020 were generally higher than previous concentrations measured at Davidson Pond during the same months between 2014 and 2019.
- Some metal parameter concentrations measured in 2020 were generally within the range of, or lower than, concentrations measured between 2014 through 2019 (for example, barium, cobalt, copper, iron, molybdenum and uranium), while other metal parameter concentrations measured in 2020 were higher than those measured between 2014 and 2019 and/or exhibit increasing trends (for example, arsenic, lithium, magnesium, manganese, potassium, sodium and strontium).
- Concentrations of total coliforms in the samples collected from Davidson Pond in 2020 were generally lower than those measured in 2014 through 2019; E. coli concentrations were variable, but within the range of those measured in 2014 through 2019.
- Ammonia (as N), chloride and total sodium concentration trends are provided in Figure B below. A slight increase in trend is noted in ammonia (as N) and sodium concentrations between 2014 and 2020. There is no apparent trend in chloride concentrations.

6.2.2 Rose's Pond

Concentrations of most parameters were less than the BCWQG AW guidelines and CSR AW and DW standards during the three sampling events in 2020, except for the following parameters:

- Chloride concentrations exceeded the long-term average BCWQG AW guideline and the CSR DW standard, but were less than the short-term maximum BCWQG AW guideline and the CSR AW standard, during the three sampling events.
- Total lithium concentrations exceeded the CSR DW standard during the three sampling events. Should the regional background concentration for lithium of 0.096 mg/L apply at the Site, lithium concentrations at Rose's Pond would be below the regional background concentration for lithium.
- Total sodium concentrations exceeded the CSR DW standard during the three sampling events.

The following is a summary of notable trends observed between 2014 and 2020 at Rose's Pond.

- Ammonia (as N) concentrations measured in September through November 2020 exhibited a slight increase in trend with the peak concentration measured in November 2020.
- The remaining parameter concentrations measured in 2020 were generally within the range of concentrations measured in 2014 through 2019.
- Concentrations of total coliforms in the samples collected from Rose's Pond were generally higher than those measured in 2019, but lower than those measured in 2014 through 2017; and E. coli concentrations were within the range of those measured in 2014 through 2019.
- Ammonia (as N), chloride and total sodium concentration trends are provided in Figure B below. An overall decrease in trends is noted in chloride and total sodium concentrations between 2014 and 2019. Chloride and total sodium concentrations were generally stable between 2019 and 2020.

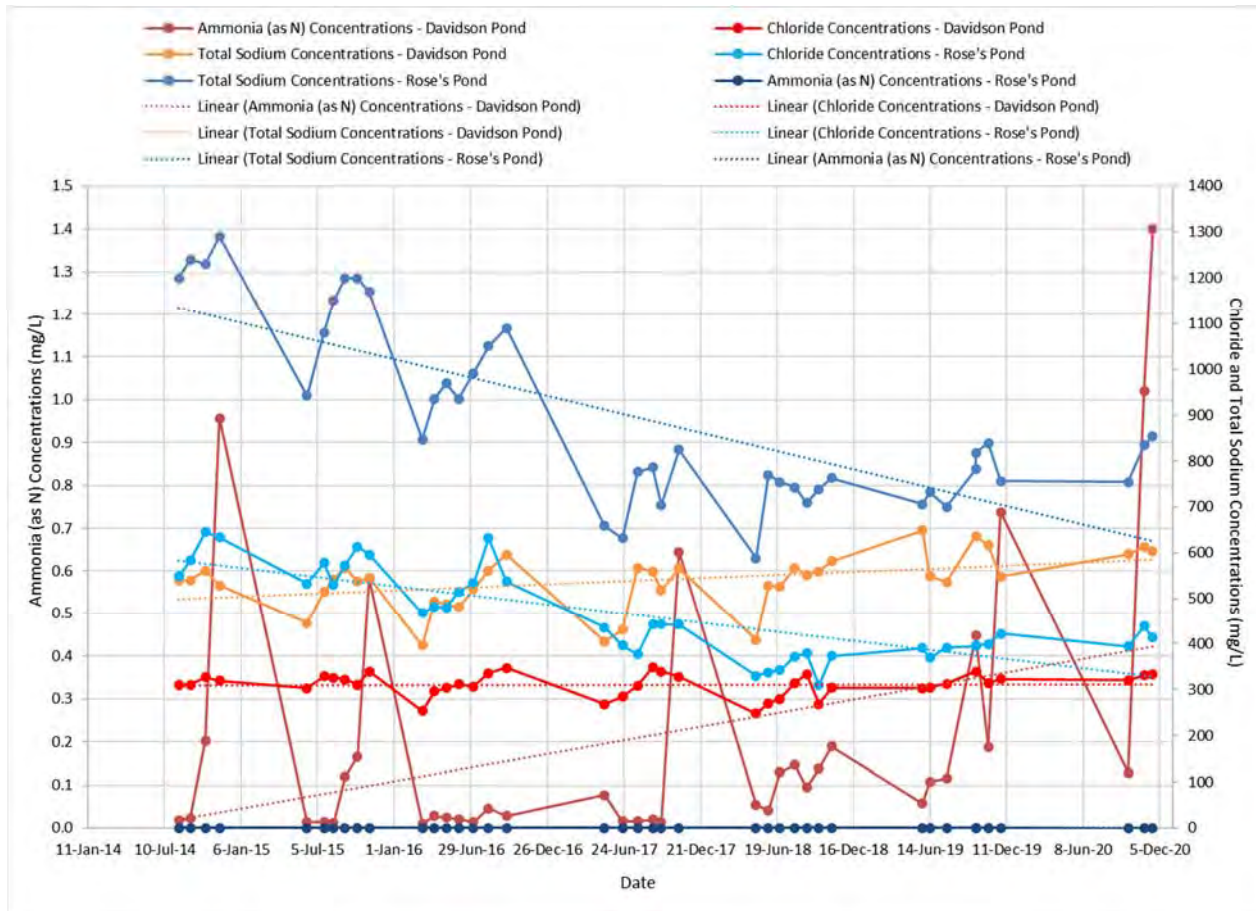


Figure B: Ammonia (as N), Chloride and Total Sodium Concentration Trends in Water at Davidson's Pond and Rose's Pond (2014-2020 data)

7.0 DISCUSSION

The concentrations of typical septage contaminants at the Drainage Pond (i.e., ammonia, BOD, COD, nitrate and nitrite), and most total and dissolved metal parameters, were generally similar to those measured in 2019 and higher than those measured in 2014 through 2018. The ammonia (as N) concentrations at the Drainage Pond exceeded the CSR AW standard in September through December 2020; and the October 2020 ammonia (as N) concentration was the highest measured concentration at the Drainage Pond to date. The ammonia (as N) concentrations at the Drainage Pond in September through December of 2020 were much greater than the nitrate (as N) and nitrite (as N) concentrations, and, as in previous years, indicative that little nitrification is occurring. The total nitrogen concentrations at the Drainage Pond were greater than the combined ammonia, nitrate and nitrite concentrations (as in previous years), indicative that a portion of the total nitrogen in the water samples was organic nitrogen.

At Davidson Pond, ammonia (as N) concentrations were higher in 2020 than those measured in 2014 through 2019; however, the concentrations of remaining typical septage contaminants (BOD, COD, nitrate, nitrite, and total nitrogen) were generally within the range of concentrations previously measured in 2014 through 2019.

At Rose's Pond, concentrations of septage contaminants were generally within the range of concentrations previously measured in 2014 through 2019, including ammonia (as N).

CoK personnel have observed waterfowl at the Drainage Pond, Davidson Pond, and Rose's Pond; and have previously noted that cattle have access to Davidson's Pond. It is likely that wildlife using these ponds have contributed to the elevated total coliform and E. coli counts measured at the ponds. As these parameters were generally higher at the Drainage Pond than at Davidson Pond and Rose's Pond, it is possible that elevated total coliform and E. coli counts at the Drainage Pond may also be due to Site runoff into the Drainage Pond.

As in 2014 through 2019, samples collected during the 2020 sampling events indicated that biosolids (i.e., septage) parameter concentrations were higher at the Drainage Pond than at Davidson Pond and Rose's Pond, as follows:

- Ammonia concentrations were up to approximately two orders of magnitude greater at the Drainage Pond than at Davidson Pond and Rose's Pond; and total nitrogen concentrations were up to approximately 20 times greater at the Drainage Pond than at Davidson Pond and Rose's Pond.
- BOD concentrations were generally higher (up to approximately 6 times greater) at the Drainage Pond than at Davidson Pond and Rose's Pond.
- Certain metals parameters were higher at the Drainage Pond than at Davidson Pond and Rose's Pond (including aluminum, barium, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, molybdenum, nickel, phosphorus, silicon and zinc).

As in 2014 through 2019, samples collected during the 2020 sampling events indicated that certain inorganic and metals parameters were higher at Davidson Pond and Rose's Pond relative to the Drainage Pond, as follows:

- Chloride concentrations were approximately three times higher at Davidson Pond, and approximately three to four times higher at Rose's Pond, than at the Drainage Pond.
- Sodium concentrations were approximately five to six times higher at Davidson Pond, and approximately seven to eight times higher at Rose's Pond, than at the Drainage Pond.
- Lithium concentrations were approximately four to five times higher at Davidson Pond and Rose's Pond than at the Drainage Pond.

- Magnesium concentrations were approximately five to six times higher at Davidson Pond, and approximately 10 times higher at Rose's Pond, than at the Drainage Pond.
- Potassium concentrations were up to approximately three times higher at Rose's Pond, than at the Drainage Pond.
- Sulphur concentrations were up to approximately 10 times higher at Davidson Pond, and up to approximately 20 times higher at Rose's Pond, than at the Drainage Pond.
- The elevated chloride and sodium (and possibly magnesium and potassium) concentrations at Davidson Pond and Rose's Pond may be due, in part, to the application of road salt on Commonage Road.
- The hardness values were up to approximately three times higher at Davidson Pond and up to approximately five to eight times higher at Rose's Pond, than at the Drainage Pond.

At this time, the regional background concentration for lithium may not be applicable at the Site; and further assessment may be required to confirm the applicability of the regional background concentrations at the Site. Based on our experience, elevated lithium concentrations in groundwater are widespread in the Okanagan Valley and the elevated lithium concentrations at the Site and surrounding area may be related to regional background conditions. Should the regional background concentration for lithium of 0.096 mg/L apply at the Site, lithium concentrations at the Drainage Pond, Davidson Pond and Rose's Pond would be below the regional background concentration for lithium.

8.0 CONCLUSIONS

Any water potentially infiltrating from the Drainage Pond may be considered a source of contamination for groundwater, particularly with respect to ammonia (as N). With the completion of the re-lining of the Drainage Pond and drainage trench in 2019 and considering that evaporation from the Drainage Pond will continue to account for most of the losses within the Drainage Pond (as in previous years), the potential for water infiltration from the Drainage Pond and drainage trench into the ground surface has been further reduced and is therefore considered to be minimal.

Given that minimal infiltration is inferred to be occurring from the Drainage Pond, and as exceedances and elevated parameter concentrations noted at one pond(s) were not noted at the other pond(s), the water quality at Davidson Pond and Rose's Pond does not appear to be adversely impacted by water that may be exfiltrating, and migrating, from the Drainage Pond.

The City of Kelowna should confirm that the quality of the water pumped from the Drainage Pond to the CoV's Mackay Reservoir is acceptable, particularly with respect to ammonia concentrations.

9.0 RECOMMENDATIONS FOR 2021

As per Section 4.2. *Surface Water Monitoring* of discharge Permit 108537, the City is required to continue to implement a surface water monitoring program at the Site, in accordance with recommendations from a Qualified Professional.

Continued monthly monitoring is recommended at the Drainage Pond and at the neighboring Davidson Pond and Rose's Pond between the months of April and November (or, when the pond is not frozen) in 2021, as follows:

- Collecting and analyzing samples for potential septage contaminants including:
 - Total phosphorous (using the total persulfate test method), chloride, ammonia, nitrate, nitrite, and total kjeldahl nitrogen.
 - BOD and COD.
 - DOC for calculating the applicable BCWQG AW dissolved copper guidelines (see below).
 - Metals (total and dissolved).
 - pH, total dissolved solids (TDS), total suspended solids (TSS) and hardness.
- Dissolved organic carbon (DOC) should be added to the list of analytical parameters for the samples at Davidson Pond and Rose's Ponds that site-specific BCWQG AW guidelines for dissolved copper can be calculated.
- Samples should be taken such that minimal to no suspended particles or disturbed sediment are collected in the sampling bottles, and that no surface matter (i.e., algae) is inadvertently collected.
- The field pH and temperature of the water samples should be measured immediately at the time of collection with a properly-calibrated meter by CoK personnel during the collection of pond water samples so that the suitability of the ammonia guidelines can be assessed. Often laboratory-measured pH can be slightly different than field pH, due to geochemical changes in the sample bottle during transport. The field pH and temperature will be used in the assessment of pond water quality and in determining the appropriate criteria to use in the comparison of analytical ammonia results. Calibration records for the meter should be retained on file by the CoK.
- Continue to implement a QA/QC program to minimize errors in the field and obtain accurate monitoring results. This should include: i) collection of a field duplicate sample from a select pond during each sampling event; ii) use of dedicated monitoring and sampling sheets during the collection of water samples (refer to next bullet); iii) review of analytical results soon after receipt; and iv) contacting the analytical laboratory should anomalous analytical results be identified to determine whether anomalous results are laboratory-related.
- Dedicated monitoring and sampling sheets should be completed during sampling events at each location and reviewed in conjunction with the analytical water quality data. Field notes on the sheets should include: sample location, date and time of sample collection, weather, surface water conditions, approximate pond levels at the time of sample collection, the approximate depth that each sample is collected (from top of water surface), equipment used for sampling, field (pH and temperature) parameter measurements, apparent sample turbidity, type and size of bottles used, and whether the sample was preserved (including preservative type) and/or field filtered.

- Continue monitoring potential leakage from the new liners at the Drainage Pond and drainage trench, including routine inspections during drainage and cleaning of the ponds, along with regular monitoring of the liners above the water level (for marmot damage, sun damage).
- Continue monitoring and assessment of the integrity of the pavement across the composting curing area.
- Operational changes, significant precipitation events, or other activities that may have a potential affect on the surface water quality at the Site (i.e., an increase, decrease or change in the amount of stormwater runoff or in the volume of water used to flush the drainage trench) should be noted during the monthly sampling events in 2021.
- Compile an annual report to the City of Kelowna with the comparison of surface water sample results to applicable criteria.

10.0 LIMITATIONS AND USE OF REPORT

This report was prepared for the exclusive use of the City of Kelowna and MoE. The findings, interpretations, and conclusions are based solely on the Site conditions during the sampling events. The data presented in this report represent the leachate quality conditions at the sampling locations tested. Leachate conditions may vary with location, depth, sampling, methodology, analytical techniques, and other factors.

Except where specifically stated to the contrary, the information contained in this report (including reports, information, and data) was provided to Golder by others and has not been independently verified or otherwise examined by Golder to determine its accuracy or completeness. Golder has relied in good faith on this information and does not accept the responsibility of any deficiency, misstatements or inaccuracies contained in the report as a result of omissions, misinterpretation and/or fraudulent acts of the persons interviewed or contacted, or errors or omissions in the reviewed documentation.

Golder makes no warranty, expressed or implied, and assumes no liability with respect to the use of the information contained in this report at the subject site, or at any other site, for other than its intended purpose.

Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. Golder accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The services performed as described in this report were conducted in a manner consistent with that level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions, subject to the time limits and financial and physical constraints applicable to the services.

If new information is discovered during future work, including excavations, borings or other studies, Golder should be requested to re-evaluate the conclusions presented in this report and to provide amendments as required.

11.0 CLOSURE

We trust that this report provides the information you require at this time. Should you have any questions or require additional information, please do not hesitate to contact the undersigned.

Golder Associates Ltd.



Aaron Keryluke, BSc, AAG
Field Technician



Pana Athanasopoulos, MSc, PGeo
Associate, Senior Hydrogeologist

AK/PA/cmc

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Table 1: 2014 - 2020 Results of Water Analyses - Drainage Pond
City of Kelowna-Vernon Biosolids Facility
511 Commonage Road, Vernon, BC

Location			Drainage Pond																	
ALS and CARO Laboratory ID	Aquatic Life		Drinking Water	L1924064-1	L1946645-1	L1965494-1	L1984896-1	L1994913-1	L2016326-1	8050004-01	8052709-2	8062501-2	8080016-2	8082786-2	8092304-2	8102373-2	9052444-02	9061376-02	9072356-02	
Date	CSR-AW ⁽¹⁾	Notes	Notes	09-May-17	21-Jun-17	26-Jul-17	31-Aug-17	20-Sep-17	31-Oct-17	30-Apr-18	29-May-18	26-Jun-18	31-Jul-18	28-Aug-18	25-Sep-18	25-Oct-18	27-May-19	13-Jun-19	23-Jul-19	
General Parameters																				
Temperature (field)				14.0	20.0	24.0	19.0	13.0	3.0	-	22.5	19	24.5	18	16	8.5	20	26	19	
pH (field)				7.6	8.0	8.0	8.0	8.1	8.7	-	8.1	7.8	8.4	8.1	8.4	8.0	8	9.3	9	
pH (laboratory)				8.00	8.23	8.20	8.20	8.19	8.68	8.27	8.18	7.90	7.84	7.79	7.67	8.05	8.08	9.29	7.96	
conductivity (laboratory)				899	1590	1070	913	1020	784	1300	1300	1850	1060	1190	891	956	1060	900	1250	
total suspended solids (TSS)				3.6	19.2	4.9	9.1	11.6	31.3	36	6.0	41.7	30.0	40.0	66.7	6.5	39.3	29	62	
biochemical oxygen demand (5-day BOD)				<2.0	13.4	<2.0	3.9	3.0	15.0	7.6	6.1	69.7	29.2	36.4	50.3	<4.2	25.2	17.9	61.3	
chemical oxygen demand				28	281	61	49	121	117	36	61	364	117	460	249	89	197	104	547	
hardness as CaCO3				217	484	279	226	254	107	385	412	548	223	232	216	212	242	233	227	
Inorganics																				
ammonia (total; as N)	1.31 - 18.5	pH/T		0.915	10.6	3.29	1.38	6.55	3.99	1.88	3.49	19.2	10.4	18.2	8.09	5.84	5.68	0.31	24.6	
nitrate (as N)	400		10	1.21	1.72	0.356	0.314	0.150	1.04	7.25	1.21	0.035	0.015	<0.010	0.128	0.856	<0.010	<0.010	<0.010	
nitrite (as N)	0.2 - 2	Cl	1	0.0156	0.287	0.106	0.0230	0.106	0.104	0.0156	0.253	<0.010	0.035	<0.010	0.041	0.027	<0.010	<0.010	<0.010	
total nitrogen	1500		250	3.26	25.5	5.63	3.17	12.0	10.3	13.8	8.19	44.8	22.3	43.3	20.7	12.6	15.8	5	47.7	
chloride				97.6	132	105	104	104	73.8	108	118	105	99.6	104	79.2	94.4	91.4	96.2	99.4	
ortho-phosphate (dissolved; as P)				0.647	1.65	2.05	0.929	1.69	2.51	-	-	-	-	-	-	2.47	1.06	-	-	
Total Kjeldahl Nitrogen				2.03	23.5	5.17	2.83	11.7	9.20	6.40	6.73	44.8	22.2	43.3	20.5	11.7	15.8	5	47.7	
Microbiological Analyses																				
total coliforms (mpn/100mL)				980	90000	24200	>24196	3260	24200	390	24000	110000	>110000	>110000	>110000	91	24000	11000	>110000	
Escherichia coli (mpn/100mL)				23	<10000	120	480	70	290	9.1	30	11000	>110000	24000	46000	15	930	15	29000	
Total Metals																				
aluminum	0.09		9.5	0.0282	0.215	0.047	0.108	0.026	0.069	0.482	0.0636	0.343	0.131	0.239	0.228	0.0963	0.0882	0.0796	0.182	
antimony	0.006		0.006	<0.00050	0.0007	<0.00050	<0.00050	<0.00050	<0.00050	0.00047	0.00034	0.00083	0.00036	0.00074	0.00050	0.00042	0.00043	0.00035	0.0006	
arsenic	0.05		0.01	0.00086	0.00447	0.0015	0.00130	0.0020	0.0024	0.00201	0.00217	0.00773	0.00324	0.00506	0.00321	0.00202	0.00329	0.00256	0.00673	
barium	10		1	0.029	0.056	0.035	0.035	0.030	0.023	0.0646	0.0355	0.101	0.0380	0.0590	0.0603	0.0433	0.0478	0.0341	0.0686	
beryllium	0.0015		0.008	<0.0010	<0.0010	<0.00010	<0.00010	<0.00050	<0.00050	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
bismuth				<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.00050	0.00014	0.00077	0.00020	0.00129	0.00057	0.00026	0.00028	<0.00010	0.0012	
boron	12		5	0.15	0.17	0.14	0.15	0.16	0.16	0.174	0.497	0.35	0.181	0.190	0.149	0.204	0.168	0.162	0.196	
cadmium	0.0005 - 0.004	H	0.005	0.0000125	0.000285	<0.000050	0.0000249	<0.000050	0.000063	0.000141	0.000068	0.000300	0.000078	0.000399	0.000207	0.000076	0.000125	0.000041	0.000822	
calcium				56.2	105	72.1	55.6	57.7	41.1	79.5	91.1	127	58.0	53.7	52.3	57.7	59.8	57.4	55.6	
chromium	0.010 ^{VI} , 0.090 ^{III}	V	0.05 ^{VI} , 6 ^{III}	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	0.00063	0.00171	<0.00050	0.00163	0.00098	0.00210	0.00105	0.00078	0.00069	0.00107	0.00159	
cobalt	0.04		0.001 (0.020)	0.00030	0.00081	<0.00050	0.00033	<0.00050	<0.00050	0.00061	0.0005	0.00121	0.00067	0.00113	0.00065	0.00061	0.00051	0.00051	0.0012	
copper	0.020 - 0.090	H	1.5	0.0032	0.0544	0.0043	0.0039	0.0062	0.0130	<0.0010	0.0156	0.0469	0.0180	0.0767	0.0368	0.0173	0.0118	0.00691	0.0814	
iron			6.5	0.061	0.484	0.205	0.170	0.108	0.237	1.10	0.210	0.738	0.327	0.739	0.471	0.301	0.332	0.203	0.575	
lead	0.040 - 0.160	H	0.01	<0.00050	0.00123	<0.0010	<0.00050	<0.0010	<0.0010	0.00305	0.00079	0.00136	0.00055	0.00157	0.00092	0.00068	0.0006	0.00042	0.00169	
lithium			0.008	0.0102	0.0178	0.0131	0.0105	<0.050	<0.050	0.0140	0.0157	0.0243	0.0116	0.0130	0.00998	0.0133	0.0125	0.0125	0.0153	
magnesium				23.3	54.8	28.4	23.1	23.6	18.4	41.4	46.5	74.4	26.1	22.5	24.3	24.3	26.8	26	24.3	
manganese	0.00025		1.5	0.0980	0.272	0.183	0.117	0.095	0.137	0.148	0.123	0.547	0.216	0.288	0.300	0.164	0.194	0.126	0.316	
mercury			0.001	<0.000050	0.000062	<0.000050	0.0000135	<0.00020	<0.00020	0.000077	<0.000010	0.000035	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
molybdenum	10		0.25	0.0043	0.0119	0.0044	0.0043	0.0042	0.0039	0.00809	0.0106	0.0103	0.00488	0.00556	0.00413	0.00420	0.00454	0.00354	0.00472	
nickel	0.250 - 1.5	H	0.08	0.0017	0.0044	<0.00050	0.0019	<0.00050	<0.00050	0.00325	0.00280	0.00599	0.00354	0.00579	0.00307	0.00220	0.00296	0.00245	0.00505	
phosphorus				0.85	2.59	2.31	1.22	1.84	3.33	1.82	2.05	11.1	5.49	5.22	5.28	3.58	3.93	2.13	10.2	
potassium				19.5	44.5	22.8	20.8	28.9	28.2	21.4	29.7	76.1	38.2	59.1	28.7	28.2	32.8	25.1	68	
selenium	0.02		0.01	0.000512	0.00187	<0.00010	0.000622	<0.00010	<0.00010	0.00207	0.00140	0.00234	0.00118	0.00165	0.00082	0.00069	0.00108	0.00068	0.0012	
silicon				2.96	4.76	4.11	3.68	3.92	0.49	3.0	<1.0	12.7	4.9	4.4	4.2	5.0	2.9	3.3	4.3	
silver	0.0005 - 0.015	H	0.02	<0.000020	0.000227	<0.000050	0.000036	<0.000050	<0.000050	0.000145	<0.000050	0.000148	<0.000050	0.000241	<0.000050	0.000053	0.000054	<0.000050	0.000199	
sodium	200		200	103	135	103	103	109	81.4	118	132	147	109	94.2	89.2	104	95.2	102	98.5	
strontium	2.5		2.5	0.541	1.10	0.647	0.551	0.569	0.376	0.922	0.841	1.35	0.581	0.509	0.523	0.548	0.63	0.603	0.608	
sulfur				<0.00020	<0.00020	<0.00020	<0.000010	<0.00020	<0.00020	59.4	88.3	150	37.2	30.8	30.4	35	46	41.3	35.1	
tellurium				-	-	-	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
thallium	0.003		0.003	<0.00020	<0.00020	<0.00020	<0.000010	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00032	<0.00020	<0.00020	<0.00020	<0.00020	0.00038	
thorium				-	-	-	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
titanium	1		2.5	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	0.0155	<0.0050	0.0127	0.0054	0.0092	0.0066	<0.0050	<0.0050	<0.0050	0.0058	
tin			0.003	<0.00050	0.00080	<0.00050	<0.00050	<0.030	<0.030	0.00068	0.00036	0.00106	0.00033	0.00185	0.00044	0.00043	0.00052	0.00025	0.00102	
tungsten	0.085		0.02	<0.010	<0.010	<0.012	<0.010	<0.010	<0.010	<0.010	<0.010	0.0012	<0.010	0.0014	<0.010	<0.010	<0.010	<0.010	<0.010	
vanadium			0.02	0.00241	0.00984	0.00306	0.00275	0.00262	0.00134	0.00638	0.00625	0.00759	0.00253	0.00271	0.00220	0.00129	0.00245	0.00161	0.00197	
zinc	0.075 - 2.4																			

Table 2: 2014 - 2020 Results of Water Analyses at Davidson Pond and Rose's Pond City of Kelowna-Vernon Biosolids Facility 511 Commonage Road, Vernon, BC

Main data table with columns for Location, Date, Aquatic Life, Drinking Water, BC Water Quality, and various chemical parameters (Temperature, pH, conductivity, etc.) across multiple sampling events.

Notes: All concentrations in milligrams per litre (mg/L), unless otherwise noted. Standards from the Contaminated Sites Regulation (CSR), updated 24 January 2019. Land Use abbreviations: AW (Aquatic Life); and DW (Drinking Water). The regional background concentration for cobalt is shown in red bracketed text; this concentration is from BC CSR Technical Bulletin 3, dated 24 September 2018. BCWQG = British Columbia Approved (August 2019) and Working (updated June 2017) Water Quality Guidelines. Approved WQG provided, unless otherwise noted (as W: Working WQG). H = standard is Hardness dependent; pH = standard is pH dependent; Cl = standard is chloride dependent; V = standard is valence dependent; VI = chromium VI and III; T = standard varies with temperature (assumed 10 deg C). Note 1: the guidelines provided for ortho-phosphate are the BCWQG for total phosphorus (as P), and are applicable for lakes where salmonids are the predominant fish species. Guidelines are for reference only, and may not be applicable to Davidson Pond or Rose's Pond. * = long-term average BCWQG AW guideline; ** = short-term maximum BCWQG AW guideline. Long-term average BCWQG provided, unless otherwise noted. (dis) = BCWQG AW guideline is for dissolved concentration. calculation = indicates that a calculation is required to determine BCWQG. No exceedances were identified for those parameters where BCWQG was calculated. Note 2: the guideline of 0.001 mg/L is an alert concentration; the guideline of 0.002 mg/L is the BCWQG. Note 3: the guideline of 0.001 mg/L is an alert concentration; the guideline of 0.002 mg/L is the BCWQG. Note 4: indicates parameter concentration exceeds applicable CSR AW or DW standards. For cobalt, only parameter concentrations exceeding the regional background concentration are highlighted. Note 5: indicates parameter concentration exceeds applicable BCWQG guideline. Note 6: indicates parameter concentration exceeds applicable BCWQG guideline based on laboratory pH (not field pH). Note 7: indicates parameter concentration exceeds applicable CSR DW standard and long-term average BCWQG guideline. Note 8: indicates parameter concentration exceeds applicable CSR DW standard and short-term maximum BCWQG guideline. Note 9: indicates that the reported detection limit is greater than the applicable criteria.

Table 2: 2014 - 2020 Results of Water Analyses at Davidson Pond and Rose's Pond City of Kelowna-Vernon Biosolids Facility 511 Commonage Road, Vernon, BC

Table with columns for Location, ALS and CARO Laboratory ID, Date, Aquatic Life, Drinking Water, BC Water Quality, and various parameters (Temperature, pH, conductivity, etc.) across multiple dates from 2014 to 2020.

Notes: All concentrations in milligrams per litre (mg/L), unless otherwise noted. Standards from the Contaminated Sites Regulation (CSR), updated 24 January 2019. Land Use abbreviations: AW (Aquatic Life), and DW (Drinking Water). The regional background concentration for cobalt is shown in red bracketed text; this concentration is from BC CSR Technical Bulletin 3, dated 24 September 2018. BCWQG = British Columbia Approved (March 2018) and Working (updated June 2017) Water Quality Guidelines. Approved WQG provided, unless otherwise noted (as W: Working WQG). H = standard is Hardness dependent; pH = standard is pH dependent; Cl = standard is chloride dependent; V = standard is valence dependent; VI=chromium VI and III=chromium III. T = standard varies with temperature (10 deg C assumed for ammonia criteria for 2014-2016). Note 1: the guidelines provided for ortho-phosphate are the BCWQG for total phosphorus (as P), and are applicable for lakes where salmonids are the predominant fish species. Guidelines are for reference only, and may not be applicable to Davidson Pond or Rose's Pond. + = long-term average BCWQG AW guideline; * = short-term maximum BCWQG AW guideline. Long-term average BCWQG provided, unless otherwise noted. (dis) = BCWQG AW guideline is for dissolved concentration. calculation = indicates that a calculation is required to determine BCWQG. No exceedences were identified for those parameters where BCWQG was calculated.

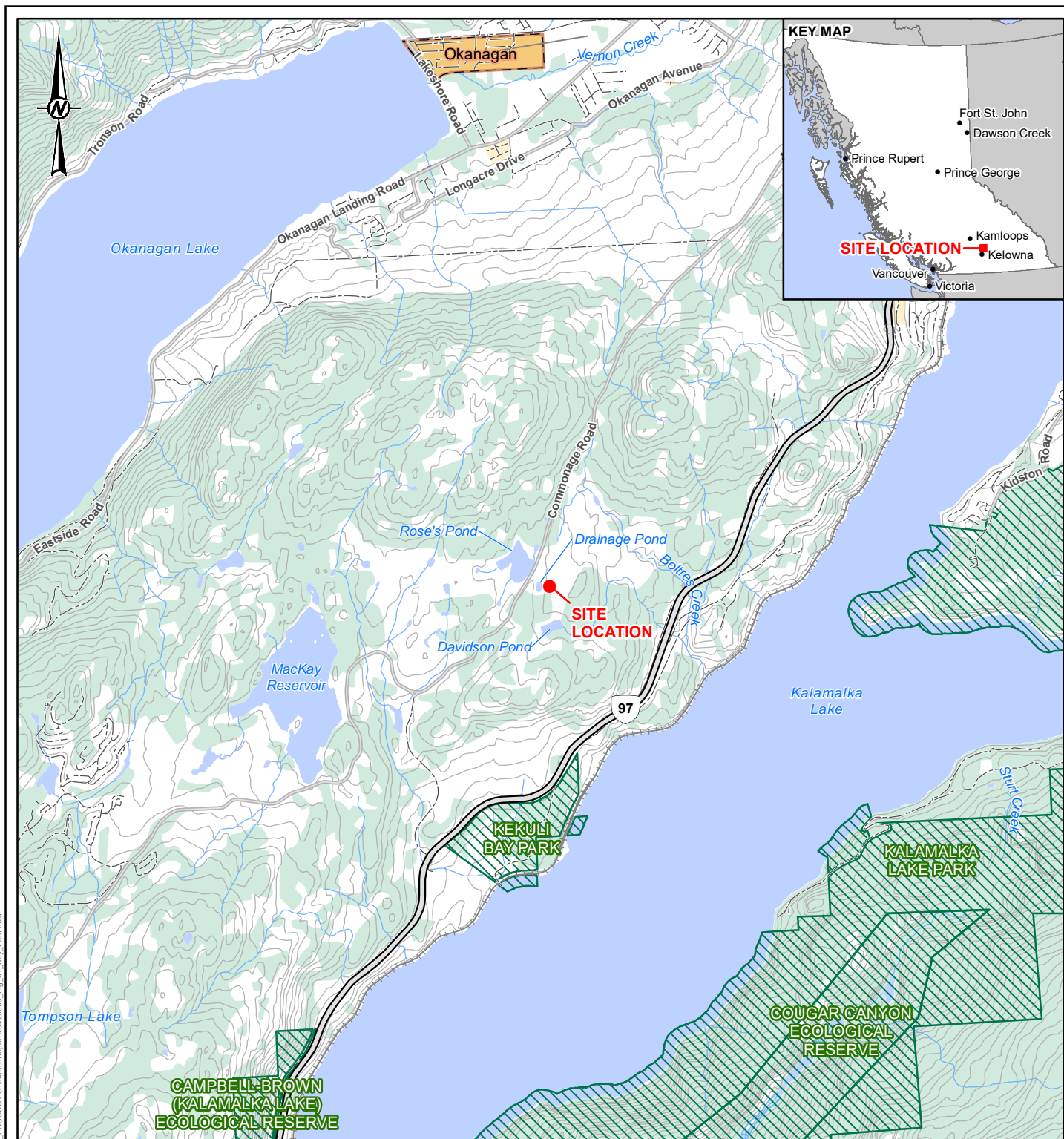
310 indicates parameter concentration exceeds applicable CSR AW or DW standards. For cobalt, only parameter concentrations exceeding the regional background concentration are highlighted. 0.957 indicates parameter concentration exceeds applicable BCWQG guideline. 0.957 indicates parameter concentration exceeds applicable BCWQG guideline based on laboratory pH (not field pH). 340 indicates parameter concentration exceeds applicable CSR DW standard and long-term average BCWQG guideline. 645 indicates parameter concentration exceeds applicable CSR DW standard and short-term maximum BCWQG guideline. <0.0050 indicates that the reported detection limit is greater than the applicable criteria.

Table 2: 2014 - 2020 Results of Water Analyses at Davidson Pond and Rose's Pond City of Kelowna-Vernon Biosolids Facility 511 Commonage Road, Vernon, BC

Main data table with columns for Location, Aquatic Life, Drinking Water, BC Water Quality, and various parameters (Temperature, pH, Conductivity, etc.) across multiple dates and locations.

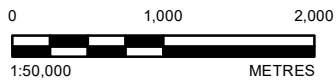
Notes: All concentrations in milligrams per litre (mg/L), unless otherwise noted. Standards from the Contaminated Sites Regulation (CSR), updated 24 January 2019. Land Use abbreviations: AW (Aquatic Life) and DW (Drinking Water). The regional background concentration for cobalt is shown in red bracketed text; this concentration is from BC CSR Technical Bulletin 3, dated 24 September 2018. BCWQG = British Columbia Approved (March 2018) and Working (Updated June 2017) Water Quality Guidelines. Approved WQG provided, unless otherwise noted (as W: Working WQG). H = standard is Hardness dependent; pH = standard is pH dependent; Cl = standard is chloride dependent; V = standard is valence dependent; V=chromium VI and III=chromium III; T = standard varies with temperature (10 deg C assumed for ammonia criteria for 2014-2016). Note 1: the guidelines provided for ortho-phosphate are the BCWQG for total phosphorus (as P), and are applicable for lakes where salmonids are the predominant fish species. BCWQGs are for reference only, and may not be applicable to Davidson Pond or Rose's Pond. * = long-term average BCWQG AW guideline; * = short-term maximum BCWQG AW guideline. Long-term average BCWQG provided, unless otherwise noted. (ds) = BCWQG AW guideline is for dissolved concentration. calculation = indicates that a calculation is required to determine BCWQG. No exceedences were identified for those parameters where BCWQG was calculated.

Legend table with columns for parameter name and guideline type. Includes entries for 310, 0.97, 0.97, 340, 845, and <0.0050.



LEGEND

- SITE LOCATION
- AIRFIELD
- INDIAN RESERVE
- PARK / PROTECTED AREA
- RESIDENTIAL AREA
- WETLAND
- WATERBODY
- WOODED AREA
- HIGHWAY
- MAJOR ROAD
- LOCAL ROAD
- RAILWAY
- WATERCOURSE
- CONTOUR (20m)



REFERENCES

1. ROAD, CONTOUR, WOODED AREA, HYDROLOGY, RESIDENTIAL AREAS AND AIRFIELD DATA OBTAINED FROM CANVEC © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED.
2. INDIAN RESERVES, PARK / PROTECTED AREAS, RAILWAY AND TOWN DATA CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENSE – BRITISH COLUMBIA.
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 10N

CLIENT
CITY OF KELOWNA

PROJECT
2020 ANNUAL MONITORING REPORT
BIOSOLID COMPOSTING FACILITY, VERNON, BC.

TITLE
KEY PLAN

CONSULTANT	YYYY-MM-DD	2021-01-07
DESIGNED	AK	
PREPARED	MH	
REVIEWED	AK	
APPROVED	PA	

PROJECT NO.	PHASE	REV.	FIGURE
20429009	1000	0	1



PATH: Y:\municipal\CAD-GIS\Clients\City of Kelowna\ Vernon\09 - PROJECT\2020\2020\01\01\02 - PRODUCTION\MXD\Report\2020\20009_Fig_01_Key_Plan.mxd

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSIA 25mm

APPENDIX A

**CARO Analytical Services,
Laboratory Certificates of Analysis
(2020)**



CERTIFICATE OF ANALYSIS

REPORTED TO Kelowna, City of
1435 Water Street
KELOWNA, BC V1Y 1J4

ATTENTION Jose Garcia

PO NUMBER 527007

PROJECT RBCF Ponds

PROJECT INFO

WORK ORDER 0092295

RECEIVED / TEMP 2020-09-22 11:37 / 10°C

REPORTED 2020-09-30 15:50

COC NUMBER 44095.44709

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO/IEC 17025:2017 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks



You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry



It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve



Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

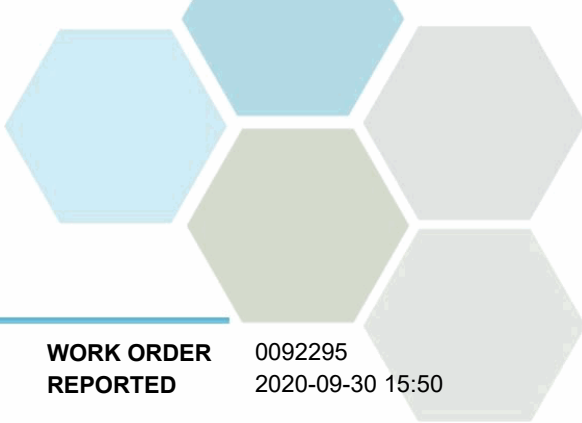
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7

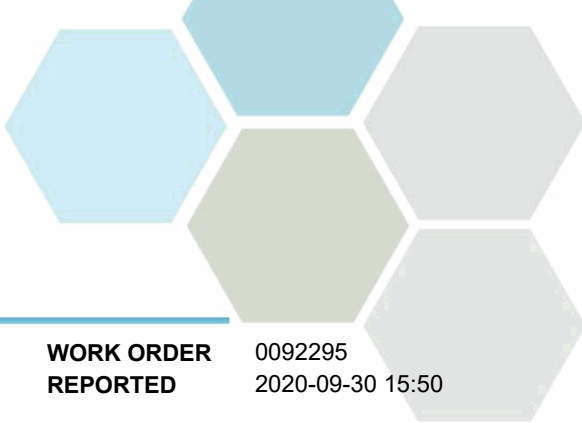


TEST RESULTS

REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

WORK ORDER REPORTED 0092295
2020-09-30 15:50

Analyte	Result	RL	Units	Analyzed	Qualifier
Rose's Pond (0092295-01) Matrix: Water Sampled: 2020-09-22 09:00					F2, PRES
Anions					
Chloride	395	0.10	mg/L	2020-09-24	
Nitrate (as N)	< 0.010	0.010	mg/L	2020-09-24	
Nitrite (as N)	< 0.010	0.010	mg/L	2020-09-24	
Calculated Parameters					
Hardness, Total (as CaCO3)	1210	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	1.52	0.100	mg/L	N/A	
Dissolved Metals					
Lithium, dissolved	0.0481	0.00010	mg/L	2020-09-30	
Aluminum, dissolved	0.0059	0.0050	mg/L	2020-09-30	
Antimony, dissolved	0.00040	0.00020	mg/L	2020-09-30	
Arsenic, dissolved	0.00382	0.00050	mg/L	2020-09-30	
Barium, dissolved	0.0150	0.0050	mg/L	2020-09-30	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2020-09-30	
Bismuth, dissolved	< 0.00010	0.00010	mg/L	2020-09-30	
Boron, dissolved	0.0945	0.0500	mg/L	2020-09-30	
Cadmium, dissolved	< 0.000010	0.000010	mg/L	2020-09-30	
Calcium, dissolved	62.7	0.20	mg/L	2020-09-30	
Chromium, dissolved	< 0.00050	0.00050	mg/L	2020-09-30	
Cobalt, dissolved	< 0.00010	0.00010	mg/L	2020-09-30	
Copper, dissolved	< 0.00040	0.00040	mg/L	2020-09-30	
Iron, dissolved	< 0.010	0.010	mg/L	2020-09-30	
Lead, dissolved	< 0.00020	0.00020	mg/L	2020-09-30	
Magnesium, dissolved	255	0.010	mg/L	2020-09-30	
Manganese, dissolved	0.00422	0.00020	mg/L	2020-09-30	
Mercury, dissolved	< 0.000010	0.000010	mg/L	2020-09-26	
Molybdenum, dissolved	0.00167	0.00010	mg/L	2020-09-30	
Nickel, dissolved	0.00100	0.00040	mg/L	2020-09-30	
Phosphorus, dissolved	< 0.050	0.050	mg/L	2020-09-30	
Potassium, dissolved	80.8	0.10	mg/L	2020-09-30	
Selenium, dissolved	< 0.00050	0.00050	mg/L	2020-09-30	
Silicon, dissolved	< 1.0	1.0	mg/L	2020-09-30	
Silver, dissolved	< 0.000050	0.000050	mg/L	2020-09-30	
Sodium, dissolved	749	0.10	mg/L	2020-09-30	
Strontium, dissolved	0.556	0.0010	mg/L	2020-09-30	
Sulfur, dissolved	770	3.0	mg/L	2020-09-30	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2020-09-30	
Thallium, dissolved	< 0.000020	0.000020	mg/L	2020-09-30	
Thorium, dissolved	< 0.00010	0.00010	mg/L	2020-09-30	
Tin, dissolved	< 0.00020	0.00020	mg/L	2020-09-30	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2020-09-30	
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2020-09-30	



TEST RESULTS

REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

WORK ORDER REPORTED 0092295
2020-09-30 15:50

Analyte	Result	RL	Units	Analyzed	Qualifier
Rose's Pond (0092295-01) Matrix: Water Sampled: 2020-09-22 09:00, Continued					F2, PRES

Dissolved Metals, Continued

Uranium, dissolved	0.00428	0.000020	mg/L	2020-09-30	
Vanadium, dissolved	0.0011	0.0010	mg/L	2020-09-30	
Zinc, dissolved	< 0.0040	0.0040	mg/L	2020-09-30	
Zirconium, dissolved	0.00019	0.00010	mg/L	2020-09-30	

General Parameters

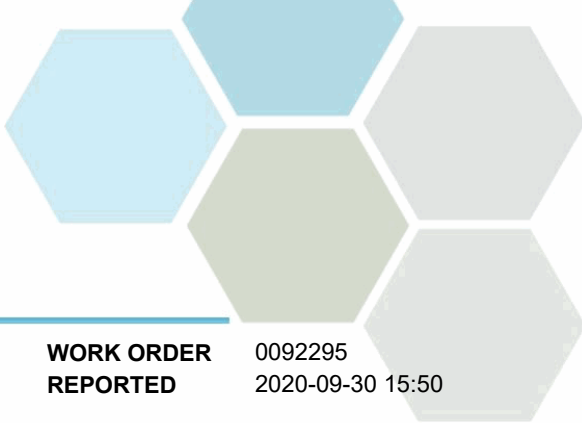
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2020-09-23	
BOD, 5-day	< 5.6	2.0	mg/L	2020-09-29	
Chemical Oxygen Demand	57	20	mg/L	2020-09-24	
Conductivity (EC)	4840	2.0	µS/cm	2020-09-25	
Nitrogen, Total Kjeldahl	1.52	0.050	mg/L	2020-09-27	
pH	8.49	0.10	pH units	2020-09-25	HT2
Solids, Total Dissolved	3730	15	mg/L	2020-09-26	
Solids, Total Suspended	4.0	2.0	mg/L	2020-09-23	

Microbiological Parameters

Coliforms, Total	> 2420	1	MPN/100 mL	2020-09-23	
E. coli	4	1	MPN/100 mL	2020-09-23	

Total Metals

Aluminum, total	0.0053	0.0050	mg/L	2020-09-28	
Antimony, total	0.00056	0.00020	mg/L	2020-09-28	
Arsenic, total	0.00420	0.00050	mg/L	2020-09-28	
Barium, total	0.0151	0.0050	mg/L	2020-09-28	
Beryllium, total	< 0.00010	0.00010	mg/L	2020-09-28	
Bismuth, total	< 0.00010	0.00010	mg/L	2020-09-28	
Boron, total	0.101	0.0500	mg/L	2020-09-28	
Cadmium, total	< 0.000010	0.000010	mg/L	2020-09-28	
Calcium, total	62.5	0.20	mg/L	2020-09-28	
Chromium, total	< 0.00050	0.00050	mg/L	2020-09-28	
Cobalt, total	< 0.00010	0.00010	mg/L	2020-09-28	
Copper, total	< 0.00040	0.00040	mg/L	2020-09-28	
Iron, total	< 0.010	0.010	mg/L	2020-09-28	
Lead, total	< 0.00020	0.00020	mg/L	2020-09-28	
Lithium, total	0.0497	0.00010	mg/L	2020-09-28	
Magnesium, total	257	0.010	mg/L	2020-09-28	
Manganese, total	0.0336	0.00020	mg/L	2020-09-28	
Mercury, total	< 0.000010	0.000010	mg/L	2020-09-26	
Molybdenum, total	0.00191	0.00010	mg/L	2020-09-28	
Nickel, total	0.00100	0.00040	mg/L	2020-09-28	
Phosphorus, total	< 0.050	0.050	mg/L	2020-09-28	
Potassium, total	77.3	0.10	mg/L	2020-09-28	
Selenium, total	< 0.00050	0.00050	mg/L	2020-09-28	
Silicon, total	< 1.0	1.0	mg/L	2020-09-28	



TEST RESULTS

REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

WORK ORDER REPORTED 0092295
2020-09-30 15:50

Analyte	Result	RL	Units	Analyzed	Qualifier
Rose's Pond (0092295-01) Matrix: Water Sampled: 2020-09-22 09:00, Continued					F2, PRES

Total Metals, Continued

Silver, total	< 0.000050	0.000050	mg/L	2020-09-28	
Sodium, total	754	0.10	mg/L	2020-09-28	
Strontium, total	0.563	0.0010	mg/L	2020-09-28	
Sulfur, total	701	3.0	mg/L	2020-09-28	
Tellurium, total	< 0.00050	0.00050	mg/L	2020-09-28	
Thallium, total	< 0.000020	0.000020	mg/L	2020-09-28	
Thorium, total	< 0.00010	0.00010	mg/L	2020-09-28	
Tin, total	< 0.00020	0.00020	mg/L	2020-09-28	
Titanium, total	< 0.0050	0.0050	mg/L	2020-09-28	
Tungsten, total	< 0.0010	0.0010	mg/L	2020-09-28	
Uranium, total	0.00446	0.000020	mg/L	2020-09-28	
Vanadium, total	0.0015	0.0010	mg/L	2020-09-28	
Zinc, total	< 0.0040	0.0040	mg/L	2020-09-28	
Zirconium, total	0.00016	0.00010	mg/L	2020-09-28	

Rose's Pond (0092295-01RE1) | Matrix: Water | Sampled: 2020-09-22 09:00 F2, PRES

Microbiological Parameters

Coliforms, Total	2990	1	MPN/100 mL	2020-09-24	HT1
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Drainage Pond (0092295-02) | Matrix: Water | Sampled: 2020-09-22 10:00 F2, PRES

Anions

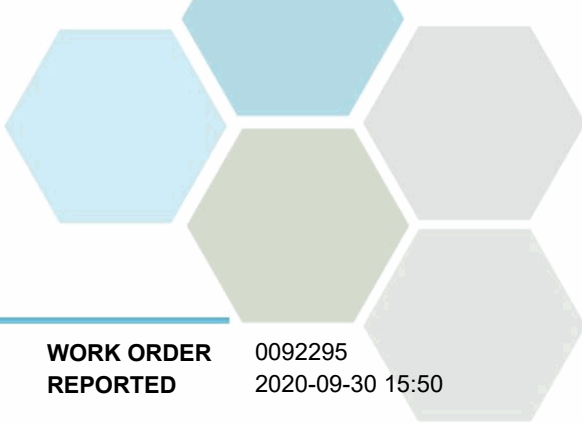
Chloride	95.7	0.10	mg/L	2020-09-24	
Nitrate (as N)	0.173	0.010	mg/L	2020-09-24	
Nitrite (as N)	0.041	0.010	mg/L	2020-09-24	

Calculated Parameters

Hardness, Total (as CaCO3)	223	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	0.214	0.0100	mg/L	N/A	
Nitrogen, Total	27.1	1.00	mg/L	N/A	

Dissolved Metals

Lithium, dissolved	0.0106	0.00010	mg/L	2020-09-30	
Aluminum, dissolved	0.0467	0.0050	mg/L	2020-09-30	
Antimony, dissolved	0.00029	0.00020	mg/L	2020-09-30	
Arsenic, dissolved	0.00250	0.00050	mg/L	2020-09-30	
Barium, dissolved	0.0168	0.0050	mg/L	2020-09-30	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2020-09-30	
Bismuth, dissolved	0.00046	0.00010	mg/L	2020-09-30	
Boron, dissolved	0.170	0.0500	mg/L	2020-09-30	
Cadmium, dissolved	0.000121	0.000010	mg/L	2020-09-30	
Calcium, dissolved	53.0	0.20	mg/L	2020-09-30	



TEST RESULTS

REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

WORK ORDER REPORTED 0092295
2020-09-30 15:50

Analyte	Result	RL	Units	Analyzed	Qualifier
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Drainage Pond (0092295-02) | Matrix: Water | Sampled: 2020-09-22 10:00, Continued

F2, PRES

Dissolved Metals, Continued

Chromium, dissolved	0.00051	0.00050	mg/L	2020-09-30	
Cobalt, dissolved	0.00061	0.00010	mg/L	2020-09-30	
Copper, dissolved	0.0249	0.00040	mg/L	2020-09-30	
Iron, dissolved	0.146	0.010	mg/L	2020-09-30	
Lead, dissolved	0.00046	0.00020	mg/L	2020-09-30	
Magnesium, dissolved	22.0	0.010	mg/L	2020-09-30	
Manganese, dissolved	0.136	0.00020	mg/L	2020-09-30	
Mercury, dissolved	< 0.000010	0.000010	mg/L	2020-09-26	
Molybdenum, dissolved	0.00368	0.00010	mg/L	2020-09-30	
Nickel, dissolved	0.00297	0.00040	mg/L	2020-09-30	
Phosphorus, dissolved	8.61	0.050	mg/L	2020-09-30	
Potassium, dissolved	30.9	0.10	mg/L	2020-09-30	
Selenium, dissolved	0.00055	0.00050	mg/L	2020-09-30	
Silicon, dissolved	3.8	1.0	mg/L	2020-09-30	
Silver, dissolved	< 0.000050	0.000050	mg/L	2020-09-30	
Sodium, dissolved	93.1	0.10	mg/L	2020-09-30	
Strontium, dissolved	0.531	0.0010	mg/L	2020-09-30	
Sulfur, dissolved	34.2	3.0	mg/L	2020-09-30	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2020-09-30	
Thallium, dissolved	< 0.000020	0.000020	mg/L	2020-09-30	
Thorium, dissolved	< 0.00010	0.00010	mg/L	2020-09-30	
Tin, dissolved	0.00035	0.00020	mg/L	2020-09-30	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2020-09-30	
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2020-09-30	
Uranium, dissolved	0.00166	0.000020	mg/L	2020-09-30	
Vanadium, dissolved	0.0013	0.0010	mg/L	2020-09-30	
Zinc, dissolved	0.0572	0.0040	mg/L	2020-09-30	
Zirconium, dissolved	0.00032	0.00010	mg/L	2020-09-30	

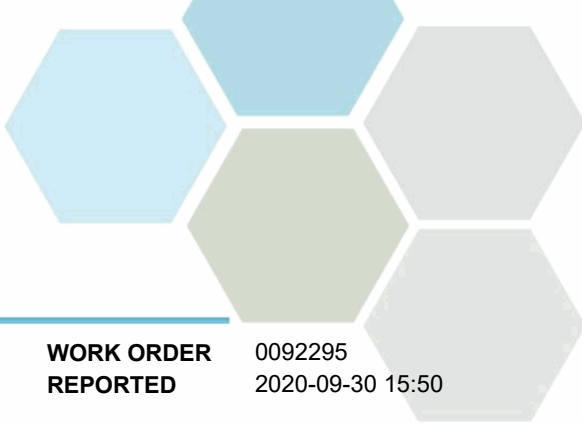
General Parameters

Ammonia, Total (as N)	7.77	0.050	mg/L	2020-09-23	
BOD, 5-day	36.4	2.0	mg/L	2020-09-29	
Chemical Oxygen Demand	253	20	mg/L	2020-09-24	
Conductivity (EC)	978	2.0	µS/cm	2020-09-25	
Nitrogen, Total Kjeldahl	26.9	0.050	mg/L	2020-09-27	
pH	8.15	0.10	pH units	2020-09-25	HT2
Solids, Total Dissolved	667	15	mg/L	2020-09-26	
Solids, Total Suspended	53.5	2.0	mg/L	2020-09-23	

Microbiological Parameters

Coliforms, Total (MPN)	11000	3.0	MPN/100 mL	2020-09-23	
E. coli (MPN)	11000	3.0	MPN/100 mL	2020-09-23	

Total Metals



TEST RESULTS

REPORTED TO PROJECT Kelowna, City of RBCF Ponds

WORK ORDER REPORTED 0092295
2020-09-30 15:50

Analyte	Result	RL	Units	Analyzed	Qualifier
Drainage Pond (0092295-02) Matrix: Water Sampled: 2020-09-22 10:00, Continued					F2, PRES

Total Metals, Continued

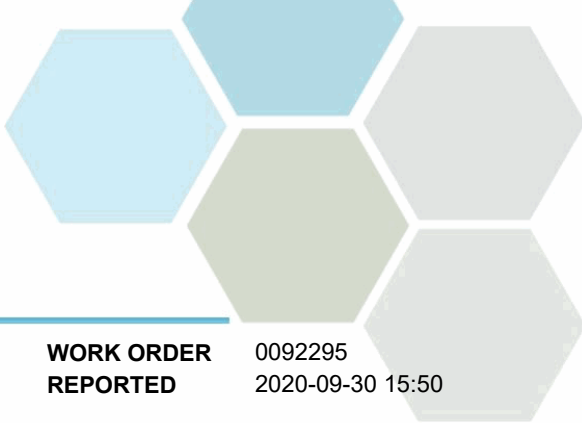
Aluminum, total	0.0483	0.0050	mg/L	2020-09-28	
Antimony, total	0.00039	0.00020	mg/L	2020-09-28	
Arsenic, total	0.00271	0.00050	mg/L	2020-09-28	
Barium, total	0.0200	0.0050	mg/L	2020-09-28	
Beryllium, total	< 0.00010	0.00010	mg/L	2020-09-28	
Bismuth, total	0.00058	0.00010	mg/L	2020-09-28	
Boron, total	0.174	0.0500	mg/L	2020-09-28	
Cadmium, total	0.000134	0.000010	mg/L	2020-09-28	
Calcium, total	55.1	0.20	mg/L	2020-09-28	
Chromium, total	0.00070	0.00050	mg/L	2020-09-28	
Cobalt, total	0.00065	0.00010	mg/L	2020-09-28	
Copper, total	0.0283	0.00040	mg/L	2020-09-28	
Iron, total	0.156	0.010	mg/L	2020-09-28	
Lead, total	0.00050	0.00020	mg/L	2020-09-28	
Lithium, total	0.0113	0.00010	mg/L	2020-09-28	
Magnesium, total	22.3	0.010	mg/L	2020-09-28	
Manganese, total	0.140	0.00020	mg/L	2020-09-28	
Mercury, total	< 0.000010	0.000010	mg/L	2020-09-26	
Molybdenum, total	0.00410	0.00010	mg/L	2020-09-28	
Nickel, total	0.00308	0.00040	mg/L	2020-09-28	
Phosphorus, total	8.82	0.050	mg/L	2020-09-28	
Potassium, total	30.2	0.10	mg/L	2020-09-28	
Selenium, total	0.00075	0.00050	mg/L	2020-09-28	
Silicon, total	4.4	1.0	mg/L	2020-09-28	
Silver, total	0.000120	0.000050	mg/L	2020-09-28	
Sodium, total	96.3	0.10	mg/L	2020-09-28	
Strontium, total	0.551	0.0010	mg/L	2020-09-28	
Sulfur, total	34.3	3.0	mg/L	2020-09-28	
Tellurium, total	< 0.00050	0.00050	mg/L	2020-09-28	
Thallium, total	< 0.000020	0.000020	mg/L	2020-09-28	
Thorium, total	< 0.00010	0.00010	mg/L	2020-09-28	
Tin, total	0.00045	0.00020	mg/L	2020-09-28	
Titanium, total	< 0.0050	0.0050	mg/L	2020-09-28	
Tungsten, total	< 0.0010	0.0010	mg/L	2020-09-28	
Uranium, total	0.00190	0.000020	mg/L	2020-09-28	
Vanadium, total	0.0019	0.0010	mg/L	2020-09-28	
Zinc, total	0.0667	0.0040	mg/L	2020-09-28	
Zirconium, total	0.00024	0.00010	mg/L	2020-09-28	

Davidson Pond (0092295-03) | Matrix: Water | Sampled: 2020-09-22 10:30

F2, PRES

Anions

Chloride	320	0.10	mg/L	2020-09-24	
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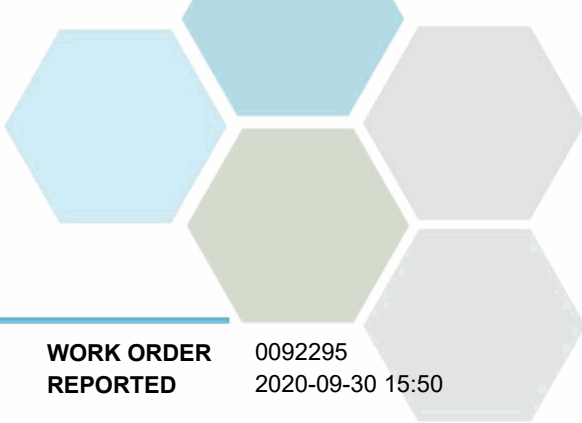


TEST RESULTS

REPORTED TO PROJECT Kelowna, City of RBCF Ponds

WORK ORDER REPORTED 0092295
2020-09-30 15:50

Analyte	Result	RL	Units	Analyzed	Qualifier
Davidson Pond (0092295-03) Matrix: Water Sampled: 2020-09-22 10:30, Continued					F2, PRES
<i>Anions, Continued</i>					
Nitrate (as N)	< 0.010	0.010	mg/L	2020-09-24	
Nitrite (as N)	< 0.010	0.010	mg/L	2020-09-24	
<i>Calculated Parameters</i>					
Hardness, Total (as CaCO3)	663	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	2.45	0.100	mg/L	N/A	
<i>Dissolved Metals</i>					
Lithium, dissolved	0.0474	0.00010	mg/L	2020-09-30	
Aluminum, dissolved	0.0076	0.0050	mg/L	2020-09-30	
Antimony, dissolved	0.00024	0.00020	mg/L	2020-09-30	
Arsenic, dissolved	0.00385	0.00050	mg/L	2020-09-30	
Barium, dissolved	0.0064	0.0050	mg/L	2020-09-30	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2020-09-30	
Bismuth, dissolved	< 0.00010	0.00010	mg/L	2020-09-30	
Boron, dissolved	< 0.0500	0.0500	mg/L	2020-09-30	
Cadmium, dissolved	< 0.000010	0.000010	mg/L	2020-09-30	
Calcium, dissolved	68.5	0.20	mg/L	2020-09-30	
Chromium, dissolved	< 0.00050	0.00050	mg/L	2020-09-30	
Cobalt, dissolved	< 0.00010	0.00010	mg/L	2020-09-30	
Copper, dissolved	< 0.00040	0.00040	mg/L	2020-09-30	
Iron, dissolved	0.013	0.010	mg/L	2020-09-30	
Lead, dissolved	< 0.00020	0.00020	mg/L	2020-09-30	
Magnesium, dissolved	119	0.010	mg/L	2020-09-30	
Manganese, dissolved	0.0831	0.00020	mg/L	2020-09-30	
Mercury, dissolved	< 0.000010	0.000010	mg/L	2020-09-26	
Molybdenum, dissolved	0.00104	0.00010	mg/L	2020-09-30	
Nickel, dissolved	0.00181	0.00040	mg/L	2020-09-30	
Phosphorus, dissolved	< 0.050	0.050	mg/L	2020-09-30	
Potassium, dissolved	47.7	0.10	mg/L	2020-09-30	
Selenium, dissolved	< 0.00050	0.00050	mg/L	2020-09-30	
Silicon, dissolved	3.8	1.0	mg/L	2020-09-30	
Silver, dissolved	0.000138	0.000050	mg/L	2020-09-30	
Sodium, dissolved	566	0.10	mg/L	2020-09-30	
Strontium, dissolved	1.03	0.0010	mg/L	2020-09-30	
Sulfur, dissolved	441	3.0	mg/L	2020-09-30	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2020-09-30	
Thallium, dissolved	< 0.000020	0.000020	mg/L	2020-09-30	
Thorium, dissolved	< 0.00010	0.00010	mg/L	2020-09-30	
Tin, dissolved	< 0.00020	0.00020	mg/L	2020-09-30	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2020-09-30	
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2020-09-30	
Uranium, dissolved	0.00520	0.000020	mg/L	2020-09-30	



TEST RESULTS

REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

WORK ORDER REPORTED 0092295
2020-09-30 15:50

Analyte	Result	RL	Units	Analyzed	Qualifier
Davidson Pond (0092295-03) Matrix: Water Sampled: 2020-09-22 10:30, Continued					F2, PRES

Dissolved Metals, Continued

Vanadium, dissolved	0.0015	0.0010	mg/L	2020-09-30	
Zinc, dissolved	< 0.0040	0.0040	mg/L	2020-09-30	
Zirconium, dissolved	0.00013	0.00010	mg/L	2020-09-30	

General Parameters

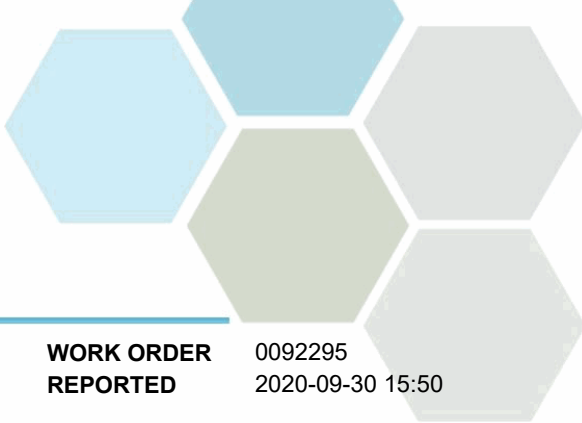
Ammonia, Total (as N)	0.128	0.050	mg/L	2020-09-23	
BOD, 5-day	< 5.6	2.0	mg/L	2020-09-29	
Chemical Oxygen Demand	68	20	mg/L	2020-09-24	
Conductivity (EC)	3350	2.0	µS/cm	2020-09-25	
Nitrogen, Total Kjeldahl	2.45	0.050	mg/L	2020-09-27	
pH	8.51	0.10	pH units	2020-09-25	HT2
Solids, Total Dissolved	2350	15	mg/L	2020-09-26	
Solids, Total Suspended	4.6	2.0	mg/L	2020-09-23	

Microbiological Parameters

Coliforms, Total	548	1	MPN/100 mL	2020-09-23	
E. coli	< 1	1	MPN/100 mL	2020-09-23	

Total Metals

Aluminum, total	0.0239	0.0050	mg/L	2020-09-28	
Antimony, total	0.00038	0.00020	mg/L	2020-09-28	
Arsenic, total	0.00412	0.00050	mg/L	2020-09-28	
Barium, total	0.0066	0.0050	mg/L	2020-09-28	
Beryllium, total	< 0.00010	0.00010	mg/L	2020-09-28	
Bismuth, total	< 0.00010	0.00010	mg/L	2020-09-28	
Boron, total	< 0.0500	0.0500	mg/L	2020-09-28	
Cadmium, total	< 0.000010	0.000010	mg/L	2020-09-28	
Calcium, total	69.7	0.20	mg/L	2020-09-28	
Chromium, total	< 0.00050	0.00050	mg/L	2020-09-28	
Cobalt, total	< 0.00010	0.00010	mg/L	2020-09-28	
Copper, total	0.00042	0.00040	mg/L	2020-09-28	
Iron, total	0.034	0.010	mg/L	2020-09-28	
Lead, total	< 0.00020	0.00020	mg/L	2020-09-28	
Lithium, total	0.0513	0.00010	mg/L	2020-09-28	
Magnesium, total	124	0.010	mg/L	2020-09-28	
Manganese, total	0.0964	0.00020	mg/L	2020-09-28	
Mercury, total	< 0.000010	0.000010	mg/L	2020-09-26	
Molybdenum, total	0.00120	0.00010	mg/L	2020-09-28	
Nickel, total	0.00176	0.00040	mg/L	2020-09-28	
Phosphorus, total	< 0.050	0.050	mg/L	2020-09-28	
Potassium, total	47.0	0.10	mg/L	2020-09-28	
Selenium, total	< 0.00050	0.00050	mg/L	2020-09-28	
Silicon, total	4.3	1.0	mg/L	2020-09-28	
Silver, total	< 0.000050	0.000050	mg/L	2020-09-28	



TEST RESULTS

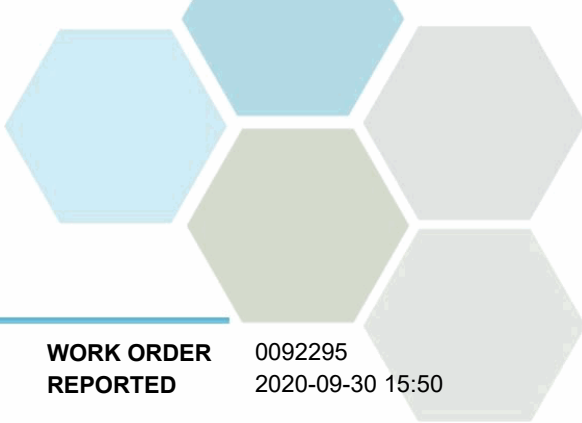
REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

WORK ORDER REPORTED 0092295
2020-09-30 15:50

Analyte	Result	RL	Units	Analyzed	Qualifier
Davidson Pond (0092295-03) Matrix: Water Sampled: 2020-09-22 10:30, Continued					F2, PRES
<i>Total Metals, Continued</i>					
Sodium, total	597	0.10	mg/L	2020-09-28	
Strontium, total	1.06	0.0010	mg/L	2020-09-28	
Sulfur, total	423	3.0	mg/L	2020-09-28	
Tellurium, total	< 0.00050	0.00050	mg/L	2020-09-28	
Thallium, total	< 0.000020	0.000020	mg/L	2020-09-28	
Thorium, total	< 0.00010	0.00010	mg/L	2020-09-28	
Tin, total	< 0.00020	0.00020	mg/L	2020-09-28	
Titanium, total	< 0.0050	0.0050	mg/L	2020-09-28	
Tungsten, total	< 0.0010	0.0010	mg/L	2020-09-28	
Uranium, total	0.00562	0.000020	mg/L	2020-09-28	
Vanadium, total	0.0015	0.0010	mg/L	2020-09-28	
Zinc, total	< 0.0040	0.0040	mg/L	2020-09-28	
Zirconium, total	0.00012	0.00010	mg/L	2020-09-28	

Sample Qualifiers:

- F2 The sample was not field-preserved with HNO3 and was therefore preserved in the laboratory and held for at least 16 hours prior to analysis for total metals.
- HT1 The sample was prepared and/or analyzed past the recommended holding time.
- HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
- PRES Sample has been preserved for COD, TKN and NH3 in the laboratory and the holding time has been extended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

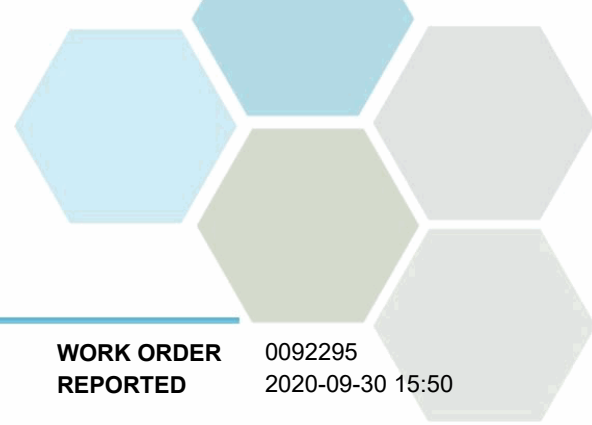
WORK ORDER REPORTED 0092295
2020-09-30 15:50

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Coliforms, Total in Water	SM 9221 B (2017)	Most Probable Number / Multiple-Tube Fermentation	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
Dissolved Metals in Water	EPA 200.8 / EPA 6020B	0.45 µm Filtration / Inductively Coupled Plasma-Mass Spectrometry (ICP-MS)	✓	Richmond
E. coli in Water	SM 9221 (2017)	Most Probable Number / Multiple-Tube Fermentation	✓	Kelowna
Hardness in Water	SM 2340 B (2017)	Calculation: 2.497 [diss Ca] + 4.118 [diss Mg]	✓	N/A
Mercury, dissolved in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	✓	Richmond
Mercury, total in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	✓	Richmond
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Solids, Total Dissolved in Water	SM 2540 C* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectrometry (ICP-MS)	✓	Richmond

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
>	Greater than the specified Result
mg/L	Milligrams per litre
MPN/100 mL	Most Probable Number per 100 millilitres
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association



APPENDIX 1: SUPPORTING INFORMATION

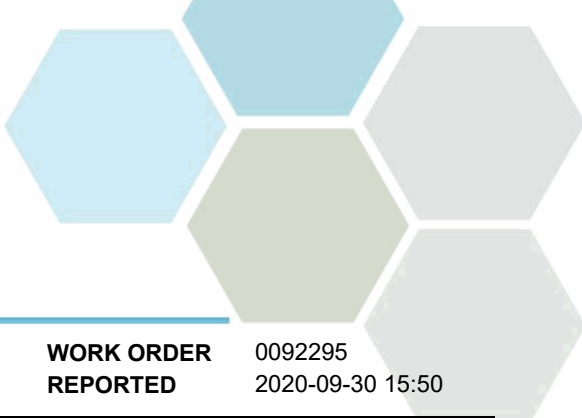
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General Comments:

The results in this report apply to the samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Samples will be disposed of 30 days after the test report has been issued unless otherwise agreed to in writing.

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APPENDIX 2: QUALITY CONTROL RESULTS

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The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

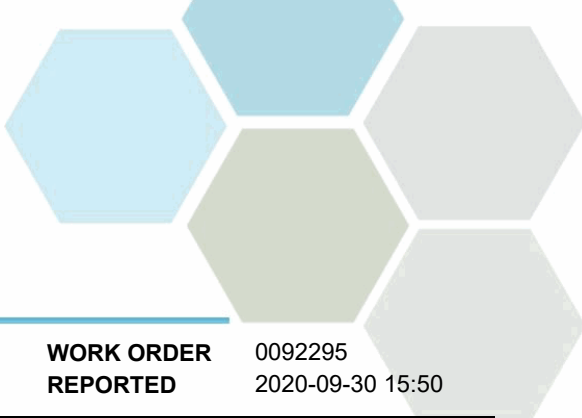
- **Method Blank (Blk):** A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup):** An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS):** A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS):** A second aliquot of sample is fortified with with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM):** A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B0I2102									
Blank (B0I2102-BLK1)			Prepared: 2020-09-24, Analyzed: 2020-09-24						
Chloride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
Blank (B0I2102-BLK2)			Prepared: 2020-09-25, Analyzed: 2020-09-25						
Chloride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
Blank (B0I2102-BLK3)			Prepared: 2020-09-25, Analyzed: 2020-09-25						
Chloride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
LCS (B0I2102-BS1)			Prepared: 2020-09-24, Analyzed: 2020-09-24						
Chloride	16.2	0.10 mg/L	16.0		101	90-110			
Nitrate (as N)	4.08	0.010 mg/L	4.00		102	90-110			
Nitrite (as N)	2.03	0.010 mg/L	2.00		101	85-115			
LCS (B0I2102-BS2)			Prepared: 2020-09-25, Analyzed: 2020-09-25						
Chloride	16.2	0.10 mg/L	16.0		101	90-110			
Nitrate (as N)	4.09	0.010 mg/L	4.00		102	90-110			
Nitrite (as N)	2.03	0.010 mg/L	2.00		102	85-115			
LCS (B0I2102-BS3)			Prepared: 2020-09-25, Analyzed: 2020-09-25						
Chloride	16.1	0.10 mg/L	16.0		101	90-110			
Nitrate (as N)	4.04	0.010 mg/L	4.00		101	90-110			
Nitrite (as N)	2.02	0.010 mg/L	2.00		101	85-115			

Dissolved Metals, Batch B0I2416

Blank (B0I2416-BLK1)			Prepared: 2020-09-25, Analyzed: 2020-09-26						
Mercury, dissolved	< 0.000010	0.000010 mg/L							
Blank (B0I2416-BLK2)			Prepared: 2020-09-25, Analyzed: 2020-09-26						
Mercury, dissolved	< 0.000010	0.000010 mg/L							

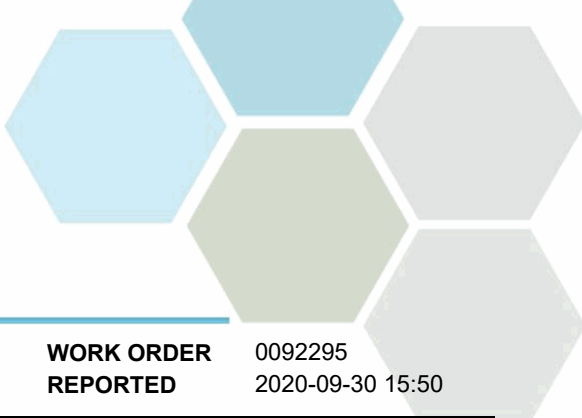


APPENDIX 2: QUALITY CONTROL RESULTS

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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Dissolved Metals, Batch B0I2416, Continued									
Reference (B0I2416-SRM1)			Prepared: 2020-09-25, Analyzed: 2020-09-26						
Mercury, dissolved	0.00641	0.000010 mg/L	0.00581		110	70-130			
Reference (B0I2416-SRM2)			Prepared: 2020-09-25, Analyzed: 2020-09-26						
Mercury, dissolved	0.00584	0.000010 mg/L	0.00581		100	70-130			
Dissolved Metals, Batch B0I2637									
Blank (B0I2637-BLK1)			Prepared: 2020-09-29, Analyzed: 2020-09-29						
Lithium, dissolved	< 0.00010	0.00010 mg/L							
Aluminum, dissolved	< 0.0050	0.0050 mg/L							
Antimony, dissolved	< 0.00020	0.00020 mg/L							
Arsenic, dissolved	< 0.00050	0.00050 mg/L							
Barium, dissolved	< 0.0050	0.0050 mg/L							
Beryllium, dissolved	< 0.00010	0.00010 mg/L							
Bismuth, dissolved	< 0.00010	0.00010 mg/L							
Boron, dissolved	< 0.0500	0.0500 mg/L							
Cadmium, dissolved	< 0.000010	0.000010 mg/L							
Calcium, dissolved	< 0.20	0.20 mg/L							
Chromium, dissolved	< 0.00050	0.00050 mg/L							
Cobalt, dissolved	< 0.00010	0.00010 mg/L							
Copper, dissolved	< 0.00040	0.00040 mg/L							
Iron, dissolved	< 0.010	0.010 mg/L							
Lead, dissolved	< 0.00020	0.00020 mg/L							
Magnesium, dissolved	< 0.010	0.010 mg/L							
Manganese, dissolved	< 0.00020	0.00020 mg/L							
Molybdenum, dissolved	< 0.00010	0.00010 mg/L							
Nickel, dissolved	< 0.00040	0.00040 mg/L							
Phosphorus, dissolved	< 0.050	0.050 mg/L							
Potassium, dissolved	< 0.10	0.10 mg/L							
Selenium, dissolved	< 0.00050	0.00050 mg/L							
Silicon, dissolved	< 1.0	1.0 mg/L							
Silver, dissolved	< 0.000050	0.000050 mg/L							
Sodium, dissolved	< 0.10	0.10 mg/L							
Strontium, dissolved	< 0.0010	0.0010 mg/L							
Sulfur, dissolved	< 3.0	3.0 mg/L							
Tellurium, dissolved	< 0.00050	0.00050 mg/L							
Thallium, dissolved	< 0.000020	0.000020 mg/L							
Thorium, dissolved	< 0.00010	0.00010 mg/L							
Tin, dissolved	< 0.00020	0.00020 mg/L							
Titanium, dissolved	< 0.0050	0.0050 mg/L							
Tungsten, dissolved	< 0.0010	0.0010 mg/L							
Uranium, dissolved	< 0.000020	0.000020 mg/L							
Vanadium, dissolved	< 0.0010	0.0010 mg/L							
Zinc, dissolved	< 0.0040	0.0040 mg/L							
Zirconium, dissolved	< 0.00010	0.00010 mg/L							
Blank (B0I2637-BLK2)			Prepared: 2020-09-30, Analyzed: 2020-09-30						
Lithium, dissolved	< 0.00010	0.00010 mg/L							
Aluminum, dissolved	< 0.0050	0.0050 mg/L							
Antimony, dissolved	< 0.00020	0.00020 mg/L							
Arsenic, dissolved	< 0.00050	0.00050 mg/L							
Barium, dissolved	< 0.0050	0.0050 mg/L							
Beryllium, dissolved	< 0.00010	0.00010 mg/L							
Bismuth, dissolved	< 0.00010	0.00010 mg/L							
Boron, dissolved	< 0.0500	0.0500 mg/L							
Cadmium, dissolved	< 0.000010	0.000010 mg/L							



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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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Dissolved Metals, Batch B012637, Continued

Blank (B012637-BLK2), Continued

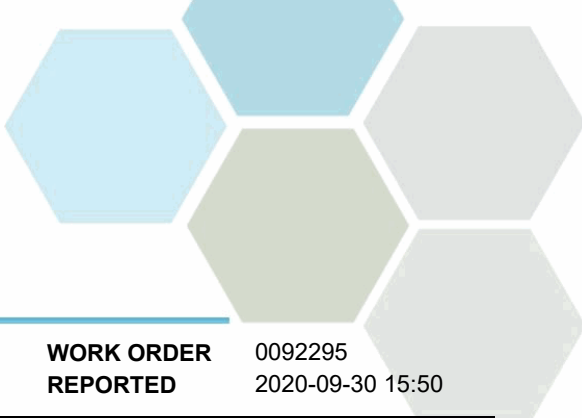
Prepared: 2020-09-30, Analyzed: 2020-09-30

Calcium, dissolved	< 0.20	0.20 mg/L							
Chromium, dissolved	< 0.00050	0.00050 mg/L							
Cobalt, dissolved	< 0.00010	0.00010 mg/L							
Copper, dissolved	< 0.00040	0.00040 mg/L							
Iron, dissolved	< 0.010	0.010 mg/L							
Lead, dissolved	< 0.00020	0.00020 mg/L							
Magnesium, dissolved	< 0.010	0.010 mg/L							
Manganese, dissolved	< 0.00020	0.00020 mg/L							
Molybdenum, dissolved	< 0.00010	0.00010 mg/L							
Nickel, dissolved	< 0.00040	0.00040 mg/L							
Phosphorus, dissolved	< 0.050	0.050 mg/L							
Potassium, dissolved	< 0.10	0.10 mg/L							
Selenium, dissolved	< 0.00050	0.00050 mg/L							
Silicon, dissolved	< 1.0	1.0 mg/L							
Silver, dissolved	< 0.000050	0.000050 mg/L							
Sodium, dissolved	< 0.10	0.10 mg/L							
Strontium, dissolved	< 0.0010	0.0010 mg/L							
Sulfur, dissolved	< 3.0	3.0 mg/L							
Tellurium, dissolved	< 0.00050	0.00050 mg/L							
Thallium, dissolved	< 0.000020	0.000020 mg/L							
Thorium, dissolved	< 0.00010	0.00010 mg/L							
Tin, dissolved	< 0.00020	0.00020 mg/L							
Titanium, dissolved	< 0.0050	0.0050 mg/L							
Tungsten, dissolved	< 0.0010	0.0010 mg/L							
Uranium, dissolved	< 0.000020	0.000020 mg/L							
Vanadium, dissolved	< 0.0010	0.0010 mg/L							
Zinc, dissolved	< 0.0040	0.0040 mg/L							
Zirconium, dissolved	< 0.00010	0.00010 mg/L							

LCS (B012637-BS1)

Prepared: 2020-09-29, Analyzed: 2020-09-29

Lithium, dissolved	0.0204	0.00010 mg/L	0.0200		102	80-120			
Aluminum, dissolved	0.0227	0.0050 mg/L	0.0199		114	80-120			
Antimony, dissolved	0.0188	0.00020 mg/L	0.0200		94	80-120			
Arsenic, dissolved	0.0191	0.00050 mg/L	0.0200		96	80-120			
Barium, dissolved	0.0200	0.0050 mg/L	0.0198		101	80-120			
Beryllium, dissolved	0.0205	0.00010 mg/L	0.0198		103	80-120			
Bismuth, dissolved	0.0204	0.00010 mg/L	0.0200		102	80-120			
Boron, dissolved	< 0.0500	0.0500 mg/L	0.0200		106	80-120			
Cadmium, dissolved	0.0192	0.000010 mg/L	0.0199		97	80-120			
Calcium, dissolved	2.09	0.20 mg/L	2.02		103	80-120			
Chromium, dissolved	0.0196	0.00050 mg/L	0.0198		99	80-120			
Cobalt, dissolved	0.0198	0.00010 mg/L	0.0199		99	80-120			
Copper, dissolved	0.0197	0.00040 mg/L	0.0200		98	80-120			
Iron, dissolved	1.97	0.010 mg/L	2.02		98	80-120			
Lead, dissolved	0.0200	0.00020 mg/L	0.0199		101	80-120			
Magnesium, dissolved	1.99	0.010 mg/L	2.02		98	80-120			
Manganese, dissolved	0.0203	0.00020 mg/L	0.0199		102	80-120			
Molybdenum, dissolved	0.0193	0.00010 mg/L	0.0200		96	80-120			
Nickel, dissolved	0.0199	0.00040 mg/L	0.0200		99	80-120			
Phosphorus, dissolved	1.99	0.050 mg/L	2.00		100	80-120			
Potassium, dissolved	2.02	0.10 mg/L	2.02		100	80-120			
Selenium, dissolved	0.0187	0.00050 mg/L	0.0200		94	80-120			
Silicon, dissolved	2.0	1.0 mg/L	2.00		100	80-120			
Silver, dissolved	0.0194	0.000050 mg/L	0.0200		97	80-120			
Sodium, dissolved	1.99	0.10 mg/L	2.02		99	80-120			
Strontium, dissolved	0.0198	0.0010 mg/L	0.0200		99	80-120			



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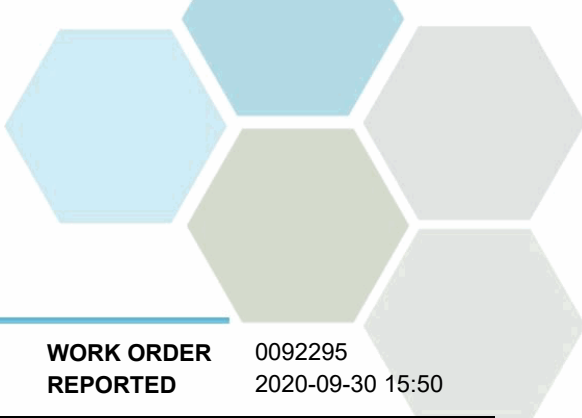
Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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Dissolved Metals, Batch B012637, Continued

LCS (B012637-BS1), Continued				Prepared: 2020-09-29, Analyzed: 2020-09-29					
Sulfur, dissolved	4.6	3.0 mg/L	5.00		91	80-120			
Tellurium, dissolved	0.0184	0.00050 mg/L	0.0200		92	80-120			
Thallium, dissolved	0.0204	0.000020 mg/L	0.0199		102	80-120			
Thorium, dissolved	0.0196	0.00010 mg/L	0.0200		98	80-120			
Tin, dissolved	0.0196	0.00020 mg/L	0.0200		98	80-120			
Titanium, dissolved	0.0203	0.0050 mg/L	0.0200		101	80-120			
Tungsten, dissolved	0.0199	0.0010 mg/L	0.0200		100	80-120			
Uranium, dissolved	0.0198	0.000020 mg/L	0.0200		99	80-120			
Vanadium, dissolved	0.0194	0.0010 mg/L	0.0200		97	80-120			
Zinc, dissolved	0.0213	0.0040 mg/L	0.0200		107	80-120			
Zirconium, dissolved	0.0190	0.00010 mg/L	0.0200		95	80-120			

LCS (B012637-BS2)				Prepared: 2020-09-30, Analyzed: 2020-09-30					
Lithium, dissolved	0.0200	0.00010 mg/L	0.0200		100	80-120			
Aluminum, dissolved	0.0224	0.0050 mg/L	0.0199		112	80-120			
Antimony, dissolved	0.0190	0.00020 mg/L	0.0200		95	80-120			
Arsenic, dissolved	0.0191	0.00050 mg/L	0.0200		96	80-120			
Barium, dissolved	0.0200	0.0050 mg/L	0.0198		101	80-120			
Beryllium, dissolved	0.0199	0.00010 mg/L	0.0198		100	80-120			
Bismuth, dissolved	0.0201	0.00010 mg/L	0.0200		101	80-120			
Boron, dissolved	< 0.0500	0.0500 mg/L	0.0200		100	80-120			
Cadmium, dissolved	0.0194	0.000010 mg/L	0.0199		97	80-120			
Calcium, dissolved	2.10	0.20 mg/L	2.02		104	80-120			
Chromium, dissolved	0.0196	0.00050 mg/L	0.0198		99	80-120			
Cobalt, dissolved	0.0199	0.00010 mg/L	0.0199		100	80-120			
Copper, dissolved	0.0203	0.00040 mg/L	0.0200		101	80-120			
Iron, dissolved	2.01	0.010 mg/L	2.02		99	80-120			
Lead, dissolved	0.0198	0.00020 mg/L	0.0199		99	80-120			
Magnesium, dissolved	1.95	0.010 mg/L	2.02		96	80-120			
Manganese, dissolved	0.0204	0.00020 mg/L	0.0199		102	80-120			
Molybdenum, dissolved	0.0195	0.00010 mg/L	0.0200		97	80-120			
Nickel, dissolved	0.0202	0.00040 mg/L	0.0200		101	80-120			
Phosphorus, dissolved	1.85	0.050 mg/L	2.00		92	80-120			
Potassium, dissolved	1.98	0.10 mg/L	2.02		98	80-120			
Selenium, dissolved	0.0189	0.00050 mg/L	0.0200		94	80-120			
Silicon, dissolved	2.0	1.0 mg/L	2.00		99	80-120			
Silver, dissolved	0.0194	0.000050 mg/L	0.0200		97	80-120			
Sodium, dissolved	1.93	0.10 mg/L	2.02		95	80-120			
Strontium, dissolved	0.0198	0.0010 mg/L	0.0200		99	80-120			
Sulfur, dissolved	4.1	3.0 mg/L	5.00		82	80-120			
Tellurium, dissolved	0.0195	0.00050 mg/L	0.0200		98	80-120			
Thallium, dissolved	0.0201	0.000020 mg/L	0.0199		101	80-120			
Thorium, dissolved	0.0195	0.00010 mg/L	0.0200		98	80-120			
Tin, dissolved	0.0200	0.00020 mg/L	0.0200		100	80-120			
Titanium, dissolved	0.0209	0.0050 mg/L	0.0200		104	80-120			
Tungsten, dissolved	0.0198	0.0010 mg/L	0.0200		99	80-120			
Uranium, dissolved	0.0195	0.000020 mg/L	0.0200		98	80-120			
Vanadium, dissolved	0.0197	0.0010 mg/L	0.0200		98	80-120			
Zinc, dissolved	0.0238	0.0040 mg/L	0.0200		119	80-120			
Zirconium, dissolved	0.0195	0.00010 mg/L	0.0200		97	80-120			

Reference (B012637-SRM1)				Prepared: 2020-09-29, Analyzed: 2020-09-29					
Lithium, dissolved	0.101	0.00010 mg/L	0.100		101	70-130			
Aluminum, dissolved	0.224	0.0050 mg/L	0.235		95	70-130			
Antimony, dissolved	0.0425	0.00020 mg/L	0.0431		99	70-130			
Arsenic, dissolved	0.427	0.00050 mg/L	0.423		101	70-130			
Barium, dissolved	3.14	0.0050 mg/L	3.30		95	70-130			



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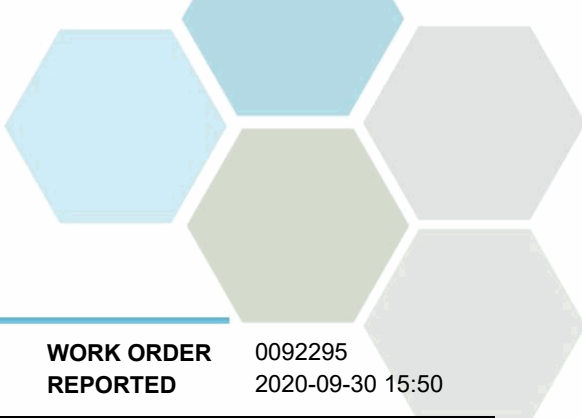
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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Dissolved Metals, Batch B0I2637, Continued									
Reference (B0I2637-SRM1), Continued					Prepared: 2020-09-29, Analyzed: 2020-09-29				
Beryllium, dissolved	0.214	0.00010 mg/L	0.209		102	70-130			
Boron, dissolved	1.66	0.0500 mg/L	1.65		101	70-130			
Cadmium, dissolved	0.215	0.000010 mg/L	0.221		97	70-130			
Calcium, dissolved	7.23	0.20 mg/L	7.72		94	70-130			
Chromium, dissolved	0.422	0.00050 mg/L	0.434		97	70-130			
Cobalt, dissolved	0.124	0.00010 mg/L	0.124		100	70-130			
Copper, dissolved	0.796	0.00040 mg/L	0.815		98	70-130			
Iron, dissolved	1.28	0.010 mg/L	1.27		100	70-130			
Lead, dissolved	0.106	0.00020 mg/L	0.110		96	70-130			
Magnesium, dissolved	6.53	0.010 mg/L	6.59		99	70-130			
Manganese, dissolved	0.347	0.00020 mg/L	0.342		101	70-130			
Molybdenum, dissolved	0.399	0.00010 mg/L	0.404		99	70-130			
Nickel, dissolved	0.831	0.00040 mg/L	0.835		99	70-130			
Phosphorus, dissolved	0.499	0.050 mg/L	0.499		100	70-130			
Potassium, dissolved	3.04	0.10 mg/L	2.88		105	70-130			
Selenium, dissolved	0.0326	0.00050 mg/L	0.0324		101	70-130			
Sodium, dissolved	17.7	0.10 mg/L	18.0		98	70-130			
Strontium, dissolved	0.903	0.0010 mg/L	0.935		97	70-130			
Thallium, dissolved	0.0382	0.000020 mg/L	0.0385		99	70-130			
Uranium, dissolved	0.235	0.000020 mg/L	0.258		91	70-130			
Vanadium, dissolved	0.827	0.0010 mg/L	0.873		95	70-130			
Zinc, dissolved	0.890	0.0040 mg/L	0.848		105	70-130			

Reference (B0I2637-SRM2)					Prepared: 2020-09-30, Analyzed: 2020-09-30				
Lithium, dissolved	0.102	0.00010 mg/L	0.100		102	70-130			
Aluminum, dissolved	0.228	0.0050 mg/L	0.235		97	70-130			
Antimony, dissolved	0.0429	0.00020 mg/L	0.0431		100	70-130			
Arsenic, dissolved	0.431	0.00050 mg/L	0.423		102	70-130			
Barium, dissolved	3.15	0.0050 mg/L	3.30		95	70-130			
Beryllium, dissolved	0.215	0.00010 mg/L	0.209		103	70-130			
Boron, dissolved	1.67	0.0500 mg/L	1.65		101	70-130			
Cadmium, dissolved	0.215	0.000010 mg/L	0.221		97	70-130			
Calcium, dissolved	7.28	0.20 mg/L	7.72		94	70-130			
Chromium, dissolved	0.425	0.00050 mg/L	0.434		98	70-130			
Cobalt, dissolved	0.126	0.00010 mg/L	0.124		101	70-130			
Copper, dissolved	0.798	0.00040 mg/L	0.815		98	70-130			
Iron, dissolved	1.26	0.010 mg/L	1.27		99	70-130			
Lead, dissolved	0.108	0.00020 mg/L	0.110		98	70-130			
Magnesium, dissolved	6.54	0.010 mg/L	6.59		99	70-130			
Manganese, dissolved	0.348	0.00020 mg/L	0.342		102	70-130			
Molybdenum, dissolved	0.400	0.00010 mg/L	0.404		99	70-130			
Nickel, dissolved	0.838	0.00040 mg/L	0.835		100	70-130			
Phosphorus, dissolved	0.517	0.050 mg/L	0.499		104	70-130			
Potassium, dissolved	3.04	0.10 mg/L	2.88		106	70-130			
Selenium, dissolved	0.0328	0.00050 mg/L	0.0324		101	70-130			
Sodium, dissolved	17.6	0.10 mg/L	18.0		98	70-130			
Strontium, dissolved	0.908	0.0010 mg/L	0.935		97	70-130			
Thallium, dissolved	0.0384	0.000020 mg/L	0.0385		100	70-130			
Uranium, dissolved	0.234	0.000020 mg/L	0.258		91	70-130			
Vanadium, dissolved	0.837	0.0010 mg/L	0.873		96	70-130			
Zinc, dissolved	0.872	0.0040 mg/L	0.848		103	70-130			

General Parameters, Batch B0I2040

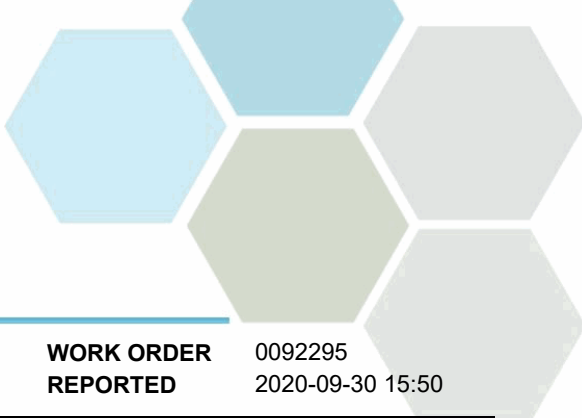
Blank (B0I2040-BLK1)					Prepared: 2020-09-23, Analyzed: 2020-09-23				
Solids, Total Suspended	< 2.0	2.0 mg/L							



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT	Kelowna, City of RBCF Ponds	WORK ORDER REPORTED	0092295 2020-09-30 15:50
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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B0I2040, Continued									
Blank (B0I2040-BLK2)			Prepared: 2020-09-23, Analyzed: 2020-09-23						
Solids, Total Suspended	< 2.0	2.0 mg/L							
LCS (B0I2040-BS1)			Prepared: 2020-09-23, Analyzed: 2020-09-23						
Solids, Total Suspended	91.0	10.0 mg/L	100		91	85-115			
LCS (B0I2040-BS2)			Prepared: 2020-09-23, Analyzed: 2020-09-23						
Solids, Total Suspended	101	10.0 mg/L	100		101	85-115			
General Parameters, Batch B0I2093									
Blank (B0I2093-BLK1)			Prepared: 2020-09-23, Analyzed: 2020-09-23						
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
Blank (B0I2093-BLK2)			Prepared: 2020-09-23, Analyzed: 2020-09-23						
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
Blank (B0I2093-BLK3)			Prepared: 2020-09-23, Analyzed: 2020-09-23						
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
Blank (B0I2093-BLK4)			Prepared: 2020-09-23, Analyzed: 2020-09-23						
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
LCS (B0I2093-BS1)			Prepared: 2020-09-23, Analyzed: 2020-09-23						
Ammonia, Total (as N)	1.05	0.050 mg/L	1.00		105	90-115			
LCS (B0I2093-BS2)			Prepared: 2020-09-23, Analyzed: 2020-09-23						
Ammonia, Total (as N)	1.04	0.050 mg/L	1.00		104	90-115			
LCS (B0I2093-BS3)			Prepared: 2020-09-23, Analyzed: 2020-09-23						
Ammonia, Total (as N)	1.04	0.050 mg/L	1.00		104	90-115			
LCS (B0I2093-BS4)			Prepared: 2020-09-23, Analyzed: 2020-09-23						
Ammonia, Total (as N)	1.02	0.050 mg/L	1.00		102	90-115			
General Parameters, Batch B0I2221									
Blank (B0I2221-BLK1)			Prepared: 2020-09-24, Analyzed: 2020-09-29						
BOD, 5-day	< 2.0	2.0 mg/L							
LCS (B0I2221-BS1)			Prepared: 2020-09-24, Analyzed: 2020-09-29						
BOD, 5-day	159	46.8 mg/L	180		88	85-115			
General Parameters, Batch B0I2237									
Blank (B0I2237-BLK1)			Prepared: 2020-09-24, Analyzed: 2020-09-24						
Chemical Oxygen Demand	< 20	20 mg/L							
LCS (B0I2237-BS1)			Prepared: 2020-09-24, Analyzed: 2020-09-24						
Chemical Oxygen Demand	515	20 mg/L	500		103	89-115			
General Parameters, Batch B0I2290									
Blank (B0I2290-BLK1)			Prepared: 2020-09-26, Analyzed: 2020-09-26						
Solids, Total Dissolved	< 15	15 mg/L							



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT	Kelowna, City of RBCF Ponds	WORK ORDER REPORTED	0092295 2020-09-30 15:50
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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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General Parameters, Batch B012290, Continued

LCS (B012290-BS1)			Prepared: 2020-09-26, Analyzed: 2020-09-26						
Solids, Total Dissolved	228	15 mg/L	240		95	85-115			
Duplicate (B012290-DUP1)			Source: 0092295-01 Prepared: 2020-09-26, Analyzed: 2020-09-26						
Solids, Total Dissolved	3660	15 mg/L		3730			2	15	

General Parameters, Batch B012387

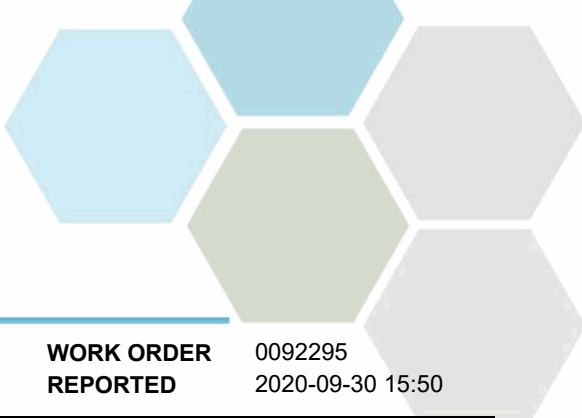
Blank (B012387-BLK1)			Prepared: 2020-09-25, Analyzed: 2020-09-25						
Conductivity (EC)	< 2.0	2.0 µS/cm							
Blank (B012387-BLK2)			Prepared: 2020-09-25, Analyzed: 2020-09-25						
Conductivity (EC)	< 2.0	2.0 µS/cm							
Blank (B012387-BLK3)			Prepared: 2020-09-25, Analyzed: 2020-09-25						
Conductivity (EC)	< 2.0	2.0 µS/cm							
LCS (B012387-BS4)			Prepared: 2020-09-25, Analyzed: 2020-09-25						
Conductivity (EC)	1390	2.0 µS/cm	1410		99	95-104			
LCS (B012387-BS5)			Prepared: 2020-09-25, Analyzed: 2020-09-25						
Conductivity (EC)	1340	2.0 µS/cm	1410		95	95-104			
LCS (B012387-BS6)			Prepared: 2020-09-25, Analyzed: 2020-09-25						
Conductivity (EC)	1410	2.0 µS/cm	1410		100	95-104			
Reference (B012387-SRM1)			Prepared: 2020-09-25, Analyzed: 2020-09-25						
pH	7.01	0.10 pH units	7.01		100	98-102			
Reference (B012387-SRM2)			Prepared: 2020-09-25, Analyzed: 2020-09-25						
pH	7.00	0.10 pH units	7.01		100	98-102			
Reference (B012387-SRM3)			Prepared: 2020-09-25, Analyzed: 2020-09-25						
pH	7.01	0.10 pH units	7.01		100	98-102			

General Parameters, Batch B012419

Blank (B012419-BLK1)			Prepared: 2020-09-26, Analyzed: 2020-09-27						
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							
Blank (B012419-BLK2)			Prepared: 2020-09-26, Analyzed: 2020-09-27						
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							
LCS (B012419-BS1)			Prepared: 2020-09-26, Analyzed: 2020-09-27						
Nitrogen, Total Kjeldahl	1.04	0.050 mg/L	1.00		104	85-115			
LCS (B012419-BS2)			Prepared: 2020-09-26, Analyzed: 2020-09-27						
Nitrogen, Total Kjeldahl	1.03	0.050 mg/L	1.00		103	85-115			

Microbiological Parameters, Batch B012089

Blank (B012089-BLK1)			Prepared: 2020-09-23, Analyzed: 2020-09-23						
Coliforms, Total	< 1	1 MPN/100 mL							
E. coli	< 1	1 MPN/100 mL							
Blank (B012089-BLK2)			Prepared: 2020-09-23, Analyzed: 2020-09-23						
E. coli	< 1	1 MPN/100 mL							



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT	Kelowna, City of RBCF Ponds	WORK ORDER REPORTED	0092295 2020-09-30 15:50
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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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Microbiological Parameters, Batch B0I2089, Continued

Blank (B0I2089-BLK3)			Prepared: 2020-09-23, Analyzed: 2020-09-23						
Coliforms, Total	< 1	1 MPN/100 mL							
E. coli	< 1	1 MPN/100 mL							
Blank (B0I2089-BLK4)			Prepared: 2020-09-23, Analyzed: 2020-09-23						
E. coli	< 1	1 MPN/100 mL							

Microbiological Parameters, Batch B0I2127

Blank (B0I2127-BLK1)			Prepared: 2020-09-23, Analyzed: 2020-09-23						
Coliforms, Total (MPN)	< 3.0	3.0 MPN/100 mL							
Coliforms, Fecal (MPN)	< 3.0	3.0 MPN/100 mL							
E. coli (MPN)	< 3.0	3.0 MPN/100 mL							
Duplicate (B0I2127-DUP1)			Source: 0092295-02		Prepared: 2020-09-23, Analyzed: 2020-09-23				
Coliforms, Total (MPN)	24000	3.0 MPN/100 mL		11000			74	136	
Coliforms, Fecal (MPN)	24000	3.0 MPN/100 mL		11000			74	107	
E. coli (MPN)	11000	3.0 MPN/100 mL		11000			< 1	133	

Microbiological Parameters, Batch B0I2235

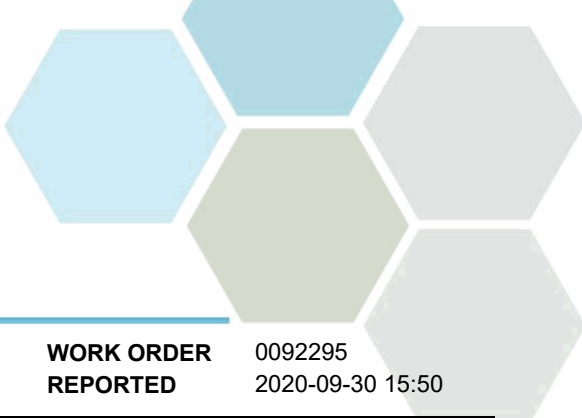
Blank (B0I2235-BLK1)			Prepared: 2020-09-24, Analyzed: 2020-09-24						
Coliforms, Total	< 1	1 MPN/100 mL							
Blank (B0I2235-BLK4)			Prepared: 2020-09-24, Analyzed: 2020-09-24						
Coliforms, Total	< 1	1 MPN/100 mL							
Blank (B0I2235-BLK5)			Prepared: 2020-09-24, Analyzed: 2020-09-24						
Coliforms, Total	< 1	1 MPN/100 mL							
Blank (B0I2235-BLK6)			Prepared: 2020-09-24, Analyzed: 2020-09-24						
Coliforms, Total	< 1	1 MPN/100 mL							

Total Metals, Batch B0I2417

Blank (B0I2417-BLK1)			Prepared: 2020-09-25, Analyzed: 2020-09-26						
Mercury, total	< 0.000010	0.000010 mg/L							
Blank (B0I2417-BLK2)			Prepared: 2020-09-25, Analyzed: 2020-09-26						
Mercury, total	< 0.000010	0.000010 mg/L							
Reference (B0I2417-SRM1)			Prepared: 2020-09-25, Analyzed: 2020-09-26						
Mercury, total	0.00579	0.000010 mg/L	0.00581		100	70-130			
Reference (B0I2417-SRM2)			Prepared: 2020-09-25, Analyzed: 2020-09-26						
Mercury, total	0.00591	0.000010 mg/L	0.00581		102	70-130			

Total Metals, Batch B0I2467

Blank (B0I2467-BLK1)			Prepared: 2020-09-27, Analyzed: 2020-09-28						
Aluminum, total	< 0.0050	0.0050 mg/L							
Antimony, total	< 0.00020	0.00020 mg/L							
Arsenic, total	< 0.00050	0.00050 mg/L							
Barium, total	< 0.0050	0.0050 mg/L							
Beryllium, total	< 0.00010	0.00010 mg/L							
Bismuth, total	< 0.00010	0.00010 mg/L							



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

WORK ORDER REPORTED 0092295
2020-09-30 15:50

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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Total Metals, Batch B012467, Continued

Blank (B012467-BLK1), Continued

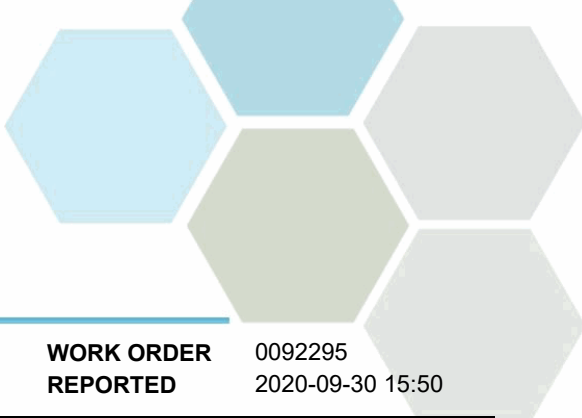
Prepared: 2020-09-27, Analyzed: 2020-09-28

Boron, total	< 0.0500	0.0500 mg/L							
Cadmium, total	< 0.000010	0.000010 mg/L							
Calcium, total	< 0.20	0.20 mg/L							
Chromium, total	< 0.00050	0.00050 mg/L							
Cobalt, total	< 0.00010	0.00010 mg/L							
Copper, total	< 0.00040	0.00040 mg/L							
Iron, total	< 0.010	0.010 mg/L							
Lead, total	< 0.00020	0.00020 mg/L							
Lithium, total	< 0.00010	0.00010 mg/L							
Magnesium, total	< 0.010	0.010 mg/L							
Manganese, total	< 0.00020	0.00020 mg/L							
Molybdenum, total	< 0.00010	0.00010 mg/L							
Nickel, total	< 0.00040	0.00040 mg/L							
Phosphorus, total	< 0.050	0.050 mg/L							
Potassium, total	< 0.10	0.10 mg/L							
Selenium, total	< 0.00050	0.00050 mg/L							
Silicon, total	< 1.0	1.0 mg/L							
Silver, total	< 0.000050	0.000050 mg/L							
Sodium, total	< 0.10	0.10 mg/L							
Strontium, total	< 0.0010	0.0010 mg/L							
Sulfur, total	< 3.0	3.0 mg/L							
Tellurium, total	< 0.00050	0.00050 mg/L							
Thallium, total	< 0.000020	0.000020 mg/L							
Thorium, total	< 0.00010	0.00010 mg/L							
Tin, total	< 0.00020	0.00020 mg/L							
Titanium, total	< 0.0050	0.0050 mg/L							
Tungsten, total	< 0.0010	0.0010 mg/L							
Uranium, total	< 0.000020	0.000020 mg/L							
Vanadium, total	< 0.0010	0.0010 mg/L							
Zinc, total	< 0.0040	0.0040 mg/L							
Zirconium, total	< 0.00010	0.00010 mg/L							

LCS (B012467-BS1)

Prepared: 2020-09-27, Analyzed: 2020-09-28

Aluminum, total	0.0199	0.0050 mg/L	0.0199		100	80-120			
Antimony, total	0.0213	0.00020 mg/L	0.0200		107	80-120			
Arsenic, total	0.0201	0.00050 mg/L	0.0200		101	80-120			
Barium, total	0.0203	0.0050 mg/L	0.0198		102	80-120			
Beryllium, total	0.0196	0.00010 mg/L	0.0198		99	80-120			
Bismuth, total	0.0206	0.00010 mg/L	0.0200		103	80-120			
Boron, total	< 0.0500	0.0500 mg/L	0.0200		117	80-120			
Cadmium, total	0.0202	0.000010 mg/L	0.0199		101	80-120			
Calcium, total	1.68	0.20 mg/L	2.02		83	80-120			
Chromium, total	0.0204	0.00050 mg/L	0.0198		103	80-120			
Cobalt, total	0.0202	0.00010 mg/L	0.0199		101	80-120			
Copper, total	0.0212	0.00040 mg/L	0.0200		106	80-120			
Iron, total	1.94	0.010 mg/L	2.02		96	80-120			
Lead, total	0.0202	0.00020 mg/L	0.0199		101	80-120			
Lithium, total	0.0203	0.00010 mg/L	0.0200		101	80-120			
Magnesium, total	1.94	0.010 mg/L	2.02		96	80-120			
Manganese, total	0.0195	0.00020 mg/L	0.0199		98	80-120			
Molybdenum, total	0.0198	0.00010 mg/L	0.0200		99	80-120			
Nickel, total	0.0208	0.00040 mg/L	0.0200		104	80-120			
Phosphorus, total	2.11	0.050 mg/L	2.00		106	80-120			
Potassium, total	1.85	0.10 mg/L	2.02		92	80-120			
Selenium, total	0.0193	0.00050 mg/L	0.0200		97	80-120			
Silicon, total	2.0	1.0 mg/L	2.00		102	80-120			



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

WORK ORDER REPORTED 0092295
2020-09-30 15:50

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B0I2467, Continued									
LCS (B0I2467-BS1), Continued					Prepared: 2020-09-27, Analyzed: 2020-09-28				
Silver, total	0.0207	0.000050 mg/L	0.0200		103	80-120			
Sodium, total	1.91	0.10 mg/L	2.02		94	80-120			
Strontium, total	0.0199	0.0010 mg/L	0.0200		100	80-120			
Sulfur, total	4.7	3.0 mg/L	5.00		94	80-120			
Tellurium, total	0.0201	0.00050 mg/L	0.0200		100	80-120			
Thallium, total	0.0203	0.000020 mg/L	0.0199		102	80-120			
Thorium, total	0.0204	0.00010 mg/L	0.0200		102	80-120			
Tin, total	0.0206	0.00020 mg/L	0.0200		103	80-120			
Titanium, total	0.0206	0.0050 mg/L	0.0200		103	80-120			
Tungsten, total	0.0206	0.0010 mg/L	0.0200		103	80-120			
Uranium, total	0.0205	0.000020 mg/L	0.0200		102	80-120			
Vanadium, total	0.0204	0.0010 mg/L	0.0200		102	80-120			
Zinc, total	0.0217	0.0040 mg/L	0.0200		108	80-120			
Zirconium, total	0.0204	0.00010 mg/L	0.0200		102	80-120			
Reference (B0I2467-SRM1)					Prepared: 2020-09-27, Analyzed: 2020-09-28				
Aluminum, total	0.310	0.0050 mg/L	0.299		104	70-130			
Antimony, total	0.0557	0.00020 mg/L	0.0517		108	70-130			
Arsenic, total	0.128	0.00050 mg/L	0.119		107	70-130			
Barium, total	0.828	0.0050 mg/L	0.801		103	70-130			
Beryllium, total	0.0538	0.00010 mg/L	0.0501		107	70-130			
Boron, total	4.17	0.0500 mg/L	4.11		101	70-130			
Cadmium, total	0.0532	0.000010 mg/L	0.0503		106	70-130			
Calcium, total	9.44	0.20 mg/L	10.7		88	70-130			
Chromium, total	0.264	0.00050 mg/L	0.250		105	70-130			
Cobalt, total	0.0408	0.00010 mg/L	0.0384		106	70-130			
Copper, total	0.530	0.00040 mg/L	0.487		109	70-130			
Iron, total	0.499	0.010 mg/L	0.504		99	70-130			
Lead, total	0.302	0.00020 mg/L	0.278		109	70-130			
Lithium, total	0.441	0.00010 mg/L	0.398		111	70-130			
Magnesium, total	3.75	0.010 mg/L	3.59		104	70-130			
Manganese, total	0.116	0.00020 mg/L	0.111		104	70-130			
Molybdenum, total	0.215	0.00010 mg/L	0.196		110	70-130			
Nickel, total	0.269	0.00040 mg/L	0.248		108	70-130			
Phosphorus, total	0.192	0.050 mg/L	0.213		90	70-130			
Potassium, total	6.06	0.10 mg/L	5.89		103	70-130			
Selenium, total	0.128	0.00050 mg/L	0.120		107	70-130			
Sodium, total	9.05	0.10 mg/L	8.71		104	70-130			
Strontium, total	0.412	0.0010 mg/L	0.393		105	70-130			
Thallium, total	0.0862	0.000020 mg/L	0.0787		110	70-130			
Uranium, total	0.0368	0.000020 mg/L	0.0344		107	70-130			
Vanadium, total	0.407	0.0010 mg/L	0.391		104	70-130			
Zinc, total	2.67	0.0040 mg/L	2.50		107	70-130			

CERTIFICATE OF ANALYSIS

REPORTED TO Kelowna, City of
1435 Water Street
KELOWNA, BC V1Y 1J4

ATTENTION Jose Garcia

PO NUMBER 527007

PROJECT RBCF Ponds

PROJECT INFO

WORK ORDER 20J3022

RECEIVED / TEMP 2020-10-29 14:00 / 12°C

REPORTED 2020-11-09 11:26

COC NUMBER 44133.52953

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO/IEC 17025:2017 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks



You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry



It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve



Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

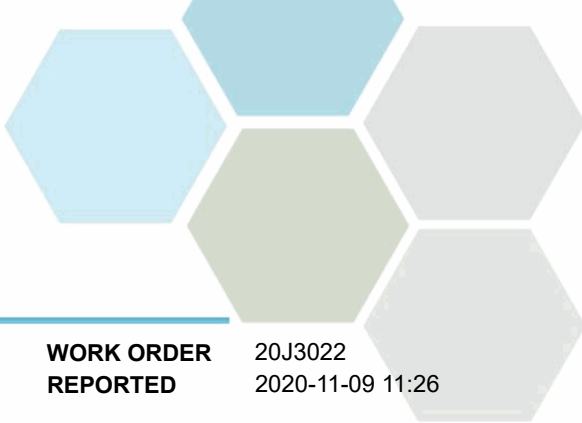
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7

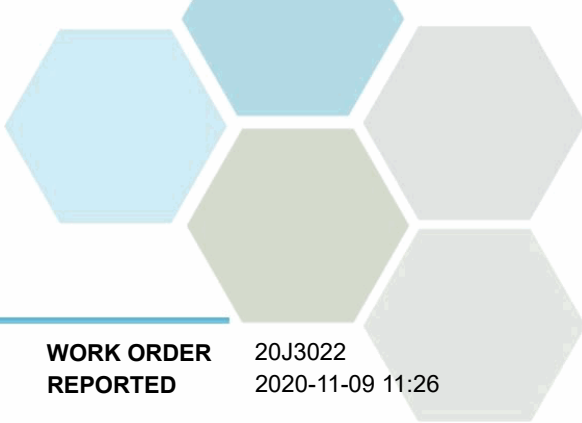


TEST RESULTS

REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

WORK ORDER REPORTED 20J3022
2020-11-09 11:26

Analyte	Result	RL	Units	Analyzed	Qualifier
Rose's Pond (20J3022-01) Matrix: Water Sampled: 2020-10-29					
Anions					
Chloride	439	0.10	mg/L	2020-10-30	
Nitrate (as N)	< 0.010	0.010	mg/L	2020-10-30	
Nitrite (as N)	< 0.010	0.010	mg/L	2020-10-30	
Calculated Parameters					
Hardness, Total (as CaCO3)	1240	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	1.61	0.0500	mg/L	N/A	
Dissolved Metals					
Lithium, dissolved	0.0514	0.00010	mg/L	2020-11-07	
Aluminum, dissolved	< 0.0050	0.0050	mg/L	2020-11-07	
Antimony, dissolved	0.00039	0.00020	mg/L	2020-11-07	
Arsenic, dissolved	0.00378	0.00050	mg/L	2020-11-07	
Barium, dissolved	0.0181	0.0050	mg/L	2020-11-07	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2020-11-07	
Bismuth, dissolved	< 0.00010	0.00010	mg/L	2020-11-07	
Boron, dissolved	0.101	0.0500	mg/L	2020-11-07	
Cadmium, dissolved	0.000020	0.000010	mg/L	2020-11-07	
Calcium, dissolved	68.4	0.20	mg/L	2020-11-07	
Chromium, dissolved	< 0.00050	0.00050	mg/L	2020-11-07	
Cobalt, dissolved	0.00011	0.00010	mg/L	2020-11-07	
Copper, dissolved	0.00085	0.00040	mg/L	2020-11-07	
Iron, dissolved	0.024	0.010	mg/L	2020-11-07	
Lead, dissolved	< 0.00020	0.00020	mg/L	2020-11-07	
Magnesium, dissolved	260	0.010	mg/L	2020-11-07	
Manganese, dissolved	0.0957	0.00020	mg/L	2020-11-07	
Mercury, dissolved	< 0.000010	0.000010	mg/L	2020-11-02	
Molybdenum, dissolved	0.00156	0.00010	mg/L	2020-11-07	
Nickel, dissolved	0.00100	0.00040	mg/L	2020-11-07	
Phosphorus, dissolved	< 0.050	0.050	mg/L	2020-11-07	
Potassium, dissolved	76.7	0.10	mg/L	2020-11-07	
Selenium, dissolved	< 0.00050	0.00050	mg/L	2020-11-07	
Silicon, dissolved	< 1.0	1.0	mg/L	2020-11-07	
Silver, dissolved	< 0.000050	0.000050	mg/L	2020-11-07	
Sodium, dissolved	761	0.10	mg/L	2020-11-07	
Strontium, dissolved	0.643	0.0010	mg/L	2020-11-07	
Sulfur, dissolved	698	3.0	mg/L	2020-11-07	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2020-11-07	
Thallium, dissolved	< 0.000020	0.000020	mg/L	2020-11-07	
Thorium, dissolved	< 0.00010	0.00010	mg/L	2020-11-07	
Tin, dissolved	< 0.00020	0.00020	mg/L	2020-11-07	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2020-11-07	
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2020-11-07	



TEST RESULTS

REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

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Analyte	Result	RL	Units	Analyzed	Qualifier
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Rose's Pond (20J3022-01) | Matrix: Water | Sampled: 2020-10-29, Continued

Dissolved Metals, Continued

Uranium, dissolved	0.00439	0.000020	mg/L	2020-11-07	
Vanadium, dissolved	< 0.0010	0.0010	mg/L	2020-11-07	
Zinc, dissolved	< 0.0040	0.0040	mg/L	2020-11-07	
Zirconium, dissolved	0.00029	0.00010	mg/L	2020-11-07	

General Parameters

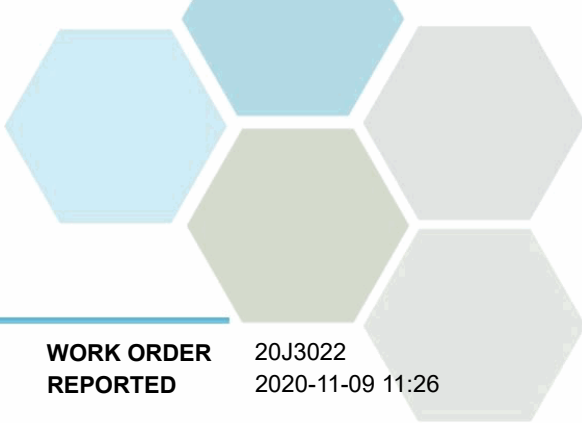
Ammonia, Total (as N)	0.180	0.050	mg/L	2020-10-30	
BOD, 5-day	< 6.2	2.0	mg/L	2020-11-04	
Chemical Oxygen Demand	69	20	mg/L	2020-11-01	
Conductivity (EC)	5110	2.0	µS/cm	2020-11-02	
Nitrogen, Total Kjeldahl	1.61	0.050	mg/L	2020-11-03	
pH	8.22	0.10	pH units	2020-11-02	HT2
Solids, Total Dissolved	3550	15	mg/L	2020-11-03	
Solids, Total Suspended	2.0	2.0	mg/L	2020-11-03	

Microbiological Parameters

Coliforms, Total	579	1	MPN/100 mL	2020-10-30	
E. coli	1	1	MPN/100 mL	2020-10-30	

Total Metals

Aluminum, total	0.0099	0.0050	mg/L	2020-11-04	
Antimony, total	0.00040	0.00020	mg/L	2020-11-04	
Arsenic, total	0.00398	0.00050	mg/L	2020-11-04	
Barium, total	0.0179	0.0050	mg/L	2020-11-04	
Beryllium, total	< 0.00010	0.00010	mg/L	2020-11-04	
Bismuth, total	< 0.00010	0.00010	mg/L	2020-11-04	
Boron, total	0.116	0.0500	mg/L	2020-11-04	
Cadmium, total	< 0.000010	0.000010	mg/L	2020-11-04	
Calcium, total	83.0	0.20	mg/L	2020-11-04	
Chromium, total	< 0.00050	0.00050	mg/L	2020-11-04	
Cobalt, total	0.00011	0.00010	mg/L	2020-11-04	
Copper, total	< 0.00040	0.00040	mg/L	2020-11-04	
Iron, total	0.025	0.010	mg/L	2020-11-04	
Lead, total	< 0.00020	0.00020	mg/L	2020-11-04	
Lithium, total	0.0536	0.00010	mg/L	2020-11-04	
Magnesium, total	283	0.010	mg/L	2020-11-04	
Manganese, total	0.104	0.00020	mg/L	2020-11-04	
Mercury, total	< 0.000010	0.000010	mg/L	2020-11-02	
Molybdenum, total	0.00162	0.00010	mg/L	2020-11-04	
Nickel, total	0.00108	0.00040	mg/L	2020-11-04	
Phosphorus, total	0.064	0.050	mg/L	2020-11-04	
Potassium, total	89.9	0.10	mg/L	2020-11-04	
Selenium, total	< 0.00050	0.00050	mg/L	2020-11-04	
Silicon, total	1.6	1.0	mg/L	2020-11-04	



TEST RESULTS

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Analyte	Result	RL	Units	Analyzed	Qualifier
Rose's Pond (20J3022-01) Matrix: Water Sampled: 2020-10-29, Continued					
<i>Total Metals, Continued</i>					
Silver, total	< 0.000050	0.000050	mg/L	2020-11-04	
Sodium, total	834	0.10	mg/L	2020-11-04	
Strontium, total	0.686	0.0010	mg/L	2020-11-04	
Sulfur, total	781	3.0	mg/L	2020-11-04	
Tellurium, total	< 0.00050	0.00050	mg/L	2020-11-04	
Thallium, total	< 0.000020	0.000020	mg/L	2020-11-04	
Thorium, total	< 0.00010	0.00010	mg/L	2020-11-04	
Tin, total	0.00078	0.00020	mg/L	2020-11-04	
Titanium, total	< 0.0050	0.0050	mg/L	2020-11-04	
Tungsten, total	< 0.0010	0.0010	mg/L	2020-11-04	
Uranium, total	0.00433	0.000020	mg/L	2020-11-04	
Vanadium, total	< 0.0010	0.0010	mg/L	2020-11-04	
Zinc, total	< 0.0040	0.0040	mg/L	2020-11-04	
Zirconium, total	0.00023	0.00010	mg/L	2020-11-04	

Drainage Pond (20J3022-02) | Matrix: Water | Sampled: 2020-10-29

F1

Anions

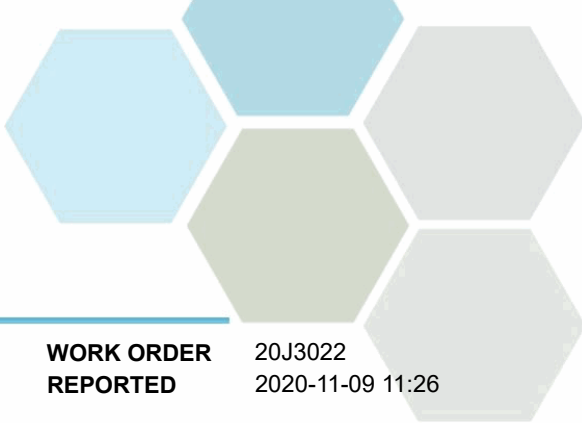
Chloride	74.8	0.10	mg/L	2020-10-30	
Nitrate (as N)	0.926	0.010	mg/L	2020-10-30	
Nitrite (as N)	< 0.010	0.010	mg/L	2020-10-30	

Calculated Parameters

Hardness, Total (as CaCO3)	216	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	0.926	0.0100	mg/L	N/A	
Nitrogen, Total	44.8	1.00	mg/L	N/A	

Dissolved Metals

Lithium, dissolved	0.0122	0.00010	mg/L	2020-11-07	
Aluminum, dissolved	0.113	0.0050	mg/L	2020-11-07	
Antimony, dissolved	0.00047	0.00020	mg/L	2020-11-07	
Arsenic, dissolved	0.00494	0.00050	mg/L	2020-11-07	
Barium, dissolved	0.0195	0.0050	mg/L	2020-11-07	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2020-11-07	
Bismuth, dissolved	0.00081	0.00010	mg/L	2020-11-07	
Boron, dissolved	0.178	0.0500	mg/L	2020-11-07	
Cadmium, dissolved	0.000205	0.000010	mg/L	2020-11-07	
Calcium, dissolved	48.6	0.20	mg/L	2020-11-07	
Chromium, dissolved	0.00122	0.00050	mg/L	2020-11-07	
Cobalt, dissolved	0.00096	0.00010	mg/L	2020-11-07	
Copper, dissolved	0.0463	0.00040	mg/L	2020-11-07	
Iron, dissolved	0.380	0.010	mg/L	2020-11-07	
Lead, dissolved	0.00082	0.00020	mg/L	2020-11-07	



TEST RESULTS

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Analyte	Result	RL	Units	Analyzed	Qualifier
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Drainage Pond (20J3022-02) | Matrix: Water | Sampled: 2020-10-29, Continued

F1

Dissolved Metals, Continued

Magnesium, dissolved	22.9	0.010	mg/L	2020-11-07	
Manganese, dissolved	0.166	0.00020	mg/L	2020-11-07	
Mercury, dissolved	0.000013	0.000010	mg/L	2020-11-02	
Molybdenum, dissolved	0.00434	0.00010	mg/L	2020-11-07	
Nickel, dissolved	0.00521	0.00040	mg/L	2020-11-07	
Phosphorus, dissolved	19.8	0.050	mg/L	2020-11-07	
Potassium, dissolved	36.2	0.10	mg/L	2020-11-07	
Selenium, dissolved	0.00087	0.00050	mg/L	2020-11-07	
Silicon, dissolved	3.5	1.0	mg/L	2020-11-07	
Silver, dissolved	< 0.000050	0.000050	mg/L	2020-11-07	
Sodium, dissolved	82.8	0.10	mg/L	2020-11-07	
Strontium, dissolved	0.504	0.0010	mg/L	2020-11-07	
Sulfur, dissolved	34.5	3.0	mg/L	2020-11-07	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2020-11-07	
Thallium, dissolved	< 0.000020	0.000020	mg/L	2020-11-07	
Thorium, dissolved	< 0.00010	0.00010	mg/L	2020-11-07	
Tin, dissolved	< 0.00020	0.00020	mg/L	2020-11-07	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2020-11-07	
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2020-11-07	
Uranium, dissolved	0.00176	0.000020	mg/L	2020-11-07	
Vanadium, dissolved	0.0012	0.0010	mg/L	2020-11-07	
Zinc, dissolved	0.0914	0.0040	mg/L	2020-11-07	
Zirconium, dissolved	0.00078	0.00010	mg/L	2020-11-07	

General Parameters

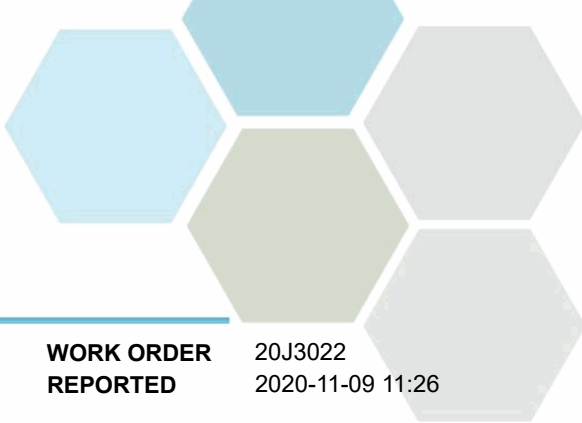
Ammonia, Total (as N)	24.7	0.050	mg/L	2020-10-30	
BOD, 5-day	22.6	2.0	mg/L	2020-11-04	
Chemical Oxygen Demand	358	20	mg/L	2020-11-01	
Conductivity (EC)	1030	2.0	µS/cm	2020-11-02	
Nitrogen, Total Kjeldahl	43.9	0.050	mg/L	2020-11-03	
pH	7.11	0.10	pH units	2020-11-02	HT2
Solids, Total Dissolved	736	15	mg/L	2020-11-03	
Solids, Total Suspended	20.7	2.0	mg/L	2020-11-01	

Microbiological Parameters

Coliforms, Total	> 24200	1	MPN/100 mL	2020-10-30	
E. coli	3650	1	MPN/100 mL	2020-10-30	

Total Metals

Aluminum, total	0.324	0.0050	mg/L	2020-11-04	
Antimony, total	0.00050	0.00020	mg/L	2020-11-04	
Arsenic, total	0.00528	0.00050	mg/L	2020-11-04	
Barium, total	0.0318	0.0050	mg/L	2020-11-04	
Beryllium, total	< 0.00010	0.00010	mg/L	2020-11-04	



TEST RESULTS

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Analyte	Result	RL	Units	Analyzed	Qualifier
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Drainage Pond (20J3022-02) | Matrix: Water | Sampled: 2020-10-29, Continued

F1

Total Metals, Continued

Bismuth, total	0.00147	0.00010	mg/L	2020-11-04	
Boron, total	0.206	0.0500	mg/L	2020-11-04	
Cadmium, total	0.000284	0.000010	mg/L	2020-11-04	
Calcium, total	64.3	0.20	mg/L	2020-11-04	
Chromium, total	0.00143	0.00050	mg/L	2020-11-04	
Cobalt, total	0.00114	0.00010	mg/L	2020-11-04	
Copper, total	0.0678	0.00040	mg/L	2020-11-04	
Iron, total	0.548	0.010	mg/L	2020-11-04	
Lead, total	0.00160	0.00020	mg/L	2020-11-04	
Lithium, total	0.0136	0.00010	mg/L	2020-11-04	
Magnesium, total	27.0	0.010	mg/L	2020-11-04	
Manganese, total	0.223	0.00020	mg/L	2020-11-04	
Mercury, total	< 0.000010	0.000010	mg/L	2020-11-02	
Molybdenum, total	0.00406	0.00010	mg/L	2020-11-04	
Nickel, total	0.00430	0.00040	mg/L	2020-11-04	
Phosphorus, total	23.5	0.050	mg/L	2020-11-04	
Potassium, total	43.5	0.10	mg/L	2020-11-04	
Selenium, total	0.00096	0.00050	mg/L	2020-11-04	
Silicon, total	6.0	1.0	mg/L	2020-11-04	
Silver, total	0.000164	0.000050	mg/L	2020-11-04	
Sodium, total	88.5	0.10	mg/L	2020-11-04	
Strontium, total	0.553	0.0010	mg/L	2020-11-04	
Sulfur, total	40.9	3.0	mg/L	2020-11-04	
Tellurium, total	< 0.00050	0.00050	mg/L	2020-11-04	
Thallium, total	< 0.000020	0.000020	mg/L	2020-11-04	
Thorium, total	< 0.00010	0.00010	mg/L	2020-11-04	
Tin, total	0.00120	0.00020	mg/L	2020-11-04	
Titanium, total	0.0057	0.0050	mg/L	2020-11-04	
Tungsten, total	< 0.0010	0.0010	mg/L	2020-11-04	
Uranium, total	0.00193	0.000020	mg/L	2020-11-04	
Vanadium, total	0.0019	0.0010	mg/L	2020-11-04	
Zinc, total	0.123	0.0040	mg/L	2020-11-04	
Zirconium, total	0.00076	0.00010	mg/L	2020-11-04	

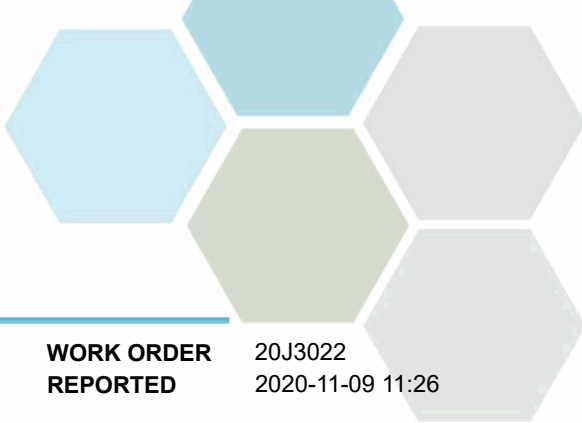
Davidson Pond (20J3022-03) | Matrix: Water | Sampled: 2020-10-29

Anions

Chloride	331	0.10	mg/L	2020-10-30	
Nitrate (as N)	< 0.010	0.010	mg/L	2020-10-30	
Nitrite (as N)	< 0.010	0.010	mg/L	2020-10-30	

Calculated Parameters

Hardness, Total (as CaCO3)	691	0.500	mg/L	N/A	
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TEST RESULTS

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Analyte	Result	RL	Units	Analyzed	Qualifier
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Davidson Pond (20J3022-03) | Matrix: Water | Sampled: 2020-10-29, Continued

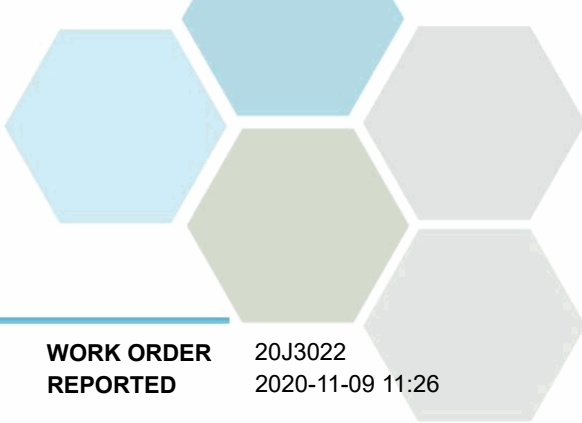
Calculated Parameters, Continued

Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	2.90	0.0500	mg/L	N/A	

Dissolved Metals

Lithium, dissolved	0.0528	0.00010	mg/L	2020-11-07	
Aluminum, dissolved	0.0189	0.0050	mg/L	2020-11-07	
Antimony, dissolved	0.00032	0.00020	mg/L	2020-11-07	
Arsenic, dissolved	0.00416	0.00050	mg/L	2020-11-07	
Barium, dissolved	0.0144	0.0050	mg/L	2020-11-07	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2020-11-07	
Bismuth, dissolved	< 0.00010	0.00010	mg/L	2020-11-07	
Boron, dissolved	< 0.0500	0.0500	mg/L	2020-11-07	
Cadmium, dissolved	0.000012	0.000010	mg/L	2020-11-07	
Calcium, dissolved	72.2	0.20	mg/L	2020-11-07	
Chromium, dissolved	< 0.00050	0.00050	mg/L	2020-11-07	
Cobalt, dissolved	< 0.00010	0.00010	mg/L	2020-11-07	
Copper, dissolved	< 0.00040	0.00040	mg/L	2020-11-07	
Iron, dissolved	0.044	0.010	mg/L	2020-11-07	
Lead, dissolved	< 0.00020	0.00020	mg/L	2020-11-07	
Magnesium, dissolved	124	0.010	mg/L	2020-11-07	
Manganese, dissolved	0.333	0.00020	mg/L	2020-11-07	
Mercury, dissolved	< 0.000010	0.000010	mg/L	2020-11-02	
Molybdenum, dissolved	0.00088	0.00010	mg/L	2020-11-07	
Nickel, dissolved	0.00182	0.00040	mg/L	2020-11-07	
Phosphorus, dissolved	0.200	0.050	mg/L	2020-11-07	
Potassium, dissolved	46.2	0.10	mg/L	2020-11-07	
Selenium, dissolved	< 0.00050	0.00050	mg/L	2020-11-07	
Silicon, dissolved	5.5	1.0	mg/L	2020-11-07	
Silver, dissolved	< 0.000050	0.000050	mg/L	2020-11-07	
Sodium, dissolved	590	0.10	mg/L	2020-11-07	
Strontium, dissolved	1.07	0.0010	mg/L	2020-11-07	
Sulfur, dissolved	403	3.0	mg/L	2020-11-07	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2020-11-07	
Thallium, dissolved	< 0.000020	0.000020	mg/L	2020-11-07	
Thorium, dissolved	< 0.00010	0.00010	mg/L	2020-11-07	
Tin, dissolved	< 0.00020	0.00020	mg/L	2020-11-07	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2020-11-07	
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2020-11-07	
Uranium, dissolved	0.00512	0.000020	mg/L	2020-11-07	
Vanadium, dissolved	< 0.0010	0.0010	mg/L	2020-11-07	
Zinc, dissolved	0.0090	0.0040	mg/L	2020-11-07	
Zirconium, dissolved	0.00016	0.00010	mg/L	2020-11-07	

General Parameters



TEST RESULTS

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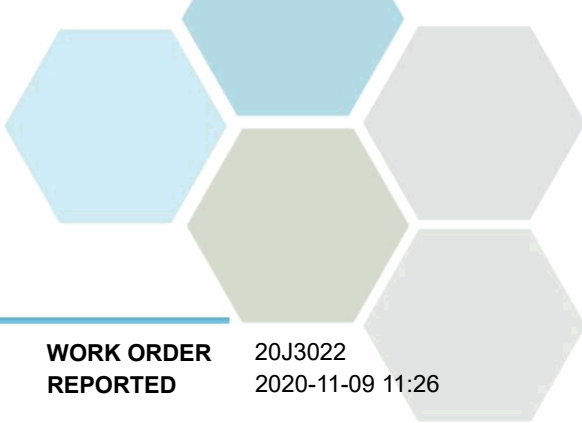
Analyte	Result	RL	Units	Analyzed	Qualifier
Davidson Pond (20J3022-03) Matrix: Water Sampled: 2020-10-29, Continued					
<i>General Parameters, Continued</i>					
Ammonia, Total (as N)	1.02	0.050	mg/L	2020-10-30	
BOD, 5-day	< 6.2	2.0	mg/L	2020-11-04	
Chemical Oxygen Demand	75	20	mg/L	2020-11-01	
Conductivity (EC)	3610	2.0	µS/cm	2020-11-02	
Nitrogen, Total Kjeldahl	2.90	0.050	mg/L	2020-11-03	
pH	8.21	0.10	pH units	2020-11-02	HT2
Solids, Total Dissolved	2140	15	mg/L	2020-11-03	
Solids, Total Suspended	8.0	2.0	mg/L	2020-11-01	

Microbiological Parameters

Coliforms, Total	70	1	MPN/100 mL	2020-10-30	
E. coli	13	1	MPN/100 mL	2020-10-30	

Total Metals

Aluminum, total	0.0812	0.0050	mg/L	2020-11-04	
Antimony, total	0.00034	0.00020	mg/L	2020-11-04	
Arsenic, total	0.00405	0.00050	mg/L	2020-11-04	
Barium, total	0.0147	0.0050	mg/L	2020-11-04	
Beryllium, total	< 0.00010	0.00010	mg/L	2020-11-04	
Bismuth, total	< 0.00010	0.00010	mg/L	2020-11-04	
Boron, total	< 0.0500	0.0500	mg/L	2020-11-04	
Cadmium, total	< 0.000010	0.000010	mg/L	2020-11-04	
Calcium, total	87.9	0.20	mg/L	2020-11-04	
Chromium, total	< 0.00050	0.00050	mg/L	2020-11-04	
Cobalt, total	0.00011	0.00010	mg/L	2020-11-04	
Copper, total	0.00065	0.00040	mg/L	2020-11-04	
Iron, total	0.120	0.010	mg/L	2020-11-04	
Lead, total	< 0.00020	0.00020	mg/L	2020-11-04	
Lithium, total	0.0556	0.00010	mg/L	2020-11-04	
Magnesium, total	130	0.010	mg/L	2020-11-04	
Manganese, total	0.354	0.00020	mg/L	2020-11-04	
Mercury, total	< 0.000010	0.000010	mg/L	2020-11-02	
Molybdenum, total	0.00086	0.00010	mg/L	2020-11-04	
Nickel, total	0.00187	0.00040	mg/L	2020-11-04	
Phosphorus, total	0.266	0.050	mg/L	2020-11-04	
Potassium, total	52.2	0.10	mg/L	2020-11-04	
Selenium, total	< 0.00050	0.00050	mg/L	2020-11-04	
Silicon, total	8.2	1.0	mg/L	2020-11-04	
Silver, total	< 0.000050	0.000050	mg/L	2020-11-04	
Sodium, total	612	0.10	mg/L	2020-11-04	
Strontium, total	1.12	0.0010	mg/L	2020-11-04	
Sulfur, total	432	3.0	mg/L	2020-11-04	
Tellurium, total	< 0.00050	0.00050	mg/L	2020-11-04	
Thallium, total	< 0.000020	0.000020	mg/L	2020-11-04	



TEST RESULTS

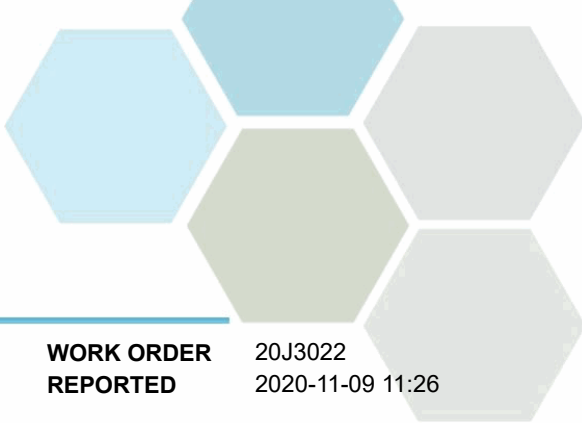
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Analyte	Result	RL	Units	Analyzed	Qualifier
Davidson Pond (20J3022-03) Matrix: Water Sampled: 2020-10-29, Continued					
<i>Total Metals, Continued</i>					
Thorium, total	< 0.00010	0.00010	mg/L	2020-11-04	
Tin, total	0.00037	0.00020	mg/L	2020-11-04	
Titanium, total	< 0.0050	0.0050	mg/L	2020-11-04	
Tungsten, total	< 0.0010	0.0010	mg/L	2020-11-04	
Uranium, total	0.00498	0.000020	mg/L	2020-11-04	
Vanadium, total	< 0.0010	0.0010	mg/L	2020-11-04	
Zinc, total	< 0.0040	0.0040	mg/L	2020-11-04	
Zirconium, total	0.00015	0.00010	mg/L	2020-11-04	

Sample Qualifiers:

- F1 The sample was not field-filtered and was therefore filtered through a 0.45 µm membrane in the laboratory and preserved with HNO3 prior to analysis for dissolved metals.
- HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.



APPENDIX 1: SUPPORTING INFORMATION

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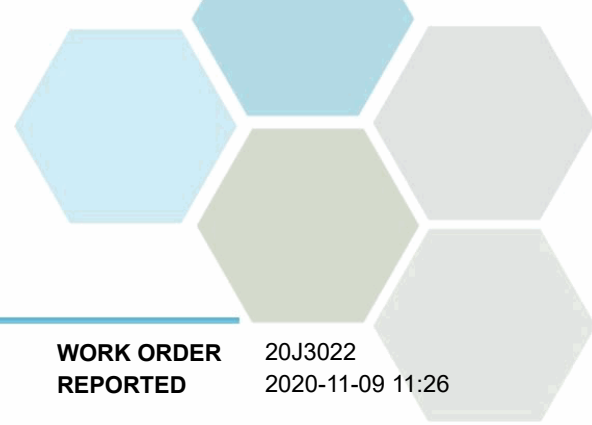
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Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Coliforms, Total in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
Dissolved Metals in Water	EPA 200.8 / EPA 6020B	0.45 µm Filtration / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Hardness in Water	SM 2340 B (2017)	Calculation: 2.497 [diss Ca] + 4.118 [diss Mg]	✓	N/A
Mercury, dissolved in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	✓	Richmond
Mercury, total in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	✓	Richmond
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Solids, Total Dissolved in Water	SM 2540 C* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
>	Greater than the specified Result
mg/L	Milligrams per litre
MPN/100 mL	Most Probable Number per 100 millilitres
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association



APPENDIX 1: SUPPORTING INFORMATION

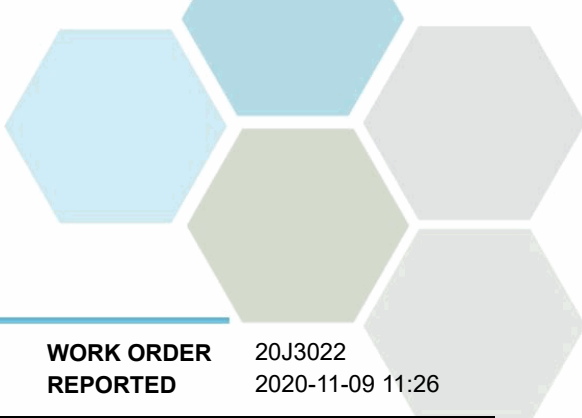
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WORK ORDER 20J3022
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General Comments:

The results in this report apply to the samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Samples will be disposed of 30 days after the test report has been issued unless otherwise agreed to in writing.

Please note any regulatory guidelines applied to this report are added as a convenience to the client, at their request, to help provide some initial context to analytical results obtained. Although CARO makes every effort to ensure accuracy of the associated regulatory guideline(s) applied, the guidelines applied cannot be assumed to be correct due to a variety of factors and as such CARO Analytical Services assumes no liability or responsibility for the use of those guidelines to make any decisions. The original source of the regulation should be verified and a review of the guideline(s) should be validated as correct in order to make any decisions arising from the comparison of the analytical data obtained to the relevant regulatory guideline for one's particular circumstances. Further, CARO Analytical Services assumes no liability or responsibility for any loss attributed from the use of these guidelines in any way.



APPENDIX 2: QUALITY CONTROL RESULTS

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2020-11-09 11:26

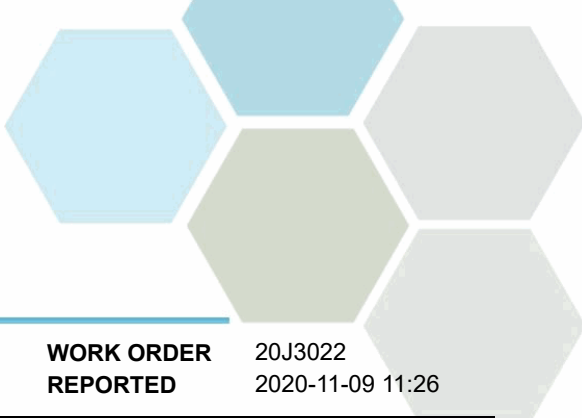
The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk):** A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup):** An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS):** A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS):** A second aliquot of sample is fortified with with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM):** A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B0J2830									
Blank (B0J2830-BLK1)			Prepared: 2020-10-30, Analyzed: 2020-10-30						
Chloride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
Blank (B0J2830-BLK2)			Prepared: 2020-10-30, Analyzed: 2020-10-30						
Chloride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
LCS (B0J2830-BS1)			Prepared: 2020-10-30, Analyzed: 2020-10-30						
Chloride	16.1	0.10 mg/L	16.0		100	90-110			
Nitrate (as N)	3.93	0.010 mg/L	4.00		98	90-110			
Nitrite (as N)	2.04	0.010 mg/L	2.00		102	85-115			
LCS (B0J2830-BS2)			Prepared: 2020-10-30, Analyzed: 2020-10-30						
Chloride	16.0	0.10 mg/L	16.0		100	90-110			
Nitrate (as N)	3.93	0.010 mg/L	4.00		98	90-110			
Nitrite (as N)	2.04	0.010 mg/L	2.00		102	85-115			
Dissolved Metals, Batch B0J2885									
Blank (B0J2885-BLK1)			Prepared: 2020-10-30, Analyzed: 2020-11-02						
Mercury, dissolved	< 0.000010	0.000010 mg/L							
Blank (B0J2885-BLK2)			Prepared: 2020-10-30, Analyzed: 2020-11-02						
Mercury, dissolved	< 0.000010	0.000010 mg/L							
Reference (B0J2885-SRM1)			Prepared: 2020-10-30, Analyzed: 2020-11-02						
Mercury, dissolved	0.00597	0.000010 mg/L	0.00581		103	70-130			
Reference (B0J2885-SRM2)			Prepared: 2020-10-30, Analyzed: 2020-11-02						
Mercury, dissolved	0.00604	0.000010 mg/L	0.00581		104	70-130			

Dissolved Metals, Batch B0J2939

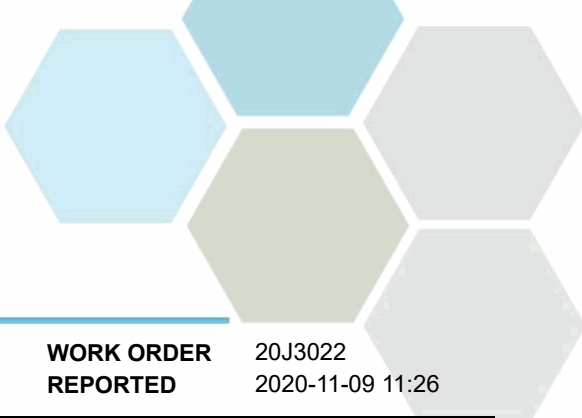


APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

WORK ORDER REPORTED 20J3022
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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Dissolved Metals, Batch B0J2939, Continued									
Blank (B0J2939-BLK1)			Prepared: 2020-10-31, Analyzed: 2020-11-02						
Mercury, dissolved	< 0.000010	0.000010 mg/L							
Reference (B0J2939-SRM1)			Prepared: 2020-10-31, Analyzed: 2020-11-02						
Mercury, dissolved	0.00596	0.000010 mg/L	0.00581		103	70-130			
Dissolved Metals, Batch B0K0219									
Blank (B0K0219-BLK1)			Prepared: 2020-11-07, Analyzed: 2020-11-07						
Lithium, dissolved	< 0.00010	0.00010 mg/L							
Aluminum, dissolved	< 0.0050	0.0050 mg/L							
Antimony, dissolved	< 0.00020	0.00020 mg/L							
Arsenic, dissolved	< 0.00050	0.00050 mg/L							
Barium, dissolved	< 0.0050	0.0050 mg/L							
Beryllium, dissolved	< 0.00010	0.00010 mg/L							
Bismuth, dissolved	< 0.00010	0.00010 mg/L							
Boron, dissolved	< 0.0500	0.0500 mg/L							
Cadmium, dissolved	< 0.000010	0.000010 mg/L							
Calcium, dissolved	< 0.20	0.20 mg/L							
Chromium, dissolved	< 0.00050	0.00050 mg/L							
Cobalt, dissolved	< 0.00010	0.00010 mg/L							
Copper, dissolved	< 0.00040	0.00040 mg/L							
Iron, dissolved	< 0.010	0.010 mg/L							
Lead, dissolved	< 0.00020	0.00020 mg/L							
Magnesium, dissolved	< 0.010	0.010 mg/L							
Manganese, dissolved	< 0.00020	0.00020 mg/L							
Molybdenum, dissolved	< 0.00010	0.00010 mg/L							
Nickel, dissolved	< 0.00040	0.00040 mg/L							
Phosphorus, dissolved	< 0.050	0.050 mg/L							
Potassium, dissolved	< 0.10	0.10 mg/L							
Selenium, dissolved	< 0.00050	0.00050 mg/L							
Silicon, dissolved	< 1.0	1.0 mg/L							
Silver, dissolved	< 0.000050	0.000050 mg/L							
Sodium, dissolved	< 0.10	0.10 mg/L							
Strontium, dissolved	< 0.0010	0.0010 mg/L							
Sulfur, dissolved	< 3.0	3.0 mg/L							
Tellurium, dissolved	< 0.00050	0.00050 mg/L							
Thallium, dissolved	< 0.000020	0.000020 mg/L							
Thorium, dissolved	< 0.00010	0.00010 mg/L							
Tin, dissolved	< 0.00020	0.00020 mg/L							
Titanium, dissolved	< 0.0050	0.0050 mg/L							
Tungsten, dissolved	< 0.0010	0.0010 mg/L							
Uranium, dissolved	< 0.000020	0.000020 mg/L							
Vanadium, dissolved	< 0.0010	0.0010 mg/L							
Zinc, dissolved	< 0.0040	0.0040 mg/L							
Zirconium, dissolved	< 0.00010	0.00010 mg/L							
LCS (B0K0219-BS1)			Prepared: 2020-11-07, Analyzed: 2020-11-07						
Lithium, dissolved	0.0193	0.00010 mg/L	0.0200		97	80-120			
Aluminum, dissolved	0.0195	0.0050 mg/L	0.0199		98	80-120			
Antimony, dissolved	0.0172	0.00020 mg/L	0.0200		86	80-120			
Arsenic, dissolved	0.0188	0.00050 mg/L	0.0200		94	80-120			
Barium, dissolved	0.0186	0.0050 mg/L	0.0198		94	80-120			
Beryllium, dissolved	0.0186	0.00010 mg/L	0.0198		94	80-120			
Bismuth, dissolved	0.0189	0.00010 mg/L	0.0200		94	80-120			
Boron, dissolved	< 0.0500	0.0500 mg/L	0.0200		96	80-120			
Cadmium, dissolved	0.0186	0.000010 mg/L	0.0199		93	80-120			



APPENDIX 2: QUALITY CONTROL RESULTS

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RBCF Ponds

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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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Dissolved Metals, Batch B0K0219, Continued

LCS (B0K0219-BS1), Continued

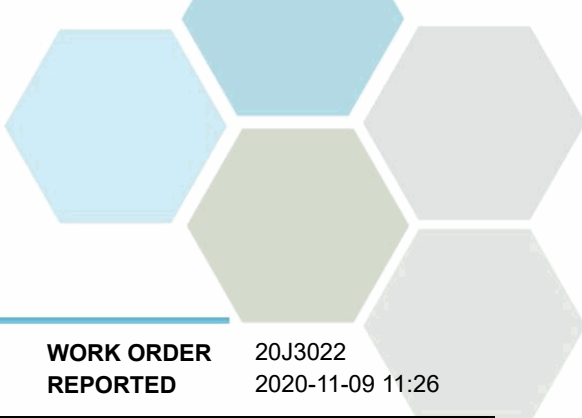
Prepared: 2020-11-07, Analyzed: 2020-11-07

Calcium, dissolved	1.72	0.20 mg/L	2.02		85	80-120			
Chromium, dissolved	0.0183	0.00050 mg/L	0.0198		92	80-120			
Cobalt, dissolved	0.0188	0.00010 mg/L	0.0199		95	80-120			
Copper, dissolved	0.0190	0.00040 mg/L	0.0200		95	80-120			
Iron, dissolved	1.89	0.010 mg/L	2.02		93	80-120			
Lead, dissolved	0.0187	0.00020 mg/L	0.0199		94	80-120			
Magnesium, dissolved	1.86	0.010 mg/L	2.02		92	80-120			
Manganese, dissolved	0.0182	0.00020 mg/L	0.0199		91	80-120			
Molybdenum, dissolved	0.0184	0.00010 mg/L	0.0200		92	80-120			
Nickel, dissolved	0.0190	0.00040 mg/L	0.0200		95	80-120			
Phosphorus, dissolved	1.79	0.050 mg/L	2.00		89	80-120			
Potassium, dissolved	1.78	0.10 mg/L	2.02		88	80-120			
Selenium, dissolved	0.0194	0.00050 mg/L	0.0200		97	80-120			
Silicon, dissolved	1.9	1.0 mg/L	2.00		97	80-120			
Silver, dissolved	0.0186	0.000050 mg/L	0.0200		93	80-120			
Sodium, dissolved	1.81	0.10 mg/L	2.02		90	80-120			
Strontium, dissolved	0.0184	0.0010 mg/L	0.0200		92	80-120			
Sulfur, dissolved	4.2	3.0 mg/L	5.00		84	80-120			
Tellurium, dissolved	0.0182	0.00050 mg/L	0.0200		91	80-120			
Thallium, dissolved	0.0186	0.000020 mg/L	0.0199		94	80-120			
Thorium, dissolved	0.0169	0.00010 mg/L	0.0200		84	80-120			
Tin, dissolved	0.0186	0.00020 mg/L	0.0200		93	80-120			
Titanium, dissolved	0.0201	0.0050 mg/L	0.0200		101	80-120			
Tungsten, dissolved	0.0181	0.0010 mg/L	0.0200		91	80-120			
Uranium, dissolved	0.0192	0.000020 mg/L	0.0200		96	80-120			
Vanadium, dissolved	0.0176	0.0010 mg/L	0.0200		88	80-120			
Zinc, dissolved	0.0195	0.0040 mg/L	0.0200		97	80-120			
Zirconium, dissolved	0.0186	0.00010 mg/L	0.0200		93	80-120			

Reference (B0K0219-SRM1)

Prepared: 2020-11-07, Analyzed: 2020-11-07

Lithium, dissolved	0.105	0.00010 mg/L	0.100		105	70-130			
Aluminum, dissolved	0.234	0.0050 mg/L	0.235		99	70-130			
Antimony, dissolved	0.0437	0.00020 mg/L	0.0431		101	70-130			
Arsenic, dissolved	0.425	0.00050 mg/L	0.423		100	70-130			
Barium, dissolved	2.90	0.0050 mg/L	3.30		88	70-130			
Beryllium, dissolved	0.214	0.00010 mg/L	0.209		103	70-130			
Boron, dissolved	1.63	0.0500 mg/L	1.65		99	70-130			
Cadmium, dissolved	0.213	0.000010 mg/L	0.221		97	70-130			
Calcium, dissolved	6.96	0.20 mg/L	7.72		90	70-130			
Chromium, dissolved	0.410	0.00050 mg/L	0.434		94	70-130			
Cobalt, dissolved	0.122	0.00010 mg/L	0.124		99	70-130			
Copper, dissolved	0.803	0.00040 mg/L	0.815		99	70-130			
Iron, dissolved	1.27	0.010 mg/L	1.27		100	70-130			
Lead, dissolved	0.106	0.00020 mg/L	0.110		97	70-130			
Magnesium, dissolved	6.56	0.010 mg/L	6.59		100	70-130			
Manganese, dissolved	0.330	0.00020 mg/L	0.342		96	70-130			
Molybdenum, dissolved	0.387	0.00010 mg/L	0.404		96	70-130			
Nickel, dissolved	0.826	0.00040 mg/L	0.835		99	70-130			
Phosphorus, dissolved	0.546	0.050 mg/L	0.499		109	70-130			
Potassium, dissolved	2.84	0.10 mg/L	2.88		98	70-130			
Selenium, dissolved	0.0340	0.00050 mg/L	0.0324		105	70-130			
Sodium, dissolved	17.5	0.10 mg/L	18.0		97	70-130			
Strontium, dissolved	0.863	0.0010 mg/L	0.935		92	70-130			
Thallium, dissolved	0.0375	0.000020 mg/L	0.0385		97	70-130			
Uranium, dissolved	0.242	0.000020 mg/L	0.258		94	70-130			
Vanadium, dissolved	0.802	0.0010 mg/L	0.873		92	70-130			



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT	Kelowna, City of RBCF Ponds	WORK ORDER REPORTED	20J3022 2020-11-09 11:26
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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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Dissolved Metals, Batch B0K0219, Continued

Reference (B0K0219-SRM1), Continued			Prepared: 2020-11-07, Analyzed: 2020-11-07						
Zinc, dissolved	0.847	0.0040 mg/L	0.848		100	70-130			

General Parameters, Batch B0J2808

Blank (B0J2808-BLK1)			Prepared: 2020-10-30, Analyzed: 2020-10-30						
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
Blank (B0J2808-BLK2)			Prepared: 2020-10-30, Analyzed: 2020-10-30						
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
Blank (B0J2808-BLK3)			Prepared: 2020-10-30, Analyzed: 2020-10-30						
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
LCS (B0J2808-BS1)			Prepared: 2020-10-30, Analyzed: 2020-10-30						
Ammonia, Total (as N)	0.997	0.050 mg/L	1.00		100	90-115			
LCS (B0J2808-BS2)			Prepared: 2020-10-30, Analyzed: 2020-10-30						
Ammonia, Total (as N)	0.983	0.050 mg/L	1.00		98	90-115			
Duplicate (B0J2808-DUP2)			Source: 20J3022-03		Prepared: 2020-10-30, Analyzed: 2020-10-30				
Ammonia, Total (as N)	1.02	0.050 mg/L		1.02			< 1	15	
Matrix Spike (B0J2808-MS2)			Source: 20J3022-03		Prepared: 2020-10-30, Analyzed: 2020-10-30				
Ammonia, Total (as N)	1.27	0.050 mg/L	0.250	1.02	101	75-125			

General Parameters, Batch B0J2832

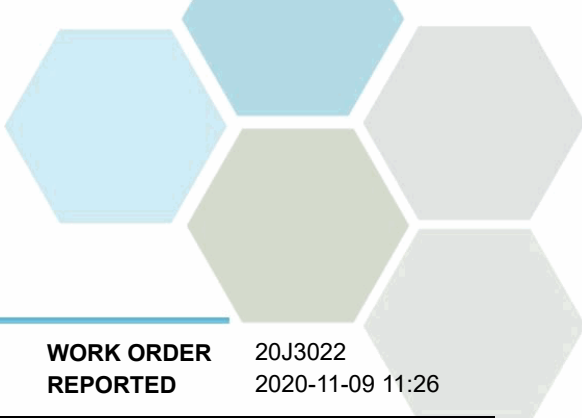
Blank (B0J2832-BLK1)			Prepared: 2020-10-30, Analyzed: 2020-11-04						
BOD, 5-day	< 2.0	2.0 mg/L							
LCS (B0J2832-BS1)			Prepared: 2020-10-30, Analyzed: 2020-11-04						
BOD, 5-day	190	51.4 mg/L	180		106	85-115			

General Parameters, Batch B0K0001

Blank (B0K0001-BLK1)			Prepared: 2020-11-01, Analyzed: 2020-11-01						
Chemical Oxygen Demand	< 20	20 mg/L							
LCS (B0K0001-BS1)			Prepared: 2020-11-01, Analyzed: 2020-11-01						
Chemical Oxygen Demand	503	20 mg/L	500		101	89-115			

General Parameters, Batch B0K0004

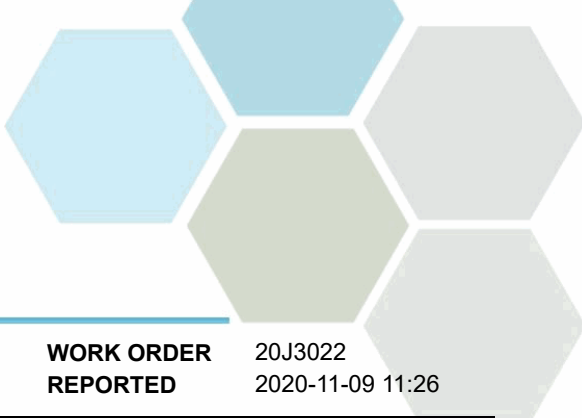
Blank (B0K0004-BLK1)			Prepared: 2020-11-01, Analyzed: 2020-11-01						
Solids, Total Suspended	< 2.0	2.0 mg/L							
Blank (B0K0004-BLK2)			Prepared: 2020-11-01, Analyzed: 2020-11-01						
Solids, Total Suspended	< 2.0	2.0 mg/L							
LCS (B0K0004-BS1)			Prepared: 2020-11-01, Analyzed: 2020-11-01						
Solids, Total Suspended	91.0	10.0 mg/L	100		91	85-115			
LCS (B0K0004-BS2)			Prepared: 2020-11-01, Analyzed: 2020-11-01						
Solids, Total Suspended	94.0	10.0 mg/L	100		94	85-115			



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT	Kelowna, City of RBCF Ponds	WORK ORDER REPORTED	20J3022 2020-11-09 11:26
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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B0K0056									
Blank (B0K0056-BLK1)			Prepared: 2020-11-02, Analyzed: 2020-11-02						
Conductivity (EC)	< 2.0	2.0 µS/cm							
LCS (B0K0056-BS1)			Prepared: 2020-11-02, Analyzed: 2020-11-02						
pH	6.99	0.10 pH units	7.01		100	98-102			
Duplicate (B0K0056-DUP1)			Source: 20J3022-02		Prepared: 2020-11-02, Analyzed: 2020-11-02				
Conductivity (EC)	1040	2.0 µS/cm		1030			< 1	5	
pH	7.16	0.10 pH units		7.11			< 1	4	
General Parameters, Batch B0K0057									
Blank (B0K0057-BLK1)			Prepared: 2020-11-02, Analyzed: 2020-11-02						
Conductivity (EC)	< 2.0	2.0 µS/cm							
Blank (B0K0057-BLK2)			Prepared: 2020-11-02, Analyzed: 2020-11-02						
Conductivity (EC)	< 2.0	2.0 µS/cm							
LCS (B0K0057-BS3)			Prepared: 2020-11-02, Analyzed: 2020-11-02						
Conductivity (EC)	1410	2.0 µS/cm	1410		100	95-104			
LCS (B0K0057-BS4)			Prepared: 2020-11-02, Analyzed: 2020-11-02						
Conductivity (EC)	1410	2.0 µS/cm	1410		100	95-104			
Reference (B0K0057-SRM1)			Prepared: 2020-11-02, Analyzed: 2020-11-02						
pH	6.99	0.10 pH units	7.01		100	98-102			
Reference (B0K0057-SRM2)			Prepared: 2020-11-02, Analyzed: 2020-11-02						
pH	6.99	0.10 pH units	7.01		100	98-102			
General Parameters, Batch B0K0082									
Blank (B0K0082-BLK1)			Prepared: 2020-11-02, Analyzed: 2020-11-03						
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							
Blank (B0K0082-BLK2)			Prepared: 2020-11-02, Analyzed: 2020-11-03						
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							
LCS (B0K0082-BS1)			Prepared: 2020-11-02, Analyzed: 2020-11-03						
Nitrogen, Total Kjeldahl	1.06	0.050 mg/L	1.00		106	85-115			
LCS (B0K0082-BS2)			Prepared: 2020-11-02, Analyzed: 2020-11-03						
Nitrogen, Total Kjeldahl	1.03	0.050 mg/L	1.00		103	85-115			
Duplicate (B0K0082-DUP2)			Source: 20J3022-01		Prepared: 2020-11-02, Analyzed: 2020-11-03				
Nitrogen, Total Kjeldahl	1.51	0.050 mg/L		1.61			6	15	
Matrix Spike (B0K0082-MS2)			Source: 20J3022-01		Prepared: 2020-11-02, Analyzed: 2020-11-03				
Nitrogen, Total Kjeldahl	3.59	0.100 mg/L	2.00	1.61	99	65-135			
General Parameters, Batch B0K0198									
Blank (B0K0198-BLK1)			Prepared: 2020-11-03, Analyzed: 2020-11-03						
Solids, Total Dissolved	< 15	15 mg/L							
LCS (B0K0198-BS1)			Prepared: 2020-11-03, Analyzed: 2020-11-03						
Solids, Total Dissolved	221	15 mg/L	240		92	85-115			



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT	Kelowna, City of RBCF Ponds	WORK ORDER REPORTED	20J3022 2020-11-09 11:26
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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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General Parameters, Batch B0K0200

Blank (B0K0200-BLK1)			Prepared: 2020-11-03, Analyzed: 2020-11-03						
Solids, Total Suspended	< 2.0	2.0 mg/L							
LCS (B0K0200-BS1)			Prepared: 2020-11-03, Analyzed: 2020-11-03						
Solids, Total Suspended	95.0	10.0 mg/L	100	95	85-115				

Microbiological Parameters, Batch B0J2826

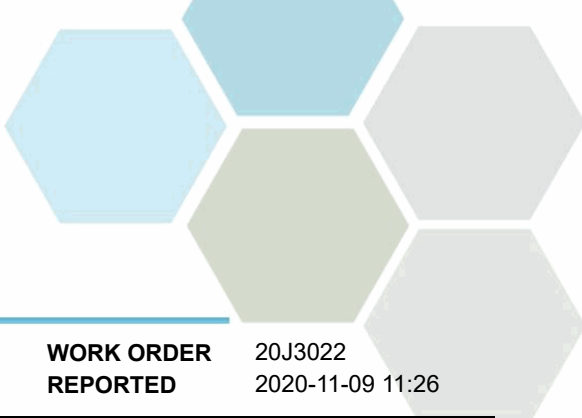
Blank (B0J2826-BLK1)			Prepared: 2020-10-30, Analyzed: 2020-10-30						
Coliforms, Total	< 1	1 MPN/100 mL							
E. coli	< 1	1 MPN/100 mL							
Blank (B0J2826-BLK2)			Prepared: 2020-10-30, Analyzed: 2020-10-30						
Coliforms, Total	< 1	1 MPN/100 mL							
E. coli	< 1	1 MPN/100 mL							
Blank (B0J2826-BLK3)			Prepared: 2020-10-30, Analyzed: 2020-10-30						
E. coli	< 1	1 MPN/100 mL							
Blank (B0J2826-BLK4)			Prepared: 2020-10-30, Analyzed: 2020-10-30						
Coliforms, Total	< 1	1 MPN/100 mL							
E. coli	< 1	1 MPN/100 mL							
Blank (B0J2826-BLK5)			Prepared: 2020-10-30, Analyzed: 2020-10-30						
E. coli	< 1	1 MPN/100 mL							
Duplicate (B0J2826-DUP1)			Source: 20J3022-01		Prepared: 2020-10-30, Analyzed: 2020-10-30				
Coliforms, Total	613	1 MPN/100 mL	579	6	80				
E. coli	< 1	1 MPN/100 mL	1	80	MIC29				

Total Metals, Batch B0J2887

Blank (B0J2887-BLK1)			Prepared: 2020-10-30, Analyzed: 2020-11-02						
Mercury, total	< 0.000010	0.000010 mg/L							
Blank (B0J2887-BLK2)			Prepared: 2020-10-30, Analyzed: 2020-11-02						
Mercury, total	< 0.000010	0.000010 mg/L							
Reference (B0J2887-SRM1)			Prepared: 2020-10-30, Analyzed: 2020-11-02						
Mercury, total	0.00611	0.000010 mg/L	0.00581	105	70-130				
Reference (B0J2887-SRM2)			Prepared: 2020-10-30, Analyzed: 2020-11-02						
Mercury, total	0.00638	0.000010 mg/L	0.00581	110	70-130				

Total Metals, Batch B0K0096

Blank (B0K0096-BLK1)			Prepared: 2020-11-02, Analyzed: 2020-11-04						
Aluminum, total	< 0.0050	0.0050 mg/L							
Antimony, total	< 0.00020	0.00020 mg/L							
Arsenic, total	< 0.00050	0.00050 mg/L							
Barium, total	< 0.0050	0.0050 mg/L							
Beryllium, total	< 0.00010	0.00010 mg/L							
Bismuth, total	< 0.00010	0.00010 mg/L							
Boron, total	< 0.0500	0.0500 mg/L							
Cadmium, total	< 0.000010	0.000010 mg/L							
Calcium, total	< 0.20	0.20 mg/L							
Chromium, total	< 0.00050	0.00050 mg/L							



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

WORK ORDER REPORTED 20J3022
2020-11-09 11:26

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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Total Metals, Batch B0K0096, Continued

Blank (B0K0096-BLK1), Continued

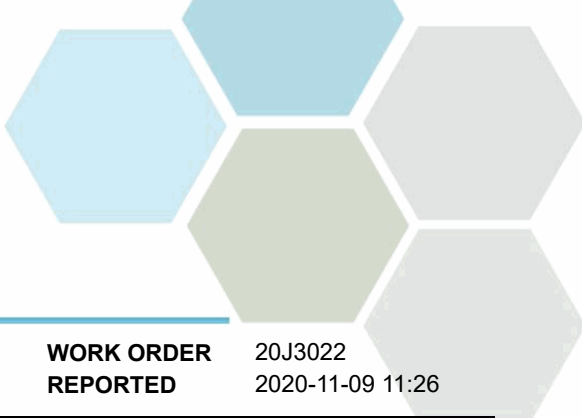
Prepared: 2020-11-02, Analyzed: 2020-11-04

Cobalt, total	< 0.00010	0.00010 mg/L							
Copper, total	< 0.00040	0.00040 mg/L							
Iron, total	< 0.010	0.010 mg/L							
Lead, total	< 0.00020	0.00020 mg/L							
Lithium, total	< 0.00010	0.00010 mg/L							
Magnesium, total	< 0.010	0.010 mg/L							
Manganese, total	< 0.00020	0.00020 mg/L							
Molybdenum, total	< 0.00010	0.00010 mg/L							
Nickel, total	< 0.00040	0.00040 mg/L							
Phosphorus, total	< 0.050	0.050 mg/L							
Potassium, total	< 0.10	0.10 mg/L							
Selenium, total	< 0.00050	0.00050 mg/L							
Silicon, total	< 1.0	1.0 mg/L							
Silver, total	< 0.000050	0.000050 mg/L							
Sodium, total	< 0.10	0.10 mg/L							
Strontium, total	< 0.0010	0.0010 mg/L							
Sulfur, total	< 3.0	3.0 mg/L							
Tellurium, total	< 0.00050	0.00050 mg/L							
Thallium, total	< 0.000020	0.000020 mg/L							
Thorium, total	< 0.00010	0.00010 mg/L							
Tin, total	< 0.00020	0.00020 mg/L							
Titanium, total	< 0.0050	0.0050 mg/L							
Tungsten, total	< 0.0010	0.0010 mg/L							
Uranium, total	< 0.000020	0.000020 mg/L							
Vanadium, total	< 0.0010	0.0010 mg/L							
Zinc, total	< 0.0040	0.0040 mg/L							
Zirconium, total	< 0.00010	0.00010 mg/L							

LCS (B0K0096-BS1)

Prepared: 2020-11-02, Analyzed: 2020-11-04

Aluminum, total	0.0211	0.0050 mg/L	0.0199	106	80-120
Antimony, total	0.0212	0.00020 mg/L	0.0200	106	80-120
Arsenic, total	0.0205	0.00050 mg/L	0.0200	103	80-120
Barium, total	0.0207	0.0050 mg/L	0.0198	105	80-120
Beryllium, total	0.0216	0.00010 mg/L	0.0198	109	80-120
Bismuth, total	0.0213	0.00010 mg/L	0.0200	106	80-120
Boron, total	< 0.0500	0.0500 mg/L	0.0200	118	80-120
Cadmium, total	0.0201	0.000010 mg/L	0.0199	101	80-120
Calcium, total	2.22	0.20 mg/L	2.02	110	80-120
Chromium, total	0.0200	0.00050 mg/L	0.0198	101	80-120
Cobalt, total	0.0200	0.00010 mg/L	0.0199	100	80-120
Copper, total	0.0211	0.00040 mg/L	0.0200	105	80-120
Iron, total	2.02	0.010 mg/L	2.02	100	80-120
Lead, total	0.0228	0.00020 mg/L	0.0199	115	80-120
Lithium, total	0.0234	0.00010 mg/L	0.0200	117	80-120
Magnesium, total	2.34	0.010 mg/L	2.02	116	80-120
Manganese, total	0.0201	0.00020 mg/L	0.0199	101	80-120
Molybdenum, total	0.0200	0.00010 mg/L	0.0200	100	80-120
Nickel, total	0.0204	0.00040 mg/L	0.0200	102	80-120
Phosphorus, total	2.22	0.050 mg/L	2.00	111	80-120
Potassium, total	2.41	0.10 mg/L	2.02	119	80-120
Selenium, total	0.0198	0.00050 mg/L	0.0200	99	80-120
Silicon, total	2.2	1.0 mg/L	2.00	111	80-120
Silver, total	0.0194	0.000050 mg/L	0.0200	97	80-120
Sodium, total	2.29	0.10 mg/L	2.02	113	80-120
Strontium, total	0.0209	0.0010 mg/L	0.0200	105	80-120
Sulfur, total	5.1	3.0 mg/L	5.00	102	80-120



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

WORK ORDER REPORTED 20J3022
2020-11-09 11:26

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B0K0096, Continued									
LCS (B0K0096-BS1), Continued					Prepared: 2020-11-02, Analyzed: 2020-11-04				
Tellurium, total	0.0213	0.00050 mg/L	0.0200		106	80-120			
Thallium, total	0.0203	0.000020 mg/L	0.0199		102	80-120			
Thorium, total	0.0196	0.00010 mg/L	0.0200		98	80-120			
Tin, total	0.0215	0.00020 mg/L	0.0200		107	80-120			
Titanium, total	0.0215	0.0050 mg/L	0.0200		108	80-120			
Tungsten, total	0.0192	0.0010 mg/L	0.0200		96	80-120			
Uranium, total	0.0204	0.000020 mg/L	0.0200		102	80-120			
Vanadium, total	0.0202	0.0010 mg/L	0.0200		101	80-120			
Zinc, total	0.0214	0.0040 mg/L	0.0200		107	80-120			
Zirconium, total	0.0207	0.00010 mg/L	0.0200		104	80-120			
Reference (B0K0096-SRM1)					Prepared: 2020-11-02, Analyzed: 2020-11-04				
Aluminum, total	0.362	0.0050 mg/L	0.299		121	70-130			
Antimony, total	0.0515	0.00020 mg/L	0.0517		100	70-130			
Arsenic, total	0.123	0.00050 mg/L	0.119		103	70-130			
Barium, total	0.788	0.0050 mg/L	0.801		98	70-130			
Beryllium, total	0.0513	0.00010 mg/L	0.0501		102	70-130			
Boron, total	4.36	0.0500 mg/L	4.11		106	70-130			
Cadmium, total	0.0489	0.000010 mg/L	0.0503		97	70-130			
Calcium, total	11.9	0.20 mg/L	10.7		111	70-130			
Chromium, total	0.251	0.00050 mg/L	0.250		101	70-130			
Cobalt, total	0.0386	0.00010 mg/L	0.0384		101	70-130			
Copper, total	0.491	0.00040 mg/L	0.487		101	70-130			
Iron, total	0.490	0.010 mg/L	0.504		97	70-130			
Lead, total	0.300	0.00020 mg/L	0.278		108	70-130			
Lithium, total	0.452	0.00010 mg/L	0.398		114	70-130			
Magnesium, total	4.23	0.010 mg/L	3.59		118	70-130			
Manganese, total	0.107	0.00020 mg/L	0.111		97	70-130			
Molybdenum, total	0.199	0.00010 mg/L	0.196		102	70-130			
Nickel, total	0.249	0.00040 mg/L	0.248		100	70-130			
Phosphorus, total	0.230	0.050 mg/L	0.213		108	70-130			
Potassium, total	7.23	0.10 mg/L	5.89		123	70-130			
Selenium, total	0.118	0.00050 mg/L	0.120		98	70-130			
Sodium, total	9.80	0.10 mg/L	8.71		113	70-130			
Strontium, total	0.408	0.0010 mg/L	0.393		104	70-130			
Thallium, total	0.0796	0.000020 mg/L	0.0787		101	70-130			
Uranium, total	0.0345	0.000020 mg/L	0.0344		100	70-130			
Vanadium, total	0.394	0.0010 mg/L	0.391		101	70-130			
Zinc, total	2.44	0.0040 mg/L	2.50		98	70-130			

QC Qualifiers:

MIC29 The difference in logs is less than the R value.



CERTIFICATE OF ANALYSIS

REPORTED TO Kelowna, City of
1435 Water Street
KELOWNA, BC V1Y 1J4

ATTENTION Jose Garcia

PO NUMBER 527007

PROJECT RBCF Ponds

PROJECT INFO

WORK ORDER 20K2112

RECEIVED / TEMP 2020-11-18 13:40 / 2°C

REPORTED 2020-11-25 12:06

COC NUMBER 44153.36163

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO/IEC 17025:2017 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks



You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry



It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve



Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

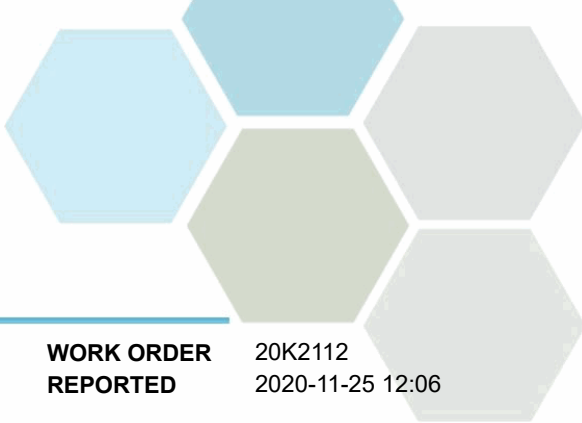
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7

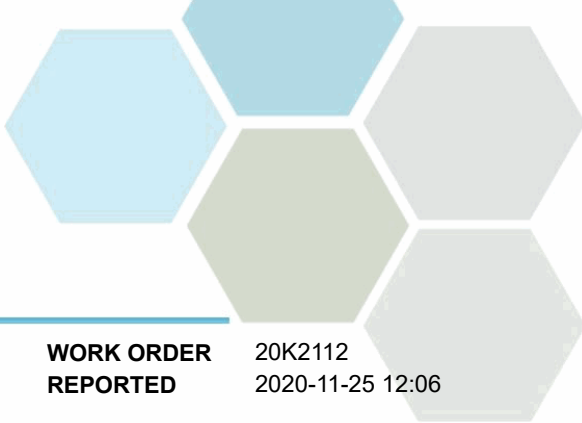


TEST RESULTS

REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

WORK ORDER REPORTED 20K2112
2020-11-25 12:06

Analyte	Result	RL	Units	Analyzed	Qualifier
Rose's Pond (20K2112-01) Matrix: Water Sampled: 2020-11-18					
Anions					
Chloride	414	0.10	mg/L	2020-11-19	
Nitrate (as N)	< 0.010	0.010	mg/L	2020-11-19	
Nitrite (as N)	< 0.010	0.010	mg/L	2020-11-19	
Calculated Parameters					
Hardness, Total (as CaCO3)	1350	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	1.76	0.0500	mg/L	N/A	
Dissolved Metals					
Lithium, dissolved	0.0498	0.00010	mg/L	2020-11-21	
Aluminum, dissolved	< 0.0050	0.0050	mg/L	2020-11-21	
Antimony, dissolved	0.00040	0.00020	mg/L	2020-11-21	
Arsenic, dissolved	0.00417	0.00050	mg/L	2020-11-21	
Barium, dissolved	0.0192	0.0050	mg/L	2020-11-21	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2020-11-21	
Bismuth, dissolved	< 0.00010	0.00010	mg/L	2020-11-21	
Boron, dissolved	0.0973	0.0500	mg/L	2020-11-21	
Cadmium, dissolved	< 0.000010	0.000010	mg/L	2020-11-21	
Calcium, dissolved	70.5	0.20	mg/L	2020-11-21	
Chromium, dissolved	< 0.00050	0.00050	mg/L	2020-11-21	
Cobalt, dissolved	< 0.00010	0.00010	mg/L	2020-11-21	
Copper, dissolved	< 0.00040	0.00040	mg/L	2020-11-21	
Iron, dissolved	< 0.010	0.010	mg/L	2020-11-21	
Lead, dissolved	< 0.00020	0.00020	mg/L	2020-11-21	
Magnesium, dissolved	284	0.010	mg/L	2020-11-21	
Manganese, dissolved	0.0657	0.00020	mg/L	2020-11-21	
Mercury, dissolved	< 0.000010	0.000010	mg/L	2020-11-21	
Molybdenum, dissolved	0.00145	0.00010	mg/L	2020-11-21	
Nickel, dissolved	0.00103	0.00040	mg/L	2020-11-21	
Phosphorus, dissolved	0.053	0.050	mg/L	2020-11-21	
Potassium, dissolved	83.0	0.10	mg/L	2020-11-21	
Selenium, dissolved	< 0.00050	0.00050	mg/L	2020-11-21	
Silicon, dissolved	< 1.0	1.0	mg/L	2020-11-21	
Silver, dissolved	< 0.000050	0.000050	mg/L	2020-11-21	
Sodium, dissolved	825	0.10	mg/L	2020-11-21	
Strontium, dissolved	0.675	0.0010	mg/L	2020-11-21	
Sulfur, dissolved	857	3.0	mg/L	2020-11-21	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2020-11-21	
Thallium, dissolved	< 0.000020	0.000020	mg/L	2020-11-21	
Thorium, dissolved	< 0.00010	0.00010	mg/L	2020-11-21	
Tin, dissolved	< 0.00020	0.00020	mg/L	2020-11-21	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2020-11-21	
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2020-11-21	



TEST RESULTS

REPORTED TO PROJECT Kelowna, City of RBCF Ponds

WORK ORDER REPORTED 20K2112
2020-11-25 12:06

Analyte	Result	RL	Units	Analyzed	Qualifier
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Rose's Pond (20K2112-01) | Matrix: Water | Sampled: 2020-11-18, Continued

Dissolved Metals, Continued

Uranium, dissolved	0.00417	0.000020	mg/L	2020-11-21	
Vanadium, dissolved	< 0.0010	0.0010	mg/L	2020-11-21	
Zinc, dissolved	< 0.0040	0.0040	mg/L	2020-11-21	
Zirconium, dissolved	0.00024	0.00010	mg/L	2020-11-21	

General Parameters

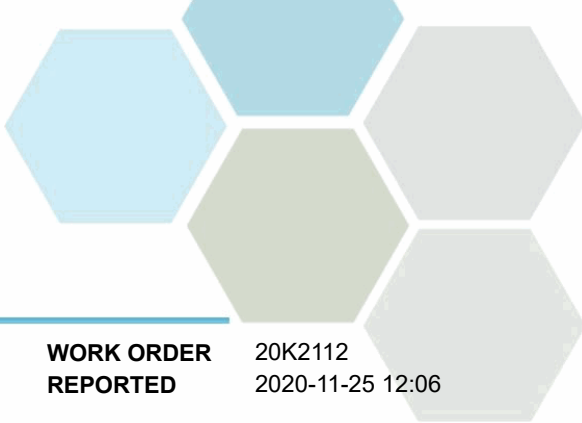
Ammonia, Total (as N)	0.311	0.050	mg/L	2020-11-19	
BOD, 5-day	< 6.3	2.0	mg/L	2020-11-25	
Chemical Oxygen Demand	63	20	mg/L	2020-11-19	
Conductivity (EC)	5210	2.0	µS/cm	2020-11-22	
Nitrogen, Total Kjeldahl	1.76	0.050	mg/L	2020-11-24	
pH	8.21	0.10	pH units	2020-11-22	HT2
Solids, Total Dissolved	3810	15	mg/L	2020-11-24	
Solids, Total Suspended	2.8	2.0	mg/L	2020-11-23	

Microbiological Parameters

Coliforms, Total	106	1	MPN/100 mL	2020-11-19	
E. coli	1	1	MPN/100 mL	2020-11-19	

Total Metals

Aluminum, total	0.0079	0.0050	mg/L	2020-11-23	
Antimony, total	0.00043	0.00020	mg/L	2020-11-23	
Arsenic, total	0.00440	0.00050	mg/L	2020-11-23	
Barium, total	0.0198	0.0050	mg/L	2020-11-23	
Beryllium, total	< 0.00010	0.00010	mg/L	2020-11-23	
Bismuth, total	< 0.00010	0.00010	mg/L	2020-11-23	
Boron, total	0.100	0.0500	mg/L	2020-11-23	
Cadmium, total	< 0.000010	0.000010	mg/L	2020-11-23	
Calcium, total	76.1	0.20	mg/L	2020-11-23	
Chromium, total	< 0.00050	0.00050	mg/L	2020-11-23	
Cobalt, total	0.00012	0.00010	mg/L	2020-11-23	
Copper, total	0.00083	0.00040	mg/L	2020-11-23	
Iron, total	< 0.010	0.010	mg/L	2020-11-23	
Lead, total	< 0.00020	0.00020	mg/L	2020-11-23	
Lithium, total	0.0527	0.00010	mg/L	2020-11-23	
Magnesium, total	292	0.010	mg/L	2020-11-23	
Manganese, total	0.0837	0.00020	mg/L	2020-11-23	
Mercury, total	< 0.000010	0.000010	mg/L	2020-11-21	
Molybdenum, total	0.00168	0.00010	mg/L	2020-11-23	
Nickel, total	0.00119	0.00040	mg/L	2020-11-23	
Phosphorus, total	< 0.050	0.050	mg/L	2020-11-23	
Potassium, total	87.6	0.10	mg/L	2020-11-23	
Selenium, total	< 0.00050	0.00050	mg/L	2020-11-23	
Silicon, total	< 1.0	1.0	mg/L	2020-11-23	



TEST RESULTS

REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

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Analyte	Result	RL	Units	Analyzed	Qualifier
Rose's Pond (20K2112-01) Matrix: Water Sampled: 2020-11-18, Continued					
<i>Total Metals, Continued</i>					
Silver, total	< 0.000050	0.000050	mg/L	2020-11-23	
Sodium, total	854	0.10	mg/L	2020-11-23	
Strontium, total	0.745	0.0010	mg/L	2020-11-23	
Sulfur, total	726	3.0	mg/L	2020-11-23	
Tellurium, total	< 0.00050	0.00050	mg/L	2020-11-23	
Thallium, total	< 0.000020	0.000020	mg/L	2020-11-23	
Thorium, total	< 0.00010	0.00010	mg/L	2020-11-23	
Tin, total	< 0.00020	0.00020	mg/L	2020-11-23	
Titanium, total	< 0.0050	0.0050	mg/L	2020-11-23	
Tungsten, total	< 0.0010	0.0010	mg/L	2020-11-23	
Uranium, total	0.00439	0.000020	mg/L	2020-11-23	
Vanadium, total	< 0.0010	0.0010	mg/L	2020-11-23	
Zinc, total	< 0.0040	0.0040	mg/L	2020-11-23	
Zirconium, total	0.00025	0.00010	mg/L	2020-11-23	

Drainage Pond (20K2112-02) | Matrix: Water | Sampled: 2020-11-18

F1

Anions

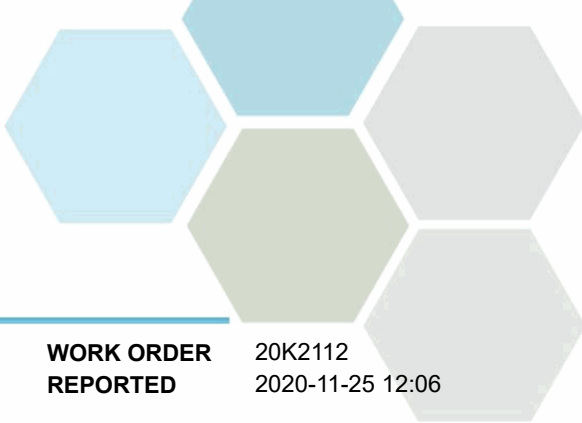
Chloride	78.6	0.10	mg/L	2020-11-19	
Nitrate (as N)	1.60	0.010	mg/L	2020-11-19	
Nitrite (as N)	0.068	0.010	mg/L	2020-11-19	

Calculated Parameters

Hardness, Total (as CaCO3)	179	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	1.67	0.0100	mg/L	N/A	
Nitrogen, Total	36.3	1.00	mg/L	N/A	

Dissolved Metals

Lithium, dissolved	0.00982	0.00010	mg/L	2020-11-21	
Aluminum, dissolved	0.127	0.0050	mg/L	2020-11-21	
Antimony, dissolved	0.00048	0.00020	mg/L	2020-11-21	
Arsenic, dissolved	0.00450	0.00050	mg/L	2020-11-21	
Barium, dissolved	0.0143	0.0050	mg/L	2020-11-21	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2020-11-21	
Bismuth, dissolved	0.00069	0.00010	mg/L	2020-11-21	
Boron, dissolved	0.167	0.0500	mg/L	2020-11-21	
Cadmium, dissolved	0.000123	0.000010	mg/L	2020-11-21	
Calcium, dissolved	41.2	0.20	mg/L	2020-11-21	
Chromium, dissolved	0.00105	0.00050	mg/L	2020-11-21	
Cobalt, dissolved	0.00078	0.00010	mg/L	2020-11-21	
Copper, dissolved	0.0358	0.00040	mg/L	2020-11-21	
Iron, dissolved	0.257	0.010	mg/L	2020-11-21	
Lead, dissolved	0.00062	0.00020	mg/L	2020-11-21	



TEST RESULTS

REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

WORK ORDER REPORTED 20K2112
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Analyte	Result	RL	Units	Analyzed	Qualifier
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Drainage Pond (20K2112-02) | Matrix: Water | Sampled: 2020-11-18, Continued

F1

Dissolved Metals, Continued

Magnesium, dissolved	18.4	0.010	mg/L	2020-11-21	
Manganese, dissolved	0.113	0.00020	mg/L	2020-11-21	
Mercury, dissolved	0.000012	0.000010	mg/L	2020-11-21	
Molybdenum, dissolved	0.00358	0.00010	mg/L	2020-11-21	
Nickel, dissolved	0.00305	0.00040	mg/L	2020-11-21	
Phosphorus, dissolved	17.5	0.050	mg/L	2020-11-21	
Potassium, dissolved	32.1	0.10	mg/L	2020-11-21	
Selenium, dissolved	0.00077	0.00050	mg/L	2020-11-21	
Silicon, dissolved	4.2	1.0	mg/L	2020-11-21	
Silver, dissolved	0.000058	0.000050	mg/L	2020-11-21	
Sodium, dissolved	79.5	0.10	mg/L	2020-11-21	
Strontium, dissolved	0.389	0.0010	mg/L	2020-11-21	
Sulfur, dissolved	34.0	3.0	mg/L	2020-11-21	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2020-11-21	
Thallium, dissolved	< 0.000020	0.000020	mg/L	2020-11-21	
Thorium, dissolved	< 0.00010	0.00010	mg/L	2020-11-21	
Tin, dissolved	0.00050	0.00020	mg/L	2020-11-21	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2020-11-21	
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2020-11-21	
Uranium, dissolved	0.00110	0.000020	mg/L	2020-11-21	
Vanadium, dissolved	< 0.0010	0.0010	mg/L	2020-11-21	
Zinc, dissolved	0.0884	0.0040	mg/L	2020-11-21	
Zirconium, dissolved	0.00101	0.00010	mg/L	2020-11-21	

General Parameters

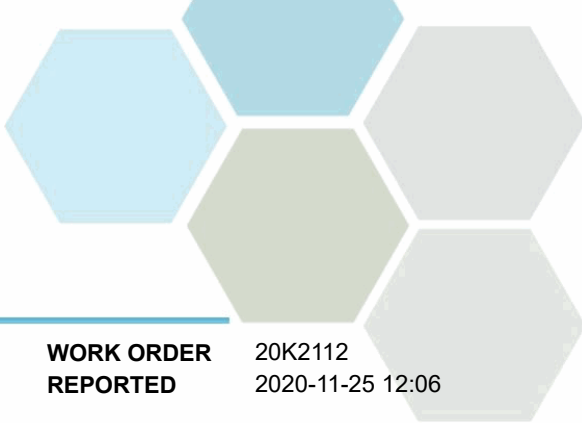
Ammonia, Total (as N)	16.9	0.050	mg/L	2020-11-19	
BOD, 5-day	16.9	2.0	mg/L	2020-11-25	
Chemical Oxygen Demand	268	20	mg/L	2020-11-19	
Conductivity (EC)	928	2.0	µS/cm	2020-11-22	
Nitrogen, Total Kjeldahl	34.7	0.050	mg/L	2020-11-24	
pH	7.75	0.10	pH units	2020-11-22	HT2
Solids, Total Dissolved	618	15	mg/L	2020-11-24	
Solids, Total Suspended	26.0	2.0	mg/L	2020-11-23	

Microbiological Parameters

Coliforms, Total	199000	1	MPN/100 mL	2020-11-19	
E. coli	6440	1	MPN/100 mL	2020-11-19	

Total Metals

Aluminum, total	0.289	0.0050	mg/L	2020-11-23	
Antimony, total	0.00059	0.00020	mg/L	2020-11-23	
Arsenic, total	0.00464	0.00050	mg/L	2020-11-23	
Barium, total	0.0289	0.0050	mg/L	2020-11-23	
Beryllium, total	< 0.00010	0.00010	mg/L	2020-11-23	



TEST RESULTS

REPORTED TO PROJECT Kelowna, City of RBCF Ponds

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Analyte	Result	RL	Units	Analyzed	Qualifier
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Drainage Pond (20K2112-02) | Matrix: Water | Sampled: 2020-11-18, Continued

F1

Total Metals, Continued

Bismuth, total	0.00114	0.00010	mg/L	2020-11-23	
Boron, total	0.164	0.0500	mg/L	2020-11-23	
Cadmium, total	0.000144	0.000010	mg/L	2020-11-23	
Calcium, total	42.9	0.20	mg/L	2020-11-23	
Chromium, total	0.00167	0.00050	mg/L	2020-11-23	
Cobalt, total	0.00102	0.00010	mg/L	2020-11-23	
Copper, total	0.0521	0.00040	mg/L	2020-11-23	
Iron, total	0.457	0.010	mg/L	2020-11-23	
Lead, total	0.00126	0.00020	mg/L	2020-11-23	
Lithium, total	0.00956	0.00010	mg/L	2020-11-23	
Magnesium, total	18.0	0.010	mg/L	2020-11-23	
Manganese, total	0.165	0.00020	mg/L	2020-11-23	
Mercury, total	< 0.000010	0.000010	mg/L	2020-11-21	
Molybdenum, total	0.00360	0.00010	mg/L	2020-11-23	
Nickel, total	0.00387	0.00040	mg/L	2020-11-23	
Phosphorus, total	18.5	0.050	mg/L	2020-11-23	
Potassium, total	32.3	0.10	mg/L	2020-11-23	
Selenium, total	0.00089	0.00050	mg/L	2020-11-23	
Silicon, total	4.5	1.0	mg/L	2020-11-23	
Silver, total	0.000129	0.000050	mg/L	2020-11-23	
Sodium, total	77.5	0.10	mg/L	2020-11-23	
Strontium, total	0.410	0.0010	mg/L	2020-11-23	
Sulfur, total	28.0	3.0	mg/L	2020-11-23	
Tellurium, total	< 0.00050	0.00050	mg/L	2020-11-23	
Thallium, total	< 0.000020	0.000020	mg/L	2020-11-23	
Thorium, total	< 0.00010	0.00010	mg/L	2020-11-23	
Tin, total	0.00072	0.00020	mg/L	2020-11-23	
Titanium, total	0.0147	0.0050	mg/L	2020-11-23	
Tungsten, total	< 0.0010	0.0010	mg/L	2020-11-23	
Uranium, total	0.00133	0.000020	mg/L	2020-11-23	
Vanadium, total	< 0.0010	0.0010	mg/L	2020-11-23	
Zinc, total	0.113	0.0040	mg/L	2020-11-23	
Zirconium, total	0.00130	0.00010	mg/L	2020-11-23	

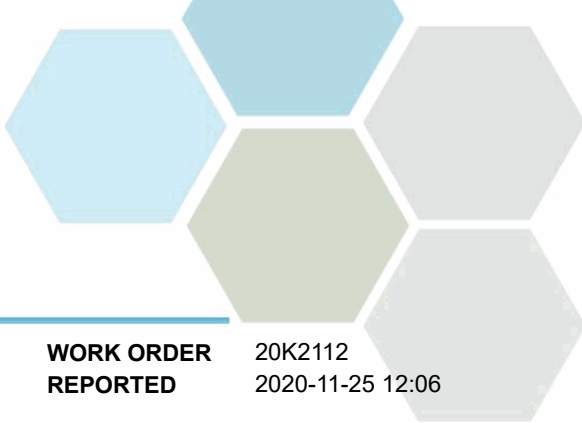
Davidson Pond (20K2112-03) | Matrix: Water | Sampled: 2020-11-18

Anions

Chloride	333	0.10	mg/L	2020-11-19	
Nitrate (as N)	< 0.010	0.010	mg/L	2020-11-19	
Nitrite (as N)	< 0.010	0.010	mg/L	2020-11-19	

Calculated Parameters

Hardness, Total (as CaCO3)	727	0.500	mg/L	N/A	
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TEST RESULTS

REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

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Analyte	Result	RL	Units	Analyzed	Qualifier
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Davidson Pond (20K2112-03) | Matrix: Water | Sampled: 2020-11-18, Continued

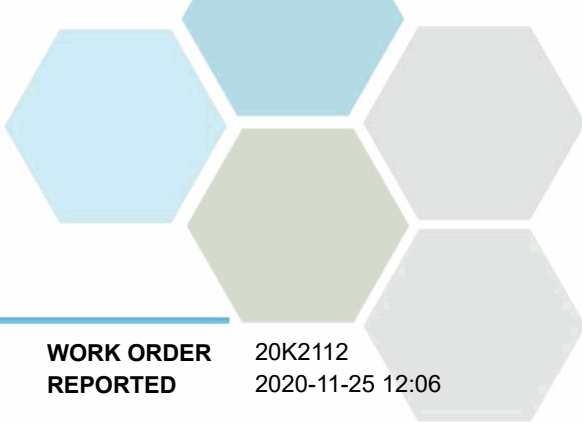
Calculated Parameters, Continued

Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	3.25	0.0500	mg/L	N/A	

Dissolved Metals

Lithium, dissolved	0.0511	0.00010	mg/L	2020-11-21	
Aluminum, dissolved	< 0.0050	0.0050	mg/L	2020-11-21	
Antimony, dissolved	0.00030	0.00020	mg/L	2020-11-21	
Arsenic, dissolved	0.00421	0.00050	mg/L	2020-11-21	
Barium, dissolved	0.0164	0.0050	mg/L	2020-11-21	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2020-11-21	
Bismuth, dissolved	< 0.00010	0.00010	mg/L	2020-11-21	
Boron, dissolved	< 0.0500	0.0500	mg/L	2020-11-21	
Cadmium, dissolved	< 0.000010	0.000010	mg/L	2020-11-21	
Calcium, dissolved	75.2	0.20	mg/L	2020-11-21	
Chromium, dissolved	< 0.00050	0.00050	mg/L	2020-11-21	
Cobalt, dissolved	0.00010	0.00010	mg/L	2020-11-21	
Copper, dissolved	< 0.00040	0.00040	mg/L	2020-11-21	
Iron, dissolved	0.016	0.010	mg/L	2020-11-21	
Lead, dissolved	< 0.00020	0.00020	mg/L	2020-11-21	
Magnesium, dissolved	131	0.010	mg/L	2020-11-21	
Manganese, dissolved	0.311	0.00020	mg/L	2020-11-21	
Mercury, dissolved	< 0.000010	0.000010	mg/L	2020-11-21	
Molybdenum, dissolved	0.00076	0.00010	mg/L	2020-11-21	
Nickel, dissolved	0.00175	0.00040	mg/L	2020-11-21	
Phosphorus, dissolved	0.284	0.050	mg/L	2020-11-21	
Potassium, dissolved	48.5	0.10	mg/L	2020-11-21	
Selenium, dissolved	< 0.00050	0.00050	mg/L	2020-11-21	
Silicon, dissolved	5.6	1.0	mg/L	2020-11-21	
Silver, dissolved	< 0.000050	0.000050	mg/L	2020-11-21	
Sodium, dissolved	617	0.10	mg/L	2020-11-21	
Strontium, dissolved	1.12	0.0010	mg/L	2020-11-21	
Sulfur, dissolved	483	3.0	mg/L	2020-11-21	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2020-11-21	
Thallium, dissolved	< 0.000020	0.000020	mg/L	2020-11-21	
Thorium, dissolved	< 0.00010	0.00010	mg/L	2020-11-21	
Tin, dissolved	< 0.00020	0.00020	mg/L	2020-11-21	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2020-11-21	
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2020-11-21	
Uranium, dissolved	0.00487	0.000020	mg/L	2020-11-21	
Vanadium, dissolved	< 0.0010	0.0010	mg/L	2020-11-21	
Zinc, dissolved	< 0.0040	0.0040	mg/L	2020-11-21	
Zirconium, dissolved	0.00014	0.00010	mg/L	2020-11-21	

General Parameters



TEST RESULTS

REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

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2020-11-25 12:06

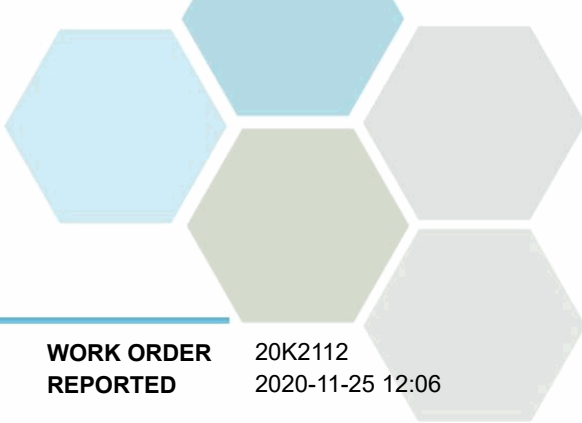
Analyte	Result	RL	Units	Analyzed	Qualifier
Davidson Pond (20K2112-03) Matrix: Water Sampled: 2020-11-18, Continued					
<i>General Parameters, Continued</i>					
Ammonia, Total (as N)	1.40	0.050	mg/L	2020-11-19	
BOD, 5-day	< 6.3	2.0	mg/L	2020-11-25	
Chemical Oxygen Demand	65	20	mg/L	2020-11-19	
Conductivity (EC)	3640	2.0	µS/cm	2020-11-22	
Nitrogen, Total Kjeldahl	3.25	0.050	mg/L	2020-11-24	
pH	8.17	0.10	pH units	2020-11-22	HT2
Solids, Total Dissolved	2440	15	mg/L	2020-11-24	
Solids, Total Suspended	3.0	2.0	mg/L	2020-11-23	

Microbiological Parameters

Coliforms, Total	84	1	MPN/100 mL	2020-11-19	
E. coli	4	1	MPN/100 mL	2020-11-19	

Total Metals

Aluminum, total	0.0158	0.0050	mg/L	2020-11-23	
Antimony, total	0.00045	0.00020	mg/L	2020-11-23	
Arsenic, total	0.00436	0.00050	mg/L	2020-11-23	
Barium, total	0.0167	0.0050	mg/L	2020-11-23	
Beryllium, total	< 0.00010	0.00010	mg/L	2020-11-23	
Bismuth, total	< 0.00010	0.00010	mg/L	2020-11-23	
Boron, total	< 0.0500	0.0500	mg/L	2020-11-23	
Cadmium, total	< 0.000010	0.000010	mg/L	2020-11-23	
Calcium, total	75.4	0.20	mg/L	2020-11-23	
Chromium, total	< 0.00050	0.00050	mg/L	2020-11-23	
Cobalt, total	0.00012	0.00010	mg/L	2020-11-23	
Copper, total	< 0.00040	0.00040	mg/L	2020-11-23	
Iron, total	0.032	0.010	mg/L	2020-11-23	
Lead, total	< 0.00020	0.00020	mg/L	2020-11-23	
Lithium, total	0.0506	0.00010	mg/L	2020-11-23	
Magnesium, total	127	0.010	mg/L	2020-11-23	
Manganese, total	0.308	0.00020	mg/L	2020-11-23	
Mercury, total	< 0.000010	0.000010	mg/L	2020-11-21	
Molybdenum, total	0.00104	0.00010	mg/L	2020-11-23	
Nickel, total	0.00195	0.00040	mg/L	2020-11-23	
Phosphorus, total	0.294	0.050	mg/L	2020-11-23	
Potassium, total	49.0	0.10	mg/L	2020-11-23	
Selenium, total	< 0.00050	0.00050	mg/L	2020-11-23	
Silicon, total	6.0	1.0	mg/L	2020-11-23	
Silver, total	< 0.000050	0.000050	mg/L	2020-11-23	
Sodium, total	604	0.10	mg/L	2020-11-23	
Strontium, total	1.17	0.0010	mg/L	2020-11-23	
Sulfur, total	390	3.0	mg/L	2020-11-23	
Tellurium, total	< 0.00050	0.00050	mg/L	2020-11-23	
Thallium, total	< 0.000020	0.000020	mg/L	2020-11-23	



TEST RESULTS

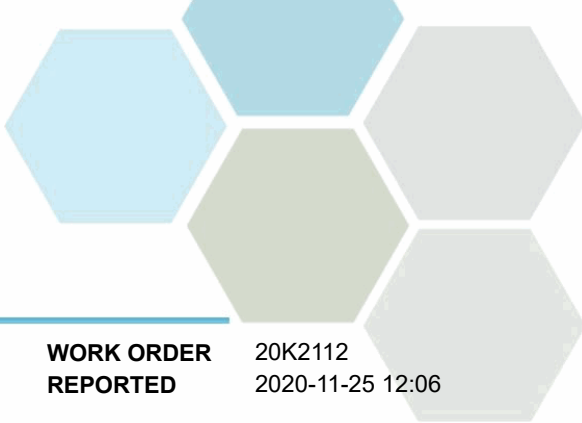
REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

WORK ORDER REPORTED 20K2112
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Analyte	Result	RL	Units	Analyzed	Qualifier
Davidson Pond (20K2112-03) Matrix: Water Sampled: 2020-11-18, Continued					
<i>Total Metals, Continued</i>					
Thorium, total	< 0.00010	0.00010	mg/L	2020-11-23	
Tin, total	< 0.00020	0.00020	mg/L	2020-11-23	
Titanium, total	< 0.0050	0.0050	mg/L	2020-11-23	
Tungsten, total	< 0.0010	0.0010	mg/L	2020-11-23	
Uranium, total	0.00491	0.000020	mg/L	2020-11-23	
Vanadium, total	< 0.0010	0.0010	mg/L	2020-11-23	
Zinc, total	< 0.0040	0.0040	mg/L	2020-11-23	
Zirconium, total	0.00015	0.00010	mg/L	2020-11-23	

Sample Qualifiers:

- F1 The sample was not field-filtered and was therefore filtered through a 0.45 µm membrane in the laboratory and preserved with HNO3 prior to analysis for dissolved metals.
- HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

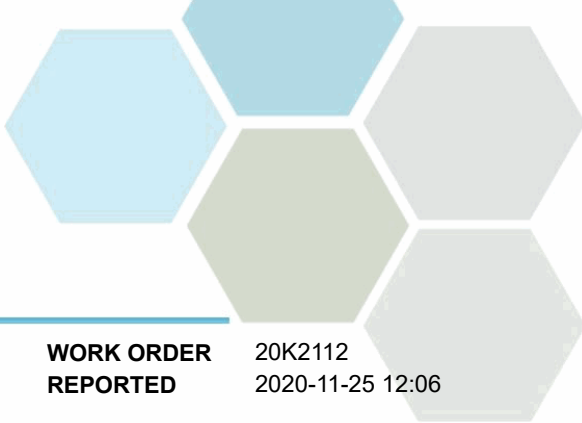
WORK ORDER REPORTED 20K2112
2020-11-25 12:06

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Coliforms, Total in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
Dissolved Metals in Water	EPA 200.8 / EPA 6020B	0.45 µm Filtration / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Hardness in Water	SM 2340 B (2017)	Calculation: 2.497 [diss Ca] + 4.118 [diss Mg]	✓	N/A
Mercury, dissolved in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	✓	Richmond
Mercury, total in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	✓	Richmond
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Solids, Total Dissolved in Water	SM 2540 C* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
mg/L	Milligrams per litre
MPN/100 mL	Most Probable Number per 100 millilitres
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association



APPENDIX 1: SUPPORTING INFORMATION

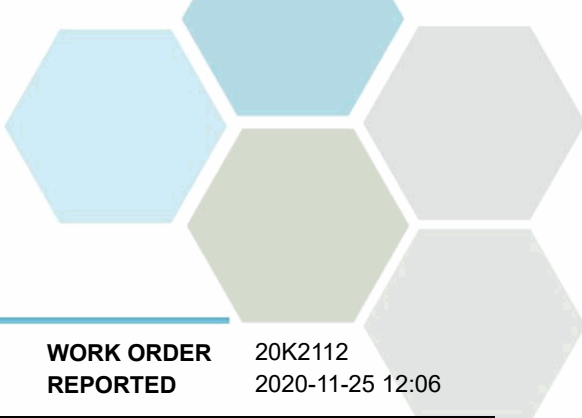
REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

WORK ORDER REPORTED 20K2112
2020-11-25 12:06

General Comments:

The results in this report apply to the samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Samples will be disposed of 30 days after the test report has been issued or once samples expire, whichever comes first. Longer hold is possible if agreed to in writing.

Please note any regulatory guidelines applied to this report are added as a convenience to the client, at their request, to help provide some initial context to analytical results obtained. Although CARO makes every effort to ensure accuracy of the associated regulatory guideline(s) applied, the guidelines applied cannot be assumed to be correct due to a variety of factors and as such CARO Analytical Services assumes no liability or responsibility for the use of those guidelines to make any decisions. The original source of the regulation should be verified and a review of the guideline(s) should be validated as correct in order to make any decisions arising from the comparison of the analytical data obtained to the relevant regulatory guideline for one's particular circumstances. Further, CARO Analytical Services assumes no liability or responsibility for any loss attributed from the use of these guidelines in any way.



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

WORK ORDER REPORTED 20K2112
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The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk):** A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup):** An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS):** A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS):** A second aliquot of sample is fortified with with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM):** A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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Anions, Batch B0K1707

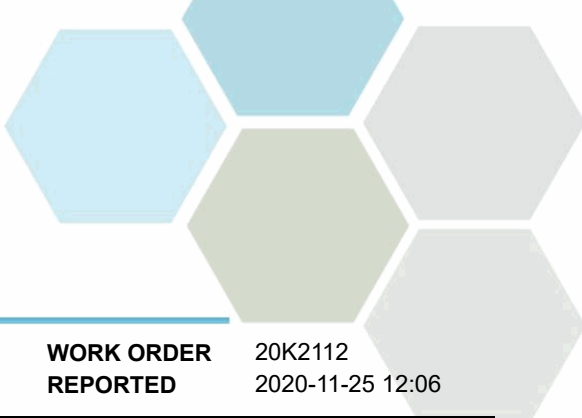
Blank (B0K1707-BLK1)			Prepared: 2020-11-19, Analyzed: 2020-11-19						
Chloride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
LCS (B0K1707-BS1)			Prepared: 2020-11-19, Analyzed: 2020-11-19						
Chloride	16.0	0.10 mg/L	16.0		100	90-110			
Nitrate (as N)	4.02	0.010 mg/L	4.00		100	90-110			
Nitrite (as N)	2.02	0.010 mg/L	2.00		101	85-115			

Dissolved Metals, Batch B0K1871

Blank (B0K1871-BLK1)			Prepared: 2020-11-20, Analyzed: 2020-11-21						
Mercury, dissolved	< 0.000010	0.000010 mg/L							
Reference (B0K1871-SRM1)			Prepared: 2020-11-20, Analyzed: 2020-11-21						
Mercury, dissolved	0.00651	0.000010 mg/L	0.00581		112	70-130			

Dissolved Metals, Batch B0K1919

Blank (B0K1919-BLK1)			Prepared: 2020-11-21, Analyzed: 2020-11-21						
Lithium, dissolved	< 0.00010	0.00010 mg/L							
Aluminum, dissolved	< 0.0050	0.0050 mg/L							
Antimony, dissolved	< 0.00020	0.00020 mg/L							
Arsenic, dissolved	< 0.00050	0.00050 mg/L							
Barium, dissolved	< 0.0050	0.0050 mg/L							
Beryllium, dissolved	< 0.00010	0.00010 mg/L							
Bismuth, dissolved	< 0.00010	0.00010 mg/L							
Boron, dissolved	< 0.0500	0.0500 mg/L							
Cadmium, dissolved	< 0.000010	0.000010 mg/L							
Calcium, dissolved	< 0.20	0.20 mg/L							
Chromium, dissolved	< 0.00050	0.00050 mg/L							
Cobalt, dissolved	< 0.00010	0.00010 mg/L							
Copper, dissolved	< 0.00040	0.00040 mg/L							
Iron, dissolved	< 0.010	0.010 mg/L							
Lead, dissolved	< 0.00020	0.00020 mg/L							



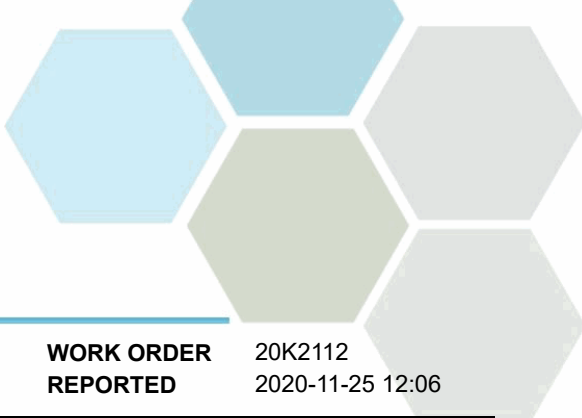
APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

WORK ORDER REPORTED 20K2112
2020-11-25 12:06

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Dissolved Metals, Batch B0K1919, Continued									
Blank (B0K1919-BLK1), Continued					Prepared: 2020-11-21, Analyzed: 2020-11-21				
Magnesium, dissolved	< 0.010	0.010 mg/L							
Manganese, dissolved	< 0.00020	0.00020 mg/L							
Molybdenum, dissolved	< 0.00010	0.00010 mg/L							
Nickel, dissolved	< 0.00040	0.00040 mg/L							
Phosphorus, dissolved	< 0.050	0.050 mg/L							
Potassium, dissolved	< 0.10	0.10 mg/L							
Selenium, dissolved	< 0.00050	0.00050 mg/L							
Silicon, dissolved	< 1.0	1.0 mg/L							
Silver, dissolved	< 0.000050	0.000050 mg/L							
Sodium, dissolved	< 0.10	0.10 mg/L							
Strontium, dissolved	< 0.0010	0.0010 mg/L							
Sulfur, dissolved	< 3.0	3.0 mg/L							
Tellurium, dissolved	< 0.00050	0.00050 mg/L							
Thallium, dissolved	< 0.000020	0.000020 mg/L							
Thorium, dissolved	< 0.00010	0.00010 mg/L							
Tin, dissolved	< 0.00020	0.00020 mg/L							
Titanium, dissolved	< 0.0050	0.0050 mg/L							
Tungsten, dissolved	< 0.0010	0.0010 mg/L							
Uranium, dissolved	< 0.000020	0.000020 mg/L							
Vanadium, dissolved	< 0.0010	0.0010 mg/L							
Zinc, dissolved	< 0.0040	0.0040 mg/L							
Zirconium, dissolved	< 0.00010	0.00010 mg/L							

LCS (B0K1919-BS1)					Prepared: 2020-11-21, Analyzed: 2020-11-21				
Lithium, dissolved	0.0209	0.00010 mg/L	0.0200		105	80-120			
Aluminum, dissolved	0.0226	0.0050 mg/L	0.0199		114	80-120			
Antimony, dissolved	0.0204	0.00020 mg/L	0.0200		102	80-120			
Arsenic, dissolved	0.0195	0.00050 mg/L	0.0200		98	80-120			
Barium, dissolved	0.0206	0.0050 mg/L	0.0198		104	80-120			
Beryllium, dissolved	0.0216	0.00010 mg/L	0.0198		109	80-120			
Bismuth, dissolved	0.0210	0.00010 mg/L	0.0200		105	80-120			
Boron, dissolved	< 0.0500	0.0500 mg/L	0.0200		92	80-120			
Cadmium, dissolved	0.0201	0.000010 mg/L	0.0199		101	80-120			
Calcium, dissolved	2.08	0.20 mg/L	2.02		103	80-120			
Chromium, dissolved	0.0190	0.00050 mg/L	0.0198		96	80-120			
Cobalt, dissolved	0.0195	0.00010 mg/L	0.0199		98	80-120			
Copper, dissolved	0.0203	0.00040 mg/L	0.0200		101	80-120			
Iron, dissolved	1.92	0.010 mg/L	2.02		95	80-120			
Lead, dissolved	0.0206	0.00020 mg/L	0.0199		103	80-120			
Magnesium, dissolved	2.02	0.010 mg/L	2.02		100	80-120			
Manganese, dissolved	0.0205	0.00020 mg/L	0.0199		103	80-120			
Molybdenum, dissolved	0.0194	0.00010 mg/L	0.0200		97	80-120			
Nickel, dissolved	0.0194	0.00040 mg/L	0.0200		97	80-120			
Phosphorus, dissolved	2.05	0.050 mg/L	2.00		103	80-120			
Potassium, dissolved	1.93	0.10 mg/L	2.02		96	80-120			
Selenium, dissolved	0.0201	0.00050 mg/L	0.0200		100	80-120			
Silicon, dissolved	2.0	1.0 mg/L	2.00		101	80-120			
Silver, dissolved	0.0202	0.000050 mg/L	0.0200		101	80-120			
Sodium, dissolved	2.00	0.10 mg/L	2.02		99	80-120			
Strontium, dissolved	0.0200	0.0010 mg/L	0.0200		100	80-120			
Sulfur, dissolved	5.5	3.0 mg/L	5.00		110	80-120			
Tellurium, dissolved	0.0204	0.00050 mg/L	0.0200		102	80-120			
Thallium, dissolved	0.0206	0.000020 mg/L	0.0199		104	80-120			
Thorium, dissolved	0.0201	0.00010 mg/L	0.0200		100	80-120			
Tin, dissolved	0.0212	0.00020 mg/L	0.0200		106	80-120			
Titanium, dissolved	0.0187	0.0050 mg/L	0.0200		94	80-120			



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Kelowna, City of RBCF Ponds **WORK ORDER REPORTED** 20K2112 2020-11-25 12:06

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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Dissolved Metals, Batch B0K1919, Continued

LCS (B0K1919-BS1), Continued

Prepared: 2020-11-21, Analyzed: 2020-11-21

Tungsten, dissolved	0.0205	0.0010 mg/L	0.0200		102	80-120			
Uranium, dissolved	0.0204	0.000020 mg/L	0.0200		102	80-120			
Vanadium, dissolved	0.0230	0.0010 mg/L	0.0200		115	80-120			
Zinc, dissolved	0.0200	0.0040 mg/L	0.0200		100	80-120			
Zirconium, dissolved	0.0201	0.00010 mg/L	0.0200		100	80-120			

Reference (B0K1919-SRM1)

Prepared: 2020-11-21, Analyzed: 2020-11-21

Lithium, dissolved	0.107	0.00010 mg/L	0.100		107	70-130			
Aluminum, dissolved	0.246	0.0050 mg/L	0.235		105	70-130			
Antimony, dissolved	0.0473	0.00020 mg/L	0.0431		110	70-130			
Arsenic, dissolved	0.446	0.00050 mg/L	0.423		105	70-130			
Barium, dissolved	3.23	0.0050 mg/L	3.30		98	70-130			
Beryllium, dissolved	0.234	0.00010 mg/L	0.209		112	70-130			
Boron, dissolved	1.72	0.0500 mg/L	1.65		104	70-130			
Cadmium, dissolved	0.234	0.000010 mg/L	0.221		106	70-130			
Calcium, dissolved	7.30	0.20 mg/L	7.72		95	70-130			
Chromium, dissolved	0.431	0.00050 mg/L	0.434		99	70-130			
Cobalt, dissolved	0.127	0.00010 mg/L	0.124		102	70-130			
Copper, dissolved	0.846	0.00040 mg/L	0.815		104	70-130			
Iron, dissolved	1.27	0.010 mg/L	1.27		100	70-130			
Lead, dissolved	0.114	0.00020 mg/L	0.110		104	70-130			
Magnesium, dissolved	6.79	0.010 mg/L	6.59		103	70-130			
Manganese, dissolved	0.349	0.00020 mg/L	0.342		102	70-130			
Molybdenum, dissolved	0.421	0.00010 mg/L	0.404		104	70-130			
Nickel, dissolved	0.855	0.00040 mg/L	0.835		102	70-130			
Phosphorus, dissolved	0.520	0.050 mg/L	0.499		104	70-130			
Potassium, dissolved	2.96	0.10 mg/L	2.88		103	70-130			
Selenium, dissolved	0.0343	0.00050 mg/L	0.0324		106	70-130			
Sodium, dissolved	18.4	0.10 mg/L	18.0		102	70-130			
Strontium, dissolved	0.956	0.0010 mg/L	0.935		102	70-130			
Thallium, dissolved	0.0409	0.000020 mg/L	0.0385		106	70-130			
Uranium, dissolved	0.256	0.000020 mg/L	0.258		99	70-130			
Vanadium, dissolved	0.858	0.0010 mg/L	0.873		98	70-130			
Zinc, dissolved	0.885	0.0040 mg/L	0.848		104	70-130			

General Parameters, Batch B0K1717

Blank (B0K1717-BLK1)

Prepared: 2020-11-19, Analyzed: 2020-11-19

Chemical Oxygen Demand	< 20	20 mg/L							
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LCS (B0K1717-BS1)

Prepared: 2020-11-19, Analyzed: 2020-11-19

Chemical Oxygen Demand	496	20 mg/L	500		99	89-115			
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Duplicate (B0K1717-DUP1)

Source: 20K2112-02

Prepared: 2020-11-19, Analyzed: 2020-11-19

Chemical Oxygen Demand	267	20 mg/L		268			< 1	14	
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Matrix Spike (B0K1717-MS1)

Source: 20K2112-02

Prepared: 2020-11-19, Analyzed: 2020-11-19

Chemical Oxygen Demand	2260	20 mg/L	2000	268	99	75-125			
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General Parameters, Batch B0K1749

Blank (B0K1749-BLK1)

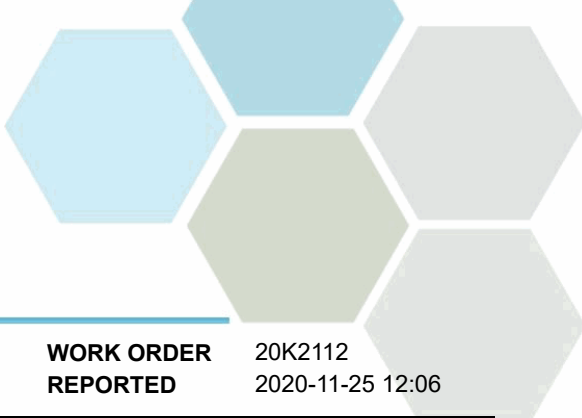
Prepared: 2020-11-19, Analyzed: 2020-11-19

Ammonia, Total (as N)	< 0.050	0.050 mg/L							
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Blank (B0K1749-BLK2)

Prepared: 2020-11-19, Analyzed: 2020-11-19

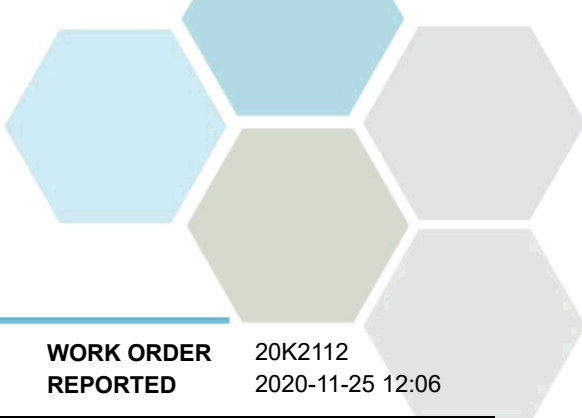
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
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APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Kelowna, City of RBCF Ponds
WORK ORDER REPORTED 20K2112 2020-11-25 12:06

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B0K1749, Continued									
LCS (B0K1749-BS1)			Prepared: 2020-11-19, Analyzed: 2020-11-19						
Ammonia, Total (as N)	0.992	0.050 mg/L	1.00		99	90-115			
LCS (B0K1749-BS2)			Prepared: 2020-11-19, Analyzed: 2020-11-19						
Ammonia, Total (as N)	0.994	0.050 mg/L	1.00		99	90-115			
General Parameters, Batch B0K1792									
Blank (B0K1792-BLK1)			Prepared: 2020-11-23, Analyzed: 2020-11-23						
Solids, Total Suspended	< 2.0	2.0 mg/L							
LCS (B0K1792-BS1)			Prepared: 2020-11-23, Analyzed: 2020-11-23						
Solids, Total Suspended	93.0	10.0 mg/L	100		93	85-115			
General Parameters, Batch B0K1809									
Blank (B0K1809-BLK1)			Prepared: 2020-11-20, Analyzed: 2020-11-25						
BOD, 5-day	< 2.0	2.0 mg/L							
LCS (B0K1809-BS1)			Prepared: 2020-11-20, Analyzed: 2020-11-25						
BOD, 5-day	178	2.0 mg/L	180		99	85-115			
General Parameters, Batch B0K1948									
Blank (B0K1948-BLK1)			Prepared: 2020-11-22, Analyzed: 2020-11-22						
Conductivity (EC)	< 2.0	2.0 µS/cm							
Blank (B0K1948-BLK2)			Prepared: 2020-11-22, Analyzed: 2020-11-22						
Conductivity (EC)	< 2.0	2.0 µS/cm							
Blank (B0K1948-BLK3)			Prepared: 2020-11-22, Analyzed: 2020-11-22						
Conductivity (EC)	< 2.0	2.0 µS/cm							
LCS (B0K1948-BS4)			Prepared: 2020-11-22, Analyzed: 2020-11-22						
Conductivity (EC)	1460	2.0 µS/cm	1410		103	95-104			
LCS (B0K1948-BS5)			Prepared: 2020-11-22, Analyzed: 2020-11-22						
Conductivity (EC)	1470	2.0 µS/cm	1410		104	95-104			
LCS (B0K1948-BS6)			Prepared: 2020-11-22, Analyzed: 2020-11-22						
Conductivity (EC)	1440	2.0 µS/cm	1410		102	95-104			
Reference (B0K1948-SRM1)			Prepared: 2020-11-22, Analyzed: 2020-11-22						
pH	6.99	0.10 pH units	7.01		100	98-102			
Reference (B0K1948-SRM2)			Prepared: 2020-11-22, Analyzed: 2020-11-22						
pH	6.99	0.10 pH units	7.01		100	98-102			
Reference (B0K1948-SRM3)			Prepared: 2020-11-22, Analyzed: 2020-11-22						
pH	6.99	0.10 pH units	7.01		100	98-102			
General Parameters, Batch B0K1982									
Blank (B0K1982-BLK1)			Prepared: 2020-11-24, Analyzed: 2020-11-24						
Solids, Total Dissolved	< 15	15 mg/L							



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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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General Parameters, Batch B0K1982, Continued

LCS (B0K1982-BS1)			Prepared: 2020-11-24, Analyzed: 2020-11-24						
Solids, Total Dissolved	237	15 mg/L	240		99	85-115			
Duplicate (B0K1982-DUP1)			Source: 20K2112-01 Prepared: 2020-11-24, Analyzed: 2020-11-24						
Solids, Total Dissolved	3700	15 mg/L		3810			3	15	

General Parameters, Batch B0K2014

Blank (B0K2014-BLK1)			Prepared: 2020-11-23, Analyzed: 2020-11-24						
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							
Blank (B0K2014-BLK2)			Prepared: 2020-11-23, Analyzed: 2020-11-24						
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							
LCS (B0K2014-BS1)			Prepared: 2020-11-23, Analyzed: 2020-11-24						
Nitrogen, Total Kjeldahl	1.01	0.050 mg/L	1.00		101	85-115			
LCS (B0K2014-BS2)			Prepared: 2020-11-23, Analyzed: 2020-11-24						
Nitrogen, Total Kjeldahl	1.01	0.050 mg/L	1.00		101	85-115			

Microbiological Parameters, Batch B0K1693

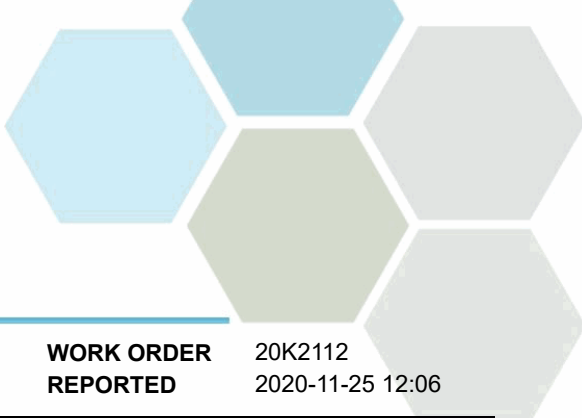
Blank (B0K1693-BLK1)			Prepared: 2020-11-19, Analyzed: 2020-11-19						
Coliforms, Total	< 1	1 MPN/100 mL							
E. coli	< 1	1 MPN/100 mL							
Blank (B0K1693-BLK2)			Prepared: 2020-11-19, Analyzed: 2020-11-19						
Coliforms, Total	< 1	1 MPN/100 mL							
E. coli	< 1	1 MPN/100 mL							

Total Metals, Batch B0K1872

Blank (B0K1872-BLK1)			Prepared: 2020-11-20, Analyzed: 2020-11-21						
Mercury, total	< 0.000010	0.000010 mg/L							
Blank (B0K1872-BLK2)			Prepared: 2020-11-20, Analyzed: 2020-11-21						
Mercury, total	< 0.000010	0.000010 mg/L							
Reference (B0K1872-SRM1)			Prepared: 2020-11-20, Analyzed: 2020-11-21						
Mercury, total	0.00568	0.000010 mg/L	0.00581		98	70-130			
Reference (B0K1872-SRM2)			Prepared: 2020-11-20, Analyzed: 2020-11-21						
Mercury, total	0.00585	0.000010 mg/L	0.00581		101	70-130			

Total Metals, Batch B0K2013

Blank (B0K2013-BLK1)			Prepared: 2020-11-23, Analyzed: 2020-11-23						
Aluminum, total	< 0.0050	0.0050 mg/L							
Antimony, total	< 0.00020	0.00020 mg/L							
Arsenic, total	< 0.00050	0.00050 mg/L							
Barium, total	< 0.0050	0.0050 mg/L							
Beryllium, total	< 0.00010	0.00010 mg/L							
Bismuth, total	< 0.00010	0.00010 mg/L							
Boron, total	< 0.0500	0.0500 mg/L							
Cadmium, total	< 0.000010	0.000010 mg/L							
Calcium, total	< 0.20	0.20 mg/L							



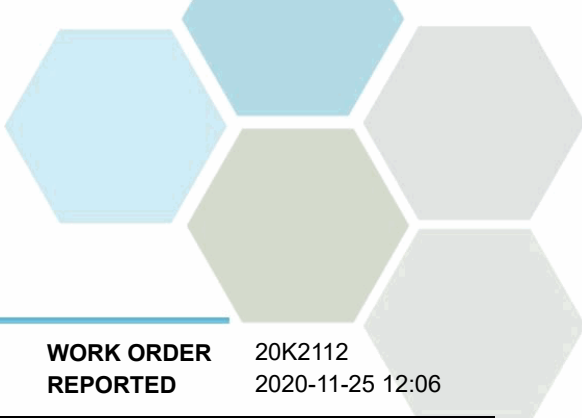
APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

WORK ORDER REPORTED 20K2112
2020-11-25 12:06

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B0K2013, Continued									
Blank (B0K2013-BLK1), Continued					Prepared: 2020-11-23, Analyzed: 2020-11-23				
Chromium, total	< 0.00050	0.00050 mg/L							
Cobalt, total	< 0.00010	0.00010 mg/L							
Copper, total	< 0.00040	0.00040 mg/L							
Iron, total	< 0.010	0.010 mg/L							
Lead, total	< 0.00020	0.00020 mg/L							
Lithium, total	< 0.00010	0.00010 mg/L							
Magnesium, total	< 0.010	0.010 mg/L							
Manganese, total	< 0.00020	0.00020 mg/L							
Molybdenum, total	< 0.00010	0.00010 mg/L							
Nickel, total	< 0.00040	0.00040 mg/L							
Phosphorus, total	< 0.050	0.050 mg/L							
Potassium, total	< 0.10	0.10 mg/L							
Selenium, total	< 0.00050	0.00050 mg/L							
Silicon, total	< 1.0	1.0 mg/L							
Silver, total	< 0.000050	0.000050 mg/L							
Sodium, total	< 0.10	0.10 mg/L							
Strontium, total	< 0.0010	0.0010 mg/L							
Sulfur, total	< 3.0	3.0 mg/L							
Tellurium, total	< 0.00050	0.00050 mg/L							
Thallium, total	< 0.000020	0.000020 mg/L							
Thorium, total	< 0.00010	0.00010 mg/L							
Tin, total	< 0.00020	0.00020 mg/L							
Titanium, total	< 0.0050	0.0050 mg/L							
Tungsten, total	< 0.0010	0.0010 mg/L							
Uranium, total	< 0.000020	0.000020 mg/L							
Vanadium, total	< 0.0010	0.0010 mg/L							
Zinc, total	< 0.0040	0.0040 mg/L							
Zirconium, total	< 0.00010	0.00010 mg/L							

LCS (B0K2013-BS1)				Prepared: 2020-11-23, Analyzed: 2020-11-23					
Aluminum, total	0.0227	0.0050 mg/L	0.0199	114	80-120				
Antimony, total	0.0223	0.00020 mg/L	0.0200	112	80-120				
Arsenic, total	0.0216	0.00050 mg/L	0.0200	108	80-120				
Barium, total	0.0205	0.0050 mg/L	0.0198	104	80-120				
Beryllium, total	0.0232	0.00010 mg/L	0.0198	117	80-120				
Bismuth, total	0.0209	0.00010 mg/L	0.0200	105	80-120				
Boron, total	< 0.0500	0.0500 mg/L	0.0200	116	80-120				
Cadmium, total	0.0196	0.000010 mg/L	0.0199	99	80-120				
Calcium, total	2.34	0.20 mg/L	2.02	116	80-120				
Chromium, total	0.0219	0.00050 mg/L	0.0198	110	80-120				
Cobalt, total	0.0237	0.00010 mg/L	0.0199	119	80-120				
Copper, total	0.0224	0.00040 mg/L	0.0200	112	80-120				
Iron, total	2.02	0.010 mg/L	2.02	100	80-120				
Lead, total	0.0209	0.00020 mg/L	0.0199	105	80-120				
Lithium, total	0.0222	0.00010 mg/L	0.0200	111	80-120				
Magnesium, total	2.21	0.010 mg/L	2.02	109	80-120				
Manganese, total	0.0204	0.00020 mg/L	0.0199	102	80-120				
Molybdenum, total	0.0214	0.00010 mg/L	0.0200	107	80-120				
Nickel, total	0.0238	0.00040 mg/L	0.0200	119	80-120				
Phosphorus, total	2.29	0.050 mg/L	2.00	114	80-120				
Potassium, total	2.14	0.10 mg/L	2.02	106	80-120				
Selenium, total	0.0186	0.00050 mg/L	0.0200	93	80-120				
Silicon, total	2.0	1.0 mg/L	2.00	102	80-120				
Silver, total	0.0203	0.000050 mg/L	0.0200	101	80-120				
Sodium, total	2.20	0.10 mg/L	2.02	109	80-120				
Strontium, total	0.0216	0.0010 mg/L	0.0200	108	80-120				



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

WORK ORDER REPORTED 20K2112
2020-11-25 12:06

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B0K2013, Continued									
LCS (B0K2013-BS1), Continued					Prepared: 2020-11-23, Analyzed: 2020-11-23				
Sulfur, total	5.0	3.0 mg/L	5.00		99	80-120			
Tellurium, total	0.0218	0.00050 mg/L	0.0200		109	80-120			
Thallium, total	0.0210	0.000020 mg/L	0.0199		105	80-120			
Thorium, total	0.0204	0.00010 mg/L	0.0200		102	80-120			
Tin, total	0.0228	0.00020 mg/L	0.0200		114	80-120			
Titanium, total	0.0236	0.0050 mg/L	0.0200		118	80-120			
Tungsten, total	0.0216	0.0010 mg/L	0.0200		108	80-120			
Uranium, total	0.0206	0.000020 mg/L	0.0200		103	80-120			
Vanadium, total	0.0217	0.0010 mg/L	0.0200		108	80-120			
Zinc, total	0.0218	0.0040 mg/L	0.0200		109	80-120			
Zirconium, total	0.0222	0.00010 mg/L	0.0200		111	80-120			
Reference (B0K2013-SRM1)					Prepared: 2020-11-23, Analyzed: 2020-11-23				
Aluminum, total	0.317	0.0050 mg/L	0.299		106	70-130			
Antimony, total	0.0541	0.00020 mg/L	0.0517		105	70-130			
Arsenic, total	0.132	0.00050 mg/L	0.119		111	70-130			
Barium, total	0.808	0.0050 mg/L	0.801		101	70-130			
Beryllium, total	0.0576	0.00010 mg/L	0.0501		115	70-130			
Boron, total	4.26	0.0500 mg/L	4.11		104	70-130			
Cadmium, total	0.0495	0.000010 mg/L	0.0503		98	70-130			
Calcium, total	10.7	0.20 mg/L	10.7		100	70-130			
Chromium, total	0.268	0.00050 mg/L	0.250		107	70-130			
Cobalt, total	0.0463	0.00010 mg/L	0.0384		120	70-130			
Copper, total	0.547	0.00040 mg/L	0.487		112	70-130			
Iron, total	0.487	0.010 mg/L	0.504		97	70-130			
Lead, total	0.287	0.00020 mg/L	0.278		103	70-130			
Lithium, total	0.438	0.00010 mg/L	0.398		110	70-130			
Magnesium, total	4.01	0.010 mg/L	3.59		112	70-130			
Manganese, total	0.111	0.00020 mg/L	0.111		100	70-130			
Molybdenum, total	0.210	0.00010 mg/L	0.196		107	70-130			
Nickel, total	0.292	0.00040 mg/L	0.248		118	70-130			
Phosphorus, total	0.267	0.050 mg/L	0.213		125	70-130			
Potassium, total	6.43	0.10 mg/L	5.89		109	70-130			
Selenium, total	0.115	0.00050 mg/L	0.120		96	70-130			
Sodium, total	9.41	0.10 mg/L	8.71		108	70-130			
Strontium, total	0.423	0.0010 mg/L	0.393		108	70-130			
Thallium, total	0.0823	0.000020 mg/L	0.0787		105	70-130			
Uranium, total	0.0347	0.000020 mg/L	0.0344		101	70-130			
Vanadium, total	0.424	0.0010 mg/L	0.391		109	70-130			
Zinc, total	2.65	0.0040 mg/L	2.50		106	70-130			



CERTIFICATE OF ANALYSIS

REPORTED TO Kelowna, City of
1435 Water Street
KELOWNA, BC V1Y 1J4

ATTENTION Morgan Lewis

PO NUMBER 527007

PROJECT RBCF Ponds

PROJECT INFO

WORK ORDER 20L1364

RECEIVED / TEMP 2020-12-11 10:40 / 5°C

REPORTED 2020-12-21 09:47

COC NUMBER 44176.14913

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO/IEC 17025:2017 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks



You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry



It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve



Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

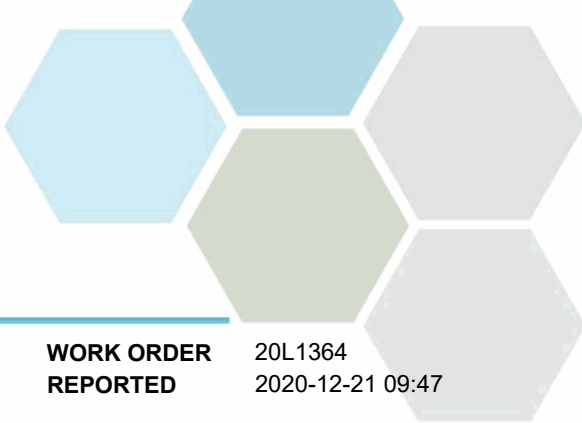
If you have any questions or concerns, please contact me at acrump@caro.ca

Authorized By:

Alana Crump
Team Lead, Client Service

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7

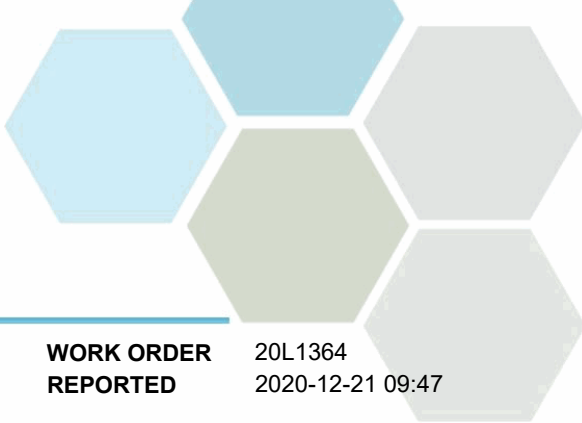


TEST RESULTS

REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

WORK ORDER REPORTED 20L1364
2020-12-21 09:47

Analyte	Result	RL	Units	Analyzed	Qualifier
Drainage Pond (20L1364-01) Matrix: Water Sampled: 2020-12-11					F1
Anions					
Chloride	72.4	0.10	mg/L	2020-12-12	
Nitrate (as N)	2.42	0.010	mg/L	2020-12-12	
Nitrite (as N)	< 0.010	0.010	mg/L	2020-12-12	
Calculated Parameters					
Hardness, Total (as CaCO3)	162	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	2.42	0.0100	mg/L	N/A	
Nitrogen, Total	25.5	2.00	mg/L	N/A	
Dissolved Metals					
Lithium, dissolved	0.00870	0.00010	mg/L	2020-12-16	
Aluminum, dissolved	0.0668	0.0050	mg/L	2020-12-16	
Antimony, dissolved	0.00027	0.00020	mg/L	2020-12-16	
Arsenic, dissolved	0.00315	0.00050	mg/L	2020-12-16	
Barium, dissolved	0.0143	0.0050	mg/L	2020-12-16	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2020-12-16	
Bismuth, dissolved	0.00046	0.00010	mg/L	2020-12-16	
Boron, dissolved	0.160	0.0500	mg/L	2020-12-16	
Cadmium, dissolved	0.000073	0.000010	mg/L	2020-12-16	
Calcium, dissolved	39.2	0.20	mg/L	2020-12-16	
Chromium, dissolved	0.00083	0.00050	mg/L	2020-12-16	
Cobalt, dissolved	0.00062	0.00010	mg/L	2020-12-16	
Copper, dissolved	0.0204	0.00040	mg/L	2020-12-16	
Iron, dissolved	0.176	0.010	mg/L	2020-12-16	
Lead, dissolved	0.00047	0.00020	mg/L	2020-12-16	
Magnesium, dissolved	15.4	0.010	mg/L	2020-12-16	
Manganese, dissolved	0.0852	0.00020	mg/L	2020-12-16	
Mercury, dissolved	< 0.000010	0.000010	mg/L	2020-12-18	
Molybdenum, dissolved	0.00338	0.00010	mg/L	2020-12-16	
Nickel, dissolved	0.00232	0.00040	mg/L	2020-12-16	
Phosphorus, dissolved	12.0	0.050	mg/L	2020-12-16	
Potassium, dissolved	25.4	0.10	mg/L	2020-12-16	
Selenium, dissolved	0.00073	0.00050	mg/L	2020-12-16	
Silicon, dissolved	4.4	1.0	mg/L	2020-12-16	
Silver, dissolved	< 0.000050	0.000050	mg/L	2020-12-16	
Sodium, dissolved	69.6	0.10	mg/L	2020-12-16	
Strontium, dissolved	0.345	0.0010	mg/L	2020-12-16	
Sulfur, dissolved	12.5	3.0	mg/L	2020-12-16	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2020-12-16	
Thallium, dissolved	< 0.000020	0.000020	mg/L	2020-12-16	
Thorium, dissolved	< 0.00010	0.00010	mg/L	2020-12-16	
Tin, dissolved	0.00037	0.00020	mg/L	2020-12-16	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2020-12-16	
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2020-12-16	



TEST RESULTS

REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

WORK ORDER REPORTED 20L1364
2020-12-21 09:47

Analyte	Result	RL	Units	Analyzed	Qualifier
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Drainage Pond (20L1364-01) | Matrix: Water | Sampled: 2020-12-11, Continued

F1

Dissolved Metals, Continued

Uranium, dissolved	0.000899	0.000020	mg/L	2020-12-16	
Vanadium, dissolved	< 0.0010	0.0010	mg/L	2020-12-16	
Zinc, dissolved	0.0815	0.0040	mg/L	2020-12-16	
Zirconium, dissolved	0.00065	0.00010	mg/L	2020-12-16	

General Parameters

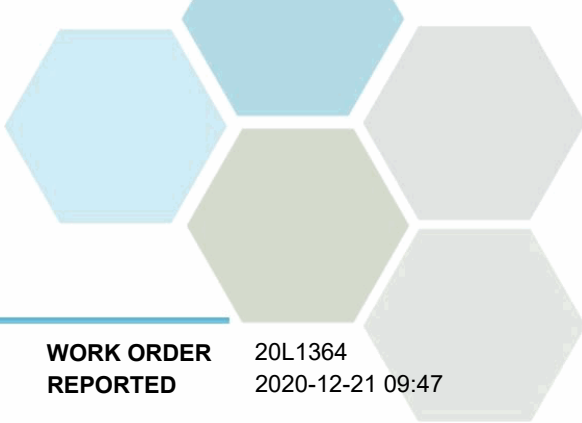
Ammonia, Total (as N)	15.4	0.050	mg/L	2020-12-14	
BOD, 5-day	8.5	2.0	mg/L	2020-12-17	
Chemical Oxygen Demand	166	20	mg/L	2020-12-14	
Conductivity (EC)	854	2.0	µS/cm	2020-12-17	
Nitrogen, Total Kjeldahl	23.1	0.050	mg/L	2020-12-17	
pH	7.86	0.10	pH units	2020-12-17	HT2
Solids, Total Dissolved	513	15	mg/L	2020-11-16	HT1
Solids, Total Suspended	13.0	2.0	mg/L	2020-12-14	

Microbiological Parameters

Coliforms, Total	43500	1	MPN/100 mL	2020-12-11	
E. coli	174	1	MPN/100 mL	2020-12-11	

Total Metals

Aluminum, total	0.169	0.0050	mg/L	2020-12-17	
Antimony, total	0.00057	0.00020	mg/L	2020-12-17	
Arsenic, total	0.00398	0.00050	mg/L	2020-12-17	
Barium, total	0.0228	0.0050	mg/L	2020-12-17	
Beryllium, total	< 0.00010	0.00010	mg/L	2020-12-17	
Bismuth, total	0.00083	0.00010	mg/L	2020-12-17	
Boron, total	0.303	0.0500	mg/L	2020-12-17	
Cadmium, total	0.000085	0.000010	mg/L	2020-12-17	
Calcium, total	42.2	0.20	mg/L	2020-12-17	
Chromium, total	0.00156	0.00050	mg/L	2020-12-17	
Cobalt, total	0.00077	0.00010	mg/L	2020-12-17	
Copper, total	0.0299	0.00040	mg/L	2020-12-17	
Iron, total	0.330	0.010	mg/L	2020-12-17	
Lead, total	0.00076	0.00020	mg/L	2020-12-17	
Lithium, total	0.00787	0.00010	mg/L	2020-12-17	
Magnesium, total	17.0	0.010	mg/L	2020-12-17	
Manganese, total	0.124	0.00020	mg/L	2020-12-17	
Mercury, total	< 0.000010	0.000010	mg/L	2020-12-18	
Molybdenum, total	0.00361	0.00010	mg/L	2020-12-17	
Nickel, total	0.00330	0.00040	mg/L	2020-12-17	
Phosphorus, total	13.4	0.050	mg/L	2020-12-17	
Potassium, total	27.5	0.10	mg/L	2020-12-17	
Selenium, total	0.00078	0.00050	mg/L	2020-12-17	
Silicon, total	6.4	1.0	mg/L	2020-12-17	



TEST RESULTS

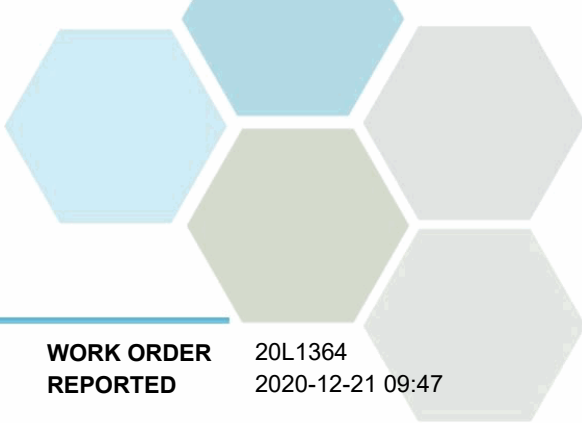
REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

WORK ORDER REPORTED 20L1364
2020-12-21 09:47

Analyte	Result	RL	Units	Analyzed	Qualifier
Drainage Pond (20L1364-01) Matrix: Water Sampled: 2020-12-11, Continued					F1
<i>Total Metals, Continued</i>					
Silver, total	0.000079	0.000050	mg/L	2020-12-17	
Sodium, total	76.1	0.10	mg/L	2020-12-17	
Strontium, total	0.408	0.0010	mg/L	2020-12-17	
Sulfur, total	38.4	3.0	mg/L	2020-12-17	
Tellurium, total	< 0.00050	0.00050	mg/L	2020-12-17	
Thallium, total	< 0.000020	0.000020	mg/L	2020-12-17	
Thorium, total	< 0.00010	0.00010	mg/L	2020-12-17	
Tin, total	0.00074	0.00020	mg/L	2020-12-17	
Titanium, total	0.0063	0.0050	mg/L	2020-12-17	
Tungsten, total	< 0.0010	0.0010	mg/L	2020-12-17	
Uranium, total	0.000988	0.000020	mg/L	2020-12-17	
Vanadium, total	< 0.0010	0.0010	mg/L	2020-12-17	
Zinc, total	0.107	0.0040	mg/L	2020-12-17	
Zirconium, total	0.00085	0.00010	mg/L	2020-12-17	

Sample Qualifiers:

- F1 The sample was not field-filtered and was therefore filtered through a 0.45 µm membrane in the laboratory and preserved with HNO3 prior to analysis for dissolved metals.
- HT1 The sample was prepared and/or analyzed past the recommended holding time.
- HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

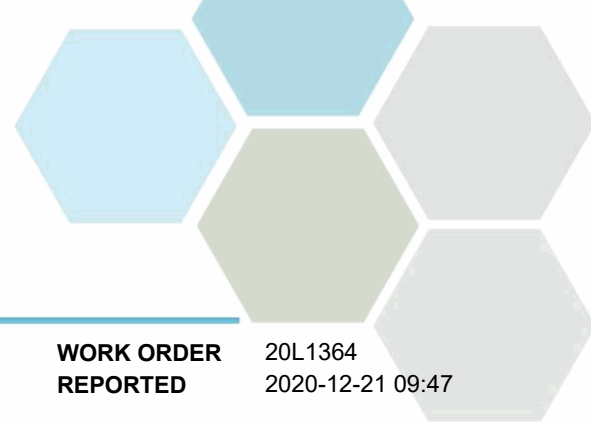
WORK ORDER REPORTED 20L1364
2020-12-21 09:47

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Biochemical Oxygen Demand in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Chemical Oxygen Demand in Water	SM 5220 D* (2017)	Closed Reflux, Colorimetry	✓	Kelowna
Coliforms, Total in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
Dissolved Metals in Water	EPA 200.8 / EPA 6020B	0.45 µm Filtration / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Hardness in Water	SM 2340 B (2017)	Calculation: 2.497 [diss Ca] + 4.118 [diss Mg]	✓	N/A
Mercury, dissolved in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	✓	Richmond
Mercury, total in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	✓	Richmond
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Solids, Total Dissolved in Water	SM 2540 C* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
mg/L	Milligrams per litre
MPN/100 mL	Most Probable Number per 100 millilitres
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association



APPENDIX 1: SUPPORTING INFORMATION

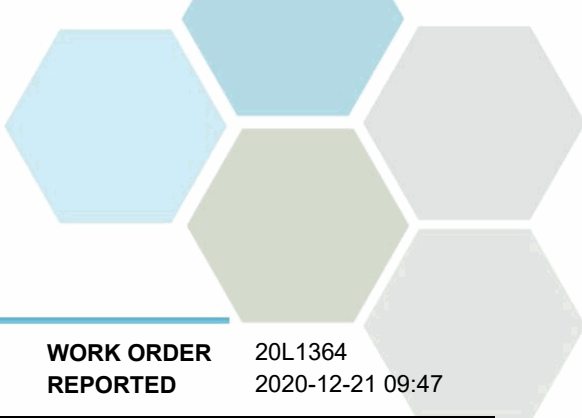
REPORTED TO Kelowna, City of
PROJECT RBCF Ponds

WORK ORDER 20L1364
REPORTED 2020-12-21 09:47

General Comments:

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Please note any regulatory guidelines applied to this report are added as a convenience to the client, at their request, to help provide some initial context to analytical results obtained. Although CARO makes every effort to ensure accuracy of the associated regulatory guideline(s) applied, the guidelines applied cannot be assumed to be correct due to a variety of factors and as such CARO Analytical Services assumes no liability or responsibility for the use of those guidelines to make any decisions. The original source of the regulation should be verified and a review of the guideline(s) should be validated as correct in order to make any decisions arising from the comparison of the analytical data obtained to the relevant regulatory guideline for one's particular circumstances. Further, CARO Analytical Services assumes no liability or responsibility for any loss attributed from the use of these guidelines in any way.



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

WORK ORDER REPORTED 20L1364
2020-12-21 09:47

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in “batches” and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

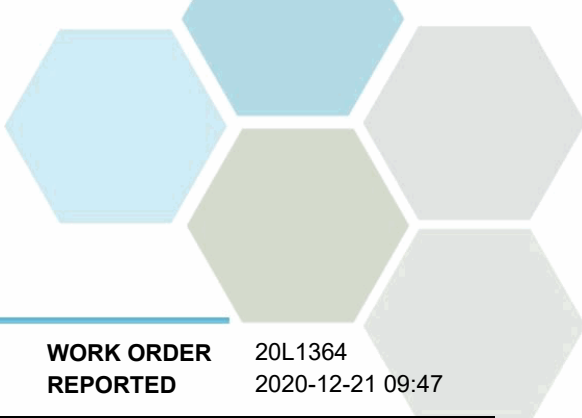
- **Method Blank (Blk):** A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup):** An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS):** A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS):** A second aliquot of sample is fortified with with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM):** A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B0L1125									
Blank (B0L1125-BLK1)			Prepared: 2020-12-12, Analyzed: 2020-12-12						
Chloride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
Blank (B0L1125-BLK2)			Prepared: 2020-12-12, Analyzed: 2020-12-12						
Chloride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
LCS (B0L1125-BS1)			Prepared: 2020-12-12, Analyzed: 2020-12-12						
Chloride	16.2	0.10 mg/L	16.0		101	90-110			
Nitrate (as N)	4.00	0.010 mg/L	4.00		100	90-110			
Nitrite (as N)	2.01	0.010 mg/L	2.00		101	85-115			
LCS (B0L1125-BS2)			Prepared: 2020-12-12, Analyzed: 2020-12-12						
Chloride	16.0	0.10 mg/L	16.0		100	90-110			
Nitrate (as N)	3.94	0.010 mg/L	4.00		99	90-110			
Nitrite (as N)	2.03	0.010 mg/L	2.00		101	85-115			

Dissolved Metals, Batch B0L1525

Blank (B0L1525-BLK1)			Prepared: 2020-12-16, Analyzed: 2020-12-16						
Lithium, dissolved	< 0.00010	0.00010 mg/L							
Aluminum, dissolved	< 0.0050	0.0050 mg/L							
Antimony, dissolved	< 0.00020	0.00020 mg/L							
Arsenic, dissolved	< 0.00050	0.00050 mg/L							
Barium, dissolved	< 0.0050	0.0050 mg/L							
Beryllium, dissolved	< 0.00010	0.00010 mg/L							
Bismuth, dissolved	< 0.00010	0.00010 mg/L							
Boron, dissolved	< 0.0500	0.0500 mg/L							
Cadmium, dissolved	< 0.000010	0.000010 mg/L							
Calcium, dissolved	< 0.20	0.20 mg/L							
Chromium, dissolved	< 0.00050	0.00050 mg/L							
Cobalt, dissolved	< 0.00010	0.00010 mg/L							
Copper, dissolved	< 0.00040	0.00040 mg/L							
Iron, dissolved	< 0.010	0.010 mg/L							



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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Dissolved Metals, Batch B0L1525, Continued

Blank (B0L1525-BLK1), Continued

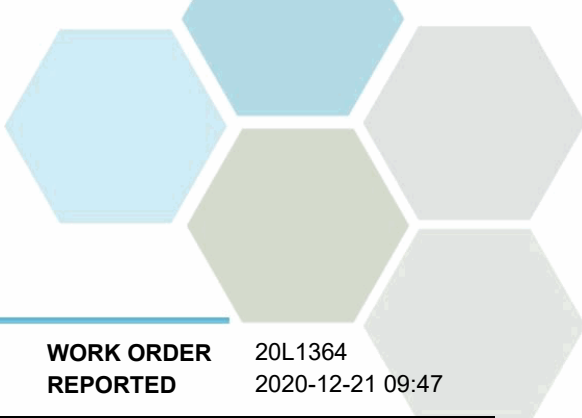
Prepared: 2020-12-16, Analyzed: 2020-12-16

Lead, dissolved	< 0.00020	0.00020 mg/L							
Magnesium, dissolved	< 0.010	0.010 mg/L							
Manganese, dissolved	< 0.00020	0.00020 mg/L							
Molybdenum, dissolved	< 0.00010	0.00010 mg/L							
Nickel, dissolved	< 0.00040	0.00040 mg/L							
Phosphorus, dissolved	< 0.050	0.050 mg/L							
Potassium, dissolved	< 0.10	0.10 mg/L							
Selenium, dissolved	< 0.00050	0.00050 mg/L							
Silicon, dissolved	< 1.0	1.0 mg/L							
Silver, dissolved	< 0.000050	0.000050 mg/L							
Sodium, dissolved	< 0.10	0.10 mg/L							
Strontium, dissolved	< 0.0010	0.0010 mg/L							
Sulfur, dissolved	< 3.0	3.0 mg/L							
Tellurium, dissolved	< 0.00050	0.00050 mg/L							
Thallium, dissolved	< 0.000020	0.000020 mg/L							
Thorium, dissolved	< 0.00010	0.00010 mg/L							
Tin, dissolved	< 0.00020	0.00020 mg/L							
Titanium, dissolved	< 0.0050	0.0050 mg/L							
Tungsten, dissolved	< 0.0010	0.0010 mg/L							
Uranium, dissolved	< 0.000020	0.000020 mg/L							
Vanadium, dissolved	< 0.0010	0.0010 mg/L							
Zinc, dissolved	< 0.0040	0.0040 mg/L							
Zirconium, dissolved	< 0.00010	0.00010 mg/L							

LCS (B0L1525-BS1)

Prepared: 2020-12-16, Analyzed: 2020-12-16

Lithium, dissolved	0.0208	0.00010 mg/L	0.0200		104	80-120			
Aluminum, dissolved	0.0203	0.0050 mg/L	0.0199		102	80-120			
Antimony, dissolved	0.0227	0.00020 mg/L	0.0200		114	80-120			
Arsenic, dissolved	0.0212	0.00050 mg/L	0.0200		106	80-120			
Barium, dissolved	0.0202	0.0050 mg/L	0.0198		102	80-120			
Beryllium, dissolved	0.0206	0.00010 mg/L	0.0198		104	80-120			
Bismuth, dissolved	0.0207	0.00010 mg/L	0.0200		104	80-120			
Boron, dissolved	< 0.0500	0.0500 mg/L	0.0200		110	80-120			
Cadmium, dissolved	0.0198	0.000010 mg/L	0.0199		100	80-120			
Calcium, dissolved	2.21	0.20 mg/L	2.02		109	80-120			
Chromium, dissolved	0.0213	0.00050 mg/L	0.0198		108	80-120			
Cobalt, dissolved	0.0211	0.00010 mg/L	0.0199		106	80-120			
Copper, dissolved	0.0215	0.00040 mg/L	0.0200		107	80-120			
Iron, dissolved	1.92	0.010 mg/L	2.02		95	80-120			
Lead, dissolved	0.0203	0.00020 mg/L	0.0199		102	80-120			
Magnesium, dissolved	2.00	0.010 mg/L	2.02		99	80-120			
Manganese, dissolved	0.0186	0.00020 mg/L	0.0199		94	80-120			
Molybdenum, dissolved	0.0209	0.00010 mg/L	0.0200		104	80-120			
Nickel, dissolved	0.0214	0.00040 mg/L	0.0200		107	80-120			
Phosphorus, dissolved	1.97	0.050 mg/L	2.00		98	80-120			
Potassium, dissolved	1.97	0.10 mg/L	2.02		97	80-120			
Selenium, dissolved	0.0193	0.00050 mg/L	0.0200		97	80-120			
Silicon, dissolved	2.1	1.0 mg/L	2.00		107	80-120			
Silver, dissolved	0.0195	0.000050 mg/L	0.0200		97	80-120			
Sodium, dissolved	1.98	0.10 mg/L	2.02		98	80-120			
Strontium, dissolved	0.0206	0.0010 mg/L	0.0200		103	80-120			
Sulfur, dissolved	4.8	3.0 mg/L	5.00		97	80-120			
Tellurium, dissolved	0.0192	0.00050 mg/L	0.0200		96	80-120			
Thallium, dissolved	0.0204	0.000020 mg/L	0.0199		102	80-120			
Thorium, dissolved	0.0206	0.00010 mg/L	0.0200		103	80-120			
Tin, dissolved	0.0207	0.00020 mg/L	0.0200		104	80-120			



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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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Dissolved Metals, Batch B0L1525, Continued

LCS (B0L1525-BS1), Continued

Prepared: 2020-12-16, Analyzed: 2020-12-16

Titanium, dissolved	0.0238	0.0050 mg/L	0.0200		119	80-120			
Tungsten, dissolved	0.0215	0.0010 mg/L	0.0200		107	80-120			
Uranium, dissolved	0.0206	0.000020 mg/L	0.0200		103	80-120			
Vanadium, dissolved	0.0220	0.0010 mg/L	0.0200		110	80-120			
Zinc, dissolved	0.0215	0.0040 mg/L	0.0200		107	80-120			
Zirconium, dissolved	0.0214	0.00010 mg/L	0.0200		107	80-120			

Reference (B0L1525-SRM1)

Prepared: 2020-12-16, Analyzed: 2020-12-16

Lithium, dissolved	0.104	0.00010 mg/L	0.100		104	70-130			
Aluminum, dissolved	0.214	0.0050 mg/L	0.235		91	70-130			
Antimony, dissolved	0.0492	0.00020 mg/L	0.0431		114	70-130			
Arsenic, dissolved	0.468	0.00050 mg/L	0.423		111	70-130			
Barium, dissolved	3.01	0.0050 mg/L	3.30		91	70-130			
Beryllium, dissolved	0.219	0.00010 mg/L	0.209		105	70-130			
Boron, dissolved	1.53	0.0500 mg/L	1.65		93	70-130			
Cadmium, dissolved	0.219	0.000010 mg/L	0.221		99	70-130			
Calcium, dissolved	7.55	0.20 mg/L	7.72		98	70-130			
Chromium, dissolved	0.460	0.00050 mg/L	0.434		106	70-130			
Cobalt, dissolved	0.132	0.00010 mg/L	0.124		106	70-130			
Copper, dissolved	0.861	0.00040 mg/L	0.815		106	70-130			
Iron, dissolved	1.20	0.010 mg/L	1.27		94	70-130			
Lead, dissolved	0.111	0.00020 mg/L	0.110		101	70-130			
Magnesium, dissolved	6.60	0.010 mg/L	6.59		100	70-130			
Manganese, dissolved	0.309	0.00020 mg/L	0.342		90	70-130			
Molybdenum, dissolved	0.425	0.00010 mg/L	0.404		105	70-130			
Nickel, dissolved	0.889	0.00040 mg/L	0.835		106	70-130			
Phosphorus, dissolved	0.576	0.050 mg/L	0.499		116	70-130			
Potassium, dissolved	2.92	0.10 mg/L	2.88		101	70-130			
Selenium, dissolved	0.0324	0.00050 mg/L	0.0324		100	70-130			
Sodium, dissolved	18.0	0.10 mg/L	18.0		100	70-130			
Strontium, dissolved	0.942	0.0010 mg/L	0.935		101	70-130			
Thallium, dissolved	0.0395	0.000020 mg/L	0.0385		103	70-130			
Uranium, dissolved	0.255	0.000020 mg/L	0.258		99	70-130			
Vanadium, dissolved	0.913	0.0010 mg/L	0.873		105	70-130			
Zinc, dissolved	0.900	0.0040 mg/L	0.848		106	70-130			

Dissolved Metals, Batch B0L1738

Blank (B0L1738-BLK1)

Prepared: 2020-12-18, Analyzed: 2020-12-18

Mercury, dissolved	< 0.000010	0.000010 mg/L							
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Reference (B0L1738-SRM1)

Prepared: 2020-12-18, Analyzed: 2020-12-18

Mercury, dissolved	0.00655	0.000010 mg/L	0.00581		113	70-130			
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General Parameters, Batch B0L1174

Blank (B0L1174-BLK1)

Prepared: 2020-12-12, Analyzed: 2020-12-17

BOD, 5-day	< 2.0	2.0 mg/L							
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LCS (B0L1174-BS1)

Prepared: 2020-12-12, Analyzed: 2020-12-17

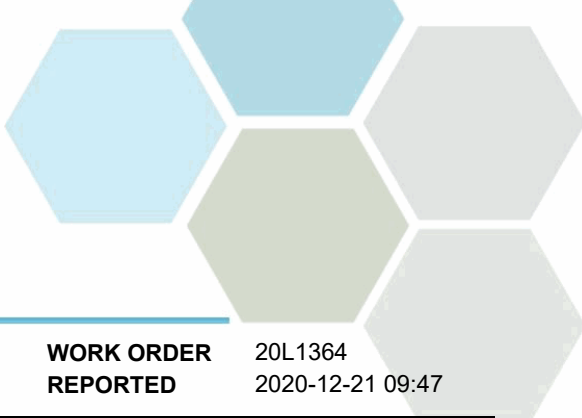
BOD, 5-day	180	45.1 mg/L	180		100	85-115			
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Duplicate (B0L1174-DUP1)

Source: 20L1364-01

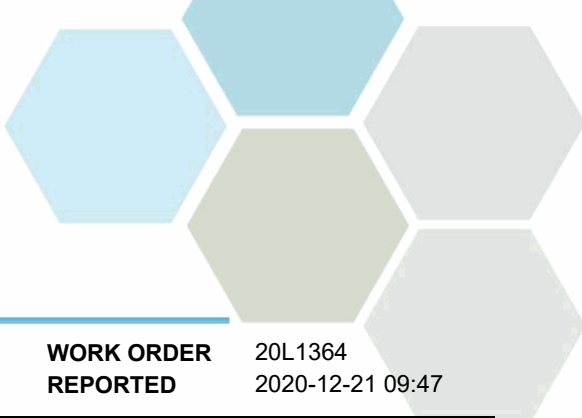
Prepared: 2020-12-12, Analyzed: 2020-12-17

BOD, 5-day	9.0	2.0 mg/L	8.5					22	
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APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT	Kelowna, City of RBCF Ponds		WORK ORDER REPORTED	20L1364 2020-12-21 09:47					
Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B0L1227									
Blank (B0L1227-BLK1)			Prepared: 2020-12-14, Analyzed: 2020-12-14						
Chemical Oxygen Demand	< 20	20 mg/L							
LCS (B0L1227-BS1)			Prepared: 2020-12-14, Analyzed: 2020-12-14						
Chemical Oxygen Demand	501	20 mg/L	500		100	89-115			
General Parameters, Batch B0L1243									
Blank (B0L1243-BLK1)			Prepared: 2020-12-14, Analyzed: 2020-12-14						
Solids, Total Suspended	< 2.0	2.0 mg/L							
Blank (B0L1243-BLK2)			Prepared: 2020-12-14, Analyzed: 2020-12-14						
Solids, Total Suspended	< 2.0	2.0 mg/L							
LCS (B0L1243-BS1)			Prepared: 2020-12-14, Analyzed: 2020-12-14						
Solids, Total Suspended	92.0	10.0 mg/L	100		92	85-115			
LCS (B0L1243-BS2)			Prepared: 2020-12-14, Analyzed: 2020-12-14						
Solids, Total Suspended	95.0	10.0 mg/L	100		95	85-115			
General Parameters, Batch B0L1249									
Blank (B0L1249-BLK1)			Prepared: 2020-12-14, Analyzed: 2020-12-14						
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
Blank (B0L1249-BLK2)			Prepared: 2020-12-14, Analyzed: 2020-12-14						
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
Blank (B0L1249-BLK3)			Prepared: 2020-12-14, Analyzed: 2020-12-14						
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
LCS (B0L1249-BS1)			Prepared: 2020-12-14, Analyzed: 2020-12-14						
Ammonia, Total (as N)	0.961	0.050 mg/L	1.00		96	90-115			
LCS (B0L1249-BS2)			Prepared: 2020-12-14, Analyzed: 2020-12-14						
Ammonia, Total (as N)	0.965	0.050 mg/L	1.00		96	90-115			
LCS (B0L1249-BS3)			Prepared: 2020-12-14, Analyzed: 2020-12-14						
Ammonia, Total (as N)	0.962	0.050 mg/L	1.00		96	90-115			
General Parameters, Batch B0L1463									
Blank (B0L1463-BLK1)			Prepared: 2020-11-16, Analyzed: 2020-11-16						
Solids, Total Dissolved	< 15	15 mg/L							
LCS (B0L1463-BS1)			Prepared: 2020-11-16, Analyzed: 2020-11-16						
Solids, Total Dissolved	239	15 mg/L	240		100	85-115			
General Parameters, Batch B0L1509									
Blank (B0L1509-BLK1)			Prepared: 2020-12-16, Analyzed: 2020-12-17						
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							
Blank (B0L1509-BLK2)			Prepared: 2020-12-16, Analyzed: 2020-12-17						
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							



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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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General Parameters, Batch B0L1509, Continued

LCS (B0L1509-BS1)			Prepared: 2020-12-16, Analyzed: 2020-12-17						
Nitrogen, Total Kjeldahl	1.02	0.050 mg/L	1.00		102	85-115			
LCS (B0L1509-BS2)			Prepared: 2020-12-16, Analyzed: 2020-12-17						
Nitrogen, Total Kjeldahl	1.02	0.050 mg/L	1.00		102	85-115			

General Parameters, Batch B0L1667

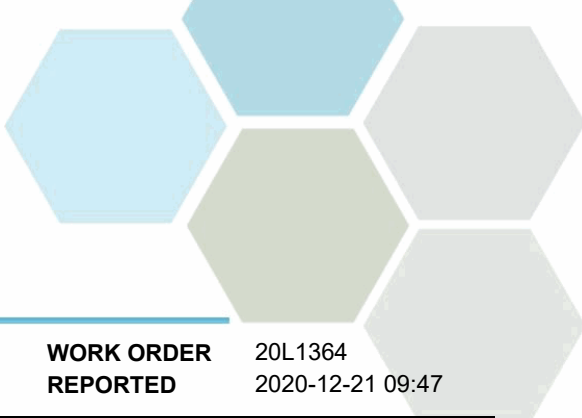
Blank (B0L1667-BLK1)			Prepared: 2020-12-17, Analyzed: 2020-12-17						
Conductivity (EC)	< 2.0	2.0 µS/cm							
Blank (B0L1667-BLK2)			Prepared: 2020-12-17, Analyzed: 2020-12-17						
Conductivity (EC)	< 2.0	2.0 µS/cm							
Blank (B0L1667-BLK3)			Prepared: 2020-12-17, Analyzed: 2020-12-17						
Conductivity (EC)	< 2.0	2.0 µS/cm							
LCS (B0L1667-BS4)			Prepared: 2020-12-17, Analyzed: 2020-12-17						
Conductivity (EC)	1430	2.0 µS/cm	1410		101	95-104			
LCS (B0L1667-BS5)			Prepared: 2020-12-17, Analyzed: 2020-12-17						
Conductivity (EC)	1440	2.0 µS/cm	1410		102	95-104			
LCS (B0L1667-BS6)			Prepared: 2020-12-17, Analyzed: 2020-12-17						
Conductivity (EC)	1440	2.0 µS/cm	1410		102	95-104			
Reference (B0L1667-SRM1)			Prepared: 2020-12-17, Analyzed: 2020-12-17						
pH	6.95	0.10 pH units	7.01		99	98-102			
Reference (B0L1667-SRM2)			Prepared: 2020-12-17, Analyzed: 2020-12-17						
pH	6.95	0.10 pH units	7.01		99	98-102			
Reference (B0L1667-SRM3)			Prepared: 2020-12-17, Analyzed: 2020-12-17						
pH	6.96	0.10 pH units	7.01		99	98-102			

Microbiological Parameters, Batch B0L1069

Blank (B0L1069-BLK1)			Prepared: 2020-12-11, Analyzed: 2020-12-11						
E. coli	< 1	1 MPN/100 mL							
Blank (B0L1069-BLK2)			Prepared: 2020-12-11, Analyzed: 2020-12-11						
Coliforms, Total	< 1	1 MPN/100 mL							
E. coli	< 1	1 MPN/100 mL							
Blank (B0L1069-BLK3)			Prepared: 2020-12-11, Analyzed: 2020-12-11						
Coliforms, Total	< 1	1 MPN/100 mL							
E. coli	< 1	1 MPN/100 mL							

Total Metals, Batch B0L1610

Blank (B0L1610-BLK1)			Prepared: 2020-12-17, Analyzed: 2020-12-18						
Mercury, total	< 0.000010	0.000010 mg/L							
Blank (B0L1610-BLK2)			Prepared: 2020-12-17, Analyzed: 2020-12-18						
Mercury, total	< 0.000010	0.000010 mg/L							
Blank (B0L1610-BLK3)			Prepared: 2020-12-17, Analyzed: 2020-12-18						
Mercury, total	< 0.000010	0.000010 mg/L							

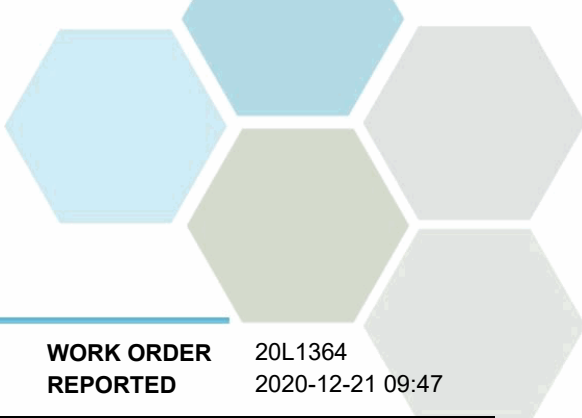


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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B0L1610, Continued									
Blank (B0L1610-BLK3), Continued			Prepared: 2020-12-17, Analyzed: 2020-12-18						
Reference (B0L1610-SRM1)			Prepared: 2020-12-17, Analyzed: 2020-12-18						
Mercury, total	0.00497	0.000010 mg/L	0.00581		86	70-130			
Reference (B0L1610-SRM2)			Prepared: 2020-12-17, Analyzed: 2020-12-18						
Mercury, total	0.00549	0.000010 mg/L	0.00581		95	70-130			
Reference (B0L1610-SRM3)			Prepared: 2020-12-17, Analyzed: 2020-12-18						
Mercury, total	0.00407	0.000010 mg/L	0.00581		70	70-130			
Total Metals, Batch B0L1646									
Blank (B0L1646-BLK1)			Prepared: 2020-12-17, Analyzed: 2020-12-17						
Aluminum, total	< 0.0050	0.0050 mg/L							
Antimony, total	< 0.00020	0.00020 mg/L							
Arsenic, total	< 0.00050	0.00050 mg/L							
Barium, total	< 0.0050	0.0050 mg/L							
Beryllium, total	< 0.00010	0.00010 mg/L							
Bismuth, total	< 0.00010	0.00010 mg/L							
Boron, total	< 0.0500	0.0500 mg/L							
Cadmium, total	< 0.000010	0.000010 mg/L							
Calcium, total	< 0.20	0.20 mg/L							
Chromium, total	< 0.00050	0.00050 mg/L							
Cobalt, total	< 0.00010	0.00010 mg/L							
Copper, total	< 0.00040	0.00040 mg/L							
Iron, total	< 0.010	0.010 mg/L							
Lead, total	< 0.00020	0.00020 mg/L							
Lithium, total	< 0.00010	0.00010 mg/L							
Magnesium, total	< 0.010	0.010 mg/L							
Manganese, total	< 0.00020	0.00020 mg/L							
Molybdenum, total	< 0.00010	0.00010 mg/L							
Nickel, total	< 0.00040	0.00040 mg/L							
Phosphorus, total	< 0.050	0.050 mg/L							
Potassium, total	< 0.10	0.10 mg/L							
Selenium, total	< 0.00050	0.00050 mg/L							
Silicon, total	< 1.0	1.0 mg/L							
Silver, total	< 0.000050	0.000050 mg/L							
Sodium, total	< 0.10	0.10 mg/L							
Strontium, total	< 0.0010	0.0010 mg/L							
Sulfur, total	< 3.0	3.0 mg/L							
Tellurium, total	< 0.00050	0.00050 mg/L							
Thallium, total	< 0.000020	0.000020 mg/L							
Thorium, total	< 0.00010	0.00010 mg/L							
Tin, total	< 0.00020	0.00020 mg/L							
Titanium, total	< 0.0050	0.0050 mg/L							
Tungsten, total	< 0.0010	0.0010 mg/L							
Uranium, total	< 0.000020	0.000020 mg/L							
Vanadium, total	< 0.0010	0.0010 mg/L							
Zinc, total	< 0.0040	0.0040 mg/L							
Zirconium, total	< 0.00010	0.00010 mg/L							
LCS (B0L1646-BS1)			Prepared: 2020-12-17, Analyzed: 2020-12-17						
Aluminum, total	0.0230	0.0050 mg/L	0.0199		116	80-120			
Antimony, total	0.0228	0.00020 mg/L	0.0200		114	80-120			
Arsenic, total	0.0221	0.00050 mg/L	0.0200		110	80-120			
Barium, total	0.0179	0.0050 mg/L	0.0198		90	80-120			



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

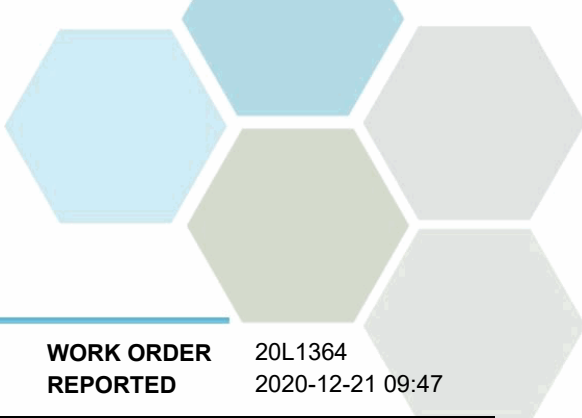
WORK ORDER REPORTED 20L1364
2020-12-21 09:47

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
---------	--------	----------	-------------	---------------	-------	-----------	-------	-----------	-----------

Total Metals, Batch B0L1646, Continued

LCS (B0L1646-BS1), Continued				Prepared: 2020-12-17, Analyzed: 2020-12-17					
Beryllium, total	0.0195	0.00010 mg/L	0.0198	99	80-120				
Bismuth, total	0.0204	0.00010 mg/L	0.0200	102	80-120				
Boron, total	< 0.0500	0.0500 mg/L	0.0200	90	80-120				
Cadmium, total	0.0204	0.000010 mg/L	0.0199	103	80-120				
Calcium, total	1.66	0.20 mg/L	2.02	82	80-120				
Chromium, total	0.0208	0.00050 mg/L	0.0198	105	80-120				
Cobalt, total	0.0205	0.00010 mg/L	0.0199	103	80-120				
Copper, total	0.0192	0.00040 mg/L	0.0200	96	80-120				
Iron, total	1.95	0.010 mg/L	2.02	96	80-120				
Lead, total	0.0200	0.00020 mg/L	0.0199	100	80-120				
Lithium, total	0.0200	0.00010 mg/L	0.0200	100	80-120				
Magnesium, total	2.05	0.010 mg/L	2.02	102	80-120				
Manganese, total	0.0195	0.00020 mg/L	0.0199	98	80-120				
Molybdenum, total	0.0201	0.00010 mg/L	0.0200	101	80-120				
Nickel, total	0.0210	0.00040 mg/L	0.0200	105	80-120				
Phosphorus, total	2.01	0.050 mg/L	2.00	100	80-120				
Potassium, total	1.89	0.10 mg/L	2.02	94	80-120				
Selenium, total	0.0184	0.00050 mg/L	0.0200	92	80-120				
Silicon, total	2.4	1.0 mg/L	2.00	119	80-120				
Silver, total	0.0204	0.000050 mg/L	0.0200	102	80-120				
Sodium, total	2.05	0.10 mg/L	2.02	102	80-120				
Strontium, total	0.0211	0.0010 mg/L	0.0200	106	80-120				
Sulfur, total	5.0	3.0 mg/L	5.00	100	80-120				
Tellurium, total	0.0198	0.00050 mg/L	0.0200	99	80-120				
Thallium, total	0.0204	0.000020 mg/L	0.0199	102	80-120				
Thorium, total	0.0197	0.00010 mg/L	0.0200	99	80-120				
Tin, total	0.0207	0.00020 mg/L	0.0200	103	80-120				
Titanium, total	0.0221	0.0050 mg/L	0.0200	110	80-120				
Tungsten, total	0.0202	0.0010 mg/L	0.0200	101	80-120				
Uranium, total	0.0202	0.000020 mg/L	0.0200	101	80-120				
Vanadium, total	0.0191	0.0010 mg/L	0.0200	95	80-120				
Zinc, total	0.0195	0.0040 mg/L	0.0200	97	80-120				
Zirconium, total	0.0207	0.00010 mg/L	0.0200	103	80-120				

Reference (B0L1646-SRM1)				Prepared: 2020-12-17, Analyzed: 2020-12-17					
Aluminum, total	0.303	0.0050 mg/L	0.299	101	70-130				
Antimony, total	0.0568	0.00020 mg/L	0.0517	110	70-130				
Arsenic, total	0.136	0.00050 mg/L	0.119	115	70-130				
Barium, total	0.832	0.0050 mg/L	0.801	104	70-130				
Beryllium, total	0.0500	0.00010 mg/L	0.0501	100	70-130				
Boron, total	3.30	0.0500 mg/L	4.11	80	70-130				
Cadmium, total	0.0522	0.000010 mg/L	0.0503	104	70-130				
Calcium, total	9.60	0.20 mg/L	10.7	90	70-130				
Chromium, total	0.265	0.00050 mg/L	0.250	106	70-130				
Cobalt, total	0.0406	0.00010 mg/L	0.0384	106	70-130				
Copper, total	0.519	0.00040 mg/L	0.487	107	70-130				
Iron, total	0.497	0.010 mg/L	0.504	99	70-130				
Lead, total	0.285	0.00020 mg/L	0.278	102	70-130				
Lithium, total	0.405	0.00010 mg/L	0.398	102	70-130				
Magnesium, total	3.79	0.010 mg/L	3.59	106	70-130				
Manganese, total	0.109	0.00020 mg/L	0.111	98	70-130				
Molybdenum, total	0.202	0.00010 mg/L	0.196	103	70-130				
Nickel, total	0.263	0.00040 mg/L	0.248	106	70-130				
Phosphorus, total	0.224	0.050 mg/L	0.213	105	70-130				
Potassium, total	5.99	0.10 mg/L	5.89	102	70-130				
Selenium, total	0.115	0.00050 mg/L	0.120	95	70-130				



APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Kelowna, City of
RBCF Ponds

WORK ORDER REPORTED 20L1364
2020-12-21 09:47

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B0L1646, Continued									
Reference (B0L1646-SRM1), Continued					Prepared: 2020-12-17, Analyzed: 2020-12-17				
Sodium, total	9.21	0.10 mg/L	8.71		106	70-130			
Strontium, total	0.422	0.0010 mg/L	0.393		107	70-130			
Thallium, total	0.0821	0.000020 mg/L	0.0787		104	70-130			
Uranium, total	0.0343	0.000020 mg/L	0.0344		100	70-130			
Vanadium, total	0.412	0.0010 mg/L	0.391		105	70-130			
Zinc, total	2.59	0.0040 mg/L	2.50		104	70-130			



golder.com

Appendix C

CQA Compost Analytical Results



www.compostquality.ca

SUMMARY OF ANALYSIS REPORT

To: City of Kelowna
1435 Water Street
Kelowna, British Columbia V1Y 1J4

CQA Member#: 18-2800

Attention: Marcia Browne or Jose Garcia

Sample I.D.: OGOGROW JANUARY 2020

Report#: C20142-10132
C20142-70019

Sample Date:

Reported Date: 2020-6-2

Compost to be Manufacture in: British Columbia

Feedstock:
Municipal Biosolids and Forestry Residues

CQA COMPOST QUALITY & VALUE TESTING PARAMETERS REPORT

SAMPLE ID	RECOMMENDED END USE/MARKET
OGOGROW JANUARY 2020	Category A
Regulatory	See Appendix I
Product Quality	See Appendix II
Product Value/ Soil Suitability*	See Appendix III (Soil, Enviro, Manure Compost)

The Compost Quality Alliance (CQA) is a voluntary quality monitoring program established by the Compost Council of Canada and the compost producers utilizing recognized standardized testing methodologies and uniform operating protocols to provide customer assurance in compost selection its use, and proper end-use utilization.

All analysis of this compost product was conducted and provided by A&L Canada Laboratories Inc. for the Compost Quality Alliance (CQA).

Haifeng Song, Senior Chemist

Ian McLachlin, Vice-President



A&L Canada Laboratories Inc.
London, Ontario Canada
(519) 457-2575

A proud member of



***PLEASE NOTE: Major Nutrients under the Fertilizer Act and Regulations (CFIA)**

Please see Appendix III for nutrient content (of impact to claims and labelling if used in declarations).

Compost is classified in Schedule II as a supplement, and as such nutrient guarantees are not mandatory. However, if any claims are made regarding nutritional value of the product, such as for composted manure, the product would then be classified as a supplement and a fertilizer, and the label would have to include the guarantees for the major nutrients. The guarantees for the major nutrients include the minimum amounts of Total Nitrogen (N), Available Phosphoric Acid (P2O5) and Soluble Potash K2O. Source: T-4-120 - Regulation of Compost under the Fertilizers Act and Regulations. <http://www.inspection.gc.ca/plants/fertilizers/trade-memoranda/t-4-120/eng/1307910204607/1307910352783>



Appendix I



CCME Guidelines 2005 & CFIA Fertilizer Act & Regulations:

Alberta, Manitoba, New Brunswick, Nova Scotia, Newfoundland, Prince Edward Island & Territories

A. Maximum Concentrations for Trace Metals in Compost†

Trace Elements	Test Results (ug/g)	Category A	Category B
		Maximum Concentration within Product (mg/kg dry weight)	
Arsenic (As)	1.35	13	75
Cadmium (Cd)	BDL	3	20
Chromium (Cr)	7.00	210	**
Cobalt (Co)	1.44	34	150
Copper (Cu)	107.15	400	**
Lead (Pb)	4.77	150	500
Mercury (Hg)	0.12	0.8	5
Molybdenum (Mo)	3.20	5	20
Nickel (Ni)	5.19	62	180
Selenium (Se)	BDL	2	14
Zinc (Zn)	138.75	700	1850

** Upper limits are not established in the Trade Memorandum.

B. Foreign Matter in Compost†

Test Results		Category A	Category B
Foreign Matter		Contains no more than 1 piece of foreign matter >25mm/500ml	Contains no more than 2 pieces of foreign matter > 25mm/500mL
Pieces >25mm/500mL	0		
Sharp Foreign Matter		No sharp foreign matter >3mm per 500ml	No more than 3 pieces of sharp matter < 12.5mm/500mL Note: This compost shall not be used in pastures, parks, or residential
Pieces > 3mm/500mL	0		
Pieces > 12.5mm/500mL	0		

C. Maturity/Stability†

Method	Test Results	Required Limits
CO ₂ Respiration Rate CO ₂ Respiration Rate	BDL	≤ 4 mg of carbon in the form of carbon dioxide per gram of organic matter per day
O ₂ Uptake Respiration Rate O ₂ Uptake Respiration Rate		≤ 400 mg oxygen/kg of volatile solids (or organic matter)/hour

D. Pathogens†

Pathogen	Test Results	Required Limits
Fecal Coliform (MPN/g dry)	19	<1000 MPN/g of total solids calculated on a dry weight basis
Salmonella (P-A/25g(ml))	NEGATIVE	<3 MPN/4g total solids calculated on a dry weight basis

†The following references are from the CCME guidelines (PN1340), October 2005

*BDL = Below Detectable Limits

E. CFIA

Parameter	Test Results
Total Organic Matter (%)	87.13%
Moisture (%)	52.48%

All analysis conducted and prepared by:

A L Canada Laboratories

2136 Jetstream Rd London, Ontario N5V 3P5 (519) 457-2575



Appendix II Finished Compost Quality



Parameter	Test Results
pH	6.9
Carbon to Nitrogen Ratio	31:1
Particle Size/Texture (inch)+	1/2 Inch
Soluble Salts (ms/cm)	2.8
Sodium Base Saturation (%Na)	7.48%
Major Nutrients	
Available Potassium (%K)	23.98%
Available Magnesium (%Mg)	28.84%
Available Calcium (%Ca)	34.60%

+ Majority of sample passes through this sieve size

Reference Compost Quality Parameters for CQA

Use	pH	C:N	Moisture	Particle Size	Soluble Salts	%Na
Remediation	5.8-8.5	10-40	NA	<2 in	<20	<3%
Soil Amendment	5.8-8.5	10-30	NA	<1/2 in	<6	<2%
Landscaping	5.8-8.5	12-22	<50%	<1/2 in	<5	<2%
Planting Media	5.5-7.8	12-22	<50%	<1/2 in	<4	<2%
Turf Establishment & Topdressing	5.5-7.8	12-22	<50%	<3/8 in	<3	<1%
Greenhouse Seeding	6-7	12-22	<25%	<1/4 in	<2	<0.5%
Greenhouse Establishment	6-7	12-22	<30%	<1/2 in	2-3.5	<0.5%
Field Nursery	5.8-8	10-30	<50%	<1/2 in	<3.5	<1%
Agricultural Soil Amendments	6-8	10-30	<50%	<1/2 in	<20	none
Potting Soil	5.5-7.2	12-22	<50%	<1/4 in	<2	<1%

These are examples of some of the many end uses suitable for compost

Unrestricted Use: Category A - Compost that can be used in any application, such as agricultural lands, residential gardens, horticultural operations, the nursery industry, and other businesses. Category A criteria for trace elements are achievable using best source separated MSW feedstock, municipal biosolids, pulp and paper mill biosolids, or manure.

Restricted Use: Category B - Compost that has a restricted use because of the presence of sharp foreign matter or higher trace element content. Category B compost may require additional control when deemed necessary by a province or territory.

Note: For a compost to meet the unrestricted use category, it must meet the unrestricted (Category A) requirements for all trace elements and sharp foreign matter. If the compost fails one criterion of the guideline for unrestricted use but meets the criteria for restricted (Category B) use, then it is classified as a Category B product. Products that do not meet the criteria for either Category A or B must be used or disposed of appropriately.



Appendix III
Compost Agricultural Product Value
on as is basis



Agricultural End-Use	Analysis Result	Unit	Quantity in lbs/Ton
Physical Parameters			
Dry Matter	47.52%	%	
pH	6.9		
Bulk Density	401	kg/m3	
C:N Ratio	31:1		
Fertilizer Equivalent Minerals			
Nitrogen Total	1.70%	%	34.0
Ammonium Nitrogen	852.55	ppm	1.71
Total Phosphate (P as P2O5)	0.54%	%	10.8
Total Potash (K as K2O)	0.35%	%	7.0
Calcium	0.43%	%	8.6
Magnesium	0.10%	%	2.0
Sulfur	1206.53	ppm	2.4

The Compost Quality Assurance program goes beyond the provincial requirements to establish full value and appropriate end-use. The Compost Report and Compost End-use table in Appendix II, has 10 different compost application uses from soil remediation, through to potting soil blends. Of note are available soluble salt limits and the percent available sodium for sensitive plants. Appendix III, lists the primary agricultural use parameters and quantitative nutrient content that reflects this compost samples agricultural end-use, and application value. This value includes macro and micro nutrients, soil building properties such as the addition of organic matter, increasing moisture holding capacity, and the soils slow release nutrients. These parameters improve beneficial soil health components soil structure and stability.

The results of our testing on this sample indicates that this product is a medium textured, compost (87%+ 1/2 in.), with rich mineral properties, which would meet criteria for agricultural soil amendment, blending and topdressing end-uses purposes. The C:N ratio 31:1 from Appendix II, on the soil suitability report indicates a low C:N ratio and indicating good nitrogen availability. The low C:N ratio in conjunction with the higher total nitrogen content listed in Appendix III indicates early high available nitrogen levels, and should be considered for crop planning. The proportion of available sodium (7.48% Na), which if used in too heavy a proportion could cause some problems with sensitive species. The sodium levels of this compost sample though high, is suitable for agricultural broadcast field applications and are made to improve the organic matter level and major nutrients phosphorus, potassium and magnesium levels. The compost is also rich in available calcium, sulfur, and iron, which make it ideal for soil enriching, and amendment. We recommend blending this material at a minimum of 5-6 parts soil blended to each part of this compost to dilute the sodium concentration.

Major Nutrients - Compost is classified in Schedule II (CFIA Fertilizer Act & Regulations) as a supplement, and as such, nutrient guarantees are not mandatory. However, if any claims are made regarding nutritional value of the product, such as for composted manure, the product would then be classified as a supplement and a fertilizer, and label would have to include the guarantees for the major nutrients. The guarantees for the major nutrients include the minimum amounts of Total Nitrogen (N), Available Phosphoric Acid (P2O5) and Soluble Potash (K2O).

Report Number: C20142-10132
 Account Number: 01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, Ontario, N5V 3P5
 Telephone: (519) 457-2575 Fax: (519) 457-2664



C20142-10132



To: CITY OF KELOWNA
 1435 WATER STREET
 KELOWNA, BC V1Y 1J4

For: OGOGROW JANUARY 2020

Attn: MARCIA BROWNE OR JOSE GARCIA

P.O. Number: 529772

Reported Date:
 Printed Date: Jun 2, 2020

COMPOST REPORT

Page: 1 / 1

Sample Number	Lab Number	pH	Lime Index	Available Organic Matter %	Phosphorus P ppm	Potassium K ppm	Magnesium Mg ppm	Calcium Ca ppm
OGOGROW JANU	93137	6.9	6.3	78.1	1547	2200	825	1628

Sulfur S ppm	Zinc Zn ppm	Manganese Mn ppm	Iron Fe ppm	Copper Cu ppm	Boron B ppm	Sodium Na ppm	Nitrate-N NO3-N ppm	Soluble Salt ms/cm	Nitrogen (Total) (%)	Chloride ppm
120	48.4	87	173	8.2	2.7	405	46	2.8	1.70	1530

INTERPRETATION

CEC		Percent Base Saturation				Proportional Equivalents (meq)				Cation Ratio		C/N Ratio
meq/100g	% BS	% K	% Mg	% Ca	% Na	K	Mg	Ca	Na	Mg/K	Ca/Mg	
23.5	94.9	23.98	28.84	34.60	7.48	5.64	6.78	8.14	1.76	1:1	1:1	31:1
Optimum Range:		3 - 5	8 - 20	60 - 80		0.5 - 1.3				7:1	5:1	

CQA

* Results reported on a dry weight basis.

The results of this report relate to the sample submitted and analyzed.

* Crop yield is influenced by a number of factors in addition to soil fertility.

No guarantee or warranty concerning crop performance is made by A & L.

Results Authorized By:  Ian McLachlin, Vice President

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A & L Canada Laboratories Inc.

2136 Jetstream Rd, London, Ontario, N5V 3P5

Telephone: (519) 457-2575 Fax: (519) 457-2664



REPORT NUMBER: C20142-10132

ACCOUNT NUMBER: 01759

REPORT OF ANALYSIS

TO: CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

RE: OGOGROW JANUARY 2020

CQA2000149

DATE RECEIVED: 2020-05-21

DATE REPORTED: 2020-06-02

PAGE: 1 / 1

P.O. NUMBER: 529772

Attn: MARCIA BROWNE OR JOSE GARCIA

LAB NO.	SAMPLE ID	ANALYSIS	RESULT	UNIT	METHOD
93137	OGOGROW JANUARY 2020	Nitrogen (Total)	1.7	%	TMECC.04.02-D



C20142-10132

Results Authorized By:

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REPORT NO.
C20142-70019

ACCOUNT NUMBER
01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664



TO:CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR:OGOGROW JANUARY 2020

ATTN:Marcia Browne or Jose Garcia

Phone:250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 1 / 3

PROJECT NO:

SAMPLE MATRIX:

PO#:

DATE SAMPLED:NONE GIVEN

LAB NUMBER:1427027

DATE RECEIVED:2020-05-21

SAMPLE ID:OGOGROW JANUARY 2020

DATE REPORTED:2020-05-29

DATE PRINTED:2020-06-02

PARAMETER	Result	UNIT	DETECTION LIMIT	METHOD REFERENCE
Arsenic	1.35	ug/g	1.00	EPA 3050B/6010B(mod) *
Cadmium	BDL	ug/g	1.00	EPA 3050B/6010B(mod) *
Cobalt	1.44	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Chromium	7.00	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)*
Copper	107.15	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Mercury	0.12	ug/g	0.10	EPA 7471 *
Molybdenum	3.2	ug/g	1.0	TMECC.04.06;EPA 3050/6010(mod)*
Nickel	5.19	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Lead	4.77	ug/g	1.00	EPA 3050B/6010B(mod) *
Selenium	BDL	ug/g	1.00	EPA 3050/6010 (mod) *
Zinc	138.75	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20142-70019

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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Additional information available upon request

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REPORT NO.
C20142-70019

ACCOUNT NUMBER
01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664



TO:CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR:OGOGROW JANUARY 2020

ATTN:Marcia Browne or Jose Garcia
Phone:250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 2 / 3

PROJECT NO:

PO#:
LAB NUMBER:1427027
SAMPLE ID:OGOGROW JANUARY 2020

SAMPLE MATRIX:
DATE SAMPLED:NONE GIVEN
DATE RECEIVED:2020-05-21
DATE REPORTED:2020-05-29
DATE PRINTED:2020-06-02

PARAMETER	Result	UNIT	DETECTION LIMIT	METHOD REFERENCE
E. coli	<3	MPN/g dry	3	TMECC 07.01
Salmonella spp.	NEGATIVE	P-A/ 25.0g(ml)	1 CFU	MFLP-75 *
Fecal Coliform	19	MPN/g dry	3	TMECC 07.01
Total sharps > 2.8 mm*	0	pieces/500ml		TMECC 03.08
Total sharps > 12.5 mm	0	pieces/500ml		TMECC 03.08
Total FM > 2.8 mm*	BDL	%	0.01	TMECC 03.08
Total FM > 25 mm	0	pieces/500ml		TMECC 03.08
Total plastics > 2.8 mm*	BDL	%	0.01	TMECC 03.08
Total Organic Matter @ 550 deg C	87.13	%	0.10	LOI@550C
Moisture	52.48	%	0.10	TMECC.03.09-A
Sieve 2 Inch (% Passing)	100.00	%	0.10	ASTMD422
Sieve 1 Inch (% Passing)	100.00	%	0.10	ASTMD422
Sieve 1/2 Inch (% Passing)	86.70	%	0.10	ASTMD422
Sieve 3/8 Inch (% Passing)	78.80	%	0.01	ASTMD422
Sieve 1/4 Inch (% Passing)	64.10	%	0.10	ASTMD422
Compost Stability Index	8	---		TMECC.05.08-B
Respiration-mgCO ₂ -C/g OM/day	BDL	mgCO ₂ -C/ gOM/day	0.01	TMECC.05.08-B
Respiration - mgCO ₂ -C/g TS/day	BDL	mgCO ₂ -C/ gTS/day	0.01	TMECC.05.08-B

Maturity Index: 8 - Inactive, highly matured compost, very well aged, possibly over-aged, like soil; no limitations for usage.

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20142-70019

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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REPORT NO.
C20142-70019

ACCOUNT NUMBER
01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664



TO: CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR: OGOGROW JANUARY 2020

ATTN: Marcia Browne or Jose Garcia
Phone: 250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 3 / 3

PROJECT NO:

PO#:
LAB NUMBER: 1427027
SAMPLE ID: OGOGROW JANUARY 2020

SAMPLE MATRIX:
DATE SAMPLED: NONE GIVEN
DATE RECEIVED: 2020-05-21
DATE REPORTED: 2020-05-29
DATE PRINTED: 2020-06-02

PARAMETER	Result Dry Weight	Result As Received	UNIT	DETECTION LIMIT	METHOD REFERENCE
Total Solids (as received)		47.52	%	0.10	Gravimetric
Nitrogen & Carbon					
Total Organic Carbon		48.41	%	0.10	Combustion
Nitrogen (Insoluble)	1.51	0.72	%	.01	TMECC.04.02-D
Nitrogen (Total)	1.64	0.78	%	0.10	ENV-G-003-6 *
Ammonia (NH3/NH4-N)	1794.09	852.55	ug/g	.01	Colourimetric
Metals					
Potassium	6060.00	2879.71	ug/g	5.00	TMECC.04.04
Total Potassium (as K2O)	0.73	0.35	%	0.05	ICP
Phosphorus	4950.50	2352.48	ug/g	5.00	TMECC.04.03 *
Total Phosphorus (as P2O5)	1.13	0.54	%	0.05	ICP
Aluminum	1251.50	594.71	ug/g	5.00	TMECC.04.07 *
Boron	17.43	8.28	ug/g	1.00	TMECC.04.05 *
Calcium	0.90	0.43	%	0.01	TMECC.04.05
Iron	3948.00	1876.09	ug/g	5.00	TMECC.04.05 *
Magnesium	0.20	0.10	%	0.01	TMECC.04.05 *
Manganese	209.40	99.51	ug/g	1.00	TMECC.04.05 *
Sodium	0.14	0.07	%	0.01	TMECC.04.05 *
Sulphur	2539.00	1206.53	ug/g	5.00	TMECC.04.05 *
Additional Parameters					
Bulk Density (as Recieved)		401	kg/m3	10	Gravimetric
Conductivity (@ 25 deg C)		2.79	ms/cm	0.02	Conductivity Meter

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20142-70019

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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www.compostquality.ca

SUMMARY OF ANALYSIS REPORT

To: City of Kelowna
1435 Water Street
Kelowna, British Columbia V1Y 1J4

CQA Member#: 18-2800

Attention: Marcia Browne or Jose Garcia

Sample I.D.: OGOGROW FEBRUARY 2020

Report#: C20142-10111
C20142-70006

Sample Date:
Reported Date: 2020-6-2

Compost to be Manufacture in: British Columbia

Feedstock:
Municipal Biosolids and Forestry Residues

CQA COMPOST QUALITY & VALUE TESTING PARAMETERS REPORT

SAMPLE ID	RECOMMENDED END USE/MARKET
OGOGROW FEBRUARY 2020	Category A
Regulatory	See Appendix I
Product Quality	See Appendix II
Product Value/ Soil Suitability*	See Appendix III (Soil, Enviro, Manure Compost)

The Compost Quality Alliance (CQA) is a voluntary quality monitoring program established by the Compost Council of Canada and the compost producers utilizing recognized standardized testing methodologies and uniform operating protocols to provide customer assurance in compost selection its use, and proper end-use utilization.

All analysis of this compost product was conducted and provided by A&L Canada Laboratories Inc. for the Compost Quality Alliance (CQA).

Haifeng Song, Senior Chemist

Ian McLachlin, Vice-President



A&L Canada Laboratories Inc.
London, Ontario Canada
(519) 457-2575

A proud member of



***PLEASE NOTE: Major Nutrients under the Fertilizer Act and Regulations (CFIA)**

Please see Appendix III for nutrient content (of impact to claims and labelling if used in declarations).

Compost is classified in Schedule II as a supplement, and as such nutrient guarantees are not mandatory. However, if any claims are made regarding nutritional value of the product, such as for composted manure, the product would then be classified as a supplement and a fertilizer, and the label would have to include the guarantees for the major nutrients. The guarantees for the major nutrients include the minimum amounts of Total Nitrogen (N), Available Phosphoric Acid (P2O5) and Soluble Potash K2O. Source: T-4-120 - Regulation of Compost under the Fertilizers Act and Regulations. <http://www.inspection.gc.ca/plants/fertilizers/trade-memoranda/t-4-120/eng/1307910204607/1307910352783>



Appendix I



CCME Guidelines 2005 & CFIA Fertilizer Act & Regulations:

Alberta, Manitoba, New Brunswick, Nova Scotia, Newfoundland, Prince Edward Island & Territories

A. Maximum Concentrations for Trace Metals in Compost:

Trace Elements	Test Results (ug/g)	Category A	Category B
		Maximum Concentration within Product (mg/kg dry weight)	
Arsenic (As)	1.81	13	75
Cadmium (Cd)	BDL	3	20
Chromium (Cr)	7.51	210	**
Cobalt (Co)	1.52	34	150
Copper (Cu)	140.85	400	**
Lead (Pb)	5.32	150	500
Mercury (Hg)	0.20	0.8	5
Molybdenum (Mo)	3.30	5	20
Nickel (Ni)	5.37	62	180
Selenium (Se)	BDL	2	14
Zinc (Zn)	185.40	700	1850

** Upper limits are not established in the Trade Memorandum.

B. Foreign Matter in Compost:

Test Results		Category A	Category B
Foreign Matter		Contains no more than 1 piece of foreign matter >25mm/500ml	Contains no more than 2 pieces of foreign matter > 25mm/500mL
Pieces >25mm/500mL	0		
Sharp Foreign Matter		No sharp foreign matter >3mm per 500ml	No more than 3 pieces of sharp matter < 12.5mm/500mL Note: This compost shall not be used in pastures, parks, or residential
Pieces > 3mm/500mL	0		
Pieces > 12.5mm/500mL	0		

C. Maturity/Stability:

Method	Test Results	Required Limits
CO ₂ Respiration Rate CO ₂ Respiration Rate	0.50	≤ 4 mg of carbon in the form of carbon dioxide per gram of organic matter per day
O ₂ Uptake Respiration Rate O ₂ Uptake Respiration Rate		≤ 400 mg oxygen/kg of volatile solids (or organic matter)/hour

D. Pathogens:

Pathogen	Test Results	Required Limits
Fecal Coliform (MPN/g dry)	484	<1000 MPN/g of total solids calculated on a dry weight basis
Salmonella (P-A/25g(ml))	NEGATIVE	<3 MPN/4g total solids calculated on a dry weight basis

The following references are from the CCME guidelines (PN1340), October 2005

*BDL = Below Detectable Limits

E. CFIA

Parameter	Test Results
Total Organic Matter (%)	84.87%
Moisture (%)	50.38%

All analysis conducted and prepared by:

A L Canada Laboratories

2136 Jetstream Rd London, Ontario N5V 3P5 (519) 457-2575



Appendix II Finished Compost Quality



Parameter	Test Results
pH	6.7
Carbon to Nitrogen Ratio	22:1
Particle Size/Texture (inch)+	1 Inch
Soluble Salts (ms/cm)	2.8
Sodium Base Saturation (%Na)	7.56%
Major Nutrients	
Available Potassium (%K)	25.88%
Available Magnesium (%Mg)	32.23%
Available Calcium (%Ca)	28.33%

+ Majority of sample passes through this sieve size

Reference Compost Quality Parameters for CQA

Use	pH	C:N	Moisture	Particle Size	Soluble Salts	%Na
Remediation	5.8-8.5	10-40	NA	<2 in	<20	<3%
Soil Amendment	5.8-8.5	10-30	NA	<1/2 in	<6	<2%
Landscaping	5.8-8.5	12-22	<50%	<1/2 in	<5	<2%
Planting Media	5.5-7.8	12-22	<50%	<1/2 in	<4	<2%
Turf Establishment & Topdressing	5.5-7.8	12-22	<50%	<3/8 in	<3	<1%
Greenhouse Seeding	6-7	12-22	<25%	<1/4 in	<2	<0.5%
Greenhouse Establishment	6-7	12-22	<30%	<1/2 in	2-3.5	<0.5%
Field Nursery	5.8-8	10-30	<50%	<1/2 in	<3.5	<1%
Agricultural Soil Amendments	6-8	10-30	<50%	<1/2 in	<20	none
Potting Soil	5.5-7.2	12-22	<50%	<1/4 in	<2	<1%

These are examples of some of the many end uses suitable for compost

Unrestricted Use: Category A - Compost that can be used in any application, such as agricultural lands, residential gardens, horticultural operations, the nursery industry, and other businesses. Category A criteria for trace elements are achievable using best source separated MSW feedstock, municipal biosolids, pulp and paper mill biosolids, or manure.

Restricted Use: Category B - Compost that has a restricted use because of the presence of sharp foreign matter or higher trace element content. Category B compost may require additional control when deemed necessary by a province or territory.

Note: For a compost to meet the unrestricted use category, it must meet the unrestricted (Category A) requirements for all trace elements and sharp foreign matter. If the compost fails one criterion of the guideline for unrestricted use but meets the criteria for restricted (Category B) use, then it is classified as a Category B product. Products that do not meet the criteria for either Category A or B must be used or disposed of appropriately.



Appendix III
Compost Agricultural Product Value
on as is basis



Agricultural End-Use	Analysis Result	Unit	Quantity in lbs/Ton
Physical Parameters			
Dry Matter	49.62%	%	
pH	6.7		
Bulk Density	471	kg/m3	
C:N Ratio	22:1		
Fertilizer Equivalent Minerals			
Nitrogen Total	2.29%	%	45.8
Ammonium Nitrogen	853.10	ppm	1.71
Total Phosphate (P as P2O5)	0.72%	%	14.4
Total Potash (K as K2O)	0.35%	%	7.0
Calcium	0.50%	%	10.0
Magnesium	0.13%	%	2.6
Sulfur	1382.66	ppm	2.8

The Compost Quality Assurance program goes beyond the provincial requirements to establish full value and appropriate end-use. The Compost Report and Compost End-use table in Appendix II, has 10 different compost application uses from soil remediation, through to potting soil blends. Of note are available soluble salt limits and the percent available sodium for sensitive plants. Appendix III, lists the primary agricultural use parameters and quantitative nutrient content that reflects this compost samples agricultural end-use, and application value. This value includes macro and micro nutrients, soil building properties such as the addition of organic matter, increasing moisture holding capacity, and the soils slow release nutrients. These parameters improve beneficial soil health components soil structure and stability.

The results of our testing on this sample indicates that this product is a coarse textured, compost (83%+ 1 in.), with rich mineral properties, which would meet criteria for remediation and mulching end-uses purposes. The C:N ratio 22:1 from Appendix II, on the soil suitability report indicates a low C:N ratio and indicating good nitrogen availability. The low C:N ratio in conjunction with the higher total nitrogen content listed in Appendix III indicates early high available nitrogen levels, and should be considered for crop planning. The proportion of available sodium (7.56% Na), which if used in too heavy a proportion could cause some problems with sensitive species. The sodium levels of this compost sample though high, is suitable for agricultural broadcast field applications and are made to improve the organic matter level and major nutrients phosphorus, potassium and magnesium levels. The compost is also rich in available calcium, sulfur, and iron, which make it ideal for soil enriching, and amendment. We recommend blending this material at a minimum of 5-6 parts soil blended to each part of this compost to dilute the sodium concentration.

Major Nutrients - Compost is classified in Schedule II (CFIA Fertilizer Act & Regulations) as a supplement, and as such, nutrient guarantees are not mandatory. However, if any claims are made regarding nutritional value of the product, such as for composted manure, the product would then be classified as a supplement and a fertilizer, and label would have to include the guarantees for the major nutrients. The guarantees for the major nutrients include the minimum amounts of Total Nitrogen (N), Available Phosphoric Acid (P2O5) and Soluble Potash (K2O).

Report Number: C20142-10111
Account Number: 01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, Ontario, N5V 3P5
Telephone: (519) 457-2575 Fax: (519) 457-2664



C20142-10111



To: CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

For: OGOGROW FEBRUARY 2020

Attn: MARCIA BROWNE OR JOSE GARCIA

P.O. Number: 529772

Reported Date:
Printed Date: Jun 2, 2020

COMPOST REPORT

Page: 1 / 1

Sample Number	Lab Number	pH	Lime Index	Available Organic Matter %	Phosphorus P ppm	Potassium K ppm	Magnesium Mg ppm	Calcium Ca ppm
OGOGROW FEBF	93094	6.7	6.2	76.0	1795	2688	1044	1509

Sulfur S ppm	Zinc Zn ppm	Manganese Mn ppm	Iron Fe ppm	Copper Cu ppm	Boron B ppm	Sodium Na ppm	Nitrate-N NO3-N ppm	Soluble Salt ms/cm	Nitrogen (Total) (%)	Chloride ppm
151	63.8	90	217	7.9	3.2	463	77	2.8	2.29	1646

INTERPRETATION

CEC		Percent Base Saturation				Proportional Equivalents (meq)				Cation Ratio		C/N Ratio
meq/100g	% BS	% K	% Mg	% Ca	% Na	K	Mg	Ca	Na	Mg/K	Ca/Mg	
26.6	94.0	25.88	32.23	28.33	7.56	6.89	8.59	7.54	2.01	1:1	1:1	22:1
Optimum Range:		3 - 5	8 - 20	60 - 80		0.5 - 1.3				7:1	5:1	

CQA

* Results reported on a dry weight basis.

The results of this report relate to the sample submitted and analyzed.

* Crop yield is influenced by a number of factors in addition to soil fertility.

No guarantee or warranty concerning crop performance is made by A & L.

Results Authorized By:

Ian McLachlin, Vice President

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A & L Canada Laboratories Inc.

2136 Jetstream Rd, London, Ontario, N5V 3P5
Telephone: (519) 457-2575 Fax: (519) 457-2664



REPORT NUMBER: C20142-10111
ACCOUNT NUMBER: 01759

REPORT OF ANALYSIS

TO: CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

RE: OGOGROW FEBRUARY 2020

CQA2000137

DATE RECEIVED: 2020-05-21

DATE REPORTED: 2020-06-02

PAGE: 1 / 1

P.O. NUMBER: 529772

Attn: MARCIA BROWNE OR JOSE GARCIA

LAB NO.	SAMPLE ID	ANALYSIS	RESULT	UNIT	METHOD
93094	OGOGROW FEBRUARY 202	Nitrogen (Total)	2.3	%	TMECC.04.02-D



C20142-10111

Results Authorized By:

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REPORT NO.
C20142-70006

ACCOUNT NUMBER
01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664



TO:CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR:OGOGROW FEBRUARY 2020

ATTN:Marcia Browne or Jose Garcia

Phone:250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 1 / 3

PROJECT NO:

PO#:529772

LAB NUMBER:1427015

SAMPLE ID:OGOGROW FEBRUARY 2020

SAMPLE MATRIX:

DATE SAMPLED:NONE GIVEN

DATE RECEIVED:2020-05-21

DATE REPORTED:2020-06-01

DATE PRINTED:2020-06-02

PARAMETER	Result	UNIT	DETECTION LIMIT	METHOD REFERENCE
Arsenic	1.81	ug/g	1.00	EPA 3050B/6010B(mod) *
Cadmium	BDL	ug/g	1.00	EPA 3050B/6010B(mod) *
Cobalt	1.52	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Chromium	7.51	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)*
Copper	140.85	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Mercury	0.20	ug/g	0.10	EPA 7471 *
Molybdenum	3.3	ug/g	1.0	TMECC.04.06;EPA 3050/6010(mod)*
Nickel	5.37	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Lead	5.32	ug/g	1.00	EPA 3050B/6010B(mod) *
Selenium	BDL	ug/g	1.00	EPA 3050/6010 (mod) *
Zinc	185.40	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20142-70006

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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REPORT NO.
C20142-70006

A & L Canada Laboratories Inc.



ACCOUNT NUMBER
01759

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664

TO:CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR:OGOGROW FEBRUARY 2020

ATTN:Marcia Browne or Jose Garcia

Phone:250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 2 / 3

PROJECT NO:

PO#:529772
LAB NUMBER:1427015
SAMPLE ID:OGOGROW FEBRUARY 2020

SAMPLE MATRIX:
DATE SAMPLED:NONE GIVEN
DATE RECEIVED:2020-05-21
DATE REPORTED:2020-06-01
DATE PRINTED:2020-06-02

PARAMETER	Result	UNIT	DETECTION LIMIT	METHOD REFERENCE
E. coli	188	MPN/g dry	3	TMECC 07.01
Salmonella spp.	NEGATIVE	P-A/ 25.0g(ml)	1 CFU	MFLP-75 *
Fecal Coliform	484	MPN/g dry	3	TMECC 07.01
Total sharps > 2.8 mm*	0	pieces/500ml		TMECC 03.08
Total sharps > 12.5 mm	0	pieces/500ml		TMECC 03.08
Total FM > 2.8 mm*	BDL	%	0.01	TMECC 03.08
Total FM > 25 mm	0	pieces/500ml		TMECC 03.08
Total plastics > 2.8 mm*	BDL	%	0.01	TMECC 03.08
Total Organic Matter @ 550 deg C	84.87	%	0.10	LOI@550C
Moisture	50.38	%	0.10	TMECC.03.09-A
Sieve 2 Inch (% Passing)	100.00	%	0.10	ASTMD422
Sieve 1 Inch (% Passing)	82.90	%	0.10	ASTMD422
Sieve 1/2 Inch (% Passing)	75.30	%	0.10	ASTMD422
Sieve 3/8 Inch (% Passing)	63.80	%	0.01	ASTMD422
Sieve 1/4 Inch (% Passing)	49.30	%	0.10	ASTMD422
Compost Stability Index	8	---		TMECC.05.08-B
Respiration-mgCO ₂ -C/g OM/day	0.50	mgCO ₂ -C/ gOM/day	0.01	TMECC.05.08-B
Respiration - mgCO ₂ -C/g TS/day	0.40	mgCO ₂ -C/ gTS/day	0.01	TMECC.05.08-B

Maturity Index: 8 - Inactive, highly matured compost, very well aged, possibly over-aged, like soil; no limitations for usage.

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20142-70006

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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REPORT NO.
C20142-70006

A & L Canada Laboratories Inc.



ACCOUNT NUMBER
01759

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664

TO:CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR:OGOGROW FEBRUARY 2020

ATTN:Marcia Browne or Jose Garcia
Phone:250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 3 / 3

PROJECT NO:

PO#:529772
LAB NUMBER:1427015
SAMPLE ID:OGOGROW FEBRUARY 2020

SAMPLE MATRIX:
DATE SAMPLED:NONE GIVEN
DATE RECEIVED:2020-05-21
DATE REPORTED:2020-06-01
DATE PRINTED:2020-06-02

PARAMETER	Result Dry Weight	Result As Received	UNIT	DETECTION LIMIT	METHOD REFERENCE
Total Solids (as received)		49.62	%	0.10	Gravimetric
Nitrogen & Carbon					
Total Organic Carbon		47.15	%	0.10	Combustion
Nitrogen (Insoluble)	1.79	0.89	%	.01	TMECC.04.02-D
Nitrogen (Total)	2.33	1.16	%	0.10	ENV-G-003-6 *
Ammonia (NH3/NH4-N)	1719.27	853.10	ug/g	.01	Colourimetric
Metals					
Potassium	5815.00	2885.40	ug/g	5.00	TMECC.04.04
Total Potassium (as K2O)	0.70	0.35	%	0.05	ICP
Phosphorus	6370.00	3160.79	ug/g	5.00	TMECC.04.03 *
Total Phosphorus (as P2O5)	1.46	0.72	%	0.05	ICP
Aluminum	1379.50	684.51	ug/g	5.00	TMECC.04.07 *
Boron	20.27	10.06	ug/g	1.00	TMECC.04.05 *
Calcium	1.00	0.50	%	0.01	TMECC.04.05
Iron	3382.50	1678.40	ug/g	5.00	TMECC.04.05 *
Magnesium	0.26	0.13	%	0.01	TMECC.04.05 *
Manganese	255.55	126.80	ug/g	1.00	TMECC.04.05 *
Sodium	0.12	0.06	%	0.01	TMECC.04.05 *
Sulphur	2786.50	1382.66	ug/g	5.00	TMECC.04.05 *
Additional Parameters					
Bulk Density (as Recieved)		471	kg/m3	10	Gravimetric
Conductivity (@ 25 deg C)		3.14	ms/cm	0.02	Conductivity Meter

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20142-70006

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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www.compostquality.ca

SUMMARY OF ANALYSIS REPORT

To: City of Kelowna
1435 Water Street
Kelowna, British Columbia V1Y 1J4

CQA Member#: 18-2800

Attention: Marcia Browne or Jose Garcia

Sample I.D.: OGOGROW MARCH 2020

Report#: C20142-10112
C20142-70007

Sample Date:
Reported Date: 2020-6-2

Compost to be Manufacture in: British Columbia

Feedstock:
Municipal Biosolids and Forestry Residues

CQA COMPOST QUALITY & VALUE TESTING PARAMETERS REPORT

SAMPLE ID	RECOMMENDED END USE/MARKET
OGOGROW MARCH 2020	Category A
Regulatory	See Appendix I
Product Quality	See Appendix II
Product Value/ Soil Suitability*	See Appendix III (Soil, Enviro, Manure Compost)

The Compost Quality Alliance (CQA) is a voluntary quality monitoring program established by the Compost Council of Canada and the compost producers utilizing recognized standardized testing methodologies and uniform operating protocols to provide customer assurance in compost selection its use, and proper end-use utilization.

All analysis of this compost product was conducted and provided by A&L Canada Laboratories Inc. for the Compost Quality Alliance (CQA).

Haifeng Song, Senior Chemist

Ian McLachlin, Vice-President



A&L Canada Laboratories Inc.
London, Ontario Canada
(519) 457-2575

A proud member of



***PLEASE NOTE: Major Nutrients under the Fertilizer Act and Regulations (CFIA)**

Please see Appendix III for nutrient content (of impact to claims and labelling if used in declarations).

Compost is classified in Schedule II as a supplement, and as such nutrient guarantees are not mandatory. However, if any claims are made regarding nutritional value of the product, such as for composted manure, the product would then be classified as a supplement and a fertilizer, and the label would have to include the guarantees for the major nutrients. The guarantees for the major nutrients include the minimum amounts of Total Nitrogen (N), Available Phosphoric Acid (P2O5) and Soluble Potash K2O. Source: T-4-120 - Regulation of Compost under the Fertilizers Act and Regulations. <http://www.inspection.gc.ca/plants/fertilizers/trade-memoranda/t-4-120/eng/1307910204607/1307910352783>



Appendix I



CCME Guidelines 2005 & CFIA Fertilizer Act & Regulations:

Alberta, Manitoba, New Brunswick, Nova Scotia, Newfoundland, Prince Edward Island & Territories

A. Maximum Concentrations for Trace Metals in Compost†

Trace Elements	Test Results (ug/g)	Maximum Concentration within Product (mg/kg dry weight)	
		Category A	Category B
Arsenic (As)	2.44	13	75
Cadmium (Cd)	BDL	3	20
Chromium (Cr)	11.36	210	**
Cobalt (Co)	2.22	34	150
Copper (Cu)	224.45	400	**
Lead (Pb)	8.68	150	500
Mercury (Hg)	0.13	0.8	5
Molybdenum (Mo)	4.40	5	20
Nickel (Ni)	8.15	62	180
Selenium (Se)	BDL	2	14
Zinc (Zn)	296.90	700	1850

** Upper limits are not established in the Trade Memorandum.

B. Foreign Matter in Compost†

Test Results		Category A	Category B
Foreign Matter		Contains no more than 1 piece of foreign matter >25mm/500ml	Contains no more than 2 pieces of foreign matter > 25mm/500mL
Pieces >25mm/500mL	0		
Sharp Foreign Matter		No sharp foreign matter >3mm per 500ml	No more than 3 pieces of sharp matter < 12.5mm/500mL Note: This compost shall not be used in pastures, parks, or residential
Pieces > 3mm/500mL	0		
Pieces > 12.5mm/500mL	0		

C. Maturity/Stability†

Method	Test Results	Required Limits
CO ₂ Respiration Rate CO ₂ Respiration Rate	BDL	≤ 4 mg of carbon in the form of carbon dioxide per gram of organic matter per day
O ₂ Uptake Respiration Rate O ₂ Uptake Respiration Rate		≤ 400 mg oxygen/kg of volatile solids (or organic matter)/hour

D. Pathogens†

Pathogen	Test Results	Required Limits
Fecal Coliform (MPN/g dry)	7	<1000 MPN/g of total solids calculated on a dry weight basis
Salmonella (P-A/25g(ml))	NEGATIVE	<3 MPN/4g total solids calculated on a dry weight basis

†The following references are from the CCME guidelines (PN1340), October 2005

*BDL = Below Detectable Limits

E. CFIA

Parameter	Test Results
Total Organic Matter (%)	81.76%
Moisture (%)	51.66%

All analysis conducted and prepared by:

A L Canada Laboratories

2136 Jetstream Rd London, Ontario N5V 3P5 (519) 457-2575



Appendix II Finished Compost Quality



Parameter	Test Results
pH	6.7
Carbon to Nitrogen Ratio	16:1
Particle Size/Texture (inch)+	1/2 Inch
Soluble Salts (ms/cm)	3.5
Sodium Base Saturation (%Na)	6.90%
Major Nutrients	
Available Potassium (%K)	28.26%
Available Magnesium (%Mg)	34.78%
Available Calcium (%Ca)	23.83%

+ Majority of sample passes through this sieve size

Reference Compost Quality Parameters for CQA

Use	pH	C:N	Moisture	Particle Size	Soluble Salts	%Na
Remediation	5.8-8.5	10-40	NA	<2 in	<20	<3%
Soil Amendment	5.8-8.5	10-30	NA	<1/2 in	<6	<2%
Landscaping	5.8-8.5	12-22	<50%	<1/2 in	<5	<2%
Planting Media	5.5-7.8	12-22	<50%	<1/2 in	<4	<2%
Turf Establishment & Topdressing	5.5-7.8	12-22	<50%	<3/8 in	<3	<1%
Greenhouse Seeding	6-7	12-22	<25%	<1/4 in	<2	<0.5%
Greenhouse Establishment	6-7	12-22	<30%	<1/2 in	2-3.5	<0.5%
Field Nursery	5.8-8	10-30	<50%	<1/2 in	<3.5	<1%
Agricultural Soil Amendments	6-8	10-30	<50%	<1/2 in	<20	none
Potting Soil	5.5-7.2	12-22	<50%	<1/4 in	<2	<1%

These are examples of some of the many end uses suitable for compost

Unrestricted Use: Category A - Compost that can be used in any application, such as agricultural lands, residential gardens, horticultural operations, the nursery industry, and other businesses. Category A criteria for trace elements are achievable using best source separated MSW feedstock, municipal biosolids, pulp and paper mill biosolids, or manure.

Restricted Use: Category B - Compost that has a restricted use because of the presence of sharp foreign matter or higher trace element content. Category B compost may require additional control when deemed necessary by a province or territory.

Note: For a compost to meet the unrestricted use category, it must meet the unrestricted (Category A) requirements for all trace elements and sharp foreign matter. If the compost fails one criterion of the guideline for unrestricted use but meets the criteria for restricted (Category B) use, then it is classified as a Category B product. Products that do not meet the criteria for either Category A or B must be used or disposed of appropriately.



Appendix III
Compost Agricultural Product Value
on as is basis



Agricultural End-Use	Analysis Result	Unit	Quantity in lbs/Ton
Physical Parameters			
Dry Matter	48.34%	%	
pH	6.7		
Bulk Density	400	kg/m3	
C:N Ratio	16:1		
Fertilizer Equivalent Minerals			
Nitrogen Total	3.12%	%	62.4
Ammonium Nitrogen	1265.92	ppm	2.53
Total Phosphate (P as P2O5)	1.30%	%	26.0
Total Potash (K as K2O)	0.43%	%	8.6
Calcium	0.73%	%	14.6
Magnesium	0.19%	%	3.8
Sulfur	1983.39	ppm	4.0

The Compost Quality Assurance program goes beyond the provincial requirements to establish full value and appropriate end-use. The Compost Report and Compost End-use table in Appendix II, has 10 different compost application uses from soil remediation, through to potting soil blends. Of note are available soluble salt limits and the percent available sodium for sensitive plants. Appendix III, lists the primary agricultural use parameters and quantitative nutrient content that reflects this compost samples agricultural end-use, and application value. This value includes macro and micro nutrients, soil building properties such as the addition of organic matter, increasing moisture holding capacity, and the soils slow release nutrients. These parameters improve beneficial soil health components soil structure and stability.

The results of our testing on this sample indicates that this product is a medium textured, compost (88%+ 1 in.), with rich mineral properties, which would meet criteria for agricultural soil amendment, blending and mulching end-uses purposes. The C:N ratio 16:1 from Appendix II, on the soil suitability report indicates a low C:N ratio and indicating good nitrogen availability. The low C:N ratio in conjunction with the higher total nitrogen content listed in Appendix III indicates early high available nitrogen levels, and should be considered for crop planning. The proportion of available sodium (6.90% Na), which if used in too heavy a proportion could cause some problems with sensitive species. The sodium levels of this compost sample though high, is suitable for agricultural broadcast field applications and are made to improve the organic matter level and major nutrients phosphorus, potassium and magnesium levels. The compost is also rich in available calcium, sulfur, and iron, which make it ideal for soil enriching, and amendment. We recommend blending this material at a minimum of 4-5 parts soil blended to each part of this compost to dilute the sodium concentration.

Major Nutrients - Compost is classified in Schedule II (CFIA Fertilizer Act & Regulations) as a supplement, and as such, nutrient guarantees are not mandatory. However, if any claims are made regarding nutritional value of the product, such as for composted manure, the product would then be classified as a supplement and a fertilizer, and label would have to include the guarantees for the major nutrients. The guarantees for the major nutrients include the minimum amounts of Total Nitrogen (N), Available Phosphoric Acid (P2O5) and Soluble Potash (K2O).

Report Number: C20142-10112
Account Number: 01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, Ontario, N5V 3P5
Telephone: (519) 457-2575 Fax: (519) 457-2664



C20142-10112



To: CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

For: OGOGROW MARCH 2020

Attn: MARCIA BROWNE OR JOSE GARCIA

P.O. Number: 529772

Reported Date:
Printed Date: Jun 2, 2020

COMPOST REPORT

Page: 1 / 1

Sample Number	Lab Number	pH	Lime Index	Available Organic Matter %	Phosphorus P ppm	Potassium K ppm	Magnesium Mg ppm	Calcium Ca ppm
OGOGROW MAR	93095	6.7	6.2	73.0	2261	2833	1087	1225

Sulfur S ppm	Zinc Zn ppm	Manganese Mn ppm	Iron Fe ppm	Copper Cu ppm	Boron B ppm	Sodium Na ppm	Nitrate-N NO3-N ppm	Soluble Salt ms/cm	Nitrogen (Total) (%)	Chloride ppm
226	72.5	74	184	10.0	2.9	408	23	3.5	3.12	1162

INTERPRETATION

CEC		Percent Base Saturation				Proportional Equivalents (meq)				Cation Ratio		C/N Ratio
meq/100g	% BS	% K	% Mg	% Ca	% Na	K	Mg	Ca	Na	Mg/K	Ca/Mg	
25.7	93.8	28.26	34.78	23.83	6.90	7.26	8.94	6.13	1.77	1:1	1:1	16:1
Optimum Range:		3 - 5	8 - 20	60 - 80		0.5 - 1.3				7:1	5:1	

CQA

* Results reported on a dry weight basis.

The results of this report relate to the sample submitted and analyzed.

* Crop yield is influenced by a number of factors in addition to soil fertility.

No guarantee or warranty concerning crop performance is made by A & L.

Results Authorized By:

Ian McLachlin, Vice President

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A & L Canada Laboratories Inc.

2136 Jetstream Rd, London, Ontario, N5V 3P5

Telephone: (519) 457-2575 Fax: (519) 457-2664



REPORT NUMBER: C20142-10112

ACCOUNT NUMBER: 01759

REPORT OF ANALYSIS

TO: CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

RE: OGOGROW MARCH 2020

CQA2000138

DATE RECEIVED: 2020-05-21

DATE REPORTED: 2020-06-02

PAGE: 1 / 1

P.O. NUMBER: 529772

Attn: MARCIA BROWNE OR JOSE GARCIA

LAB NO.	SAMPLE ID	ANALYSIS	RESULT	UNIT	METHOD
93095	OGOGROW MARCH 2020	Nitrogen (Total)	3.1	%	TMECC.04.02-D



C20142-10112

Results Authorized By:

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REPORT NO.
C20142-70007

ACCOUNT NUMBER
01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664



TO:CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR:OGOGROW MARCH 2020

ATTN:Marcia Browne or Jose Garcia
Phone:250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 1 / 3

PROJECT NO:

PO#:529772
LAB NUMBER:1427016
SAMPLE ID:OGOGROW MARCH 2020

SAMPLE MATRIX:
DATE SAMPLED:NONE GIVEN
DATE RECEIVED:2020-05-21
DATE REPORTED:2020-06-01
DATE PRINTED:2020-06-02

PARAMETER	Result	UNIT	DETECTION LIMIT	METHOD REFERENCE
Arsenic	2.44	ug/g	1.00	EPA 3050B/6010B(mod) *
Cadmium	BDL	ug/g	1.00	EPA 3050B/6010B(mod) *
Cobalt	2.22	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Chromium	11.36	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)*
Copper	224.45	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Mercury	0.13	ug/g	0.10	EPA 7471 *
Molybdenum	4.4	ug/g	1.0	TMECC.04.06;EPA 3050/6010(mod)*
Nickel	8.15	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Lead	8.68	ug/g	1.00	EPA 3050B/6010B(mod) *
Selenium	BDL	ug/g	1.00	EPA 3050/6010 (mod) *
Zinc	296.90	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20142-70007

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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TO:CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR:OGOGROW MARCH 2020

ATTN:Marcia Browne or Jose Garcia

Phone:250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 2 / 3

PROJECT NO:

PO#:529772
LAB NUMBER:1427016
SAMPLE ID:OGOGROW MARCH 2020

SAMPLE MATRIX:

DATE SAMPLED:NONE GIVEN
DATE RECEIVED:2020-05-21
DATE REPORTED:2020-06-01
DATE PRINTED:2020-06-02

PARAMETER	Result	UNIT	DETECTION LIMIT	METHOD REFERENCE
E. coli	7	MPN/g dry	3	TMECC 07.01
Salmonella spp.	NEGATIVE	P-A/ 25.0g(ml)	1 CFU	MFLP-75 *
Fecal Coliform	7	MPN/g dry	3	TMECC 07.01
Total sharps > 2.8 mm*	0	pieces/500ml		TMECC 03.08
Total sharps > 12.5 mm	0	pieces/500ml		TMECC 03.08
Total FM > 2.8 mm*	BDL	%	0.01	TMECC 03.08
Total FM > 25 mm	0	pieces/500ml		TMECC 03.08
Total plastics > 2.8 mm*	BDL	%	0.01	TMECC 03.08
Total Organic Matter @ 550 deg C	81.76	%	0.10	LOI@550C
Moisture	51.66	%	0.10	TMECC.03.09-A
Sieve 2 Inch (% Passing)	100.00	%	0.10	ASTMD422
Sieve 1 Inch (% Passing)	97.90	%	0.10	ASTMD422
Sieve 1/2 Inch (% Passing)	86.60	%	0.10	ASTMD422
Sieve 3/8 Inch (% Passing)	73.70	%	0.01	ASTMD422
Sieve 1/4 Inch (% Passing)	54.30	%	0.10	ASTMD422
Compost Stability Index	8	---		TMECC.05.08-B
Respiration-mgCO ₂ -C/g OM/day	BDL	mgCO ₂ -C/ gOM/day	0.01	TMECC.05.08-B
Respiration - mgCO ₂ -C/g TS/day	BDL	mgCO ₂ -C/ gTS/day	0.01	TMECC.05.08-B

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20142-70007

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664

TO: CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR: OGOGROW MARCH 2020

ATTN: Marcia Browne or Jose Garcia
Phone: 250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 3 / 3

PROJECT NO:

PO#: 529772
LAB NUMBER: 1427016
SAMPLE ID: OGOGROW MARCH 2020

SAMPLE MATRIX:
DATE SAMPLED: NONE GIVEN
DATE RECEIVED: 2020-05-21
DATE REPORTED: 2020-06-01
DATE PRINTED: 2020-06-02

PARAMETER	Result Dry Weight	Result As Received	UNIT	DETECTION LIMIT	METHOD REFERENCE
Total Solids (as received)		48.34	%	0.10	Gravimetric
Nitrogen & Carbon					
Total Organic Carbon		81.76	%	0.10	Combustion
Nitrogen (Insoluble)	2.94	1.42	%	.01	TMECC.04.02-D
Nitrogen (Total)	3.18	1.54	%	0.10	ENV-G-003-6 *
Ammonia (NH3/NH4-N)	2618.78	1265.92	ug/g	.01	Colourimetric
Metals					
Potassium	7380.00	3567.49	ug/g	5.00	TMECC.04.04
Total Potassium (as K2O)	0.89	0.43	%	0.05	ICP
Phosphorus	11690.00	5650.95	ug/g	5.00	TMECC.04.03 *
Total Phosphorus (as P2O5)	2.68	1.30	%	0.05	ICP
Aluminum	2543.50	1229.53	ug/g	5.00	TMECC.04.07 *
Boron	24.76	11.97	ug/g	1.00	TMECC.04.05 *
Calcium	1.52	0.73	%	0.01	TMECC.04.05
Iron	5385.00	2603.11	ug/g	5.00	TMECC.04.05 *
Magnesium	0.40	0.19	%	0.01	TMECC.04.05 *
Manganese	343.45	166.02	ug/g	1.00	TMECC.04.05 *
Sodium	0.14	0.07	%	0.01	TMECC.04.05 *
Sulphur	4103.00	1983.39	ug/g	5.00	TMECC.04.05 *
Additional Parameters					
Bulk Density (as Recieved)		400	kg/m3	10	Gravimetric
Conductivity (@ 25 deg C)		3.49	ms/cm	0.02	Conductivity Meter

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20142-70007

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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www.compostquality.ca

SUMMARY OF ANALYSIS REPORT

To: City of Kelowna
1435 Water Street
Kelowna, British Columbia V1Y 1J4

CQA Member#: 18-2800

Attention: Marcia Browne or Jose Garcia

Sample I.D.: OGOGROWAPRIL2020

Report#: C20303-10946
C20303-70015

Sample Date:
Reported Date: 2020-11-5

Compost to be Manufacture in: British Columbia
Feedstock: *Municipal Biosolids and Forestry Residues*

CQA COMPOST QUALITY & VALUE TESTING PARAMETERS REPORT

SAMPLE ID	RECOMMENDED END USE/MARKET
OGOGROWAPRIL2020	Category A
Regulatory	See Appendix I
Product Quality	See Appendix II
Product Value/ Soil Suitability*	See Appendix III (Soil, Enviro, Manure Compost)

The Compost Quality Alliance (CQA) is a voluntary quality monitoring program established by the Compost Council of Canada and the compost producers utilizing recognized standardized testing methodologies and uniform operating protocols to provide customer assurance in compost selection its use, and proper end-use utilization.

All analysis of this compost product was conducted and provided by A&L Canada Laboratories Inc. for the Compost Quality Alliance (CQA).

Haifeng Song, Senior Chemist

Ian McLachlin, Vice-President



A&L Canada Laboratories Inc.
London, Ontario Canada
(519) 457-2575

A proud member of



***PLEASE NOTE: Major Nutrients under the Fertilizer Act and Regulations (CFIA)**

Please see Appendix III for nutrient content (of impact to claims and labelling if used in declarations).

Compost is classified in Schedule II as a supplement, and as such nutrient guarantees are not mandatory. However, if any claims are made regarding nutritional value of the product, such as for composted manure, the product would then be classified as a supplement and a fertilizer, and the label would have to include the guarantees for the major nutrients. The guarantees for the major nutrients include the minimum amounts of Total Nitrogen (N), Available Phosphoric Acid (P2O5) and Soluble Potash K2O. Source: T-4-120 - Regulation of Compost under the Fertilizers Act and Regulations. <http://www.inspection.gc.ca/plants/fertilizers/trade-memoranda/t-4-120/eng/1307910204607/1307910352783>



Appendix I



CCME Guidelines 2005 & CFIA Fertilizer Act & Regulations:

Alberta, Manitoba, New Brunswick, Nova Scotia, Newfoundland, Prince Edward Island & Territories

A. Maximum Concentrations for Trace Metals in Compost†

Trace Elements	Test Results (ug/g)	Category A	Category B
		Maximum Concentration within Product (mg/kg dry weight)	
Arsenic (As)	2.49	13	75
Cadmium (Cd)	BDL	3	20
Chromium (Cr)	12.69	210	**
Cobalt (Co)	1.81	34	150
Copper (Cu)	227.85	400	**
Lead (Pb)	6.89	150	500
Mercury (Hg)	0.25	0.8	5
Molybdenum (Mo)	3.60	5	20
Nickel (Ni)	7.26	62	180
Selenium (Se)	BDL	2	14
Zinc (Zn)	260.25	700	1850

** Upper limits are not established in the Trade Memorandum.

B. Foreign Matter in Compost†

Test Results		Category A	Category B
Foreign Matter		Contains no more than 1 piece of foreign matter >25mm/500ml	Contains no more than 2 pieces of foreign matter > 25mm/500mL
Pieces >25mm/500mL	0		
Sharp Foreign Matter		No sharp foreign matter >3mm per 500ml	No more than 3 pieces of sharp matter < 12.5mm/500mL Note: This compost shall not be used in pastures, parks, or residential
Pieces > 3mm/500mL	0		
Pieces > 12.5mm/500mL	0		

C. Maturity/Stability†

Method	Test Results	Required Limits
CO₂ Respiration Rate CO ₂ Respiration Rate	BDL	≤ 4 mg of carbon in the form of carbon dioxide per gram of organic matter per day
O₂ Uptake Respiration Rate O ₂ Uptake Respiration Rate		≤ 400 mg oxygen/kg of volatile solids (or organic matter)/hour

D. Pathogens†

Pathogen	Test Results	Required Limits
Fecal Coliform (MPN/g dry)	318	<1000 MPN/g of total solids calculated on a dry weight basis
Salmonella (P-A/25g(ml))	NEGATIVE	<3 MPN/4g total solids calculated on a dry weight basis

†The following references are from the CCME guidelines (PN1340), October 2005

*BDL = Below Detectable Limits

E. CFIA

Parameter	Test Results
Total Organic Matter (%)	84.26%
Moisture (%)	52.76%

All analysis conducted and prepared by:

A L Canada Laboratories

2136 Jetstream Rd London, Ontario N5V 3P5 (519) 457-2575



Appendix II Finished Compost Quality



Parameter	Test Results
pH	6.6
Carbon to Nitrogen Ratio	18:1
Particle Size/Texture (inch)+	1 Inch
Soluble Salts (ms/cm)	1.5
Sodium Base Saturation (%Na)	7.87%
Major Nutrients	
Available Potassium (%K)	24.77%
Available Magnesium (%Mg)	35.96%
Available Calcium (%Ca)	23.67%

+ Majority of sample passes through this sieve size

Reference Compost Quality Parameters for CQA

Use	pH	C:N	Moisture	Particle Size	Soluble Salts	%Na
Remediation	5.8-8.5	10-40	NA	<2 in	<20	<3%
Soil Amendment	5.8-8.5	10-30	NA	<1/2 in	<6	<2%
Landscaping	5.8-8.5	12-22	<50%	<1/2 in	<5	<2%
Planting Media	5.5-7.8	12-22	<50%	<1/2 in	<4	<2%
Turf Establishment & Topdressing	5.5-7.8	12-22	<50%	<3/8 in	<3	<1%
Greenhouse Seeding	6-7	12-22	<25%	<1/4 in	<2	<0.5%
Greenhouse Establishment	6-7	12-22	<30%	<1/2 in	2-3.5	<0.5%
Field Nursery	5.8-8	10-30	<50%	<1/2 in	<3.5	<1%
Agricultural Soil Amendments	6-8	10-30	<50%	<1/2 in	<20	none
Potting Soil	5.5-7.2	12-22	<50%	<1/4 in	<2	<1%

These are examples of some of the many end uses suitable for compost

Unrestricted Use: Category A - Compost that can be used in any application, such as agricultural lands, residential gardens, horticultural operations, the nursery industry, and other businesses. Category A criteria for trace elements are achievable using best source separated MSW feedstock, municipal biosolids, pulp and paper mill biosolids, or manure.

Restricted Use: Category B - Compost that has a restricted use because of the presence of sharp foreign matter or higher trace element content. Category B compost may require additional control when deemed necessary by a province or territory.

Note: For a compost to meet the unrestricted use category, it must meet the unrestricted (Category A) requirements for all trace elements and sharp foreign matter. If the compost fails one criterion of the guideline for unrestricted use but meets the criteria for restricted (Category B) use, then it is classified as a Category B product. Products that do not meet the criteria for either Category A or B must be used or disposed of appropriately.



Appendix III
Compost Agricultural Product Value
on as is basis



Agricultural End-Use	Analysis Result	Unit	Quantity in lbs/Ton
Physical Parameters			
Dry Matter	47.24%	%	
pH	6.6		
Bulk Density	579	kg/m3	
C:N Ratio	18:1		
Fertilizer Equivalent Minerals			
Nitrogen Total	2.71%	%	54.2
Ammonium Nitrogen	947.37	ppm	1.89
Total Phosphate (P as P2O5)	1.36%	%	27.2
Total Potash (K as K2O)	0.31%	%	6.2
Calcium	0.60%	%	12.0
Magnesium	0.18%	%	3.6
Sulfur	1710.32	ppm	3.4

The Compost Quality Assurance program goes beyond the provincial requirements to establish full value and appropriate end-use. The Compost Report and Compost End-use table in Appendix II, has 10 different compost application uses from soil remediation, through to potting soil blends. Of note are available soluble salt limits and the percent available sodium for sensitive plants. Appendix III, lists the primary agricultural use parameters and quantitative nutrient content that reflects this compost samples agricultural end-use, and application value. This value includes macro and micro nutrients, soil building properties such as the addition of organic matter, increasing moisture holding capacity, and the soils slow release nutrients. These parameters improve beneficial soil health components soil structure and stability.

The results of our testing on this sample indicates that this product is a medium textured, compost (100%+ 1 in.), with rich mineral properties, which would meet criteria for remediation and mulching end-uses purposes. The C:N ratio 18:1 from Appendix II, on the soil suitability report indicates a low C:N ratio and indicating good nitrogen availability. The low C:N ratio in conjunction with the higher total nitrogen content listed in Appendix III indicates early high available nitrogen levels, and should be considered for crop planning. The proportion of available sodium (7.87% Na), which if used in too heavy a proportion could cause some problems with sensitive species. The sodium levels of this compost sample though high, is suitable for agricultural broadcast field applications and are made to improve the organic matter level and major nutrients phosphorus, potassium and magnesium levels. The compost is also rich in available calcium, sulfur, and iron, which make it ideal for soil enriching, and amendment. We recommend blending this material at a minimum of 5-6 parts soil blended to each part of this compost to dilute the sodium concentration.

Major Nutrients - Compost is classified in Schedule II (CFIA Fertilizer Act & Regulations) as a supplement, and as such, nutrient guarantees are not mandatory. However, if any claims are made regarding nutritional value of the product, such as for composted manure, the product would then be classified as a supplement and a fertilizer, and label would have to include the guarantees for the major nutrients. The guarantees for the major nutrients include the minimum amounts of Total Nitrogen (N), Available Phosphoric Acid (P2O5) and Soluble Potash (K2O).

Report Number: C20303-10946
 Account Number: 01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, Ontario, N5V 3P5
 Telephone: (519) 457-2575 Fax: (519) 457-2664



C20303-10946



To: CITY OF KELOWNA
 1435 WATER STREET
 KELOWNA, BC V1Y 1J4

For: OGOGROWAPRIL2020

Attn: MARCIA BROWNE OR JOSE GARCIA

P.O. Number: 532988

Reported Date:
 Printed Date: Nov 5, 2020

COMPOST REPORT

Page: 1 / 1

Sample Number	Lab Number	pH	Lime Index	Available Organic Matter %	Phosphorus P ppm	Potassium K ppm	Magnesium Mg ppm	Calcium Ca ppm
OGOGROWAPRIL	68600	6.6	6.3	74.3	1616	1500	679	735

Sulfur S ppm	Zinc Zn ppm	Manganese Mn ppm	Iron Fe ppm	Copper Cu ppm	Boron B ppm	Sodium Na ppm	Nitrate-N NO3-N ppm	Soluble Salt ms/cm	Nitrogen (Total) (%)	Chloride ppm
147	40.5	42	143	4.7	2.1	281	114	1.5	2.71	1092

INTERPRETATION

CEC		Percent Base Saturation				Proportional Equivalents (meq)				Cation Ratio		C/N Ratio
meq/100g	% BS	% K	% Mg	% Ca	% Na	K	Mg	Ca	Na	Mg/K	Ca/Mg	
15.5	92.3	24.77	35.96	23.67	7.87	3.85	5.58	3.67	1.22	1:1	1:1	18:1
Optimum Range:		3 - 5	8 - 20	60 - 80		0.5 - 1.3				7:1	5:1	

CQA

* Results reported on a dry weight basis.

The results of this report relate to the sample submitted and analyzed.

* Crop yield is influenced by a number of factors in addition to soil fertility.

No guarantee or warranty concerning crop performance is made by A & L.

Results Authorized By:

Ian McLachlin, Vice President

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A & L Canada Laboratories Inc.

2136 Jetstream Rd, London, Ontario, N5V 3P5

Telephone: (519) 457-2575 Fax: (519) 457-2664



REPORT NUMBER: C20303-10946

ACCOUNT NUMBER: 01759

REPORT OF ANALYSIS

TO: CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

RE: OGOGROWAPRIL2020

CQA2000368

DATE RECEIVED: 2020-10-29

DATE REPORTED: 2020-11-05

PAGE: 1 / 1

P.O. NUMBER: 532988

Attn: MARCIA BROWNE OR JOSE GARCIA

LAB NO.	SAMPLE ID	ANALYSIS	RESULT	UNIT	METHOD
68600	OGOGROWAPRIL20	Nitrogen (Total)	2.7	%	TMECC.04.02-D



C20303-10946

Results Authorized By:

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REPORT NO.
C20303-70015

ACCOUNT NUMBER
01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664



TO:CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR:OGOGROW APRIL 2020

ATTN:Marcia Browne or Jose Garcia
Phone:250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 1 / 3

PROJECT NO:

PO#:532988
LAB NUMBER:3037026
SAMPLE ID:OGOGROW APRIL 2020

SAMPLE MATRIX:COMPOST
DATE SAMPLED:NONE GIVEN
DATE RECEIVED:2020-10-29
DATE REPORTED:2020-11-05
DATE PRINTED:2020-11-05

PARAMETER	Result	UNIT	DETECTION LIMIT	METHOD REFERENCE
Arsenic	2.49	ug/g	1.00	EPA 3050B/6010B(mod) *
Cadmium	BDL	ug/g	1.00	EPA 3050B/6010B(mod) *
Cobalt	1.81	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Chromium	12.69	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)*
Copper	227.85	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Mercury	0.25	ug/g	0.10	EPA 7471 *
Molybdenum	3.6	ug/g	1.0	TMECC.04.06;EPA 3050/6010(mod)*
Nickel	7.26	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Lead	6.89	ug/g	1.00	EPA 3050B/6010B(mod) *
Selenium	BDL	ug/g	1.00	EPA 3050/6010 (mod) *
Zinc	260.25	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20303-70015

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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REPORT NO.
C20303-70015

A & L Canada Laboratories Inc.



ACCOUNT NUMBER
01759

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664

TO:CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR:OGOGROW APRIL 2020

ATTN:Marcia Browne or Jose Garcia
Phone:250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 2 / 3

PROJECT NO:

PO#:532988
LAB NUMBER:3037026
SAMPLE ID:OGOGROW APRIL 2020

SAMPLE MATRIX:COMPOST
DATE SAMPLED:NONE GIVEN
DATE RECEIVED:2020-10-29
DATE REPORTED:2020-11-05
DATE PRINTED:2020-11-05

PARAMETER	Result	UNIT	DETECTION LIMIT	METHOD REFERENCE
E. coli	197	MPN/g dry	3	TMECC 07.01
Salmonella spp.	NEGATIVE	P-A/ 25.0g(ml)	1 CFU	MFLP-75 *
Fecal Coliform	318	MPN/g dry	3	TMECC 07.01
Total sharps > 2.8 mm*	0	pieces/500ml		TMECC 03.08
Total sharps > 12.5 mm	0	pieces/500ml		TMECC 03.08
Total FM > 2.8 mm*	BDL	%	0.01	TMECC 03.08
Total FM > 25 mm	0	pieces/500ml		TMECC 03.08
Total plastics > 2.8 mm*	BDL	%	0.01	TMECC 03.08
Total Organic Matter @ 550 deg C	84.26	%	0.10	LOI@550C
Moisture	52.76	%	0.10	TMECC.03.09-A
Sieve 2 Inch (% Passing)	100.00	%	0.10	ASTMD422
Sieve 1 Inch (% Passing)	100.00	%	0.10	ASTMD422
Sieve 1/2 Inch (% Passing)	79.10	%	0.10	ASTMD422
Sieve 3/8 Inch (% Passing)	68.90	%	0.01	ASTMD422
Sieve 1/4 Inch (% Passing)	50.40	%	0.10	ASTMD422
Compost Stability Index	8	---		TMECC.05.08-B
Respiration-mgCO ₂ -C/g OM/day	BDL	mgCO ₂ -C/ gOM/day	0.01	TMECC.05.08-B
Respiration - mgCO ₂ -C/g TS/day	BDL	mgCO ₂ -C/ gTS/day	0.01	TMECC.05.08-B

Maturity Index: 8 - Inactive, highly matured compost, very well aged, possibly over-aged, like soil; no limitations for usage.

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20303-70015

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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REPORT NO.
C20303-70015

ACCOUNT NUMBER
01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664



TO:CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR:OGOGROW APRIL 2020

ATTN:Marcia Browne or Jose Garcia
Phone:250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 3 / 3

PROJECT NO:

PO#:532988
LAB NUMBER:3037026
SAMPLE ID:OGOGROW APRIL 2020

SAMPLE MATRIX:COMPOST
DATE SAMPLED:NONE GIVEN
DATE RECEIVED:2020-10-29
DATE REPORTED:2020-11-05
DATE PRINTED:2020-11-05

PARAMETER	Result Dry Weight	Result As Received	UNIT	DETECTION LIMIT	METHOD REFERENCE
Total Solids (as received)		47.24	%	0.10	Gravimetric
Nitrogen & Carbon					
Total Organic Carbon		46.81	%	0.10	Combustion
Nitrogen (Insoluble)	2.24	1.06	%	.01	TMECC.04.02-D
Nitrogen (Total)	3.00	1.42	%	0.10	ENV-G-003-6 *
Ammonia (NH3/NH4-N)	2005.44	947.37	ug/g	.01	Colourimetric
Metals					
Potassium	5440.00	2569.86	ug/g	5.00	TMECC.04.04
Total Potassium (as K2O)	0.66	0.31	%	0.05	ICP
Phosphorus	12595.00	5949.88	ug/g	5.00	TMECC.04.03 *
Total Phosphorus (as P2O5)	2.88	1.36	%	0.05	ICP
Aluminum	2677.50	1264.85	ug/g	5.00	TMECC.04.07 *
Boron	16.65	7.87	ug/g	1.00	TMECC.04.05 *
Calcium	1.27	0.60	%	0.01	TMECC.04.05
Iron	3881.50	1833.62	ug/g	5.00	TMECC.04.05 *
Magnesium	0.39	0.18	%	0.01	TMECC.04.05 *
Manganese	340.65	160.92	ug/g	1.00	TMECC.04.05 *
Sodium	0.15	0.07	%	0.01	TMECC.04.05 *
Sulphur	3620.50	1710.32	ug/g	5.00	TMECC.04.05 *
Additional Parameters					
Bulk Density (as Recieved)		579	kg/m3	10	Gravimetric
Conductivity (@ 25 deg C)		4.86	ms/cm	0.02	Conductivity Meter

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20303-70015

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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www.compostquality.ca

SUMMARY OF ANALYSIS REPORT

To: City of Kelowna
1435 Water Street
Kelowna, British Columbia V1Y 1J4

CQA Member#: 18-2800

Attention: Marcia Browne or Jose Garcia

Sample I.D.: OGOGROWMAY2020

Report#: C20303-10947
C20303-70016

Sample Date:
Reported Date: 2020-11-5
2020-12-16

Compost to be Manufacture in: British Columbia
Feedstock: *Municipal Biosolids and Forestry Residues*

CQA COMPOST QUALITY & VALUE TESTING PARAMETERS REPORT

SAMPLE ID	RECOMMENDED END USE/MARKET
OGOGROWMAY2020	Category A
Regulatory	See Appendix I
Product Quality	See Appendix II
Product Value/ Soil Suitability*	See Appendix III (Soil, Enviro, Manure Compost)

The Compost Quality Alliance (CQA) is a voluntary quality monitoring program established by the Compost Council of Canada and the compost producers utilizing recognized standardized testing methodologies and uniform operating protocols to provide customer assurance in compost selection its use, and proper end-use utilization.

All analysis of this compost product was conducted and provided by A&L Canada Laboratories Inc. for the Compost Quality Alliance (CQA).

Haifeng Song, Senior Chemist

Ian McLachlin, Vice-President



A&L Canada Laboratories Inc.
London, Ontario Canada
(519) 457-2575

A proud member of



***PLEASE NOTE: Major Nutrients under the Fertilizer Act and Regulations (CFIA)**

Please see Appendix III for nutrient content (of impact to claims and labelling if used in declarations).

Compost is classified in Schedule II as a supplement, and as such nutrient guarantees are not mandatory. However, if any claims are made regarding nutritional value of the product, such as for composted manure, the product would then be classified as a supplement and a fertilizer, and the label would have to include the guarantees for the major nutrients. The guarantees for the major nutrients include the minimum amounts of Total Nitrogen (N), Available Phosphoric Acid (P2O5) and Soluble Potash K2O. Source: T-4-120 - Regulation of Compost under the Fertilizers Act and Regulations. <http://www.inspection.gc.ca/plants/fertilizers/trade-memoranda/t-4-120/eng/1307910204607/1307910352783>



Appendix I



CCME Guidelines 2005 & CFIA Fertilizer Act & Regulations:

Alberta, Manitoba, New Brunswick, Nova Scotia, Newfoundland, Prince Edward Island & Territories

A. Maximum Concentrations for Trace Metals in Compost:

Trace Elements	Test Results (ug/g)	Category A	Category B
		Maximum Concentration within Product (mg/kg dry weight)	
Arsenic (As)	1.90	13	75
Cadmium (Cd)	BDL	3	20
Chromium (Cr)	10.03	210	**
Cobalt (Co)	1.68	34	150
Copper (Cu)	216.00	400	**
Lead (Pb)	6.34	150	500
Mercury (Hg)	0.18	0.8	5
Molybdenum (Mo)	3.50	5	20
Nickel (Ni)	6.64	62	180
Selenium (Se)	BDL	2	14
Zinc (Zn)	230.70	700	1850

** Upper limits are not established in the Trade Memorandum.

B. Foreign Matter in Compost:

Test Results		Category A	Category B
Foreign Matter		Contains no more than 1 piece of foreign matter >25mm/500ml	Contains no more than 2 pieces of foreign matter > 25mm/500mL
Pieces >25mm/500mL	0		
Sharp Foreign Matter		No sharp foreign matter >3mm per 500ml	No more than 3 pieces of sharp matter < 12.5mm/500mL Note: This compost shall not be used in pastures, parks, or residential
Pieces > 3mm/500mL	0		
Pieces > 12.5mm/500mL	0		

C. Maturity/Stability:

Method	Test Results	Required Limits
CO ₂ Respiration Rate CO ₂ Respiration Rate	0.10	≤ 4 mg of carbon in the form of carbon dioxide per gram of organic matter per day
O ₂ Uptake Respiration Rate O ₂ Uptake Respiration Rate		≤ 400 mg oxygen/kg of volatile solids (or organic matter)/hour

D. Pathogens:

Pathogen	Test Results	Required Limits
Fecal Coliform (MPN/g dry)	84	<1000 MPN/g of total solids calculated on a dry weight basis
Salmonella (P-A/25g(ml))	NEGATIVE	<3 MPN/4g total solids calculated on a dry weight basis

The following references are from the CCME guidelines (PN1340), October 2005

*BDL = Below Detectable Limits

E. CFIA

Parameter	Test Results
Total Organic Matter (%)	85.71%
Moisture (%)	55.96%

All analysis conducted and prepared by:

A L Canada Laboratories

2136 Jetstream Rd London, Ontario N5V 3P5 (519) 457-2575



Appendix II Finished Compost Quality



Parameter	Test Results
pH	7.2
Carbon to Nitrogen Ratio	19:1
Particle Size/Texture (inch)+	3/8 Inch
Soluble Salts (ms/cm)	1.5
Sodium Base Saturation (%Na)	8.10%
Major Nutrients	
Available Potassium (%K)	27.55%
Available Magnesium (%Mg)	42.55%
Available Calcium (%Ca)	21.79%

+ Majority of sample passes through this sieve size

Reference Compost Quality Parameters for CQA

Use	pH	C:N	Moisture	Particle Size	Soluble Salts	%Na
Remediation	5.8-8.5	10-40	NA	<2 in	<20	<3%
Soil Amendment	5.8-8.5	10-30	NA	<1/2 in	<6	<2%
Landscaping	5.8-8.5	12-22	<50%	<1/2 in	<5	<2%
Planting Media	5.5-7.8	12-22	<50%	<1/2 in	<4	<2%
Turf Establishment & Topdressing	5.5-7.8	12-22	<50%	<3/8 in	<3	<1%
Greenhouse Seeding	6-7	12-22	<25%	<1/4 in	<2	<0.5%
Greenhouse Establishment	6-7	12-22	<30%	<1/2 in	2-3.5	<0.5%
Field Nursery	5.8-8	10-30	<50%	<1/2 in	<3.5	<1%
Agricultural Soil Amendments	6-8	10-30	<50%	<1/2 in	<20	none
Potting Soil	5.5-7.2	12-22	<50%	<1/4 in	<2	<1%

These are examples of some of the many end uses suitable for compost

Unrestricted Use: Category A - Compost that can be used in any application, such as agricultural lands, residential gardens, horticultural operations, the nursery industry, and other businesses. Category A criteria for trace elements are achievable using best source separated MSW feedstock, municipal biosolids, pulp and paper mill biosolids, or manure.

Restricted Use: Category B - Compost that has a restricted use because of the presence of sharp foreign matter or higher trace element content. Category B compost may require additional control when deemed necessary by a province or territory.

Note: For a compost to meet the unrestricted use category, it must meet the unrestricted (Category A) requirements for all trace elements and sharp foreign matter. If the compost fails one criterion of the guideline for unrestricted use but meets the criteria for restricted (Category B) use, then it is classified as a Category B product. Products that do not meet the criteria for either Category A or B must be used or disposed of appropriately.



Appendix III
Compost Agricultural Product Value
on as is basis



Agricultural End-Use	Analysis Result	Unit	Quantity in lbs/Ton
Physical Parameters			
Dry Matter	44.04%	%	
pH	7.2		
Bulk Density	620	kg/m3	
C:N Ratio	19:1		
Fertilizer Equivalent Minerals			
Nitrogen Total	2.58%	%	51.6
Ammonium Nitrogen	1082.60	ppm	2.17
Total Phosphate (P as P2O5)	1.26%	%	25.2
Total Potash (K as K2O)	0.27%	%	5.4
Calcium	0.56%	%	11.2
Magnesium	0.15%	%	3.0
Sulfur	1401.79	ppm	2.8

The Compost Quality Assurance program goes beyond the provincial requirements to establish full value and appropriate end-use. The Compost Report and Compost End-use table in Appendix II, has 10 different compost application uses from soil remediation, through to potting soil blends. Of note are available soluble salt limits and the percent available sodium for sensitive plants. Appendix III, lists the primary agricultural use parameters and quantitative nutrient content that reflects this compost samples agricultural end-use, and application value. This value includes macro and micro nutrients, soil building properties such as the addition of organic matter, increasing moisture holding capacity, and the soils slow release nutrients. These parameters improve beneficial soil health components soil structure and stability.

The results of our testing on this sample indicates that this product is a fine textured, compost (84%+ 3/8 in.), with rich mineral properties, which would meet criteria for agricultural soil amendment, blending and topdressing end-uses purposes. The C:N ratio 19:1 from Appendix II, on the soil suitability report indicates a low C:N ratio and indicating good nitrogen availability. The low C:N ratio in conjunction with the higher total nitrogen content listed in Appendix III indicates early high available nitrogen levels, and should be considered for crop planning. The proportion of available sodium (8.10% Na), which if used in too heavy a proportion could cause some problems with sensitive species. The sodium levels of this compost sample though high, is suitable for agricultural broadcast field applications and are made to improve the organic matter level and major nutrients phosphorus, potassium and magnesium levels. The compost is also rich in available calcium, sulfur, and zinc, which make it ideal for soil enriching, and amendment. We recommend blending this material at a minimum of 5-6 parts soil blended to each part of this compost to dilute the sodium concentration.

Major Nutrients - Compost is classified in Schedule II (CFIA Fertilizer Act & Regulations) as a supplement, and as such, nutrient guarantees are not mandatory. However, if any claims are made regarding nutritional value of the product, such as for composted manure, the product would then be classified as a supplement and a fertilizer, and label would have to include the guarantees for the major nutrients. The guarantees for the major nutrients include the minimum amounts of Total Nitrogen (N), Available Phosphoric Acid (P2O5) and Soluble Potash (K2O).

Report Number: C20303-10947
 Account Number: 01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, Ontario, N5V 3P5
 Telephone: (519) 457-2575 Fax: (519) 457-2664



C20303-10947



To: CITY OF KELOWNA
 1435 WATER STREET
 KELOWNA, BC V1Y 1J4

For: OGOGROWMAY2020

Attn: MARCIA BROWNE OR JOSE GARCIA

P.O. Number: 532988

Reported Date:
 Printed Date: Nov 5, 2020

COMPOST REPORT

Page: 1 / 1

Sample Number	Lab Number	pH	Lime Index	Available Organic Matter %	Phosphorus P ppm	Potassium K ppm	Magnesium Mg ppm	Calcium Ca ppm
OGOGROWMAY2	68601	7.2	6.6	75.2	1798	1701	819	690

Sulfur S ppm	Zinc Zn ppm	Manganese Mn ppm	Iron Fe ppm	Copper Cu ppm	Boron B ppm	Sodium Na ppm	Nitrate-N NO3-N ppm	Soluble Salt ms/cm	Nitrogen (Total) (%)	Chloride ppm
76	43.4	49	148	6.6	2.6	295	29	1.5	2.58	1128

INTERPRETATION

CEC		Percent Base Saturation				Proportional Equivalents (meq)				Cation Ratio		C/N Ratio
meq/100g	% BS	% K	% Mg	% Ca	% Na	K	Mg	Ca	Na	Mg/K	Ca/Mg	
15.8	100.0	27.55	42.55	21.79	8.10	4.36	6.74	3.45	1.28	2:1	1:1	19:1
Optimum Range:		3 - 5	8 - 20	60 - 80		0.5 - 1.3				7:1	5:1	

CQA

* Results reported on a dry weight basis.

The results of this report relate to the sample submitted and analyzed.

* Crop yield is influenced by a number of factors in addition to soil fertility.

No guarantee or warranty concerning crop performance is made by A & L.

Results Authorized By:

Ian McLachlin, Vice President

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A & L Canada Laboratories Inc.

2136 Jetstream Rd, London, Ontario, N5V 3P5

Telephone: (519) 457-2575 Fax: (519) 457-2664



REPORT NUMBER: C20303-10947

ACCOUNT NUMBER: 01759

REPORT OF ANALYSIS

TO: CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

RE: OGOGROWMAY2020

CQA2000369

DATE RECEIVED: 2020-10-29

DATE REPORTED: 2020-11-05

PAGE: 1 / 1

P.O. NUMBER: 532988

Attn: MARCIA BROWNE OR JOSE GARCIA

LAB NO.	SAMPLE ID	ANALYSIS	RESULT	UNIT	METHOD
68601	OGOGROWMAY202	Nitrogen (Total)	2.6	%	TMECC.04.02-D



C20303-10947

Results Authorized By:

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REPORT NO.
C20303-70016

A & L Canada Laboratories Inc.



ACCOUNT NUMBER
01759

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664

TO:CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR:OGOGROW MAY 2020

ATTN:Marcia Browne or Jose Garcia

Phone:250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 1 / 3

PROJECT NO:

SAMPLE MATRIX:COMPOST
DATE SAMPLED:NONE GIVEN
DATE RECEIVED:2020-10-29
DATE REPORTED:2020-11-05
DATE PRINTED:2020-11-05

PO#:

LAB NUMBER:3037027
SAMPLE ID:OGOGROW MAY 2020

PARAMETER	Result	UNIT	DETECTION LIMIT	METHOD REFERENCE
Arsenic	1.90	ug/g	1.00	EPA 3050B/6010B(mod) *
Cadmium	BDL	ug/g	1.00	EPA 3050B/6010B(mod) *
Cobalt	1.68	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Chromium	10.03	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)*
Copper	216.00	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Mercury	0.18	ug/g	0.10	EPA 7471 *
Molybdenum	3.5	ug/g	1.0	TMECC.04.06;EPA 3050/6010(mod)*
Nickel	6.64	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Lead	6.34	ug/g	1.00	EPA 3050B/6010B(mod) *
Selenium	BDL	ug/g	1.00	EPA 3050/6010 (mod) *
Zinc	230.70	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20303-70016

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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A & L Canada Laboratories Inc.



ACCOUNT NUMBER
01759

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664

TO:CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR:OGOGROW MAY 2020

ATTN:Marcia Browne or Jose Garcia

Phone:250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 2 / 3

PROJECT NO:

SAMPLE MATRIX:COMPOST
DATE SAMPLED:NONE GIVEN
DATE RECEIVED:2020-10-29
DATE REPORTED:2020-11-05
DATE PRINTED:2020-11-05

PO#:

LAB NUMBER:3037027
SAMPLE ID:OGOGROW MAY 2020

PARAMETER	Result	UNIT	DETECTION LIMIT	METHOD REFERENCE
E. coli	>1000	MPN/g dry	3	TMECC 07.01
Salmonella spp.	NEGATIVE	P-A/ 25.0g(ml)	1 CFU	MFLP-75 *
Fecal Coliform	>1000	MPN/g dry	3	TMECC 07.01
Total sharps > 2.8 mm*	0	pieces/500ml		TMECC 03.08
Total sharps > 12.5 mm	0	pieces/500ml		TMECC 03.08
Total FM > 2.8 mm*	BDL	%	0.01	TMECC 03.08
Total FM > 25 mm	0	pieces/500ml		TMECC 03.08
Total plastics > 2.8 mm*	BDL	%	0.01	TMECC 03.08
Total Organic Matter @ 550 deg C	85.71	%	0.10	LOI@550C
Moisture	55.96	%	0.10	TMECC.03.09-A
Sieve 2 Inch (% Passing)	100.00	%	0.10	ASTMD422
Sieve 1 Inch (% Passing)	100.00	%	0.10	ASTMD422
Sieve 1/2 Inch (% Passing)	89.50	%	0.10	ASTMD422
Sieve 3/8 Inch (% Passing)	83.50	%	0.01	ASTMD422
Sieve 1/4 Inch (% Passing)	76.00	%	0.10	ASTMD422
Compost Stability Index	8	---		TMECC.05.08-B
Respiration-mgCO ₂ -C/g OM/day	0.10	mgCO ₂ -C/ gOM/day	0.01	TMECC.05.08-B
Respiration - mgCO ₂ -C/g TS/day	0.10	mgCO ₂ -C/ gTS/day	0.01	TMECC.05.08-B

Maturity Index: 8 - Inactive, highly matured compost, very well aged, possibly over-aged, like soil; no limitations for usage.

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20303-70016

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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REPORT NO.
C20303-70016

ACCOUNT NUMBER
01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664



TO:CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR:OGOGROW MAY 2020

ATTN:Marcia Browne or Jose Garcia
Phone:250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 3 / 3

PROJECT NO:

PO#:
LAB NUMBER:3037027
SAMPLE ID:OGOGROW MAY 2020

SAMPLE MATRIX:COMPOST
DATE SAMPLED:NONE GIVEN
DATE RECEIVED:2020-10-29
DATE REPORTED:2020-11-05
DATE PRINTED:2020-11-05

PARAMETER	Result Dry Weight	Result As Received	UNIT	DETECTION LIMIT	METHOD REFERENCE
Total Solids (as received)		44.04	%	0.10	Gravimetric
Nitrogen & Carbon					
Total Organic Carbon		47.62	%	0.10	Combustion
Nitrogen (Insoluble)	1.83	0.81	%	.01	TMECC.04.02-D
Nitrogen (Total)	2.68	1.18	%	0.10	ENV-G-003-6 *
Ammonia (NH3/NH4-N)	2458.22	1082.60	ug/g	.01	Colourimetric
Metals					
Potassium	5105.00	2248.24	ug/g	5.00	TMECC.04.04
Total Potassium (as K2O)	0.61	0.27	%	0.05	ICP
Phosphorus	12485.00	5498.39	ug/g	5.00	TMECC.04.03 *
Total Phosphorus (as P2O5)	2.86	1.26	%	0.05	ICP
Aluminum	2075.00	913.83	ug/g	5.00	TMECC.04.07 *
Boron	16.05	7.07	ug/g	1.00	TMECC.04.05 *
Calcium	1.27	0.56	%	0.01	TMECC.04.05
Iron	3419.00	1505.73	ug/g	5.00	TMECC.04.05 *
Magnesium	0.35	0.15	%	0.01	TMECC.04.05 *
Manganese	341.10	150.22	ug/g	1.00	TMECC.04.05 *
Sodium	0.14	0.06	%	0.01	TMECC.04.05 *
Sulphur	3183.00	1401.79	ug/g	5.00	TMECC.04.05 *
Additional Parameters					
Bulk Density (as Recieved)		620	kg/m3	10	Gravimetric
Conductivity (@ 25 deg C)		4.15	ms/cm	0.02	Conductivity Meter

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20303-70016

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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REPORT NO.
C20338-90001

ACCOUNT NUMBER
01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664



TO: CITY OF KELOWNA
1435 WATER STREET
2720 JOHN HINDLE DRIVE
KELOWNA, BC V1Y 1J4

ATTN: Marcia Browne or Jose Garcia

Phone: 250-469-8796



CERTIFICATE OF ANALYSIS

PAGE: 2 / 4

PROJECT NO:
PO#: 532988
LAB NUMBER: 3389030
SAMPLE ID: OGOGROW MAY 2020

SAMPLE MATRIX: SOLID
DATE SAMPLED: NONE GIVEN
DATE RECEIVED: 2020-12-03
DATE REPORTED: 2020-12-07
DATE PRINTED: 2020-12-16

PARAMETER	RESULT	UNIT	DETECTION LIMIT	METHOD REFERENCE
Fecal Coliform	84	MPN/g dry	3	TMECC 07.01

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20338-90001

Results Authorized By:

Keri Wang, Microbiology Manager

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www.compostquality.ca

SUMMARY OF ANALYSIS REPORT

To: City of Kelowna
1435 Water Street
Kelowna, British Columbia V1Y 1J4

CQA Member#: 18-2800

Attention: Marcia Browne or Jose Garcia

Sample I.D.: Ogogrow June 2020

Report#: C20324-10618
C20324-70011

Sample Date: 2020-11-18
Reported Date: 2020-11-27
2020-12-16

Compost to be Manufacture in: British Columbia
Feedstock: *Municipal Biosolids, Agroforestry Residues*

CQA COMPOST QUALITY & VALUE TESTING PARAMETERS REPORT

SAMPLE ID	RECOMMENDED END USE/MARKET
Ogogrow June 2020	Category A
Regulatory	See Appendix I
Product Quality	See Appendix II
Product Value/ Soil Suitability*	See Appendix III (Soil, Enviro, Manure Compost)

The Compost Quality Alliance (CQA) is a voluntary quality monitoring program established by the Compost Council of Canada and the compost producers utilizing recognized standardized testing methodologies and uniform operating protocols to provide customer assurance in compost selection its use, and proper end-use utilization.

All analysis of this compost product was conducted and provided by A&L Canada Laboratories Inc. for the Compost Quality Alliance (CQA).

Haifeng Song, Senior Chemist

Ian McLachlin, Vice-President



A&L Canada Laboratories Inc.
London, Ontario Canada
(519) 457-2575

A proud member of



***PLEASE NOTE: Major Nutrients under the Fertilizer Act and Regulations (CFIA)**

Please see Appendix III for nutrient content (of impact to claims and labelling if used in declarations).

Compost is classified in Schedule II as a supplement, and as such nutrient guarantees are not mandatory. However, if any claims are made regarding nutritional value of the product, such as for composted manure, the product would then be classified as a supplement and a fertilizer, and the label would have to include the guarantees for the major nutrients. The guarantees for the major nutrients include the minimum amounts of Total Nitrogen (N), Available Phosphoric Acid (P2O5) and Soluble Potash K2O. Source: T-4-120 - Regulation of Compost under the Fertilizers Act and Regulations. <http://www.inspection.gc.ca/plants/fertilizers/trade-memoranda/t-4-120/eng/1307910204607/1307910352783>



Appendix I



CCME Guidelines 2005 & CFIA Fertilizer Act & Regulations:

Alberta, Manitoba, New Brunswick, Nova Scotia, Newfoundland, Prince Edward Island & Territories

A. Maximum Concentrations for Trace Metals in Compost:

Trace Elements	Test Results (ug/g)	Category A	Category B
		Maximum Concentration within Product (mg/kg dry weight)	
Arsenic (As)	2.60	13	75
Cadmium (Cd)	BDL	3	20
Chromium (Cr)	12.32	210	**
Cobalt (Co)	1.86	34	150
Copper (Cu)	207.40	400	**
Lead (Pb)	7.53	150	500
Mercury (Hg)	0.23	0.8	5
Molybdenum (Mo)	4.40	5	20
Nickel (Ni)	7.75	62	180
Selenium (Se)	1.91	2	14
Zinc (Zn)	267.25	700	1850

** Upper limits are not established in the Trade Memorandum.

B. Foreign Matter in Compost:

Test Results		Category A	Category B
Foreign Matter		Contains no more than 1 piece of foreign matter >25mm/500ml	Contains no more than 2 pieces of foreign matter > 25mm/500mL
Pieces >25mm/500mL	0		
Sharp Foreign Matter		No sharp foreign matter >3mm per 500ml	No more than 3 pieces of sharp matter < 12.5mm/500mL Note: This compost shall not be used in pastures, parks, or residential
Pieces > 3mm/500mL	0		
Pieces > 12.5mm/500mL	0		

C. Maturity/Stability:

Method	Test Results	Required Limits
CO ₂ Respiration Rate CO ₂ Respiration Rate	1.50	≤ 4 mg of carbon in the form of carbon dioxide per gram of organic matter per day
O ₂ Uptake Respiration Rate O ₂ Uptake Respiration Rate		≤ 400 mg oxygen/kg of volatile solids (or organic matter)/hour

D. Pathogens:

Pathogen	Test Results	Required Limits
Fecal Coliform (MPN/g dry)	18	<1000 MPN/g of total solids calculated on a dry weight basis
Salmonella (P-A/25g(ml))	NEGATIVE	<3 MPN/4g total solids calculated on a dry weight basis

The following references are from the CCME guidelines (PN1340), October 2005

*BDL = Below Detectable Limits

E. CFIA

Parameter	Test Results
Total Organic Matter (%)	82.06%
Moisture (%)	44.22%

All analysis conducted and prepared by:

A L Canada Laboratories

2136 Jetstream Rd London, Ontario N5V 3P5 (519) 457-2575



Appendix II Finished Compost Quality



Parameter	Test Results
pH	6.5
Carbon to Nitrogen Ratio	14:1
Particle Size/Texture (inch)+	1/2 Inch
Soluble Salts (ms/cm)	3.6
Sodium Base Saturation (%Na)	6.35%
Major Nutrients	
Available Potassium (%K)	22.62%
Available Magnesium (%Mg)	47.78%
Available Calcium (%Ca)	16.16%

+ Majority of sample passes through this sieve size

Reference Compost Quality Parameters for CQA

Use	pH	C:N	Moisture	Particle Size	Soluble Salts	%Na
Remediation	5.8-8.5	10-40	NA	<2 in	<20	<3%
Soil Amendment	5.8-8.5	10-30	NA	<1/2 in	<6	<2%
Landscaping	5.8-8.5	12-22	<50%	<1/2 in	<5	<2%
Planting Media	5.5-7.8	12-22	<50%	<1/2 in	<4	<2%
Turf Establishment & Topdressing	5.5-7.8	12-22	<50%	<3/8 in	<3	<1%
Greenhouse Seeding	6-7	12-22	<25%	<1/4 in	<2	<0.5%
Greenhouse Establishment	6-7	12-22	<30%	<1/2 in	2-3.5	<0.5%
Field Nursery	5.8-8	10-30	<50%	<1/2 in	<3.5	<1%
Agricultural Soil Amendments	6-8	10-30	<50%	<1/2 in	<20	none
Potting Soil	5.5-7.2	12-22	<50%	<1/4 in	<2	<1%

These are examples of some of the many end uses suitable for compost

Unrestricted Use: Category A - Compost that can be used in any application, such as agricultural lands, residential gardens, horticultural operations, the nursery industry, and other businesses. Category A criteria for trace elements are achievable using best source separated MSW feedstock, municipal biosolids, pulp and paper mill biosolids, or manure.

Restricted Use: Category B - Compost that has a restricted use because of the presence of sharp foreign matter or higher trace element content. Category B compost may require additional control when deemed necessary by a province or territory.

Note: For a compost to meet the unrestricted use category, it must meet the unrestricted (Category A) requirements for all trace elements and sharp foreign matter. If the compost fails one criterion of the guideline for unrestricted use but meets the criteria for restricted (Category B) use, then it is classified as a Category B product. Products that do not meet the criteria for either Category A or B must be used or disposed of appropriately.



Appendix III
Compost Agricultural Product Value
 on as is basis



Agricultural End-Use	Analysis Result	Unit	Quantity in lbs/Ton
Physical Parameters			
Dry Matter	55.78%	%	
pH	6.5		
Bulk Density	543	kg/m3	
C:N Ratio	14:1		
Fertilizer Equivalent Minerals			
Nitrogen Total	3.42%	%	68.4
Ammonium Nitrogen	1935.75	ppm	3.87
Total Phosphate (P as P2O5)	1.66%	%	33.2
Total Potash (K as K2O)	0.35%	%	7.0
Calcium	0.80%	%	16.0
Magnesium	0.23%	%	4.6
Sulfur	1957.88	ppm	3.9

The Compost Quality Assurance program goes beyond the provincial requirements to establish full value and appropriate end-use. The Compost Report and Compost End-use table in Appendix II, has 10 different compost application uses from soil remediation, through to potting soil blends. Of note are available soluble salt limits and the percent available sodium for sensitive plants. Appendix III, lists the primary agricultural use parameters and quantitative nutrient content that reflects this compost samples agricultural end-use, and application value. This value includes macro and micro nutrients, soil building properties such as the addition of organic matter, increasing moisture holding capacity, and the soils slow release nutrients. These parameters improve beneficial soil health components soil structure and stability.

The results of our testing on this sample indicates that this product is a fine textured, compost (80%+ 3/8 in.), with rich mineral properties, which would meet criteria for agricultural soil amendment, blending and topdressing end-uses purposes. The C:N ratio 14:1 from Appendix II, on the soil suitability report indicates a low C:N ratio and indicating good nitrogen availability. The low C:N ratio in conjunction with the higher total nitrogen content listed in Appendix III indicates early high available nitrogen levels, and should be considered for crop planning. The proportion of available sodium (6.35% Na), which if used in too heavy a proportion could cause some problems with sensitive species. The sodium levels of this compost sample though high, is suitable for agricultural broadcast field applications and are made to improve the organic matter level and major nutrients phosphorus, potassium and magnesium levels. The compost is also rich in available calcium, sulfur, and zinc, which make it ideal for soil enriching, and amendment. We recommend blending this material at a minimum of 4-5 parts soil blended to each part of this compost to dilute the sodium concentration.

Major Nutrients - Compost is classified in Schedule II (CFIA Fertilizer Act & Regulations) as a supplement, and as such, nutrient guarantees are not mandatory. However, if any claims are made regarding nutritional value of the product, such as for composted manure, the product would then be classified as a supplement and a fertilizer, and label would have to include the guarantees for the major nutrients. The guarantees for the major nutrients include the minimum amounts of Total Nitrogen (N), Available Phosphoric Acid (P2O5) and Soluble Potash (K2O).

Report Number: C20324-10618
 Account Number: 01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, Ontario, N5V 3P5
 Telephone: (519) 457-2575 Fax: (519) 457-2664



C20324-10618



To: CITY OF KELOWNA
 1435 WATER STREET
 KELOWNA, BC V1Y 1J4

For: OGOGROW JUNE 2020

Attn: MARCIA BROWNE OR JOSE GARCIA

P.O. Number: 532988

Reported Date: 2020-11-26
 Printed Date: Nov 27, 2020

COMPOST REPORT

Page: 1 / 1

Sample Number	Lab Number	pH	Lime Index	Available Organic Matter %	Phosphorus P ppm	Potassium K ppm	Magnesium Mg ppm	Calcium Ca ppm
OGOGROW JUNE	25230	6.5	6.2	69.7	2958	1992	1312	730

Sulfur S ppm	Zinc Zn ppm	Manganese Mn ppm	Iron Fe ppm	Copper Cu ppm	Boron B ppm	Sodium Na ppm	Nitrate-N NO3-N ppm	Soluble Salt ms/cm	Nitrogen (Total) (%)	Chloride ppm
182	57.9	66	213	7.4	2.7	330	8	3.6	3.42	822

INTERPRETATION

CEC		Percent Base Saturation				Proportional Equivalents (meq)				Cation Ratio		C/N Ratio
meq/100g	% BS	% K	% Mg	% Ca	% Na	K	Mg	Ca	Na	Mg/K	Ca/Mg	
22.6	92.9	22.62	47.78	16.16	6.35	5.11	10.79	3.65	1.43	2:1		14:1
Optimum Range:		3 - 5	8 - 20	60 - 80		0.5 - 1.3				7:1		5:1

CQA

* Results reported on a dry weight basis.

The results of this report relate to the sample submitted and analyzed.

* Crop yield is influenced by a number of factors in addition to soil fertility.

No guarantee or warranty concerning crop performance is made by A & L.

Results Authorized By:

Ian McLachlin, Vice President

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A & L Canada Laboratories Inc.

2136 Jetstream Rd, London, Ontario, N5V 3P5

Telephone: (519) 457-2575 Fax: (519) 457-2664



REPORT NUMBER: C20324-10618

ACCOUNT NUMBER: 01759

REPORT OF ANALYSIS

TO: CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

RE: Oogrow June 2020

CQA2000411

DATE RECEIVED: 2020-11-19

DATE REPORTED: 2020-11-27

PAGE: 1 / 1

P.O. NUMBER: 532988

Attn: MARCIA BROWNE OR JOSE GARCIA

LAB NO.	SAMPLE ID	ANALYSIS	RESULT	UNIT	METHOD
25230	OGOGROW JUNE 2020	Nitrogen (Total)	3.4	%	TMECC.04.02-D



C20324-10618

Results Authorized By:

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REPORT NO.
C20324-70011

ACCOUNT NUMBER
01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664



TO:CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR:OGOGROW JUNE 2020

ATTN:Marcia Browne or Jose Garcia
Phone:250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 1 / 3

PROJECT NO:

PO#:532988
LAB NUMBER:3247016
SAMPLE ID:OGOGROW JUNE 2020

SAMPLE MATRIX:COMPOST
DATE SAMPLED:2020-11-18
DATE RECEIVED:2020-11-19
DATE REPORTED:2020-11-26
DATE PRINTED:2020-11-27

PARAMETER	Result	UNIT	DETECTION LIMIT	METHOD REFERENCE
Arsenic	2.60	ug/g	1.00	EPA 3050B/6010B(mod) *
Cadmium	BDL	ug/g	1.00	EPA 3050B/6010B(mod) *
Cobalt	1.86	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Chromium	12.32	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)*
Copper	207.40	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Mercury	0.23	ug/g	0.10	EPA 7471 *
Molybdenum	4.4	ug/g	1.0	TMECC.04.06;EPA 3050/6010(mod)*
Nickel	7.75	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Lead	7.53	ug/g	1.00	EPA 3050B/6010B(mod) *
Selenium	1.91	ug/g	1.00	EPA 3050/6010 (mod) *
Zinc	267.25	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20324-70011

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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C20324-70011

ACCOUNT NUMBER
01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664



TO:CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR:OGOGROW JUNE 2020

ATTN:Marcia Browne or Jose Garcia

Phone:250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 2 / 3

PROJECT NO:

PO#:532988
LAB NUMBER:3247016
SAMPLE ID:OGOGROW JUNE 2020

SAMPLE MATRIX:COMPOST
DATE SAMPLED:2020-11-18
DATE RECEIVED:2020-11-19
DATE REPORTED:2020-11-26
DATE PRINTED:2020-11-27

PARAMETER	Result	UNIT	DETECTION LIMIT	METHOD REFERENCE
E. coli	>1000	MPN/g dry	3	TMECC 07.01
Salmonella spp.	NEGATIVE	P-A/ 25.0g(ml)	1 CFU	MFLP-75 *
Fecal Coliform	>1000	MPN/g dry	3	TMECC 07.01
Total sharps > 2.8 mm*	0	pieces/500ml		TMECC 03.08
Total sharps > 12.5 mm	0	pieces/500ml		TMECC 03.08
Total FM > 2.8 mm*	BDL	%	0.01	TMECC 03.08
Total FM > 25 mm	0	pieces/500ml		TMECC 03.08
Total plastics > 2.8 mm*	BDL	%	0.01	TMECC 03.08
Total Organic Matter @ 550 deg C	82.06	%	0.10	LOI@550C
Moisture	44.22	%	0.10	TMECC.03.09-A
Sieve 2 Inch (% Passing)	100.00	%	0.10	ASTMD422
Sieve 1 Inch (% Passing)	100.00	%	0.10	ASTMD422
Sieve 1/2 Inch (% Passing)	89.20	%	0.10	ASTMD422
Sieve 3/8 Inch (% Passing)	79.70	%	0.01	ASTMD422
Sieve 1/4 Inch (% Passing)	63.50	%	0.10	ASTMD422
Compost Stability Index	8	---		TMECC.05.08-B
Respiration-mgCO ₂ -C/g OM/day	1.50	mgCO ₂ -C/ gOM/day	0.01	TMECC.05.08-B
Respiration - mgCO ₂ -C/g TS/day	1.20	mgCO ₂ -C/ gTS/day	0.01	TMECC.05.08-B

Maturity Index: 8 - Inactive, highly matured compost, very well aged, possibly over-aged, like soil; no limitations for usage.

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20324-70011

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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REPORT NO.
C20324-70011

A & L Canada Laboratories Inc.



ACCOUNT NUMBER
01759

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664

TO: CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR: OGOGROW JUNE 2020

ATTN: Marcia Browne or Jose Garcia
Phone: 250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 3 / 3

PROJECT NO:

PO#: 532988
LAB NUMBER: 3247016
SAMPLE ID: OGOGROW JUNE 2020

SAMPLE MATRIX: COMPOST
DATE SAMPLED: 2020-11-18
DATE RECEIVED: 2020-11-19
DATE REPORTED: 2020-11-26
DATE PRINTED: 2020-11-27

PARAMETER	Result Dry Weight	Result As Received	UNIT	DETECTION LIMIT	METHOD REFERENCE
Total Solids (as received)		55.78	%	0.10	Gravimetric
Nitrogen & Carbon					
Total Organic Carbon		45.59	%	0.10	Combustion
Ammonia (NH ₃ /NH ₄ -N)	3470.33	1935.75	ug/g	.01	Colourimetric
Metals					
Potassium	5185.00	2892.19	ug/g	5.00	TMECC.04.04
Total Potassium (as K ₂ O)	0.62	0.35	%	0.05	ICP
Phosphorus	12965.00	7231.88	ug/g	5.00	TMECC.04.03 *
Total Phosphorus (as P ₂ O ₅)	2.97	1.66	%	0.05	ICP
Aluminum	2761.00	1540.09	ug/g	5.00	TMECC.04.07 *
Boron	17.38	9.69	ug/g	1.00	TMECC.04.05 *
Calcium	1.43	0.80	%	0.01	TMECC.04.05
Iron	4786.50	2669.91	ug/g	5.00	TMECC.04.05 *
Magnesium	0.42	0.23	%	0.01	TMECC.04.05 *
Manganese	390.10	217.60	ug/g	1.00	TMECC.04.05 *
Sodium	0.17	0.09	%	0.01	TMECC.04.05 *
Sulphur	3510.00	1957.88	ug/g	5.00	TMECC.04.05 *
Additional Parameters					
Bulk Density (as Recieved)		543	kg/m ³	10	Gravimetric
Conductivity (@ 25 deg C)		2.52	ms/cm	0.02	Conductivity Meter

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20324-70011

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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REPORT NO.
C20338-90001

ACCOUNT NUMBER
01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664



TO: CITY OF KELOWNA
1435 WATER STREET
2720 JOHN HINDLE DRIVE
KELOWNA, BC V1Y 1J4

ATTN: Marcia Browne or Jose Garcia
Phone: 250-469-8796



CERTIFICATE OF ANALYSIS

PAGE: 1 / 4

PROJECT NO:
PO#: 532988
LAB NUMBER: 3389029
SAMPLE ID: OGOGROW JUNE 2020

SAMPLE MATRIX: SOLID
DATE SAMPLED: NONE GIVEN
DATE RECEIVED: 2020-12-03
DATE REPORTED: 2020-12-07
DATE PRINTED: 2020-12-16

PARAMETER	RESULT	UNIT	DETECTION LIMIT	METHOD REFERENCE
Fecal Coliform	18	MPN/g dry	3	TMECC 07.01

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20338-90001

Results Authorized By:

Keri Wang, Microbiology Manager

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www.compostquality.ca

SUMMARY OF ANALYSIS REPORT

To: City of Kelowna
1435 Water Street
Kelowna, British Columbia V1Y 1J4

CQA Member#: 18-2800

Attention: Marcia Browne or Jose Garcia

Sample I.D.: Ogogrow July 2020

Report#: C20324-10619
C20324-70012

Sample Date: 2020-11-18
Reported Date: 2020-11-27
2020-12-16

Compost to be Manufacture in: British Columbia
Feedstock: *Municipal Biosolids, Agriforestry Residues*

CQA COMPOST QUALITY & VALUE TESTING PARAMETERS REPORT

SAMPLE ID	RECOMMENDED END USE/MARKET
Ogogrow July 2020	Category A
Regulatory	See Appendix I
Product Quality	See Appendix II
Product Value/ Soil Suitability*	See Appendix III (Soil, Enviro, Manure Compost)

The Compost Quality Alliance (CQA) is a voluntary quality monitoring program established by the Compost Council of Canada and the compost producers utilizing recognized standardized testing methodologies and uniform operating protocols to provide customer assurance in compost selection its use, and proper end-use utilization.

All analysis of this compost product was conducted and provided by A&L Canada Laboratories Inc. for the Compost Quality Alliance (CQA).

Haifeng Song, Senior Chemist

Ian McLachlin, Vice-President



A&L Canada Laboratories Inc.
London, Ontario Canada
(519) 457-2575

A proud member of



***PLEASE NOTE: Major Nutrients under the Fertilizer Act and Regulations (CFIA)**

Please see Appendix III for nutrient content (of impact to claims and labelling if used in declarations).

Compost is classified in Schedule II as a supplement, and as such nutrient guarantees are not mandatory. However, if any claims are made regarding nutritional value of the product, such as for composted manure, the product would then be classified as a supplement and a fertilizer, and the label would have to include the guarantees for the major nutrients. The guarantees for the major nutrients include the minimum amounts of Total Nitrogen (N), Available Phosphoric Acid (P2O5) and Soluble Potash K2O. Source: T-4-120 - Regulation of Compost under the Fertilizers Act and Regulations. <http://www.inspection.gc.ca/plants/fertilizers/trade-memoranda/t-4-120/eng/1307910204607/1307910352783>



Appendix I



CCME Guidelines 2005 & CFIA Fertilizer Act & Regulations:

Alberta, Manitoba, New Brunswick, Nova Scotia, Newfoundland, Prince Edward Island & Territories

A. Maximum Concentrations for Trace Metals in Compost:

Trace Elements	Test Results (ug/g)	Category A	Category B
		Maximum Concentration within Product (mg/kg dry weight)	
Arsenic (As)	2.54	13	75
Cadmium (Cd)	BDL	3	20
Chromium (Cr)	13.11	210	**
Cobalt (Co)	2.51	34	150
Copper (Cu)	205.60	400	**
Lead (Pb)	7.86	150	500
Mercury (Hg)	0.25	0.8	5
Molybdenum (Mo)	3.90	5	20
Nickel (Ni)	8.33	62	180
Selenium (Se)	1.81	2	14
Zinc (Zn)	296.55	700	1850

** Upper limits are not established in the Trade Memorandum.

B. Foreign Matter in Compost:

Test Results		Category A	Category B
Foreign Matter		Contains no more than 1 piece of foreign matter >25mm/500ml	Contains no more than 2 pieces of foreign matter > 25mm/500mL
Pieces >25mm/500mL	0		
Sharp Foreign Matter		No sharp foreign matter >3mm per 500ml	No more than 3 pieces of sharp matter < 12.5mm/500mL Note: This compost shall not be used in pastures, parks, or residential
Pieces > 3mm/500mL	0		
Pieces > 12.5mm/500mL	0		

C. Maturity/Stability:

Method	Test Results	Required Limits
CO ₂ Respiration Rate CO ₂ Respiration Rate	0.90	≤ 4 mg of carbon in the form of carbon dioxide per gram of organic matter per day
O ₂ Uptake Respiration Rate O ₂ Uptake Respiration Rate		≤ 400 mg oxygen/kg of volatile solids (or organic matter)/hour

D. Pathogens:

Pathogen	Test Results	Required Limits
Fecal Coliform (MPN/g dry)	18	<1000 MPN/g of total solids calculated on a dry weight basis
Salmonella (P-A/25g(ml))	NEGATIVE	<3 MPN/4g total solids calculated on a dry weight basis

The following references are from the CCME guidelines (PN1340), October 2005

*BDL = Below Detectable Limits

E. CFIA

Parameter	Test Results
Total Organic Matter (%)	78.14%
Moisture (%)	53.95%

All analysis conducted and prepared by:

A L Canada Laboratories

2136 Jetstream Rd London, Ontario N5V 3P5 (519) 457-2575



Appendix II Finished Compost Quality



Parameter	Test Results
pH	7.8
Carbon to Nitrogen Ratio	16:1
Particle Size/Texture (inch)+	1/2 Inch
Soluble Salts (ms/cm)	2.3
Sodium Base Saturation (%Na)	6.59%
Major Nutrients	
Available Potassium (%K)	23.93%
Available Magnesium (%Mg)	44.60%
Available Calcium (%Ca)	24.88%

+ Majority of sample passes through this sieve size

Reference Compost Quality Parameters for CQA

Use	pH	C:N	Moisture	Particle Size	Soluble Salts	%Na
Remediation	5.8-8.5	10-40	NA	<2 in	<20	<3%
Soil Amendment	5.8-8.5	10-30	NA	<1/2 in	<6	<2%
Landscaping	5.8-8.5	12-22	<50%	<1/2 in	<5	<2%
Planting Media	5.5-7.8	12-22	<50%	<1/2 in	<4	<2%
Turf Establishment & Topdressing	5.5-7.8	12-22	<50%	<3/8 in	<3	<1%
Greenhouse Seeding	6-7	12-22	<25%	<1/4 in	<2	<0.5%
Greenhouse Establishment	6-7	12-22	<30%	<1/2 in	2-3.5	<0.5%
Field Nursery	5.8-8	10-30	<50%	<1/2 in	<3.5	<1%
Agricultural Soil Amendments	6-8	10-30	<50%	<1/2 in	<20	none
Potting Soil	5.5-7.2	12-22	<50%	<1/4 in	<2	<1%

These are examples of some of the many end uses suitable for compost

Unrestricted Use: Category A - Compost that can be used in any application, such as agricultural lands, residential gardens, horticultural operations, the nursery industry, and other businesses. Category A criteria for trace elements are achievable using best source separated MSW feedstock, municipal biosolids, pulp and paper mill biosolids, or manure.

Restricted Use: Category B - Compost that has a restricted use because of the presence of sharp foreign matter or higher trace element content. Category B compost may require additional control when deemed necessary by a province or territory.

Note: For a compost to meet the unrestricted use category, it must meet the unrestricted (Category A) requirements for all trace elements and sharp foreign matter. If the compost fails one criterion of the guideline for unrestricted use but meets the criteria for restricted (Category B) use, then it is classified as a Category B product. Products that do not meet the criteria for either Category A or B must be used or disposed of appropriately.



Appendix III
Compost Agricultural Product Value
 on as is basis



Agricultural End-Use	Analysis Result	Unit	Quantity in lbs/Ton
Physical Parameters			
Dry Matter	46.05%	%	
pH	7.8		
Bulk Density	594	kg/m3	
C:N Ratio	16:1		
Fertilizer Equivalent Minerals			
Nitrogen Total	2.81%	%	56.2
Ammonium Nitrogen	942.17	ppm	1.88
Total Phosphate (P as P2O5)	1.32%	%	26.4
Total Potash (K as K2O)	0.26%	%	5.2
Calcium	0.72%	%	14.4
Magnesium	0.20%	%	4.0
Sulfur	1580.67	ppm	3.2

The Compost Quality Assurance program goes beyond the provincial requirements to establish full value and appropriate end-use. The Compost Report and Compost End-use table in Appendix II, has 10 different compost application uses from soil remediation, through to potting soil blends. Of note are available soluble salt limits and the percent available sodium for sensitive plants. Appendix III, lists the primary agricultural use parameters and quantitative nutrient content that reflects this compost samples agricultural end-use, and application value. This value includes macro and micro nutrients, soil building properties such as the addition of organic matter, increasing moisture holding capacity, and the soils slow release nutrients. These parameters improve beneficial soil health components soil structure and stability.

The results of our testing on this sample indicates that this product is a medium textured, compost (87%+ 1/2 in.), with rich mineral properties, which would meet criteria for agricultural soil amendment, blending and mulching end-uses purposes. The C:N ratio 16:1 from Appendix II, on the soil suitability report indicates a low C:N ratio and indicating good nitrogen availability. The low C:N ratio in conjunction with the higher total nitrogen content listed in Appendix III indicates early high available nitrogen levels, and should be considered for crop planning. The proportion of available sodium (6.59% Na), which if used in too heavy a proportion could cause some problems with sensitive species. The sodium levels of this compost sample though high, is suitable for agricultural broadcast field applications and are made to improve the organic matter level and major nutrients phosphorus, potassium and magnesium levels. The compost is also rich in available calcium, sulfur, and zinc, which make it ideal for soil enriching, and amendment. We recommend blending this material at a minimum of 4-5 parts soil blended to each part of this compost to dilute the sodium concentration.

Major Nutrients - Compost is classified in Schedule II (CFIA Fertilizer Act & Regulations) as a supplement, and as such, nutrient guarantees are not mandatory. However, if any claims are made regarding nutritional value of the product, such as for composted manure, the product would then be classified as a supplement and a fertilizer, and label would have to include the guarantees for the major nutrients. The guarantees for the major nutrients include the minimum amounts of Total Nitrogen (N), Available Phosphoric Acid (P2O5) and Soluble Potash (K2O).

Report Number: C20324-10619
 Account Number: 01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, Ontario, N5V 3P5
 Telephone: (519) 457-2575 Fax: (519) 457-2664



C20324-10619



To: CITY OF KELOWNA
 1435 WATER STREET
 KELOWNA, BC V1Y 1J4

For: OGOGROW JULY 2020

Attn: MARCIA BROWNE OR JOSE GARCIA

P.O. Number: 532988

Reported Date: 2020-11-26
 Printed Date: Nov 27, 2020

COMPOST REPORT

Page: 1 / 1

Sample Number	Lab Number	pH	Lime Index	Available Organic Matter %	Phosphorus P ppm	Potassium K ppm	Magnesium Mg ppm	Calcium Ca ppm
OGOGROW JULY	25231	7.8	6.6	67.7	2259	1731	1006	923

Sulfur S ppm	Zinc Zn ppm	Manganese Mn ppm	Iron Fe ppm	Copper Cu ppm	Boron B ppm	Sodium Na ppm	Nitrate-N NO3-N ppm	Soluble Salt ms/cm	Nitrogen (Total) (%)	Chloride ppm
104	56.6	56	143	7.5	2.5	281	15	2.3	2.81	1084

INTERPRETATION

CEC		Percent Base Saturation				Proportional Equivalents (meq)				Cation Ratio		C/N Ratio
meq/100g	% BS	% K	% Mg	% Ca	% Na	K	Mg	Ca	Na	Mg/K	Ca/Mg	
18.5	100.0	23.93	44.60	24.88	6.59	4.44	8.27	4.62	1.22	2:1	1:1	16:1
Optimum Range:		3 - 5	8 - 20	60 - 80		0.5 - 1.3				7:1	5:1	

CQA

* Results reported on a dry weight basis.

The results of this report relate to the sample submitted and analyzed.

* Crop yield is influenced by a number of factors in addition to soil fertility.

No guarantee or warranty concerning crop performance is made by A & L.

Results Authorized By:

Ian McLachlin, Vice President

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Telephone: (519) 457-2575 Fax: (519) 457-2664



REPORT NUMBER: C20324-10619
ACCOUNT NUMBER: 01759

REPORT OF ANALYSIS

TO: CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

RE: Ogogrow July 2020

CQA2000412

DATE RECEIVED: 2020-11-19
DATE REPORTED: 2020-11-27
PAGE: 1 / 1
P.O. NUMBER: 532988

Attn: MARCIA BROWNE OR JOSE GARCIA

LAB NO.	SAMPLE ID	ANALYSIS	RESULT	UNIT	METHOD
25231	OGOGROW JULY 2020	Nitrogen (Total)	2.8	%	TMECC.04.02-D



C20324-10619

Results Authorized By:

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REPORT NO.
C20324-70012

A & L Canada Laboratories Inc.



ACCOUNT NUMBER
01759

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664

TO:CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR:OGOGROW JULY 2020

ATTN:Marcia Browne or Jose Garcia

Phone:250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 1 / 3

PROJECT NO:

PO#:532988

LAB NUMBER:3247017

SAMPLE ID:OGOGROW JULY 2020

SAMPLE MATRIX:COMPOST

DATE SAMPLED:2020-11-18

DATE RECEIVED:2020-11-19

DATE REPORTED:2020-11-26

DATE PRINTED:2020-11-27

PARAMETER	Result	UNIT	DETECTION LIMIT	METHOD REFERENCE
Arsenic	2.54	ug/g	1.00	EPA 3050B/6010B(mod) *
Cadmium	BDL	ug/g	1.00	EPA 3050B/6010B(mod) *
Cobalt	2.51	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Chromium	13.11	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)*
Copper	205.60	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Mercury	0.25	ug/g	0.10	EPA 7471 *
Molybdenum	3.9	ug/g	1.0	TMECC.04.06;EPA 3050/6010(mod)*
Nickel	8.33	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Lead	7.86	ug/g	1.00	EPA 3050B/6010B(mod) *
Selenium	1.81	ug/g	1.00	EPA 3050/6010 (mod) *
Zinc	296.55	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20324-70012

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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REPORT NO.
C20324-70012

ACCOUNT NUMBER
01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664



TO:CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR:OGOGROW JULY 2020

ATTN:Marcia Browne or Jose Garcia
Phone:250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 2 / 3

PROJECT NO:

PO#:532988
LAB NUMBER:3247017
SAMPLE ID:OGOGROW JULY 2020

SAMPLE MATRIX:COMPOST
DATE SAMPLED:2020-11-18
DATE RECEIVED:2020-11-19
DATE REPORTED:2020-11-26
DATE PRINTED:2020-11-27

PARAMETER	Result	UNIT	DETECTION LIMIT	METHOD REFERENCE
E. coli	>1000	MPN/g dry	3	TMECC 07.01
Salmonella spp.	NEGATIVE	P-A/ 25.0g(ml)	1 CFU	MFLP-75 *
Fecal Coliform	>1000	MPN/g dry	3	TMECC 07.01
Total sharps > 2.8 mm*	0	pieces/500ml		TMECC 03.08
Total sharps > 12.5 mm	0	pieces/500ml		TMECC 03.08
Total FM > 2.8 mm*	BDL	%	0.01	TMECC 03.08
Total FM > 25 mm	0	pieces/500ml		TMECC 03.08
Total plastics > 2.8 mm*	BDL	%	0.01	TMECC 03.08
Total Organic Matter @ 550 deg C	78.14	%	0.10	LOI@550C
Moisture	53.95	%	0.10	TMECC.03.09-A
Sieve 2 Inch (% Passing)	100.00	%	0.10	ASTMD422
Sieve 1 Inch (% Passing)	100.00	%	0.10	ASTMD422
Sieve 1/2 Inch (% Passing)	87.10	%	0.10	ASTMD422
Sieve 3/8 Inch (% Passing)	79.20	%	0.01	ASTMD422
Sieve 1/4 Inch (% Passing)	56.80	%	0.10	ASTMD422
Compost Stability Index	8	---		TMECC.05.08-B
Respiration-mgCO ₂ -C/g OM/day	0.90	mgCO ₂ -C/ gOM/day	0.01	TMECC.05.08-B
Respiration - mgCO ₂ -C/g TS/day	0.70	mgCO ₂ -C/ gTS/day	0.01	TMECC.05.08-B

Maturity Index: 8 - Inactive, highly matured compost, very well aged, possibly over-aged, like soil; no limitations for usage.

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20324-70012

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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C20324-70012

ACCOUNT NUMBER
01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664



TO: CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR: OGOGROW JULY 2020

ATTN: Marcia Browne or Jose Garcia
Phone: 250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 3 / 3

PROJECT NO:

PO#: 532988
LAB NUMBER: 3247017
SAMPLE ID: OGOGROW JULY 2020

SAMPLE MATRIX: COMPOST
DATE SAMPLED: 2020-11-18
DATE RECEIVED: 2020-11-19
DATE REPORTED: 2020-11-26
DATE PRINTED: 2020-11-27

PARAMETER	Result Dry Weight	Result As Received	UNIT	DETECTION LIMIT	METHOD REFERENCE
Total Solids (as received)		46.05	%	0.10	Gravimetric
Nitrogen & Carbon					
Total Organic Carbon		43.41	%	0.10	Combustion
Ammonia (NH3/NH4-N)	2045.97	942.17	ug/g	.01	Colourimetric
Metals					
Potassium	4745.50	2185.30	ug/g	5.00	TMECC.04.04
Total Potassium (as K2O)	0.57	0.26	%	0.05	ICP
Phosphorus	12535.00	5772.37	ug/g	5.00	TMECC.04.03 *
Total Phosphorus (as P2O5)	2.87	1.32	%	0.05	ICP
Aluminum	3268.50	1505.14	ug/g	5.00	TMECC.04.07 *
Boron	15.89	7.32	ug/g	1.00	TMECC.04.05 *
Calcium	1.57	0.72	%	0.01	TMECC.04.05
Iron	5050.00	2325.52	ug/g	5.00	TMECC.04.05 *
Magnesium	0.44	0.20	%	0.01	TMECC.04.05 *
Manganese	388.50	178.90	ug/g	1.00	TMECC.04.05 *
Sodium	0.16	0.07	%	0.01	TMECC.04.05 *
Sulphur	3432.50	1580.67	ug/g	5.00	TMECC.04.05 *
Additional Parameters					
Bulk Density (as Recieved)		594	kg/m3	10	Gravimetric
Conductivity (@ 25 deg C)		3.28	ms/cm	0.02	Conductivity Meter

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20324-70012

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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REPORT NO.
C20338-90001

ACCOUNT NUMBER
01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664



TO: CITY OF KELOWNA
1435 WATER STREET
2720 JOHN HINDLE DRIVE
KELOWNA, BC V1Y 1J4

ATTN: Marcia Browne or Jose Garcia
Phone: 250-469-8796



CERTIFICATE OF ANALYSIS

PAGE: 1 / 4

PROJECT NO:
PO#: 532988
LAB NUMBER: 3389029
SAMPLE ID: OGOGROW JUNE 2020

SAMPLE MATRIX: SOLID
DATE SAMPLED: NONE GIVEN
DATE RECEIVED: 2020-12-03
DATE REPORTED: 2020-12-07
DATE PRINTED: 2020-12-16

PARAMETER	RESULT	UNIT	DETECTION LIMIT	METHOD REFERENCE
Fecal Coliform	18	MPN/g dry	3	TMECC 07.01

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20338-90001

Results Authorized By:

Keri Wang, Microbiology Manager

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TO: CITY OF KELOWNA
1435 WATER STREET
2720 JOHN HINDLE DRIVE
KELOWNA, BC V1Y 1J4

ATTN: Marcia Browne or Jose Garcia
Phone: 250-469-8796



CERTIFICATE OF ANALYSIS

PAGE: 2 / 4

PROJECT NO:
PO#: 532988
LAB NUMBER: 3389030
SAMPLE ID: OGOGROW MAY 2020

SAMPLE MATRIX: SOLID
DATE SAMPLED: NONE GIVEN
DATE RECEIVED: 2020-12-03
DATE REPORTED: 2020-12-07
DATE PRINTED: 2020-12-16

PARAMETER	RESULT	UNIT	DETECTION LIMIT	METHOD REFERENCE
Fecal Coliform	84	MPN/g dry	3	TMECC 07.01

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20338-90001

Results Authorized By:

Keri Wang, Microbiology Manager

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C20338-90001

ACCOUNT NUMBER
01759

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TO: CITY OF KELOWNA
1435 WATER STREET
2720 JOHN HINDLE DRIVE
KELOWNA, BC V1Y 1J4

ATTN: Marcia Browne or Jose Garcia

Phone: 250-469-8796



CERTIFICATE OF ANALYSIS

PAGE: 3 / 4

PROJECT NO:
PO#: 532988
LAB NUMBER: 3389031
SAMPLE ID: OGOGROW SEPTEMBER 2020

SAMPLE MATRIX: SOLID
DATE SAMPLED: NONE GIVEN
DATE RECEIVED: 2020-12-03
DATE REPORTED: 2020-12-07
DATE PRINTED: 2020-12-16

PARAMETER	RESULT	UNIT	DETECTION LIMIT	METHOD REFERENCE
Fecal Coliform	8	MPN/g dry	3	TMECC 07.01

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20338-90001

Results Authorized By:

Keri Wang, Microbiology Manager

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TO: CITY OF KELOWNA
1435 WATER STREET
2720 JOHN HINDLE DRIVE
KELOWNA, BC V1Y 1J4

ATTN: Marcia Browne or Jose Garcia

Phone: 250-469-8796



CERTIFICATE OF ANALYSIS

PAGE: 4 / 4

PROJECT NO:
PO#: 532988
LAB NUMBER: 3389032
SAMPLE ID: OGOGROW JULY 2020

SAMPLE MATRIX: SOLID
DATE SAMPLED: NONE GIVEN
DATE RECEIVED: 2020-12-03
DATE REPORTED: 2020-12-07
DATE PRINTED: 2020-12-16

PARAMETER	RESULT	UNIT	DETECTION LIMIT	METHOD REFERENCE
Fecal Coliform	15	MPN/g dry	3	TMECC 07.01

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20338-90001

Results Authorized By:

Keri Wang, Microbiology Manager

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www.compostquality.ca

SUMMARY OF ANALYSIS REPORT

To: City of Kelowna
1435 Water Street
Kelowna, British Columbia V1Y 1J4

CQA Member#: 18-2800

Attention: Marcia Browne or Jose Garcia

Sample I.D.: Ogogrow August 2020

Report#: C20324-10616
C20324-70009
C21014-90004

Sample Date: 2020-11-18
Reported Date: 2020-11-27
retest 2021-01-20

Compost to be Manufacture in: British Columbia
Feedstock: *Municipal Biosolids, Agriforestry Residues*

CQA COMPOST QUALITY & VALUE TESTING PARAMETERS REPORT

SAMPLE ID	RECOMMENDED END USE/MARKET
Ogogrow August 2020	Category A
Regulatory	See Appendix I
Product Quality	See Appendix II
Product Value/ Soil Suitability*	See Appendix III (Soil, Enviro, Manure Compost)

The Compost Quality Alliance (CQA) is a voluntary quality monitoring program established by the Compost Council of Canada and the compost producers utilizing recognized standardized testing methodologies and uniform operating protocols to provide customer assurance in compost selection its use, and proper end-use utilization.

All analysis of this compost product was conducted and provided by A&L Canada Laboratories Inc. for the Compost Quality Alliance (CQA).

Haifeng Song, Senior Chemist

Ian McLachlin, Vice-President



A&L Canada Laboratories Inc.
London, Ontario Canada
(519) 457-2575

A proud member of



***PLEASE NOTE: Major Nutrients under the Fertilizer Act and Regulations (CFIA)**

Please see Appendix III for nutrient content (of impact to claims and labelling if used in declarations).

Compost is classified in Schedule II as a supplement, and as such nutrient guarantees are not mandatory. However, if any claims are made regarding nutritional value of the product, such as for composted manure, the product would then be classified as a supplement and a fertilizer, and the label would have to include the guarantees for the major nutrients. The guarantees for the major nutrients include the minimum amounts of Total Nitrogen (N), Available Phosphoric Acid (P2O5) and Soluble Potash K2O. Source: T-4-120 - Regulation of Compost under the Fertilizers Act and Regulations. <http://www.inspection.gc.ca/plants/fertilizers/trade-memoranda/t-4-120/eng/1307910204607/1307910352783>



Appendix I



CCME Guidelines 2005 & CFIA Fertilizer Act & Regulations:

Alberta, Manitoba, New Brunswick, Nova Scotia, Newfoundland, Prince Edward Island & Territories

A. Maximum Concentrations for Trace Metals in Compost:

Trace Elements	Test Results (ug/g)	Category A	Category B
		Maximum Concentration within Product (mg/kg dry weight)	
Arsenic (As)	1.81	13	75
Cadmium (Cd)	BDL	3	20
Chromium (Cr)	9.88	210	**
Cobalt (Co)	1.64	34	150
Copper (Cu)	182.05	400	**
Lead (Pb)	6.24	150	500
Mercury (Hg)	0.34	0.8	5
Molybdenum (Mo)	3.80	5	20
Nickel (Ni)	7.00	62	180
Selenium (Se)	1.94	2	14
Zinc (Zn)	227.40	700	1850

** Upper limits are not established in the Trade Memorandum.

B. Foreign Matter in Compost:

Test Results		Category A	Category B
Foreign Matter		Contains no more than 1 piece of foreign matter >25mm/500ml	Contains no more than 2 pieces of foreign matter > 25mm/500mL
Pieces >25mm/500mL	0		
Sharp Foreign Matter		No sharp foreign matter >3mm per 500ml	No more than 3 pieces of sharp matter < 12.5mm/500mL Note: This compost shall not be used in pastures, parks, or residential
Pieces > 3mm/500mL	0		
Pieces > 12.5mm/500mL	0		

C. Maturity/Stability:

Method	Test Results	Required Limits
CO ₂ Respiration Rate CO ₂ Respiration Rate	0.40	≤ 4 mg of carbon in the form of carbon dioxide per gram of organic matter per day
O ₂ Uptake Respiration Rate O ₂ Uptake Respiration Rate		≤ 400 mg oxygen/kg of volatile solids (or organic matter)/hour

D. Pathogens:

Pathogen	Test Results	Required Limits
Fecal Coliform (MPN/g dry)	7	<1000 MPN/g of total solids calculated on a dry weight basis
Salmonella (P-A/25g(ml))	NEGATIVE	<3 MPN/4g total solids calculated on a dry weight basis

The following references are from the CCME guidelines (PN1340), October 2005

*BDL = Below Detectable Limits

E. CFIA

Parameter	Test Results
Total Organic Matter (%)	85.62%
Moisture (%)	56.95%

All analysis conducted and prepared by:

A L Canada Laboratories

2136 Jetstream Rd London, Ontario N5V 3P5 (519) 457-2575



Appendix II Finished Compost Quality



Parameter	Test Results
pH	7.3
Carbon to Nitrogen Ratio	16:1
Particle Size/Texture (inch)+	1/2 Inch
Soluble Salts (ms/cm)	1.5
Sodium Base Saturation (%Na)	6.64%
Major Nutrients	
Available Potassium (%K)	23.65%
Available Magnesium (%Mg)	41.74%
Available Calcium (%Ca)	27.96%

+ Majority of sample passes through this sieve size

Reference Compost Quality Parameters for CQA

Use	pH	C:N	Moisture	Particle Size	Soluble Salts	%Na
Remediation	5.8-8.5	10-40	NA	<2 in	<20	<3%
Soil Amendment	5.8-8.5	10-30	NA	<1/2 in	<6	<2%
Landscaping	5.8-8.5	12-22	<50%	<1/2 in	<5	<2%
Planting Media	5.5-7.8	12-22	<50%	<1/2 in	<4	<2%
Turf Establishment & Topdressing	5.5-7.8	12-22	<50%	<3/8 in	<3	<1%
Greenhouse Seeding	6-7	12-22	<25%	<1/4 in	<2	<0.5%
Greenhouse Establishment	6-7	12-22	<30%	<1/2 in	2-3.5	<0.5%
Field Nursery	5.8-8	10-30	<50%	<1/2 in	<3.5	<1%
Agricultural Soil Amendments	6-8	10-30	<50%	<1/2 in	<20	none
Potting Soil	5.5-7.2	12-22	<50%	<1/4 in	<2	<1%

These are examples of some of the many end uses suitable for compost

Unrestricted Use: Category A - Compost that can be used in any application, such as agricultural lands, residential gardens, horticultural operations, the nursery industry, and other businesses. Category A criteria for trace elements are achievable using best source separated MSW feedstock, municipal biosolids, pulp and paper mill biosolids, or manure.

Restricted Use: Category B - Compost that has a restricted use because of the presence of sharp foreign matter or higher trace element content. Category B compost may require additional control when deemed necessary by a province or territory.

Note: For a compost to meet the unrestricted use category, it must meet the unrestricted (Category A) requirements for all trace elements and sharp foreign matter. If the compost fails one criterion of the guideline for unrestricted use but meets the criteria for restricted (Category B) use, then it is classified as a Category B product. Products that do not meet the criteria for either Category A or B must be used or disposed of appropriately.



Appendix III
Compost Agricultural Product Value
on as is basis



Agricultural End-Use	Analysis Result	Unit	Quantity in lbs/Ton
Physical Parameters			
Dry Matter	43.05%	%	
pH	7.3		
Bulk Density	585	kg/m3	
C:N Ratio	16:1		
Fertilizer Equivalent Minerals			
Nitrogen Total	3.06%	%	61.2
Ammonium Nitrogen	950.86	ppm	1.90
Total Phosphate (P as P2O5)	1.09%	%	21.8
Total Potash (K as K2O)	0.24%	%	4.8
Calcium	0.54%	%	10.8
Magnesium	0.15%	%	3.0
Sulfur	1339.29	ppm	2.7

The Compost Quality Assurance program goes beyond the provincial requirements to establish full value and appropriate end-use. The Compost Report and Compost End-use table in Appendix II, has 10 different compost application uses from soil remediation, through to potting soil blends. Of note are available soluble salt limits and the percent available sodium for sensitive plants. Appendix III, lists the primary agricultural use parameters and quantitative nutrient content that reflects this compost samples agricultural end-use, and application value. This value includes macro and micro nutrients, soil building properties such as the addition of organic matter, increasing moisture holding capacity, and the soils slow release nutrients. These parameters improve beneficial soil health components soil structure and stability.

The results of our testing on this sample indicates that this product is a medium textured, compost (82%+ 1/2 in.), with rich mineral properties, which would meet criteria for agricultural soil amendment, blending and mulching end-uses purposes. The C:N ratio 16:1 from Appendix II, on the soil suitability report indicates a low C:N ratio and indicating good nitrogen availability. The low C:N ratio in conjunction with the higher total nitrogen content listed in Appendix III indicates early high available nitrogen levels, and should be considered for crop planning. The proportion of available sodium (6.64% Na), which if used in too heavy a proportion could cause some problems with sensitive species. The sodium levels of this compost sample though high, is suitable for agricultural broadcast field applications and are made to improve the organic matter level and major nutrients phosphorus, potassium and magnesium levels. The compost is also rich in available calcium, sulfur, and zinc, which make it ideal for soil enriching, and amendment. We recommend blending this material at a minimum of 4-5 parts soil blended to each part of this compost to dilute the sodium concentration.

Major Nutrients - Compost is classified in Schedule II (CFIA Fertilizer Act & Regulations) as a supplement, and as such, nutrient guarantees are not mandatory. However, if any claims are made regarding nutritional value of the product, such as for composted manure, the product would then be classified as a supplement and a fertilizer, and label would have to include the guarantees for the major nutrients. The guarantees for the major nutrients include the minimum amounts of Total Nitrogen (N), Available Phosphoric Acid (P2O5) and Soluble Potash (K2O).

Report Number: C20324-10616
 Account Number: 01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, Ontario, N5V 3P5
 Telephone: (519) 457-2575 Fax: (519) 457-2664



C20324-10616



To: CITY OF KELOWNA
 1435 WATER STREET
 KELOWNA, BC V1Y 1J4

For: OGOGROW AUGUST 2020

Attn: MARCIA BROWNE OR JOSE GARCIA

P.O. Number: 532988

Reported Date: 2020-11-26
 Printed Date: Nov 27, 2020

COMPOST REPORT

Page: 1 / 1

Sample Number	Lab Number	pH	Lime Index	Available Organic Matter %	Phosphorus P ppm	Potassium K ppm	Magnesium Mg ppm	Calcium Ca ppm
OGOGROW AUGI	25228	7.3	6.6	74.9	1969	1823	1003	1105

Sulfur S ppm	Zinc Zn ppm	Manganese Mn ppm	Iron Fe ppm	Copper Cu ppm	Boron B ppm	Sodium Na ppm	Nitrate-N NO3-N ppm	Soluble Salt ms/cm	Nitrogen (Total) (%)	Chloride ppm
69	46.8	56	140	7.7	2.9	302	25	1.5	3.06	1134

INTERPRETATION

CEC		Percent Base Saturation				Proportional Equivalents (meq)				Cation Ratio		C/N Ratio
meq/100g	% BS	% K	% Mg	% Ca	% Na	K	Mg	Ca	Na	Mg/K	Ca/Mg	
19.8	100.0	23.65	41.74	27.96	6.64	4.67	8.25	5.53	1.31	2:1	1:1	16:1
Optimum Range:		3 - 5	8 - 20	60 - 80		0.5 - 1.3				7:1	5:1	

CQA

* Results reported on a dry weight basis.

The results of this report relate to the sample submitted and analyzed.

* Crop yield is influenced by a number of factors in addition to soil fertility.

No guarantee or warranty concerning crop performance is made by A & L.

Results Authorized By:

Ian McLachlin, Vice President

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A & L Canada Laboratories Inc.

2136 Jetstream Rd, London, Ontario, N5V 3P5
Telephone: (519) 457-2575 Fax: (519) 457-2664



REPORT NUMBER: C20324-10616
ACCOUNT NUMBER: 01759

REPORT OF ANALYSIS

TO: CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

RE: Oogrow August 2020

CQA2000409

DATE RECEIVED: 2020-11-19
DATE REPORTED: 2020-11-27
PAGE: 1 / 1
P.O. NUMBER: 532988

Attn: MARCIA BROWNE OR JOSE GARCIA

LAB NO.	SAMPLE ID	ANALYSIS	RESULT	UNIT	METHOD
25228	OGOGROW AUGUST 2020	Nitrogen (Total)	3.1	%	TMECC.04.02-D



C20324-10616

Results Authorized By:

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REPORT NO.
C20324-70009

ACCOUNT NUMBER
01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664



TO: CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR: OGROGROW AUGUST 2020

ATTN: Marcia Browne or Jose Garcia

Phone: 250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 1 / 3

PROJECT NO:

PO#: 532988

LAB NUMBER: 3247014

SAMPLE ID: OGROGROW AUGUST 2020

SAMPLE MATRIX: COMPOST

DATE SAMPLED: 2020-11-18

DATE RECEIVED: 2020-11-19

DATE REPORTED: 2020-11-26

DATE PRINTED: 2020-11-27

PARAMETER	Result	UNIT	DETECTION LIMIT	METHOD REFERENCE
Arsenic	1.81	ug/g	1.00	EPA 3050B/6010B(mod) *
Cadmium	BDL	ug/g	1.00	EPA 3050B/6010B(mod) *
Cobalt	1.64	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Chromium	9.88	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)*
Copper	182.05	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Mercury	0.34	ug/g	0.10	EPA 7471 *
Molybdenum	3.8	ug/g	1.0	TMECC.04.06;EPA 3050/6010(mod)*
Nickel	7.00	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Lead	6.24	ug/g	1.00	EPA 3050B/6010B(mod) *
Selenium	1.94	ug/g	1.00	EPA 3050/6010 (mod) *
Zinc	227.40	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20324-70009

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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REPORT NO.
C20324-70009

ACCOUNT NUMBER
01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664



TO:CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR:OGROGROW AUGUST 2020

ATTN:Marcia Browne or Jose Garcia
Phone:250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 2 / 3

PROJECT NO:

PO#:532988
LAB NUMBER:3247014
SAMPLE ID:OGROGROW AUGUST 2020

SAMPLE MATRIX:COMPOST
DATE SAMPLED:2020-11-18
DATE RECEIVED:2020-11-19
DATE REPORTED:2020-11-26
DATE PRINTED:2020-11-27

PARAMETER	Result	UNIT	DETECTION LIMIT	METHOD REFERENCE
E. coli	349	MPN/g dry	3	TMECC 07.01
Salmonella spp.	NEGATIVE	P-A/ 25.0g(ml)	1 CFU	MFLP-75 *
Fecal Coliform	>1000	MPN/g dry	3	TMECC 07.01
Total sharps > 2.8 mm*	0	pieces/500ml		TMECC 03.08
Total sharps > 12.5 mm	0	pieces/500ml		TMECC 03.08
Total FM > 2.8 mm*	BDL	%	0.01	TMECC 03.08
Total FM > 25 mm	0	pieces/500ml		TMECC 03.08
Total plastics > 2.8 mm*	BDL	%	0.01	TMECC 03.08
Total Organic Matter @ 550 deg C	85.62	%	0.10	LOI@550C
Moisture	56.95	%	0.10	TMECC.03.09-A
Sieve 2 Inch (% Passing)	100.00	%	0.10	ASTMD422
Sieve 1 Inch (% Passing)	95.90	%	0.10	ASTMD422
Sieve 1/2 Inch (% Passing)	82.20	%	0.10	ASTMD422
Sieve 3/8 Inch (% Passing)	71.10	%	0.01	ASTMD422
Sieve 1/4 Inch (% Passing)	53.80	%	0.10	ASTMD422
Compost Stability Index	8	---		TMECC.05.08-B
Respiration-mgCO ₂ -C/g OM/day	0.40	mgCO ₂ -C/ gOM/day	0.01	TMECC.05.08-B
Respiration - mgCO ₂ -C/g TS/day	0.30	mgCO ₂ -C/ gTS/day	0.01	TMECC.05.08-B

Maturity Index: 8 - Inactive, highly matured compost, very well aged, possibly over-aged, like soil; no limitations for usage.

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20324-70009

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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REPORT NO.
C20324-70009

A & L Canada Laboratories Inc.



ACCOUNT NUMBER
01759

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664

TO:CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR:OGROGROW AUGUST 2020

ATTN:Marcia Browne or Jose Garcia
Phone:250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 3 / 3

PROJECT NO:

PO#:532988
LAB NUMBER:3247014
SAMPLE ID:OGROGROW AUGUST 2020

SAMPLE MATRIX:COMPOST
DATE SAMPLED:2020-11-18
DATE RECEIVED:2020-11-19
DATE REPORTED:2020-11-26
DATE PRINTED:2020-11-27

PARAMETER	Result Dry Weight	Result As Received	UNIT	DETECTION LIMIT	METHOD REFERENCE
Total Solids (as received)		43.05	%	0.10	Gravimetric
Nitrogen & Carbon					
Total Organic Carbon		47.57	%	0.10	Combustion
Ammonia (NH3/NH4-N)	2208.73	950.86	ug/g	.01	Colourimetric
Metals					
Potassium	4539.50	1954.25	ug/g	5.00	TMECC.04.04
Total Potassium (as K2O)	0.55	0.24	%	0.05	ICP
Phosphorus	11050.00	4757.02	ug/g	5.00	TMECC.04.03 *
Total Phosphorus (as P2O5)	2.53	1.09	%	0.05	ICP
Aluminum	2476.50	1066.13	ug/g	5.00	TMECC.04.07 *
Boron	15.47	6.66	ug/g	1.00	TMECC.04.05 *
Calcium	1.25	0.54	%	0.01	TMECC.04.05
Iron	3526.00	1517.94	ug/g	5.00	TMECC.04.05 *
Magnesium	0.35	0.15	%	0.01	TMECC.04.05 *
Manganese	316.50	136.25	ug/g	1.00	TMECC.04.05 *
Sodium	0.13	0.06	%	0.01	TMECC.04.05 *
Sulphur	3111.00	1339.29	ug/g	5.00	TMECC.04.05 *
Additional Parameters					
Bulk Density (as Recieved)		585	kg/m3	10	Gravimetric
Conductivity (@ 25 deg C)		2.81	ms/cm	0.02	Conductivity Meter

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20324-70009

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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REPORT NO.
C21014-90004

ACCOUNT NUMBER
01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664



TO: CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR: OGO Grow August 2020

ATTN: Marcia Browne or Jose Garcia
Phone: 250-469-8796



CERTIFICATE OF ANALYSIS

PAGE: 1 / 1

PROJECT NO:
PO#: 532988
LAB NUMBER: 149030
SAMPLE ID: 4 OGO GROW

SAMPLE MATRIX: SOLID
DATE SAMPLED: 2021-01-13
DATE RECEIVED: 2021-01-14
DATE REPORTED: 2021-01-20
DATE PRINTED: 2021-02-04

PARAMETER	RESULT	UNIT	DETECTION LIMIT	METHOD REFERENCE
E. coli	7	MPN/g dry	3	TMECC 07.01
Salmonella spp.	NEGATIVE	P-A/25.0g(ml)	1 CFU	MFLP-75 *
Fecal Coliform	7	MPN/g dry	3	TMECC 07.01

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C21014-90004

Results Authorized By:

Keri Wang, Microbiology Manager

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www.compostquality.ca

SUMMARY OF ANALYSIS REPORT

To: City of Kelowna
1435 Water Street
Kelowna, British Columbia V1Y 1J4

CQA Member#: 18-2800

Attention: Marcia Browne or Jose Garcia

Sample I.D.: Ogogrow September 2020

Report#: C20324-10617
C20324-70010

Sample Date: 2020-11-18

Reported Date: 2020-11-27
2020-12-16

Compost to be Manufacture in: British Columbia

Feedstock: *Municipal Biosolids, Agroforestry Residues*

CQA COMPOST QUALITY & VALUE TESTING PARAMETERS REPORT

SAMPLE ID	RECOMMENDED END USE/MARKET
Ogogrow September 2020	Category B
Regulatory	See Appendix I
Product Quality	See Appendix II
Product Value/ Soil Suitability*	See Appendix III (Soil, Enviro, Manure Compost)

The Compost Quality Alliance (CQA) is a voluntary quality monitoring program established by the Compost Council of Canada and the compost producers utilizing recognized standardized testing methodologies and uniform operating protocols to provide customer assurance in compost selection its use, and proper end-use utilization.

All analysis of this compost product was conducted and provided by A&L Canada Laboratories Inc. for the Compost Quality Alliance (CQA).

Haifeng Song, Senior Chemist

Ian McLachlin, Vice-President



A&L Canada Laboratories Inc.
London, Ontario Canada
(519) 457-2575

A proud member of



***PLEASE NOTE: Major Nutrients under the Fertilizer Act and Regulations (CFIA)**

Please see Appendix III for nutrient content (of impact to claims and labelling if used in declarations).

Compost is classified in Schedule II as a supplement, and as such nutrient guarantees are not mandatory. However, if any claims are made regarding nutritional value of the product, such as for composted manure, the product would then be classified as a supplement and a fertilizer, and the label would have to include the guarantees for the major nutrients. The guarantees for the major nutrients include the minimum amounts of Total Nitrogen (N), Available Phosphoric Acid (P2O5) and Soluble Potash K2O. Source: T-4-120 - Regulation of Compost under the Fertilizers Act and Regulations. <http://www.inspection.gc.ca/plants/fertilizers/trade-memoranda/t-4-120/eng/1307910204607/1307910352783>



Appendix I



CCME Guidelines 2005 & CFIA Fertilizer Act & Regulations:

Alberta, Manitoba, New Brunswick, Nova Scotia, Newfoundland, Prince Edward Island & Territories

A. Maximum Concentrations for Trace Metals in Compost†

Trace Elements	Test Results (ug/g)	Maximum Concentration within Product (mg/kg dry weight)	
		Category A	Category B
Arsenic (As)	3.00	13	75
Cadmium (Cd)	BDL	3	20
Chromium (Cr)	12.03	210	**
Cobalt (Co)	1.96	34	150
Copper (Cu)	203.65	400	**
Lead (Pb)	9.38	150	500
Mercury (Hg)	0.21	0.8	5
Molybdenum (Mo)	4.60	5	20
Nickel (Ni)	7.60	62	180
Selenium (Se)	2.01	2	14
Zinc (Zn)	271.70	700	1850

** Upper limits are not established in the Trade Memorandum.

B. Foreign Matter in Compost†

Test Results		Category A	Category B
Foreign Matter		Contains no more than 1 piece of foreign matter >25mm/500ml	Contains no more than 2 pieces of foreign matter > 25mm/500mL
Pieces >25mm/500mL	0		
Sharp Foreign Matter		No sharp foreign matter >3mm per 500ml	No more than 3 pieces of sharp matter < 12.5mm/500mL Note: This compost shall not be used in pastures, parks, or residential
Pieces > 3mm/500mL	0		
Pieces > 12.5mm/500mL	0		

C. Maturity/Stability†

Method	Test Results	Required Limits
CO₂ Respiration Rate CO ₂ Respiration Rate	1.00	≤ 4 mg of carbon in the form of carbon dioxide per gram of organic matter per day
O₂ Uptake Respiration Rate O ₂ Uptake Respiration Rate		≤ 400 mg oxygen/kg of volatile solids (or organic matter)/hour

D. Pathogens†

Pathogen	Test Results	Required Limits
Fecal Coliform (MPN/g dry)	8	<1000 MPN/g of total solids calculated on a dry weight basis
Salmonella (P-A/25g(ml))	NEGATIVE	<3 MPN/4g total solids calculated on a dry weight basis

†The following references are from the CCME guidelines (PN1340), October 2005

*BDL = Below Detectable Limits

E. CFIA

Parameter	Test Results
Total Organic Matter (%)	80.46%
Moisture (%)	52.39%

All analysis conducted and prepared by:

A L Canada Laboratories

2136 Jetstream Rd London, Ontario N5V 3P5 (519) 457-2575



Appendix II Finished Compost Quality



Parameter	Test Results
pH	7.4
Carbon to Nitrogen Ratio	17:1
Particle Size/Texture (inch)+	3/8 Inch
Soluble Salts (ms/cm)	2.2
Sodium Base Saturation (%Na)	6.54%
Major Nutrients	
Available Potassium (%K)	23.89%
Available Magnesium (%Mg)	40.36%
Available Calcium (%Ca)	29.22%

+ Majority of sample passes through this sieve size

Reference Compost Quality Parameters for CQA

Use	pH	C:N	Moisture	Particle Size	Soluble Salts	%Na
Remediation	5.8-8.5	10-40	NA	<2 in	<20	<3%
Soil Amendment	5.8-8.5	10-30	NA	<1/2 in	<6	<2%
Landscaping	5.8-8.5	12-22	<50%	<1/2 in	<5	<2%
Planting Media	5.5-7.8	12-22	<50%	<1/2 in	<4	<2%
Turf Establishment & Topdressing	5.5-7.8	12-22	<50%	<3/8 in	<3	<1%
Greenhouse Seeding	6-7	12-22	<25%	<1/4 in	<2	<0.5%
Greenhouse Establishment	6-7	12-22	<30%	<1/2 in	2-3.5	<0.5%
Field Nursery	5.8-8	10-30	<50%	<1/2 in	<3.5	<1%
Agricultural Soil Amendments	6-8	10-30	<50%	<1/2 in	<20	none
Potting Soil	5.5-7.2	12-22	<50%	<1/4 in	<2	<1%

These are examples of some of the many end uses suitable for compost

Unrestricted Use: Category A - Compost that can be used in any application, such as agricultural lands, residential gardens, horticultural operations, the nursery industry, and other businesses. Category A criteria for trace elements are achievable using best source separated MSW feedstock, municipal biosolids, pulp and paper mill biosolids, or manure.

Restricted Use: Category B - Compost that has a restricted use because of the presence of sharp foreign matter or higher trace element content. Category B compost may require additional control when deemed necessary by a province or territory.

Note: For a compost to meet the unrestricted use category, it must meet the unrestricted (Category A) requirements for all trace elements and sharp foreign matter. If the compost fails one criterion of the guideline for unrestricted use but meets the criteria for restricted (Category B) use, then it is classified as a Category B product. Products that do not meet the criteria for either Category A or B must be used or disposed of appropriately.



Appendix III
Compost Agricultural Product Value
on as is basis



Agricultural End-Use	Analysis Result	Unit	Quantity in lbs/Ton
Physical Parameters			
Dry Matter	47.61%	%	
pH	7.4		
Bulk Density	552	kg/m3	
C:N Ratio	17:1		
Fertilizer Equivalent Minerals			
Nitrogen Total	2.73%	%	54.6
Ammonium Nitrogen	1069.71	ppm	2.14
Total Phosphate (P as P2O5)	1.24%	%	24.8
Total Potash (K as K2O)	0.27%	%	5.4
Calcium	0.66%	%	13.2
Magnesium	0.19%	%	3.8
Sulfur	1623.98	ppm	3.2

The Compost Quality Assurance program goes beyond the provincial requirements to establish full value and appropriate end-use. The Compost Report and Compost End-use table in Appendix II, has 10 different compost application uses from soil remediation, through to potting soil blends. Of note are available soluble salt limits and the percent available sodium for sensitive plants. Appendix III, lists the primary agricultural use parameters and quantitative nutrient content that reflects this compost samples agricultural end-use, and application value. This value includes macro and micro nutrients, soil building properties such as the addition of organic matter, increasing moisture holding capacity, and the soils slow release nutrients. These parameters improve beneficial soil health components soil structure and stability.

The results of our testing on this sample indicates that this product is a fine textured, compost (81%+ 3/8 in.), with rich mineral properties, which would meet criteria for agricultural soil amendment, blending and topdressing end-uses purposes. The C:N ratio 17:1 from Appendix II, on the soil suitability report indicates a low C:N ratio and indicating good nitrogen availability. The low C:N ratio in conjunction with the higher total nitrogen content listed in Appendix III indicates early high available nitrogen levels, and should be considered for crop planning. The proportion of available sodium (6.54% Na), which if used in too heavy a proportion could cause some problems with sensitive species. The sodium levels of this compost sample though high, is suitable for agricultural broadcast field applications and are made to improve the organic matter level and major nutrients phosphorus, potassium and magnesium levels. The compost is also rich in available calcium, sulfur, and zinc, which make it ideal for soil enriching, and amendment. We recommend blending this material at a minimum of 4-5 parts soil blended to each part of this compost to dilute the sodium concentration.

Major Nutrients - Compost is classified in Schedule II (CFIA Fertilizer Act & Regulations) as a supplement, and as such, nutrient guarantees are not mandatory. However, if any claims are made regarding nutritional value of the product, such as for composted manure, the product would then be classified as a supplement and a fertilizer, and label would have to include the guarantees for the major nutrients. The guarantees for the major nutrients include the minimum amounts of Total Nitrogen (N), Available Phosphoric Acid (P2O5) and Soluble Potash (K2O).

Report Number: C20324-10617
 Account Number: 01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, Ontario, N5V 3P5
 Telephone: (519) 457-2575 Fax: (519) 457-2664



C20324-10617



To: CITY OF KELOWNA
 1435 WATER STREET
 KELOWNA, BC V1Y 1J4

For: OGOGROW SEPTEMBER 2020

Attn: MARCIA BROWNE OR JOSE GARCIA

P.O. Number: 532988

Reported Date: 2020-11-26
 Printed Date: Nov 27, 2020

COMPOST REPORT

Page: 1 / 1

Sample Number	Lab Number	pH	Lime Index	Available Organic Matter %	Phosphorus P ppm	Potassium K ppm	Magnesium Mg ppm	Calcium Ca ppm
OGOGROW SEPT	25229	7.4	6.6	69.7	1725	1344	708	843

Sulfur S ppm	Zinc Zn ppm	Manganese Mn ppm	Iron Fe ppm	Copper Cu ppm	Boron B ppm	Sodium Na ppm	Nitrate-N NO3-N ppm	Soluble Salt ms/cm	Nitrogen (Total) (%)	Chloride ppm
83	47.7	45	126	6.2	2.1	217	17	2.2	2.73	1052

INTERPRETATION

CEC		Percent Base Saturation				Proportional Equivalents (meq)				Cation Ratio		C/N Ratio
meq/100g	% BS	% K	% Mg	% Ca	% Na	K	Mg	Ca	Na	Mg/K	Ca/Mg	
14.4	100.0	23.89	40.36	29.22	6.54	3.45	5.82	4.22	0.94	2:1	1:1	17:1
Optimum Range:		3 - 5	8 - 20	60 - 80		0.5 - 1.3				7:1	5:1	

CQA

* Results reported on a dry weight basis.

The results of this report relate to the sample submitted and analyzed.

* Crop yield is influenced by a number of factors in addition to soil fertility.

No guarantee or warranty concerning crop performance is made by A & L.

Results Authorized By:

Ian McLachlin, Vice President

A&L Canada Laboratories Inc. is accredited by the Standards Council of Canada for specific tests as listed on www.scc.ca and by the Canadian Association for Laboratory Accreditation as listed on www.cala.ca

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A & L Canada Laboratories Inc.

2136 Jetstream Rd, London, Ontario, N5V 3P5
Telephone: (519) 457-2575 Fax: (519) 457-2664



REPORT NUMBER: C20324-10617
ACCOUNT NUMBER: 01759

REPORT OF ANALYSIS

TO: CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

RE: Ogogrow September 2020

CQA2000410

DATE RECEIVED: 2020-11-19
DATE REPORTED: 2020-11-27
PAGE: 1 / 1
P.O. NUMBER: 532988

Attn: MARCIA BROWNE OR JOSE GARCIA

LAB NO.	SAMPLE ID	ANALYSIS	RESULT	UNIT	METHOD
25229	OGOGROW SEPTEMBER 20	Nitrogen (Total)	2.7	%	TMECC.04.02-D



C20324-10617

Results Authorized By:

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REPORT NO.
C20324-70010

ACCOUNT NUMBER
01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664



TO:CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR:OGOGROW SEPTEMBER 2020

ATTN:Marcia Browne or Jose Garcia
Phone:250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 1 / 3

PROJECT NO:

PO#:532988
LAB NUMBER:3247015
SAMPLE ID:OGOGROW SEPTEMBER 2020

SAMPLE MATRIX:COMPOST
DATE SAMPLED:2020-11-18
DATE RECEIVED:2020-11-19
DATE REPORTED:2020-11-26
DATE PRINTED:2020-11-27

PARAMETER	Result	UNIT	DETECTION LIMIT	METHOD REFERENCE
Arsenic	3.00	ug/g	1.00	EPA 3050B/6010B(mod) *
Cadmium	BDL	ug/g	1.00	EPA 3050B/6010B(mod) *
Cobalt	1.96	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Chromium	12.03	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)*
Copper	203.65	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Mercury	0.21	ug/g	0.10	EPA 7471 *
Molybdenum	4.6	ug/g	1.0	TMECC.04.06;EPA 3050/6010(mod)*
Nickel	7.60	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Lead	9.38	ug/g	1.00	EPA 3050B/6010B(mod) *
Selenium	2.01	ug/g	1.00	EPA 3050/6010 (mod) *
Zinc	271.70	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20324-70010

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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REPORT NO.
C20324-70010

ACCOUNT NUMBER
01759

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TO:CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR:OGOGROW SEPTEMBER 2020

ATTN:Marcia Browne or Jose Garcia

Phone:250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 2 / 3

PROJECT NO:

PO#:532988
LAB NUMBER:3247015
SAMPLE ID:OGOGROW SEPTEMBER 2020

SAMPLE MATRIX:COMPOST
DATE SAMPLED:2020-11-18
DATE RECEIVED:2020-11-19
DATE REPORTED:2020-11-26
DATE PRINTED:2020-11-27

PARAMETER	Result	UNIT	DETECTION LIMIT	METHOD REFERENCE
E. coli	>1000	MPN/g dry	3	TMECC 07.01
Salmonella spp.	NEGATIVE	P-A/ 25.0g(ml)	1 CFU	MFLP-75 *
Fecal Coliform	>1000	MPN/g dry	3	TMECC 07.01
Total sharps > 2.8 mm*	0	pieces/500ml		TMECC 03.08
Total sharps > 12.5 mm	0	pieces/500ml		TMECC 03.08
Total FM > 2.8 mm*	BDL	%	0.01	TMECC 03.08
Total FM > 25 mm	0	pieces/500ml		TMECC 03.08
Total plastics > 2.8 mm*	BDL	%	0.01	TMECC 03.08
Total Organic Matter @ 550 deg C	80.46	%	0.10	LOI@550C
Moisture	52.39	%	0.10	TMECC.03.09-A
Sieve 2 Inch (% Passing)	100.00	%	0.10	ASTMD422
Sieve 1 Inch (% Passing)	100.00	%	0.10	ASTMD422
Sieve 1/2 Inch (% Passing)	89.30	%	0.10	ASTMD422
Sieve 3/8 Inch (% Passing)	80.70	%	0.01	ASTMD422
Sieve 1/4 Inch (% Passing)	61.20	%	0.10	ASTMD422
Compost Stability Index	8	---		TMECC.05.08-B
Respiration-mgCO ₂ -C/g OM/day	1.00	mgCO ₂ -C/ gOM/day	0.01	TMECC.05.08-B
Respiration - mgCO ₂ -C/g TS/day	0.80	mgCO ₂ -C/ gTS/day	0.01	TMECC.05.08-B

Maturity Index: 8 - Inactive, highly matured compost, very well aged, possibly over-aged, like soil; no limitations for usage.

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20324-70010

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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REPORT NO.
C20324-70010

ACCOUNT NUMBER
01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664



TO:CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR:OGOGROW SEPTEMBER 2020

ATTN:Marcia Browne or Jose Garcia
Phone:250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 3 / 3

PROJECT NO:

PO#:532988
LAB NUMBER:3247015
SAMPLE ID:OGOGROW SEPTEMBER 2020

SAMPLE MATRIX:COMPOST
DATE SAMPLED:2020-11-18
DATE RECEIVED:2020-11-19
DATE REPORTED:2020-11-26
DATE PRINTED:2020-11-27

PARAMETER	Result Dry Weight	Result As Received	UNIT	DETECTION LIMIT	METHOD REFERENCE
Total Solids (as received)		47.61	%	0.10	Gravimetric
Nitrogen & Carbon					
Total Organic Carbon		44.70	%	0.10	Combustion
Ammonia (NH3/NH4-N)	2246.82	1069.71	ug/g	.01	Colourimetric
Metals					
Potassium	4681.00	2228.62	ug/g	5.00	TMECC.04.04
Total Potassium (as K2O)	0.56	0.27	%	0.05	ICP
Phosphorus	11355.00	5406.12	ug/g	5.00	TMECC.04.03 *
Total Phosphorus (as P2O5)	2.60	1.24	%	0.05	ICP
Aluminum	2770.50	1319.04	ug/g	5.00	TMECC.04.07 *
Boron	16.98	8.08	ug/g	1.00	TMECC.04.05 *
Calcium	1.38	0.66	%	0.01	TMECC.04.05
Iron	4447.50	2117.45	ug/g	5.00	TMECC.04.05 *
Magnesium	0.39	0.19	%	0.01	TMECC.04.05 *
Manganese	322.10	153.35	ug/g	1.00	TMECC.04.05 *
Sodium	0.13	0.06	%	0.01	TMECC.04.05 *
Sulphur	3411.00	1623.98	ug/g	5.00	TMECC.04.05 *
Additional Parameters					
Bulk Density (as Recieved)		552	kg/m3	10	Gravimetric
Conductivity (@ 25 deg C)		2.52	ms/cm	0.02	Conductivity Meter

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20324-70010

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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REPORT NO.
C20338-90001

ACCOUNT NUMBER
01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664



TO: CITY OF KELOWNA
1435 WATER STREET
2720 JOHN HINDLE DRIVE
KELOWNA, BC V1Y 1J4

ATTN: Marcia Browne or Jose Garcia
Phone: 250-469-8796



CERTIFICATE OF ANALYSIS

PAGE: 3 / 4

PROJECT NO:
PO#: 532988
LAB NUMBER: 3389031
SAMPLE ID: OGOGROW SEPTEMBER 2020

SAMPLE MATRIX: SOLID
DATE SAMPLED: NONE GIVEN
DATE RECEIVED: 2020-12-03
DATE REPORTED: 2020-12-07
DATE PRINTED: 2020-12-16

PARAMETER	RESULT	UNIT	DETECTION LIMIT	METHOD REFERENCE
Fecal Coliform	8	MPN/g dry	3	TMECC 07.01

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C20338-90001

Results Authorized By:

Keri Wang, Microbiology Manager

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www.compostquality.ca

SUMMARY OF ANALYSIS REPORT

To: City of Kelowna
1435 Water Street
Kelowna, British Columbia V1Y 1J4

CQA Member#: 18-2800

Attention: Marcia Browne or Jose Garcia

Sample I.D.: OGOGROWOCTOBER2020

Report#: C21014-10073
C21014-70002

Sample Date: 2021-01-13

Reported Date: 2021-1-21

Compost to be Manufacture in: British Columbia

Feedstock:
Municipal Biosolids and Forestry Residues

CQA COMPOST QUALITY & VALUE TESTING PARAMETERS REPORT

SAMPLE ID	RECOMMENDED END USE/MARKET
OGOGROWOCTOBER2020	Category A
Regulatory	See Appendix I
Product Quality	See Appendix II
Product Value/ Soil	See Appendix III
Suitability*	(Soil, Enviro, Manure Compost)

The Compost Quality Alliance (CQA) is a voluntary quality monitoring program established by the Compost Council of Canada and the compost producers utilizing recognized standardized testing methodologies and uniform operating protocols to provide customer assurance in compost selection its use, and proper end-use utilization.

All analysis of this compost product was conducted and provided by A&L Canada Laboratories Inc. for the Compost Quality Alliance (CQA).

Haifeng Song, Senior Chemist

Ian McLachlin, Vice-President



A&L Canada Laboratories Inc.
London, Ontario Canada
(519) 457-2575

A proud member of



***PLEASE NOTE: Major Nutrients under the Fertilizer Act and Regulations (CFIA)**

Please see Appendix III for nutrient content (of impact to claims and labelling if used in declarations).

Compost is classified in Schedule II as a supplement, and as such nutrient guarantees are not mandatory. However, if any claims are made regarding nutritional value of the product, such as for composted manure, the product would then be classified as a supplement and a fertilizer, and the label would have to include the guarantees for the major nutrients. The guarantees for the major nutrients include the minimum amounts of Total Nitrogen (N), Available Phosphoric Acid (P2O5) and Soluble Potash K2O. Source: T-4-120 - Regulation of Compost under the Fertilizers Act and Regulations. <http://www.inspection.gc.ca/plants/fertilizers/trade-memoranda/t-4-120/eng/1307910204607/1307910352783>



Appendix I



CCME Guidelines 2005 & CFIA Fertilizer Act & Regulations:

Alberta, Manitoba, New Brunswick, Nova Scotia, Newfoundland, Prince Edward Island & Territories

A. Maximum Concentrations for Trace Metals in Compost:

Trace Elements	Test Results (ug/g)	Category A	Category B
		Maximum Concentration within Product (mg/kg dry weight)	
Arsenic (As)	2.86	13	75
Cadmium (Cd)	BDL	3	20
Chromium (Cr)	15.57	210	**
Cobalt (Co)	1.97	34	150
Copper (Cu)	201.85	400	**
Lead (Pb)	7.61	150	500
Mercury (Hg)	0.21	0.8	5
Molybdenum (Mo)	4.00	5	20
Nickel (Ni)	8.46	62	180
Selenium (Se)	BDL	2	14
Zinc (Zn)	256.15	700	1850

** Upper limits are not established in the Trade Memorandum.

B. Foreign Matter in Compost:

Test Results		Category A	Category B
Foreign Matter		Contains no more than 1 piece of foreign matter >25mm/500ml	Contains no more than 2 pieces of foreign matter > 25mm/500mL
Pieces >25mm/500mL	0		
Sharp Foreign Matter		No sharp foreign matter >3mm per 500ml	No more than 3 pieces of sharp matter < 12.5mm/500mL Note: This compost shall not be used in pastures, parks, or residential
Pieces > 3mm/500mL	0		
Pieces > 12.5mm/500mL	0		

C. Maturity/Stability:

Method	Test Results	Required Limits
CO ₂ Respiration Rate CO ₂ Respiration Rate	0.80	≤ 4 mg of carbon in the form of carbon dioxide per gram of organic matter per day
O ₂ Uptake Respiration Rate O ₂ Uptake Respiration Rate		≤ 400 mg oxygen/kg of volatile solids (or organic matter)/hour

D. Pathogens:

Pathogen	Test Results	Required Limits
Fecal Coliform (MPN/g dry)	<3	<1000 MPN/g of total solids calculated on a dry weight basis
Salmonella (P-A/25g(ml))	NEGATIVE	<3 MPN/4g total solids calculated on a dry weight basis

The following references are from the CCME guidelines (PN1340), October 2005

*BDL = Below Detectable Limits

E. CFIA

Parameter	Test Results
Total Organic Matter (%)	79.95%
Moisture (%)	47.99%

All analysis conducted and prepared by:

A L Canada Laboratories

2136 Jetstream Rd London, Ontario N5V 3P5 (519) 457-2575



Appendix II Finished Compost Quality



Parameter	Test Results
pH	6.3
Carbon to Nitrogen Ratio	21:1
Particle Size/Texture (inch)+	3/8 Inch
Soluble Salts (ms/cm)	2.8
Sodium Base Saturation (%Na)	6.39%
Major Nutrients	
Available Potassium (%K)	25.04%
Available Magnesium (%Mg)	38.92%
Available Calcium (%Ca)	22.25%

+ Majority of sample passes through this sieve size

Reference Compost Quality Parameters for CQA

Use	pH	C:N	Moisture	Particle Size	Soluble Salts	%Na
Remediation	5.8-8.5	10-40	NA	<2 in	<20	<3%
Soil Amendment	5.8-8.5	10-30	NA	<1/2 in	<6	<2%
Landscaping	5.8-8.5	12-22	<50%	<1/2 in	<5	<2%
Planting Media	5.5-7.8	12-22	<50%	<1/2 in	<4	<2%
Turf Establishment & Topdressing	5.5-7.8	12-22	<50%	<3/8 in	<3	<1%
Greenhouse Seeding	6-7	12-22	<25%	<1/4 in	<2	<0.5%
Greenhouse Establishment	6-7	12-22	<30%	<1/2 in	2-3.5	<0.5%
Field Nursery	5.8-8	10-30	<50%	<1/2 in	<3.5	<1%
Agricultural Soil Amendments	6-8	10-30	<50%	<1/2 in	<20	none
Potting Soil	5.5-7.2	12-22	<50%	<1/4 in	<2	<1%

These are examples of some of the many end uses suitable for compost

Unrestricted Use: Category A - Compost that can be used in any application, such as agricultural lands, residential gardens, horticultural operations, the nursery industry, and other businesses. Category A criteria for trace elements are achievable using best source separated MSW feedstock, municipal biosolids, pulp and paper mill biosolids, or manure.

Restricted Use: Category B - Compost that has a restricted use because of the presence of sharp foreign matter or higher trace element content. Category B compost may require additional control when deemed necessary by a province or territory.

Note: For a compost to meet the unrestricted use category, it must meet the unrestricted (Category A) requirements for all trace elements and sharp foreign matter. If the compost fails one criterion of the guideline for unrestricted use but meets the criteria for restricted (Category B) use, then it is classified as a Category B product. Products that do not meet the criteria for either Category A or B must be used or disposed of appropriately.



Appendix III
Compost Agricultural Product Value
on as is basis



Agricultural End-Use	Analysis Result	Unit	Quantity in lbs/Ton
Physical Parameters			
Dry Matter	52.01%	%	
pH	6.3		
Bulk Density	543	kg/m3	
C:N Ratio	21:1		
Fertilizer Equivalent Minerals			
Nitrogen Total	2.35%	%	47.0
Ammonium Nitrogen	1415.00	ppm	2.83
Total Phosphate (P as P2O5)	1.32%	%	26.4
Total Potash (K as K2O)	0.33%	%	6.6
Calcium	0.71%	%	14.2
Magnesium	0.20%	%	4.0
Sulfur	1645.08	ppm	3.3

The Compost Quality Assurance program goes beyond the provincial requirements to establish full value and appropriate end-use. The Compost Report and Compost End-use table in Appendix II, has 10 different compost application uses from soil remediation, through to potting soil blends. Of note are available soluble salt limits and the percent available sodium for sensitive plants. Appendix III, lists the primary agricultural use parameters and quantitative nutrient content that reflects this compost samples agricultural end-use, and application value. This value includes macro and micro nutrients, soil building properties such as the addition of organic matter, increasing moisture holding capacity, and the soils slow release nutrients. These parameters improve beneficial soil health components soil structure and stability.

The results of our testing on this sample indicates that this product is a fine textured, compost (82%+ 3/8 in.), with rich mineral properties, which would meet criteria for agricultural soil amendment, blending and topdressing end-uses purposes. The C:N ratio 21:1 from Appendix II, on the soil suitability report indicates a low C:N ratio and indicating good nitrogen availability. The low C:N ratio in conjunction with the higher total nitrogen content listed in Appendix III indicates early high available nitrogen levels, and should be considered for crop planning. The proportion of available sodium (6.39% Na), which if used in too heavy a proportion could cause some problems with sensitive species. The sodium levels of this compost sample though high, is suitable for agricultural broadcast field applications and are made to improve the organic matter level and major nutrients phosphorus, potassium and magnesium levels. The compost is also rich in available calcium, sulfur, and iron, which make it ideal for soil enriching, and amendment. We recommend blending this material at a minimum of 4-5 parts soil blended to each part of this compost to dilute the sodium concentration.

Major Nutrients - Compost is classified in Schedule II (CFIA Fertilizer Act & Regulations) as a supplement, and as such, nutrient guarantees are not mandatory. However, if any claims are made regarding nutritional value of the product, such as for composted manure, the product would then be classified as a supplement and a fertilizer, and label would have to include the guarantees for the major nutrients. The guarantees for the major nutrients include the minimum amounts of Total Nitrogen (N), Available Phosphoric Acid (P2O5) and Soluble Potash (K2O).

Report Number: C21014-10073
 Account Number: 01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, Ontario, N5V 3P5
 Telephone: (519) 457-2575 Fax: (519) 457-2664



C21014-10073



To: CITY OF KELOWNA
 1435 WATER STREET
 KELOWNA, BC V1Y 1J4

For: OGOGROWOCTOBER2020

Attn: MARCIA BROWNE OR JOSE GARCIA

P.O. Number: 532988

Reported Date:
 Printed Date: Jan 21, 2021

COMPOST REPORT

Page: 1 / 1

Sample Number	Lab Number	pH	Lime Index	Available Organic Matter %	Phosphorus P ppm	Potassium K ppm	Magnesium Mg ppm	Calcium Ca ppm
OGOGROWOCTC	54598	6.3	6.2	73.9	2193	2113	1024	963

Sulfur S ppm	Zinc Zn ppm	Manganese Mn ppm	Iron Fe ppm	Copper Cu ppm	Boron B ppm	Sodium Na ppm	Nitrate-N NO3-N ppm	Soluble Salt ms/cm	Nitrogen (Total) (%)	Chloride ppm
157	62.4	58	157	4.2	1.8	318	13	2.8	2.35	1262

INTERPRETATION

CEC		Percent Base Saturation				Proportional Equivalents (meq)				Cation Ratio		C/N Ratio
meq/100g	% BS	% K	% Mg	% Ca	% Na	K	Mg	Ca	Na	Mg/K	Ca/Mg	
21.6	92.6	25.04	38.92	22.25	6.39	5.42	8.42	4.82	1.38	2:1	1:1	21:1
Optimum Range:		3 - 5	8 - 20	60 - 80		0.5 - 1.3				7:1	5:1	

CQA

* Results reported on a dry weight basis.

The results of this report relate to the sample submitted and analyzed.

* Crop yield is influenced by a number of factors in addition to soil fertility.

No guarantee or warranty concerning crop performance is made by A & L.

Results Authorized By:

Ian McLachlin, Vice President

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A & L Canada Laboratories Inc.

2136 Jetstream Rd, London, Ontario, N5V 3P5

Telephone: (519) 457-2575 Fax: (519) 457-2664



REPORT NUMBER: C21014-10073

ACCOUNT NUMBER: 01759

REPORT OF ANALYSIS

TO: CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

RE: OGOGROWOCTOBER2020

CQA2100029

DATE RECEIVED: 2021-01-14

DATE REPORTED: 2021-01-21

PAGE: 1 / 1

P.O. NUMBER: 532988

Attn: MARCIA BROWNE OR JOSE GARCIA

LAB NO.	SAMPLE ID	ANALYSIS	RESULT	UNIT	METHOD
54598	OGOGROWOCTOBE	Nitrogen (Total)	2.3	%	TMECC.04.02-D



C21014-10073

Results Authorized By:

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REPORT NO.
C21014-70002

ACCOUNT NUMBER
01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664



TO:CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR:OGOGROW OCTOBER 2020

ATTN:Marcia Browne or Jose Garcia
Phone:250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 1 / 3

PROJECT NO:

PO#:532988
LAB NUMBER:147011
SAMPLE ID:OGOGROW OCTOBER 2020

SAMPLE MATRIX:COMPOST
DATE SAMPLED:2021-01-13
DATE RECEIVED:2021-01-14
DATE REPORTED:
DATE PRINTED:2021-01-21

PARAMETER	Result	UNIT	DETECTION LIMIT	METHOD REFERENCE
Arsenic	2.86	ug/g	1.00	EPA 3050B/6010B(mod) *
Cadmium	BDL	ug/g	1.00	EPA 3050B/6010B(mod) *
Cobalt	1.97	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Chromium	15.57	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)*
Copper	201.85	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Mercury	0.21	ug/g	0.10	EPA 7471 *
Molybdenum	4.0	ug/g	1.0	TMECC.04.06;EPA 3050/6010(mod)*
Nickel	8.46	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Lead	7.61	ug/g	1.00	EPA 3050B/6010B(mod) *
Selenium	BDL	ug/g	1.00	EPA 3050/6010 (mod) *
Zinc	256.15	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C21014-70002

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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REPORT NO.
C21014-70002

ACCOUNT NUMBER
01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664



TO:CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR:OGOGROW OCTOBER 2020

ATTN:Marcia Browne or Jose Garcia
Phone:250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 2 / 3

PROJECT NO:

PO#:532988
LAB NUMBER:147011
SAMPLE ID:OGOGROW OCTOBER 2020

SAMPLE MATRIX:COMPOST
DATE SAMPLED:2021-01-13
DATE RECEIVED:2021-01-14
DATE REPORTED:
DATE PRINTED:2021-01-21

PARAMETER	Result	UNIT	DETECTION LIMIT	METHOD REFERENCE
E. coli	<3	MPN/g dry	3	TMECC 07.01
Salmonella spp.	NEGATIVE	P-A/ 25.0g(ml)	1 CFU	MFLP-75 *
Fecal Coliform	<3	MPN/g dry	3	TMECC 07.01
Total sharps > 2.8 mm*	0	pieces/500ml		TMECC 03.08
Total sharps > 12.5 mm	0	pieces/500ml		TMECC 03.08
Total FM > 2.8 mm*	BDL	%	0.01	TMECC 03.08
Total FM > 25 mm	0	pieces/500ml		TMECC 03.08
Total plastics > 2.8 mm*	BDL	%	0.01	TMECC 03.08
Total Organic Matter @ 550 deg C	79.95	%	0.10	LOI@550C
Moisture	47.99	%	0.10	TMECC.03.09-A
Sieve 2 Inch (% Passing)	100.00	%	0.10	ASTMD422
Sieve 1 Inch (% Passing)	100.00	%	0.10	ASTMD422
Sieve 1/2 Inch (% Passing)	91.70	%	0.10	ASTMD422
Sieve 3/8 Inch (% Passing)	81.50	%	0.01	ASTMD422
Sieve 1/4 Inch (% Passing)	63.50	%	0.10	ASTMD422
Compost Stability Index	8	---		TMECC.05.08-B
Respiration-mgCO ₂ -C/g OM/day	0.80	mgCO ₂ -C/ gOM/day	0.01	TMECC.05.08-B
Respiration - mgCO ₂ -C/g TS/day	0.70	mgCO ₂ -C/ gTS/day	0.01	TMECC.05.08-B

Maturity Index: 8 - Inactive, highly matured compost, very well aged, possibly over-aged, like soil; no limitations for usage.

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C21014-70002

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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REPORT NO.
C21014-70002

A & L Canada Laboratories Inc.



ACCOUNT NUMBER
01759

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664

TO: CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR: OGOGROW OCTOBER 2020

ATTN: Marcia Browne or Jose Garcia
Phone: 250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 3 / 3

PROJECT NO:

PO#: 532988
LAB NUMBER: 147011
SAMPLE ID: OGOGROW OCTOBER 2020

SAMPLE MATRIX: COMPOST
DATE SAMPLED: 2021-01-13
DATE RECEIVED: 2021-01-14
DATE REPORTED:
DATE PRINTED: 2021-01-21

PARAMETER	Result Dry Weight	Result As Received	UNIT	DETECTION LIMIT	METHOD REFERENCE
Total Solids (as received)		52.01	%	0.10	Gravimetric
Nitrogen & Carbon					
Total Organic Carbon		44.42	%	0.10	Combustion
Ammonia (NH3/NH4-N)	2720.63	1415.00	ug/g	.01	Colourimetric
Metals					
Potassium	5270.00	2740.93	ug/g	5.00	TMECC.04.04
Total Potassium (as K2O)	0.63	0.33	%	0.05	ICP
Phosphorus	11065.00	5754.91	ug/g	5.00	TMECC.04.03 *
Total Phosphorus (as P2O5)	2.53	1.32	%	0.05	ICP
Aluminum	2984.50	1552.24	ug/g	5.00	TMECC.04.07 *
Boron	20.34	10.58	ug/g	1.00	TMECC.04.05 *
Calcium	1.37	0.71	%	0.01	TMECC.04.05
Iron	4801.00	2497.00	ug/g	5.00	TMECC.04.05 *
Magnesium	0.39	0.20	%	0.01	TMECC.04.05 *
Manganese	314.80	163.73	ug/g	1.00	TMECC.04.05 *
Sodium	0.12	0.06	%	0.01	TMECC.04.05 *
Sulphur	3163.00	1645.08	ug/g	5.00	TMECC.04.05 *
Additional Parameters					
Bulk Density (as Recieved)		543	kg/m3	10	Gravimetric
Conductivity (@ 25 deg C)		2.67	ms/cm	0.02	Conductivity Meter

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C21014-70002

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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www.compostquality.ca

SUMMARY OF ANALYSIS REPORT

To: City of Kelowna
1435 Water Street
Kelowna, British Columbia V1Y 1J4

CQA Member#: 18-2800

Attention: Marcia Browne or Jose Garcia

Sample I.D.: OGOGROW NOVEMBER2020

Report#: C21014-10074
C21014-70003

Sample Date: 2021-01-13

Reported Date: 2021-1-21

Compost to be Manufacture in: British Columbia

Feedstock: *Municipal Biosolids and Forestry Residues*

CQA COMPOST QUALITY & VALUE TESTING PARAMETERS REPORT

SAMPLE ID OGOGROW	RECOMMENDED END USE/MARKET
NOVEMBER2020	Category A
Regulatory	See Appendix I
Product Quality	See Appendix II
Product Value/ Soil Suitability*	See Appendix III (Soil, Enviro, Manure Compost)

The Compost Quality Alliance (CQA) is a voluntary quality monitoring program established by the Compost Council of Canada and the compost producers utilizing recognized standardized testing methodologies and uniform operating protocols to provide customer assurance in compost selection its use, and proper end-use utilization.

All analysis of this compost product was conducted and provided by A&L Canada Laboratories Inc. for the Compost Quality Alliance (CQA).

Haifeng Song, Senior Chemist

Ian McLachlin, Vice-President



A&L Canada Laboratories Inc.
London, Ontario Canada
(519) 457-2575

A proud member of



***PLEASE NOTE: Major Nutrients under the Fertilizer Act and Regulations (CFIA)**

Please see Appendix III for nutrient content (of impact to claims and labelling if used in declarations).

Compost is classified in Schedule II as a supplement, and as such nutrient guarantees are not mandatory. However, if any claims are made regarding nutritional value of the product, such as for composted manure, the product would then be classified as a supplement and a fertilizer, and the label would have to include the guarantees for the major nutrients. The guarantees for the major nutrients include the minimum amounts of Total Nitrogen (N), Available Phosphoric Acid (P2O5) and Soluble Potash K2O. Source: T-4-120 - Regulation of Compost under the Fertilizers Act and Regulations. <http://www.inspection.gc.ca/plants/fertilizers/trade-memoranda/t-4-120/eng/1307910204607/1307910352783>



Appendix I



CCME Guidelines 2005 & CFIA Fertilizer Act & Regulations:

Alberta, Manitoba, New Brunswick, Nova Scotia, Newfoundland, Prince Edward Island & Territories

A. Maximum Concentrations for Trace Metals in Compost:

Trace Elements	Test Results (ug/g)	Category A	Category B
		Maximum Concentration within Product (mg/kg dry weight)	
Arsenic (As)	2.79	13	75
Cadmium (Cd)	BDL	3	20
Chromium (Cr)	10.61	210	**
Cobalt (Co)	1.57	34	150
Copper (Cu)	190.45	400	**
Lead (Pb)	5.10	150	500
Mercury (Hg)	0.26	0.8	5
Molybdenum (Mo)	3.30	5	20
Nickel (Ni)	6.66	62	180
Selenium (Se)	BDL	2	14
Zinc (Zn)	232.20	700	1850

** Upper limits are not established in the Trade Memorandum.

B. Foreign Matter in Compost:

Test Results		Category A	Category B
Foreign Matter		Contains no more than 1 piece of foreign matter >25mm/500ml	Contains no more than 2 pieces of foreign matter > 25mm/500mL
Pieces >25mm/500mL	0		
Sharp Foreign Matter		No sharp foreign matter >3mm per 500ml	No more than 3 pieces of sharp matter < 12.5mm/500mL Note: This compost shall not be used in pastures, parks, or residential
Pieces > 3mm/500mL	0		
Pieces > 12.5mm/500mL	0		

C. Maturity/Stability:

Method	Test Results	Required Limits
CO ₂ Respiration Rate CO ₂ Respiration Rate	1.00	≤ 4 mg of carbon in the form of carbon dioxide per gram of organic matter per day
O ₂ Uptake Respiration Rate O ₂ Uptake Respiration Rate		≤ 400 mg oxygen/kg of volatile solids (or organic matter)/hour

D. Pathogens:

Pathogen	Test Results	Required Limits
Fecal Coliform (MPN/g dry)	7	<1000 MPN/g of total solids calculated on a dry weight basis
Salmonella (P-A/25g(ml))	NEGATIVE	<3 MPN/4g total solids calculated on a dry weight basis

The following references are from the CCME guidelines (PN1340), October 2005

*BDL = Below Detectable Limits

E. CFIA

Parameter	Test Results
Total Organic Matter (%)	82.61%
Moisture (%)	48.46%

All analysis conducted and prepared by:

A L Canada Laboratories

2136 Jetstream Rd London, Ontario N5V 3P5 (519) 457-2575



Appendix II Finished Compost Quality



Parameter	Test Results
pH	6.3
Carbon to Nitrogen Ratio	21:1
Particle Size/Texture (inch)+	1/2 Inch
Soluble Salts (ms/cm)	2.3
Sodium Base Saturation (%Na)	7.05%
Major Nutrients	
Available Potassium (%K)	27.44%
Available Magnesium (%Mg)	23.61%
Available Calcium (%Ca)	35.65%

+ Majority of sample passes through this sieve size

Reference Compost Quality Parameters for CQA

Use	pH	C:N	Moisture	Particle Size	Soluble Salts	%Na
Remediation	5.8-8.5	10-40	NA	<2 in	<20	<3%
Soil Amendment	5.8-8.5	10-30	NA	<1/2 in	<6	<2%
Landscaping	5.8-8.5	12-22	<50%	<1/2 in	<5	<2%
Planting Media	5.5-7.8	12-22	<50%	<1/2 in	<4	<2%
Turf Establishment & Topdressing	5.5-7.8	12-22	<50%	<3/8 in	<3	<1%
Greenhouse Seeding	6-7	12-22	<25%	<1/4 in	<2	<0.5%
Greenhouse Establishment	6-7	12-22	<30%	<1/2 in	2-3.5	<0.5%
Field Nursery	5.8-8	10-30	<50%	<1/2 in	<3.5	<1%
Agricultural Soil Amendments	6-8	10-30	<50%	<1/2 in	<20	none
Potting Soil	5.5-7.2	12-22	<50%	<1/4 in	<2	<1%

These are examples of some of the many end uses suitable for compost

Unrestricted Use: Category A - Compost that can be used in any application, such as agricultural lands, residential gardens, horticultural operations, the nursery industry, and other businesses. Category A criteria for trace elements are achievable using best source separated MSW feedstock, municipal biosolids, pulp and paper mill biosolids, or manure.

Restricted Use: Category B - Compost that has a restricted use because of the presence of sharp foreign matter or higher trace element content. Category B compost may require additional control when deemed necessary by a province or territory.

Note: For a compost to meet the unrestricted use category, it must meet the unrestricted (Category A) requirements for all trace elements and sharp foreign matter. If the compost fails one criterion of the guideline for unrestricted use but meets the criteria for restricted (Category B) use, then it is classified as a Category B product. Products that do not meet the criteria for either Category A or B must be used or disposed of appropriately.



Appendix III
Compost Agricultural Product Value
on as is basis



Agricultural End-Use	Analysis Result	Unit	Quantity in lbs/Ton
Physical Parameters			
Dry Matter	51.54%	%	
pH	6.3		
Bulk Density	554	kg/m3	
C:N Ratio	21:1		
Fertilizer Equivalent Minerals			
Nitrogen Total	2.33%	%	46.6
Ammonium Nitrogen	1295.46	ppm	2.59
Total Phosphate (P as P2O5)	1.29%	%	25.8
Total Potash (K as K2O)	0.28%	%	5.6
Calcium	0.66%	%	13.2
Magnesium	0.18%	%	3.6
Sulfur	1549.81	ppm	3.1

The Compost Quality Assurance program goes beyond the provincial requirements to establish full value and appropriate end-use. The Compost Report and Compost End-use table in Appendix II, has 10 different compost application uses from soil remediation, through to potting soil blends. Of note are available soluble salt limits and the percent available sodium for sensitive plants. Appendix III, lists the primary agricultural use parameters and quantitative nutrient content that reflects this compost samples agricultural end-use, and application value. This value includes macro and micro nutrients, soil building properties such as the addition of organic matter, increasing moisture holding capacity, and the soils slow release nutrients. These parameters improve beneficial soil health components soil structure and stability.

The results of our testing on this sample indicates that this product is a medium textured, compost (87%+ 1/2 in.), with rich mineral properties, which would meet criteria for agricultural soil amendment, blending and mulching end-uses purposes. The C:N ratio 21:1 from Appendix II, on the soil suitability report indicates a low C:N ratio and indicating good nitrogen availability. The low C:N ratio in conjunction with the higher total nitrogen content listed in Appendix III indicates early high available nitrogen levels, and should be considered for crop planning. The proportion of available sodium (7.05% Na), which if used in too heavy a proportion could cause some problems with sensitive species. The sodium levels of this compost sample though high, is suitable for agricultural broadcast field applications and are made to improve the organic matter level and major nutrients phosphorus, potassium and magnesium levels. The compost is also rich in available calcium, sulfur, and iron, which make it ideal for soil enriching, and amendment. We recommend blending this material at a minimum of 4-5 parts soil blended to each part of this compost to dilute the sodium concentration.

Major Nutrients - Compost is classified in Schedule II (CFIA Fertilizer Act & Regulations) as a supplement, and as such, nutrient guarantees are not mandatory. However, if any claims are made regarding nutritional value of the product, such as for composted manure, the product would then be classified as a supplement and a fertilizer, and label would have to include the guarantees for the major nutrients. The guarantees for the major nutrients include the minimum amounts of Total Nitrogen (N), Available Phosphoric Acid (P2O5) and Soluble Potash (K2O).

Report Number: C21014-10074
 Account Number: 01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, Ontario, N5V 3P5
 Telephone: (519) 457-2575 Fax: (519) 457-2664



C21014-10074



To: CITY OF KELOWNA
 1435 WATER STREET
 KELOWNA, BC V1Y 1J4

For: OGOGROWNNOVEMBER2020

Attn: MARCIA BROWNE OR JOSE GARCIA

P.O. Number: 532988

Reported Date:
 Printed Date: Jan 21, 2021

COMPOST REPORT

Page: 1 / 1

Sample Number	Lab Number	pH	Lime Index	Available Organic Matter %	Phosphorus P ppm	Potassium K ppm	Magnesium Mg ppm	Calcium Ca ppm
OGOGROWNOVE	54599	6.3	6.5	73.7	551	686	184	457

Sulfur S ppm	Zinc Zn ppm	Manganese Mn ppm	Iron Fe ppm	Copper Cu ppm	Boron B ppm	Sodium Na ppm	Nitrate-N NO3-N ppm	Soluble Salt ms/cm	Nitrogen (Total) (%)	Chloride ppm
78	10.9	14	66	1.5	0.7	104	23	2.3	2.33	1276

INTERPRETATION

CEC		Percent Base Saturation				Proportional Equivalents (meq)				Cation Ratio		C/N Ratio
meq/100g	% BS	% K	% Mg	% Ca	% Na	K	Mg	Ca	Na	Mg/K	Ca/Mg	
6.4	93.8	27.44	23.61	35.65	7.05	1.76	1.51	2.29	0.45	1:1	2:1	21:1
Optimum Range:		3 - 5	8 - 20	60 - 80		0.5 - 1.3				7:1	5:1	

CQA

* Results reported on a dry weight basis.

The results of this report relate to the sample submitted and analyzed.

* Crop yield is influenced by a number of factors in addition to soil fertility.

No guarantee or warranty concerning crop performance is made by A & L.

Results Authorized By:

Ian McLachlin, Vice President

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A & L Canada Laboratories Inc.

2136 Jetstream Rd, London, Ontario, N5V 3P5

Telephone: (519) 457-2575 Fax: (519) 457-2664



REPORT NUMBER: C21014-10074

ACCOUNT NUMBER: 01759

REPORT OF ANALYSIS

TO: CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

RE: OGOGROWNNOVEMBER2020

CQA2100030

DATE RECEIVED: 2021-01-14

DATE REPORTED: 2021-01-21

PAGE: 1 / 1

P.O. NUMBER: 532988

Attn: MARCIA BROWNE OR JOSE GARCIA

LAB NO.	SAMPLE ID	ANALYSIS	RESULT	UNIT	METHOD
54599	OGOGROWNNOVEME	Nitrogen (Total)	2.3	%	TMECC.04.02-D



C21014-10074

Results Authorized By:

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REPORT NO.
C21014-70003

ACCOUNT NUMBER
01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664



TO:CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR:OGOGROW NOVEMBER 2020

ATTN:Marcia Browne or Jose Garcia
Phone:250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 1 / 3

PROJECT NO:

PO#:532988
LAB NUMBER:147012
SAMPLE ID:OGOGROW NOVEMBER 2020

SAMPLE MATRIX:COMPOST
DATE SAMPLED:2021-01-13
DATE RECEIVED:2021-01-14
DATE REPORTED:
DATE PRINTED:2021-01-21

PARAMETER	Result	UNIT	DETECTION LIMIT	METHOD REFERENCE
Arsenic	2.79	ug/g	1.00	EPA 3050B/6010B(mod) *
Cadmium	BDL	ug/g	1.00	EPA 3050B/6010B(mod) *
Cobalt	1.57	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Chromium	10.61	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)*
Copper	190.45	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Mercury	0.26	ug/g	0.10	EPA 7471 *
Molybdenum	3.3	ug/g	1.0	TMECC.04.06;EPA 3050/6010(mod)*
Nickel	6.66	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Lead	5.10	ug/g	1.00	EPA 3050B/6010B(mod) *
Selenium	BDL	ug/g	1.00	EPA 3050/6010 (mod) *
Zinc	232.20	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C21014-70003

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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REPORT NO.
C21014-70003

A & L Canada Laboratories Inc.



ACCOUNT NUMBER
01759

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664

TO:CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR:OGOGROW NOVEMBER 2020

ATTN:Marcia Browne or Jose Garcia

Phone:250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 2 / 3

PROJECT NO:

PO#:532988
LAB NUMBER:147012
SAMPLE ID:OGOGROW NOVEMBER 2020

SAMPLE MATRIX:COMPOST
DATE SAMPLED:2021-01-13
DATE RECEIVED:2021-01-14
DATE REPORTED:
DATE PRINTED:2021-01-21

PARAMETER	Result	UNIT	DETECTION LIMIT	METHOD REFERENCE
E. coli	7	MPN/g dry	3	TMECC 07.01
Salmonella spp.	NEGATIVE	P-A/ 25.0g(ml)	1 CFU	MFLP-75 *
Fecal Coliform	7	MPN/g dry	3	TMECC 07.01
Total sharps > 2.8 mm*	0	pieces/500ml		TMECC 03.08
Total sharps > 12.5 mm	0	pieces/500ml		TMECC 03.08
Total FM > 2.8 mm*	BDL	%	0.01	TMECC 03.08
Total FM > 25 mm	0	pieces/500ml		TMECC 03.08
Total plastics > 2.8 mm*	BDL	%	0.01	TMECC 03.08
Total Organic Matter @ 550 deg C	82.61	%	0.10	LOI@550C
Moisture	48.46	%	0.10	TMECC.03.09-A
Sieve 2 Inch (% Passing)	100.00	%	0.10	ASTMD422
Sieve 1 Inch (% Passing)	100.00	%	0.10	ASTMD422
Sieve 1/2 Inch (% Passing)	86.50	%	0.10	ASTMD422
Sieve 3/8 Inch (% Passing)	77.30	%	0.01	ASTMD422
Sieve 1/4 Inch (% Passing)	62.00	%	0.10	ASTMD422
Compost Stability Index	8	---		TMECC.05.08-B
Respiration-mgCO ₂ -C/g OM/day	1.00	mgCO ₂ -C/ gOM/day	0.01	TMECC.05.08-B
Respiration - mgCO ₂ -C/g TS/day	0.80	mgCO ₂ -C/ gTS/day	0.01	TMECC.05.08-B

Maturity Index: 8 - Inactive, highly matured compost, very well aged, possibly over-aged, like soil; no limitations for usage.

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C21014-70003

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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REPORT NO.
C21014-70003

A & L Canada Laboratories Inc.



ACCOUNT NUMBER
01759

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664

TO: CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR: OGOGROW NOVEMBER 2020

ATTN: Marcia Browne or Jose Garcia
Phone: 250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 3 / 3

PROJECT NO:

PO#: 532988
LAB NUMBER: 147012
SAMPLE ID: OGOGROW NOVEMBER 2020

SAMPLE MATRIX: COMPOST
DATE SAMPLED: 2021-01-13
DATE RECEIVED: 2021-01-14
DATE REPORTED:
DATE PRINTED: 2021-01-21

PARAMETER	Result Dry Weight	Result As Received	UNIT	DETECTION LIMIT	METHOD REFERENCE
Total Solids (as received)		51.54	%	0.10	Gravimetric
Nitrogen & Carbon					
Total Organic Carbon		45.90	%	0.10	Combustion
Ammonia (NH ₃ /NH ₄ -N)	2513.50	1295.46	ug/g	.01	Colourimetric
Metals					
Potassium	4537.00	2338.37	ug/g	5.00	TMECC.04.04
Total Potassium (as K ₂ O)	0.55	0.28	%	0.05	ICP
Phosphorus	10960.00	5648.78	ug/g	5.00	TMECC.04.03 *
Total Phosphorus (as P ₂ O ₅)	2.51	1.29	%	0.05	ICP
Aluminum	2310.50	1190.83	ug/g	5.00	TMECC.04.07 *
Boron	17.39	8.96	ug/g	1.00	TMECC.04.05 *
Calcium	1.28	0.66	%	0.01	TMECC.04.05
Iron	3619.50	1865.49	ug/g	5.00	TMECC.04.05 *
Magnesium	0.35	0.18	%	0.01	TMECC.04.05 *
Manganese	298.15	153.67	ug/g	1.00	TMECC.04.05 *
Sodium	0.07	0.04	%	0.01	TMECC.04.05 *
Sulphur	3007.00	1549.81	ug/g	5.00	TMECC.04.05 *
Additional Parameters					
Bulk Density (as Received)		554	kg/m ³	10	Gravimetric
Conductivity (@ 25 deg C)		1.59	ms/cm	0.02	Conductivity Meter

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C21014-70003

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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www.compostquality.ca

SUMMARY OF ANALYSIS REPORT

To: City of Kelowna
1435 Water Street
Kelowna, British Columbia V1Y 1J4

CQA Member#: 18-2800

Attention: Marcia Browne or Jose Garcia

Sample I.D.: OGOGROWDECEMBER2020

Report#: C21014-10075
C21014-70004

Sample Date: 2021-01-13

Reported Date: 2021-1-21

Compost to be Manufacture in: British Columbia

Feedstock: Municipal Biosolids and Forestry Residues

CQA COMPOST QUALITY & VALUE TESTING PARAMETERS REPORT

SAMPLE ID	RECOMMENDED END USE/MARKET
OGOGROWDECEMBER2020	Category A
Regulatory	See Appendix I
Product Quality	See Appendix II
Product Value/ Soil Suitability*	See Appendix III (Soil, Enviro, Manure Compost)

The Compost Quality Alliance (CQA) is a voluntary quality monitoring program established by the Compost Council of Canada and the compost producers utilizing recognized standardized testing methodologies and uniform operating protocols to provide customer assurance in compost selection its use, and proper end-use utilization.

All analysis of this compost product was conducted and provided by A&L Canada Laboratories Inc. for the Compost Quality Alliance (CQA).

Haifeng Song, Senior Chemist

Ian McLachlin, Vice-President



A&L Canada Laboratories Inc.
London, Ontario Canada
(519) 457-2575

A proud member of



***PLEASE NOTE: Major Nutrients under the Fertilizer Act and Regulations (CFIA)**

Please see Appendix III for nutrient content (of impact to claims and labelling if used in declarations).

Compost is classified in Schedule II as a supplement, and as such nutrient guarantees are not mandatory. However, if any claims are made regarding nutritional value of the product, such as for composted manure, the product would then be classified as a supplement and a fertilizer, and the label would have to include the guarantees for the major nutrients. The guarantees for the major nutrients include the minimum amounts of Total Nitrogen (N), Available Phosphoric Acid (P2O5) and Soluble Potash K2O. Source: T-4-120 - Regulation of Compost under the Fertilizers Act and Regulations. <http://www.inspection.gc.ca/plants/fertilizers/trade-memoranda/t-4-120/eng/1307910204607/1307910352783>



Appendix I



CCME Guidelines 2005 & CFIA Fertilizer Act & Regulations:

Alberta, Manitoba, New Brunswick, Nova Scotia, Newfoundland, Prince Edward Island & Territories

A. Maximum Concentrations for Trace Metals in Compost:

Trace Elements	Test Results (ug/g)	Category A	Category B
		Maximum Concentration within Product (mg/kg dry weight)	
Arsenic (As)	1.77	13	75
Cadmium (Cd)	BDL	3	20
Chromium (Cr)	12.88	210	**
Cobalt (Co)	1.84	34	150
Copper (Cu)	185.00	400	**
Lead (Pb)	5.48	150	500
Mercury (Hg)	0.22	0.8	5
Molybdenum (Mo)	3.90	5	20
Nickel (Ni)	7.42	62	180
Selenium (Se)	BDL	2	14
Zinc (Zn)	239.80	700	1850

** Upper limits are not established in the Trade Memorandum.

B. Foreign Matter in Compost:

Test Results		Category A	Category B
Foreign Matter		Contains no more than 1 piece of foreign matter >25mm/500ml	Contains no more than 2 pieces of foreign matter > 25mm/500mL
Pieces >25mm/500mL	0		
Sharp Foreign Matter		No sharp foreign matter >3mm per 500ml	No more than 3 pieces of sharp matter < 12.5mm/500mL Note: This compost shall not be used in pastures, parks, or residential
Pieces > 3mm/500mL	0		
Pieces > 12.5mm/500mL	0		

C. Maturity/Stability:

Method	Test Results	Required Limits
CO ₂ Respiration Rate CO ₂ Respiration Rate	0.80	≤ 4 mg of carbon in the form of carbon dioxide per gram of organic matter per day
O ₂ Uptake Respiration Rate O ₂ Uptake Respiration Rate		≤ 400 mg oxygen/kg of volatile solids (or organic matter)/hour

D. Pathogens:

Pathogen	Test Results	Required Limits
Fecal Coliform (MPN/g dry)	8	<1000 MPN/g of total solids calculated on a dry weight basis
Salmonella (P-A/25g(ml))	NEGATIVE	<3 MPN/4g total solids calculated on a dry weight basis

The following references are from the CCME guidelines (PN1340), October 2005

*BDL = Below Detectable Limits

E. CFIA

Parameter	Test Results
Total Organic Matter (%)	79.12%
Moisture (%)	55.66%

All analysis conducted and prepared by:

A L Canada Laboratories

2136 Jetstream Rd London, Ontario N5V 3P5 (519) 457-2575



Appendix II Finished Compost Quality



Parameter	Test Results
pH	6.2
Carbon to Nitrogen Ratio	23:1
Particle Size/Texture (inch)+	3/8 Inch
Soluble Salts (ms/cm)	1.8
Sodium Base Saturation (%Na)	6.50%
Major Nutrients	
Available Potassium (%K)	23.14%
Available Magnesium (%Mg)	37.08%
Available Calcium (%Ca)	26.20%

+ Majority of sample passes through this sieve size

Reference Compost Quality Parameters for CQA

Use	pH	C:N	Moisture	Particle Size	Soluble Salts	%Na
Remediation	5.8-8.5	10-40	NA	<2 in	<20	<3%
Soil Amendment	5.8-8.5	10-30	NA	<1/2 in	<6	<2%
Landscaping	5.8-8.5	12-22	<50%	<1/2 in	<5	<2%
Planting Media	5.5-7.8	12-22	<50%	<1/2 in	<4	<2%
Turf Establishment & Topdressing	5.5-7.8	12-22	<50%	<3/8 in	<3	<1%
Greenhouse Seeding	6-7	12-22	<25%	<1/4 in	<2	<0.5%
Greenhouse Establishment	6-7	12-22	<30%	<1/2 in	2-3.5	<0.5%
Field Nursery	5.8-8	10-30	<50%	<1/2 in	<3.5	<1%
Agricultural Soil Amendments	6-8	10-30	<50%	<1/2 in	<20	none
Potting Soil	5.5-7.2	12-22	<50%	<1/4 in	<2	<1%

These are examples of some of the many end uses suitable for compost

Unrestricted Use: Category A - Compost that can be used in any application, such as agricultural lands, residential gardens, horticultural operations, the nursery industry, and other businesses. Category A criteria for trace elements are achievable using best source separated MSW feedstock, municipal biosolids, pulp and paper mill biosolids, or manure.

Restricted Use: Category B - Compost that has a restricted use because of the presence of sharp foreign matter or higher trace element content. Category B compost may require additional control when deemed necessary by a province or territory.

Note: For a compost to meet the unrestricted use category, it must meet the unrestricted (Category A) requirements for all trace elements and sharp foreign matter. If the compost fails one criterion of the guideline for unrestricted use but meets the criteria for restricted (Category B) use, then it is classified as a Category B product. Products that do not meet the criteria for either Category A or B must be used or disposed of appropriately.



Appendix III
Compost Agricultural Product Value
 on as is basis



Agricultural End-Use	Analysis Result	Unit	Quantity in lbs/Ton
Physical Parameters			
Dry Matter	44.34%	%	
pH	6.2		
Bulk Density	565	kg/m3	
C:N Ratio	23:1		
Fertilizer Equivalent Minerals			
Nitrogen Total	2.10%	%	42.0
Ammonium Nitrogen	846.52	ppm	1.69
Total Phosphate (P as P2O5)	1.00%	%	20.0
Total Potash (K as K2O)	0.26%	%	5.2
Calcium	0.54%	%	10.8
Magnesium	0.16%	%	3.2
Sulfur	1308.03	ppm	2.6

The Compost Quality Assurance program goes beyond the provincial requirements to establish full value and appropriate end-use. The Compost Report and Compost End-use table in Appendix II, has 10 different compost application uses from soil remediation, through to potting soil blends. Of note are available soluble salt limits and the percent available sodium for sensitive plants. Appendix III, lists the primary agricultural use parameters and quantitative nutrient content that reflects this compost samples agricultural end-use, and application value. This value includes macro and micro nutrients, soil building properties such as the addition of organic matter, increasing moisture holding capacity, and the soils slow release nutrients. These parameters improve beneficial soil health components soil structure and stability.

The results of our testing on this sample indicates that this product is a fine textured, compost (83%+ 3/8 in.), with rich mineral properties, which would meet criteria for agricultural soil amendment, blending and topdressing end-uses purposes. The C:N ratio 23:1 from Appendix II, on the soil suitability report indicates a low C:N ratio and indicating good nitrogen availability. The low C:N ratio in conjunction with the higher total nitrogen content listed in Appendix III indicates early high available nitrogen levels, and should be considered for crop planning. The proportion of available sodium (6.50% Na), which if used in too heavy a proportion could cause some problems with sensitive species. The sodium levels of this compost sample though high, is suitable for agricultural broadcast field applications and are made to improve the organic matter level and major nutrients phosphorus, potassium and magnesium levels. The compost is also rich in available calcium, sulfur, and iron, which make it ideal for soil enriching, and amendment. We recommend blending this material at a minimum of 4-5 parts soil blended to each part of this compost to dilute the sodium concentration.

Major Nutrients - Compost is classified in Schedule II (CFIA Fertilizer Act & Regulations) as a supplement, and as such, nutrient guarantees are not mandatory. However, if any claims are made regarding nutritional value of the product, such as for composted manure, the product would then be classified as a supplement and a fertilizer, and label would have to include the guarantees for the major nutrients. The guarantees for the major nutrients include the minimum amounts of Total Nitrogen (N), Available Phosphoric Acid (P2O5) and Soluble Potash (K2O).

Report Number: C21014-10075
 Account Number: 01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, Ontario, N5V 3P5
 Telephone: (519) 457-2575 Fax: (519) 457-2664



C21014-10075



To: CITY OF KELOWNA
 1435 WATER STREET
 KELOWNA, BC V1Y 1J4

For: OGOGROWDECEMBER2020

Attn: MARCIA BROWNE OR JOSE GARCIA

P.O. Number: 532988

Reported Date:
 Printed Date: Jan 21, 2021

COMPOST REPORT

Page: 1 / 1

Sample Number	Lab Number	pH	Lime Index	Available Organic Matter %	Phosphorus P ppm	Potassium K ppm	Magnesium Mg ppm	Calcium Ca ppm
OGOGROWDECE	54600	6.2	6.1	71.1	2456	2554	1276	1483

Sulfur S ppm	Zinc Zn ppm	Manganese Mn ppm	Iron Fe ppm	Copper Cu ppm	Boron B ppm	Sodium Na ppm	Nitrate-N NO3-N ppm	Soluble Salt ms/cm	Nitrogen (Total) (%)	Chloride ppm
210	77.7	69	142	7.2	2.1	423	168	1.8	2.10	1384

INTERPRETATION

CEC		Percent Base Saturation				Proportional Equivalents (meq)				Cation Ratio		C/N Ratio
meq/100g	% BS	% K	% Mg	% Ca	% Na	K	Mg	Ca	Na	Mg/K	Ca/Mg	
28.3	92.9	23.14	37.08	26.20	6.50	6.55	10.49	7.41	1.84	2:1	1:1	23:1
Optimum Range:		3 - 5	8 - 20	60 - 80		0.5 - 1.3				7:1	5:1	

CQA

* Results reported on a dry weight basis.

The results of this report relate to the sample submitted and analyzed.

* Crop yield is influenced by a number of factors in addition to soil fertility.

No guarantee or warranty concerning crop performance is made by A & L.

Results Authorized By:

Ian McLachlin, Vice President

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A & L Canada Laboratories Inc.

2136 Jetstream Rd, London, Ontario, N5V 3P5
Telephone: (519) 457-2575 Fax: (519) 457-2664



REPORT NUMBER: C21014-10075
ACCOUNT NUMBER: 01759

REPORT OF ANALYSIS

TO: CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

RE: OGOGROWDECEMBER2020

CQA2100031

DATE RECEIVED: 2021-01-14

DATE REPORTED: 2021-01-21

PAGE: 1 / 1

P.O. NUMBER: 532988

Attn: MARCIA BROWNE OR JOSE GARCIA

LAB NO.	SAMPLE ID	ANALYSIS	RESULT	UNIT	METHOD
54600	OGOGROWDECEME	Nitrogen (Total)	2.1	%	TMECC.04.02-D



C21014-10075

Results Authorized By:

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REPORT NO.
C21014-70004

ACCOUNT NUMBER
01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664



TO:CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR:OGOGROW DECEMBER 2020

ATTN:Marcia Browne or Jose Garcia
Phone:250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 1 / 3

PROJECT NO:

PO#:532988
LAB NUMBER:147013
SAMPLE ID:OGOGROW DECEMBER 2020

SAMPLE MATRIX:COMPOST
DATE SAMPLED:2021-01-13
DATE RECEIVED:2021-01-14
DATE REPORTED:
DATE PRINTED:2021-01-21

PARAMETER	Result	UNIT	DETECTION LIMIT	METHOD REFERENCE
Arsenic	1.77	ug/g	1.00	EPA 3050B/6010B(mod) *
Cadmium	BDL	ug/g	1.00	EPA 3050B/6010B(mod) *
Cobalt	1.84	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Chromium	12.88	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)*
Copper	185.00	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Mercury	0.22	ug/g	0.10	EPA 7471 *
Molybdenum	3.9	ug/g	1.0	TMECC.04.06;EPA 3050/6010(mod)*
Nickel	7.42	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)
Lead	5.48	ug/g	1.00	EPA 3050B/6010B(mod) *
Selenium	BDL	ug/g	1.00	EPA 3050/6010 (mod) *
Zinc	239.80	ug/g	1.00	TMECC.04.06;EPA 3050/6010(mod)

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C21014-70004

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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REPORT NO.
C21014-70004

ACCOUNT NUMBER
01759

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664



TO:CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR:OGOGROW DECEMBER 2020

ATTN:Marcia Browne or Jose Garcia

Phone:250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 2 / 3

PROJECT NO:

PO#:532988

LAB NUMBER:147013

SAMPLE ID:OGOGROW DECEMBER 2020

SAMPLE MATRIX:COMPOST

DATE SAMPLED:2021-01-13

DATE RECEIVED:2021-01-14

DATE REPORTED:

DATE PRINTED:2021-01-21

PARAMETER	Result	UNIT	DETECTION LIMIT	METHOD REFERENCE
E. coli	8	MPN/g dry	3	TMECC 07.01
Salmonella spp.	NEGATIVE	P-A/ 25.0g(ml)	1 CFU	MFLP-75 *
Fecal Coliform	8	MPN/g dry	3	TMECC 07.01
Total sharps > 2.8 mm*	0	pieces/500ml		TMECC 03.08
Total sharps > 12.5 mm	0	pieces/500ml		TMECC 03.08
Total FM > 2.8 mm*	BDL	%	0.01	TMECC 03.08
Total FM > 25 mm	0	pieces/500ml		TMECC 03.08
Total plastics > 2.8 mm*	BDL	%	0.01	TMECC 03.08
Total Organic Matter @ 550 deg C	79.12	%	0.10	LOI@550C
Moisture	55.66	%	0.10	TMECC.03.09-A
Sieve 2 Inch (% Passing)	100.00	%	0.10	ASTMD422
Sieve 1 Inch (% Passing)	100.00	%	0.10	ASTMD422
Sieve 1/2 Inch (% Passing)	93.90	%	0.10	ASTMD422
Sieve 3/8 Inch (% Passing)	83.00	%	0.01	ASTMD422
Sieve 1/4 Inch (% Passing)	65.00	%	0.10	ASTMD422
Compost Stability Index	8	---		TMECC.05.08-B
Respiration-mgCO ₂ -C/g OM/day	0.80	mgCO ₂ -C/ gOM/day	0.01	TMECC.05.08-B
Respiration - mgCO ₂ -C/g TS/day	0.60	mgCO ₂ -C/ gTS/day	0.01	TMECC.05.08-B

Maturity Index: 8 - Inactive, highly matured compost, very well aged, possibly over-aged, like soil; no limitations for usage.

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C21014-70004

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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REPORT NO.
C21014-70004

ACCOUNT NUMBER
01759

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TO: CITY OF KELOWNA
1435 WATER STREET
KELOWNA, BC V1Y 1J4

FOR: OGOGROW DECEMBER 2020

ATTN: Marcia Browne or Jose Garcia
Phone: 250-469-8796

CERTIFICATE OF ANALYSIS

PAGE: 3 / 3

PROJECT NO:

PO#: 532988
LAB NUMBER: 147013
SAMPLE ID: OGOGROW DECEMBER 2020

SAMPLE MATRIX: COMPOST
DATE SAMPLED: 2021-01-13
DATE RECEIVED: 2021-01-14
DATE REPORTED:
DATE PRINTED: 2021-01-21

PARAMETER	Result Dry Weight	Result As Received	UNIT	DETECTION LIMIT	METHOD REFERENCE
Total Solids (as received)		44.34	%	0.10	Gravimetric
Nitrogen & Carbon					
Total Organic Carbon		43.96	%	0.10	Combustion
Ammonia (NH3/NH4-N)	1909.59	846.52	ug/g	.01	Colourimetric
Metals					
Potassium	4805.50	2130.28	ug/g	5.00	TMECC.04.04
Total Potassium (as K2O)	0.58	0.26	%	0.05	ICP
Phosphorus	9830.00	4357.64	ug/g	5.00	TMECC.04.03 *
Total Phosphorus (as P2O5)	2.25	1.00	%	0.05	ICP
Aluminum	2717.00	1204.45	ug/g	5.00	TMECC.04.07 *
Boron	17.83	7.90	ug/g	1.00	TMECC.04.05 *
Calcium	1.22	0.54	%	0.01	TMECC.04.05
Iron	4871.50	2159.54	ug/g	5.00	TMECC.04.05 *
Magnesium	0.36	0.16	%	0.01	TMECC.04.05 *
Manganese	289.35	128.27	ug/g	1.00	TMECC.04.05 *
Sodium	0.09	0.04	%	0.01	TMECC.04.05 *
Sulphur	2950.00	1307.73	ug/g	5.00	TMECC.04.05 *
Additional Parameters					
Bulk Density (as Recieved)		565	kg/m3	10	Gravimetric
Conductivity (@ 25 deg C)		1.23	ms/cm	0.02	Conductivity Meter

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C21014-70004

Results Authorized By:

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