LAKE COUNTRY
Life. The Okanagan Way.

Wastewater Treatment Plant

2021 Annual Report

10150 Bottom Wood Lake Road
Lake Country, British Columbia V4V 2M1
engineering@lakecountry.bc.ca
P: 250-766-6677

LAKE COUNTRY
Life. The Okanagan Way.

This document has been reviewed by the Wastewater Crew Leader and shared with wastewater operators and relevant District of Lake Country personnel. I certify that the information in this document and all attachments are correct, accurate, and complete to the best of my knowledge.

Prepared by:

Digitally signed by Nick Van Dalen
Date: 2022.03.17 10:51:57 -07'00'

March 17, 2022

Nick Van Dalen, Engineering Technician — Date

Reviewed by:

Digitally signed by Davin Larsen
Date: 2022.03.17 10:57:38 -07'00'

March 17, 2022

Davin Larsen AScT, Wastewater Crew Leader — Date

Reviewed by:

Kiel Wilkie

Digitally signed by Kiel Wilkie
Date: 2022.03.17 11:47:25 -07'00'

March 17, 2022

Kiel Wilkie AScT, Utilities Manager — Date

Table of Contents

1.0 Authorized Discharges

This annual report for Year 2021 is submitted according to the requirements of the Lake Country Wastewater Treatment Plant (LCWWTP) Operational Certificate – PE #14651. This report follows the format detailed in the "Operational Certificate Permit". The operational certificate was first issued in November, 1998 and last amended in June, 2021.

The LCWWTP, located at 4062 Beaver Lake Road in Lake Country, British Columbia, is a Class IV tertiary treatment plant owned, operated and maintained by the District of Lake Country.

1.1 Authorized Source

The site reference number for the effluent discharge is Environmental Monitoring System (EMS) E233626. The LCWWTP discharges reclaimed wastewater to a ground infiltration system located south of the treatment works. In 2012, infiltration capacity was renewed with the addition of three open basins. In 2015, the existing sub-surface field was renewed to its original condition with new pipe and media. The discharge is authorized under provisions of Operational Certificate – PE #14651, issued June 22, 2021.

1.2 Authorized Rate of Discharge (m^3/d)

The authorized maximum daily discharge limit issued for the year 2021 is 2000 m^3/d, based on a monthly average. Effluent totals are being calculated by using the effluent flow meter minus the C3 (reclaimed water) meter as this flow is taken from the effluent discharge line AFTER the effluent flow meter and recycled through the plant as process water.

- 2021 Annual Average 1952 m^3/d (2020=1756 m^3/d)
- 2021 Peak Month 63,018m^3 – January 2021; and
- 2021 Peak Daily 2258 m^3/d – January 14, 2021

Effluent Basin #1

The Septage Receiving Facility accounts for a considerable portion of the flows through the treatment plant. The daily septage flows for Year 2021 are as follows:

- Annual Average 37.5 m^3/d (2021=41.6 m^3/d)
- Peak Month 1490 m^3 – July 2021; and
- Peak Daily 147.5 m^3/d – August 30, 2021

Details of the monthly flows are provided in **Table 1**.

Table 1: Daily, Monthly, and Average Effluent Flows

2021	Influent Flow	Effluent				Septage Flow
		Flow *	Minimum*	Maximum*	Monthly Ave.*	
	m^3/month	m^3/month	m^3/day	m^3/day	m^3/day	m^3/month
January	56,866	63,018	1,840	2,258	2,033	569
February	50,336	56,154	1,902	2,143	2,006	730
March	53,114	57,846	1,614	2,084	1,866	1,237
April	51,826	55,217	1,555	2,050	1,841	1,439
May	53,842	58,339	1,691	2,058	1,882	1,392
June	52,913	57,335	1,720	2,202	1,911	1,454
July	57,183	61,183	1,850	2,069	1,974	1,490
August	56,337	62,251	1,878	2,121	2,008	1,434
September	52,559	58,203	1,716	2,082	1,940	1,156
October	55,028	61,631	1,875	2,128	1,988	1,238
November	54,113	60,240	1,857	2,132	2,008	998
December	54,662	60,933	1,844	2,082	1,966	572
Total	648,778	712,350			1,952	13,709

*Effluent calculated from Effluent minus reclaimed water usage. Daily flows can be found in Appendix A.

1.3 Effluent Quality - Ground Discharge by Infiltration

The LCWWTP treatment process is modified 3-Stage Bardenpho process that uses biological nutrient removal (BNR) arranged in sequential anaerobic, anoxic and aerobic zones for nutrient removal from the municipal wastewater. Long-term effluent discharge requirements are listed in **Table 2**.

Table 2: Effluent Quality Limits - Long Term Standards

Parameter	Daily	Annual Average
cBOD5	10	
Total Suspended Solids (mg/L)	20	
Ortho-Phosphorus (mg/L as P)	1.5	
Annual Average (mg/l as P)		0.15
Total Soluble Nitrogen TSN (mg/L as N)	10.0	
Annual Average TSN (mg/l as N)		6.0

Monthly grab samples are taken to an accredited lab for analysis, and the annual average results are calculated based on the 12 monthly results. Listed in Table 3 and Table 4 are monthly average values for these effluent parameters and their respective standards. Daily in-house samples are taken for

process control and for operational performance checks using standard methods listed in the BC Field Sampling Manual (2013 ed.) and the British Columbia Laboratory Manual (2015 ed.).

In house laboratory

The 2021 operating results and effluent discharge criteria for carbonaceous BOD, TSS, soluble phosphorus and soluble nitrogen are presented in the following sections.

1.3.1 Carbonaceous BOD (CBOD)

Monthly CBOD samples analyzed by the accredited lab (refer to Table 4) showed two occasions when the CBOD5 concentration were higher than the operational certificate requirements. One result (March 2021) exceeded the permit limit due to an ongoing issue with plant performance due to cold weather conditions. A second occurance took place in June, where the accredited lab results were over the permit limit. Anytime there is a exceedance, a second sample is taken to ensure the issue has been resolved or if it is an anomaly. For the exceedence in June, the first sample indicated a result of 18 mg/L, while the retest had an outcome of 4.3 mg/L. Due to these test results, an average of 11 mg/l is used for this report. Accredited laboratory results can be found in Appendix B.

Current upgrades to the LCWWTP (section 2.4) once completed, will help to address cold weather issues and fluctuations in effluent quality with the addition of filtration. The annual average for CBOD was 7 mg/L, the permitted daily limit is 10 mg/L.

1.3.2 Total Suspended Solids (TSS)

Suspended Solids are analyzed monthly by an accredited lab (Table 4); the yearly average was 7 mg/L with a peak month of 13 mg/L. The discharge permit states that effluent TSS shall be less than 20 mg/L. There were no occasions in 2021 when the data from the accredited lab were higher than the operational certificate requirement of 20 mg/L, with the maximum concentration of 13.0mg/L being measured on March, 2 2021. TSS is also analyzed in-house seven days a week to help inform process control.

1.3.3 Ortho Phosphorus

Effluent Ortho Phosphorus is analyzed daily on-site as well as monthly by an external accredited laboratory (Table 3). The biological nutrient removal process is supported with periodic Alum addition when required. Annual Ortho Phosphorus discharge averaged 0.02 mg/L by the monthly accredited lab analysis. This was below the operational certificate requirement of 0.15 mg/L.

At no time in 2021 did the effluent Ortho Phosphorus exceed the daily limit of 1.5 mg/L, with the maximum concentration of 0.04 mg/L being measured on July,8 2021.

1.3.4 Total Soluble Nitrogen (TSN)

Total Soluble effluent Nitrogen analysis is measured as the sum of ammonia, nitrite, and nitrate nitrogen. Results for TSN are analyzed daily in-house, as well as monthly by the accredited lab (Table 3). Issues regarding TSN removal have mostly been attributed to the strength and volume of our centrate and septage. Effluent TSN variations can typically be seen in correlation with the volume of septage received. Cold weather has also had a detrimental effect on TSN removal.

In 2021, the facility experienced 0 days where the TSN limit of 10.0 mg/L was exceeded, with the maximum concentration being 3.03 measured on September 8, 2021

The yearly average was 2.41 mg/L TSN by accredited lab analysis The permitted limit for TSN is currently **6.0** mg/L as a yearly average. Therefore, the yearly average was in compliance with the operational certificate requirements.

Table 3: Monthly Effluent Grab Samples - Ortho Phosphate and TSN

	Ortho P (mg/L as P) mg/L	Total Soluble N (mg/L as N) mg/L
Permit Levels (maximum)	**1.5**	**10.0 (permit limit beginning July, 2021)**
January	0.01	3.23
February	0.00	4.68
March	0.00	2.71
April	0.01	2.36
May	0.02	2.28
June	0.03	1.52
July	0.04	2.31
August	0.03	0.74
September	0.02	3.03
October	0.02	1.60
November	0.01	1.85
December	0.02	3.47
Annual Average	0.02	2.41

Table 4: Effluent Sampling - Monthly Accredited Lab Analysis (BOD, TSS, and pH)

	CBOD mg/L	TSS mg/L	pH
Permit Level	10	20	
January	7	13	7.76
February	6	13	7.62
March	12*	13	7.66
April	10	9	7.69
May	6	8	7.72
June	11.15*	<5	7.95
July	<5	3	7.75
August	<6	<3	7.90
September	5	4	7.92
October	<5	<2	7.74
November	5	5	7.78
December	<7	5	7.55
Annual Avg.	7	7	7.77

*Refer to Section 1.3.1.

2.0 General Requirements

2.1 Maintenance of works

District Operators complete several “Plant Operation Checklists” every day; copies of these are available upon request.

The District utilizes a Computer Maintenance Management System (CMMS) that schedules and tracks all plant maintenance.

All equipment is listed in the maintenance database and all manufacturer data and literature is indexed in binders.

2.2 Emergency Procedures

In Late 2021, the District finalized a Wastewater Operations Contigency Plan. This plan was created to outline protocols to be taken during any preconceived emergency situation as per section 2.10 of the Ministry of Environment and Climate Change Strategy (MoE) Operational Certificate 14651. This plan is intended as supplemental material for instructing new operators and supporting current operators with the proper steps to be taken if a critical failure should occur in any stage of the wastewater handling processes. The primary focus of this plan is ensuring public health and safety is maintained along with the protection of the surrounding natural environment. There were no emergency events or similar conditions that prevented normal operation in 2021.

2.3 Bypasses

There were no plant bypasses required in 2021.

2.4 Plant Modifications

The District of Lake Country is currently in the process of upgrading the Wastewater Treatment Plant with approval from the Ministry of Environment and Climate Change Strategy (MOE). In the current upgrade (Phase 4); there are provisions for added effluent treatment, increased disposal capacity, improved redundancy, and effluent filtration to help meet current and future comunity needs.

2.5 Facility Classification and Operator Certification

The British Columbia Environmental Operators Certification Program (EOCP) classifies the Lake Country Wastewater Treatment Plant as a Level IV facility and the Collection System a Class II system. The four staff members at the LCWWTP are all EOCP-certified wastewater treatment plant operators and/or Collection system operators. Levels of certification range between level II to level IV for municipal wastewater treatment.

2.6 Qualified Professional

This report was compiled by the AScT certified staff at the Wastewater Treatment facility. The required data for the report has been collected and anaylzed using the proper methods outlined in the British Columbia Field Sampling Manual and the British Columbia laboratory Manual. Where required, accredited lab services were utilized and results have been uploaded to EMS database.

Furthermore, a third party qualified professional has been contracted to review all data and the report itself for further transparency.

2.7 Plans-Works

All existing and currently constructed authorized works have been certified by a qualified person and constructed to the appropriate standards.

2.8 Operation and Maintenance

The District of Lake Country has a **Wastewater Treatment Operation and Maintenance Manual** that lists design criteria, process descriptions, maintenance and standard operating procedures for the more common functions of the facility.

2.9 Contingency Plan

A Contingency Plan was created in 2021 and sent to the MOE for approval in early 2022. The plan details the measures in place for any foreseeable emergency situation. A copy of the plan is available upon request.

2.10 Sludge Management

Biosolids produced in the wastewater treatment plant process are trucked to the Ogogrow Production Facility at 551 Commonage Road in Vernon, B.C. where they are beneficially reused to produce a soil amendment known as Ogogrow™.

The process used for the stabilization of biosolids is the Extended Aerated Static Pile Composting Method. The biosolids are mixed with wood waste and the compost is aerated for a period of about 20 days. Naturally occurring aerobic bacteria generate elevated pile temperatures that destroy pathogens. All compost processed meets the minimum temperature requirement of 55 degrees Celsius for at least three days and 45 degrees Celsius for 14 days to achieve the requirements of the Organic Matter Recycling Regulation. Composted biosolids are then placed on a secondary aeration system for 14 days, followed by a curing process for a minimum of ninety days. Compost is screened to one half inch to produce the final product. Each 500 cubic yard batch is tested for *Salmonella* and Faecal Coliform bacteria prior to sale, with upper acceptable limits of 0.75 mpn/g *Salmonella*, and 1000 mpn/g Faecal Coliform. Furthermore, Ogogrow™ is tested at regular intervals for metals, nutrients, and other parameters, which are either required by regulation, or deemed to be important information for the end user.

The Facility produces Class A compost. This means that the product can be sold with no restrictions for use, so it can be applied to flowers, shrubs and vegetable gardens. Ogogrow is widely used throughout the Okanagan by gardeners and landscapers

2.10.1 Sludge Volume Measurement

Table 5 details the total amount of dewatered sludge hauled to the Ogogrow Production Facility.

Table 5: Dewatered Sludge Quantities

2021	Total Monthly	
	# of loads	dry - tonnes *
January	15	132.1
February	16	142.8
March	22	216.5
April	22	200.7
May	24	203.5
June	22	208.6
July	22	189.9
August	22	205.6
September	20	179.9
October	19	181.7
November	17	169.4
December	18	139.7
Total	239	2,170.6

*Estimated weights to Compost Facility

2.10.2 Sludge Sampling Program

Dewatered sludge samples are sent to an accredited lab on a monthly basis. The results of this monitoring are available upon request.

Pieralisi Centrifuge

2.11 Infiltration Facilities

Plant effluent is sent to the infiltration facilities that consist of 3 open basins and a sub surface field. As part of the current phase 4 upgrade an additional sub surface field will be built to ensure proper disposal capacity is met.

The basins are rotated on a weekly basis to ensure there is a rest period and cleaned on a regular basis to remove the build up of solids on the sacrificial sand layer. Every one to two years, the sand layer is replaced with prewashed 2 and 3mm washed sand.

2.12 Sewage Collection System

The District of Lake Country Wastewater Collection system consists of 12 lift stations and 54 kilometers of sanitary sewer main. Other appurtenances are air valves, siphon chambers and odour chemical dosing stations. The system is registered as a Level II collection system by the EOCP and contains over 3,300 residential sanitary sewer service equivalancies.

2.12.1 Infiltration, Inflow and Cross Connections

As the District of Lake Country grows, so has the collection system infrastructure. While there have been no consistent infiltration issues, there have been some recognized sources of inflow from properties dealing with drainage from flood events and a high groundwater table. The District of Lake Country has been in contact with several properties and continues to deal with these on a case by case basis.

In the past, flow from pool discharge has had noticeable effects on the collections system and lift stations. These connections have been identified and a notice sent to property owners advising them of District bylaws regarding waste sent to the sanitary system. An inspection and follow up program has been completed and discharge from pools have been mitigated.

The District has 4 “Smartcovers” that remotly monitors sanitary manholes for variations in flow and level. These can assist operators in locating souces in infiltration and inflow and can be used as an alarm tool for sanitary sewer back-ups in high risk areas.

2.13 Domestic Wells

There has been no evidence of adverse groundwater impact from the wastewater treatment disposal system. In the event there was any impact the District would supply potable water to those affected. Private well data can be found in Appendix D.

2.14 Groundwater Extraction

In March of 2004, the District of Lake Country installed the Groundwater Extraction Well that would pump groundwater from the Southwest corner of the Wastewater Treatment Plant Property to the

middle of Vernon Creek at the south end of Swalwell Park. This groundwater well has not been used since its installation.

2.15 Irrigation

Treated effluent is only used for wastewater treatment plant process water and not used in the irrigation of any property.

3.0 Monitoring Requirements

3.1 Discharge Monitoring

Plant influent and effluent samples are sent to an accredited lab monthly. Accredited lab results are uploaded to the EMS website by the lab. Effluent flow meter readings are automatically stored in the Wastewater lab data management system (Hach Wims). Flow meter results are checked daily as part of the Daily Operations checklist, the results are tabulated in Table 1.

Effluent Accredited lab data is tabulated in section 1. Copies of the accredited lab reports can be found in Appendix B.

Table 6: Influent accredited lab data. Accredited results are from a single grab sample taken monthly.

	BOD	TSS	Total-P	TSN	pH
	mg/L	mg/L	mg/L as P	mg/L as N	
January	218	188	7.43	65.50	6.99
February	218	194	8.99	79.80	7.78
March	303	244	10.70	98.20	6.71
April	246	224	9.64	87.20	7.53
May	352	320	11.50	111.00	6.76
June	630	376	13.10	90.10	6.81
July	222	270	9.08	82.20	7.69
August	338	242	11.50	104.00	7.97
September	332	350	11.40	92.40	7.80
October	284	220	9.60	89.40	7.95
November	387	324	10.40	83.60	7.84
December	330	323	10.80	87.50	7.83
Average	275.6	272.9	10.3	89.2	7.47

3.2 Groundwater Monitoring

The groundwater-monitoring program has been developed and reviewed by a third party qualified professional (Urban Systems Ltd.) with interest in monitoring the following:

- groundwater flow pattern;
- groundwater quality;
- nutrient removal capability of the soil;
- groundwater levels
- reasonable notice of impending high ground water problems; and
- Elevated phosphorus or nitrate levels which may be a result of the effluent disposal.

The groundwater monitoring program is outlined in Section 3.2 of the operational certificate. A list of monitoring well locations can be found in Figure 1, and the data are summarised below.

Figure 1: Monitoring Well Locations

3.2.2 Groundwater Levels

Monthly groundwater levels are routinely monitored at five monitoring well locations (refer to Figure 1). Highest groundwater levels were consistently observed closest to the plant (MW-10); however, groundwater levels did not appear to decrease as the distance from the LCWWTP increased. All data points indicated the distance to groundwater level was over 0.5m from the ground surface. Data points for MW-10, 12, and 18 are only available from July onwards due to a change in the operational certificate.

3.2.3 Groundwater Quality

Groundwater quality results from District owned monitoring wells were found to meet the most stringent guidelines for all paramters, except chloride and faecal coliforms. It should be noted that monitoring wells over the guidelines for faecal coliforms (MW-10/12) are both located near properties with septic systems in agricultural areas where livestock can be present. Fall monitoring well sample concentrations were found to decrease as the distance from the LCWWTP increased; however, the same trend was not observed in the spring samples. It is possible that factors other than effluent quality had an effect on the furthest monitoring well results.

3.3 Modification of the Monitoring Program

The monitoring program was amended as part of the 2021 operational certificate. There have been no further changes to the monitoring plan since the operational certificate was issued in June 2021.

3.4 Sampling Facilities

The District has installed and maintains sampling facilites for all sample sites. All procedures for the sampling, storing and transporting of samples are in accordance with the BC Field Sampling Manual.

3.5 Analytical Procedures

The District follows and submits samples for laboratory analysis in accordance with the British Columbia Laboratory Manual (2015 permittee ed),

3.6 Quality Assurance

The District of Lake Country contracts Caro Analytical Services for their accredited lab testing. Along with sample results, Caro includes a copy of their quality assurance/quality control with each report. Caro is a CALA certified (Canadian Accredited Laboratories Association) and is an ISO (International Standards Organization) accredited lab.

In-house testing completed at the LCWWTP lab adheres to the BC Field Sampling Guide and standard methods for the examination of water and wastewater; in that Operators complete regularly scheduled calibrations of lab equipment as well as sampling quality control using blanks, duplicates and split samples to ensure quality operational and permit required samples. This lab is not accredited, so the data are only used for operational purposes, not for reporting purposes.

4.0 Reporting Requirements

All LCWWTP data collected from the lab and from the SCADA system are recorded on a web based software program *Hach Wims* and are available for review upon request.

4.1 Non–Compliance Notification and Reporting

All non-compliances are reported to the Director via email within 30 days of the event. This includes the cause and the resolution and a preventative plan of the non-compliance along with any lab data, pictures and supporting documents. Non-compliance reports can be found in Appendix C.

4.2 EMS Reporting

All lab data is entered into the EMS (Environmental Monitoring System) by the accredited lab within 30 days of the samples collection.

4.3 Annual Reporting

A) Exceedances - The Wastewater treatment plant experienced several non-compliances in 2021. A summary of those exceedances/non compliances are below:

- Daily flow limit exceedances (2) – In August and November the daily flow average exceeded the 2000m^3 limit for allowable effluent discharge. This exceedance is inherent with current community growth. There is a provision in the permit to raise this limit to 2200 m^3/day once the current upgrade to the Wastewater treatment facility is completed in late 2022. This will require an amendment to the operational certificate. The District is currently working through an update to the LWMP which will also provide long-term direction for managing community growth and flows.
- CBOD exceedance (1) – In one accredited monthly sample result we saw the Effluent BOD exceed the 10 mg/L permit limit. Another sample was immediately taken and the result was below the permitted level of 10mg/L. At the time, the plant was still in winter operation mode, which typically sees effluent quality decline. The current LCWWTP upgrade to be completed in 2022 will see additional measures in place that will enable a more resilient process during colder weather conditions and provide the LCWWTP with a more consistent effluent quality.
- Sewer line break (1) – A mechanical coupler, external to a lift station had corroded and a small leak surfaced. The surrounding area was cordoned off and immediate cleanup and repairs took place. MOE was notified of the event and it was found that no impact to the environment or public health in this event. Spilled wastewater did not enter receiving waters and the volume was less than 200L; therefore, PEP was not notified of the event.
- Treated effluent disposal failure (2) – On two occasions the effluent disposal area did not have the capacity to accept the peak daily effluent flow coming from the LCWWTP. These occurances took place during peak daily flow periods and during a time of year when the

groundwater table is at its highest point. The overflow was contained within the facility's property. This issue has been identified and additional infiltration beds are scheduled to be constructed in 2022. A long term solution has been identified with a discharge to Okanagan Lake, should the District of Lake Country's Liquid Waste Management Plan be accepted by the Minstry. The draft combined Stage 1/2 report was submitted to the Ministry in 2021, with the final submission scheduled for 2022.

B) Groundwater Reporting - Refer to section 3.2 for a summary of groundwater conditions at the LCWWTP. The full groundwater monitoring report can be found in Appendix D.

C) Plant performance trends

Figure 2: LCWWTP Final Effluent Flows

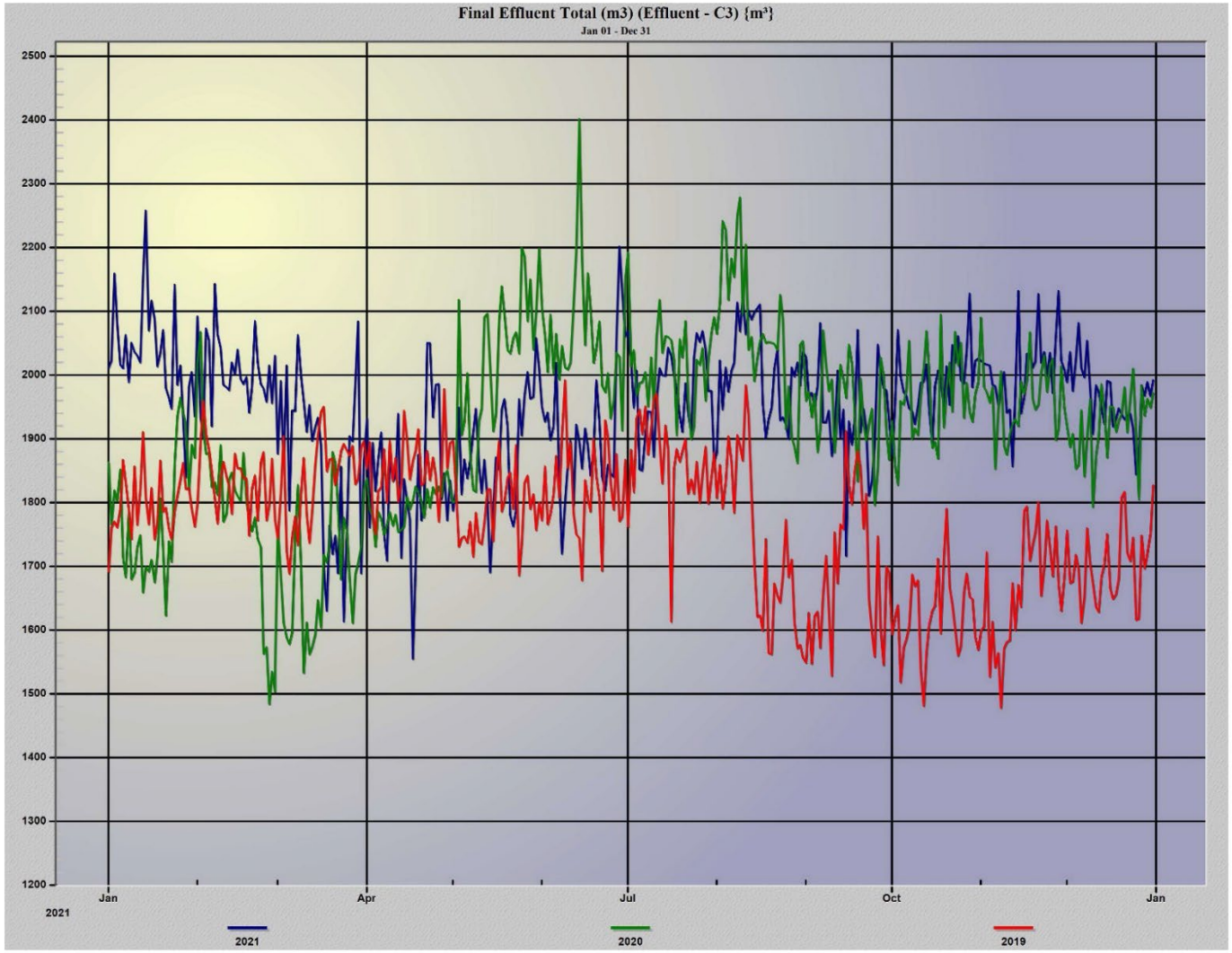


Figure 3: Effluent CBOD and TSS Concentrations

Figure 4: Effluent Orthophosphate Concentrations

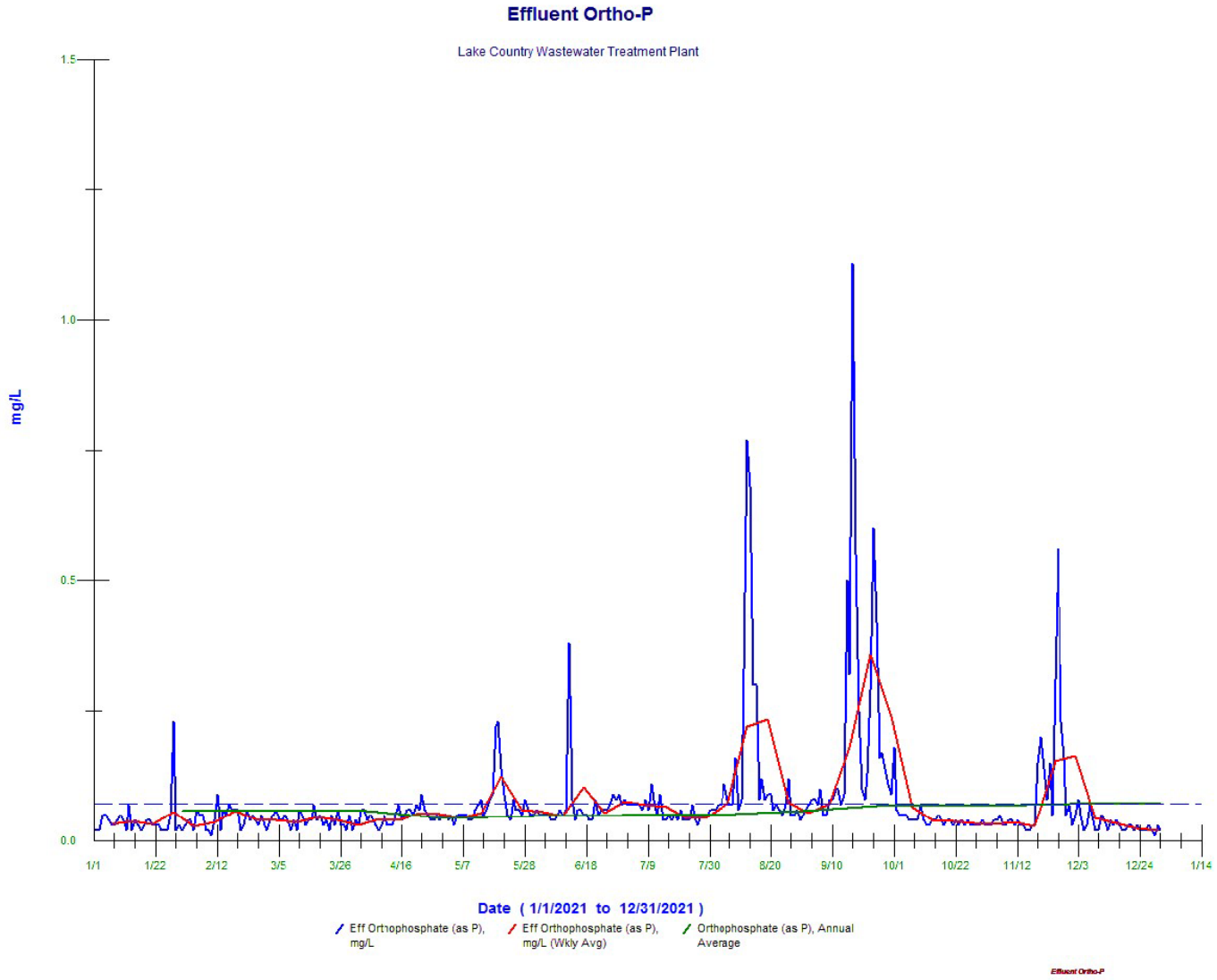


Figure 5: Effluent Ammonia, Nitrate, and Nitrite Concentrations

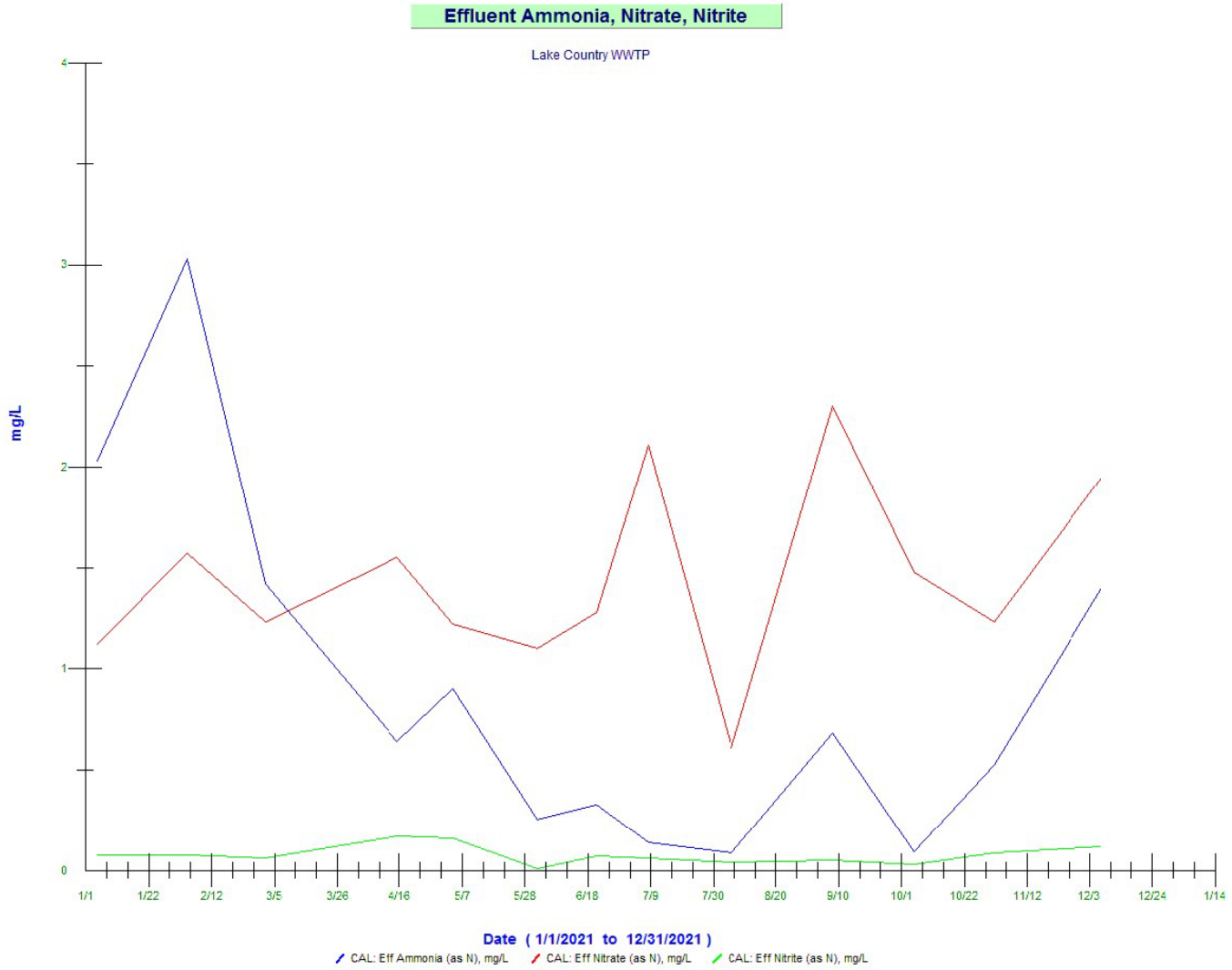
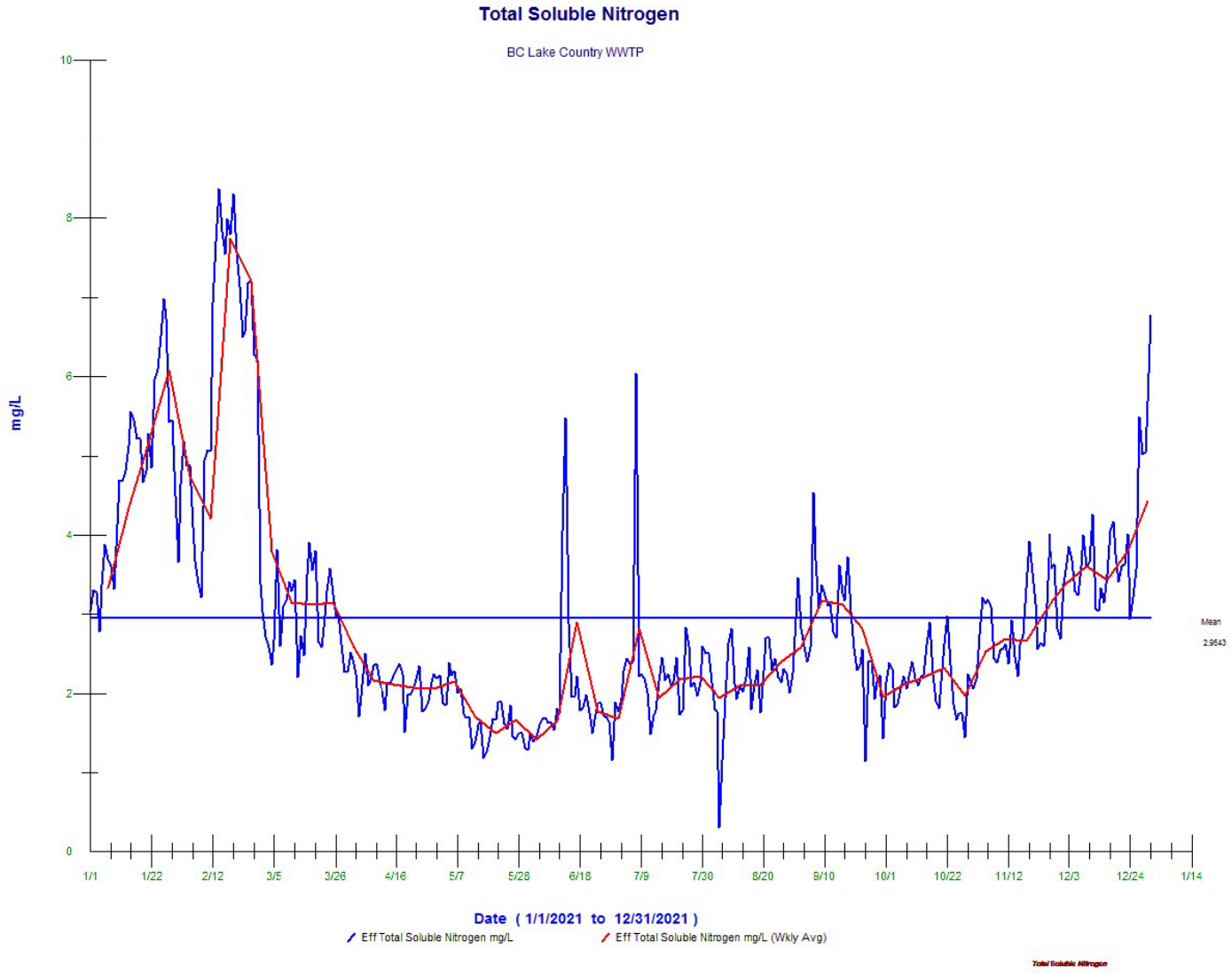


Figure 6: Total Soluble Nitrogen Concentrations



D) Lab reports – please refer to Table 3 and Table 4 for summarized accredited lab data. Copies of the accredited lab results can be found in Appendix B.

E) Quality Assurance Data – Two field blank samples for effluent quality analyzed in 2021 were flagged for errors in the CARO reports. In July, the field blank was analyzed past the recommended holding time, which resulted in a pH of 5.68 and a total coliform count of 3. In September the field blank returned a sample of 5.45. CARO test results can be found in Appendix B. No other QA/QC issues arose in 2021.

F) Sludge management recording – please refer to section 2.10.1 of this report

G) Evaluation of Authorized works – The overall current condition of the District of Lake Country Wastewater Facility is fair to good. With a recent upgrade in 2015, a current upgrade underway and another upgrade planned within 3 to 5 years, the District of Lake Country has identified components for upgrade and replacement at present and for the foreseeable future. A few of the current components have been highlighted below.

- Effluent filter addition (Completion 2022) – this will add a layer of protection to effluent quality to prevent TSS, ortho and BOD issues in the future.
- Redundant treatment components (completion 2022) – a third bioreactor and a second secondary clarifier are currently being constructed to increase treatment capacity and give some redundancy when maintenance issues arise.
- Additional infiltration gallery (completion 2022) – another infiltration galley will allow better disposal of peak daily flows and will help to avoid any treated effluent spills

H) Contingency Plan – A contingency plan (see emergency procedures 2.2) for the LCWWTP and collection system was created in 2021 and submitted to the Ministry on January 12th, 2022. There have been no further updates to the plan since its submission.

Appendix A - Total Daily Flows

	Final Effluent Total (m^3)[1]											
2021	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1st	2,012	2,092	1,877	1,932	1,787	1,950	2,069	1,878	2,029	1,875	2,023	1,989
2nd	2,022	1,934	1,991	1,761	1,821	1,927	2,022	2,023	1,967	1,949	2,018	2,036
3rd	2,159	1,902	1,859	1,894	1,949	1,941	1,949	1,946	1,972	2,071	2,017	1,975
4th	2,081	2,073	2,015	1,818	1,813	1,898	2,007	2,012	1,952	1,998	2,015	2,025
5th	2,016	2,054	1,788	1,868	1,868	1,919	1,852	1,974	1,983	1,973	1,985	2,082
6th	2,011	1,920	1,944	1,910	1,838	2,019	1,850	2,007	2,082	1,968	1,983	2,011
7th	2,063	2,143	1,944	1,752	1,866	1,840	1,908	2,019	1,926	1,948	1,953	1,996
8th	1,989	2,064	2,063	1,709	1,909	1,720	1,943	2,114	1,926	1,943	1,975	2,054
9th	2,051	2,042	2,000	1,876	1,947	1,800	1,942	2,069	1,944	1,923	2,005	1,976
10th	2,036	1,985	1,960	1,834	1,861	1,860	1,872	2,121	1,873	1,951	1,941	1,908
11th	2,031	1,981	1,911	1,840	1,815	1,897	1,961	2,064	1,908	1,988	1,946	1,984
12th	2,020	1,976	1,953	1,939	1,867	1,796	2,011	2,102	2,007	1,990	1,857	1,974
13th	2,149	2,020	1,897	1,713	1,805	1,922	2,000	2,087	1,901	2,017	1,972	1,949
14th	2,258	2,001	1,918	1,837	1,691	1,895	1,999	2,098	1,946	1,945	2,132	1,923
15th	2,070	2,040	1,933	1,803	1,785	1,853	2,043	2,105	1,716	1,890	1,940	1,991
16th	2,117	1,994	1,890	1,774	1,871	1,916	2,030	2,111	1,928	1,982	1,966	1,989
17th	2,088	1,986	1,699	1,555	1,852	1,889	1,999	1,955	1,891	2,007	2,033	1,919
18th	2,014	1,997	1,630	1,701	1,946	1,842	1,976	1,901	1,931	1,994	2,033	1,932
19th	2,035	1,941	1,764	1,875	1,962	1,882	1,936	1,930	2,071	1,950	2,012	1,948
20th	2,071	1,981	1,719	1,772	1,919	1,992	1,911	1,949	1,910	2,014	2,021	1,939
21st	1,980	2,085	1,748	1,791	1,780	1,926	1,987	2,011	1,947	1,953	2,127	1,930
22nd	1,965	2,019	1,689	2,050	1,763	1,840	1,939	2,040	1,916	2,047	2,019	1,937
23rd	1,947	1,986	1,856	2,050	1,788	1,819	1,907	1,929	1,811	2,020	2,036	1,939
24th	2,142	1,979	1,614	1,934	1,962	1,859	2,028	1,934	1,834	2,061	1,999	1,916
25th	1,985	1,958	1,758	1,985	1,905	1,846	2,066	1,922	1,895	1,992	2,035	1,844
26th	2,015	2,015	1,904	1,986	1,968	1,840	2,052	1,900	2,048	1,987	1,972	1,867
27th	1,929	1,956	1,896	1,805	2,005	2,054	2,069	2,012	2,004	2,038	2,062	1,984
28th	1,840	2,030	1,988	1,846	1,963	2,202	2,040	1,998	1,979	2,128	2,132	1,968
29th	1,982		2,084	1,772	1,966	2,130	1,975	2,020	1,976	1,981	2,022	1,989
30th	2,005		1,689	1,835	2,058	2,061	1,975	1,984	1,930	2,022	2,009	1,967
31st	1,935		1,865		2,009		1,865	2,036		2,026		1,992

[1]Volume calculated as total effluent entering the plant minus C3 water

Appendix B - Effluent Quality

Accredited Laboratory Results

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	21A0145
PO NUMBER	104395-10-9007	**RECEIVED / TEMP**	2021-01-05 10:06 / 11°C
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-01-11 14:13
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	44201.31485

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

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21A0145
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-01-11 14:13

Analyte	Result	RL	Units	Analyzed	Qualifier
Final Effluent (E233626) (21A0145-01) | Matrix: Wastewater | Sampled: 2021-01-05 09:15					
Anions					
Chloride	**121**	0.10	mg/L	2021-01-06	
Nitrate (as N)	**1.12**	0.010	mg/L	2021-01-06	
Nitrite (as N)	**0.081**	0.010	mg/L	2021-01-06	
Phosphate (as P)	**0.0057**	0.0050	mg/L	2021-01-06	
Calculated Parameters					
Nitrate+Nitrite (as N)	**1.20**	0.0100	mg/L	N/A	
Nitrogen, Total	**5.63**	0.100	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**152**	1.0	mg/L	2021-01-07	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-01-07	
Alkalinity, Bicarbonate (as CaCO3)	**152**	1.0	mg/L	2021-01-07	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-01-07	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-01-07	
Ammonia, Total (as N)	**2.03**	0.050	mg/L	2021-01-07	
BOD, 5-day Carbonaceous	**6.5**	2.0	mg/L	2021-01-11	
Nitrogen, Total Kjeldahl	**4.43**	0.050	mg/L	2021-01-07	
pH	**7.76**	0.10	pH units	2021-01-07	HT2
Phosphorus, Total (as P)	**0.557**	0.0050	mg/L	2021-01-06	
Solids, Total Suspended	**13.0**	2.0	mg/L	2021-01-07	
Microbiological Parameters					
Coliforms, Total	**> 242000**	1	MPN/100 mL	2021-01-05	
Coliforms, Fecal	**51700**	1	MPN/100 mL	2021-01-05	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21A0145
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-01-11 14:13

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
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, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Coliforms, Total in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
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
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna

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
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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. The quality control (QC) data is available upon request

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.

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	21A0143
PO NUMBER	104395-10-9007	**RECEIVED / TEMP**	2021-01-05 10:06 / 11°C
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-01-11 14:18
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	44201.31485

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

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21A0143
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-01-11 14:18

Analyte	Result	RL	Units	Analyzed	Qualifier
Raw Influent (E233627) (21A0143-01) | Matrix: Wastewater | Sampled: 2021-01-05 09:40					
Anions					
Nitrate (as N)	< 0.010	0.010	mg/L	2021-01-06	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-01-06	
Phosphate (as P)	**4.22**	0.0050	mg/L	2021-01-06	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	**65.5**	2.00	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**306**	1.0	mg/L	2021-01-07	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-01-07	
Alkalinity, Bicarbonate (as CaCO3)	**306**	1.0	mg/L	2021-01-07	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-01-07	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-01-07	
Ammonia, Total (as N)	**37.0**	0.050	mg/L	2021-01-07	
BOD, 5-day	**231**	2.0	mg/L	2021-01-11	
BOD, 5-day Carbonaceous	**218**	2.0	mg/L	2021-01-11	
Nitrogen, Total Kjeldahl	**65.5**	0.050	mg/L	2021-01-07	
pH	**6.99**	0.10	pH units	2021-01-07	HT2
Phosphorus, Total (as P)	**7.43**	0.0050	mg/L	2021-01-06	
Solids, Total Suspended	**188**	2.0	mg/L	2021-01-07	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21A0143
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-01-11 14:18

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
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
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
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
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna

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
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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. The quality control (QC) data is available upon request

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.

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	21B0665
PO NUMBER		**RECEIVED / TEMP**	2021-02-04 10:59 / 8°C
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-02-11 14:17
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	44231.32625

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

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21B0665
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-02-11 14:17

Analyte	Result	RL	Units	Analyzed	Qualifier
Final Effluent (E233626) (21B0665-01) | Matrix: Wastewater | Sampled: 2021-02-04 09:20					
Anions					
Chloride	**103**	0.10	mg/L	2021-02-06	
Nitrate (as N)	**1.57**	0.010	mg/L	2021-02-06	
Nitrite (as N)	**0.084**	0.010	mg/L	2021-02-06	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-02-06	
Calculated Parameters					
Nitrate+Nitrite (as N)	**1.65**	0.0100	mg/L	N/A	
Nitrogen, Total	**7.06**	0.100	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**150**	1.0	mg/L	2021-02-11	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-02-11	
Alkalinity, Bicarbonate (as CaCO3)	**150**	1.0	mg/L	2021-02-11	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-02-11	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-02-11	
Ammonia, Total (as N)	**3.03**	0.050	mg/L	2021-02-08	
BOD, 5-day Carbonaceous	**6.4**	2.0	mg/L	2021-02-11	
Nitrogen, Total Kjeldahl	**5.40**	0.050	mg/L	2021-02-10	
pH	**7.62**	0.10	pH units	2021-02-11	HT2
Phosphorus, Total (as P)	**0.738**	0.0050	mg/L	2021-02-08	
Solids, Total Suspended	**12.8**	2.0	mg/L	2021-02-09	
Microbiological Parameters					
Coliforms, Total	**24200**	1	MPN/100 mL	2021-02-05	HT1
Coliforms, Fecal	**24300**	1	MPN/100 mL	2021-02-05	HT1

Sample Qualifiers:

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	Lake Country, District of (Wastewater)	**WORK ORDER**	21B0665
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-02-11 14:17

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
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, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Coliforms, Total in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
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
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna

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
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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. The quality control (QC) data is available upon request

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.

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	21B0664
PO NUMBER		**RECEIVED / TEMP**	2021-02-04 10:55 / 8°C
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-02-11 13:57
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	44231.32625

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

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21B0664
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-02-11 13:57

Analyte	Result	RL	Units	Analyzed	Qualifier
Raw Influent (E233627) (21B0664-01) | Matrix: Wastewater | Sampled: 2021-02-04 09:45					
Anions					
Nitrate (as N)	**0.026**	0.010	mg/L	2021-02-06	
Nitrite (as N)	**0.012**	0.010	mg/L	2021-02-06	
Phosphate (as P)	**5.06**	0.0050	mg/L	2021-02-06	
Calculated Parameters					
Nitrate+Nitrite (as N)	**0.0385**	0.0100	mg/L	N/A	
Nitrogen, Total	**79.8**	2.00	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**333**	1.0	mg/L	2021-02-11	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-02-11	
Alkalinity, Bicarbonate (as CaCO3)	**333**	1.0	mg/L	2021-02-11	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-02-11	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-02-11	
Ammonia, Total (as N)	**53.8**	0.050	mg/L	2021-02-08	
BOD, 5-day	**185**	2.0	mg/L	2021-02-11	
BOD, 5-day Carbonaceous	**218**	2.0	mg/L	2021-02-11	
Nitrogen, Total Kjeldahl	**79.8**	0.050	mg/L	2021-02-10	
pH	**7.78**	0.10	pH units	2021-02-11	HT2
Phosphorus, Total (as P)	**8.99**	0.0050	mg/L	2021-02-08	
Solids, Total Suspended	**194**	2.0	mg/L	2021-02-09	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21B0664
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-02-11 13:57

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
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
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
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
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna

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
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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. The quality control (QC) data is available upon request

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.

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	21C0337
PO NUMBER		**RECEIVED / TEMP**	2021-03-02 11:32 / 8°C
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-03-08 14:46
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	44257.31249

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

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21C0337
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-03-08 14:46

Analyte	Result	RL	Units	Analyzed	Qualifier
Final Effluent (E233626) (21C0337-01) | Matrix: Wastewater | Sampled: 2021-03-02 10:15					
Anions					
Chloride	**112**	0.10	mg/L	2021-03-03	
Nitrate (as N)	**1.23**	0.010	mg/L	2021-03-03	
Nitrite (as N)	**0.060**	0.010	mg/L	2021-03-03	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-03-03	
Calculated Parameters					
Nitrate+Nitrite (as N)	**1.29**	0.0100	mg/L	N/A	
Nitrogen, Total	**4.95**	0.100	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**148**	1.0	mg/L	2021-03-05	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-03-05	
Alkalinity, Bicarbonate (as CaCO3)	**148**	1.0	mg/L	2021-03-05	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-03-05	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-03-05	
Ammonia, Total (as N)	**1.42**	0.050	mg/L	2021-03-03	
BOD, 5-day Carbonaceous	**11.5**	2.0	mg/L	2021-03-08	
Nitrogen, Total Kjeldahl	**3.66**	0.050	mg/L	2021-03-05	
pH	**7.66**	0.10	pH units	2021-03-05	HT2
Phosphorus, Total (as P)	**0.657**	0.0050	mg/L	2021-03-04	
Solids, Total Suspended	**12.8**	2.0	mg/L	2021-03-04	
Microbiological Parameters					
Coliforms, Total	**141000**	1	MPN/100 mL	2021-03-03	
Coliforms, Fecal	**17700**	1	MPN/100 mL	2021-03-03	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21C0337
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-03-08 14:46

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
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, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Coliforms, Total in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
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
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna

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
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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. The quality control (QC) data is available upon request

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.

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	21C0336
PO NUMBER		**RECEIVED / TEMP**	2021-03-02 11:32 / 8°C
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-03-09 16:01
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	44257.31249

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

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21C0336
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-03-09 16:01

Analyte	Result	RL	Units	Analyzed	Qualifier
Raw Influent (E233627) (21C0336-01) | Matrix: Wastewater | Sampled: 2021-03-02 10:15					
Anions					
Nitrate (as N)	< 0.010	0.010	mg/L	2021-03-03	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-03-03	
Phosphate (as P)	**5.49**	0.0050	mg/L	2021-03-03	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	**98.2**	2.00	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**336**	1.0	mg/L	2021-03-09	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-03-09	
Alkalinity, Bicarbonate (as CaCO3)	**336**	1.0	mg/L	2021-03-09	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-03-09	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-03-09	
Ammonia, Total (as N)	**57.0**	0.050	mg/L	2021-03-03	
BOD, 5-day	**392**	2.0	mg/L	2021-03-08	
BOD, 5-day Carbonaceous	**303**	2.0	mg/L	2021-03-08	
Nitrogen, Total Kjeldahl	**98.2**	0.050	mg/L	2021-03-04	
pH	**6.71**	0.10	pH units	2021-03-09	HT2
Phosphorus, Total (as P)	**10.7**	0.0050	mg/L	2021-03-04	
Solids, Total Suspended	**244**	2.0	mg/L	2021-03-04	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21C0336
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-03-09 16:01

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
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
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
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
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna

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
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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. The quality control (QC) data is available upon request

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.

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	21D1659
PO NUMBER	104395-10-9007	**RECEIVED / TEMP**	2021-04-15 11:08 / 14°C
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-04-22 12:12
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	44301.28718

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

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21D1659
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-04-22 12:12

Analyte	Result	RL	Units	Analyzed	Qualifier
Final Effluent (E233626) (21D1659-01) | Matrix: Wastewater | Sampled: 2021-04-15 09:00					
Anions					
Chloride	**114**	0.10	mg/L	2021-04-17	
Nitrate (as N)	**1.55**	0.010	mg/L	2021-04-17	
Nitrite (as N)	**0.170**	0.010	mg/L	2021-04-17	
Phosphate (as P)	**0.0084**	0.0050	mg/L	2021-04-17	
Calculated Parameters					
Nitrate+Nitrite (as N)	**1.72**	0.0100	mg/L	N/A	
Nitrogen, Total	**5.05**	0.100	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**166**	1.0	mg/L	2021-04-20	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-04-20	
Alkalinity, Bicarbonate (as CaCO3)	**166**	1.0	mg/L	2021-04-20	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-04-20	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-04-20	
Ammonia, Total (as N)	**0.644**	0.050	mg/L	2021-04-19	
BOD, 5-day Carbonaceous	**10.0**	2.0	mg/L	2021-04-21	
Nitrogen, Total Kjeldahl	**3.33**	0.050	mg/L	2021-04-20	
pH	**7.69**	0.10	pH units	2021-04-20	HT2
Phosphorus, Total (as P)	**0.532**	0.0050	mg/L	2021-04-19	
Solids, Total Suspended	**9.4**	2.0	mg/L	2021-04-20	
Microbiological Parameters					
Coliforms, Total	**> 242000**	1	MPN/100 mL	2021-04-16	
Coliforms, Fecal	**> 242000**	1	MPN/100 mL	2021-04-16	
Duplicate (21D1659-02) | Matrix: Water | Sampled: 2021-04-15 09:00					
Anions					
Chloride	**114**	0.10	mg/L	2021-04-17	
Nitrate (as N)	**1.61**	0.010	mg/L	2021-04-17	
Nitrite (as N)	**0.182**	0.010	mg/L	2021-04-17	
Phosphate (as P)	**0.0097**	0.0050	mg/L	2021-04-17	
Calculated Parameters					
Nitrate+Nitrite (as N)	**1.79**	0.0100	mg/L	N/A	
Nitrogen, Total	**5.10**	0.100	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**167**	1.0	mg/L	2021-04-20	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-04-20	
Alkalinity, Bicarbonate (as CaCO3)	**167**	1.0	mg/L	2021-04-20	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-04-20	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-04-20	

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21D1659
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-04-22 12:12

Analyte	Result	RL	Units	Analyzed	Qualifier
Duplicate (21D1659-02) | Matrix: Water | Sampled: 2021-04-15 09:00, Continued					
General Parameters, Continued					
Ammonia, Total (as N)	**0.628**	0.050	mg/L	2021-04-19	
BOD, 5-day Carbonaceous	**11.0**	2.0	mg/L	2021-04-21	
Nitrogen, Total Kjeldahl	**3.31**	0.050	mg/L	2021-04-20	
pH	**7.76**	0.10	pH units	2021-04-20	HT2
Phosphorus, Total (as P)	**0.534**	0.0050	mg/L	2021-04-19	
Solids, Total Suspended	**9.6**	2.0	mg/L	2021-04-20	
Microbiological Parameters					
Coliforms, Total	**> 2420**	1	MPN/100 mL	2021-04-16	
Coliforms, Fecal	**> 2420**	1	MPN/100 mL	2021-04-16	
Field Blank (21D1659-03) | Matrix: Water | Sampled: 2021-04-15 09:00					
Anions					
Chloride	< 0.10	0.10	mg/L	2021-04-17	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-04-17	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-04-17	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-04-17	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	< 0.0500	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L	2021-04-20	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-04-20	
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-04-20	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-04-20	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-04-20	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-04-19	
BOD, 5-day Carbonaceous	< 9.2	2.0	mg/L	2021-04-21	
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L	2021-04-20	
pH	**5.58**	0.10	pH units	2021-04-20	HT2
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L	2021-04-19	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-04-20	
Travel Blank (21D1659-04) | Matrix: Water | Sampled: 2021-04-15 09:00					
Anions					
Chloride	< 0.10	0.10	mg/L	2021-04-17	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-04-17	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-04-17	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-04-17	

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21D1659
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-04-22 12:12

Analyte	Result	RL	Units	Analyzed	Qualifier
Travel Blank (21D1659-04) | Matrix: Water | Sampled: 2021-04-15 09:00, Continued					
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	< 0.0500	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L	2021-04-20	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-04-20	
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-04-20	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-04-20	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-04-20	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-04-19	
BOD, 5-day Carbonaceous	< 9.2	2.0	mg/L	2021-04-21	
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L	2021-04-20	
pH	**5.53**	0.10	pH units	2021-04-20	HT2
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L	2021-04-19	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-04-20	
Microbiological Parameters					
Coliforms, Total	< 1	1	MPN/100 mL	2021-04-16	
Coliforms, Fecal	< 1	1	MPN/100 mL	2021-04-16	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21D1659
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-04-22 12:12

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
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, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Coliforms, Total in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
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
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna

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
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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	Lake Country, District of (Wastewater)	**WORK ORDER**	21D1659
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-04-22 12:12

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 B1D1436										
Blank (B1D1436-BLK1)				Prepared: 2021-04-16, Analyzed: 2021-04-16						
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							
Phosphate (as P)	< 0.0050	0.0050	mg/L							
LCS (B1D1436-BS1)				Prepared: 2021-04-16, Analyzed: 2021-04-16						
Chloride	16.2	0.10	mg/L	16.0		101	90-110			
Nitrate (as N)	3.95	0.010	mg/L	4.00		99	90-110			
Nitrite (as N)	2.11	0.010	mg/L	2.00		106	85-115			
Phosphate (as P)	1.08	0.0050	mg/L	1.00		108	80-120			
General Parameters, Batch B1D1498										
Blank (B1D1498-BLK1)				Prepared: 2021-04-16, Analyzed: 2021-04-21						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B1D1498-BS1)				Prepared: 2021-04-16, Analyzed: 2021-04-21						
BOD, 5-day Carbonaceous	196	76.4	mg/L	180		109	85-115			
General Parameters, Batch B1D1609										
Blank (B1D1609-BLK1)				Prepared: 2021-04-19, Analyzed: 2021-04-19						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B1D1609-BLK2)				Prepared: 2021-04-19, Analyzed: 2021-04-19						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B1D1609-BS1)				Prepared: 2021-04-19, Analyzed: 2021-04-19						
Phosphorus, Total (as P)	0.109	0.0050	mg/L	0.100		109	85-115			
LCS (B1D1609-BS2)				Prepared: 2021-04-19, Analyzed: 2021-04-19						
Phosphorus, Total (as P)	0.109	0.0050	mg/L	0.100		109	85-115			
General Parameters, Batch B1D1636										

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21D1659
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-04-22 12:12

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1D1636, Continued										
Blank (B1D1636-BLK1)				Prepared: 2021-04-19, Analyzed: 2021-04-19						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1D1636-BLK2)				Prepared: 2021-04-19, Analyzed: 2021-04-19						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1D1636-BLK3)				Prepared: 2021-04-19, Analyzed: 2021-04-19						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B1D1636-BS1)				Prepared: 2021-04-19, Analyzed: 2021-04-19						
Ammonia, Total (as N)	0.961	0.050	mg/L	1.00		96	90-115			
LCS (B1D1636-BS2)				Prepared: 2021-04-19, Analyzed: 2021-04-19						
Ammonia, Total (as N)	0.936	0.050	mg/L	1.00		94	90-115			
LCS (B1D1636-BS3)				Prepared: 2021-04-19, Analyzed: 2021-04-19						
Ammonia, Total (as N)	0.943	0.050	mg/L	1.00		94	90-115			
General Parameters, Batch B1D1665										
Blank (B1D1665-BLK1)				Prepared: 2021-04-19, Analyzed: 2021-04-20						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B1D1665-BS1)				Prepared: 2021-04-19, Analyzed: 2021-04-20						
Nitrogen, Total Kjeldahl	1.12	0.050	mg/L	1.00		112	85-115			
General Parameters, Batch B1D1708										
Blank (B1D1708-BLK1)				Prepared: 2021-04-20, Analyzed: 2021-04-20						
Solids, Total Suspended	< 2.0	2.0	mg/L							
Blank (B1D1708-BLK2)				Prepared: 2021-04-20, Analyzed: 2021-04-20						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B1D1708-BS1)				Prepared: 2021-04-20, Analyzed: 2021-04-20						
Solids, Total Suspended	89.0	10.0	mg/L	100		89	85-115			
LCS (B1D1708-BS2)				Prepared: 2021-04-20, Analyzed: 2021-04-20						
Solids, Total Suspended	93.0	10.0	mg/L	100		93	85-115			
General Parameters, Batch B1D1793										
Blank (B1D1793-BLK1)				Prepared: 2021-04-20, Analyzed: 2021-04-20						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B1D1793-BLK2)				Prepared: 2021-04-20, Analyzed: 2021-04-20						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21D1659
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-04-22 12:12

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1D1793, Continued										
Blank (B1D1793-BLK3)				Prepared: 2021-04-21, Analyzed: 2021-04-21						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B1D1793-BS1)				Prepared: 2021-04-20, Analyzed: 2021-04-20						
Alkalinity, Total (as CaCO3)	93.5	1.0	mg/L	100		94	80-120			
LCS (B1D1793-BS2)				Prepared: 2021-04-20, Analyzed: 2021-04-20						
Alkalinity, Total (as CaCO3)	96.4	1.0	mg/L	100		96	80-120			
LCS (B1D1793-BS3)				Prepared: 2021-04-21, Analyzed: 2021-04-21						
Alkalinity, Total (as CaCO3)	96.4	1.0	mg/L	100		96	80-120			
Reference (B1D1793-SRM1)				Prepared: 2021-04-20, Analyzed: 2021-04-20						
pH	6.99	0.10	pH units	7.01		100	98-102			
Reference (B1D1793-SRM2)				Prepared: 2021-04-20, Analyzed: 2021-04-20						
pH	6.99	0.10	pH units	7.01		100	98-102			
Reference (B1D1793-SRM3)				Prepared: 2021-04-21, Analyzed: 2021-04-21						
pH	6.99	0.10	pH units	7.01		100	98-102			
Microbiological Parameters, Batch B1D1455										
Blank (B1D1455-BLK1)				Prepared: 2021-04-16, Analyzed: 2021-04-16						
Coliforms, Total	< 1	1	MPN/100 mL							
Blank (B1D1455-BLK2)				Prepared: 2021-04-16, Analyzed: 2021-04-16						
Coliforms, Fecal	< 1	1	MPN/100 mL							

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	21D1657
PO NUMBER	104395-10-9007	**RECEIVED / TEMP**	2021-04-15 11:08 / 14°C
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-04-22 15:52
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	44301.28718

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

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21D1657
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-04-22 15:52

Analyte	Result	RL	Units	Analyzed	Qualifier
Raw Influent (E233627) (21D1657-01) | Matrix: Wastewater | Sampled: 2021-04-15 09:20					
Anions					
Nitrate (as N)	**0.012**	0.010	mg/L	2021-04-17	
Nitrite (as N)	**0.021**	0.010	mg/L	2021-04-17	
Phosphate (as P)	**4.95**	0.0050	mg/L	2021-04-17	
Calculated Parameters					
Nitrate+Nitrite (as N)	**0.0332**	0.0100	mg/L	N/A	
Nitrogen, Total	**87.2**	2.00	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**386**	1.0	mg/L	2021-04-22	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-04-22	
Alkalinity, Bicarbonate (as CaCO3)	**386**	1.0	mg/L	2021-04-22	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-04-22	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-04-22	
Ammonia, Total (as N)	**53.8**	0.050	mg/L	2021-04-19	
BOD, 5-day	**197**	2.0	mg/L	2021-04-22	
BOD, 5-day Carbonaceous	**246**	2.0	mg/L	2021-04-21	RA5
Nitrogen, Total Kjeldahl	**87.2**	0.050	mg/L	2021-04-20	
pH	**7.53**	0.10	pH units	2021-04-22	HT2
Phosphorus, Total (as P)	**9.64**	0.0050	mg/L	2021-04-20	
Solids, Total Suspended	**224**	2.0	mg/L	2021-04-20	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

RA5 Due to matrix interference, the sample cannot be accurately quantified. Result is Semi-Quantitative.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21D1657
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-04-22 15:52

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
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
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
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
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna

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
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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	Lake Country, District of (Wastewater)	**WORK ORDER**	21D1657
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-04-22 15:52

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 B1D1436										
Blank (B1D1436-BLK1)				Prepared: 2021-04-16, Analyzed: 2021-04-16						
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
Phosphate (as P)	< 0.0050	0.0050	mg/L							
LCS (B1D1436-BS1)				Prepared: 2021-04-16, Analyzed: 2021-04-16						
Nitrate (as N)	3.95	0.010	mg/L	4.00		99	90-110			
Nitrite (as N)	2.11	0.010	mg/L	2.00		106	85-115			
Phosphate (as P)	1.08	0.0050	mg/L	1.00		108	80-120			
General Parameters, Batch B1D1497										
Blank (B1D1497-BLK1)				Prepared: 2021-04-17, Analyzed: 2021-04-22						
BOD, 5-day	< 2.0	2.0	mg/L							
LCS (B1D1497-BS1)				Prepared: 2021-04-17, Analyzed: 2021-04-22						
BOD, 5-day	163	58.3	mg/L	180		91	85-115			
General Parameters, Batch B1D1498										
Blank (B1D1498-BLK1)				Prepared: 2021-04-16, Analyzed: 2021-04-21						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B1D1498-BS1)				Prepared: 2021-04-16, Analyzed: 2021-04-21						
BOD, 5-day Carbonaceous	196	76.4	mg/L	180		109	85-115			
General Parameters, Batch B1D1636										
Blank (B1D1636-BLK1)				Prepared: 2021-04-19, Analyzed: 2021-04-19						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1D1636-BLK2)				Prepared: 2021-04-19, Analyzed: 2021-04-19						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1D1636-BLK3)				Prepared: 2021-04-19, Analyzed: 2021-04-19						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21D1657
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-04-22 15:52

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1D1636, Continued										
LCS (B1D1636-BS1)				Prepared: 2021-04-19, Analyzed: 2021-04-19						
Ammonia, Total (as N)	0.961	0.050	mg/L	1.00		96	90-115			
LCS (B1D1636-BS2)				Prepared: 2021-04-19, Analyzed: 2021-04-19						
Ammonia, Total (as N)	0.936	0.050	mg/L	1.00		94	90-115			
LCS (B1D1636-BS3)				Prepared: 2021-04-19, Analyzed: 2021-04-19						
Ammonia, Total (as N)	0.943	0.050	mg/L	1.00		94	90-115			
General Parameters, Batch B1D1665										
Blank (B1D1665-BLK1)				Prepared: 2021-04-19, Analyzed: 2021-04-20						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B1D1665-BS1)				Prepared: 2021-04-19, Analyzed: 2021-04-20						
Nitrogen, Total Kjeldahl	1.12	0.050	mg/L	1.00		112	85-115			
General Parameters, Batch B1D1698										
Blank (B1D1698-BLK1)				Prepared: 2021-04-19, Analyzed: 2021-04-20						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B1D1698-BLK2)				Prepared: 2021-04-19, Analyzed: 2021-04-20						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B1D1698-BS1)				Prepared: 2021-04-19, Analyzed: 2021-04-20						
Phosphorus, Total (as P)	0.102	0.0050	mg/L	0.100		102	85-115			
LCS (B1D1698-BS2)				Prepared: 2021-04-19, Analyzed: 2021-04-20						
Phosphorus, Total (as P)	0.100	0.0050	mg/L	0.100		100	85-115			
General Parameters, Batch B1D1708										
Blank (B1D1708-BLK1)				Prepared: 2021-04-20, Analyzed: 2021-04-20						
Solids, Total Suspended	< 2.0	2.0	mg/L							
Blank (B1D1708-BLK2)				Prepared: 2021-04-20, Analyzed: 2021-04-20						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B1D1708-BS1)				Prepared: 2021-04-20, Analyzed: 2021-04-20						
Solids, Total Suspended	89.0	10.0	mg/L	100		89	85-115			
LCS (B1D1708-BS2)				Prepared: 2021-04-20, Analyzed: 2021-04-20						
Solids, Total Suspended	93.0	10.0	mg/L	100		93	85-115			
General Parameters, Batch B1D1895										
Blank (B1D1895-BLK1)				Prepared: 2021-04-22, Analyzed: 2021-04-22						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B1D1895-BS1)				Prepared: 2021-04-22, Analyzed: 2021-04-22						
Alkalinity, Total (as CaCO3)	102	1.0	mg/L	100		102	80-120			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21D1657
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-04-22 15:52

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1D1895, Continued										
Duplicate (B1D1895-DUP1)	**Source: 21D1657-01**			Prepared: 2021-04-22, Analyzed: 2021-04-22						
Alkalinity, Total (as CaCO3)	378	1.0	mg/L		386			2	10	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L		< 1.0				10	
Alkalinity, Bicarbonate (as CaCO3)	378	1.0	mg/L		386			2	10	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L		< 1.0				10	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L		< 1.0				10	
pH	7.49	0.10	pH units		7.53			< 1	4	
Reference (B1D1895-SRM1)				Prepared: 2021-04-22, Analyzed: 2021-04-22						
pH	6.98	0.10	pH units	7.01		100	98-102			

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	21E0424
PO NUMBER	104395-10-9007	**RECEIVED / TEMP**	2021-05-04 14:30 / 11°C
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-05-11 15:10
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	44320.28967

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 bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21E0424
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-05-11 15:10

Analyte	Result	RL	Units	Analyzed	Qualifier
Final Effluent (E233626) (21E0424-01) | Matrix: Wastewater | Sampled: 2021-05-04 10:05					
Anions					
Chloride	**97.7**	0.10	mg/L	2021-05-06	
Nitrate (as N)	**1.22**	0.010	mg/L	2021-05-06	
Nitrite (as N)	**0.160**	0.010	mg/L	2021-05-06	
Phosphate (as P)	**0.0183**	0.0050	mg/L	2021-05-06	
Calculated Parameters					
Nitrate+Nitrite (as N)	**1.38**	0.0100	mg/L	N/A	
Nitrogen, Total	**4.44**	0.100	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**195**	1.0	mg/L	2021-05-07	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-05-07	
Alkalinity, Bicarbonate (as CaCO3)	**195**	1.0	mg/L	2021-05-07	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-05-07	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-05-07	
Ammonia, Total (as N)	**0.901**	0.050	mg/L	2021-05-07	
BOD, 5-day Carbonaceous	**5.9**	2.0	mg/L	2021-05-11	
Nitrogen, Total Kjeldahl	**3.06**	0.050	mg/L	2021-05-10	
pH	**7.72**	0.10	pH units	2021-05-07	HT2
Phosphorus, Total (as P)	**0.528**	0.0050	mg/L	2021-05-06	
Solids, Total Suspended	**7.8**	2.0	mg/L	2021-05-08	
Microbiological Parameters					
Coliforms, Total	**> 242000**	1	MPN/100 mL	2021-05-05	
Coliforms, Fecal	**61300**	1	MPN/100 mL	2021-05-05	
Duplicate (21E0424-02) | Matrix: Water | Sampled: 2021-05-04 10:05					
Anions					
Chloride	**103**	0.10	mg/L	2021-05-06	
Nitrate (as N)	**1.23**	0.010	mg/L	2021-05-06	
Nitrite (as N)	**0.166**	0.010	mg/L	2021-05-06	
Phosphate (as P)	**0.0129**	0.0050	mg/L	2021-05-06	
Calculated Parameters					
Nitrate+Nitrite (as N)	**1.40**	0.0100	mg/L	N/A	
Nitrogen, Total	**4.61**	0.100	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**196**	1.0	mg/L	2021-05-07	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-05-07	
Alkalinity, Bicarbonate (as CaCO3)	**196**	1.0	mg/L	2021-05-07	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-05-07	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-05-07	

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21E0424
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-05-11 15:10

Analyte	Result	RL	Units	Analyzed	Qualifier
Duplicate (21E0424-02) | Matrix: Water | Sampled: 2021-05-04 10:05, Continued					
General Parameters, Continued					
Ammonia, Total (as N)	**0.897**	0.050	mg/L	2021-05-07	
BOD, 5-day Carbonaceous	**5.6**	2.0	mg/L	2021-05-11	
Nitrogen, Total Kjeldahl	**3.21**	0.050	mg/L	2021-05-10	
pH	**7.74**	0.10	pH units	2021-05-07	HT2
Phosphorus, Total (as P)	**0.525**	0.0050	mg/L	2021-05-06	
Solids, Total Suspended	**9.6**	2.0	mg/L	2021-05-08	
Microbiological Parameters					
Coliforms, Total	**> 242000**	1	MPN/100 mL	2021-05-05	
Coliforms, Fecal	**43500**	1	MPN/100 mL	2021-05-05	
Field Blank (21E0424-03) | Matrix: Water | Sampled: 2021-05-04 10:10					
Anions					
Chloride	< 0.10	0.10	mg/L	2021-05-06	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-05-06	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-05-06	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-05-06	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	< 0.0500	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L	2021-05-07	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-05-07	
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-05-07	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-05-07	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-05-07	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-05-07	
BOD, 5-day Carbonaceous	< 1.4	2.0	mg/L	2021-05-11	
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L	2021-05-10	
pH	**5.59**	0.10	pH units	2021-05-07	HT2
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L	2021-05-06	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-05-08	
Microbiological Parameters					
Coliforms, Total	< 1	1	MPN/100 mL	2021-05-05	
Coliforms, Fecal	< 1	1	MPN/100 mL	2021-05-05	
Travel Blank (21E0424-04) | Matrix: Water | Sampled: 2021-05-04 10:05					
Anions					
Chloride	< 0.10	0.10	mg/L	2021-05-06	

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21E0424
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-05-11 15:10

Analyte	Result	RL	Units	Analyzed	Qualifier
Travel Blank (21E0424-04) | Matrix: Water | Sampled: 2021-05-04 10:05, Continued					
Anions, Continued					
Nitrate (as N)	< 0.010	0.010	mg/L	2021-05-06	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-05-06	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-05-06	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	< 0.0500	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L	2021-05-07	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-05-07	
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-05-07	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-05-07	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-05-07	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-05-07	
BOD, 5-day Carbonaceous	< 1.4	2.0	mg/L	2021-05-11	
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L	2021-05-10	
pH	**5.62**	0.10	pH units	2021-05-07	HT2
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L	2021-05-06	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-05-08	
Microbiological Parameters					
Coliforms, Total	< 1	1	MPN/100 mL	2021-05-05	
Coliforms, Fecal	< 1	1	MPN/100 mL	2021-05-05	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21E0424
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-05-11 15:10

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
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, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Coliforms, Total in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
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
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna

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
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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	Lake Country, District of (Wastewater)	**WORK ORDER**	21E0424
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-05-11 15:10

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 B1E0340										
Blank (B1E0340-BLK1)				Prepared: 2021-05-05, Analyzed: 2021-05-05						
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							
Phosphate (as P)	< 0.0050	0.0050	mg/L							
LCS (B1E0340-BS1)				Prepared: 2021-05-05, Analyzed: 2021-05-05						
Chloride	16.1	0.10	mg/L	16.0		100	90-110			
Nitrate (as N)	4.04	0.010	mg/L	4.00		101	90-110			
Nitrite (as N)	2.03	0.010	mg/L	2.00		101	85-115			
Phosphate (as P)	1.02	0.0050	mg/L	1.00		102	80-120			
General Parameters, Batch B1E0459										
Blank (B1E0459-BLK1)				Prepared: 2021-05-05, Analyzed: 2021-05-06						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B1E0459-BLK2)				Prepared: 2021-05-05, Analyzed: 2021-05-06						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B1E0459-BS1)				Prepared: 2021-05-05, Analyzed: 2021-05-06						
Phosphorus, Total (as P)	0.106	0.0050	mg/L	0.100		106	85-115			
LCS (B1E0459-BS2)				Prepared: 2021-05-05, Analyzed: 2021-05-06						
Phosphorus, Total (as P)	0.106	0.0050	mg/L	0.100		106	85-115			
General Parameters, Batch B1E0491										
Blank (B1E0491-BLK1)				Prepared: 2021-05-06, Analyzed: 2021-05-11						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B1E0491-BS1)				Prepared: 2021-05-06, Analyzed: 2021-05-11						
BOD, 5-day Carbonaceous	184	2.0	mg/L	180		102	85-115			
General Parameters, Batch B1E0603										

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21E0424
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-05-11 15:10

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1E0603, Continued										
Blank (B1E0603-BLK1)				Prepared: 2021-05-06, Analyzed: 2021-05-10						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B1E0603-BLK2)				Prepared: 2021-05-06, Analyzed: 2021-05-10						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B1E0603-BS1)				Prepared: 2021-05-06, Analyzed: 2021-05-10						
Nitrogen, Total Kjeldahl	1.06	0.050	mg/L	1.00		106	85-115			
LCS (B1E0603-BS2)				Prepared: 2021-05-06, Analyzed: 2021-05-10						
Nitrogen, Total Kjeldahl	1.06	0.050	mg/L	1.00		106	85-115			
Duplicate (B1E0603-DUP2)		**Source: 21E0424-01**		Prepared: 2021-05-06, Analyzed: 2021-05-10						
Nitrogen, Total Kjeldahl	3.05	0.050	mg/L		3.06			< 1	15	
Matrix Spike (B1E0603-MS2)		**Source: 21E0424-01**		Prepared: 2021-05-06, Analyzed: 2021-05-10						
Nitrogen, Total Kjeldahl	7.07	0.200	mg/L	4.00	3.06	100	65-135			
General Parameters, Batch B1E0622										
Blank (B1E0622-BLK1)				Prepared: 2021-05-07, Analyzed: 2021-05-07						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B1E0622-BLK2)				Prepared: 2021-05-07, Analyzed: 2021-05-07						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B1E0622-BS1)				Prepared: 2021-05-07, Analyzed: 2021-05-07						
Alkalinity, Total (as CaCO3)	106	1.0	mg/L	100		106	80-120			
LCS (B1E0622-BS2)				Prepared: 2021-05-07, Analyzed: 2021-05-07						
Alkalinity, Total (as CaCO3)	107	1.0	mg/L	100		107	80-120			
Reference (B1E0622-SRM1)				Prepared: 2021-05-07, Analyzed: 2021-05-07						
pH	6.99	0.10	pH units	7.01		100	98-102			
Reference (B1E0622-SRM2)				Prepared: 2021-05-07, Analyzed: 2021-05-07						
pH	6.99	0.10	pH units	7.01		100	98-102			
General Parameters, Batch B1E0651										
Blank (B1E0651-BLK1)				Prepared: 2021-05-07, Analyzed: 2021-05-07						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1E0651-BLK2)				Prepared: 2021-05-07, Analyzed: 2021-05-07						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B1E0651-BS1)				Prepared: 2021-05-07, Analyzed: 2021-05-07						
Ammonia, Total (as N)	0.968	0.050	mg/L	1.00		97	90-115			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21E0424
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-05-11 15:10

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1E0651, Continued										
LCS (B1E0651-BS2)				Prepared: 2021-05-07, Analyzed: 2021-05-07						
Ammonia, Total (as N)	0.976	0.050	mg/L	1.00		98	90-115			
General Parameters, Batch B1E0764										
Blank (B1E0764-BLK1)				Prepared: 2021-05-08, Analyzed: 2021-05-08						
Solids, Total Suspended	< 2.0	2.0	mg/L							
Blank (B1E0764-BLK2)				Prepared: 2021-05-08, Analyzed: 2021-05-08						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B1E0764-BS1)				Prepared: 2021-05-08, Analyzed: 2021-05-08						
Solids, Total Suspended	101	10.0	mg/L	100		101	85-115			
LCS (B1E0764-BS2)				Prepared: 2021-05-08, Analyzed: 2021-05-08						
Solids, Total Suspended	99.0	10.0	mg/L	100		99	85-115			
Microbiological Parameters, Batch B1E0403										
Blank (B1E0403-BLK1)				Prepared: 2021-05-05, Analyzed: 2021-05-05						
Coliforms, Total	< 1	1	MPN/100 mL							
Blank (B1E0403-BLK2)				Prepared: 2021-05-05, Analyzed: 2021-05-05						
Coliforms, Fecal	< 1	1	MPN/100 mL							
Blank (B1E0403-BLK3)				Prepared: 2021-05-05, Analyzed: 2021-05-05						
Coliforms, Fecal	< 1	1	MPN/100 mL							
Blank (B1E0403-BLK4)				Prepared: 2021-05-05, Analyzed: 2021-05-05						
Coliforms, Total	< 1	1	MPN/100 mL							
Blank (B1E0403-BLK5)				Prepared: 2021-05-05, Analyzed: 2021-05-05						
Coliforms, Total	< 1	1	MPN/100 mL							
Duplicate (B1E0403-DUP3)		**Source: 21E0424-03**		Prepared: 2021-05-05, Analyzed: 2021-05-05						
Coliforms, Total	< 1	1	MPN/100 mL		< 1				80	RS2

QC Qualifiers:

RS2 The Reporting Limits for this sample have been raised due to limited sample volume.

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	21E0422
PO NUMBER	104395-10-9007	**RECEIVED / TEMP**	2021-05-04 14:30 / 11°C
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-05-11 15:02
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	44320.28967

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 bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21E0422
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-05-11 15:02

Analyte	Result	RL	Units	Analyzed	Qualifier
Raw Influent (E233627) (21E0422-01) | Matrix: Wastewater | Sampled: 2021-05-04 10:25					
Anions					
Nitrate (as N)	**0.016**	0.010	mg/L	2021-05-06	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-05-06	
Phosphate (as P)	**5.78**	0.0050	mg/L	2021-05-06	
Calculated Parameters					
Nitrate+Nitrite (as N)	**0.0157**	0.0100	mg/L	N/A	
Nitrogen, Total	**111**	2.00	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**420**	1.0	mg/L	2021-05-11	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-05-11	
Alkalinity, Bicarbonate (as CaCO3)	**420**	1.0	mg/L	2021-05-11	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-05-11	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-05-11	
Ammonia, Total (as N)	**65.9**	0.050	mg/L	2021-05-07	
BOD, 5-day	**356**	2.0	mg/L	2021-05-11	
BOD, 5-day Carbonaceous	**352**	2.0	mg/L	2021-05-11	
Nitrogen, Total Kjeldahl	**111**	0.050	mg/L	2021-05-10	
pH	**6.76**	0.10	pH units	2021-05-11	HT2
Phosphorus, Total (as P)	**11.5**	0.0050	mg/L	2021-05-07	
Solids, Total Suspended	**320**	2.0	mg/L	2021-05-08	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21E0422
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-05-11 15:02

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
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
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
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
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna

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
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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	Lake Country, District of (Wastewater)	**WORK ORDER**	21E0422
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-05-11 15:02

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 B1E0340										
Blank (B1E0340-BLK1)				Prepared: 2021-05-05, Analyzed: 2021-05-05						
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
Phosphate (as P)	< 0.0050	0.0050	mg/L							
LCS (B1E0340-BS1)				Prepared: 2021-05-05, Analyzed: 2021-05-05						
Nitrate (as N)	4.04	0.010	mg/L	4.00		101	90-110			
Nitrite (as N)	2.03	0.010	mg/L	2.00		101	85-115			
Phosphate (as P)	1.02	0.0050	mg/L	1.00		102	80-120			
General Parameters, Batch B1E0488										
Blank (B1E0488-BLK1)				Prepared: 2021-05-06, Analyzed: 2021-05-11						
BOD, 5-day	< 2.0	2.0	mg/L							
LCS (B1E0488-BS1)				Prepared: 2021-05-06, Analyzed: 2021-05-11						
BOD, 5-day	185	2.0	mg/L	180		103	85-115			
General Parameters, Batch B1E0491										
Blank (B1E0491-BLK1)				Prepared: 2021-05-06, Analyzed: 2021-05-11						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B1E0491-BS1)				Prepared: 2021-05-06, Analyzed: 2021-05-11						
BOD, 5-day Carbonaceous	184	2.0	mg/L	180		102	85-115			
General Parameters, Batch B1E0600										
Blank (B1E0600-BLK1)				Prepared: 2021-05-06, Analyzed: 2021-05-07						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B1E0600-BS1)				Prepared: 2021-05-06, Analyzed: 2021-05-07						
Phosphorus, Total (as P)	0.105	0.0050	mg/L	0.100		105	85-115			
General Parameters, Batch B1E0603										

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21E0422
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-05-11 15:02

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1E0603, Continued										
Blank (B1E0603-BLK1)				Prepared: 2021-05-06, Analyzed: 2021-05-10						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B1E0603-BLK2)				Prepared: 2021-05-06, Analyzed: 2021-05-10						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B1E0603-BS1)				Prepared: 2021-05-06, Analyzed: 2021-05-10						
Nitrogen, Total Kjeldahl	1.06	0.050	mg/L	1.00		106	85-115			
LCS (B1E0603-BS2)				Prepared: 2021-05-06, Analyzed: 2021-05-10						
Nitrogen, Total Kjeldahl	1.06	0.050	mg/L	1.00		106	85-115			
General Parameters, Batch B1E0651										
Blank (B1E0651-BLK1)				Prepared: 2021-05-07, Analyzed: 2021-05-07						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1E0651-BLK2)				Prepared: 2021-05-07, Analyzed: 2021-05-07						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B1E0651-BS1)				Prepared: 2021-05-07, Analyzed: 2021-05-07						
Ammonia, Total (as N)	0.968	0.050	mg/L	1.00		97	90-115			
LCS (B1E0651-BS2)				Prepared: 2021-05-07, Analyzed: 2021-05-07						
Ammonia, Total (as N)	0.976	0.050	mg/L	1.00		98	90-115			
General Parameters, Batch B1E0690										
Blank (B1E0690-BLK1)				Prepared: 2021-05-11, Analyzed: 2021-05-11						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B1E0690-BS1)				Prepared: 2021-05-11, Analyzed: 2021-05-11						
Alkalinity, Total (as CaCO3)	98.5	1.0	mg/L	100		98	80-120			
Reference (B1E0690-SRM1)				Prepared: 2021-05-11, Analyzed: 2021-05-11						
pH	6.97	0.10	pH units	7.01		99	98-102			
General Parameters, Batch B1E0764										
Blank (B1E0764-BLK1)				Prepared: 2021-05-08, Analyzed: 2021-05-08						
Solids, Total Suspended	< 2.0	2.0	mg/L							
Blank (B1E0764-BLK2)				Prepared: 2021-05-08, Analyzed: 2021-05-08						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B1E0764-BS1)				Prepared: 2021-05-08, Analyzed: 2021-05-08						
Solids, Total Suspended	101	10.0	mg/L	100		101	85-115			
LCS (B1E0764-BS2)				Prepared: 2021-05-08, Analyzed: 2021-05-08						
Solids, Total Suspended	99.0	10.0	mg/L	100		99	85-115			

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	21F2947
PO NUMBER		**RECEIVED / TEMP**	2021-06-21 09:18 / 20.5°C
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-06-30 13:04
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	44368.35639

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 bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21F2947
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-06-30 13:04

Analyte	Result	RL	Units	Analyzed	Qualifier
Final Effluent (E233626) (21F2947-01) | Matrix: Wastewater | Sampled: 2021-06-21					
Anions					
Chloride	**100**	0.10	mg/L	2021-06-24	
Nitrate (as N)	**1.28**	0.010	mg/L	2021-06-24	
Nitrite (as N)	**0.071**	0.010	mg/L	2021-06-24	
Phosphate (as P)	**0.0208**	0.0050	mg/L	2021-06-24	
Calculated Parameters					
Nitrate+Nitrite (as N)	**1.35**	0.0100	mg/L	N/A	
Nitrogen, Total	**3.15**	0.100	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**187**	1.0	mg/L	2021-06-25	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-06-25	
Alkalinity, Bicarbonate (as CaCO3)	**187**	1.0	mg/L	2021-06-25	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-06-25	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-06-25	
Ammonia, Total (as N)	**0.330**	0.050	mg/L	2021-06-24	
BOD, 5-day Carbonaceous	< 4.3	2.0	mg/L	2021-06-29	
Nitrogen, Total Kjeldahl	**1.80**	0.050	mg/L	2021-06-30	
pH	**7.92**	0.10	pH units	2021-06-25	HT2
Phosphorus, Total (as P)	**0.207**	0.0050	mg/L	2021-06-28	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-06-25	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21F2947
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-06-30 13:04

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
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, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
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
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna

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
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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	Lake Country, District of (Wastewater)	**WORK ORDER**	21F2947
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-06-30 13:04

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 B1F2762										
Blank (B1F2762-BLK1)				Prepared: 2021-06-25, Analyzed: 2021-06-25						
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							
Phosphate (as P)	< 0.0050	0.0050	mg/L							
LCS (B1F2762-BS1)				Prepared: 2021-06-25, Analyzed: 2021-06-25						
Chloride	16.2	0.10	mg/L	16.0		101	90-110			
Nitrate (as N)	4.06	0.010	mg/L	4.00		101	90-110			
Nitrite (as N)	1.99	0.010	mg/L	2.00		99	85-115			
Phosphate (as P)	0.949	0.0050	mg/L	1.00		95	80-120			
General Parameters, Batch B1F2822										
Blank (B1F2822-BLK1)				Prepared: 2021-06-24, Analyzed: 2021-06-24						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1F2822-BLK2)				Prepared: 2021-06-24, Analyzed: 2021-06-24						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1F2822-BLK3)				Prepared: 2021-06-24, Analyzed: 2021-06-24						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B1F2822-BS1)				Prepared: 2021-06-24, Analyzed: 2021-06-24						
Ammonia, Total (as N)	1.02	0.050	mg/L	1.00		102	90-115			
LCS (B1F2822-BS2)				Prepared: 2021-06-24, Analyzed: 2021-06-24						
Ammonia, Total (as N)	1.00	0.050	mg/L	1.00		100	90-115			
LCS (B1F2822-BS3)				Prepared: 2021-06-24, Analyzed: 2021-06-24						
Ammonia, Total (as N)	1.03	0.050	mg/L	1.00		103	90-115			
General Parameters, Batch B1F2843										
Blank (B1F2843-BLK1)				Prepared: 2021-06-24, Analyzed: 2021-06-29						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21F2947
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-06-30 13:04

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1F2843, Continued										
LCS (B1F2843-BS1)				Prepared: 2021-06-24, Analyzed: 2021-06-29						
BOD, 5-day Carbonaceous	176	35.6	mg/L	180		98	85-115			
Duplicate (B1F2843-DUP1)		**Source: 21F2947-01**		Prepared: 2021-06-24, Analyzed: 2021-06-29						
BOD, 5-day Carbonaceous	< 4.3	2.0	mg/L		< 4.3				20	
General Parameters, Batch B1F2869										
Blank (B1F2869-BLK1)				Prepared: 2021-06-24, Analyzed: 2021-06-28						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B1F2869-BLK2)				Prepared: 2021-06-24, Analyzed: 2021-06-28						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B1F2869-BS1)				Prepared: 2021-06-24, Analyzed: 2021-06-28						
Phosphorus, Total (as P)	0.105	0.0050	mg/L	0.100		105	85-115			
LCS (B1F2869-BS2)				Prepared: 2021-06-24, Analyzed: 2021-06-28						
Phosphorus, Total (as P)	0.105	0.0050	mg/L	0.100		105	85-115			
General Parameters, Batch B1F2924										
Blank (B1F2924-BLK1)				Prepared: 2021-06-25, Analyzed: 2021-06-25						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B1F2924-BLK2)				Prepared: 2021-06-25, Analyzed: 2021-06-25						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B1F2924-BS1)				Prepared: 2021-06-25, Analyzed: 2021-06-25						
Alkalinity, Total (as CaCO3)	104	1.0	mg/L	100		104	80-120			
LCS (B1F2924-BS2)				Prepared: 2021-06-25, Analyzed: 2021-06-25						
Alkalinity, Total (as CaCO3)	104	1.0	mg/L	100		104	80-120			
Reference (B1F2924-SRM1)				Prepared: 2021-06-25, Analyzed: 2021-06-25						
pH	7.03	0.10	pH units	7.01		100	98-102			
Reference (B1F2924-SRM2)				Prepared: 2021-06-25, Analyzed: 2021-06-25						
pH	7.02	0.10	pH units	7.01		100	98-102			
General Parameters, Batch B1F2943										
Blank (B1F2943-BLK1)				Prepared: 2021-06-25, Analyzed: 2021-06-25						
Solids, Total Suspended	< 2.0	2.0	mg/L							
Blank (B1F2943-BLK2)				Prepared: 2021-06-25, Analyzed: 2021-06-25						
Solids, Total Suspended	< 2.0	2.0	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21F2947
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-06-30 13:04

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1F2943, Continued										
LCS (B1F2943-BS1)				Prepared: 2021-06-25, Analyzed: 2021-06-25						
Solids, Total Suspended	101	5.0	mg/L	100		101	85-115			
LCS (B1F2943-BS2)				Prepared: 2021-06-25, Analyzed: 2021-06-25						
Solids, Total Suspended	112	5.0	mg/L	100		112	85-115			
General Parameters, Batch B1F3314										
Blank (B1F3314-BLK1)				Prepared: 2021-06-29, Analyzed: 2021-06-30						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B1F3314-BLK2)				Prepared: 2021-06-29, Analyzed: 2021-06-30						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B1F3314-BS1)				Prepared: 2021-06-29, Analyzed: 2021-06-30						
Nitrogen, Total Kjeldahl	0.990	0.050	mg/L	1.00		99	85-115			
LCS (B1F3314-BS2)				Prepared: 2021-06-29, Analyzed: 2021-06-30						
Nitrogen, Total Kjeldahl	0.991	0.050	mg/L	1.00		99	85-115			

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	21F0327
PO NUMBER	104395-10-9007	**RECEIVED / TEMP**	2021-06-01 11:46 / 7.7°C
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-06-08 16:52
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	44348.28907

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 bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21F0327
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-06-08 16:52

Analyte	Result	RL	Units	Analyzed	Qualifier
Final Effluent (E233626) (21F0327-01) | Matrix: Wastewater | Sampled: 2021-06-01 10:00					
Anions					
Chloride	**104**	0.10	mg/L	2021-06-03	
Nitrate (as N)	**1.10**	0.010	mg/L	2021-06-03	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-06-03	
Phosphate (as P)	**0.0283**	0.0050	mg/L	2021-06-03	
Calculated Parameters					
Nitrate+Nitrite (as N)	**1.10**	0.0100	mg/L	N/A	
Nitrogen, Total	**3.47**	0.100	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**210**	1.0	mg/L	2021-06-08	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-06-08	
Alkalinity, Bicarbonate (as CaCO3)	**210**	1.0	mg/L	2021-06-08	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-06-08	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-06-08	
Ammonia, Total (as N)	**0.255**	0.050	mg/L	2021-06-03	
BOD, 5-day Carbonaceous	**18.0**	2.0	mg/L	2021-06-08	
Nitrogen, Total Kjeldahl	**2.37**	0.050	mg/L	2021-06-07	
pH	**7.97**	0.10	pH units	2021-06-08	HT2
Phosphorus, Total (as P)	**0.362**	0.0050	mg/L	2021-06-07	
Solids, Total Suspended	**8.0**	2.0	mg/L	2021-06-07	
Microbiological Parameters					
Coliforms, Total	**> 242000**	1	MPN/100 mL	2021-06-02	
Coliforms, Fecal	**164000**	1	MPN/100 mL	2021-06-02	
Duplicate (21F0327-02) | Matrix: Water | Sampled: 2021-06-01 10:00					
Anions					
Chloride	**101**	0.10	mg/L	2021-06-03	
Nitrate (as N)	**1.18**	0.010	mg/L	2021-06-03	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-06-03	
Phosphate (as P)	**0.0282**	0.0050	mg/L	2021-06-03	
Calculated Parameters					
Nitrate+Nitrite (as N)	**1.18**	0.0100	mg/L	N/A	
Nitrogen, Total	**3.48**	0.100	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**202**	1.0	mg/L	2021-06-08	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-06-08	
Alkalinity, Bicarbonate (as CaCO3)	**202**	1.0	mg/L	2021-06-08	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-06-08	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-06-08	

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21F0327
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-06-08 16:52

Analyte	Result	RL	Units	Analyzed	Qualifier
Duplicate (21F0327-02) | Matrix: Water | Sampled: 2021-06-01 10:00, Continued					
General Parameters, Continued					
Ammonia, Total (as N)	**0.255**	0.050	mg/L	2021-06-03	
BOD, 5-day Carbonaceous	**18.0**	2.0	mg/L	2021-06-08	
Nitrogen, Total Kjeldahl	**2.30**	0.050	mg/L	2021-06-07	
pH	**7.95**	0.10	pH units	2021-06-08	HT2
Phosphorus, Total (as P)	**0.376**	0.0050	mg/L	2021-06-07	
Solids, Total Suspended	**6.7**	2.0	mg/L	2021-06-07	
Microbiological Parameters					
Coliforms, Total	**> 242000**	1	MPN/100 mL	2021-06-02	
Coliforms, Fecal	**242000**	1	MPN/100 mL	2021-06-02	
Field Blank (21F0327-03) | Matrix: Water | Sampled: 2021-06-01 10:15					
Anions					
Chloride	< 0.10	0.10	mg/L	2021-06-03	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-06-03	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-06-03	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-06-03	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	< 0.0500	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L	2021-06-08	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-06-08	
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-06-08	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-06-08	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-06-08	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-06-03	
BOD, 5-day Carbonaceous	< 5.8	2.0	mg/L	2021-06-08	
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L	2021-06-07	
pH	**5.90**	0.10	pH units	2021-06-08	HT2
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L	2021-06-07	
Solids, Total Suspended	< 3.3	2.0	mg/L	2021-06-07	
Microbiological Parameters					
Coliforms, Total	< 1	1	MPN/100 mL	2021-06-02	
Coliforms, Fecal	< 1	1	MPN/100 mL	2021-06-02	
Travel Blank (21F0327-04) | Matrix: Water | Sampled: 2021-06-01 10:15					
Anions					
Chloride	< 0.10	0.10	mg/L	2021-06-03	

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21F0327
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-06-08 16:52

Analyte	Result	RL	Units	Analyzed	Qualifier
Travel Blank (21F0327-04) | Matrix: Water | Sampled: 2021-06-01 10:15, Continued					
Anions, Continued					
Nitrate (as N)	< 0.010	0.010	mg/L	2021-06-03	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-06-03	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-06-03	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	< 0.0500	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L	2021-06-08	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-06-08	
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-06-08	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-06-08	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-06-08	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-06-03	
BOD, 5-day Carbonaceous	< 5.8	2.0	mg/L	2021-06-08	
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L	2021-06-07	
pH	**5.61**	0.10	pH units	2021-06-08	HT2
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L	2021-06-07	
Solids, Total Suspended	< 3.3	2.0	mg/L	2021-06-07	
Microbiological Parameters					
Coliforms, Total	< 1	1	MPN/100 mL	2021-06-02	
Coliforms, Fecal	< 1	1	MPN/100 mL	2021-06-02	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21F0327
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-06-08 16:52

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
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, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Coliforms, Total in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
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
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna

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
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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	Lake Country, District of (Wastewater)	**WORK ORDER**	21F0327
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-06-08 16:52

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 B1F0364										
Blank (B1F0364-BLK1)				Prepared: 2021-06-03, Analyzed: 2021-06-03						
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							
Phosphate (as P)	< 0.0050	0.0050	mg/L							
Blank (B1F0364-BLK2)				Prepared: 2021-06-03, Analyzed: 2021-06-03						
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							
Phosphate (as P)	< 0.0050	0.0050	mg/L							
Blank (B1F0364-BLK3)				Prepared: 2021-06-03, Analyzed: 2021-06-03						
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							
Phosphate (as P)	< 0.0050	0.0050	mg/L							
LCS (B1F0364-BS1)				Prepared: 2021-06-03, Analyzed: 2021-06-03						
Chloride	16.1	0.10	mg/L	16.0		101	90-110			
Nitrate (as N)	4.05	0.010	mg/L	4.00		101	90-110			
Nitrite (as N)	2.07	0.010	mg/L	2.00		104	85-115			
Phosphate (as P)	1.06	0.0050	mg/L	1.00		106	80-120			
LCS (B1F0364-BS2)				Prepared: 2021-06-03, Analyzed: 2021-06-03						
Chloride	15.9	0.10	mg/L	16.0		99	90-110			
Nitrate (as N)	4.08	0.010	mg/L	4.00		102	90-110			
Nitrite (as N)	2.02	0.010	mg/L	2.00		101	85-115			
Phosphate (as P)	1.12	0.0050	mg/L	1.00		112	80-120			
LCS (B1F0364-BS3)				Prepared: 2021-06-03, Analyzed: 2021-06-03						
Chloride	16.0	0.10	mg/L	16.0		100	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			
Phosphate (as P)	1.13	0.0050	mg/L	1.00		113	80-120			
General Parameters, Batch B1F0402										

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21F0327
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-06-08 16:52

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1F0402, Continued										
Blank (B1F0402-BLK1)				Prepared: 2021-06-03, Analyzed: 2021-06-03						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1F0402-BLK2)				Prepared: 2021-06-03, Analyzed: 2021-06-03						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B1F0402-BS1)				Prepared: 2021-06-03, Analyzed: 2021-06-03						
Ammonia, Total (as N)	1.02	0.050	mg/L	1.00		102	90-115			
LCS (B1F0402-BS2)				Prepared: 2021-06-03, Analyzed: 2021-06-03						
Ammonia, Total (as N)	1.04	0.050	mg/L	1.00		104	90-115			
General Parameters, Batch B1F0443										
Blank (B1F0443-BLK1)				Prepared: 2021-06-03, Analyzed: 2021-06-08						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B1F0443-BS1)				Prepared: 2021-06-03, Analyzed: 2021-06-08						
BOD, 5-day Carbonaceous	178	48.5	mg/L	180		99	85-115			
General Parameters, Batch B1F0687										
Blank (B1F0687-BLK1)				Prepared: 2021-06-05, Analyzed: 2021-06-07						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B1F0687-BLK2)				Prepared: 2021-06-05, Analyzed: 2021-06-07						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B1F0687-BS1)				Prepared: 2021-06-05, Analyzed: 2021-06-07						
Nitrogen, Total Kjeldahl	1.13	0.050	mg/L	1.00		113	85-115			
LCS (B1F0687-BS2)				Prepared: 2021-06-05, Analyzed: 2021-06-07						
Nitrogen, Total Kjeldahl	1.14	0.050	mg/L	1.00		114	85-115			
General Parameters, Batch B1F0690										
Blank (B1F0690-BLK1)				Prepared: 2021-06-05, Analyzed: 2021-06-07						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B1F0690-BLK2)				Prepared: 2021-06-05, Analyzed: 2021-06-07						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B1F0690-BS1)				Prepared: 2021-06-05, Analyzed: 2021-06-07						
Phosphorus, Total (as P)	0.109	0.0050	mg/L	0.100		109	85-115			
LCS (B1F0690-BS2)				Prepared: 2021-06-05, Analyzed: 2021-06-07						
Phosphorus, Total (as P)	0.109	0.0050	mg/L	0.100		109	85-115			
General Parameters, Batch B1F0735										
Blank (B1F0735-BLK2)				Prepared: 2021-06-07, Analyzed: 2021-06-07						
Solids, Total Suspended	< 3.3	3.3	mg/L							
Blank (B1F0735-BLK3)				Prepared: 2021-06-07, Analyzed: 2021-06-07						
Solids, Total Suspended	< 3.3	3.3	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21F0327
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-06-08 16:52

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1F0735, Continued										
LCS (B1F0735-BS2)				Prepared: 2021-06-07, Analyzed: 2021-06-07						
Solids, Total Suspended	96.0	10.0	mg/L	100		96	85-115			
LCS (B1F0735-BS3)				Prepared: 2021-06-07, Analyzed: 2021-06-07						
Solids, Total Suspended	102	10.0	mg/L	100		102	85-115			
General Parameters, Batch B1F0864										
Blank (B1F0864-BLK1)				Prepared: 2021-06-08, Analyzed: 2021-06-08						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B1F0864-BLK2)				Prepared: 2021-06-08, Analyzed: 2021-06-08						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B1F0864-BS1)				Prepared: 2021-06-08, Analyzed: 2021-06-08						
Alkalinity, Total (as CaCO3)	104	1.0	mg/L	100		104	80-120			
LCS (B1F0864-BS2)				Prepared: 2021-06-08, Analyzed: 2021-06-08						
Alkalinity, Total (as CaCO3)	105	1.0	mg/L	100		105	80-120			
Reference (B1F0864-SRM1)				Prepared: 2021-06-08, Analyzed: 2021-06-08						
pH	7.03	0.10	pH units	7.01		100	98-102			
Reference (B1F0864-SRM2)				Prepared: 2021-06-08, Analyzed: 2021-06-08						
pH	7.03	0.10	pH units	7.01		100	98-102			
Microbiological Parameters, Batch B1F0268										
Blank (B1F0268-BLK1)				Prepared: 2021-06-02, Analyzed: 2021-06-02						
Coliforms, Total	< 1	1	MPN/100 mL							
Blank (B1F0268-BLK2)				Prepared: 2021-06-02, Analyzed: 2021-06-02						
Coliforms, Fecal	< 1	1	MPN/100 mL							
Blank (B1F0268-BLK3)				Prepared: 2021-06-02, Analyzed: 2021-06-02						
Coliforms, Fecal	< 1	1	MPN/100 mL							
Blank (B1F0268-BLK4)				Prepared: 2021-06-02, Analyzed: 2021-06-02						
Coliforms, Total	< 1	1	MPN/100 mL							
Duplicate (B1F0268-DUP3)				**Source: 21F0327-01** Prepared: 2021-06-02, Analyzed: 2021-06-02						
Coliforms, Fecal	242000	1	MPN/100 mL		164000			38	80	
Duplicate (B1F0268-DUP4)				**Source: 21F0327-01** Prepared: 2021-06-02, Analyzed: 2021-06-02						
Coliforms, Total	> 242000	1	MPN/100 mL		> 242000				80	

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	21F0326
PO NUMBER	104395-10-9007	**RECEIVED / TEMP**	2021-06-01 11:46 / 7.7°C
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-06-09 14:25
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	44348.28907

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 bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21F0326
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-06-09 14:25

Analyte	Result	RL	Units	Analyzed	Qualifier
Raw Influent (E233627) (21F0326-01) | Matrix: Wastewater | Sampled: 2021-06-01 10:00					
Anions					
Nitrate (as N)	< 0.010	0.010	mg/L	2021-06-03	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-06-03	
Phosphate (as P)	**5.71**	0.0050	mg/L	2021-06-03	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	**90.1**	2.00	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**375**	1.0	mg/L	2021-06-09	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-06-09	
Alkalinity, Bicarbonate (as CaCO3)	**375**	1.0	mg/L	2021-06-09	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-06-09	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-06-09	
Ammonia, Total (as N)	**58.0**	0.050	mg/L	2021-06-07	
BOD, 5-day	**634**	2.0	mg/L	2021-06-08	
BOD, 5-day Carbonaceous	**630**	2.0	mg/L	2021-06-08	
Nitrogen, Total Kjeldahl	**90.1**	0.050	mg/L	2021-06-05	
pH	**6.81**	0.10	pH units	2021-06-09	HT2
Phosphorus, Total (as P)	**13.1**	0.0050	mg/L	2021-06-07	
Solids, Total Suspended	**376**	2.0	mg/L	2021-06-07	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21F0326
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-06-09 14:25

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
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
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
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
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna

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
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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	Lake Country, District of (Wastewater)	**WORK ORDER**	21F0326
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-06-09 14:25

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 B1F0364										
Blank (B1F0364-BLK1)				Prepared: 2021-06-03, Analyzed: 2021-06-03						
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
Phosphate (as P)	< 0.0050	0.0050	mg/L							
Blank (B1F0364-BLK2)				Prepared: 2021-06-03, Analyzed: 2021-06-03						
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
Phosphate (as P)	< 0.0050	0.0050	mg/L							
Blank (B1F0364-BLK3)				Prepared: 2021-06-03, Analyzed: 2021-06-03						
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
Phosphate (as P)	< 0.0050	0.0050	mg/L							
LCS (B1F0364-BS1)				Prepared: 2021-06-03, Analyzed: 2021-06-03						
Nitrate (as N)	4.05	0.010	mg/L	4.00		101	90-110			
Nitrite (as N)	2.07	0.010	mg/L	2.00		104	85-115			
Phosphate (as P)	1.06	0.0050	mg/L	1.00		106	80-120			
LCS (B1F0364-BS2)				Prepared: 2021-06-03, Analyzed: 2021-06-03						
Nitrate (as N)	4.08	0.010	mg/L	4.00		102	90-110			
Nitrite (as N)	2.02	0.010	mg/L	2.00		101	85-115			
Phosphate (as P)	1.12	0.0050	mg/L	1.00		112	80-120			
LCS (B1F0364-BS3)				Prepared: 2021-06-03, Analyzed: 2021-06-03						
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			
Phosphate (as P)	1.13	0.0050	mg/L	1.00		113	80-120			
General Parameters, Batch B1F0442										
Blank (B1F0442-BLK1)				Prepared: 2021-06-03, Analyzed: 2021-06-08						
BOD, 5-day	< 2.0	2.0	mg/L							
LCS (B1F0442-BS1)				Prepared: 2021-06-03, Analyzed: 2021-06-08						
BOD, 5-day	169	50.5	mg/L	180		94	85-115			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21F0326
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-06-09 14:25

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1F0443										
Blank (B1F0443-BLK1)				Prepared: 2021-06-03, Analyzed: 2021-06-08						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B1F0443-BS1)				Prepared: 2021-06-03, Analyzed: 2021-06-08						
BOD, 5-day Carbonaceous	178	48.5	mg/L	180		99	85-115			
General Parameters, Batch B1F0576										
Blank (B1F0576-BLK1)				Prepared: 2021-06-04, Analyzed: 2021-06-05						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B1F0576-BLK2)				Prepared: 2021-06-04, Analyzed: 2021-06-05						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B1F0576-BS1)				Prepared: 2021-06-04, Analyzed: 2021-06-05						
Nitrogen, Total Kjeldahl	0.917	0.050	mg/L	1.00		92	85-115			
LCS (B1F0576-BS2)				Prepared: 2021-06-04, Analyzed: 2021-06-05						
Nitrogen, Total Kjeldahl	0.917	0.050	mg/L	1.00		92	85-115			
General Parameters, Batch B1F0690										
Blank (B1F0690-BLK1)				Prepared: 2021-06-05, Analyzed: 2021-06-07						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B1F0690-BLK2)				Prepared: 2021-06-05, Analyzed: 2021-06-07						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B1F0690-BS1)				Prepared: 2021-06-05, Analyzed: 2021-06-07						
Phosphorus, Total (as P)	0.109	0.0050	mg/L	0.100		109	85-115			
LCS (B1F0690-BS2)				Prepared: 2021-06-05, Analyzed: 2021-06-07						
Phosphorus, Total (as P)	0.109	0.0050	mg/L	0.100		109	85-115			
General Parameters, Batch B1F0735										
Blank (B1F0735-BLK2)				Prepared: 2021-06-07, Analyzed: 2021-06-07						
Solids, Total Suspended	< 3.3	3.3	mg/L							
Blank (B1F0735-BLK3)				Prepared: 2021-06-07, Analyzed: 2021-06-07						
Solids, Total Suspended	< 3.3	3.3	mg/L							
LCS (B1F0735-BS2)				Prepared: 2021-06-07, Analyzed: 2021-06-07						
Solids, Total Suspended	96.0	10.0	mg/L	100		96	85-115			
LCS (B1F0735-BS3)				Prepared: 2021-06-07, Analyzed: 2021-06-07						
Solids, Total Suspended	102	10.0	mg/L	100		102	85-115			
General Parameters, Batch B1F0759										
Blank (B1F0759-BLK1)				Prepared: 2021-06-07, Analyzed: 2021-06-07						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1F0759-BLK2)				Prepared: 2021-06-07, Analyzed: 2021-06-07						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21F0326
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-06-09 14:25

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1F0759, Continued										
Blank (B1F0759-BLK3)				Prepared: 2021-06-07, Analyzed: 2021-06-07						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1F0759-BLK4)				Prepared: 2021-06-07, Analyzed: 2021-06-07						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B1F0759-BS1)				Prepared: 2021-06-07, Analyzed: 2021-06-07						
Ammonia, Total (as N)	0.965	0.050	mg/L	1.00		96	90-115			
LCS (B1F0759-BS2)				Prepared: 2021-06-07, Analyzed: 2021-06-07						
Ammonia, Total (as N)	0.935	0.050	mg/L	1.00		94	90-115			
LCS (B1F0759-BS3)				Prepared: 2021-06-07, Analyzed: 2021-06-07						
Ammonia, Total (as N)	0.936	0.050	mg/L	1.00		94	90-115			
LCS (B1F0759-BS4)				Prepared: 2021-06-07, Analyzed: 2021-06-07						
Ammonia, Total (as N)	0.974	0.050	mg/L	1.00		97	90-115			
General Parameters, Batch B1F1014										
Blank (B1F1014-BLK1)				Prepared: 2021-06-09, Analyzed: 2021-06-09						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B1F1014-BS1)				Prepared: 2021-06-09, Analyzed: 2021-06-09						
Alkalinity, Total (as CaCO3)	97.5	1.0	mg/L	100		98	80-120			

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	21G0977
PO NUMBER	104395-10-9007	**RECEIVED / TEMP**	2021-07-08 14:39 / 20.0°C
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-07-19 15:26
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	44385.41381

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 bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21G0977
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-07-19 15:26

Analyte	Result	RL	Units	Analyzed	Qualifier
Final Effluent (E233626) (21G0977-01) | Matrix: Wastewater | Sampled: 2021-07-08 10:15					
Anions					
Chloride	**109**	0.10	mg/L	2021-07-11	
Nitrate (as N)	**2.11**	0.010	mg/L	2021-07-11	
Nitrite (as N)	**0.063**	0.010	mg/L	2021-07-11	
Phosphate (as P)	**0.0370**	0.0050	mg/L	2021-07-11	
Calculated Parameters					
Nitrate+Nitrite (as N)	**2.17**	0.0100	mg/L	N/A	
Nitrogen, Total	**4.17**	0.100	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**185**	1.0	mg/L	2021-07-13	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-07-13	
Alkalinity, Bicarbonate (as CaCO3)	**185**	1.0	mg/L	2021-07-13	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-07-13	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-07-13	
Ammonia, Total (as N)	**0.139**	0.050	mg/L	2021-07-10	
BOD, 5-day Carbonaceous	< 5.4	2.0	mg/L	2021-07-19	HT1
Nitrogen, Total Kjeldahl	**2.00**	0.050	mg/L	2021-07-14	
pH	**7.75**	0.10	pH units	2021-07-13	HT2
Phosphorus, Total (as P)	**0.318**	0.0050	mg/L	2021-07-14	
Solids, Total Suspended	**3.0**	2.0	mg/L	2021-07-14	
Microbiological Parameters					
Coliforms, Total	**> 242000**	1	MPN/100 mL	2021-07-09	
Coliforms, Fecal	**61300**	1	MPN/100 mL	2021-07-09	
Duplicate (21G0977-02) | Matrix: Water | Sampled: 2021-07-08 10:15					
Anions					
Chloride	**108**	0.10	mg/L	2021-07-11	
Nitrate (as N)	**2.10**	0.010	mg/L	2021-07-11	
Nitrite (as N)	**0.061**	0.010	mg/L	2021-07-11	
Phosphate (as P)	**0.0325**	0.0050	mg/L	2021-07-11	
Calculated Parameters					
Nitrate+Nitrite (as N)	**2.16**	0.0100	mg/L	N/A	
Nitrogen, Total	**4.19**	0.100	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**185**	1.0	mg/L	2021-07-13	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-07-13	
Alkalinity, Bicarbonate (as CaCO3)	**185**	1.0	mg/L	2021-07-13	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-07-13	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-07-13	

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO Lake Country, District of (Wastewater)
PROJECT Final Effluent- PE14651

WORK ORDER 21G0977
REPORTED 2021-07-19 15:26

Analyte	Result	RL	Units	Analyzed	Qualifier
Duplicate (21G0977-02) | Matrix: Water | Sampled: 2021-07-08 10:15, Continued					
General Parameters, Continued					
Ammonia, Total (as N)	**0.144**	0.050	mg/L	2021-07-10	
BOD, 5-day Carbonaceous	< 5.4	2.0	mg/L	2021-07-19	HT1
Nitrogen, Total Kjeldahl	**2.02**	0.050	mg/L	2021-07-14	
pH	**7.78**	0.10	pH units	2021-07-13	HT2
Phosphorus, Total (as P)	**0.334**	0.0050	mg/L	2021-07-14	
Solids, Total Suspended	**3.0**	2.0	mg/L	2021-07-14	
Microbiological Parameters					
Coliforms, Total	**> 242000**	1	MPN/100 mL	2021-07-09	
Coliforms, Fecal	**51700**	1	MPN/100 mL	2021-07-09	
Field Blank (21G0977-03) | Matrix: Water | Sampled: 2021-07-08 10:11					
Anions					
Chloride	< 0.10	0.10	mg/L	2021-07-11	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-07-11	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-07-11	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-07-11	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	< 0.0500	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L	2021-07-13	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-07-13	
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-07-13	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-07-13	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-07-13	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-07-10	
BOD, 5-day Carbonaceous	< 5.4	2.0	mg/L	2021-07-19	HT1
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L	2021-07-14	
pH	**5.56**	0.10	pH units	2021-07-13	HT2
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L	2021-07-14	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-07-14	
Microbiological Parameters					
Coliforms, Total	**3**	1	MPN/100 mL	2021-07-09	
Coliforms, Fecal	< 1	1	MPN/100 mL	2021-07-09	
Travel Blank (21G0977-04) | Matrix: Water | Sampled: 2021-07-08 10:15					
Anions					
Chloride	< 0.10	0.10	mg/L	2021-07-11	

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21G0977
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-07-19 15:26

Analyte	Result	RL	Units	Analyzed	Qualifier
Travel Blank (21G0977-04) | Matrix: Water | Sampled: 2021-07-08 10:15, Continued					
Anions, Continued					
Nitrate (as N)	< 0.010	0.010	mg/L	2021-07-11	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-07-11	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-07-11	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	< 0.0500	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L	2021-07-13	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-07-13	
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-07-13	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-07-13	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-07-13	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-07-10	
BOD, 5-day Carbonaceous	< 5.4	2.0	mg/L	2021-07-19	HT1
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L	2021-07-14	
pH	**5.68**	0.10	pH units	2021-07-13	HT2
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L	2021-07-14	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-07-15	
Microbiological Parameters					
Coliforms, Total	< 1	1	MPN/100 mL	2021-07-09	
Coliforms, Fecal	< 1	1	MPN/100 mL	2021-07-09	

Sample Qualifiers:

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	Lake Country, District of (Wastewater)	**WORK ORDER**	21G0977
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-07-19 15:26

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
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, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Coliforms, Total in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
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
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna

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
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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	Lake Country, District of (Wastewater)	**WORK ORDER**	21G0977
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-07-19 15:26

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 B1G0957										
Blank (B1G0957-BLK1)				Prepared: 2021-07-11, Analyzed: 2021-07-11						
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							
Phosphate (as P)	< 0.0050	0.0050	mg/L							
Blank (B1G0957-BLK2)				Prepared: 2021-07-11, Analyzed: 2021-07-11						
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							
Phosphate (as P)	< 0.0050	0.0050	mg/L							
LCS (B1G0957-BS1)				Prepared: 2021-07-11, Analyzed: 2021-07-11						
Chloride	15.8	0.10	mg/L	16.0		99	90-110			
Nitrate (as N)	3.95	0.010	mg/L	4.00		99	90-110			
Nitrite (as N)	2.02	0.010	mg/L	2.00		101	85-115			
Phosphate (as P)	0.954	0.0050	mg/L	1.00		95	80-120			
LCS (B1G0957-BS2)				Prepared: 2021-07-11, Analyzed: 2021-07-11						
Chloride	16.0	0.10	mg/L	16.0		100	90-110			
Nitrate (as N)	4.03	0.010	mg/L	4.00		101	90-110			
Nitrite (as N)	1.93	0.010	mg/L	2.00		97	85-115			
Phosphate (as P)	0.970	0.0050	mg/L	1.00		97	80-120			
General Parameters, Batch B1G0986										
Blank (B1G0986-BLK1)				Prepared: 2021-07-10, Analyzed: 2021-07-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1G0986-BLK2)				Prepared: 2021-07-10, Analyzed: 2021-07-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1G0986-BLK3)				Prepared: 2021-07-10, Analyzed: 2021-07-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B1G0986-BS1)				Prepared: 2021-07-10, Analyzed: 2021-07-10						
Ammonia, Total (as N)	0.919	0.050	mg/L	1.00		92	90-115			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21G0977
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-07-19 15:26

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1G0986, Continued										
LCS (B1G0986-BS2)				Prepared: 2021-07-10, Analyzed: 2021-07-10						
Ammonia, Total (as N)	0.904	0.050	mg/L	1.00		90	90-115			
LCS (B1G0986-BS3)				Prepared: 2021-07-10, Analyzed: 2021-07-10						
Ammonia, Total (as N)	0.933	0.050	mg/L	1.00		93	90-115			
Duplicate (B1G0986-DUP2)		**Source: 21G0977-04**		Prepared: 2021-07-10, Analyzed: 2021-07-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L		< 0.050				15	
Matrix Spike (B1G0986-MS2)		**Source: 21G0977-04**		Prepared: 2021-07-10, Analyzed: 2021-07-10						
Ammonia, Total (as N)	0.306	0.050	mg/L	0.250	< 0.050	116	75-125			
General Parameters, Batch B1G1014										
Blank (B1G1014-BLK1)				Prepared: 2021-07-14, Analyzed: 2021-07-19						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B1G1014-BS1)				Prepared: 2021-07-14, Analyzed: 2021-07-19						
BOD, 5-day Carbonaceous	194	45.4	mg/L	180		108	85-115			
General Parameters, Batch B1G1230										
Blank (B1G1230-BLK1)				Prepared: 2021-07-13, Analyzed: 2021-07-14						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B1G1230-BLK2)				Prepared: 2021-07-13, Analyzed: 2021-07-14						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B1G1230-BS1)				Prepared: 2021-07-13, Analyzed: 2021-07-14						
Nitrogen, Total Kjeldahl	1.00	0.050	mg/L	1.00		100	85-115			
LCS (B1G1230-BS2)				Prepared: 2021-07-13, Analyzed: 2021-07-14						
Nitrogen, Total Kjeldahl	1.00	0.050	mg/L	1.00		100	85-115			
General Parameters, Batch B1G1273										
Blank (B1G1273-BLK1)				Prepared: 2021-07-13, Analyzed: 2021-07-13						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B1G1273-BLK2)				Prepared: 2021-07-13, Analyzed: 2021-07-13						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B1G1273-BLK3)				Prepared: 2021-07-13, Analyzed: 2021-07-13						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21G0977
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-07-19 15:26

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1G1273, Continued										
LCS (B1G1273-BS1)				Prepared: 2021-07-13, Analyzed: 2021-07-13						
Alkalinity, Total (as CaCO3)	105	1.0	mg/L	100		105	80-120			
LCS (B1G1273-BS2)				Prepared: 2021-07-13, Analyzed: 2021-07-13						
Alkalinity, Total (as CaCO3)	106	1.0	mg/L	100		106	80-120			
LCS (B1G1273-BS3)				Prepared: 2021-07-13, Analyzed: 2021-07-13						
Alkalinity, Total (as CaCO3)	105	1.0	mg/L	100		105	80-120			
Reference (B1G1273-SRM1)				Prepared: 2021-07-13, Analyzed: 2021-07-13						
pH	7.02	0.10	pH units	7.01		100	98-102			
Reference (B1G1273-SRM2)				Prepared: 2021-07-13, Analyzed: 2021-07-13						
pH	7.02	0.10	pH units	7.01		100	98-102			
Reference (B1G1273-SRM3)				Prepared: 2021-07-13, Analyzed: 2021-07-13						
pH	7.02	0.10	pH units	7.01		100	98-102			
General Parameters, Batch B1G1281										
Blank (B1G1281-BLK2)				Prepared: 2021-07-13, Analyzed: 2021-07-14						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B1G1281-BS2)				Prepared: 2021-07-13, Analyzed: 2021-07-14						
Phosphorus, Total (as P)	0.108	0.0050	mg/L	0.100		108	85-115			
General Parameters, Batch B1G1300										
Blank (B1G1300-BLK1)				Prepared: 2021-07-14, Analyzed: 2021-07-14						
Solids, Total Suspended	< 2.0	2.0	mg/L							
Blank (B1G1300-BLK2)				Prepared: 2021-07-14, Analyzed: 2021-07-14						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B1G1300-BS1)				Prepared: 2021-07-14, Analyzed: 2021-07-14						
Solids, Total Suspended	109	5.0	mg/L	100		109	85-115			
LCS (B1G1300-BS2)				Prepared: 2021-07-14, Analyzed: 2021-07-14						
Solids, Total Suspended	86.5	5.0	mg/L	100		86	85-115			
General Parameters, Batch B1G1427										
Blank (B1G1427-BLK1)				Prepared: 2021-07-15, Analyzed: 2021-07-15						
Solids, Total Suspended	< 2.0	2.0	mg/L							
Blank (B1G1427-BLK2)				Prepared: 2021-07-15, Analyzed: 2021-07-15						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B1G1427-BS1)				Prepared: 2021-07-15, Analyzed: 2021-07-15						
Solids, Total Suspended	93.5	5.0	mg/L	100		94	85-115			
LCS (B1G1427-BS2)				Prepared: 2021-07-15, Analyzed: 2021-07-15						
Solids, Total Suspended	92.0	5.0	mg/L	100		92	85-115			
Microbiological Parameters, Batch B1G0935										

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21G0977
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-07-19 15:26

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Microbiological Parameters, Batch B1G0935, Continued										
Blank (B1G0935-BLK1)				Prepared: 2021-07-09, Analyzed: 2021-07-09						
Coliforms, Total	< 1	1	MPN/100 mL							
Blank (B1G0935-BLK2)				Prepared: 2021-07-09, Analyzed: 2021-07-09						
Coliforms, Total	< 1	1	MPN/100 mL							
Blank (B1G0935-BLK3)				Prepared: 2021-07-09, Analyzed: 2021-07-09						
Coliforms, Total	< 1	1	MPN/100 mL							
Blank (B1G0935-BLK4)				Prepared: 2021-07-09, Analyzed: 2021-07-09						
Coliforms, Total	< 1	1	MPN/100 mL							
Blank (B1G0935-BLK5)				Prepared: 2021-07-09, Analyzed: 2021-07-09						
Coliforms, Total	< 1	1	MPN/100 mL							
Blank (B1G0935-BLK6)				Prepared: 2021-07-09, Analyzed: 2021-07-09						
Coliforms, Fecal	< 1	1	MPN/100 mL							
Blank (B1G0935-BLK7)				Prepared: 2021-07-09, Analyzed: 2021-07-09						
Coliforms, Fecal	< 1	1	MPN/100 mL							
Blank (B1G0935-BLK8)				Prepared: 2021-07-09, Analyzed: 2021-07-09						
Coliforms, Fecal	< 1	1	MPN/100 mL							
Duplicate (B1G0935-DUP3)		**Source: 21G0977-03**		Prepared: 2021-07-09, Analyzed: 2021-07-09						
Coliforms, Total	< 1	1	MPN/100 mL		3				80	MIC29

QC Qualifiers:

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

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	21G0975
PO NUMBER	104395-10-9007	**RECEIVED / TEMP**	2021-07-08 14:39 / 20.0°C
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-07-19 15:36
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	44385.41381

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 bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21G0975
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-07-19 15:36

Analyte	Result	RL	Units	Analyzed	Qualifier
Raw Influent (E233627) (21G0975-01) | Matrix: Wastewater | Sampled: 2021-07-08 10:30					
Anions					
Nitrate (as N)	< 0.010	0.010	mg/L	2021-07-11	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-07-11	
Phosphate (as P)	**4.04**	0.0050	mg/L	2021-07-11	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	**82.2**	2.00	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**370**	1.0	mg/L	2021-07-13	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-07-13	
Alkalinity, Bicarbonate (as CaCO3)	**370**	1.0	mg/L	2021-07-13	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-07-13	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-07-13	
Ammonia, Total (as N)	**43.1**	0.050	mg/L	2021-07-10	
BOD, 5-day	**305**	2.0	mg/L	2021-07-14	
BOD, 5-day Carbonaceous	**222**	2.0	mg/L	2021-07-19	HT1
Nitrogen, Total Kjeldahl	**82.2**	0.050	mg/L	2021-07-14	
pH	**7.69**	0.10	pH units	2021-07-13	HT2
Phosphorus, Total (as P)	**9.08**	0.0050	mg/L	2021-07-14	
Solids, Total Suspended	**270**	2.0	mg/L	2021-07-14	

Sample Qualifiers:

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	Lake Country, District of (Wastewater)	**WORK ORDER**	21G0975
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-07-19 15:36

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
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
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
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
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna

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
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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	Lake Country, District of (Wastewater)	**WORK ORDER**	21G0975
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-07-19 15:36

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 B1G0957										
Blank (B1G0957-BLK1)				Prepared: 2021-07-11, Analyzed: 2021-07-11						
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
Phosphate (as P)	< 0.0050	0.0050	mg/L							
Blank (B1G0957-BLK2)				Prepared: 2021-07-11, Analyzed: 2021-07-11						
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
Phosphate (as P)	< 0.0050	0.0050	mg/L							
LCS (B1G0957-BS1)				Prepared: 2021-07-11, Analyzed: 2021-07-11						
Nitrate (as N)	3.95	0.010	mg/L	4.00		99	90-110			
Nitrite (as N)	2.02	0.010	mg/L	2.00		101	85-115			
Phosphate (as P)	0.954	0.0050	mg/L	1.00		95	80-120			
LCS (B1G0957-BS2)				Prepared: 2021-07-11, Analyzed: 2021-07-11						
Nitrate (as N)	4.03	0.010	mg/L	4.00		101	90-110			
Nitrite (as N)	1.93	0.010	mg/L	2.00		97	85-115			
Phosphate (as P)	0.970	0.0050	mg/L	1.00		97	80-120			
General Parameters, Batch B1G0892										
Blank (B1G0892-BLK1)				Prepared: 2021-07-09, Analyzed: 2021-07-14						
BOD, 5-day	< 2.0	2.0	mg/L							
LCS (B1G0892-BS1)				Prepared: 2021-07-09, Analyzed: 2021-07-14						
BOD, 5-day	171	55.2	mg/L	180		95	85-115			
General Parameters, Batch B1G0986										
Blank (B1G0986-BLK1)				Prepared: 2021-07-10, Analyzed: 2021-07-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1G0986-BLK2)				Prepared: 2021-07-10, Analyzed: 2021-07-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21G0975
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-07-19 15:36

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1G0986, Continued										
Blank (B1G0986-BLK3)				Prepared: 2021-07-10, Analyzed: 2021-07-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B1G0986-BS1)				Prepared: 2021-07-10, Analyzed: 2021-07-10						
Ammonia, Total (as N)	0.919	0.050	mg/L	1.00		92	90-115			
LCS (B1G0986-BS2)				Prepared: 2021-07-10, Analyzed: 2021-07-10						
Ammonia, Total (as N)	0.904	0.050	mg/L	1.00		90	90-115			
LCS (B1G0986-BS3)				Prepared: 2021-07-10, Analyzed: 2021-07-10						
Ammonia, Total (as N)	0.933	0.050	mg/L	1.00		93	90-115			
General Parameters, Batch B1G1014										
Blank (B1G1014-BLK1)				Prepared: 2021-07-14, Analyzed: 2021-07-19						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B1G1014-BS1)				Prepared: 2021-07-14, Analyzed: 2021-07-19						
BOD, 5-day Carbonaceous	194	45.4	mg/L	180		108	85-115			
General Parameters, Batch B1G1230										
Blank (B1G1230-BLK1)				Prepared: 2021-07-13, Analyzed: 2021-07-14						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B1G1230-BLK2)				Prepared: 2021-07-13, Analyzed: 2021-07-14						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B1G1230-BS1)				Prepared: 2021-07-13, Analyzed: 2021-07-14						
Nitrogen, Total Kjeldahl	1.00	0.050	mg/L	1.00		100	85-115			
LCS (B1G1230-BS2)				Prepared: 2021-07-13, Analyzed: 2021-07-14						
Nitrogen, Total Kjeldahl	1.00	0.050	mg/L	1.00		100	85-115			
General Parameters, Batch B1G1273										
Blank (B1G1273-BLK1)				Prepared: 2021-07-13, Analyzed: 2021-07-13						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B1G1273-BLK2)				Prepared: 2021-07-13, Analyzed: 2021-07-13						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B1G1273-BLK3)				Prepared: 2021-07-13, Analyzed: 2021-07-13						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21G0975
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-07-19 15:36

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1G1273, Continued										
LCS (B1G1273-BS1)				Prepared: 2021-07-13, Analyzed: 2021-07-13						
Alkalinity, Total (as CaCO3)	105	1.0	mg/L	100		105	80-120			
LCS (B1G1273-BS2)				Prepared: 2021-07-13, Analyzed: 2021-07-13						
Alkalinity, Total (as CaCO3)	106	1.0	mg/L	100		106	80-120			
LCS (B1G1273-BS3)				Prepared: 2021-07-13, Analyzed: 2021-07-13						
Alkalinity, Total (as CaCO3)	105	1.0	mg/L	100		105	80-120			
Reference (B1G1273-SRM1)				Prepared: 2021-07-13, Analyzed: 2021-07-13						
pH	7.02	0.10	pH units	7.01		100	98-102			
Reference (B1G1273-SRM2)				Prepared: 2021-07-13, Analyzed: 2021-07-13						
pH	7.02	0.10	pH units	7.01		100	98-102			
Reference (B1G1273-SRM3)				Prepared: 2021-07-13, Analyzed: 2021-07-13						
pH	7.02	0.10	pH units	7.01		100	98-102			
General Parameters, Batch B1G1281										
Blank (B1G1281-BLK2)				Prepared: 2021-07-13, Analyzed: 2021-07-14						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B1G1281-BS2)				Prepared: 2021-07-13, Analyzed: 2021-07-14						
Phosphorus, Total (as P)	0.108	0.0050	mg/L	0.100		108	85-115			
General Parameters, Batch B1G1300										
Blank (B1G1300-BLK1)				Prepared: 2021-07-14, Analyzed: 2021-07-14						
Solids, Total Suspended	< 2.0	2.0	mg/L							
Blank (B1G1300-BLK2)				Prepared: 2021-07-14, Analyzed: 2021-07-14						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B1G1300-BS1)				Prepared: 2021-07-14, Analyzed: 2021-07-14						
Solids, Total Suspended	109	5.0	mg/L	100		109	85-115			
LCS (B1G1300-BS2)				Prepared: 2021-07-14, Analyzed: 2021-07-14						
Solids, Total Suspended	86.5	5.0	mg/L	100		86	85-115			

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	21H0588
PO NUMBER	104395-10-9007	**RECEIVED / TEMP**	2021-08-05 13:01 / 19.0°C
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-08-26 08:49
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	44413.40725

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 bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21H0588
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-08-26 08:49

Analyte	Result	RL	Units	Analyzed	Qualifier
Final Effluent (E233626) (21H0588-01) | Matrix: Wastewater | Sampled: 2021-08-05 09:50					
Anions					
Chloride	**106**	0.10	mg/L	2021-08-07	
Nitrate (as N)	**0.609**	0.010	mg/L	2021-08-07	
Nitrite (as N)	**0.035**	0.010	mg/L	2021-08-07	
Phosphate (as P)	**0.0253**	0.0050	mg/L	2021-08-07	
Calculated Parameters					
Nitrate+Nitrite (as N)	**0.644**	0.0100	mg/L	N/A	
Nitrogen, Total	**2.35**	0.100	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**194**	1.0	mg/L	2021-08-06	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-08-06	
Alkalinity, Bicarbonate (as CaCO3)	**194**	1.0	mg/L	2021-08-06	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-08-06	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-08-06	
Ammonia, Total (as N)	**0.091**	0.050	mg/L	2021-08-06	
BOD, 5-day Carbonaceous	< 6.4	2.0	mg/L	2021-08-11	
Nitrogen, Total Kjeldahl	**1.70**	0.050	mg/L	2021-08-10	
pH	**7.90**	0.10	pH units	2021-08-06	HT2
Phosphorus, Total (as P)	**0.224**	0.0050	mg/L	2021-08-10	
Solids, Total Suspended	< 3.3	2.0	mg/L	2021-08-10	
Microbiological Parameters					
Coliforms, Total	**242000**	1	MPN/100 mL	2021-08-06	
Coliforms, Fecal	**24800**	1	MPN/100 mL	2021-08-06	
Travel Blank (21H0588-02) | Matrix: Water | Sampled: 2021-08-05 09:50					
Anions					
Chloride	< 0.10	0.10	mg/L	2021-08-07	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-08-07	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-08-07	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-08-07	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	< 0.0500	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L	2021-08-06	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-08-06	
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-08-06	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-08-06	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-08-06	

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21H0588
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-08-26 08:49

Analyte	Result	RL	Units	Analyzed	Qualifier
Travel Blank (21H0588-02) | Matrix: Water | Sampled: 2021-08-05 09:50, Continued					
General Parameters, Continued					
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-08-06	
BOD, 5-day Carbonaceous	< 6.4	2.0	mg/L	2021-08-11	
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L	2021-08-10	
pH	**5.84**	0.10	pH units	2021-08-06	HT2
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L	2021-08-10	
Solids, Total Suspended	< 3.3	2.0	mg/L	2021-08-10	
Microbiological Parameters					
Coliforms, Total	< 1	1	MPN/100 mL	2021-08-06	
Coliforms, Fecal	< 1	1	MPN/100 mL	2021-08-06	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21H0588
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-08-26 08:49

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
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, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Coliforms, Total in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
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
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna

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
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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	Lake Country, District of (Wastewater)	**WORK ORDER**	21H0588
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-08-26 08:49

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 B1H0591										
Blank (B1H0591-BLK1)				Prepared: 2021-08-06, Analyzed: 2021-08-06						
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							
Phosphate (as P)	< 0.0050	0.0050	mg/L							
Blank (B1H0591-BLK2)				Prepared: 2021-08-07, Analyzed: 2021-08-07						
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							
Phosphate (as P)	< 0.0050	0.0050	mg/L							
LCS (B1H0591-BS1)				Prepared: 2021-08-06, Analyzed: 2021-08-06						
Chloride	15.9	0.10	mg/L	16.0		99	90-110			
Nitrate (as N)	4.08	0.010	mg/L	4.00		102	90-110			
Nitrite (as N)	1.95	0.010	mg/L	2.00		98	85-115			
Phosphate (as P)	0.962	0.0050	mg/L	1.00		96	80-120			
LCS (B1H0591-BS2)				Prepared: 2021-08-07, Analyzed: 2021-08-07						
Chloride	15.8	0.10	mg/L	16.0		99	90-110			
Nitrate (as N)	4.12	0.010	mg/L	4.00		103	90-110			
Nitrite (as N)	1.95	0.010	mg/L	2.00		97	85-115			
Phosphate (as P)	0.975	0.0050	mg/L	1.00		97	80-120			
General Parameters, Batch B1H0612										
Blank (B1H0612-BLK1)				Prepared: 2021-08-06, Analyzed: 2021-08-06						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B1H0612-BLK2)				Prepared: 2021-08-06, Analyzed: 2021-08-06						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21H0588
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-08-26 08:49

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1H0612, Continued										
Blank (B1H0612-BLK2), Continued				Prepared: 2021-08-06, Analyzed: 2021-08-06						
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B1H0612-BLK3)				Prepared: 2021-08-06, Analyzed: 2021-08-06						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B1H0612-BS1)				Prepared: 2021-08-06, Analyzed: 2021-08-06						
Alkalinity, Total (as CaCO3)	106	1.0	mg/L	100		106	80-120			
LCS (B1H0612-BS2)				Prepared: 2021-08-06, Analyzed: 2021-08-06						
Alkalinity, Total (as CaCO3)	107	1.0	mg/L	100		107	80-120			
LCS (B1H0612-BS3)				Prepared: 2021-08-06, Analyzed: 2021-08-06						
Alkalinity, Total (as CaCO3)	104	1.0	mg/L	100		104	80-120			
Reference (B1H0612-SRM1)				Prepared: 2021-08-06, Analyzed: 2021-08-06						
pH	7.01	0.10	pH units	7.01		100	98-102			
Reference (B1H0612-SRM2)				Prepared: 2021-08-06, Analyzed: 2021-08-06						
pH	7.01	0.10	pH units	7.01		100	98-102			
Reference (B1H0612-SRM3)				Prepared: 2021-08-06, Analyzed: 2021-08-06						
pH	7.01	0.10	pH units	7.01		100	98-102			
General Parameters, Batch B1H0623										
Blank (B1H0623-BLK1)				Prepared: 2021-08-06, Analyzed: 2021-08-06						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1H0623-BLK2)				Prepared: 2021-08-06, Analyzed: 2021-08-06						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B1H0623-BS1)				Prepared: 2021-08-06, Analyzed: 2021-08-06						
Ammonia, Total (as N)	0.956	0.050	mg/L	1.00		96	90-115			
LCS (B1H0623-BS2)				Prepared: 2021-08-06, Analyzed: 2021-08-06						
Ammonia, Total (as N)	0.952	0.050	mg/L	1.00		95	90-115			
General Parameters, Batch B1H0632										
Blank (B1H0632-BLK1)				Prepared: 2021-08-06, Analyzed: 2021-08-11						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B1H0632-BS1)				Prepared: 2021-08-06, Analyzed: 2021-08-11						
BOD, 5-day Carbonaceous	163	53.3	mg/L	180		91	85-115			
General Parameters, Batch B1H0807										
Blank (B1H0807-BLK1)				Prepared: 2021-08-09, Analyzed: 2021-08-10						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21H0588
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-08-26 08:49

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1H0807, Continued										
Blank (B1H0807-BLK2)				Prepared: 2021-08-09, Analyzed: 2021-08-10						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B1H0807-BS1)				Prepared: 2021-08-09, Analyzed: 2021-08-10						
Nitrogen, Total Kjeldahl	0.888	0.050	mg/L	1.00		89	85-115			
LCS (B1H0807-BS2)				Prepared: 2021-08-09, Analyzed: 2021-08-10						
Nitrogen, Total Kjeldahl	0.894	0.050	mg/L	1.00		89	85-115			
General Parameters, Batch B1H0835										
Blank (B1H0835-BLK1)				Prepared: 2021-08-09, Analyzed: 2021-08-10						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B1H0835-BS1)				Prepared: 2021-08-09, Analyzed: 2021-08-10						
Phosphorus, Total (as P)	0.106	0.0050	mg/L	0.100		106	85-115			
General Parameters, Batch B1H0868										
Blank (B1H0868-BLK1)				Prepared: 2021-08-10, Analyzed: 2021-08-10						
Solids, Total Suspended	< 2.0	2.0	mg/L							
Blank (B1H0868-BLK2)				Prepared: 2021-08-10, Analyzed: 2021-08-10						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B1H0868-BS1)				Prepared: 2021-08-10, Analyzed: 2021-08-10						
Solids, Total Suspended	85.7	3.3	mg/L	100		86	85-115			
LCS (B1H0868-BS2)				Prepared: 2021-08-10, Analyzed: 2021-08-10						
Solids, Total Suspended	91.0	3.3	mg/L	100		91	85-115			
Microbiological Parameters, Batch B1H0578										
Blank (B1H0578-BLK1)				Prepared: 2021-08-06, Analyzed: 2021-08-06						
Coliforms, Total	< 1	1	MPN/100 mL							
Coliforms, Fecal	< 1	1	MPN/100 mL							
Blank (B1H0578-BLK2)				Prepared: 2021-08-06, Analyzed: 2021-08-06						
Coliforms, Total	< 1	1	MPN/100 mL							
Coliforms, Fecal	< 1	1	MPN/100 mL							

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	21H0586
PO NUMBER	104395-10-9007	**RECEIVED / TEMP**	2021-08-05 13:01 / 19.0°C
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-08-12 15:59
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	44413.40725

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 bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21H0586
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-08-12 15:59

Analyte	Result	RL	Units	Analyzed	Qualifier
Raw Influent (E233627) (21H0586-01) | Matrix: Wastewater | Sampled: 2021-08-05 09:55					
Anions					
Nitrate (as N)	< 0.010	0.010	mg/L	2021-08-06	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-08-06	
Phosphate (as P)	**5.63**	0.0050	mg/L	2021-08-06	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	**104**	2.00	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**478**	1.0	mg/L	2021-08-06	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-08-06	
Alkalinity, Bicarbonate (as CaCO3)	**478**	1.0	mg/L	2021-08-06	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-08-06	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-08-06	
Ammonia, Total (as N)	**64.0**	0.050	mg/L	2021-08-09	
BOD, 5-day	**366**	2.0	mg/L	2021-08-11	
BOD, 5-day Carbonaceous	**338**	2.0	mg/L	2021-08-11	
Nitrogen, Total Kjeldahl	**104**	0.050	mg/L	2021-08-10	
pH	**7.97**	0.10	pH units	2021-08-06	HT2
Phosphorus, Total (as P)	**11.5**	0.0050	mg/L	2021-08-10	
Solids, Total Suspended	**242**	2.0	mg/L	2021-08-10	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21H0586
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-08-12 15:59

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
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
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
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
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna

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
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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	Lake Country, District of (Wastewater)	**WORK ORDER**	21H0586
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-08-12 15:59

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 B1H0591										
Blank (B1H0591-BLK1)				Prepared: 2021-08-06, Analyzed: 2021-08-06						
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
Phosphate (as P)	< 0.0050	0.0050	mg/L							
Blank (B1H0591-BLK2)				Prepared: 2021-08-07, Analyzed: 2021-08-07						
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
Phosphate (as P)	< 0.0050	0.0050	mg/L							
LCS (B1H0591-BS1)				Prepared: 2021-08-06, Analyzed: 2021-08-06						
Nitrate (as N)	4.08	0.010	mg/L	4.00		102	90-110			
Nitrite (as N)	1.95	0.010	mg/L	2.00		98	85-115			
Phosphate (as P)	0.962	0.0050	mg/L	1.00		96	80-120			
LCS (B1H0591-BS2)				Prepared: 2021-08-07, Analyzed: 2021-08-07						
Nitrate (as N)	4.12	0.010	mg/L	4.00		103	90-110			
Nitrite (as N)	1.95	0.010	mg/L	2.00		97	85-115			
Phosphate (as P)	0.975	0.0050	mg/L	1.00		97	80-120			
General Parameters, Batch B1H0612										
Blank (B1H0612-BLK1)				Prepared: 2021-08-06, Analyzed: 2021-08-06						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B1H0612-BLK2)				Prepared: 2021-08-06, Analyzed: 2021-08-06						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21H0586
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-08-12 15:59

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1H0612, Continued										
Blank (B1H0612-BLK3)				Prepared: 2021-08-06, Analyzed: 2021-08-06						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B1H0612-BS1)				Prepared: 2021-08-06, Analyzed: 2021-08-06						
Alkalinity, Total (as CaCO3)	106	1.0	mg/L	100		106	80-120			
LCS (B1H0612-BS2)				Prepared: 2021-08-06, Analyzed: 2021-08-06						
Alkalinity, Total (as CaCO3)	107	1.0	mg/L	100		107	80-120			
LCS (B1H0612-BS3)				Prepared: 2021-08-06, Analyzed: 2021-08-06						
Alkalinity, Total (as CaCO3)	104	1.0	mg/L	100		104	80-120			
Reference (B1H0612-SRM1)				Prepared: 2021-08-06, Analyzed: 2021-08-06						
pH	7.01	0.10	pH units	7.01		100	98-102			
Reference (B1H0612-SRM2)				Prepared: 2021-08-06, Analyzed: 2021-08-06						
pH	7.01	0.10	pH units	7.01		100	98-102			
Reference (B1H0612-SRM3)				Prepared: 2021-08-06, Analyzed: 2021-08-06						
pH	7.01	0.10	pH units	7.01		100	98-102			
General Parameters, Batch B1H0631										
Blank (B1H0631-BLK1)				Prepared: 2021-08-06, Analyzed: 2021-08-11						
BOD, 5-day	< 2.0	2.0	mg/L							
LCS (B1H0631-BS1)				Prepared: 2021-08-06, Analyzed: 2021-08-11						
BOD, 5-day	176	60.0	mg/L	180		98	85-115			
General Parameters, Batch B1H0632										
Blank (B1H0632-BLK1)				Prepared: 2021-08-06, Analyzed: 2021-08-11						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B1H0632-BS1)				Prepared: 2021-08-06, Analyzed: 2021-08-11						
BOD, 5-day Carbonaceous	163	53.3	mg/L	180		91	85-115			
General Parameters, Batch B1H0782										
Blank (B1H0782-BLK1)				Prepared: 2021-08-09, Analyzed: 2021-08-09						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1H0782-BLK2)				Prepared: 2021-08-09, Analyzed: 2021-08-09						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1H0782-BLK3)				Prepared: 2021-08-09, Analyzed: 2021-08-09						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B1H0782-BS1)				Prepared: 2021-08-09, Analyzed: 2021-08-09						
Ammonia, Total (as N)	0.938	0.050	mg/L	1.00		94	90-115			
LCS (B1H0782-BS2)				Prepared: 2021-08-09, Analyzed: 2021-08-09						
Ammonia, Total (as N)	0.930	0.050	mg/L	1.00		93	90-115			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21H0586
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-08-12 15:59

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1H0782, Continued										
LCS (B1H0782-BS3)				Prepared: 2021-08-09, Analyzed: 2021-08-09						
Ammonia, Total (as N)	0.907	0.050	mg/L	1.00		91	90-115			
General Parameters, Batch B1H0807										
Blank (B1H0807-BLK1)				Prepared: 2021-08-09, Analyzed: 2021-08-10						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B1H0807-BLK2)				Prepared: 2021-08-09, Analyzed: 2021-08-10						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B1H0807-BS1)				Prepared: 2021-08-09, Analyzed: 2021-08-10						
Nitrogen, Total Kjeldahl	0.888	0.050	mg/L	1.00		89	85-115			
LCS (B1H0807-BS2)				Prepared: 2021-08-09, Analyzed: 2021-08-10						
Nitrogen, Total Kjeldahl	0.894	0.050	mg/L	1.00		89	85-115			
General Parameters, Batch B1H0835										
Blank (B1H0835-BLK1)				Prepared: 2021-08-09, Analyzed: 2021-08-10						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B1H0835-BS1)				Prepared: 2021-08-09, Analyzed: 2021-08-10						
Phosphorus, Total (as P)	0.106	0.0050	mg/L	0.100		106	85-115			
General Parameters, Batch B1H0868										
Blank (B1H0868-BLK1)				Prepared: 2021-08-10, Analyzed: 2021-08-10						
Solids, Total Suspended	< 2.0	2.0	mg/L							
Blank (B1H0868-BLK2)				Prepared: 2021-08-10, Analyzed: 2021-08-10						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B1H0868-BS1)				Prepared: 2021-08-10, Analyzed: 2021-08-10						
Solids, Total Suspended	85.7	3.3	mg/L	100		86	85-115			
LCS (B1H0868-BS2)				Prepared: 2021-08-10, Analyzed: 2021-08-10						
Solids, Total Suspended	91.0	3.3	mg/L	100		91	85-115			

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	21I1211
PO NUMBER		**RECEIVED / TEMP**	2021-09-08 11:55 / 19.0°C
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-09-15 14:10
PROJECT INFO	Lake Country WWTP		

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 bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21I1211
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-09-15 14:10

Analyte	Result	RL	Units	Analyzed	Qualifier
Final Effluent (E233626) (21I1211-01) | Matrix: Wastewater | Sampled: 2021-09-08 11:00					
Anions					
Chloride	**96.6**	0.10	mg/L	2021-09-11	
Nitrate (as N)	**2.30**	0.010	mg/L	2021-09-11	
Nitrite (as N)	**0.049**	0.010	mg/L	2021-09-11	
Phosphate (as P)	**0.0158**	0.0050	mg/L	2021-09-11	
Calculated Parameters					
Nitrate+Nitrite (as N)	**2.35**	0.0100	mg/L	N/A	
Nitrogen, Total	**4.72**	0.100	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**182**	1.0	mg/L	2021-09-13	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-09-13	
Alkalinity, Bicarbonate (as CaCO3)	**182**	1.0	mg/L	2021-09-13	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-09-13	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-09-13	
Ammonia, Total (as N)	**0.682**	0.050	mg/L	2021-09-10	
BOD, 5-day Carbonaceous	**4.5**	2.0	mg/L	2021-09-15	
Nitrogen, Total Kjeldahl	**2.37**	0.050	mg/L	2021-09-14	
pH	**7.92**	0.10	pH units	2021-09-13	HT2
Phosphorus, Total (as P)	**0.301**	0.0050	mg/L	2021-09-13	
Solids, Total Suspended	**4.0**	2.0	mg/L	2021-09-13	
Microbiological Parameters					
Coliforms, Total	**155000**	1	MPN/100 mL	2021-09-09	
Coliforms, Fecal	**19400**	1	MPN/100 mL	2021-09-09	
Field Blank (21I1211-02) | Matrix: Water | Sampled: 2021-09-08 11:03					
Anions					
Chloride	< 0.10	0.10	mg/L	2021-09-11	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-09-11	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-09-11	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-09-11	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	< 0.0500	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L	2021-09-13	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-09-13	
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-09-13	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-09-13	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-09-13	

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21I1211
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-09-15 14:10

Analyte	Result	RL	Units	Analyzed	Qualifier
Field Blank (21I1211-02) | Matrix: Water | Sampled: 2021-09-08 11:03, Continued					
General Parameters, Continued					
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-09-10	
BOD, 5-day Carbonaceous	< 4.1	2.0	mg/L	2021-09-15	
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L	2021-09-14	
pH	**5.45**	0.10	pH units	2021-09-13	HT2
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L	2021-09-13	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-09-13	
Microbiological Parameters					
Coliforms, Total	< 1	1	MPN/100 mL	2021-09-09	
Coliforms, Fecal	< 1	1	MPN/100 mL	2021-09-09	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21I1211
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-09-15 14:10

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
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, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Coliforms, Total in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
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
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna

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
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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	Lake Country, District of (Wastewater)	**WORK ORDER**	21I1211
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-09-15 14:10

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 B1I1011										
Blank (B1I1011-BLK1)				Prepared: 2021-09-10, Analyzed: 2021-09-10						
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							
Phosphate (as P)	< 0.0050	0.0050	mg/L							
Blank (B1I1011-BLK2)				Prepared: 2021-09-11, Analyzed: 2021-09-11						
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							
Phosphate (as P)	< 0.0050	0.0050	mg/L							
LCS (B1I1011-BS1)				Prepared: 2021-09-10, Analyzed: 2021-09-10						
Chloride	16.0	0.10	mg/L	16.0		100	90-110			
Nitrate (as N)	4.03	0.010	mg/L	4.00		101	90-110			
Nitrite (as N)	1.89	0.010	mg/L	2.00		94	85-115			
Phosphate (as P)	0.930	0.0050	mg/L	1.00		93	80-120			
LCS (B1I1011-BS2)				Prepared: 2021-09-11, Analyzed: 2021-09-11						
Chloride	16.0	0.10	mg/L	16.0		100	90-110			
Nitrate (as N)	4.13	0.010	mg/L	4.00		103	90-110			
Nitrite (as N)	1.95	0.010	mg/L	2.00		97	85-115			
Phosphate (as P)	0.969	0.0050	mg/L	1.00		97	80-120			
General Parameters, Batch B1I1019										
Blank (B1I1019-BLK1)				Prepared: 2021-09-10, Analyzed: 2021-09-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1I1019-BLK2)				Prepared: 2021-09-10, Analyzed: 2021-09-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1I1019-BLK3)				Prepared: 2021-09-10, Analyzed: 2021-09-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1I1019-BLK4)				Prepared: 2021-09-10, Analyzed: 2021-09-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21I1211
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-09-15 14:10

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1I1019, Continued										
Blank (B1I1019-BLK5)				Prepared: 2021-09-10, Analyzed: 2021-09-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B1I1019-BS1)				Prepared: 2021-09-10, Analyzed: 2021-09-10						
Ammonia, Total (as N)	0.917	0.050	mg/L	1.00		92	90-115			
LCS (B1I1019-BS2)				Prepared: 2021-09-10, Analyzed: 2021-09-10						
Ammonia, Total (as N)	0.912	0.050	mg/L	1.00		91	90-115			
LCS (B1I1019-BS3)				Prepared: 2021-09-10, Analyzed: 2021-09-10						
Ammonia, Total (as N)	0.922	0.050	mg/L	1.00		92	90-115			
LCS (B1I1019-BS4)				Prepared: 2021-09-10, Analyzed: 2021-09-10						
Ammonia, Total (as N)	0.901	0.050	mg/L	1.00		90	90-115			
LCS (B1I1019-BS5)				Prepared: 2021-09-10, Analyzed: 2021-09-10						
Ammonia, Total (as N)	0.929	0.050	mg/L	1.00		93	90-115			
General Parameters, Batch B1I1096										
Blank (B1I1096-BLK1)				Prepared: 2021-09-10, Analyzed: 2021-09-15						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B1I1096-BS1)				Prepared: 2021-09-10, Analyzed: 2021-09-15						
BOD, 5-day Carbonaceous	184	2.0	mg/L	180		102	85-115			
General Parameters, Batch B1I1274										
Blank (B1I1274-BLK1)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
Solids, Total Suspended	< 2.0	2.0	mg/L							
Blank (B1I1274-BLK2)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B1I1274-BS1)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
Solids, Total Suspended	97.0	5.0	mg/L	100		97	85-115			
LCS (B1I1274-BS2)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
Solids, Total Suspended	92.5	5.0	mg/L	100		92	85-115			
General Parameters, Batch B1I1276										
Blank (B1I1276-BLK1)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B1I1276-BLK2)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B1I1276-BS1)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
Phosphorus, Total (as P)	0.105	0.0050	mg/L	0.100		105	85-115			
LCS (B1I1276-BS2)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
Phosphorus, Total (as P)	0.106	0.0050	mg/L	0.100		106	85-115			
General Parameters, Batch B1I1329										

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21I1211
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-09-15 14:10

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1I1329, Continued										
Blank (B1I1329-BLK1)				Prepared: 2021-09-13, Analyzed: 2021-09-14						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B1I1329-BLK2)				Prepared: 2021-09-13, Analyzed: 2021-09-14						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B1I1329-BS1)				Prepared: 2021-09-13, Analyzed: 2021-09-14						
Nitrogen, Total Kjeldahl	1.00	0.050	mg/L	1.00		100	85-115			
LCS (B1I1329-BS2)				Prepared: 2021-09-13, Analyzed: 2021-09-14						
Nitrogen, Total Kjeldahl	1.00	0.050	mg/L	1.00		100	85-115			
Duplicate (B1I1329-DUP2)		**Source: 21I1211-01**		Prepared: 2021-09-13, Analyzed: 2021-09-14						
Nitrogen, Total Kjeldahl	2.35	0.050	mg/L		2.37			< 1	15	
Matrix Spike (B1I1329-MS2)		**Source: 21I1211-01**		Prepared: 2021-09-13, Analyzed: 2021-09-14						
Nitrogen, Total Kjeldahl	6.48	0.200	mg/L	4.00	2.37	103	65-135			
General Parameters, Batch B1I1371										
Blank (B1I1371-BLK1)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
Alkalinity, Total (as CaCO3)	1.7	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	1.7	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B1I1371-BLK2)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
Alkalinity, Total (as CaCO3)	1.7	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	1.7	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B1I1371-BLK3)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B1I1371-BS1)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
Alkalinity, Total (as CaCO3)	109	1.0	mg/L	100		109	80-120			
LCS (B1I1371-BS2)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
Alkalinity, Total (as CaCO3)	109	1.0	mg/L	100		109	80-120			
LCS (B1I1371-BS3)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
Alkalinity, Total (as CaCO3)	109	1.0	mg/L	100		109	80-120			
Reference (B1I1371-SRM1)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
pH	7.00	0.10	pH units	7.01		100	98-102			
Reference (B1I1371-SRM2)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
pH	7.01	0.10	pH units	7.01		100	98-102			
Reference (B1I1371-SRM3)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
pH	7.00	0.10	pH units	7.01		100	98-102			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21I1211
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-09-15 14:10

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Microbiological Parameters, Batch B1I0927										
Blank (B1I0927-BLK1)				Prepared: 2021-09-09, Analyzed: 2021-09-09						
Coliforms, Fecal	< 1	1	MPN/100 mL							
Blank (B1I0927-BLK2)				Prepared: 2021-09-09, Analyzed: 2021-09-09						
Coliforms, Total	< 1	1	MPN/100 mL							

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	21I1206
PO NUMBER		**RECEIVED / TEMP**	2021-09-08 11:55 / 19.0°C
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-09-15 15:06
PROJECT INFO	Lake Country WWTP		

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 bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21I1206
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-09-15 15:06

Analyte	Result	RL	Units	Analyzed	Qualifier
Raw Influent (E233627) (21I1206-01) | Matrix: Wastewater | Sampled: 2021-09-08 11:10					
Anions					
Nitrate (as N)	< 0.010	0.010	mg/L	2021-09-10	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-09-10	
Phosphate (as P)	**5.78**	0.0050	mg/L	2021-09-10	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	**92.4**	2.00	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**456**	1.0	mg/L	2021-09-13	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-09-13	
Alkalinity, Bicarbonate (as CaCO3)	**456**	1.0	mg/L	2021-09-13	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-09-13	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-09-13	
Ammonia, Total (as N)	**58.0**	0.050	mg/L	2021-09-10	
BOD, 5-day	**327**	2.0	mg/L	2021-09-15	
BOD, 5-day Carbonaceous	**332**	2.0	mg/L	2021-09-15	
Nitrogen, Total Kjeldahl	**92.4**	0.050	mg/L	2021-09-14	
pH	**7.88**	0.10	pH units	2021-09-13	HT2
Phosphorus, Total (as P)	**11.4**	0.0050	mg/L	2021-09-13	
Solids, Total Suspended	**350**	2.0	mg/L	2021-09-13	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21I1206
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-09-15 15:06

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
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
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
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
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna

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
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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	Lake Country, District of (Wastewater)	**WORK ORDER**	21I1206
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-09-15 15:06

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 B1I1011										
Blank (B1I1011-BLK1)				Prepared: 2021-09-10, Analyzed: 2021-09-10						
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
Phosphate (as P)	< 0.0050	0.0050	mg/L							
Blank (B1I1011-BLK2)				Prepared: 2021-09-11, Analyzed: 2021-09-11						
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
Phosphate (as P)	< 0.0050	0.0050	mg/L							
LCS (B1I1011-BS1)				Prepared: 2021-09-10, Analyzed: 2021-09-10						
Nitrate (as N)	4.03	0.010	mg/L	4.00		101	90-110			
Nitrite (as N)	1.89	0.010	mg/L	2.00		94	85-115			
Phosphate (as P)	0.930	0.0050	mg/L	1.00		93	80-120			
LCS (B1I1011-BS2)				Prepared: 2021-09-11, Analyzed: 2021-09-11						
Nitrate (as N)	4.13	0.010	mg/L	4.00		103	90-110			
Nitrite (as N)	1.95	0.010	mg/L	2.00		97	85-115			
Phosphate (as P)	0.969	0.0050	mg/L	1.00		97	80-120			
General Parameters, Batch B1I1019										
Blank (B1I1019-BLK1)				Prepared: 2021-09-10, Analyzed: 2021-09-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1I1019-BLK2)				Prepared: 2021-09-10, Analyzed: 2021-09-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1I1019-BLK3)				Prepared: 2021-09-10, Analyzed: 2021-09-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1I1019-BLK4)				Prepared: 2021-09-10, Analyzed: 2021-09-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1I1019-BLK5)				Prepared: 2021-09-10, Analyzed: 2021-09-10						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21I1206
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-09-15 15:06

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1I1019, Continued										
LCS (B1I1019-BS1)				Prepared: 2021-09-10, Analyzed: 2021-09-10						
Ammonia, Total (as N)	0.917	0.050	mg/L	1.00		92	90-115			
LCS (B1I1019-BS2)				Prepared: 2021-09-10, Analyzed: 2021-09-10						
Ammonia, Total (as N)	0.912	0.050	mg/L	1.00		91	90-115			
LCS (B1I1019-BS3)				Prepared: 2021-09-10, Analyzed: 2021-09-10						
Ammonia, Total (as N)	0.922	0.050	mg/L	1.00		92	90-115			
LCS (B1I1019-BS4)				Prepared: 2021-09-10, Analyzed: 2021-09-10						
Ammonia, Total (as N)	0.901	0.050	mg/L	1.00		90	90-115			
LCS (B1I1019-BS5)				Prepared: 2021-09-10, Analyzed: 2021-09-10						
Ammonia, Total (as N)	0.929	0.050	mg/L	1.00		93	90-115			
General Parameters, Batch B1I1095										
Blank (B1I1095-BLK1)				Prepared: 2021-09-10, Analyzed: 2021-09-15						
BOD, 5-day	< 2.0	2.0	mg/L							
LCS (B1I1095-BS1)				Prepared: 2021-09-10, Analyzed: 2021-09-15						
BOD, 5-day	182	53.9	mg/L	180		101	85-115			
General Parameters, Batch B1I1096										
Blank (B1I1096-BLK1)				Prepared: 2021-09-10, Analyzed: 2021-09-15						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B1I1096-BS1)				Prepared: 2021-09-10, Analyzed: 2021-09-15						
BOD, 5-day Carbonaceous	184	2.0	mg/L	180		102	85-115			
General Parameters, Batch B1I1274										
Blank (B1I1274-BLK1)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
Solids, Total Suspended	< 2.0	2.0	mg/L							
Blank (B1I1274-BLK2)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B1I1274-BS1)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
Solids, Total Suspended	97.0	5.0	mg/L	100		97	85-115			
LCS (B1I1274-BS2)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
Solids, Total Suspended	92.5	5.0	mg/L	100		92	85-115			
General Parameters, Batch B1I1276										
Blank (B1I1276-BLK1)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B1I1276-BLK2)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B1I1276-BS1)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
Phosphorus, Total (as P)	0.105	0.0050	mg/L	0.100		105	85-115			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21I1206
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-09-15 15:06

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1I1276, Continued										
LCS (B1I1276-BS2)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
Phosphorus, Total (as P)	0.106	0.0050	mg/L	0.100		106	85-115			
General Parameters, Batch B1I1329										
Blank (B1I1329-BLK1)				Prepared: 2021-09-13, Analyzed: 2021-09-14						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B1I1329-BLK2)				Prepared: 2021-09-13, Analyzed: 2021-09-14						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B1I1329-BS1)				Prepared: 2021-09-13, Analyzed: 2021-09-14						
Nitrogen, Total Kjeldahl	1.00	0.050	mg/L	1.00		100	85-115			
LCS (B1I1329-BS2)				Prepared: 2021-09-13, Analyzed: 2021-09-14						
Nitrogen, Total Kjeldahl	1.00	0.050	mg/L	1.00		100	85-115			
General Parameters, Batch B1I1371										
Blank (B1I1371-BLK1)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
Alkalinity, Total (as CaCO3)	1.7	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	1.7	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B1I1371-BLK2)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
Alkalinity, Total (as CaCO3)	1.7	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	1.7	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B1I1371-BLK3)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B1I1371-BS1)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
Alkalinity, Total (as CaCO3)	109	1.0	mg/L	100		109	80-120			
LCS (B1I1371-BS2)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
Alkalinity, Total (as CaCO3)	109	1.0	mg/L	100		109	80-120			
LCS (B1I1371-BS3)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
Alkalinity, Total (as CaCO3)	109	1.0	mg/L	100		109	80-120			
Reference (B1I1371-SRM1)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
pH	7.00	0.10	pH units	7.01		100	98-102			
Reference (B1I1371-SRM2)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
pH	7.01	0.10	pH units	7.01		100	98-102			
Reference (B1I1371-SRM3)				Prepared: 2021-09-13, Analyzed: 2021-09-13						
pH	7.00	0.10	pH units	7.01		100	98-102			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21I1206
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-09-15 15:06

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	21J0561
PO NUMBER	104395-10-9007	**RECEIVED / TEMP**	2021-10-06 11:40 / 19.3°C
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-10-14 15:07
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	44474.35644

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 bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21J0561
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-10-14 15:07

Analyte	Result	RL	Units	Analyzed	Qualifier
Final Effluent (E233626) (21J0561-01) | Matrix: Wastewater | Sampled: 2021-10-05 10:15					
Anions					
Chloride	**112**	0.10	mg/L	2021-10-11	
Nitrate (as N)	**1.48**	0.010	mg/L	2021-10-11	HT1
Nitrite (as N)	**0.032**	0.010	mg/L	2021-10-11	HT1
Phosphate (as P)	**0.0180**	0.0050	mg/L	2021-10-11	HT1
Calculated Parameters					
Nitrate+Nitrite (as N)	**1.52**	0.0100	mg/L	N/A	
Nitrogen, Total	**3.17**	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**184**	1.0	mg/L	2021-10-07	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-10-07	
Alkalinity, Bicarbonate (as CaCO3)	**184**	1.0	mg/L	2021-10-07	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-10-07	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-10-07	
Ammonia, Total (as N)	**0.094**	0.050	mg/L	2021-10-07	
BOD, 5-day Carbonaceous	< 4.6	2.0	mg/L	2021-10-12	
Nitrogen, Total Kjeldahl	**1.66**	0.050	mg/L	2021-10-12	
pH	**7.74**	0.10	pH units	2021-10-07	HT2
Phosphorus, Total (as P)	**0.243**	0.0050	mg/L	2021-10-14	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-10-08	
Microbiological Parameters					
Coliforms, Total	**242000**	1	MPN/100 mL	2021-10-06	
Coliforms, Fecal	**242000**	1	MPN/100 mL	2021-10-06	
Duplicate (21J0561-02) | Matrix: Water | Sampled: 2021-10-05 10:17					
Anions					
Chloride	**113**	0.10	mg/L	2021-10-11	
Nitrate (as N)	**1.49**	0.010	mg/L	2021-10-11	HT1
Nitrite (as N)	**0.034**	0.010	mg/L	2021-10-11	HT1
Phosphate (as P)	**0.0161**	0.0050	mg/L	2021-10-11	HT1
Calculated Parameters					
Nitrate+Nitrite (as N)	**1.53**	0.0100	mg/L	N/A	
Nitrogen, Total	**2.97**	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**170**	1.0	mg/L	2021-10-07	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-10-07	
Alkalinity, Bicarbonate (as CaCO3)	**170**	1.0	mg/L	2021-10-07	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-10-07	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-10-07	

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21J0561
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-10-14 15:07

Analyte	Result	RL	Units	Analyzed	Qualifier
Duplicate (21J0561-02) | Matrix: Water | Sampled: 2021-10-05 10:17, Continued					
General Parameters, Continued					
Ammonia, Total (as N)	**0.083**	0.050	mg/L	2021-10-07	
BOD, 5-day Carbonaceous	< 4.6	2.0	mg/L	2021-10-12	
Nitrogen, Total Kjeldahl	**1.44**	0.050	mg/L	2021-10-12	
pH	**7.72**	0.10	pH units	2021-10-07	HT2
Phosphorus, Total (as P)	**0.239**	0.0050	mg/L	2021-10-14	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-10-08	
Microbiological Parameters					
Coliforms, Total	**242000**	1	MPN/100 mL	2021-10-06	
Coliforms, Fecal	**199000**	1	MPN/100 mL	2021-10-06	

Sample Qualifiers:

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	Lake Country, District of (Wastewater)	**WORK ORDER**	21J0561
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-10-14 15:07

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
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, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Coliforms, Total in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
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
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna

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
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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	Lake Country, District of (Wastewater)	**WORK ORDER**	21J0561
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-10-14 15:07

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 B1J0868										
Blank (B1J0868-BLK1)				Prepared: 2021-10-11, Analyzed: 2021-10-11						
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							
Phosphate (as P)	< 0.0050	0.0050	mg/L							
Blank (B1J0868-BLK2)				Prepared: 2021-10-12, Analyzed: 2021-10-12						
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							
Phosphate (as P)	< 0.0050	0.0050	mg/L							
LCS (B1J0868-BS1)				Prepared: 2021-10-11, Analyzed: 2021-10-11						
Chloride	15.9	0.10	mg/L	16.0		100	90-110			
Nitrate (as N)	4.09	0.010	mg/L	4.00		102	90-110			
Nitrite (as N)	2.05	0.010	mg/L	2.00		102	85-115			
Phosphate (as P)	0.979	0.0050	mg/L	1.00		98	80-120			
LCS (B1J0868-BS2)				Prepared: 2021-10-12, Analyzed: 2021-10-12						
Chloride	15.9	0.10	mg/L	16.0		99	90-110			
Nitrate (as N)	4.16	0.010	mg/L	4.00		104	90-110			
Nitrite (as N)	2.07	0.010	mg/L	2.00		104	85-115			
Phosphate (as P)	0.969	0.0050	mg/L	1.00		97	80-120			
LCS (B1J0868-BS3)				Prepared: 2021-10-12, Analyzed: 2021-10-12						
Chloride	15.9	0.10	mg/L	16.0		100	90-110			
Nitrate (as N)	4.13	0.010	mg/L	4.00		103	90-110			
Nitrite (as N)	2.07	0.010	mg/L	2.00		103	85-115			
Phosphate (as P)	1.01	0.0050	mg/L	1.00		101	80-120			
General Parameters, Batch B1J0759										
Blank (B1J0759-BLK1)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1J0759-BLK2)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21J0561
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-10-14 15:07

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1J0759, Continued										
Blank (B1J0759-BLK3)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1J0759-BLK4)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1J0759-BLK5)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1J0759-BLK6)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B1J0759-BS1)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Ammonia, Total (as N)	0.996	0.050	mg/L	1.00		100	90-115			
LCS (B1J0759-BS2)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Ammonia, Total (as N)	0.985	0.050	mg/L	1.00		98	90-115			
LCS (B1J0759-BS3)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Ammonia, Total (as N)	0.984	0.050	mg/L	1.00		98	90-115			
LCS (B1J0759-BS4)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Ammonia, Total (as N)	0.976	0.050	mg/L	1.00		98	90-115			
LCS (B1J0759-BS5)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Ammonia, Total (as N)	0.990	0.050	mg/L	1.00		99	90-115			
LCS (B1J0759-BS6)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Ammonia, Total (as N)	0.986	0.050	mg/L	1.00		99	90-115			
General Parameters, Batch B1J0905										
Blank (B1J0905-BLK1)				Prepared: 2021-10-07, Analyzed: 2021-10-12						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B1J0905-BS1)				Prepared: 2021-10-07, Analyzed: 2021-10-12						
BOD, 5-day Carbonaceous	179	38.7	mg/L	180		99	85-115			
General Parameters, Batch B1J0912										
Blank (B1J0912-BLK1)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B1J0912-BLK2)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B1J0912-BLK3)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO Lake Country, District of (Wastewater)
PROJECT Final Effluent- PE14651

WORK ORDER 21J0561
REPORTED 2021-10-14 15:07

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1J0912, Continued										
Blank (B1J0912-BLK3), Continued				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B1J0912-BS1)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Alkalinity, Total (as CaCO3)	107	1.0	mg/L	100		107	80-120			
LCS (B1J0912-BS2)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Alkalinity, Total (as CaCO3)	108	1.0	mg/L	100		108	80-120			
LCS (B1J0912-BS3)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Alkalinity, Total (as CaCO3)	108	1.0	mg/L	100		108	80-120			
Reference (B1J0912-SRM1)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
pH	6.99	0.10	pH units	7.01		100	98-102			
Reference (B1J0912-SRM2)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
pH	7.00	0.10	pH units	7.01		100	98-102			
Reference (B1J0912-SRM3)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
pH	6.99	0.10	pH units	7.01		100	98-102			
General Parameters, Batch B1J0959										
Blank (B1J0959-BLK1)				Prepared: 2021-10-08, Analyzed: 2021-10-08						
Solids, Total Suspended	< 2.0	2.0	mg/L							
Blank (B1J0959-BLK2)				Prepared: 2021-10-08, Analyzed: 2021-10-08						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B1J0959-BS1)				Prepared: 2021-10-08, Analyzed: 2021-10-08						
Solids, Total Suspended	96.0	10.0	mg/L	100		96	85-115			
LCS (B1J0959-BS2)				Prepared: 2021-10-08, Analyzed: 2021-10-08						
Solids, Total Suspended	106	10.0	mg/L	100		106	85-115			
General Parameters, Batch B1J1017										
Blank (B1J1017-BLK1)				Prepared: 2021-10-08, Analyzed: 2021-10-12						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B1J1017-BLK2)				Prepared: 2021-10-08, Analyzed: 2021-10-12						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B1J1017-BS1)				Prepared: 2021-10-08, Analyzed: 2021-10-12						
Nitrogen, Total Kjeldahl	1.01	0.050	mg/L	1.00		101	85-115			
LCS (B1J1017-BS2)				Prepared: 2021-10-08, Analyzed: 2021-10-12						
Nitrogen, Total Kjeldahl	1.01	0.050	mg/L	1.00		101	85-115			
General Parameters, Batch B1J1250										
Blank (B1J1250-BLK1)				Prepared: 2021-10-12, Analyzed: 2021-10-13						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B1J1250-BLK2)				Prepared: 2021-10-12, Analyzed: 2021-10-13						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21J0561
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-10-14 15:07

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1J1250, Continued										
Blank (B1J1250-BLK3)				Prepared: 2021-10-12, Analyzed: 2021-10-14						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B1J1250-BS1)				Prepared: 2021-10-12, Analyzed: 2021-10-14						
Phosphorus, Total (as P)	0.0977	0.0050	mg/L	0.100		98	85-115			
LCS (B1J1250-BS2)				Prepared: 2021-10-12, Analyzed: 2021-10-13						
Phosphorus, Total (as P)	0.105	0.0050	mg/L	0.100		105	85-115			
LCS (B1J1250-BS3)				Prepared: 2021-10-12, Analyzed: 2021-10-14						
Phosphorus, Total (as P)	0.101	0.0050	mg/L	0.100		101	85-115			
Microbiological Parameters, Batch B1J0698										
Blank (B1J0698-BLK1)				Prepared: 2021-10-06, Analyzed: 2021-10-06						
Coliforms, Total	< 1	1	MPN/100 mL							
Coliforms, Fecal	< 1	1	MPN/100 mL							
Blank (B1J0698-BLK2)				Prepared: 2021-10-06, Analyzed: 2021-10-06						
Coliforms, Total	< 1	1	MPN/100 mL							
Coliforms, Fecal	< 1	1	MPN/100 mL							
Blank (B1J0698-BLK3)				Prepared: 2021-10-06, Analyzed: 2021-10-06						
Coliforms, Total	< 1	1	MPN/100 mL							
Coliforms, Fecal	< 1	1	MPN/100 mL							
Blank (B1J0698-BLK4)				Prepared: 2021-10-06, Analyzed: 2021-10-06						
Coliforms, Total	< 1	1	MPN/100 mL							
Coliforms, Fecal	< 1	1	MPN/100 mL							
Blank (B1J0698-BLK5)				Prepared: 2021-10-06, Analyzed: 2021-10-06						
Coliforms, Total	< 1	1	MPN/100 mL							
Coliforms, Fecal	< 1	1	MPN/100 mL							
Duplicate (B1J0698-DUP3)				**Source: 21J0561-01**	Prepared: 2021-10-06, Analyzed: 2021-10-06					
Coliforms, Total	< 1	1	MPN/100 mL		242000			200	80	
Coliforms, Fecal	199000	1	MPN/100 mL		242000			20	80	

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	21J0560
PO NUMBER	104395-10-9007	**RECEIVED / TEMP**	2021-10-05 11:40 / 19.3°C
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-10-13 16:15
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	44474.35644

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 bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21J0560
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-10-13 16:15

Analyte	Result	RL	Units	Analyzed	Qualifier
Raw Influent (E233627) (21J0560-01) | Matrix: Wastewater | Sampled: 2021-10-05 10:30					
Anions					
Nitrate (as N)	< 0.010	0.010	mg/L	2021-10-11	HT1
Nitrite (as N)	< 0.010	0.010	mg/L	2021-10-11	HT1
Phosphate (as P)	**4.23**	0.0050	mg/L	2021-10-11	HT1
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	**89.4**	2.00	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**441**	1.0	mg/L	2021-10-07	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-10-07	
Alkalinity, Bicarbonate (as CaCO3)	**441**	1.0	mg/L	2021-10-07	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-10-07	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-10-07	
Ammonia, Total (as N)	**55.8**	0.050	mg/L	2021-10-07	
BOD, 5-day	**231**	2.0	mg/L	2021-10-12	
BOD, 5-day Carbonaceous	**284**	2.0	mg/L	2021-10-12	RA5
Nitrogen, Total Kjeldahl	**89.4**	0.050	mg/L	2021-10-12	
pH	**7.95**	0.10	pH units	2021-10-07	HT2
Phosphorus, Total (as P)	**9.60**	0.0050	mg/L	2021-10-12	
Solids, Total Suspended	**220**	2.0	mg/L	2021-10-08	

Sample Qualifiers:

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.
RA5	The sample cannot be accurately quantified due to matrix interference. Result is Semi-Quantitative.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21J0560
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-10-13 16:15

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
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
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
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
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna

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
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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	Lake Country, District of (Wastewater)	**WORK ORDER**	21J0560
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-10-13 16:15

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 B1J0868										
Blank (B1J0868-BLK1)				Prepared: 2021-10-11, Analyzed: 2021-10-11						
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
Phosphate (as P)	< 0.0050	0.0050	mg/L							
Blank (B1J0868-BLK2)				Prepared: 2021-10-12, Analyzed: 2021-10-12						
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
Phosphate (as P)	< 0.0050	0.0050	mg/L							
LCS (B1J0868-BS1)				Prepared: 2021-10-11, Analyzed: 2021-10-11						
Nitrate (as N)	4.09	0.010	mg/L	4.00		102	90-110			
Nitrite (as N)	2.05	0.010	mg/L	2.00		102	85-115			
Phosphate (as P)	0.979	0.0050	mg/L	1.00		98	80-120			
LCS (B1J0868-BS2)				Prepared: 2021-10-12, Analyzed: 2021-10-12						
Nitrate (as N)	4.16	0.010	mg/L	4.00		104	90-110			
Nitrite (as N)	2.07	0.010	mg/L	2.00		104	85-115			
Phosphate (as P)	0.969	0.0050	mg/L	1.00		97	80-120			
LCS (B1J0868-BS3)				Prepared: 2021-10-12, Analyzed: 2021-10-12						
Nitrate (as N)	4.13	0.010	mg/L	4.00		103	90-110			
Nitrite (as N)	2.07	0.010	mg/L	2.00		103	85-115			
Phosphate (as P)	1.01	0.0050	mg/L	1.00		101	80-120			
General Parameters, Batch B1J0759										
Blank (B1J0759-BLK1)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1J0759-BLK2)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1J0759-BLK3)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1J0759-BLK4)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21J0560
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-10-13 16:15

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1J0759, Continued										
Blank (B1J0759-BLK5)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1J0759-BLK6)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B1J0759-BS1)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Ammonia, Total (as N)	0.996	0.050	mg/L	1.00		100	90-115			
LCS (B1J0759-BS2)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Ammonia, Total (as N)	0.985	0.050	mg/L	1.00		98	90-115			
LCS (B1J0759-BS3)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Ammonia, Total (as N)	0.984	0.050	mg/L	1.00		98	90-115			
LCS (B1J0759-BS4)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Ammonia, Total (as N)	0.976	0.050	mg/L	1.00		98	90-115			
LCS (B1J0759-BS5)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Ammonia, Total (as N)	0.990	0.050	mg/L	1.00		99	90-115			
LCS (B1J0759-BS6)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Ammonia, Total (as N)	0.986	0.050	mg/L	1.00		99	90-115			
General Parameters, Batch B1J0904										
Blank (B1J0904-BLK1)				Prepared: 2021-10-07, Analyzed: 2021-10-12						
BOD, 5-day	< 2.0	2.0	mg/L							
LCS (B1J0904-BS1)				Prepared: 2021-10-07, Analyzed: 2021-10-12						
BOD, 5-day	175	57.0	mg/L	180		97	85-115			
General Parameters, Batch B1J0905										
Blank (B1J0905-BLK1)				Prepared: 2021-10-07, Analyzed: 2021-10-12						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B1J0905-BS1)				Prepared: 2021-10-07, Analyzed: 2021-10-12						
BOD, 5-day Carbonaceous	179	38.7	mg/L	180		99	85-115			
General Parameters, Batch B1J0912										
Blank (B1J0912-BLK1)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B1J0912-BLK2)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21J0560
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-10-13 16:15

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1J0912, Continued										
Blank (B1J0912-BLK3)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B1J0912-BS1)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Alkalinity, Total (as CaCO3)	107	1.0	mg/L	100		107	80-120			
LCS (B1J0912-BS2)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Alkalinity, Total (as CaCO3)	108	1.0	mg/L	100		108	80-120			
LCS (B1J0912-BS3)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
Alkalinity, Total (as CaCO3)	108	1.0	mg/L	100		108	80-120			
Reference (B1J0912-SRM1)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
pH	6.99	0.10	pH units	7.01		100	98-102			
Reference (B1J0912-SRM2)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
pH	7.00	0.10	pH units	7.01		100	98-102			
Reference (B1J0912-SRM3)				Prepared: 2021-10-07, Analyzed: 2021-10-07						
pH	6.99	0.10	pH units	7.01		100	98-102			
General Parameters, Batch B1J0959										
Blank (B1J0959-BLK1)				Prepared: 2021-10-08, Analyzed: 2021-10-08						
Solids, Total Suspended	< 2.0	2.0	mg/L							
Blank (B1J0959-BLK2)				Prepared: 2021-10-08, Analyzed: 2021-10-08						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B1J0959-BS1)				Prepared: 2021-10-08, Analyzed: 2021-10-08						
Solids, Total Suspended	96.0	10.0	mg/L	100		96	85-115			
LCS (B1J0959-BS2)				Prepared: 2021-10-08, Analyzed: 2021-10-08						
Solids, Total Suspended	106	10.0	mg/L	100		106	85-115			
General Parameters, Batch B1J1017										
Blank (B1J1017-BLK1)				Prepared: 2021-10-08, Analyzed: 2021-10-12						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B1J1017-BLK2)				Prepared: 2021-10-08, Analyzed: 2021-10-12						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B1J1017-BS1)				Prepared: 2021-10-08, Analyzed: 2021-10-12						
Nitrogen, Total Kjeldahl	1.01	0.050	mg/L	1.00		101	85-115			
LCS (B1J1017-BS2)				Prepared: 2021-10-08, Analyzed: 2021-10-12						
Nitrogen, Total Kjeldahl	1.01	0.050	mg/L	1.00		101	85-115			
General Parameters, Batch B1J1186										
Blank (B1J1186-BLK1)				Prepared: 2021-10-12, Analyzed: 2021-10-12						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21J0560
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-10-13 16:15

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1J1186, Continued										
Blank (B1J1186-BLK2)				Prepared: 2021-10-12, Analyzed: 2021-10-12						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B1J1186-BLK3)				Prepared: 2021-10-12, Analyzed: 2021-10-12						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B1J1186-BS1)				Prepared: 2021-10-12, Analyzed: 2021-10-12						
Phosphorus, Total (as P)	0.101	0.0050	mg/L	0.100		101	85-115			
LCS (B1J1186-BS3)				Prepared: 2021-10-12, Analyzed: 2021-10-12						
Phosphorus, Total (as P)	0.0993	0.0050	mg/L	0.100		99	85-115			

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	21K0053
PO NUMBER		**RECEIVED / TEMP**	2021-11-01 11:36 / 17.1°C
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-11-08 16:22
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	44501.41216

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 bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21K0053
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-11-08 16:22

Analyte	Result	RL	Units	Analyzed	Qualifier
Final Effluent (E233626) (21K0053-01) | Matrix: Wastewater | Sampled: 2021-11-01 10:30					
Anions					
Chloride	**93.7**	0.10	mg/L	2021-11-03	
Nitrate (as N)	**1.23**	0.010	mg/L	2021-11-03	
Nitrite (as N)	**0.093**	0.010	mg/L	2021-11-03	
Phosphate (as P)	**0.0094**	0.0050	mg/L	2021-11-03	
Calculated Parameters					
Nitrate+Nitrite (as N)	**1.32**	0.0100	mg/L	N/A	
Nitrogen, Total	**3.28**	0.0500	mg/L	N/A	
Nitrogen, Organic	**1.43**	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**183**	1.0	mg/L	2021-11-05	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-11-05	
Alkalinity, Bicarbonate (as CaCO3)	**183**	1.0	mg/L	2021-11-05	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-11-05	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-11-05	
Ammonia, Total (as N)	**0.528**	0.050	mg/L	2021-11-04	
BOD, 5-day Carbonaceous	**4.9**	2.0	mg/L	2021-11-08	
Nitrogen, Total Kjeldahl	**1.96**	0.050	mg/L	2021-11-05	
pH	**7.78**	0.10	pH units	2021-11-05	HT2
Phosphorus, Total (as P)	**0.333**	0.0050	mg/L	2021-11-08	
Solids, Total Suspended	**4.6**	2.0	mg/L	2021-11-03	
Microbiological Parameters					
Coliforms, Total	**242000**	1	MPN/100 mL	2021-11-01	
Coliforms, Fecal	**18700**	1	MPN/100 mL	2021-11-01	
Field Blank (21K0053-02) | Matrix: Wastewater | Sampled: 2021-11-01 10:30					
Anions					
Chloride	< 0.10	0.10	mg/L	2021-11-03	
Nitrate (as N)	< 0.010	0.010	mg/L	2021-11-03	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-11-03	
Phosphate (as P)	< 0.0050	0.0050	mg/L	2021-11-03	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	< 0.0500	0.0500	mg/L	N/A	
Nitrogen, Organic	< 0.0500	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L	2021-11-05	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-11-05	
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-11-05	

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21K0053
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-11-08 16:22

Analyte	Result	RL	Units	Analyzed	Qualifier
Field Blank (21K0053-02) | Matrix: Wastewater | Sampled: 2021-11-01 10:30, Continued					
General Parameters, Continued					
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-11-05	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-11-05	
Ammonia, Total (as N)	< 0.050	0.050	mg/L	2021-11-04	
BOD, 5-day Carbonaceous	< 4.7	2.0	mg/L	2021-11-08	
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L	2021-11-05	
pH	**6.00**	0.10	pH units	2021-11-05	HT2
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L	2021-11-08	
Solids, Total Suspended	< 2.0	2.0	mg/L	2021-11-03	
Microbiological Parameters					
Coliforms, Total	< 1	1	MPN/100 mL	2021-11-01	
Coliforms, Fecal	< 1	1	MPN/100 mL	2021-11-01	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21K0053
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-11-08 16:22

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
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, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Coliforms, Total in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
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
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna

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
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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	Lake Country, District of (Wastewater)	**WORK ORDER**	21K0053
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-11-08 16:22

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
General Parameters, Batch B1K0493										
Blank (B1K0493-BLK1)				Prepared: 2021-11-03, Analyzed: 2021-11-08						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B1K0493-BS1)				Prepared: 2021-11-03, Analyzed: 2021-11-08						
BOD, 5-day Carbonaceous	202	39.3	mg/L	180		112	85-115			
Duplicate (B1K0493-DUP1)		**Source: 21K0053-02**		Prepared: 2021-11-03, Analyzed: 2021-11-08						
BOD, 5-day Carbonaceous	< 4.7	2.0	mg/L		< 4.7				20	
General Parameters, Batch B1K0566										
Blank (B1K0566-BLK1)				Prepared: 2021-11-04, Analyzed: 2021-11-04						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1K0566-BLK2)				Prepared: 2021-11-04, Analyzed: 2021-11-04						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1K0566-BLK3)				Prepared: 2021-11-04, Analyzed: 2021-11-04						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B1K0566-BS1)				Prepared: 2021-11-04, Analyzed: 2021-11-04						
Ammonia, Total (as N)	0.964	0.050	mg/L	1.00		96	90-115			
LCS (B1K0566-BS2)				Prepared: 2021-11-04, Analyzed: 2021-11-04						
Ammonia, Total (as N)	0.986	0.050	mg/L	1.00		99	90-115			
LCS (B1K0566-BS3)				Prepared: 2021-11-04, Analyzed: 2021-11-04						
Ammonia, Total (as N)	1.01	0.050	mg/L	1.00		101	90-115			
General Parameters, Batch B1K0611										
Blank (B1K0611-BLK1)				Prepared: 2021-11-03, Analyzed: 2021-11-03						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B1K0611-BS1)				Prepared: 2021-11-03, Analyzed: 2021-11-03						
Solids, Total Suspended	94.0	10.0	mg/L	100		94	85-115			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21K0053
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-11-08 16:22

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1K0688										
Blank (B1K0688-BLK1)				Prepared: 2021-11-04, Analyzed: 2021-11-05						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B1K0688-BLK2)				Prepared: 2021-11-04, Analyzed: 2021-11-05						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B1K0688-BS1)				Prepared: 2021-11-04, Analyzed: 2021-11-05						
Nitrogen, Total Kjeldahl	0.963	0.050	mg/L	1.00		96	85-115			
LCS (B1K0688-BS2)				Prepared: 2021-11-04, Analyzed: 2021-11-05						
Nitrogen, Total Kjeldahl	0.941	0.050	mg/L	1.00		94	85-115			
General Parameters, Batch B1K0770										
Blank (B1K0770-BLK1)				Prepared: 2021-11-05, Analyzed: 2021-11-05						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B1K0770-BLK2)				Prepared: 2021-11-05, Analyzed: 2021-11-05						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B1K0770-BLK3)				Prepared: 2021-11-05, Analyzed: 2021-11-05						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B1K0770-BS1)				Prepared: 2021-11-05, Analyzed: 2021-11-05						
Alkalinity, Total (as CaCO3)	109	1.0	mg/L	100		109	80-120			
LCS (B1K0770-BS2)				Prepared: 2021-11-05, Analyzed: 2021-11-05						
Alkalinity, Total (as CaCO3)	107	1.0	mg/L	100		107	80-120			
LCS (B1K0770-BS3)				Prepared: 2021-11-05, Analyzed: 2021-11-05						
Alkalinity, Total (as CaCO3)	109	1.0	mg/L	100		109	80-120			
Reference (B1K0770-SRM1)				Prepared: 2021-11-05, Analyzed: 2021-11-05						
pH	7.00	0.10	pH units	7.01		100	98-102			
Reference (B1K0770-SRM2)				Prepared: 2021-11-05, Analyzed: 2021-11-05						
pH	7.00	0.10	pH units	7.01		100	98-102			
Reference (B1K0770-SRM3)				Prepared: 2021-11-05, Analyzed: 2021-11-05						
pH	7.00	0.10	pH units	7.01		100	98-102			
General Parameters, Batch B1K0937										
Blank (B1K0937-BLK1)				Prepared: 2021-11-08, Analyzed: 2021-11-08						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21K0053
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-11-08 16:22

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1K0937, Continued										
Blank (B1K0937-BLK2)				Prepared: 2021-11-08, Analyzed: 2021-11-08						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B1K0937-BLK3)				Prepared: 2021-11-08, Analyzed: 2021-11-08						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B1K0937-BS1)				Prepared: 2021-11-08, Analyzed: 2021-11-08						
Phosphorus, Total (as P)	0.113	0.0050	mg/L	0.100		113	85-115			
LCS (B1K0937-BS2)				Prepared: 2021-11-08, Analyzed: 2021-11-08						
Phosphorus, Total (as P)	0.109	0.0050	mg/L	0.100		109	85-115			
LCS (B1K0937-BS3)				Prepared: 2021-11-08, Analyzed: 2021-11-08						
Phosphorus, Total (as P)	0.108	0.0050	mg/L	0.100		108	85-115			
Microbiological Parameters, Batch B1K0211										
Blank (B1K0211-BLK1)				Prepared: 2021-11-01, Analyzed: 2021-11-01						
Coliforms, Total	< 1	1	MPN/100 mL							
Blank (B1K0211-BLK2)				Prepared: 2021-11-01, Analyzed: 2021-11-01						
Coliforms, Fecal	< 1	1	MPN/100 mL							

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	21K0052
PO NUMBER		**RECEIVED / TEMP**	2021-11-01 11:36 / 17.1°C
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-11-08 16:22
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	44501.41216

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 bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21K0052
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-11-08 16:22

Analyte	Result	RL	Units	Analyzed	Qualifier
Raw Influent (E233627) (21K0052-01) | Matrix: Wastewater | Sampled: 2021-11-01 10:45					
Anions					
Nitrate (as N)	< 0.010	0.010	mg/L	2021-11-03	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-11-03	
Phosphate (as P)	**5.05**	0.0050	mg/L	2021-11-03	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	**83.6**	2.00	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**441**	1.0	mg/L	2021-11-05	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-11-05	
Alkalinity, Bicarbonate (as CaCO3)	**441**	1.0	mg/L	2021-11-05	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-11-05	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-11-05	
Ammonia, Total (as N)	**56.8**	0.050	mg/L	2021-11-04	
BOD, 5-day	**362**	2.0	mg/L	2021-11-08	
BOD, 5-day Carbonaceous	**387**	2.0	mg/L	2021-11-08	
Nitrogen, Total Kjeldahl	**83.6**	0.050	mg/L	2021-11-05	
pH	**7.84**	0.10	pH units	2021-11-05	HT2
Phosphorus, Total (as P)	**10.4**	0.0050	mg/L	2021-11-08	
Solids, Total Suspended	**324**	2.0	mg/L	2021-11-03	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21K0052
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-11-08 16:22

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
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
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
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
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna

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
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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	Lake Country, District of (Wastewater)	**WORK ORDER**	21K0052
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-11-08 16:22

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
General Parameters, Batch B1K0491										
Blank (B1K0491-BLK1)				Prepared: 2021-11-03, Analyzed: 2021-11-08						
BOD, 5-day	< 2.0	2.0	mg/L							
LCS (B1K0491-BS1)				Prepared: 2021-11-03, Analyzed: 2021-11-08						
BOD, 5-day	202	44.1	mg/L	180		112	85-115			
General Parameters, Batch B1K0493										
Blank (B1K0493-BLK1)				Prepared: 2021-11-03, Analyzed: 2021-11-08						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B1K0493-BS1)				Prepared: 2021-11-03, Analyzed: 2021-11-08						
BOD, 5-day Carbonaceous	202	39.3	mg/L	180		112	85-115			
General Parameters, Batch B1K0566										
Blank (B1K0566-BLK1)				Prepared: 2021-11-04, Analyzed: 2021-11-04						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1K0566-BLK2)				Prepared: 2021-11-04, Analyzed: 2021-11-04						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1K0566-BLK3)				Prepared: 2021-11-04, Analyzed: 2021-11-04						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B1K0566-BS1)				Prepared: 2021-11-04, Analyzed: 2021-11-04						
Ammonia, Total (as N)	0.964	0.050	mg/L	1.00		96	90-115			
LCS (B1K0566-BS2)				Prepared: 2021-11-04, Analyzed: 2021-11-04						
Ammonia, Total (as N)	0.986	0.050	mg/L	1.00		99	90-115			
LCS (B1K0566-BS3)				Prepared: 2021-11-04, Analyzed: 2021-11-04						
Ammonia, Total (as N)	1.01	0.050	mg/L	1.00		101	90-115			
General Parameters, Batch B1K0611										

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21K0052
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-11-08 16:22

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1K0611, Continued										
Blank (B1K0611-BLK1)				Prepared: 2021-11-03, Analyzed: 2021-11-03						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B1K0611-BS1)				Prepared: 2021-11-03, Analyzed: 2021-11-03						
Solids, Total Suspended	94.0	10.0	mg/L	100		94	85-115			
General Parameters, Batch B1K0688										
Blank (B1K0688-BLK1)				Prepared: 2021-11-04, Analyzed: 2021-11-05						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
Blank (B1K0688-BLK2)				Prepared: 2021-11-04, Analyzed: 2021-11-05						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B1K0688-BS1)				Prepared: 2021-11-04, Analyzed: 2021-11-05						
Nitrogen, Total Kjeldahl	0.963	0.050	mg/L	1.00		96	85-115			
LCS (B1K0688-BS2)				Prepared: 2021-11-04, Analyzed: 2021-11-05						
Nitrogen, Total Kjeldahl	0.941	0.050	mg/L	1.00		94	85-115			
General Parameters, Batch B1K0770										
Blank (B1K0770-BLK1)				Prepared: 2021-11-05, Analyzed: 2021-11-05						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B1K0770-BLK2)				Prepared: 2021-11-05, Analyzed: 2021-11-05						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Blank (B1K0770-BLK3)				Prepared: 2021-11-05, Analyzed: 2021-11-05						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B1K0770-BS1)				Prepared: 2021-11-05, Analyzed: 2021-11-05						
Alkalinity, Total (as CaCO3)	109	1.0	mg/L	100		109	80-120			
LCS (B1K0770-BS2)				Prepared: 2021-11-05, Analyzed: 2021-11-05						
Alkalinity, Total (as CaCO3)	107	1.0	mg/L	100		107	80-120			
LCS (B1K0770-BS3)				Prepared: 2021-11-05, Analyzed: 2021-11-05						
Alkalinity, Total (as CaCO3)	109	1.0	mg/L	100		109	80-120			
Reference (B1K0770-SRM1)				Prepared: 2021-11-05, Analyzed: 2021-11-05						
pH	7.00	0.10	pH units	7.01		100	98-102			
Reference (B1K0770-SRM2)				Prepared: 2021-11-05, Analyzed: 2021-11-05						
pH	7.00	0.10	pH units	7.01		100	98-102			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21K0052
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-11-08 16:22

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1K0770, Continued										
Reference (B1K0770-SRM3)				Prepared: 2021-11-05, Analyzed: 2021-11-05						
pH	7.00	0.10	pH units	7.01		100	98-102			
General Parameters, Batch B1K0937										
Blank (B1K0937-BLK1)				Prepared: 2021-11-08, Analyzed: 2021-11-08						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B1K0937-BLK2)				Prepared: 2021-11-08, Analyzed: 2021-11-08						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
Blank (B1K0937-BLK3)				Prepared: 2021-11-08, Analyzed: 2021-11-08						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B1K0937-BS1)				Prepared: 2021-11-08, Analyzed: 2021-11-08						
Phosphorus, Total (as P)	0.113	0.0050	mg/L	0.100		113	85-115			
LCS (B1K0937-BS2)				Prepared: 2021-11-08, Analyzed: 2021-11-08						
Phosphorus, Total (as P)	0.109	0.0050	mg/L	0.100		109	85-115			
LCS (B1K0937-BS3)				Prepared: 2021-11-08, Analyzed: 2021-11-08						
Phosphorus, Total (as P)	0.108	0.0050	mg/L	0.100		108	85-115			

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	21L1019
PO NUMBER		**RECEIVED / TEMP**	2021-12-07 13:25 / 10.8°C
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-12-14 15:22
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	44537.42003

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 bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21L1019
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-12-14 15:22

Analyte	Result	RL	Units	Analyzed	Qualifier
Final Effluent (E233626) (21L1019-01) | Matrix: Wastewater | Sampled: 2021-12-07 11:20					
Anions					
Chloride	**111**	0.10	mg/L	2021-12-08	
Nitrate (as N)	**1.95**	0.010	mg/L	2021-12-08	
Nitrite (as N)	**0.123**	0.010	mg/L	2021-12-08	
Phosphate (as P)	**0.0221**	0.0050	mg/L	2021-12-08	
Calculated Parameters					
Nitrate+Nitrite (as N)	**2.07**	0.0100	mg/L	N/A	
Nitrogen, Total	**5.11**	0.0500	mg/L	N/A	
Nitrogen, Organic	**1.64**	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**169**	1.0	mg/L	2021-12-08	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-12-08	
Alkalinity, Bicarbonate (as CaCO3)	**169**	1.0	mg/L	2021-12-08	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-12-08	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-12-08	
Ammonia, Total (as N)	**1.40**	0.050	mg/L	2021-12-09	
BOD, 5-day Carbonaceous	< 7.2	2.0	mg/L	2021-12-13	
Nitrogen, Total Kjeldahl	**3.04**	0.050	mg/L	2021-12-10	
pH	**7.55**	0.10	pH units	2021-12-08	HT2
Phosphorus, Total (as P)	**0.356**	0.0050	mg/L	2021-12-13	
Solids, Total Suspended	**4.8**	2.0	mg/L	2021-12-10	
Microbiological Parameters					
Coliforms, Fecal	**5830**		MPN/100 mL	2021-12-07	
Coliforms, Total	**68700**		MPN/100 mL	2021-12-07	
Duplicate (21L1019-02) | Matrix: Water | Sampled: 2021-12-07 11:25					
Anions					
Chloride	**108**	0.10	mg/L	2021-12-08	
Nitrate (as N)	**1.94**	0.010	mg/L	2021-12-08	
Nitrite (as N)	**0.123**	0.010	mg/L	2021-12-08	
Phosphate (as P)	**0.0228**	0.0050	mg/L	2021-12-08	
Calculated Parameters					
Nitrate+Nitrite (as N)	**2.06**	0.0100	mg/L	N/A	
Nitrogen, Total	**5.12**	0.0500	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**172**	1.0	mg/L	2021-12-08	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-12-08	
Alkalinity, Bicarbonate (as CaCO3)	**172**	1.0	mg/L	2021-12-08	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-12-08	

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21L1019
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-12-14 15:22

Analyte	Result	RL	Units	Analyzed	Qualifier
Duplicate (21L1019-02) | Matrix: Water | Sampled: 2021-12-07 11:25, Continued					
General Parameters, Continued					
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-12-08	
Ammonia, Total (as N)	**1.44**	0.050	mg/L	2021-12-09	
BOD, 5-day Carbonaceous	< 7.2	2.0	mg/L	2021-12-13	
Nitrogen, Total Kjeldahl	**3.06**	0.050	mg/L	2021-12-10	
pH	**7.59**	0.10	pH units	2021-12-08	HT2
Phosphorus, Total (as P)	**0.369**	0.0050	mg/L	2021-12-13	
Solids, Total Suspended	**5.0**	2.0	mg/L	2021-12-10	
Microbiological Parameters					
Coliforms, Fecal	**5560**		MPN/100 mL	2021-12-07	
Coliforms, Total	**77000**		MPN/100 mL	2021-12-07	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21L1019
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-12-14 15:22

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
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, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Coliforms, Total in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
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
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna

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
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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	Lake Country, District of (Wastewater)	**WORK ORDER**	21L1019
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-12-14 15:22

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 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 B1L0818										
Blank (B1L0818-BLK1)				Prepared: 2021-12-08, Analyzed: 2021-12-08						
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							
Phosphate (as P)	< 0.0050	0.0050	mg/L							
LCS (B1L0818-BS1)				Prepared: 2021-12-08, Analyzed: 2021-12-08						
Chloride	15.7	0.10	mg/L	16.0		98	90-110			
Nitrate (as N)	4.09	0.010	mg/L	4.00		102	90-110			
Nitrite (as N)	2.00	0.010	mg/L	2.00		100	85-115			
Phosphate (as P)	1.07	0.0050	mg/L	1.00		107	80-120			
General Parameters, Batch B1L0866										
Blank (B1L0866-BLK1)				Prepared: 2021-12-08, Analyzed: 2021-12-08						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B1L0866-BS1)				Prepared: 2021-12-08, Analyzed: 2021-12-08						
Alkalinity, Total (as CaCO3)	102	1.0	mg/L	100		102	80-120			
Reference (B1L0866-SRM1)				Prepared: 2021-12-08, Analyzed: 2021-12-08						
pH	7.00	0.10	pH units	7.01		100	98-102			
General Parameters, Batch B1L0916										
Blank (B1L0916-BLK1)				Prepared: 2021-12-08, Analyzed: 2021-12-13						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B1L0916-BS1)				Prepared: 2021-12-08, Analyzed: 2021-12-13						
BOD, 5-day Carbonaceous	194	39.8	mg/L	180		108	85-115			
Duplicate (B1L0916-DUP1)		**Source: 21L1019-01**		Prepared: 2021-12-08, Analyzed: 2021-12-13						
BOD, 5-day Carbonaceous	< 4.8	2.0	mg/L		< 7.2				20	

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21L1019
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-12-14 15:22

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1L0992										
Blank (B1L0992-BLK1)				Prepared: 2021-12-09, Analyzed: 2021-12-09						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1L0992-BLK2)				Prepared: 2021-12-09, Analyzed: 2021-12-09						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1L0992-BLK3)				Prepared: 2021-12-09, Analyzed: 2021-12-09						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B1L0992-BS1)				Prepared: 2021-12-09, Analyzed: 2021-12-09						
Ammonia, Total (as N)	0.974	0.050	mg/L	1.00		97	90-115			
LCS (B1L0992-BS2)				Prepared: 2021-12-09, Analyzed: 2021-12-09						
Ammonia, Total (as N)	0.992	0.050	mg/L	1.00		99	90-115			
LCS (B1L0992-BS3)				Prepared: 2021-12-09, Analyzed: 2021-12-09						
Ammonia, Total (as N)	0.984	0.050	mg/L	1.00		98	90-115			
General Parameters, Batch B1L1123										
Blank (B1L1123-BLK1)				Prepared: 2021-12-09, Analyzed: 2021-12-10						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B1L1123-BS1)				Prepared: 2021-12-09, Analyzed: 2021-12-10						
Nitrogen, Total Kjeldahl	1.04	0.050	mg/L	1.00		104	85-115			
General Parameters, Batch B1L1178										
Blank (B1L1178-BLK1)				Prepared: 2021-12-10, Analyzed: 2021-12-10						
Solids, Total Suspended	< 2.0	2.0	mg/L							
Blank (B1L1178-BLK2)				Prepared: 2021-12-10, Analyzed: 2021-12-10						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B1L1178-BS1)				Prepared: 2021-12-10, Analyzed: 2021-12-10						
Solids, Total Suspended	90.0	10.0	mg/L	100		90	85-115			
LCS (B1L1178-BS2)				Prepared: 2021-12-10, Analyzed: 2021-12-10						
Solids, Total Suspended	96.0	10.0	mg/L	100		96	85-115			
General Parameters, Batch B1L1392										
Blank (B1L1392-BLK1)				Prepared: 2021-12-13, Analyzed: 2021-12-13						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B1L1392-BS1)				Prepared: 2021-12-13, Analyzed: 2021-12-13						
Phosphorus, Total (as P)	0.101	0.0050	mg/L	0.100		101	85-115			
Microbiological Parameters, Batch B1L0741										
Blank (B1L0741-BLK1)				Prepared: 2021-12-07, Analyzed: 2021-12-07						
Coliforms, Total	< 1	1	MPN/100 mL							
Blank (B1L0741-BLK2)				Prepared: 2021-12-07, Analyzed: 2021-12-07						
Coliforms, Total	< 1	1	MPN/100 mL							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21L1019
PROJECT	Final Effluent- PE14651	**REPORTED**	2021-12-14 15:22

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Microbiological Parameters, Batch B1L0741, Continued										
Blank (B1L0741-BLK3)				Prepared: 2021-12-07, Analyzed: 2021-12-07						
Coliforms, Fecal	< 1	1	MPN/100 mL							
Duplicate (B1L0741-DUP3)			**Source: 21L1019-01**	Prepared: 2021-12-07, Analyzed: 2021-12-07						
Coliforms, Fecal	5380		MPN/100 mL		5830			8	80	

CERTIFICATE OF ANALYSIS

REPORTED TO	Lake Country, District of (Wastewater) 4062 Beaver Lake Rd LAKE COUNTRY, BC V4V 1T5		
ATTENTION	Davin Larsen	**WORK ORDER**	21L1016
PO NUMBER		**RECEIVED / TEMP**	2021-12-07 13:25 / 10.8°C
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-12-14 15:33
PROJECT INFO	Lake Country WWTP	**COC NUMBER**	44537.42003

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 bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Client Scientist - Team Lead

TEST RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21L1016
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-12-14 15:33

Analyte	Result	RL	Units	Analyzed	Qualifier
Raw Influent (E233627) (21L1016-01) | Matrix: Wastewater | Sampled: 2021-12-07 11:05					
Anions					
Nitrate (as N)	< 0.010	0.010	mg/L	2021-12-08	
Nitrite (as N)	< 0.010	0.010	mg/L	2021-12-08	
Phosphate (as P)	**5.25**	0.0050	mg/L	2021-12-08	
Calculated Parameters					
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	**87.5**	2.00	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	**360**	1.0	mg/L	2021-12-08	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-12-08	
Alkalinity, Bicarbonate (as CaCO3)	**360**	1.0	mg/L	2021-12-08	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2021-12-08	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2021-12-08	
Ammonia, Total (as N)	**44.6**	0.050	mg/L	2021-12-09	
BOD, 5-day	**372**	2.0	mg/L	2021-12-13	
BOD, 5-day Carbonaceous	**330**	2.0	mg/L	2021-12-13	
Nitrogen, Total Kjeldahl	**87.5**	0.050	mg/L	2021-12-10	
pH	**7.83**	0.10	pH units	2021-12-08	HT2
Phosphorus, Total (as P)	**10.8**	0.0050	mg/L	2021-12-13	
Solids, Total Suspended	**323**	2.0	mg/L	2021-12-10	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21L1016
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-12-14 15:33

Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
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
Biochemical Oxygen Demand, Carbonaceous in Water	SM 5210 B (2017)	Dissolved Oxygen Meter	✓	Kelowna
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
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna

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
pH units	pH < 7 = acidic, ph > 7 = basic
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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	Lake Country, District of (Wastewater)	**WORK ORDER**	21L1016
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-12-14 15:33

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 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 B1L0818										
Blank (B1L0818-BLK1)				Prepared: 2021-12-08, Analyzed: 2021-12-08						
Nitrate (as N)	< 0.010	0.010	mg/L							
Nitrite (as N)	< 0.010	0.010	mg/L							
Phosphate (as P)	< 0.0050	0.0050	mg/L							
LCS (B1L0818-BS1)				Prepared: 2021-12-08, Analyzed: 2021-12-08						
Nitrate (as N)	4.09	0.010	mg/L	4.00		102	90-110			
Nitrite (as N)	2.00	0.010	mg/L	2.00		100	85-115			
Phosphate (as P)	1.07	0.0050	mg/L	1.00		107	80-120			
General Parameters, Batch B1L0866										
Blank (B1L0866-BLK1)				Prepared: 2021-12-08, Analyzed: 2021-12-08						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
LCS (B1L0866-BS1)				Prepared: 2021-12-08, Analyzed: 2021-12-08						
Alkalinity, Total (as CaCO3)	102	1.0	mg/L	100		102	80-120			
Duplicate (B1L0866-DUP1)		**Source: 21L1016-01**		Prepared: 2021-12-08, Analyzed: 2021-12-08						
Alkalinity, Total (as CaCO3)	364	1.0	mg/L		360			1	10	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L		< 1.0				10	
Alkalinity, Bicarbonate (as CaCO3)	364	1.0	mg/L		360			1	10	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L		< 1.0				10	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L		< 1.0				10	
pH	7.84	0.10	pH units		7.83			< 1	4	
Reference (B1L0866-SRM1)				Prepared: 2021-12-08, Analyzed: 2021-12-08						
pH	7.00	0.10	pH units	7.01		100	98-102			
General Parameters, Batch B1L0915										
Blank (B1L0915-BLK1)				Prepared: 2021-12-08, Analyzed: 2021-12-13						
BOD, 5-day	< 2.0	2.0	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21L1016
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-12-14 15:33

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1L0915, Continued										
LCS (B1L0915-BS1)				Prepared: 2021-12-08, Analyzed: 2021-12-13						
BOD, 5-day	193	50.1	mg/L	180		107	85-115			
General Parameters, Batch B1L0916										
Blank (B1L0916-BLK1)				Prepared: 2021-12-08, Analyzed: 2021-12-13						
BOD, 5-day Carbonaceous	< 2.0	2.0	mg/L							
LCS (B1L0916-BS1)				Prepared: 2021-12-08, Analyzed: 2021-12-13						
BOD, 5-day Carbonaceous	194	39.8	mg/L	180		108	85-115			
General Parameters, Batch B1L0992										
Blank (B1L0992-BLK1)				Prepared: 2021-12-09, Analyzed: 2021-12-09						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1L0992-BLK2)				Prepared: 2021-12-09, Analyzed: 2021-12-09						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
Blank (B1L0992-BLK3)				Prepared: 2021-12-09, Analyzed: 2021-12-09						
Ammonia, Total (as N)	< 0.050	0.050	mg/L							
LCS (B1L0992-BS1)				Prepared: 2021-12-09, Analyzed: 2021-12-09						
Ammonia, Total (as N)	0.974	0.050	mg/L	1.00		97	90-115			
LCS (B1L0992-BS2)				Prepared: 2021-12-09, Analyzed: 2021-12-09						
Ammonia, Total (as N)	0.992	0.050	mg/L	1.00		99	90-115			
LCS (B1L0992-BS3)				Prepared: 2021-12-09, Analyzed: 2021-12-09						
Ammonia, Total (as N)	0.984	0.050	mg/L	1.00		98	90-115			
General Parameters, Batch B1L1123										
Blank (B1L1123-BLK1)				Prepared: 2021-12-09, Analyzed: 2021-12-10						
Nitrogen, Total Kjeldahl	< 0.050	0.050	mg/L							
LCS (B1L1123-BS1)				Prepared: 2021-12-09, Analyzed: 2021-12-10						
Nitrogen, Total Kjeldahl	1.04	0.050	mg/L	1.00		104	85-115			
General Parameters, Batch B1L1178										
Blank (B1L1178-BLK1)				Prepared: 2021-12-10, Analyzed: 2021-12-10						
Solids, Total Suspended	< 2.0	2.0	mg/L							
Blank (B1L1178-BLK2)				Prepared: 2021-12-10, Analyzed: 2021-12-10						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B1L1178-BS1)				Prepared: 2021-12-10, Analyzed: 2021-12-10						
Solids, Total Suspended	90.0	10.0	mg/L	100		90	85-115			
LCS (B1L1178-BS2)				Prepared: 2021-12-10, Analyzed: 2021-12-10						
Solids, Total Suspended	96.0	10.0	mg/L	100		96	85-115			
General Parameters, Batch B1L1392										

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Lake Country, District of (Wastewater)	**WORK ORDER**	21L1016
PROJECT	Raw Influent- PE14651	**REPORTED**	2021-12-14 15:33

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1L1392, Continued										
Blank (B1L1392-BLK1)				Prepared: 2021-12-13, Analyzed: 2021-12-13						
Phosphorus, Total (as P)	< 0.0050	0.0050	mg/L							
LCS (B1L1392-BS1)				Prepared: 2021-12-13, Analyzed: 2021-12-13						
Phosphorus, Total (as P)	0.101	0.0050	mg/L	0.100		101	85-115			

Appendix C – Non-Compliance Reporting

MINISTRY OF ENVIRONMENT
REGIONAL OPERATIONS BRANCH

NON-COMPLIANCE REPORTING MAILBOX NOTIFICATION TEMPLATE

To: EnvironmentalCompliance@gov.bc.ca
Subject: 2021-03-08 Authorization # 14651 Monthly BOD exceedance

Attention: *Non-compliance Report for Authorization # 14651*
Monthly accredited sample exceeded permit limit

Date of Non-compliance: 2021-03-08 0800

Location of Non-compliance [address, long. & lat.]:4062 Beaver Lake Rd 50.0549n 119.4148w

---

Nature of Non-compliance: Monthly CBOD sample came back from accredited lab at 11.6 mg/l, permit limit is 10 mg/l cBOD.

Initial Response/Actions taken: Resampled for cBOD (March 17th) and results were same as previous(11.6 mg/l)

Monitoring conducted: All other parameters are meeting permit limits, operating within standard SOP for this time of year, just coming off a cold weather upset, and suspect this might be a after effect from that.

Future action items: Will closely monitor next month accredited results to see if BOD has improved, we suspect this is an anomaly, BOD is not a typical parameter we exceed. Upgrade planned for Fall 2021 to include filters that should improve effluent quality.

Contact information: Davin Larsen dlarsen@lakecountry.bc.ca 250-869-5703

Attachments: Accredited Lab results

Note: This form is intended to facilitate communication regarding non-compliance events between authorisation holders and the ministry. Submission of this form by an authorization holder does not constitute an inspection or a finding of non-compliance in accordance with ministry compliance and enforcement policy and procedure.

All reportable spills must be reported to PEP at 1-800-663-3456.

More detailed information may be required by the ministry on follow-up.

MINISTRY OF ENVIRONMENT
REGIONAL OPERATIONS BRANCH

NON-COMPLIANCE REPORTING MAILBOX NOTIFICATION TEMPLATE

To: EnvironmentalCompliance@gov.bc.ca
Subject: 2021-03-23 Authorization # 14651 Effluent disposal failure

Attention: *Non-compliance Report for Authorization # 14951 infiltration capacity has been exceeded*

Date of Non-compliance: 2021-03-23 01:00

Location of Non-compliance [address, long. & lat.]: 4062 Beaver Lake Rd 50.0549n 119.4148w

---

Nature of Non-compliance: Effluent disposal fields are not meeting capacity of the wastewater treatment facility during peak flow periods.

Initial Response/Actions taken: reduce flows to basins to as low as possible, are rotating basins on a regular basis to get rest periods and attempt to dry and clean.

Monitoring conducted: effluent currently meeting permit limits, more frequent basin inspections.

Future action items: Expansion of disposal fields planned for next upgrade (fall 2021), try to equalize flow to basins so that daily peaks are not as high,

Contact information: Davin Larsen - District of Lake Country 250-869-5703 dlarsen@lakecountry.bc.ca

Attachments: Photo

Note: This form is intended to facilitate communication regarding non-compliance events between authorisation holders and the ministry. Submission of this form by an authorization holder does not constitute an inspection or a finding of non-compliance in accordance with ministry compliance and enforcement policy and procedure.

All reportable spills must be reported to PEP at 1-800-663-3456.

More detailed information may be required by the ministry on follow-up.

MINISTRY OF ENVIRONMENT
REGIONAL OPERATIONS BRANCH

NON-COMPLIANCE REPORTING MAILBOX NOTIFICATION TEMPLATE

To: EnvironmentalCompliance@gov.bc.ca
Subject: 2021-05-18 Authorization #14651 Treated Effluent Spill

Attention: *Non-compliance Report for Authorization # 14651*
Effluent disposal basin at capacity

Date of Non-compliance: 2021-05-18 1100hrs to 1600hrs

Location of Non-compliance 4062 Beaver Lake Rd,Lake Country BC. 50.022657, -119.386830

Nature of Non-compliance: In the process of maintaining the rapid infiltration basins, the capacity of the basins were exceeded causing a basin to overflow. To drain, dry and clean out a basin it requires the basin to be taken out of service for several days. This puts added flow to the other basins as well as some additional flow to empty the basin being serviced.

Initial Response/Actions taken: The spill volume is estimated to be 100m3 of treated effluent, occurring over several hours while the basin being maintained is pumped out. This flow has been contained on site and is not accessible to the public. The effluent meets quality parameters set out in the OC 14651. The contained effluent is then allowed to soak in to the containment area.

Future action Items: The District has plans in place to add another basin as part of its next phase of upgrade. This should commence in the Fall of 2021. In addition to this, filtration will be added to reduce solids going to the basins. The LWMP is being developed with the long term solution of sending treated effluent to Okanagan Lake.

Current situation: Basin drainage improves when being allowed to dry and cleaned out. Basin sand will be looked at to see if there is clogging of the sacrificial media and replaced if necessary. Continual draining, drying and cleaning has improved overall basin operation.

Contact information: Davin Larsen 250-869-5703 or dlarsen@lakecountry.bc.ca

Attachments: monitoring data, photos, etc.

Note: This form is intended to facilitate communication regarding non-compliance events between authorisation holders and the ministry. Submission of this form by an authorization holder does not constitute an inspection or a finding of non-compliance in accordance with ministry compliance and enforcement policy and procedure.

MINISTRY OF ENVIRONMENT
REGIONAL OPERATIONS BRANCH

NON-COMPLIANCE REPORTING MAILBOX NOTIFICATION TEMPLATE

To: EnvironmentalCompliance@gov.bc.ca
Subject: 14651-NCR-20211208 effluent volume exceedance

Attention: *Non-compliance Report for Authorization # 14651*

Date of Non-compliance: 2021-12-08 0800

Location of Non-compliance [4062 beaver lake rd 50.024865, -119.385069]:

Nature of Non-compliance: Monthly permit limit for effluent volume has been exceeded. Limit is currently at 2000 M3/day and the monthly average for November was 2008 M3/day.

Initial Response/Actions taken: After a monthly report was compiled, it was determined the monthly average for November was slightly above the permit limit. Flows have been close to exceedance for all of 2021, with another exceedance in August of the same amount (2008 M3/day monthly average).

Monitoring conducted: There has been no irregularities in the collection system and the exceedances we are seeing are just natural flows that are getting progressivly higher due to development.

Future action items: Phase 4 upgrades are underway at the DLC WWTP, which include an expansion to the infiltration basins. Permit has already been ok'd to increase effluent limits when upgrades are complete. Upgrade completion expected fall/winter 2022.

Contact information: Davin Larsen 250-869-5703 or dlarsen@lakecountry.bc.ca

Attachments: monitoring data, photos, etc.

Note: This form is intended to facilitate communication regarding non-compliance events between authorisation holders and the ministry. Submission of this form by an authorization holder does not constitute an inspection or a finding of non-compliance in accordance with ministry compliance and enforcement policy and procedure.

All reportable spills must be reported to PEP at 1-800-663-3456.

More detailed information may be required by the ministry on follow-up.

Appendix D - Groundwater Monitoring

URBAN SYSTEMS MEMORANDUM

DATE: March 7, 2022
TO: Davin Larsen, AScT
FROM: Dr. Joanne Quarmby, R.P.Bio.
FILE: 1577.0022.01
SUBJECT: Review of 2021 Groundwater Data

1.0 INTRODUCTION

Groundwater monitoring is required as part of the 2021 operational certificate. The monitoring requirements are outlined in Section 3.2 of the operational certificate, and are summarised in Table 1.1, below. The groundwater monitoring program is implemented by District staff, with the analyses being completed at an accredited laboratory. Conductance and pH are to be field measurements.

Table 1.1: Groundwater Monitoring Program

Site	Description	Monitoring Scope	
		Groundwater Depth	**Water Quality**
MW-2	Background (up-gradient) well	Monthly	Once in the spring and fall for the following parameters: sodium, chloride, conductance, ammonia, nitrate/nitrite, TKN, total nitrogen, total phosphorus, orthophosphorus, pH and *E. coli*.
MW-18	Down-gradient within treatment plant boundary	Continuous	
MW-10	Down-gradient near treatment plant boundary	Continuous	
MW-12	Down-gradient near treatment plant boundary	Continuous	
MW-14	Down-gradient, by Lodge Road	Monthly	
H1	10050 McCarthy Road	Not required	
H2	10101A Konschuh Road		
H3	9989 Bottom Wood Lake Road		
H4	10101B Konschuh Road		
H5	9815 McCarthy Road		
H6	9719 McCarthy Road		
H7	9991 McCarthy Road		

The location of the various wells can be found in the attached figure.

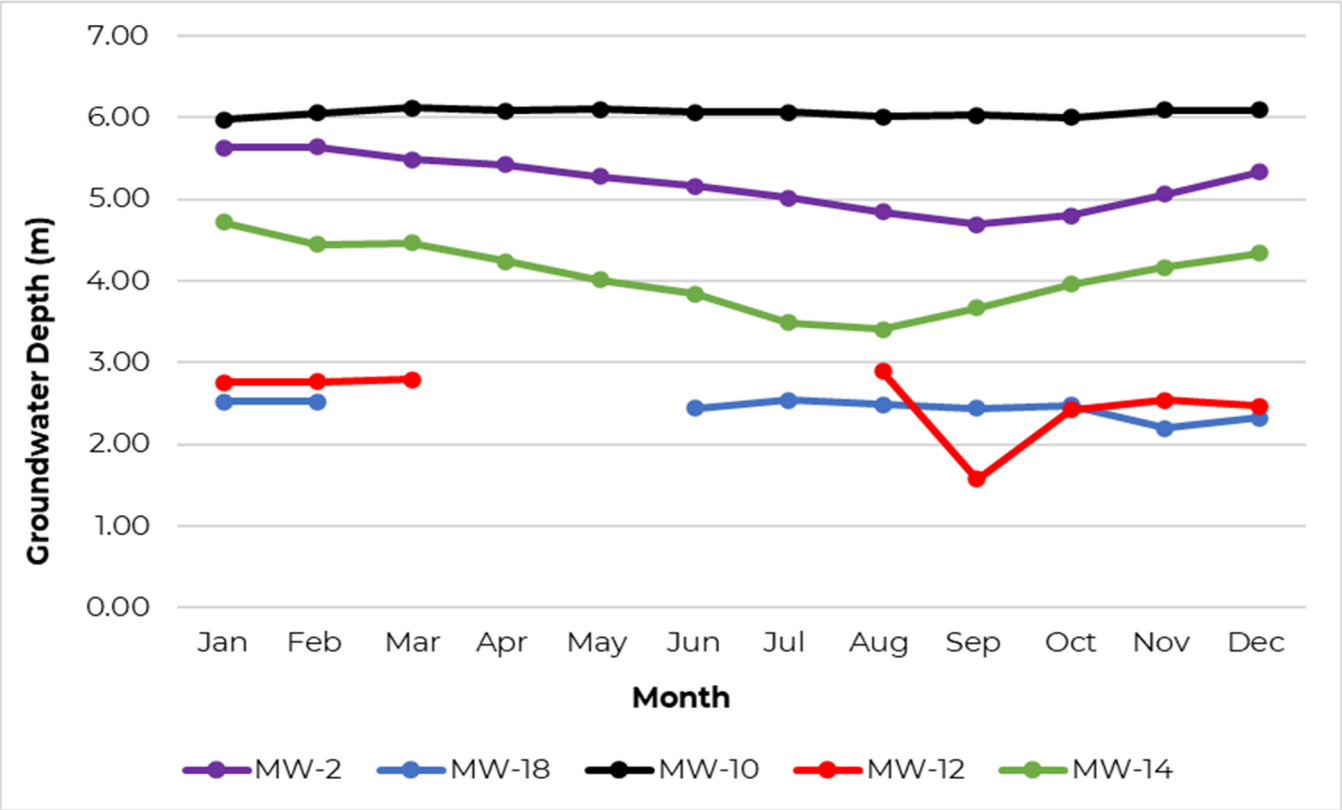
2.0 GROUNDWATER DEPTH

The District provided these data for review and interpretation in a summarised and tabulated form. The amended operational certificate was issued in June, 2021, and included the approved groundwater monitoring program. Therefore, any data collection prior to this date would have been under the previous monitoring program. With respect to the monthly data after the amended operational certificate had been issued, there is no groundwater depth reading for MW-12 for the month of July as the well was not accessible due to the casing

being damaged by a vehicle. The monthly data for this well resumed in August, once the casing had been repaired.

Figure 2.1 shows the monthly groundwater depths (below ground surface) for the 5 monitoring wells. The highest groundwater levels were consistently observed at MW-10, located close to the plant, with the lowest groundwater levels being observed at MW-12 and MW-18. There was no trend of decreasing groundwater levels with an increasing distance from the infiltration facilities. All data points indicated that the distance to the groundwater level was over 0.5 m from the ground surface. This depth is not a requirement of the operational certificate but is taken from the Municipal Wastewater Regulation for a minimum unsaturated soil depth for a Class A or B effluent.

Figure 2.1: Groundwater Depths – Monthly Readings

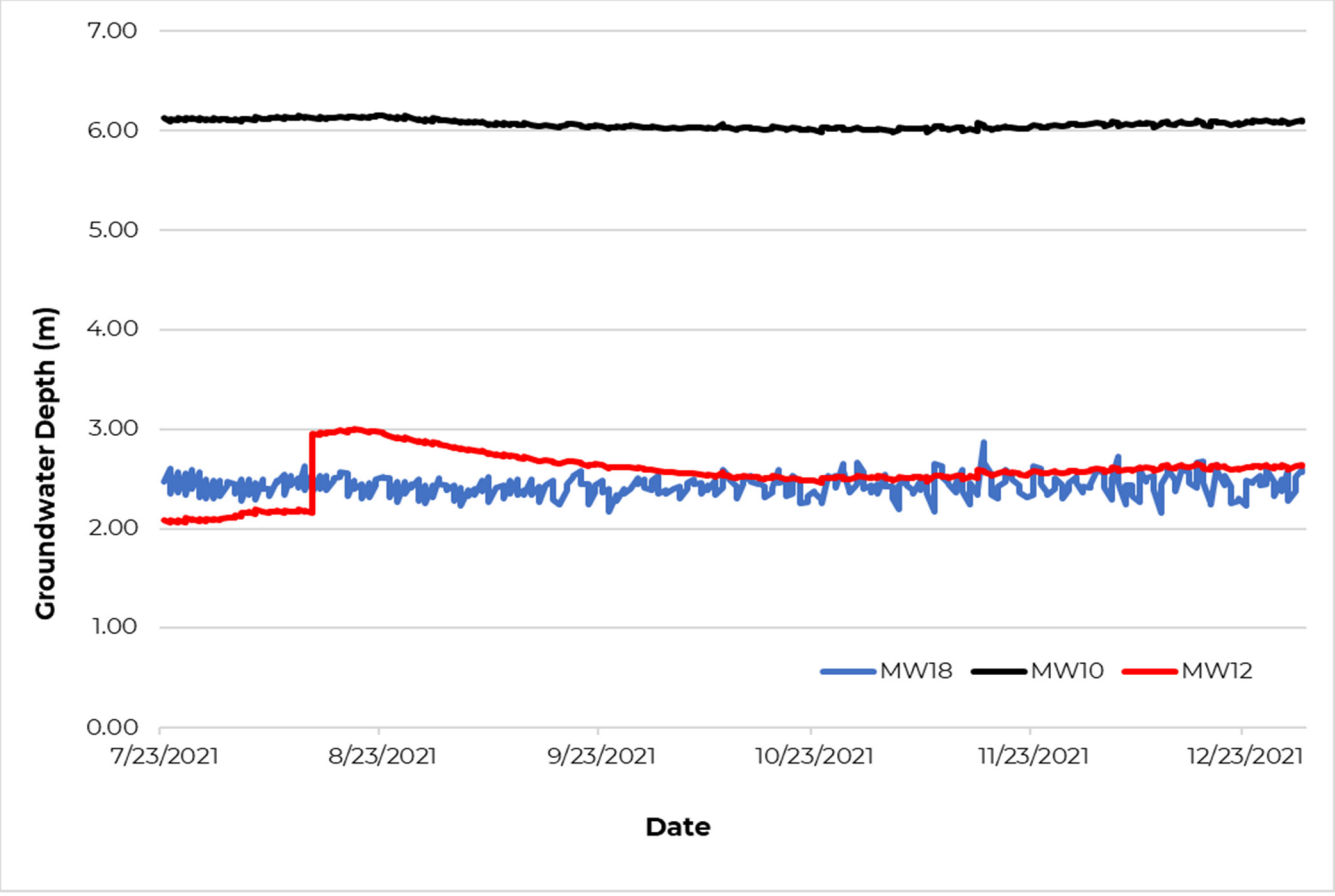


The data indicated little change in the levels through the year for MW-10 and MW-18. Potential changes were observed for MW-12, and a full dataset from 2021 may have provided more information on this observation. The groundwater level was observed to fluctuate at MW-2 and MW-14 with the lowest levels occurring in the summer/early fall and the highest levels being in the winter. Given the similarity in the groundwater level pattern between MW-14 and the background well, plus the relative consistency in the release from the centralised plant and the lack of change for the monitoring wells closer to the plant, it is possible that the fluctuation in groundwater levels at MW-14 was related to environmental influences rather than effluent release.

Figure 2.2. shows the water level data from the data loggers in MW-18, MW-10 and MW-12. These data are only available for July onwards, due to the timing of the amended operational certificate being issued and the consequent purchase/installment of the dataloggers. As with the monthly data, the information from the data loggers indicated that there was little change in the groundwater levels over time. The sharp change in the groundwater level for MW-12 was likely related to repositioning of the data logger after the repairs had been completed. There is a greater similarity between the water levels in MW-18 and MW-12 than with MW-10.

As with the manually collected monthly data, all data points indicated that the distance to the groundwater level was over 0.5 m from the ground surface. This depth is not a requirement of the operational certificate but is taken from the Municipal Wastewater Regulation for a minimum unsaturated soil depth for a Class A or B effluent.

Figure 2.2: Groundwater Depths – Data Logger Information



3.0 GROUNDWATER QUALITY

3.1 DISTRICT-OWNED WELLS

The District provided these data for review and interpretation in a summarised and tabulated form. The concentration of organic nitrogen was calculated using the TKN and ammonia data, with half the detection limit being used where the data were reported to be below the analytical detection limit. Monitoring data for the spring do not include all sites and parameters in the amended operational certificate, as a result of the monitoring being completed before the revised operational certificate was issued. For the fall, there are no data for *E. coli* available, due to an operational error. However, faecal coliform data are available and will represent a worst case scenario, given that *E. coli* is only one type of faecal coliform. The spring samples were taken on April 22nd and the fall samples were taken on September 20th, so the spring samples were taken before the parameters and locations were confirmed in the amended operational certificate.

Table 3.1 summarises the spring data. For the three sites where data are available, should an influence be observed from the effluent release, the expectation is that the lowest concentrations should be associated with the background well MW-2 and that the highest concentrations should be observed at MW-10, decreasing at MW-14 as a result of assimilation, rejuvenation and dilution as the effluent moves through the ground. While the lowest concentrations were generally observed for MW-2, the increasing then decreasing trend for MW-10 and MW-14 was inconsistent.

Table 3.1: Summary of Spring Data

Parameter	Units	Location				
		MW-2	MW-18	MW-10	MW-12	MW-14
Total Nitrogen	mg/L	1.11	-	2.32	-	3.31
TKN	mg/L	0.061	-	0.387	-	3.31
Organic Nitrogen	mg/L	0.036	-	0.362	-	3.14
Ammonia	mg/L	< 0.050	-	< 0.050	-	0.167
Nitrate	mg/L	1.05	-	1.93	-	< 0.01
Nitrite	mg/L	< 0.01	-	< 0.01	-	< 0.01
Total Phosphorus	mg/L	0.146	-	0.628	-	2.19
Orthophosphorus	mg/L	< 0.0050	-	< 0.0050	-	< 0.0050
Sodium	mg/L	18.1	-	66.6	-	78.6
Chloride	mg/L	6.8	-	97.8	-	134
Conductivity	µS/cm	444	-	890	-	1,200
pH	pH units	8.08	-	8.01	-	7.84
E. coli	MPN/100 mL	-	-	-	-	-

Table 3.2 summarises the fall data. As with the spring data, it is reasonable to assume that an influence from the effluent release should translate to the lowest concentrations being associated with the background well MW-2, and the highest concentrations being associated with the closest down-gradient wells (MW-18 and/or MW-10), then decreasing through from MW-12 to MW-14 as a result of assimilation, rejuvenation and dilution as the effluent moves through the ground. While this trend was not clear, the highest concentrations were generally associated with MW-12, and the lowest concentrations were associated with MW-2. Concentration increases that were observed at MW-18, MW-10 and/or MW-12 were followed by decreases at MW-14, with the resulting concentrations of ammonia, nitrate and faecal coliforms being either the same or lower than the data reported for MW-2.

Table 3.2: Summary of Fall Data

Parameter	Units	Location				
		MW-2	MW-18	MW-10	MW-12	MW-14
Total Nitrogen	mg/L	1.73	3.45	3.68	3.91	2.21
TKN	mg/L	0.084	1.33	1.05	3.91	1.01
Organic Nitrogen	mg/L	0.059	1.221	0.938	3.719	0.985
Ammonia	mg/L	< 0.050	0.109	0.112	0.191	< 0.005
Nitrate	mg/L	1.64	2.12	2.63	<0.01	1.19
Nitrite	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Total Phosphorus	mg/L	0.0528	0.0528	0.526	1.25	0.278
Orthophosphorus	mg/L	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Sodium	mg/L	19.1	75.3	93.3	92.7	87.3
Chloride	mg/L	7.14	102	109	118	109
Conductivity	µS/cm	469	905	911	1,290	861
pH	pH units	7.98	7.97	7.88	7.75	7.93
Faecal Coliforms	MPN/100 mL	< 1	< 1	15	770	< 1

The water quality was compared with the BC Water Quality Guidelines, focusing on groundwater uses for the most stringent of either potable or agricultural purposes, given the distance from surface water. The parameters where guidelines exist for parameters which were measurable in the samples are: nitrate, chloride, conductivity, pH and faecal coliforms/*E. coli*. The outcomes are summarised in Table 3.3, with green indicating concentrations below the guideline and red indicating that at least 1 data point was above the guideline. The guideline for conductivity for irrigation is crop dependent and varies depending on the crop tolerance. The guideline ranges from 700 µS/cm for the most sensitive crops to 5,000 µS/cm for least sensitive crops. For the purpose of this assessment, a moderately tolerant crop was selected, as this type of crop also includes grasses which are expected to be a general common vegetation for the general area. For faecal coliforms, there were several guidelines which ranged up to ≤ 1,000 CFU/100 mL (general irrigation). Selection of the most stringent guideline may not be the best representative of water quality, given that it does not allow for any faecal coliforms to be present and assumes that there is no disinfection of what is expected to be untreated water.

There were only two parameters which were higher than the most stringent guideline. Chloride concentrations were generally above the most stringent guideline at all down-gradient wells. This could be reflective of the influence from the effluent, given that the chloride concentration in the effluent is typically in the 100 to 130 mg/L range, but there are other anthropogenic sources of chloride in the environment, with common inputs being from road salts. The faecal coliform concentration was above the most stringent guideline at MW-10 and MW-12, but not MW-18. This could be related to the effluent, but these two wells are located by properties which are on septic systems in agricultural areas where livestock can be present.

Table 3.3: Guideline Comparison

Parameter	Units	Guideline	Location				
			MW-2	MW-18	MW-10	MW-12	MW-14
Nitrate	mg/L	≤ 10 (drinking water)					
Chloride	mg/L	100 (irrigation)					
Conductivity	µS/cm	2,200 (irrigation)					
pH	pH units	5.0 to 9.5 (irrigation)					
Faecal Coliforms	MPN/100 mL	0 (livestock in closely confined conditions with no water treatment)					

3.2 PRIVATELY-OWNED WELLS

The District provided these data for review and interpretation in a summarised and tabulated form. The concentration of organic nitrogen was calculated using the TKN and ammonia data, with half the detection limit being used where the data were reported to be below the analytical detection limit. The spring samples (May 14th) were taken before the parameters and locations were confirmed in the amended operational certificate. The fall samples were taken on October 7th. There are no data for *E. coli* available, due to an operational error. There are no data available for H6 as this site is no longer accessible. The property was sold and is now an industrial marijuana operation with high security. The samples for H7 were taken by the home owner, and there is no guarantee that the approach used for sampling meets the standards that are used by trained District staff.

Tables 3.4 and 3.5 summarise the spring and fall data, respectively, and include the data from MW-2 as a potential indication of background water quality. To summarise:

- For both the spring and the fall data, the samples collected from H1 had the highest frequency of being the lowest concentration.
- For both the spring and the fall data, the concentrations at all other house wells were generally higher than MW-2. Focusing on key parameters which can be used to track the movement of domestic wastewater effluent, total nitrogen/nitrate were the highest at H3 in the spring and H7 in the fall, although there was little difference between the two sites. Sodium, chloride and conductivity were the highest at H4, which is the furthest well from the wastewater treatment plant.

Table 3.4: Summary of Spring Data

Parameter	Units	Location						
		MW-2	H1	H2	H3	H4	H5	H7
Total Nitrogen	mg/L	1.11	0.29	3.76	4.96	1.88	4.15	4.27
TKN	mg/L	0.061	0.29	0.10	0.11	0.23	0.22	0.20
Organic Nitrogen	mg/L	0.036	0.030	0.075	0.060	0.205	0.195	0.175
Ammonia	mg/L	< 0.050	0.26	< 0.05	0.05	< 0.05	< 0.05	< 0.05
Nitrate	mg/L	1.05	< 0.01	3.66	4.85	1.65	3.93	4.08
Nitrite	mg/L	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Total Phosphorus	mg/L	0.146	0.24	0.01	0.01	0.01	0.01	0.02
Orthophosphorus	mg/L	< 0.0050	0.12	< 0.0050	0.01	0.01	0.01	0.01
Sodium	mg/L	18.1	8.97	54.2	22.7	75.7	67.2	53.8
Chloride	mg/L	6.8	0.5	85.6	44.7	107.0	94.5	83.2
Conductivity	µS/cm	444	262	745	453	853	836	756
pH	pH units	8.08	8.06	7.52	7.58	7.83	7.94	7.85

Table 3.5: Summary of Fall Data

Parameter	Units	Location						
		MW-2	H1	H2	H3	H4	H5	H7
Total Nitrogen	mg/L	1.73	0.22	3.60	0.37	1.91	3.78	3.80
TKN	mg/L	0.084	0.22	0.10	0.06	0.09	0.15	0.14
Organic Nitrogen	mg/L	0.059	0	0.075	0.035	0.065	0.125	0.115
Ammonia	mg/L	< 0.050	0.27	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrate	mg/L	1.64	< 0.01	3.50	0.31	1.82	1.82	3.66
Nitrite	mg/L	<0.01	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Total Phosphorus	mg/L	0.0528	0.22	0.01	0.01	0.01	0.01	0.01
Orthophosphorus	mg/L	< 0.0050	0.09	< 0.0050	0.01	0.01	0.01	0.01
Sodium	mg/L	19.1	9.44	58.1	24.3	90.0	72.6	76.9
Chloride	mg/L	7.14	0.4	83.7	39.6	106.0	94.6	69.8
Conductivity	µS/cm	469	332	812	464	911	910	820
pH	pH units	7.98	8.40	6.90	6.80	7.20	7.00	7.10

The water quality was compared with the BC Water Quality Guidelines, focusing on groundwater uses for the most stringent of either potable or agricultural purposes, given the assumption that any water from these wells would be used to support potable and/or agricultural activities on the property. As in Section 3.1, the outcomes are summarised in Table 3.6, with green indicating concentrations below the guideline and red indicating that

at least 1 data point was above the guideline. The guideline comparison is for the following parameters: nitrate, chloride, conductivity and pH, with the guideline for conductivity being based on a moderately tolerant crop. There was one occasion when the concentrations were higher than the corresponding guideline. This was for chloride at H4 (spring and fall data).

Table 3.6: Guideline Comparison

Parameter	Units	Guideline	Location					
			H1	H2	H3	H4	H5	H7
Nitrate	mg/L	≤ 10 (drinking water)						
Chloride	mg/L	100 (irrigation)						
Conductivity	µS/cm	2,200 (irrigation)						
pH	pH units	5.0 to 9.5 (irrigation)						

With respect to the potential for impacts as a result of the release, it is reasonable to assume that the wells more likely to be impacted would be H5 and H6, as these are the closest wells to the disposal area. The highest concentrations were associated with wells located further away. Given the limited information on well depth, construction, maintenance and other activities in the near vicinity (such as septic fields, livestock raising, fertilizer addition, manure stockpiles, etc.) it will continue to be challenging to clearly define if any water quality characteristics are directly related to the release from the District's wastewater treatment plant.

4.0 CONCLUSIONS AND RECOMMENDATIONS

From the information which was reviewed and evaluated, the following conclusions are drawn:

- Although there were discrepancies between the manually collected monthly water levels and the data logger information, all data points indicated that the distance to the groundwater level was over 0.5 m from the ground surface. This depth is not a requirement of the operational certificate but is taken from the Municipal Wastewater Regulation for a minimum unsaturated soil depth for a Class A or B effluent.
- For the District-owned monitoring wells, there was an increase in some parameters compared with the background well. It is possible that the observed increases were related to the effluent release. While the concentrations were observed to decrease with increasing distance from the wastewater treatment plant for the fall data, this was not the case for the spring data. Therefore, it is possible that other factors other than the effluent release were affecting the water quality at the furthest well. With respect to BC Water Quality Guidelines for either potable or agricultural uses, chloride and faecal coliforms were above the most stringent guideline. It is not known whether the increase above the guideline was related to the effluent release or other factors, given that the proximity to roads and agricultural areas.
- For the privately-owned monitoring wells, the highest concentrations were not associated with the wells which are located closest to the wastewater treatment plant, which is the reverse of what would be expected if there was an impact from the effluent discharge. With respect to BC Water Quality Guidelines for either potable or agricultural uses, only chloride at H4 was above the most stringent guideline. Given the limited information on well depth, construction, maintenance and other activities in the near vicinity (such as septic field, livestock raising, fertilizer addition, manure stockpiles, etc.) it will continue to be challenging to clearly

define if any water quality characteristics are directly related to the release from the District's wastewater treatment plant.

The following recommendations are made:

- Water quality samples from all locations should be taken on the same date, or within a day or two of each other, where possible.
- There are missing locations and parameters compared with the requirements laid out in Section 3.2 of the operational certificate. Missing data should be reported via the Ministry of Environment email: environmentalcompliance@gov.bc.ca, using the standard approach as for any non-compliance with the operational certificate.
- As the privately-owned well at H6 can no longer be sampled, a request should be made to the Ministry of Environment (Authorisations) to remove this well from the schedule outlined in Section 3.2 of the operational certificate. Retaining this well in the monitoring table will result in on-going non-compliance.

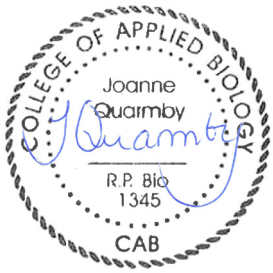
5.0 CLOSURE

Groundwater monitoring is required as part of the 2021 operational certificate and the data are to be reported annually with interpretation, as indicated in Section 4.4 of the operational certificate. The information presented in this technical memorandum aims to fulfil the requirement of this clause of the operational certificate.

Please do not hesitate to contact us if there are any questions or if clarification is required.

Sincerely,

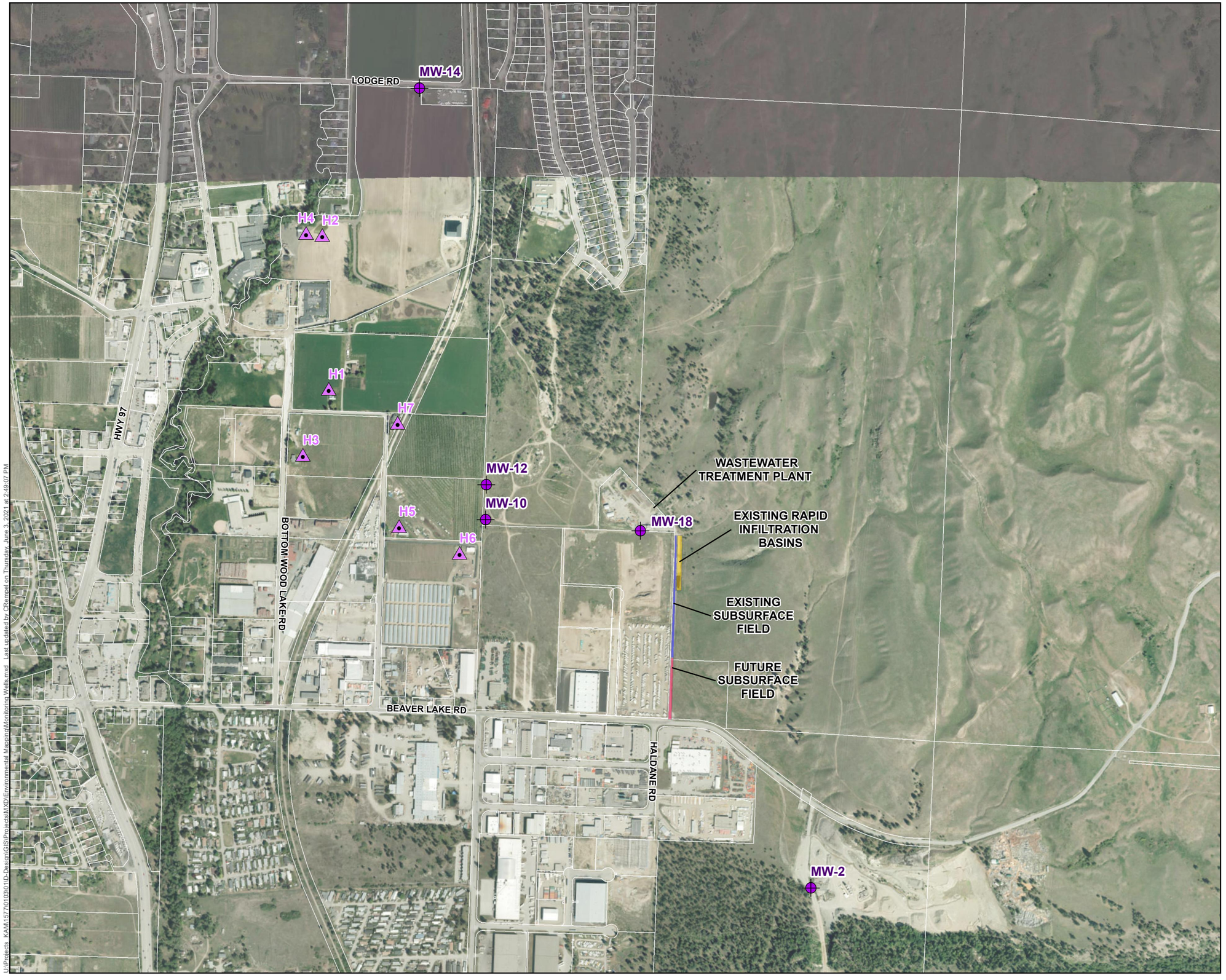
URBAN SYSTEMS LTD.



Dr. Joanne Quarmby, R.P.Bio.
Water and Wastewater Specialist

/jq

\\usl.urban-systems.com\projects\Projects_KEL\1577\0022\01\X-Single-File\2021 Annual wastewater reports\Central plant\2022-03-07 MEM 2021 groundwater data final.docx



LAKE COUNTRY
Life. The Okanagan Way.

District of Lake Country
OC Amendment

Monitoring Wells

House Well

Monitoring Well

The accuracy & completeness of information shown on this drawing is not guaranteed. It will be the responsibility of the user of the information shown on this drawing to locate & establish the precise location of all existing information whether shown or not.

0 50 100 200 300
Meters

N

Coordinate System:
NAD 1983 UTM Zone 11N

Scale:
1:9,500

Data Sources:

- Imagery provided by ESRI.
- Parcels provided by DataBC.

Project #:	1577.0103.01
Author:	CR
Checked:	
Status:	
Revision:	A
Date:	2021 / 6 / 3

URBAN systems

U:\Projects\KAM\1577\0103\10-Design\GIS\Projects\MXD\Environmental Mapping\Monitoring Wells.mxd Last updated by CRampel on Thursday, June 3, 2021 at 2:49:07 PM