

# Wastewater Treatment Plant 2021 Annual Report

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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.

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# 1.0 Authorized Discharges

This annual report for Year 2021 is submitted according to the requirements of the Lake Country Wastewater Treatment Plant (LCWWTP) <u>Operational Certificate – PE #14651</u>. 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<sup>3</sup>/d)

The authorized maximum daily discharge limit issued for the year 2021 is 2000 m³/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<sup>3</sup>/d (2020=1756 m<sup>3</sup>/d)
- 2021 Peak Month 63,018m³ January 2021; and
- 2021 Peak Daily 2258 m<sup>3</sup>/d January 14, 2021

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:



Effluent Basin #1

Annual Average 37.5 m³/d (2021=41.6 m³/d)
 Peak Month 1490 m³ – July 2021; and
 Peak Daily 147.5 m³/d – August 30, 2021

Details of the monthly flows are provided in Table 1.



Table 1: Daily, Monthly, and Average Effluent Flows

	Influent		E	ffluent		Septage
2021	Flow	Flow *	Minimum*	Maximum*	Monthly Ave.*	Flow
	m³/month	m³/month	m³/day	m³/day	m³/day	m³/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

<sup>\*</sup>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 <u>Table 3</u> and <u>Table 4</u> 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 <u>Table 4</u>) 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 (<u>Table 3</u>). 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 (<u>Table 3</u>). 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)	Total Soluble N (mg/L as N)
	mg/L	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	рН
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	<b>&lt;</b> 5	3	7.75
August	<b>&lt;</b> 6	<3	7.90
September	5	4	7.92
October	<b>&lt;</b> 5	<2	7.74
November	5	5	7.78
December	<7	5	7.55
Annual Avg.	7	7	7.77

<sup>\*</sup>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 analyzed 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	Tota	l 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 equivalencies.



### 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 <u>Appendix D</u>.

### 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 <u>Table 1</u>.

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

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

	BOD	TSS	Total-P	TSN	
	mg/L	mg/L	mg/L as P	mg/L as N	рН
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 <u>Figure 1</u>, 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 2000m³ 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 m³/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

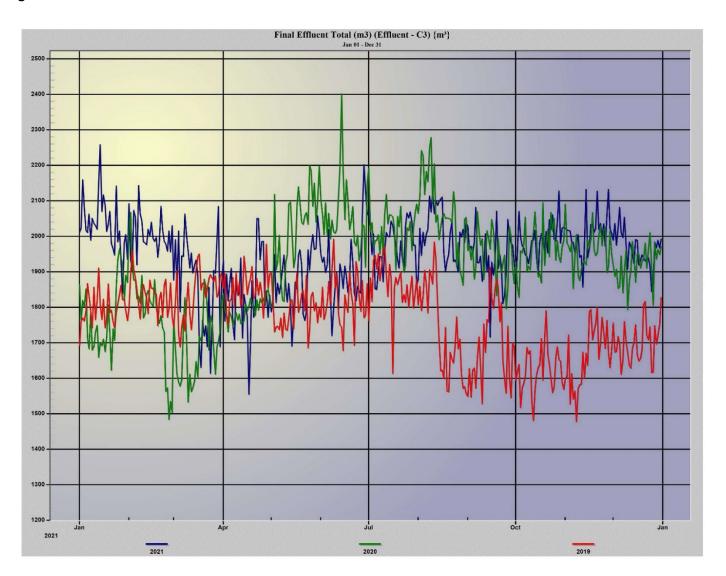




Figure 3: Effluent CBOD and TSS Concentrations

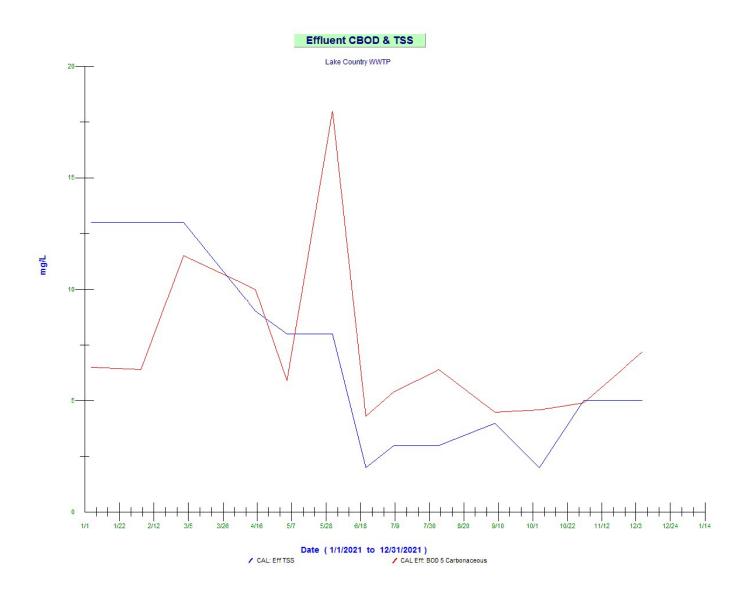




Figure 4: Effluent Orthophosphate Concentrations

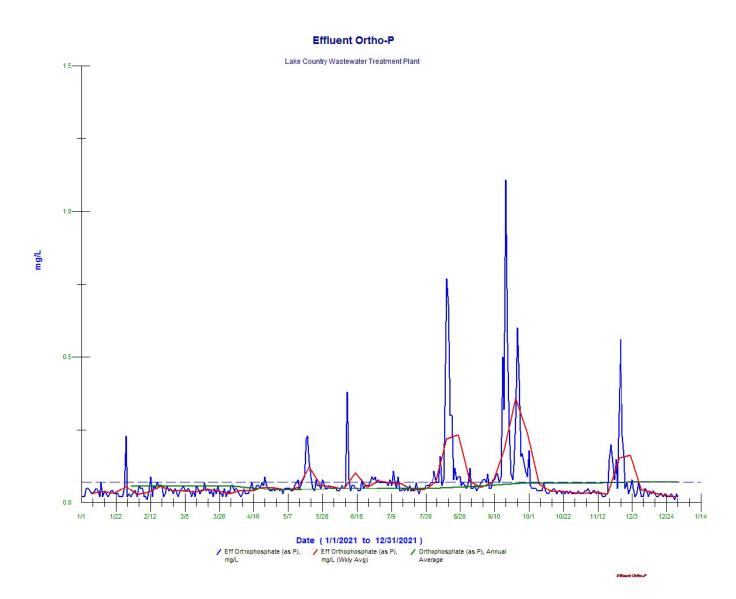




Figure 5: Effluent Ammonia, Nitrate, and Nitrite Concentrations

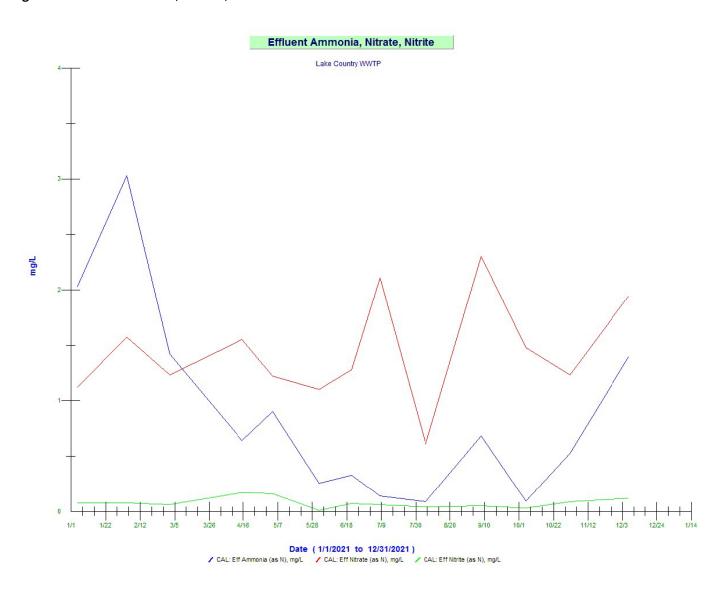
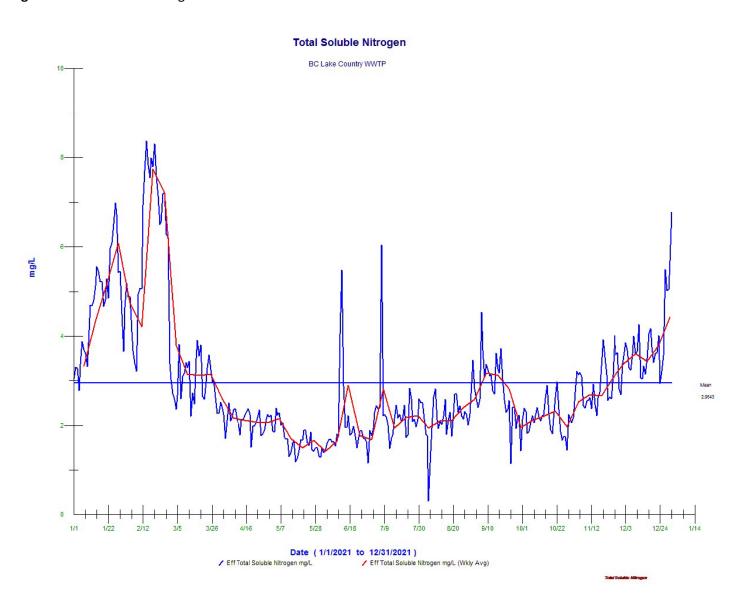




Figure 6: Total Soluble Nitrogen Concentrations

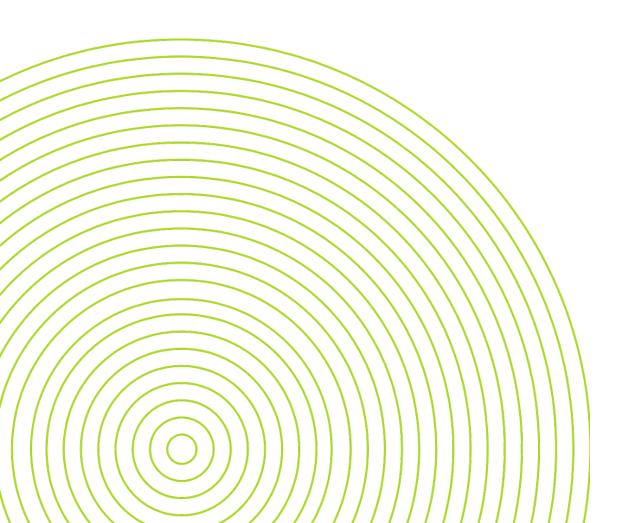




- **D)** Lab reports please refer to <u>Table 3</u> and <u>Table 4</u> for summarized accredited lab data. Copies of the accredited lab results can be found in <u>Appendix B</u>.
- **E)** Quality Assurance Data Two field blank samples for effluent quality analyzed in 2021 were flagged for errors in the 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 <u>Appendix B</u>. 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 12<sup>th</sup>, 2022. There have been no further updates to the plan since its submission.



# **Appendix A - Total Daily Flows**





						Final Effluer	it Total (m³)¹					
2021	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ОСТ	NOV	DEC
1 <sup>st</sup>	2,012	2,092	1,877	1,932	1,787	1,950	2,069	1,878	2,029	1,875	2,023	1,989
2 <sup>nd</sup>	2,022	1,934	1,991	1,761	1,821	1,927	2,022	2,023	1,967	1,949	2,018	2,036
3 <sup>rd</sup>	2,159	1,902	1,859	1,894	1,949	1,941	1,949	1,946	1,972	2,071	2,017	1,975
4 <sup>th</sup>	2,081	2,073	2,015	1,818	1,813	1,898	2,007	2,012	1,952	1,998	2,015	2,025
5 <sup>th</sup>	2,016	2,054	1,788	1,868	1,868	1,919	1,852	1,974	1,983	1,973	1,985	2,082
6 <sup>th</sup>	2,011	1,920	1,944	1,910	1,838	2,019	1,850	2,007	2,082	1,968	1,983	2,011
7 <sup>th</sup>	2,063	2,143	1,944	1,752	1,866	1,840	1,908	2,019	1,926	1,948	1,953	1,996
8 <sup>th</sup>	1,989	2,064	2,063	1,709	1,909	1,720	1,943	2,114	1,926	1,943	1,975	2,054
9 <sup>th</sup>	2,051	2,042	2,000	1,876	1,947	1,800	1,942	2,069	1,944	1,923	2,005	1,976
10 <sup>th</sup>	2,036	1,985	1,960	1,834	1,861	1,860	1,872	2,121	1,873	1,951	1,941	1,908
11 <sup>th</sup>	2,031	1,981	1,911	1,840	1,815	1,897	1,961	2,064	1,908	1,988	1,946	1,984
12 <sup>th</sup>	2,020	1,976	1,953	1,939	1,867	1,796	2,011	2,102	2,007	1,990	1,857	1,974
13 <sup>th</sup>	2,149	2,020	1,897	1,713	1,805	1,922	2,000	2,087	1,901	2,017	1,972	1,949
14 <sup>th</sup>	2,258	2,001	1,918	1,837	1,691	1,895	1,999	2,098	1,946	1,945	2,132	1,923
15 <sup>th</sup>	2,070	2,040	1,933	1,803	1,785	1,853	2,043	2,105	1,716	1,890	1,940	1,991
16 <sup>th</sup>	2,117	1,994	1,890	1,774	1,871	1,916	2,030	2,111	1,928	1,982	1,966	1,989
17 <sup>th</sup>	2,088	1,986	1,699	1,555	1,852	1,889	1,999	1,955	1,891	2,007	2,033	1,919
18 <sup>th</sup>	2,014	1,997	1,630	1,701	1,946	1,842	1,976	1,901	1,931	1,994	2,033	1,932
19 <sup>th</sup>	2,035	1,941	1,764	1,875	1,962	1,882	1,936	1,930	2,071	1,950	2,012	1,948
20 <sup>th</sup>	2,071	1,981	1,719	1,772	1,919	1,992	1,911	1,949	1,910	2,014	2,021	1,939
21 <sup>st</sup>	1,980	2,085	1,748	1,791	1,780	1,926	1,987	2,011	1,947	1,953	2,127	1,930
22 <sup>nd</sup>	1,965	2,019	1,689	2,050	1,763	1,840	1,939	2,040	1,916	2,047	2,019	1,937
23 <sup>rd</sup>	1,947	1,986	1,856	2,050	1,788	1,819	1,907	1,929	1,811	2,020	2,036	1,939
24 <sup>th</sup>	2,142	1,979	1,614	1,934	1,962	1,859	2,028	1,934	1,834	2,061	1,999	1,916
25 <sup>th</sup>	1,985	1,958	1,758	1,985	1,905	1,846	2,066	1,922	1,895	1,992	2,035	1,844
26 <sup>th</sup>	2,015	2,015	1,904	1,986	1,968	1,840	2,052	1,900	2,048	1,987	1,972	1,867
27 <sup>th</sup>	1,929	1,956	1,896	1,805	2,005	2,054	2,069	2,012	2,004	2,038	2,062	1,984
28 <sup>th</sup>	1,840	2,030	1,988	1,846	1,963	2,202	2,040	1,998	1,979	2,128	2,132	1,968
29 <sup>th</sup>	1,982		2,084	1,772	1,966	2,130	1,975	2,020	1,976	1,981	2,022	1,989
30 <sup>th</sup>	2,005		1,689	1,835	2,058	2,061	1,975	1,984	1,930	2,022	2,009	1,967
31 <sup>st</sup>	1,935		1,865		2,009		1,865	2,036		2,026		1,992

 $<sup>^{1}</sup>$ Volume calculated as total effluent entering the plant minus C3 water



# Appendix B - Effluent Quality Accredited Laboratory Results







21A0145

# **CERTIFICATE OF ANALYSIS**

REPORTED TO Lake Country, District of (Wastewater)

4062 Beaver Lake Rd

LAKE COUNTRY, BC V4V 1T5

ATTENTION Davin Larsen WORK ORDER

 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.

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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 HEF



# **TEST RESULTS**

**REPORTED TO** Lake Country, District of (Wastewater)

PROJECT Final Effluent- PE14651

WORK ORDER REPORTED 21A0145 2021-01-11 14:13

	•				
Analyte	Result	RL	Units	Analyzed	Qualifie
Final Effluent (E233626) (21A0145-01)   M	atrix: Wastewater   Sample	d: 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	
рН	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)

PROJECT Final Effluent- PE14651

WORK ORDER REPORTED 21A0145 2021-01-11 14:13

Analysis Description	Method Ref.	Technique A	ccredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	<b>√</b>	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 Ac	sid) ✓	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:**

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# **CERTIFICATE OF ANALYSIS**

REPORTED TO Lake Country, District of (Wastewater)

4062 Beaver Lake Rd

LAKE COUNTRY, BC V4V 1T5

ATTENTION Davin Larsen

PO NUMBER 104395-10-9007
PROJECT Raw Influent- PE14651
PROJECT INFO Lake Country WWTP

WORK ORDER 21A0143

**RECEIVED / TEMP** 2021-01-05 10:06 / 11°C **REPORTED** 2021-01-11 14:18

**COC NUMBER** 44201.31485

### Introduction:

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

**Authorized By:** 

Alana Crump Team Lead, Client Service HEET



# **TEST RESULTS**

**REPORTED TO** Lake Country, District of (Wastewater)

PROJECT Raw Influent- PE14651

WORK ORDER REPORTED

21A0143

**REPORTED** 2021-01-11 14:18

Analyte	Result	RL	Units	Analyzed	Qualifi
Raw Influent (E233627) (21A0143-01)   Ma	trix: Wastewater   Sample	ed: 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	
рН	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

Lake Country, District of (Wastewater) **REPORTED TO** 

Raw Influent- PE14651 **PROJECT** 

**WORK ORDER** 

21A0143

2021-01-11 14:18 REPORTED

<b>Analysis Description</b>	Method Ref.	Technique Ad	credited	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 Aci	d) ✓	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:

RLReporting Limit (default)

Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors

Milligrams per litre mg/L

pH units pH < 7 = acidic, ph > 7 = basic

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

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to the lab for time sensitive results needed to

make important and expensive

(whew) is VERY important. We know that too.

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

PROJECTFinal Effluent- PE14651REPORTED2021-02-11 14:17PROJECT INFOLake Country WWTPCOC NUMBER44231.32625

### 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.

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

decisions

**Authorized By:** 

Alana Crump Team Lead, Client Service Seco



# **TEST RESULTS**

**REPORTED TO** Lake Country, District of (Wastewater)

Final Effluent- PE14651 **PROJECT** 

**WORK ORDER** REPORTED

21B0665 2021-02-11 14:17

Analyte	Result	RL	Units	Analyzed	Qualifie
Final Effluent (E233626) (21B0665-01)   M	atrix: Wastewater   Sample	ed: 2021-02-04 09:20			
Anions					
Chloride	103	0.10	mg/L	2021-02-06	
Nitrate (as N)	1.57	0.010		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:

The sample was prepared and/or analyzed past the recommended holding time. HT1

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)

PROJECT Final Effluent- PE14651

WORK ORDER REPORTED 21B0665

2021-02-11 14:17

Analysis Description	Method Ref.	Technique A	ccredited	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 Ac	sid) ✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna

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to the lab for time sensitive results needed to

(whew) is VERY important. We know that too.

expensive

decisions

REPORTED TO Lake Country, District of (Wastewater)

4062 Beaver Lake Rd

LAKE COUNTRY, BC V4V 1T5

**ATTENTION** Davin Larsen **WORK ORDER** 21B0664

2021-02-04 10:55 / 8°C **PO NUMBER RECEIVED / TEMP** 

Raw Influent- PE14651 **REPORTED** 2021-02-11 13:57 **PROJECT** Lake Country WWTP 44231.32625 **PROJECT INFO COC NUMBER** 

#### Introduction:

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regulation research, and instrumentation, analytical centre the technical knowledge you BEFORE you need it, so you can stay

Through and knowledge, more are your

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



**REPORTED TO** Lake Country, District of (Wastewater)

PROJECT Raw Influent- PE14651

WORK ORDER REPORTED

21B0664

2021-02-11 13:57

Analyte	Result	RL	Units	Analyzed	Qualifi			
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	·	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)

PROJECT Raw Influent- PE14651

WORK ORDER

21B0664

**REPORTED** 2021-02-11 13:57

Analysis Description	Method Ref.	Technique A	ccredited	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 Ac	d) ✓	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

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## **CERTIFICATE OF ANALYSIS**

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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

PROJECTFinal Effluent- PE14651REPORTED2021-03-08 14:46PROJECT INFOLake Country WWTPCOC NUMBER44257.31249

#### Introduction:

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**Authorized By:** 

Alana Crump Team Lead, Client Service Seco



**REPORTED TO** Lake Country, District of (Wastewater)

PROJECT Final Effluent- PE14651

WORK ORDER REPORTED 21C0337

**RTED** 2021-03-08 14:46

Analyte	Result	RL	Units	Analyzed	Qualifie
Final Effluent (E233626) (21C0337-01)   M	atrix: Wastewater   Sample	d: 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)

PROJECT Final Effluent- PE14651

WORK ORDER

21C0337

**REPORTED** 2021-03-08 14:46

Analysis Description	Method Ref.	Technique A	ccredited	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 Ac	id) ✓	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

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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:

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decisions

Authorized By:

Alana Crump Team Lead, Client Service Seco



**REPORTED TO** Lake Country, District of (Wastewater)

PROJECT Raw Influent- PE14651

WORK ORDER

21C0336

**REPORTED** 2021-03-09 16:01

Analyte	Result	RL	Units	Analyzed	Qualifi
Raw Influent (E233627) (21C0336-01)   Ma	atrix: Wastewater   Sample	d: 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)

PROJECT Raw Influent- PE14651

WORK ORDER REPORTED 21C0336

2021-03-09 16:01

Analysis Description	Method Ref.	Technique A	ccredited	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 Ac	id) ✓	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

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21D1659

## **CERTIFICATE OF ANALYSIS**

REPORTED TO Lake Country, District of (Wastewater)

4062 Beaver Lake Rd

LAKE COUNTRY, BC V4V 1T5

**ATTENTION** Davin Larsen

104395-10-9007 **PO NUMBER PROJECT** Final Effluent- PE14651 Lake Country WWTP **PROJECT INFO** 

**WORK ORDER** 2021-04-15 11:08 / 14°C **RECEIVED / TEMP** 

**REPORTED** 2021-04-22 12:12 44301.28718 **COC NUMBER** 

#### Introduction:

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Authorized By:

Alana Crump Team Lead, Client Service



	TO Lake Country, District of (Wastewater) Final Effluent- PE14651			WORK ORDER REPORTED	21D1659 2021-04-2	2 12:12
Analyte		Result	RL	Units	Analyzed	Qualifier
Final Effluent (E2336	26) (21D1659-01)   M	atrix: Wastewater   Sar	npled: 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 Ca	CO3)	166	1.0	mg/L	2021-04-20	
Alkalinity, Phenolphtha	· · · · · · · · · · · · · · · · · · ·	< 1.0		mg/L	2021-04-20	
Alkalinity, Bicarbonate	(as CaCO3)	166	1.0	mg/L	2021-04-20	
Alkalinity, Carbonate (a	as CaCO3)	< 1.0	1.0	mg/L	2021-04-20	
Alkalinity, Hydroxide (a	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 Carbonac	eous	10.0	2.0	mg/L	2021-04-21	
Nitrogen, Total Kjeldah	1	3.33	0.050	mg/L	2021-04-20	
pH		7.69		pH units	2021-04-20	HT2
Phosphorus, Total (as	P)	0.532	0.0050	mg/L	2021-04-19	
Solids, Total Suspende	ed	9.4	2.0	mg/L	2021-04-20	
Microbiological Parame	eters					
Coliforms, Total		> 242000	1	MPN/100 mL	2021-04-16	
Coliforms, Fecal		> 242000	1	MPN/100 mL	2021-04-16	
Anions	02)   Matrix: Water   S	Sampled: 2021-04-15 09				
Chloride		114		mg/L	2021-04-17	
Nitrate (as N)		1.61	0.010		2021-04-17	
Nitrite (as N)		0.182	0.010		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						
			1.0	mg/L	2021-04-20	
Alkalinity, Total (as Cat	CO3)	167				
Alkalinity, Total (as Cad		167 < 1.0		mg/L	2021-04-20	
	lein (as CaCO3)		1.0			
Alkalinity, Phenolphtha	lein (as CaCO3) (as CaCO3)	< 1.0	1.0 1.0	mg/L	2021-04-20	



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

Analyte	Result	RL	Units	Analyzed	Qualifi
Duplicate (21D1659-02)   Matrix: Water   S	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	
Anions Chloride	< 0.10	0.10	ma/l	2021-04-17	
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					
				2024 04 20	
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L	2021-04-20	
Alkalinity, Total (as CaCO3)  Alkalinity, Phenolphthalein (as CaCO3)	< 1.0 < 1.0			2021-04-20	
		1.0	mg/L mg/L		
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0 1.0	mg/L	2021-04-20	
Alkalinity, Phenolphthalein (as CaCO3) Alkalinity, Bicarbonate (as CaCO3)	< 1.0 < 1.0	1.0 1.0 1.0	mg/L mg/L	2021-04-20 2021-04-20	
Alkalinity, Phenolphthalein (as CaCO3) Alkalinity, Bicarbonate (as CaCO3) Alkalinity, Carbonate (as CaCO3)	< 1.0 < 1.0 < 1.0	1.0 1.0 1.0	mg/L mg/L mg/L mg/L	2021-04-20 2021-04-20 2021-04-20	
Alkalinity, Phenolphthalein (as CaCO3) Alkalinity, Bicarbonate (as CaCO3) Alkalinity, Carbonate (as CaCO3) Alkalinity, Hydroxide (as CaCO3)	< 1.0 < 1.0 < 1.0 < 1.0	1.0 1.0 1.0 1.0 0.050	mg/L mg/L mg/L mg/L	2021-04-20 2021-04-20 2021-04-20 2021-04-20	
Alkalinity, Phenolphthalein (as CaCO3) Alkalinity, Bicarbonate (as CaCO3) Alkalinity, Carbonate (as CaCO3) Alkalinity, Hydroxide (as CaCO3) Ammonia, Total (as N)	< 1.0 < 1.0 < 1.0 < 1.0 < 0.050	1.0 1.0 1.0 1.0 0.050	mg/L mg/L mg/L mg/L mg/L mg/L	2021-04-20 2021-04-20 2021-04-20 2021-04-20 2021-04-19	
Alkalinity, Phenolphthalein (as CaCO3) Alkalinity, Bicarbonate (as CaCO3) Alkalinity, Carbonate (as CaCO3) Alkalinity, Hydroxide (as CaCO3) Ammonia, Total (as N) BOD, 5-day Carbonaceous	< 1.0 < 1.0 < 1.0 < 1.0 < 0.050 < 9.2	1.0 1.0 1.0 1.0 0.050 2.0 0.050	mg/L mg/L mg/L mg/L mg/L mg/L	2021-04-20 2021-04-20 2021-04-20 2021-04-20 2021-04-19 2021-04-21	HT2
Alkalinity, Phenolphthalein (as CaCO3) Alkalinity, Bicarbonate (as CaCO3) Alkalinity, Carbonate (as CaCO3) Alkalinity, Hydroxide (as CaCO3) Ammonia, Total (as N) BOD, 5-day Carbonaceous Nitrogen, Total Kjeldahl	< 1.0 < 1.0 < 1.0 < 1.0 < 0.050 < 9.2 < 0.050	1.0 1.0 1.0 1.0 0.050 2.0 0.050	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	2021-04-20 2021-04-20 2021-04-20 2021-04-20 2021-04-19 2021-04-21 2021-04-20	HT2

## 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	



**REPORTED TO** Lake Country, District of (Wastewater)

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Analyte	Result	RL Units	Analyzed	Qualifier
Allaryto	rtoouit	ILE OIIILO	Analyzou	Qualifici

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	
dicrobiological 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)

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Analysis Description	Method Ref.	Technique A	ccredited	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 Ad	oid) ✓	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.



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

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

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

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B1D1436									
Blank (B1D1436-BLK1)			Prepared	d: 2021-04-1	I6, Analyze	d: 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	d: 2021-04-1	I6, Analyze	d: 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			
Blank (B1D1498-BLK1) BOD, 5-day Carbonaceous	< 2.0	2.0 mg/L	Prepared	d: 2021-04-1	I6, Analyze	ed: 2021-	04-21		
LCS (B1D1498-BS1)	<b>\ 2.0</b>	2.0 Hig/L	Prepared	d: 2021-04-1	I6. Analvze	d: 2021-	04-21		
BOD, 5-day Carbonaceous	196	76.4 mg/L	180		109	85-115			
General Parameters, Batch B1D1609									
Blank (B1D1609-BLK1)			Prepared	d: 2021-04-1	19, Analyze	d: 2021-	04-19		
Phosphorus, Total (as P)	< 0.0050	0.0050 mg/L							
Blank (B1D1609-BLK2)			Prepared	d: 2021-04-1	19, Analyze	d: 2021-	04-19		
Phosphorus, Total (as P)	< 0.0050	0.0050 mg/L							
LCS (B1D1609-BS1)			Prepared	d: 2021-04-1	19, Analyze	d: 2021-	04-19		
Phosphorus, Total (as P)	0.109	0.0050 mg/L	0.100		109	85-115			

General Parameters, Batch B1D1636

LCS (B1D1609-BS2) Phosphorus, Total (as P)

0.100

0.0050 mg/L

0.109

Prepared: 2021-04-19, Analyzed: 2021-04-19

85-115



<b>PROJECT</b> F	ake Country, Distr Final Effluent- PE14	•	iter)			WORK (		21D <sup>-</sup> 2021	1659 -04-22	12:12
Analyte		Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters,	Batch B1D1636, Co	ntinued								
Blank (B1D1636-BLK	1)			Prepared	: 2021-04-19	, Analyzed	l: 2021-0	4-19		
Ammonia, Total (as N)		< 0.050	0.050 mg/L	·						
Blank (B1D1636-BLK	2)			Prepared	: 2021-04-19	, Analyzed	l: 2021-0	4-19		
Ammonia, Total (as N)	•	< 0.050	0.050 mg/L	•		·				
Blank (B1D1636-BLK	3)			Prepared	: 2021-04-19	. Analvzec	l: 2021-0	4-19		
Ammonia, Total (as N)	-,	< 0.050	0.050 mg/L			, <b>,</b>				
LCS (B1D1636-BS1)				Prenared	: 2021-04-19	Analyzeo	I· 2021 <u>-</u> 0	4-19		
Ammonia, Total (as N)		0.961	0.050 mg/L	1.00	. 2021 04 10	96	90-115	7 10		
		0.001	0.000g/_		. 2021 04 10			4.10		
LCS (B1D1636-BS2) Ammonia, Total (as N)		0.936	0.050 mg/L	1.00	: 2021-04-19	, Analyzed	90-115	7-18		
		0.930	0.030 Hig/L							
LCS (B1D1636-BS3)				· '	: 2021-04-19	•		4-19		
Ammonia, Total (as N)		0.943	0.050 mg/L	1.00		94	90-115			
Blank (B1D1665-BLK Nitrogen, Total Kjeldahl	1)	< 0.050	0.050 mg/L	Prepared	: 2021-04-19	, Analyzed	l: 2021-0	4-20		
LCS (B1D1665-BS1)				Prepared	: 2021-04-19	, Analyzed	l: 2021-0	4-20		
Nitrogen, Total Kjeldahl		1.12	0.050 mg/L	1.00		112	85-115			
Nitrogen, Total Kjeldahl  General Parameters,  Blank (B1D1708-BLK		< 2.0	0.050 mg/L	1.00	: 2021-04-20	112	85-115			
Nitrogen, Total Kjeldahl  General Parameters,  Blank (B1D1708-BLK  Solids, Total Suspended	1)		·	1.00	: 2021-04-20	112 , Analyzed	85-115 I: 2021-0	4-20		
Nitrogen, Total Kjeldahl  General Parameters,  Blank (B1D1708-BLK Solids, Total Suspended Blank (B1D1708-BLK	1)	< 2.0	2.0 mg/L	1.00		112 , Analyzed	85-115 I: 2021-0	4-20		
Nitrogen, Total Kjeldahl  General Parameters,  Blank (B1D1708-BLK Solids, Total Suspended Blank (B1D1708-BLK Solids, Total Suspended	1)		·	1.00 Prepared Prepared	: 2021-04-20	, Analyzed	85-115 I: 2021-0	4-20 4-20		
Nitrogen, Total Kjeldahl  General Parameters,  Blank (B1D1708-BLK Solids, Total Suspended Blank (B1D1708-BLK Solids, Total Suspended LCS (B1D1708-BS1)	1)	< 2.0 < 2.0	2.0 mg/L 2.0 mg/L	1.00 Prepared Prepared	: 2021-04-20	, Analyzed , Analyzed , Analyzed	85-115 d: 2021-0 d: 2021-0 d: 2021-0	4-20 4-20		
Nitrogen, Total Kjeldahl  General Parameters,  Blank (B1D1708-BLK Solids, Total Suspended  Blank (B1D1708-BLK Solids, Total Suspended  LCS (B1D1708-BS1) Solids, Total Suspended	1)	< 2.0	2.0 mg/L	1.00 Prepared Prepared Prepared 100	: 2021-04-20 : 2021-04-20 : 2021-04-20	, Analyzed , Analyzed , Analyzed , Analyzed	85-115 d: 2021-C d: 2021-C d: 2021-C 85-115	4-20 4-20 4-20		
Nitrogen, Total Kjeldahl  General Parameters,  Blank (B1D1708-BLK Solids, Total Suspended Blank (B1D1708-BLK Solids, Total Suspended LCS (B1D1708-BS1) Solids, Total Suspended LCS (B1D1708-BS2)	1)	< 2.0 < 2.0 89.0	2.0 mg/L  2.0 mg/L  10.0 mg/L	Prepared Prepared 100 Prepared	: 2021-04-20	, Analyzed , Analyzed , Analyzed , Analyzed	85-115 I: 2021-C I: 2021-C 85-115 I: 2021-C	4-20 4-20 4-20		
Nitrogen, Total Kjeldahl  General Parameters,  Blank (B1D1708-BLK Solids, Total Suspended  Blank (B1D1708-BLK Solids, Total Suspended  LCS (B1D1708-BS1) Solids, Total Suspended	1)	< 2.0 < 2.0	2.0 mg/L 2.0 mg/L	1.00 Prepared Prepared Prepared 100	: 2021-04-20 : 2021-04-20 : 2021-04-20	, Analyzed , Analyzed , Analyzed , Analyzed	85-115 d: 2021-C d: 2021-C d: 2021-C 85-115	4-20 4-20 4-20		
Nitrogen, Total Kjeldahl  General Parameters,  Blank (B1D1708-BLK Solids, Total Suspended Blank (B1D1708-BLK Solids, Total Suspended LCS (B1D1708-BS1) Solids, Total Suspended LCS (B1D1708-BS2)	2)	< 2.0 < 2.0 89.0	2.0 mg/L  2.0 mg/L  10.0 mg/L	Prepared Prepared 100 Prepared	: 2021-04-20 : 2021-04-20 : 2021-04-20	, Analyzed , Analyzed , Analyzed , Analyzed	85-115 I: 2021-C I: 2021-C 85-115 I: 2021-C	4-20 4-20 4-20		
Nitrogen, Total Kjeldahl  General Parameters,  Blank (B1D1708-BLK Solids, Total Suspended Blank (B1D1708-BLK Solids, Total Suspended LCS (B1D1708-BS1) Solids, Total Suspended LCS (B1D1708-BS2) Solids, Total Suspended General Parameters,	1) 2) Batch B1D1793	< 2.0 < 2.0 89.0	2.0 mg/L  2.0 mg/L  10.0 mg/L	Prepared Prepared 100 Prepared 100 Prepared	: 2021-04-20 : 2021-04-20 : 2021-04-20 : 2021-04-20	, Analyzed , Analyzed , Analyzed , Analyzed 93	85-115 d: 2021-0 d: 2021-0 85-115 d: 2021-0 85-115	4-20 4-20 4-20 4-20		
Nitrogen, Total Kjeldahl  General Parameters,  Blank (B1D1708-BLK Solids, Total Suspended Blank (B1D1708-BLK Solids, Total Suspended LCS (B1D1708-BS1) Solids, Total Suspended LCS (B1D1708-BS2) Solids, Total Suspended General Parameters, Blank (B1D1793-BLK	1) 2) Batch B1D1793	< 2.0 < 2.0 89.0 93.0	2.0 mg/L  2.0 mg/L  10.0 mg/L	Prepared Prepared 100 Prepared 100 Prepared	: 2021-04-20 : 2021-04-20 : 2021-04-20	, Analyzed , Analyzed , Analyzed , Analyzed 93	85-115 d: 2021-0 d: 2021-0 85-115 d: 2021-0 85-115	4-20 4-20 4-20 4-20		
Nitrogen, Total Kjeldahl  General Parameters,  Blank (B1D1708-BLK Solids, Total Suspended Blank (B1D1708-BLK Solids, Total Suspended LCS (B1D1708-BS1) Solids, Total Suspended LCS (B1D1708-BS2) Solids, Total Suspended General Parameters,	1) 2)  Batch B1D1793 1)	< 2.0 < 2.0 89.0	2.0 mg/L  2.0 mg/L  10.0 mg/L	Prepared Prepared 100 Prepared 100 Prepared	: 2021-04-20 : 2021-04-20 : 2021-04-20 : 2021-04-20	, Analyzed , Analyzed , Analyzed , Analyzed 93	85-115 d: 2021-0 d: 2021-0 85-115 d: 2021-0 85-115	4-20 4-20 4-20 4-20		
Nitrogen, Total Kjeldahl  General Parameters, Blank (B1D1708-BLK Solids, Total Suspended Blank (B1D1708-BLK Solids, Total Suspended LCS (B1D1708-BS1) Solids, Total Suspended LCS (B1D1708-BS2) Solids, Total Suspended General Parameters, Blank (B1D1793-BLK Alkalinity, Total (as CaCC Alkalinity, Phenolphthalei Alkalinity, Bicarbonate (a	Batch B1D1793  1)  03) in (as CaCO3) s CaCO3)	< 2.0 < 2.0 89.0 93.0 < 1.0 < 1.0 < 1.0	2.0 mg/L  2.0 mg/L  10.0 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L	Prepared Prepared 100 Prepared 100 Prepared	: 2021-04-20 : 2021-04-20 : 2021-04-20 : 2021-04-20	, Analyzed , Analyzed , Analyzed , Analyzed 93	85-115 d: 2021-0 d: 2021-0 85-115 d: 2021-0 85-115	4-20 4-20 4-20 4-20		
Nitrogen, Total Kjeldahl  General Parameters, Blank (B1D1708-BLK Solids, Total Suspended Blank (B1D1708-BLK Solids, Total Suspended LCS (B1D1708-BS1) Solids, Total Suspended LCS (B1D1708-BS2) Solids, Total Suspended General Parameters, Blank (B1D1793-BLK Alkalinity, Total (as CaCC Alkalinity, Phenolphthale Alkalinity, Bicarbonate (as	Batch B1D1793  1)  23)  in (as CaCO3)  s CaCO3)  CaCO3)	< 2.0 < 2.0 89.0 93.0 < 1.0 < 1.0 < 1.0 < 1.0	2.0 mg/L  2.0 mg/L  10.0 mg/L  10.0 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L	Prepared Prepared 100 Prepared 100 Prepared	: 2021-04-20 : 2021-04-20 : 2021-04-20 : 2021-04-20	, Analyzed , Analyzed , Analyzed , Analyzed 93	85-115 d: 2021-0 d: 2021-0 85-115 d: 2021-0 85-115	4-20 4-20 4-20 4-20		
Nitrogen, Total Kjeldahl  General Parameters, Blank (B1D1708-BLK Solids, Total Suspended Blank (B1D1708-BLK Solids, Total Suspended LCS (B1D1708-BS1) Solids, Total Suspended LCS (B1D1708-BS2) Solids, Total Suspended General Parameters, Blank (B1D1793-BLK Alkalinity, Total (as CaCC Alkalinity, Phenolphthalei Alkalinity, Bicarbonate (as Alkalinity, Carbonate (as Alkalinity, Hydroxide (as	Batch B1D1793  1)  D3) in (as CaCO3)	< 2.0 < 2.0 89.0 93.0 < 1.0 < 1.0 < 1.0	2.0 mg/L  2.0 mg/L  10.0 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L	Prepared Prepared 100 Prepared 100 Prepared	: 2021-04-20 : 2021-04-20 : 2021-04-20 : 2021-04-20	, Analyzed , Analyzed , Analyzed , Analyzed 93	85-115 d: 2021-0 d: 2021-0 d: 2021-0 85-115 d: 2021-0 85-115	4-20 4-20 4-20 4-20		
Nitrogen, Total Kjeldahl  General Parameters, Blank (B1D1708-BLK Solids, Total Suspended Blank (B1D1708-BS1) Solids, Total Suspended LCS (B1D1708-BS1) Solids, Total Suspended LCS (B1D1708-BS2) Solids, Total Suspended General Parameters, Blank (B1D1793-BLK Alkalinity, Total (as CaCC Alkalinity, Phenolphthale (as Alkalinity, Hydroxide (as Blank (B1D1793-BLK	Batch B1D1793  1)  03) iin (as CaCO3) s CaCO3) CaCO3) CaCO3)	< 2.0 < 2.0 < 89.0  93.0  < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0	2.0 mg/L  2.0 mg/L  10.0 mg/L  10.0 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L	Prepared Prepared 100 Prepared 100 Prepared	: 2021-04-20 : 2021-04-20 : 2021-04-20 : 2021-04-20	, Analyzed , Analyzed , Analyzed , Analyzed 93	85-115 d: 2021-0 d: 2021-0 d: 2021-0 85-115 d: 2021-0 85-115	4-20 4-20 4-20 4-20		
Nitrogen, Total Kjeldahl  General Parameters, Blank (B1D1708-BLK Solids, Total Suspended Blank (B1D1708-BLK Solids, Total Suspended LCS (B1D1708-BS1) Solids, Total Suspended LCS (B1D1708-BS2) Solids, Total Suspended General Parameters, Blank (B1D1793-BLK Alkalinity, Total (as CaCC Alkalinity, Phenolphthalei Alkalinity, Garbonate (as Alkalinity, Hydroxide (as Blank (B1D1793-BLK Alkalinity, Total (as CaCC	Batch B1D1793  1)  03) in (as CaCO3)	< 2.0 < 2.0 < 89.0  93.0  < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.1.0 < 1.0 < 1.0	2.0 mg/L  2.0 mg/L  10.0 mg/L  10.0 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L	Prepared Prepared 100 Prepared 100 Prepared	: 2021-04-20 : 2021-04-20 : 2021-04-20 : 2021-04-20	, Analyzed , Analyzed , Analyzed , Analyzed 93	85-115 d: 2021-0 d: 2021-0 d: 2021-0 85-115 d: 2021-0 85-115	4-20 4-20 4-20 4-20		
Nitrogen, Total Kjeldahl  General Parameters, Blank (B1D1708-BLK Solids, Total Suspended Blank (B1D1708-BLK Solids, Total Suspended LCS (B1D1708-BS1) Solids, Total Suspended LCS (B1D1708-BS2) Solids, Total Suspended CS (B1D1708-BS2) Solids, Total Suspended General Parameters, Blank (B1D1793-BLK Alkalinity, Total (as CaCC Alkalinity, Carbonate (as Alkalinity, Hydroxide (as Blank (B1D1793-BLK Alkalinity, Total (as CaCC Alkalinity, Total (as CaCC Alkalinity, Phenolphthalei	Batch B1D1793  1)  03) in (as CaCO3)	< 2.0 < 2.0 < 89.0  93.0  < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0	2.0 mg/L  2.0 mg/L  10.0 mg/L  10.0 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L	Prepared Prepared 100 Prepared 100 Prepared	: 2021-04-20 : 2021-04-20 : 2021-04-20 : 2021-04-20	, Analyzed , Analyzed , Analyzed , Analyzed 93	85-115 d: 2021-0 d: 2021-0 d: 2021-0 85-115 d: 2021-0 85-115	4-20 4-20 4-20 4-20		
Nitrogen, Total Kjeldahl  General Parameters, Blank (B1D1708-BLK Solids, Total Suspended Blank (B1D1708-BLK Solids, Total Suspended LCS (B1D1708-BS1) Solids, Total Suspended LCS (B1D1708-BS2) Solids, Total Suspended General Parameters, Blank (B1D1793-BLK Alkalinity, Total (as CaCC Alkalinity, Phenolphthalei Alkalinity, Garbonate (as Alkalinity, Hydroxide (as Blank (B1D1793-BLK Alkalinity, Total (as CaCC	Batch B1D1793  1)  2)  (1)  (2)  (3)  (4)  (5)  (6)  (7)  (7)  (7)  (8)  (8)  (9)  (9)  (9)  (9)  (9)  (9	< 2.0 < 2.0 < 89.0  93.0  < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.1.0 < 1.0 < 1.0	2.0 mg/L  2.0 mg/L  10.0 mg/L  10.0 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L	Prepared Prepared 100 Prepared 100 Prepared	: 2021-04-20 : 2021-04-20 : 2021-04-20 : 2021-04-20	, Analyzed , Analyzed , Analyzed , Analyzed 93	85-115 d: 2021-0 d: 2021-0 d: 2021-0 85-115 d: 2021-0 85-115	4-20 4-20 4-20 4-20		



REPORTED TO Lake Country, Dis PROJECT Final Effluent- PE	strict of (Wastewa 14651	ter)			WORK REPOR	ORDER TED			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	l: 2021-04-2	21, Analyze	d: 2021-0	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	l: 2021-04-2	20, Analyze	d: 2021-0	04-20		
Alkalinity, Total (as CaCO3)	93.5	1.0 mg/L	100		94	80-120			
LCS (B1D1793-BS2)			Prepared	l: 2021-04-2	20, Analyze	d: 2021-0	04-20		
Alkalinity, Total (as CaCO3)	96.4	1.0 mg/L	100		96	80-120			
LCS (B1D1793-BS3)			Prepared	l: 2021-04-2	21, Analyze	d: 2021-0	04-21		
Alkalinity, Total (as CaCO3)	96.4	1.0 mg/L	100		96	80-120			
Reference (B1D1793-SRM1)			Prepared	l: 2021-04-2	20, Analyze	d: 2021-0	04-20		
рН	6.99	0.10 pH units	7.01		100	98-102			
Reference (B1D1793-SRM2)			Prepared	l: 2021-04-2	20, Analyze	d: 2021-0	04-20		
рН	6.99	0.10 pH units	7.01		100	98-102			
Reference (B1D1793-SRM3)			Prepared	I: 2021-04-2	21, Analyze	d: 2021-0	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

PO NUMBER 104395-10-9007
PROJECT Raw Influent- PE14651
PROJECT INFO Lake Country WWTP

WORK ORDER 21D1657

**RECEIVED / TEMP** 2021-04-15 11:08 / 14°C **REPORTED** 2021-04-22 15:52

**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



We've Got Chemistry



Ahead of the Curve



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.

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.

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 HECT



**REPORTED TO** Lake Country, District of (Wastewater)

PROJECT Raw Influent- PE14651

WORK ORDER REPORTED

21D1657 2021-04-22 15:52

Analyte	Result	RL	Units	Analyzed	Qualifie
Raw Influent (E233627) (21D1657-01)   Mar	trix: Wastewater   Sample	d: 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)

PROJECT Raw Influent- PE14651

WORK ORDER REPORTED 21D1657 2021-04-22 15:52

Analysis Description	Method Ref.	Technique A	ccredited	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 Ac	id) ✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	<b>√</b>	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.



Ammonia, Total (as N)

## **APPENDIX 2: QUALITY CONTROL RESULTS**

**REPORTED TO** Lake Country, District of (Wastewater)

PROJECT Raw Influent- PE14651

WORK ORDER REPORTED

21D1657 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	l: 2021-04-1	16, Analyze	d: 2021-0	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	l: 2021-04-1	16, Analyze	d: 2021-0	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	l: 2021-04-1	17, Analyze	d: 2021-0	04-22		
BOD, 5-day	< 2.0	2.0 mg/L	-		-				
LCS (B1D1497-BS1)			Prepared	l: 2021-04-1	17, Analyze	d: 2021-0	04-22		
BOD, 5-day	163	58.3 mg/L	180		91	85-115			
General Parameters, Batch B1D1498									
Blank (B1D1498-BLK1)			Prepared	l: 2021-04-1	16, Analyze	d: 2021-0	04-21		
BOD, 5-day Carbonaceous	< 2.0	2.0 mg/L			-				
LCS (B1D1498-BS1)			Prepared	l: 2021-04-1	16, Analyze	d: 2021-0	04-21		
BOD, 5-day Carbonaceous	196	76.4 mg/L	180		109	85-115			
General Parameters, Batch B1D1636									
Blank (B1D1636-BLK1)			Prepared	I: 2021-04-1	19, Analyze	d: 2021-0	04-19		
Ammonia, Total (as N)	< 0.050	0.050 mg/L	· · · · · · · · · · · · · · · · · · ·						
Blank (B1D1636-BLK2)			Prepared	l: 2021-04-1	19, Analyze	d: 2021-0	04-19		
Ammonia, Total (as N)	< 0.050	0.050 mg/L	•		-				
Blank (B1D1636-BLK3)			Prepared	l: 2021-04-1	19, Analyze	d: 2021-0	04-19		

0.050 mg/L

< 0.050



REPORTED TO Lake Country, Dis PROJECT Raw Influent- PE1	•	ater)			WORK REPOR	ORDER TED		1657 1-04-22	15:52
Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1D1636, C	ontinued								
LCS (B1D1636-BS1)			Prepared	I: 2021-04-1	9, Analyze	d: 2021-0	4-19		
Ammonia, Total (as N)	0.961	0.050 mg/L	1.00		96	90-115			
LCS (B1D1636-BS2)			Prepared	I: 2021-04-1	9, Analyze	d: 2021-0	4-19		
Ammonia, Total (as N)	0.936	0.050 mg/L	1.00		94	90-115			
LCS (B1D1636-BS3)			Prepared	I: 2021-04-1	9, Analyze	d: 2021-0	4-19		
Ammonia, Total (as N)	0.943	0.050 mg/L	1.00		94	90-115			
General Parameters, Batch B1D1665									
Blank (B1D1665-BLK1)			Prepared	I: 2021-04-1	9, Analyze	d: 2021-0	4-20		
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							
LCS (B1D1665-BS1)			Prepared	I: 2021-04-1	9, Analyze	d: 2021-0	4-20		
Nitrogen, Total Kjeldahl	1.12	0.050 mg/L	1.00		112	85-115			
General Parameters, Batch B1D1698									
Blank (B1D1698-BLK1)			Prepared	I: 2021-04-1	9, Analyze	d: 2021-0	4-20		
Phosphorus, Total (as P)	< 0.0050	0.0050 mg/L							
Blank (B1D1698-BLK2)			Prepared	I: 2021-04-1	9, Analyze	d: 2021-0	4-20		
Phosphorus, Total (as P)	< 0.0050	0.0050 mg/L							
LCS (B1D1698-BS1)				I: 2021-04-1			4-20		
Phosphorus, Total (as P)	0.102	0.0050 mg/L	0.100		102	85-115			
LCS (B1D1698-BS2)				I: 2021-04-1			4-20		
Phosphorus, Total (as P)	0.100	0.0050 mg/L	0.100		100	85-115			
General Parameters, Batch B1D1708  Blank (B1D1708-BLK1)			Prepared	I: 2021-04-2	20. Analyze	ed: 2021-0	4-20		
Solids, Total Suspended	< 2.0	2.0 mg/L			<u>-, , ,                                </u>				
Blank (B1D1708-BLK2)			Prepared	I: 2021-04-2	20, Analyze	d: 2021-0	4-20		
Solids, Total Suspended	< 2.0	2.0 mg/L	•						
LCS (B1D1708-BS1)			Prepared	I: 2021-04-2	20, Analyze	ed: 2021-0	4-20		
Solids, Total Suspended	89.0	10.0 mg/L	100		89	85-115			
LCS (B1D1708-BS2)			Prepared	I: 2021-04-2	20, Analyze	ed: 2021-0	4-20		
Solids, Total Suspended	93.0	10.0 mg/L	100		93	85-115			
General Parameters, Batch B1D1895									
Blank (B1D1895-BLK1)			Prepared	I: 2021-04-2	22, Analyze	ed: 2021-0	4-22		
Alkalinity, Total (as CaCO3)	< 1.0	1.0 mg/L							
Alkalinity, Phenolphthalein (as CaCO3)  Alkalinity, Bicarbonate (as CaCO3)	< 1.0 < 1.0	1.0 mg/L 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	I: 2021-04-2		d: 2021-0	4-22		
Alkalinity, Total (as CaCO3)	102	1.0 mg/L	100		102	80-120			



REPORTED TO PROJECT	Lake Country, Dist Raw Influent- PE1	`	ter)			WORK REPOR	ORDER RTED		1657 -04-22	15:52
Analyte		Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameter  Duplicate (B1D189	rs, <i>Batch B1D1895, Co</i> 95-DUP1)		ce: 21D1657-01	Prepared	l: 2021-04-2	22. Analyze	ed: 2021-0	)4-22		
Alkalinity, Total (as Ca	•	378	1.0 mg/L		386	, · · · · · · · · · · · · · · · · · ·		2	10	
Alkalinity, Phenolphth	,	< 1.0	1.0 mg/L		< 1.0				10	
Alkalinity, Bicarbonate	, ,	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	
рН		7.49	0.10 pH units		7.53			< 1	4	
Reference (B1D18	95-SRM1)			Prepared	l: 2021-04-2	22, Analyze	ed: 2021-0	)4-22		
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

PO NUMBER 104395-10-9007
PROJECT Final Effluent- PE14651
PROJECT INFO Lake Country WWTP

WORK ORDER 21E0424

**RECEIVED / TEMP** 2021-05-04 14:30 / 11°C **REPORTED** 2021-05-11 15:10

**COC NUMBER** 44320.28967

#### Introduction:

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Ahead of the Curve



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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 M what



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  Nitrate (as N) 0.160 0.010 mg/L 2021-05-06  Nitrate (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  Nitrogen, Total (as CaCO3) 1.95 1.0 mg/L 2021-05-07  Alkalinity, Pentophythaliani (as CaCO3) < 1.0 1.0 mg/L 2021-05-07  Alkalinity, Pentophythaliani (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, 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  Alkalinity, Carbonate (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, Carbonate (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, 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  Alkalinity, Carbonate (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  Alkalinity, Hydroxide (as CaCO3) < 1.0 0.00 mg/L 2021-05-07  BOO, 5-day Carbonaceous 5.9 2.0 mg/L 2021-05-07  BOO, 5-day Carbonaceous 6.0 6.0 0.00 mg/L 2021-05-07  BOO, 5-day Carbonaceous 6.0 6.0 0.00 mg/L 2021-05-06  BOO, 5-day Carbonaceous 6.0 6.0 0.00 mg/L 2021-05-06  BOO, 5-day Carbonaceous 6.0 0.00 mg/L 2021-05-06  BOO, 5-da	REPORTED TO PROJECT	Lake Country, District of Final Effluent- PE1465	,		WORK ORDER REPORTED	21E0424 2021-05-1	1 15:10
Chloride	Analyte		Result	RL	Units	Analyzed	Qualifier
Chloride	Final Effluent (E2	233626) (21E0424-01)   M	atrix: Wastewater   Sample	ed: 2021-05-04 10:05			
Nitrate (as N)	Anions						
Nitride (as N)	Chloride		97.7	0.10	ma/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 N/A    **Calculated Parameters**  **Nitrate+Nitrite (as N) 1.38 0.0100 mg/L N/A    **Nitrogen, Total 4.44 0.100 mg/L N/A    **Nitrogen, Total (as CaCO3) 195 1.0 mg/L 2021-05-07    **Alkalinity, Total (as CaCO3) 195 1.0 mg/L 2021-05-07    **Alkalinity, Bicarbonate (as CaCO3) 195 1.0 mg/L 2021-05-07    **Alkalinity, Bicarbonate (as CaCO3) 195 1.0 mg/L 2021-05-07    **Alkalinity, Bicarbonate (as CaCO3) 195 1.0 mg/L 2021-05-07    **Alkalinity, Carbonate (as CaCO3) 195 1.0 mg/L 2021-05-07    **Alkalinity, Carbonate (as CaCO3) 195 1.0 mg/L 2021-05-07    **Alkalinity, Alkalinity, Alkalinity							
Phosphate (as P)							
Nitrate + Nitrite (as N)							
Nitrogen, Total   4.44	Calculated Parame	eters					
Alkalinity, Total (as CaCO3)	Nitrate+Nitrite (as	N)	1.38	0.0100	mg/L	N/A	
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, 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     Alkalinity, Hydroxide (as CaCO3)   <1.0   1.0 mg/L   2021-05-07     Ammonia, Total (as N)   0.901   0.050 mg/L   2021-05-01     Ammonia, Total (as N)   0.901   0.050 mg/L   2021-05-01     Nitrogen, Total Kjeldahl   3.06   0.050 mg/L   2021-05-11     Nitrogen, Total Kjeldahl   3.06   0.050 mg/L   2021-05-07     Phosphorus, Total (as P)   0.528   0.0050 mg/L   2021-05-07     Phosphorus, Total (as P)   0.528   0.0050 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     Coliforms, Fecal   61300   1 MPN/100 mL   2021-05-05     Coliforms, Fecal   61300   1 MPN/100 mL   2021-05-06     Nitrate (as N)   1.23   0.010 mg/L   2021-05-06     Nitrate (as N)   1.23   0.010 mg/L   2021-05-06     Phosphate (as P)   0.0129   0.0050 mg/L   2021-05-06     Phosphate (as P)   0.166   0.010 mg/L   2021-05-06     Phosphate (as P)   0.129   0.0050 mg/L   2021-05-06     Phosphate (as N)   1.40   0.010 mg/L   2021-05-06     Phosphate (as N)   1.40   0.010 mg/L   2021-05-06     Phosphate (as N)   1.40   0.010 mg/L   N/A     Nitrogen, Total   4.61   0.10 mg/L   2021-05-07     Alkalinity, Phenolphthalein (as CaCO3)   196   1.0 mg/L   2021-05-07     Alkalinity, Phenolphthalein (as CaCO3)   196   1.0 mg/L   2021-05-07     Alkalinity, Carbonate (as CaCO3)   196   1.0 mg/L   2021-05-07     Alkalinity, Carbonate (as CaCO3)   196   1.0 mg/L   2021-05-07     Alkalinity, Carbonate (as CaCO3)   1.0 mg/L   2021-05-07     Alkalinity, Carbonate (as CaCO3)   1.0 mg/L   2021-05-07     Alkalinity, Carbonate (as CaCO3)   1.0 mg/L   2021	Nitrogen, Total		4.44	0.100	mg/L	N/A	
Alkalinity, Phenolphthalein (as CaCO3)	General Parameter	's					
Alkalinity, Phenolphthalein (as CaCO3)	Alkalinity Total (as	s CaCO3)	195	1.0	ma/l	2021-05-07	
Alkalinity, Bicarbonate (as CaCO3)		· · · · · · · · · · · · · · · · · · ·					
Alkalinity, Carbonate (as CaCO3)   < 1.0   1.0   mg/L   2021-05-07							
Alkalinity, Hydroxide (as CaCO3)							
Ammonia, Total (as N)		,					
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		, ,					
Nitrogen, Total Kjeldahl   3.06   0.050 mg/L   2021-05-10     ph   7.72   0.10 ph units   2021-05-07   HT     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	<u>_</u>	· · · · · · · · · · · · · · · · · · ·					
pH         7.72         0.10 pH units         2021-05-07 pH         HT           Phosphorus, Total (as P)         0.528         0.0050 mg/L         2021-05-06         2021-05-06         2021-05-06         2021-05-08         2021-05-08         2021-05-08         2021-05-08         2021-05-08         2021-05-08         2021-05-08         2021-05-08         2021-05-08         2021-05-08         2021-05-08         2021-05-05         2021-05-05         2021-05-05         2021-05-05         2021-05-05         2021-05-05         2021-05-05         2021-05-05         2021-05-05         2021-05-05         2021-05-05         2021-05-05         2021-05-05         2021-05-05         2021-05-05         2021-05-05         2021-05-05         2021-05-05         2021-05-05         2021-05-05         2021-05-05         2021-05-05         2021-05-05         2021-05-06         2021-05-06         2021-05-06         2021-05-06         2021-05-06         2021-05-06         2021-05-06         2021-05-06         2021-05-06         2021-05-06         2021-05-06         2021-05-06         2021-05-06         2021-05-06         2021-05-06         2021-05-06         2021-05-06         2021-05-06         2021-05-06         2021-05-06         2021-05-06         2021-05-06         2021-05-06         2021-05-06         2021-05-06         2021-05-06         2021-05-06							
Phosphorus, Total (as P)   0.528   0.0050 mg/L   2021-05-06							HT2
Solids, Total Suspended   7.8   2.0 mg/L   2021-05-08		I (as P)			•		
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)         4.96         1.0 mg/L         2021-05-07           Alkalinity, Bicarbonate (as CaCO3)         4.96         1.0 mg/L         2021-05-07           Alkalinity, Carbonate (as CaCO3)         4.10         1.0 mg/L         2021-05-07		` '					
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, Bicarbonate (as CaCO3) 4.0 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, Carbonate (as CaCO3) < 1.0 1.0 mg/L 2021-05-07							
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, 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, Carbonate (as CaCO3) < 1.0 1.0 mg/L 2021-05-07	_		> 242000	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, Bicarbonate (as CaCO3)         196         1.0 mg/L         2021-05-07           Alkalinity, Carbonate (as CaCO3)         196         1.0 mg/L         2021-05-07           Alkalinity, Carbonate (as CaCO3)         < 1.0							
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		24-02)   Matrix: Water   S	Sampled: 2021-05-04 10:05				
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			103				
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			1.23				
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							
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	Phosphate (as P)		0.0129	0.0050	mg/L	2021-05-06	
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	Calculated Parame	eters					
General Parameters         Alkalinity, Total (as CaCO3)       196       1.0 mg/L       2021-05-07         Alkalinity, Phenolphthalein (as CaCO3)       < 1.0	Nitrate+Nitrite (as	N)	1.40	0.0100	mg/L	N/A	
Alkalinity, Total (as CaCO3)       196       1.0 mg/L       2021-05-07         Alkalinity, Phenolphthalein (as CaCO3)       < 1.0	Nitrogen, Total		4.61	0.100	mg/L	N/A	
Alkalinity, Phenolphthalein (as CaCO3)       < 1.0	General Parameter	rs					
Alkalinity, Phenolphthalein (as CaCO3)       < 1.0	Alkalinity, Total (as	s CaCO3)	196	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			2021-05-07	
Alkalinity, Carbonate (as CaCO3) < 1.0 1.0 mg/L 2021-05-07			196				
,, ,			< 1.0			2021-05-07	



REPORTED TO Lake Country, District of PROJECT Final Effluent- PE1465	•		WORK ORDER REPORTED	21E0424 2021-05-	11 15:10
Analyte	Result	RL	Units	Analyzed	Qualifie
Duplicate (21E0424-02)   Matrix: Water   \$	Sampled: 2021-05-04 10:05, Contin	ued			
General Parameters, Continued					
Ammonia, Total (as N)	0.897	0.050	mg/L	2021-05-07	
BOD, 5-day Carbonaceous	5.6		mg/L	2021-05-11	
Nitrogen, Total Kjeldahl	3.21		mg/L	2021-05-10	
pH	7.74		pH units	2021-05-07	HT2
Phosphorus, Total (as P)	0.525	0.0050	·	2021-05-06	
Solids, Total Suspended	9.6		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		mg/L	2021-05-06	
Nitrate (as N)	< 0.010	0.010		2021-05-06	
Nitrite (as N)	< 0.010	0.010		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		mg/L	2021-05-07	
Alkalinity, Bicarbonate (as CaCO3)	< 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	r   Sampled: 2021-05-04 10:05				
Anions					
		0.10			



**REPORTED TO** Lake Country, District of (Wastewater)

PROJECT Final Effluent- PE14651

WORK ORDER REPORTED 21E0424

2021-05-11 15:10

Analyte	Result	RL	Units	Analyzed	Qualifie
Travel Blank (21E0424-04)   Matrix: Water	Sampled: 2021-05-04 1	0:05, 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)

PROJECT Final Effluent- PE14651

WORK ORDER REPORTED

Persulfate Digestion / Automated Colorimetry (Ascorbic Acid) ✓

21E0424 2021-05-11 15:10

Kelowna

Kelowna

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

Gravimetry (Dried at 103-105C)

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

SM 4500-P B.5\* (2011)

/ SM 4500-P F (2017)

SM 2540 D\* (2017)

#### **Glossary of Terms:**

Phosphorus, Total in Water

Solids, Total Suspended in

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.



**REPORTED TO** Lake Country, District of (Wastewater)

Final Effluent- PE14651 **PROJECT** 

**WORK ORDER REPORTED** 

21E0424 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	Qualifie
Anions, Batch B1E0340									
Blank (B1E0340-BLK1)			Prepared	d: 2021-05-0	05, Analyze	d: 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	d: 2021-05-0	05, Analyze	d: 2021-0	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			
Blank (B1E0459-BLK1) Phosphorus, Total (as P)	< 0.0050	0.0050 mg/L	Troparoc	d: 2021-05-0	, , , , , , , , , , , , , , , , , , ,	u. 2021	,		
Blank (B1E0459-BLK2)	10.0000	0.0000 mg/L	Prenared	d: 2021-05-0	05 Analyze	d. 2021-i	n5-06		
Phosphorus, Total (as P)	< 0.0050	0.0050 mg/L	Тторигос	2. 2021 00 (	50, 7 thaty20	u. 2021 (	<del>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</del>		
LCS (B1E0459-BS1)			Prepared	d: 2021-05-0	)5, Analyze	d: 2021-(	05-06		
Phosphorus, Total (as P)	0.106	0.0050 mg/L	0.100		106	85-115			
LCS (B1E0459-BS2)			Prepared	d: 2021-05-0	05, Analyze	d: 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)			Prenareo	d: 2021-05-(	06 Analyze	d· 2021 <b>-</b> (	N <b>5-</b> 11		
BOD, 5-day Carbonaceous	< 2.0	2.0 mg/L	, roparoc	0_ 1 00 0	20,71101920				
LCS (B1E0491-BS1)		2.09,2	Prepared	d: 2021-05-0	06. Analyze	d: 2021-0	)5-11		
BOD, 5-day Carbonaceous	184	2.0 mg/L	180		102	85-115			
DOD, J-uay Calbullaceuus	104	Z.U IIIY/L	100		102	00-110			

General Parameters, Batch B1E0603



REPORTED TO Lake Country, Dist PROJECT Final Effluent- PE1		•	ter)			WORK REPOR	ORDER RTED	21E0 2021	0424  -05-11	15:10
Analyte		Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters	s, Batch B1E0603, Co	ntinued								
Blank (B1E0603-Bl	_K1)			Prepared	l: 2021-05-0	6, Analyze	ed: 2021-0	5-10		
Nitrogen, Total Kjelda	hl	< 0.050	0.050 mg/L							
Blank (B1E0603-Bl	_K2)			Prepared	l: 2021-05-0	6, Analyze	ed: 2021-0	5-10		
Nitrogen, Total Kjelda	hl	< 0.050	0.050 mg/L	· ·		<u> </u>				
LCS (B1E0603-BS1	1)			Prepared	l: 2021-05-0	6, Analyze	ed: 2021-0	5-10		
Nitrogen, Total Kjelda	•	1.06	0.050 mg/L	1.00		106	85-115			
LCS (B1E0603-BS2	)\			Prepared	l: 2021-05-0	6 Analyze	ed: 2021-0	5-10		
Nitrogen, Total Kjelda	*	1.06	0.050 mg/L	1.00	2021 00 0	106	85-115	- 10		
					l: 2021-05-0			F 10		
Duplicate (B1E060 Nitrogen, Total Kjelda	•	3.05	0.050 mg/L	Fiepaleu	3.06	o, Allalyze	eu. 2021-0	< 1	15	
									10	
Matrix Spike (B1E0	· · · · · · · · · · · · · · · · · · ·		ce: 21E0424-01		1: 2021-05-0			5-10		
Nitrogen, Total Kjelda	nl	7.07	0.200 mg/L	4.00	3.06	100	65-135			
General Parameters  Blank (B1E0622-Bl  Alkalinity, Total (as Ca	<b>_K1)</b> (CO3)	< 1.0	1.0 mg/L	Prepared	l: 2021-05-0	7, Analyze	ed: 2021-0	5-07		
Alkalinity, Phenolphthal Alkalinity, Bicarbonate		< 1.0 < 1.0	1.0 mg/L 1.0 mg/L							
Alkalinity, Carbonate (	· ,	< 1.0	1.0 mg/L							
Alkalinity, Hydroxide (	<u>'</u>	< 1.0	1.0 mg/L							
Blank (B1E0622-Bl	_K2)			Prepared	l: 2021-05-0	7, Analyze	ed: 2021-0	5-07		
Alkalinity, Total (as Ca		< 1.0	1.0 mg/L							
Alkalinity, Phenolphth		< 1.0	1.0 mg/L							
Alkalinity, Bicarbonate (	· '	< 1.0 < 1.0	1.0 mg/L 1.0 mg/L							
Alkalinity, Hydroxide (	<u>'</u>	< 1.0	1.0 mg/L							
LCS (B1E0622-BS1	l <b>)</b>			Prepared	l: 2021-05-0	7, Analyze	ed: 2021-0	5-07		
Alkalinity, Total (as Ca	iCO3)	106	1.0 mg/L	100		106	80-120			
LCS (B1E0622-BS2	2)			Prepared	l: 2021-05-0	7. Analyze	ed: 2021-0	5-07		
Alkalinity, Total (as Ca	·	107	1.0 mg/L	100		107	80-120			
Reference (B1E062	22-SRM1)			Prenared	l: 2021-05-0	7 Analyze	-d· 2021-0	5-07		
pH	Z-ORWII)	6.99	0.10 pH units	7.01	. 2021 00 0	100	98-102	0 07		
Reference (B1E062	22-SRM2)				l: 2021-05-0			5-07		
pH	Z-ORWZ)	6.99	0.10 pH units	7.01	. 2021 00 0	100	98-102	0 07		
General Parameters Blank (B1E0651-Bl	•	0.00	0.10 p. a.me		l: 2021-05-0			5-07		
Ammonia, Total (as N	)	< 0.050	0.050 mg/L							
Blank (B1E0651-Bl	_K2)			Prepared	l: 2021-05-0	7, Analyze	ed: 2021-0	5-07		
Ammonia, Total (as N	•	< 0.050	0.050 mg/L			, , ,				
LCS (B1E0651-BS1				Prepared	l: 2021-05-0	7. Analyze	ed: 2021-0	5-07		
Ammonia, Total (as N	•	0.968	0.050 mg/L	1.00		97	90-115			
, (12.11	•									



REPORTED TO Lake Country, District Final Effluent- PE14		•	iter)			WORK REPOR	ORDER TED	21E0 2021	424 -05-11	15:10
Analyte		Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifie
General Parameter	s, Batch B1E0651, Conti	nued								
LCS (B1E0651-BS	2)			Prepared	I: 2021-05-0	7, Analyze	d: 2021-0	5-07		
Ammonia, Total (as N	))	0.976	0.050 mg/L	1.00		98	90-115			
General Parameter	s, Batch B1E0764									
Blank (B1E0764-B	LK1)			Prepared	I: 2021-05-0	8, Analyze	d: 2021-0	5-08		
Solids, Total Suspend	led	< 2.0	2.0 mg/L							
Blank (B1E0764-B	LK2)			Prepared	I: 2021-05-0	8, Analyze	d: 2021-0	5-08		
Solids, Total Suspend	ded	< 2.0	2.0 mg/L							
LCS (B1E0764-BS	1)			Prepared	I: 2021-05-0	8, Analyze	d: 2021-0	5-08		
Solids, Total Suspend	led	101	10.0 mg/L	100		101	85-115			
Condo, rotal Caopona		101	10.0 Hig/L	100			00 110			
LCS (B1E0764-BS		101	10.0 mg/L		I: 2021-05-0			5-08		
•	2)	99.0	10.0 mg/L		I: 2021-05-0			5-08		
LCS (B1E0764-BS) Solids, Total Suspend	<b>2)</b> ded	99.0	<u> </u>	Prepared	l: 2021-05-0	)8, Analyze	d: 2021-0	5-08		
LCS (B1E0764-BS. Solids, Total Suspending Microbiological Parameters)	2) <sup>ded</sup> rameters, Batch B1E040	99.0	<u> </u>	Prepared		99	d: 2021-0 85-115			
LCS (B1E0764-BS) Solids, Total Suspend	2) <sup>ded</sup> rameters, Batch B1E040	99.0	<u> </u>	Prepared	l: 2021-05-0	99	d: 2021-0 85-115			
LCS (B1E0764-BS) Solids, Total Suspend Microbiological Pal Blank (B1E0403-B	2) <sup>ded</sup> rameters, Batch B1E040 LK1)	99.0	10.0 mg/L	Prepared  Prepared  mL		99 95, Analyze	d: 2021-0 85-115 d: 2021-0	5-05		
LCS (B1E0764-BS). Solids, Total Suspend Microbiological Pai Blank (B1E0403-B Coliforms, Total	2) <sup>ded</sup> rameters, Batch B1E040 LK1)	99.0	10.0 mg/L	Prepared  Prepared  mL  Prepared	I: 2021-05-0	99 95, Analyze	d: 2021-0 85-115 d: 2021-0	5-05		
LCS (B1E0764-BS: Solids, Total Suspend Microbiological Pal Blank (B1E0403-B Coliforms, Total Blank (B1E0403-B	2) <sup>ded</sup> rameters, Batch B1E040 LK1) LK2)	99.0	10.0 mg/L 1 MPN/100	Prepared mL Prepared mL	I: 2021-05-0	99 95, Analyze 95, Analyze	d: 2021-0 85-115 d: 2021-0 d: 2021-0	5-05 5-05		
LCS (B1E0764-BS). Solids, Total Suspend Microbiological Paid Blank (B1E0403-B) Coliforms, Total Blank (B1E0403-B) Coliforms, Fecal	2) <sup>ded</sup> rameters, Batch B1E040 LK1) LK2)	99.0	10.0 mg/L 1 MPN/100	Prepared mL Prepared mL Prepared	l: 2021-05-0 l: 2021-05-0	99 95, Analyze 95, Analyze	d: 2021-0 85-115 d: 2021-0 d: 2021-0	5-05 5-05		
LCS (B1E0764-BS: Solids, Total Suspend Microbiological Pal Blank (B1E0403-B Coliforms, Total Blank (B1E0403-B Coliforms, Fecal Blank (B1E0403-B	2)  Jed  rameters, Batch B1E040  LK1)  LK2)  LK3)	99.0	10.0 mg/L  1 MPN/100  1 MPN/100	Prepared mL Prepared mL Prepared mL Prepared	l: 2021-05-0 l: 2021-05-0	99 95, Analyze 95, Analyze 95, Analyze	d: 2021-0 85-115 d: 2021-0 d: 2021-0 d: 2021-0	5-05 5-05 5-05		
LCS (B1E0764-BS: Solids, Total Suspend Microbiological Pai Blank (B1E0403-B Coliforms, Total Blank (B1E0403-B Coliforms, Fecal Blank (B1E0403-B Coliforms, Fecal	2)  Jed  rameters, Batch B1E040  LK1)  LK2)  LK3)	99.0	10.0 mg/L  1 MPN/100  1 MPN/100	Prepared mL Prepared mL Prepared mL Prepared	l: 2021-05-0 l: 2021-05-0 l: 2021-05-0	99 95, Analyze 95, Analyze 95, Analyze	d: 2021-0 85-115 d: 2021-0 d: 2021-0 d: 2021-0	5-05 5-05 5-05		
LCS (B1E0764-BS). Solids, Total Suspend Microbiological Paid Blank (B1E0403-B). Coliforms, Total Blank (B1E0403-B). Coliforms, Fecal Blank (B1E0403-B). Coliforms, Fecal Blank (B1E0403-B). Blank (B1E0403-B).	2)  ded  rameters, Batch B1E040  LK1)  LK2)  LK3)	99.0	1 MPN/100  1 MPN/100  1 MPN/100	Prepared mL Prepared mL Prepared mL Prepared mL Prepared mL	l: 2021-05-0 l: 2021-05-0 l: 2021-05-0	99 95, Analyze 95, Analyze 95, Analyze	d: 2021-0 85-115 d: 2021-0 d: 2021-0 d: 2021-0	5-05 5-05 5-05 5-05		
LCS (B1E0764-BS: Solids, Total Suspend Microbiological Pal Blank (B1E0403-B Coliforms, Total Blank (B1E0403-B Coliforms, Fecal Blank (B1E0403-B Coliforms, Fecal Blank (B1E0403-B Coliforms, Total	2)  ded  rameters, Batch B1E040  LK1)  LK2)  LK3)	99.0	1 MPN/100  1 MPN/100  1 MPN/100	Prepared mL Prepared mL Prepared mL Prepared mL Prepared mL Prepared	l: 2021-05-0 l: 2021-05-0 l: 2021-05-0 l: 2021-05-0	99 95, Analyze 95, Analyze 95, Analyze	d: 2021-0 85-115 d: 2021-0 d: 2021-0 d: 2021-0	5-05 5-05 5-05 5-05		
LCS (B1E0764-BS: Solids, Total Suspend Microbiological Par Blank (B1E0403-B Coliforms, Total Blank (B1E0403-B Coliforms, Fecal Blank (B1E0403-B Coliforms, Fecal Blank (B1E0403-B Coliforms, Total Blank (B1E0403-B Coliforms, Total Blank (B1E0403-B	2) ded rameters, Batch B1E040 LK1)  LK2)  LK3)  LK4)	99.0  3  <1  <1  <1  <1  <1  <1	1 MPN/100  1 MPN/100  1 MPN/100  1 MPN/100	Prepared mL Prepared mL Prepared mL Prepared mL Prepared mL Prepared mL	l: 2021-05-0 l: 2021-05-0 l: 2021-05-0 l: 2021-05-0	99 95, Analyze 95, Analyze 95, Analyze 95, Analyze	d: 2021-0 85-115 d: 2021-0 d: 2021-0 d: 2021-0 d: 2021-0	5-05 5-05 5-05 5-05		

### 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

PO NUMBER 104395-10-9007
PROJECT Raw Influent- PE14651
PROJECT INFO Lake Country WWTP

WORK ORDER 21E0422

**RECEIVED / TEMP** 2021-05-04 14:30 / 11°C **REPORTED** 2021-05-11 15:02

**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



We've Got Chemistry



Ahead of the Curve



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.

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.

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

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**REPORTED TO** Lake Country, District of (Wastewater)

PROJECT Raw Influent- PE14651

WORK ORDER

21E0422

**REPORTED** 2021-05-11 15:02

Analyte	Result	RL	Units	Analyzed	Qualifi
Raw Influent (E233627) (21E0422-01)   Mar	trix: Wastewater   Sample	d: 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	
рН	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)

PROJECT Raw Influent- PE14651

WORK ORDER

21E0422

REPORTED	2021-05-11 15:02

Analysis Description	Method Ref.	Technique A	ccredited	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 Ac	id) ✓	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

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**REPORTED TO** Lake Country, District of (Wastewater) **PROJECT** 

Raw Influent- PE14651

**WORK ORDER REPORTED** 

21E0422 2021-05-11 15:02

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- 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	I: 2021-05-0	5, Analyze	ed: 2021-0	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	I: 2021-05-0	5, Analyze	ed: 2021-0	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			
Blank (B1E0488-BLK1) BOD, 5-day	< 2.0	2.0 mg/L	Prepared	l: 2021-05-0	06, Analyze	ed: 2021-(	)5-11		
•	-		D	. 2024 05 0	)C A l	٦. ٥٥٥١ (	DE 44		
LCS (B1E0488-BS1) BOD, 5-day	185	2.0 mg/L	180	I: 2021-05-0	103	85-115	73-11		
General Parameters, Batch B1E0491	100	E.o mg/E	100		100	00 110			
Blank (B1E0491-BLK1)			Prepared	I: 2021-05-0	)6, Analyze	ed: 2021-0	05-11		
BOD, 5-day Carbonaceous	< 2.0	2.0 mg/L							
LCS (B1E0491-BS1)			Prepared	I: 2021-05-0	6, Analyze	ed: 2021-0	05-11		
BOD, 5-day Carbonaceous	184	2.0 mg/L	180		102	85-115			
General Parameters, Batch B1E0600									
Blank (B1E0600-BLK1)			Prepared	I: 2021-05-0	6, Analyze	ed: 2021-0	05-07		
Phosphorus, Total (as P)	< 0.0050	0.0050 mg/L							
LCS (B1E0600-BS1)			Prepared	I: 2021-05-0	6, Analyze	ed: 2021-0	05-07		

Phosphorus, Total (as P)

85-115

0.100

0.0050 mg/L

0.105



	ke Country, Distric w Influent- PE146	•	ater)			WORK REPOR		21E0 2021	)422 -05-11	15:02
Analyte		Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifie
General Parameters, Ba	atch B1E0603, Con	tinued								
Blank (B1E0603-BLK1)				Prepared	: 2021-05-0	6, Analyze	d: 2021 <b>-</b> 0	5-10		
Nitrogen, Total Kjeldahl		< 0.050	0.050 mg/L							
Blank (B1E0603-BLK2)				Prepared	: 2021-05-0	6, Analyze	d: 2021-0	5-10		
Nitrogen, Total Kjeldahl		< 0.050	0.050 mg/L	· · · · · · · · · · · · · · · · · · ·		· ·				
LCS (B1E0603-BS1)				Prepared	: 2021-05-0	6 Analyze	d· 2021-0	5-10		
Nitrogen, Total Kjeldahl		1.06	0.050 mg/L	1.00	. 2021 00 0	106	85-115	0 10		
			0.000g/_		. 2024 05 0			T 10		
LCS (B1E0603-BS2)  Nitrogen, Total Kjeldahl		1.06	0.050 mg/L	1.00	: 2021-05-0	0, Analyze 106	85-115	5-10		
General Parameters, B	atch B1E0651									
Blank (B1E0651-BLK1)				Prepared	: 2021-05-0	7, Analyze	d: 2021-0	5-07		
Ammonia, Total (as N)		< 0.050	0.050 mg/L	-						
Blank (B1E0651-BLK2)				Prepared	: 2021-05-0	7. Analyze	d: 2021 <b>-</b> 0	5-07		
Ammonia, Total (as N)		< 0.050	0.050 mg/L		0 00 0	.,,		<del> </del>		
				Droparad	. 2021 05 0	7 Analyza	d: 2021 0	5.07		
Ammonia, Total (as N)		0.968	0.050 mg/L	1.00	: 2021-05-0	7, Allalyze 97	90-115	3-0 <i>1</i>		
· · · · · ·		0.900	0.030 Hig/L							
Ammonia, Total (as N)		0.976	0.050 mg/L	Prepared 1.00	: 2021-05-0	7, Analyze	d: 2021-0 90-115	5-07		
General Parameters, Ba Blank (B1E0690-BLK1)				Prepared	: 2021-05-1	1, Analyze	d: 2021-0	5-11		
·		< 1.0	1.0 mg/L	Prepared	: 2021-05-1	1, Analyze	d: 2021-0	5-11		
Blank (B1E0690-BLK1) Alkalinity, Total (as CaCO3 Alkalinity, Phenolphthalein	) (as CaCO3)	< 1.0	1.0 mg/L	Prepared	: 2021-05-1	1, Analyze	d: 2021-0	5-11		
Blank (B1E0690-BLK1) Alkalinity, Total (as CaCO3 Alkalinity, Phenolphthalein Alkalinity, Bicarbonate (as	) (as CaCO3) CaCO3)	< 1.0 < 1.0	1.0 mg/L 1.0 mg/L	Prepared	: 2021-05-1	1, Analyze	d: 2021-0	5-11		
Blank (B1E0690-BLK1) Alkalinity, Total (as CaCO3 Alkalinity, Phenolphthalein	) (as CaCO3) CaCO3) aCO3)	< 1.0	1.0 mg/L	Prepared	: 2021-05-1	1, Analyze	d: 2021-0	5-11		
Blank (B1E0690-BLK1) Alkalinity, Total (as CaCO3 Alkalinity, Phenolphthalein Alkalinity, Bicarbonate (as C Alkalinity, Carbonate (as C Alkalinity, Hydroxide (as Ca	) (as CaCO3) CaCO3) aCO3)	< 1.0 < 1.0 < 1.0	1.0 mg/L 1.0 mg/L 1.0 mg/L							
Blank (B1E0690-BLK1) Alkalinity, Total (as CaCO3 Alkalinity, Phenolphthalein Alkalinity, Bicarbonate (as Calkalinity, Carbonate (as Calkalinity, Hydroxide (as Calkalinity, Hydroxide)	) (as CaCO3) CaCO3) aCO3) aCO3)	< 1.0 < 1.0 < 1.0 < 1.0	1.0 mg/L 1.0 mg/L 1.0 mg/L 1.0 mg/L	Prepared	: 2021-05-1 : 2021-05-1	1, Analyze	d: 2021-0			
Blank (B1E0690-BLK1)  Alkalinity, Total (as CaCO3  Alkalinity, Phenolphthalein  Alkalinity, Bicarbonate (as Cacos)  Alkalinity, Carbonate (as Cacos)  Alkalinity, Hydroxide (as Cacos)  LCS (B1E0690-BS1)  Alkalinity, Total (as CaCO3)	) (as CaCO3) CaCO3) aCO3) aCO3)	< 1.0 < 1.0 < 1.0	1.0 mg/L 1.0 mg/L 1.0 mg/L	Prepared	: 2021-05-1	1, Analyzeo	d: 2021-0: 80-120	5-11		
Blank (B1E0690-BLK1) Alkalinity, Total (as CaCO3 Alkalinity, Phenolphthalein Alkalinity, Bicarbonate (as Calkalinity, Carbonate (as Calkalinity, Hydroxide (as Calkalinity, Hydroxide (as Calkalinity, Total (as CaCO3) Reference (B1E0690-SI	) (as CaCO3) CaCO3) aCO3) aCO3)	< 1.0 < 1.0 < 1.0 < 1.0	1.0 mg/L 1.0 mg/L 1.0 mg/L 1.0 mg/L 1.0 mg/L	Prepared 100 Prepared		1, Analyze 98 1, Analyze	d: 2021-0 80-120 d: 2021-0	5-11		
Blank (B1E0690-BLK1)  Alkalinity, Total (as CaCO3  Alkalinity, Phenolphthalein  Alkalinity, Bicarbonate (as Cacos)  Alkalinity, Carbonate (as Cacos)  Alkalinity, Hydroxide (as Cacos)  LCS (B1E0690-BS1)  Alkalinity, Total (as CaCO3)	) (as CaCO3) CaCO3) aCO3) aCO3)	< 1.0 < 1.0 < 1.0 < 1.0	1.0 mg/L 1.0 mg/L 1.0 mg/L 1.0 mg/L	Prepared	: 2021-05-1	1, Analyzeo	d: 2021-0: 80-120	5-11		
Blank (B1E0690-BLK1) Alkalinity, Total (as CaCO3 Alkalinity, Phenolphthalein Alkalinity, Bicarbonate (as CaCo3) Alkalinity, Carbonate (as CaCo3) Alkalinity, Hydroxide (as CaCo3) LCS (B1E0690-BS1) Alkalinity, Total (as CaCO3) Reference (B1E0690-SI) pH  General Parameters, Ba	) (as CaCO3) CaCO3) aCO3) aCO3) ) RM1)	< 1.0 < 1.0 < 1.0 < 1.0	1.0 mg/L 1.0 mg/L 1.0 mg/L 1.0 mg/L 1.0 mg/L	Prepared 100 Prepared 7.01	: 2021-05-1 : 2021-05-1	1, Analyzed 98 1, Analyzed	d: 2021-0: 80-120 d: 2021-0: 98-102	5-11 5-11		
Blank (B1E0690-BLK1) Alkalinity, Total (as CaCO3 Alkalinity, Phenolphthalein Alkalinity, Bicarbonate (as CaCo3) Alkalinity, Carbonate (as CaCo3) Alkalinity, Hydroxide (as CaCo3) Alkalinity, Total (as CaCO3) Reference (B1E0690-SI) PH General Parameters, Balank (B1E0764-BLK1)	) (as CaCO3) CaCO3) aCO3) aCO3) ) RM1)	< 1.0 < 1.0 < 1.0 < 1.0 < 1.0	1.0 mg/L 1.0 mg/L 1.0 mg/L 1.0 mg/L 1.0 mg/L 0.10 pH units	Prepared 100 Prepared 7.01	: 2021-05-1	1, Analyzed 98 1, Analyzed	d: 2021-0: 80-120 d: 2021-0: 98-102	5-11 5-11		
Blank (B1E0690-BLK1) Alkalinity, Total (as CaCO3 Alkalinity, Phenolphthalein Alkalinity, Bicarbonate (as CaCo3) Alkalinity, Carbonate (as CaCo3) Alkalinity, Carbonate (as CaCo3) Alkalinity, Hydroxide (as CaCo3) Alkalinity, Total (as CaCO3) Reference (B1E0690-SI) pH  General Parameters, Baseliank (B1E0764-BLK1) Solids, Total Suspended	) (as CaCO3) CaCO3) aCO3) aCO3) ) RM1)	< 1.0 < 1.0 < 1.0 < 1.0	1.0 mg/L 1.0 mg/L 1.0 mg/L 1.0 mg/L 1.0 mg/L	Prepared 7.01  Prepared 7.01	: 2021-05-1 : 2021-05-1 : 2021-05-0	1, Analyze 98 1, Analyze 99 8, Analyze	d: 2021-0 80-120 d: 2021-0 98-102 d: 2021-0	5-11 5-11 5-08		
Blank (B1E0690-BLK1) Alkalinity, Total (as CaCO3 Alkalinity, Phenolphthalein Alkalinity, Bicarbonate (as CaCo3) Alkalinity, Bicarbonate (as CaCo3) Alkalinity, Carbonate (as CaCo3) Alkalinity, Hydroxide (as CaCo3) Alkalinity, Total (as CaCO3) Reference (B1E0690-Sliph  General Parameters, Bacaco3 Blank (B1E0764-BLK1) Solids, Total Suspended Blank (B1E0764-BLK2)	) (as CaCO3) CaCO3) aCO3) aCO3) ) RM1)	< 1.0 < 1.0 < 1.0 < 1.0 98.5	1.0 mg/L 1.0 mg/L 1.0 mg/L 1.0 mg/L 1.0 mg/L  1.0 mg/L  2.0 mg/L	Prepared 7.01  Prepared 7.01	: 2021-05-1 : 2021-05-1	1, Analyze 98 1, Analyze 99 8, Analyze	d: 2021-0 80-120 d: 2021-0 98-102 d: 2021-0	5-11 5-11 5-08		
Blank (B1E0690-BLK1) Alkalinity, Total (as CaCO3 Alkalinity, Phenolphthalein Alkalinity, Bicarbonate (as Calkalinity, Carbonate (as Calkalinity, Hydroxide (as Calkalinity, Hydroxide (as Calkalinity, Total (as CaCO3 Alkalinity, Total (as CaCO3 Reference (B1E0690-Siph  General Parameters, Balank (B1E0764-BLK1) Solids, Total Suspended Blank (B1E0764-BLK2) Solids, Total Suspended	) (as CaCO3) CaCO3) aCO3) aCO3) ) RM1)	< 1.0 < 1.0 < 1.0 < 1.0 < 1.0	1.0 mg/L 1.0 mg/L 1.0 mg/L 1.0 mg/L 1.0 mg/L 0.10 pH units	Prepared 7.01  Prepared Prepared	: 2021-05-1 : 2021-05-1 : 2021-05-0 : 2021-05-0	1, Analyzer 98 1, Analyzer 99 8, Analyze	d: 2021-0 80-120 d: 2021-0 98-102 d: 2021-0 d: 2021-0	5-11 5-11 5-08		
Blank (B1E0690-BLK1) Alkalinity, Total (as CaCO3 Alkalinity, Phenolphthalein Alkalinity, Bicarbonate (as Calkalinity, Bicarbonate (as Calkalinity, Carbonate (as Calkalinity, Hydroxide (as Calkalinity, Hydroxide (as Calkalinity, Total (as CaCO3 Reference (B1E0690-SI pH  General Parameters, Balank (B1E0764-BLK1) Solids, Total Suspended Blank (B1E0764-BLK2) Solids, Total Suspended LCS (B1E0764-BS1)	) (as CaCO3) CaCO3) aCO3) aCO3) ) RM1)	< 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 2.0	1.0 mg/L 1.0 mg/L 1.0 mg/L 1.0 mg/L 1.0 mg/L  1.0 mg/L  2.0 mg/L  2.0 mg/L	Prepared 7.01  Prepared Prepared Prepared	: 2021-05-1 : 2021-05-1 : 2021-05-0	1, Analyze 98 1, Analyze 99 8, Analyze 8, Analyze	d: 2021-0 80-120 d: 2021-0 98-102 d: 2021-0 d: 2021-0	5-11 5-11 5-08		
Blank (B1E0690-BLK1) Alkalinity, Total (as CaCO3 Alkalinity, Phenolphthalein Alkalinity, Bicarbonate (as C Alkalinity, Carbonate (as C Alkalinity, Hydroxide (as CaCO3 LCS (B1E0690-BS1) Alkalinity, Total (as CaCO3 Reference (B1E0690-SI pH  General Parameters, Baseliank (B1E0764-BLK1) Solids, Total Suspended Blank (B1E0764-BLK2) Solids, Total Suspended	) (as CaCO3) CaCO3) aCO3) aCO3) ) RM1)	< 1.0 < 1.0 < 1.0 < 1.0 98.5	1.0 mg/L 1.0 mg/L 1.0 mg/L 1.0 mg/L 1.0 mg/L  1.0 mg/L  2.0 mg/L	Prepared 7.01  Prepared Prepared	: 2021-05-1 : 2021-05-1 : 2021-05-0 : 2021-05-0	1, Analyzer 98 1, Analyzer 99 8, Analyze	d: 2021-0 80-120 d: 2021-0 98-102 d: 2021-0 d: 2021-0	5-11 5-11 5-08		
Blank (B1E0690-BLK1) Alkalinity, Total (as CaCO3 Alkalinity, Phenolphthalein Alkalinity, Bicarbonate (as Calkalinity, Bicarbonate (as Calkalinity, Carbonate (as Calkalinity, Hydroxide (as Calkalinity, Hydroxide (as Calkalinity, Total (as CaCO3 Reference (B1E0690-SI pH  General Parameters, Balank (B1E0764-BLK1) Solids, Total Suspended Blank (B1E0764-BLK2) Solids, Total Suspended LCS (B1E0764-BS1)	) (as CaCO3) CaCO3) aCO3) aCO3) ) RM1)	< 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 2.0	1.0 mg/L 1.0 mg/L 1.0 mg/L 1.0 mg/L 1.0 mg/L  1.0 mg/L  2.0 mg/L  2.0 mg/L	Prepared 7.01  Prepared Prepared Prepared 100	: 2021-05-1 : 2021-05-1 : 2021-05-0 : 2021-05-0	1, Analyzer 98 1, Analyzer 99 8, Analyzer 8, Analyzer 101	d: 2021-0 80-120 d: 2021-0 98-102 d: 2021-0 d: 2021-0 d: 2021-0	5-11 5-11 5-08 5-08		





## **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

PROJECTFinal Effluent- PE14651REPORTED2021-06-30 13:04PROJECT INFOLake Country WWTPCOC NUMBER44368.35639

#### 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

We've Got Chemistry

Ahead of the Curve



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.

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.

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 A what



**REPORTED TO** Lake Country, District of (Wastewater)

PROJECT Final Effluent- PE14651

WORK ORDER REPORTED 21F2947

2021-06-30 13:04

Analyte	Result	RL	Units	Analyzed	Qualifie
Final Effluent (E233626) (21F2947-01)   Ma	atrix: Wastewater   Sample	d: 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)

PROJECT Final Effluent- PE14651

WORK ORDER
REPORTED

21F2947

ORTED 2021-06-30 13:04

	Made at Dat	Trabations		
Analysis Description	Method Ref.	Technique A	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 Ad	cid) ✓	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	✓	Kelowna

### 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

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

### **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.



**PROJECT** 

BOD, 5-day Carbonaceous

# **APPENDIX 2: QUALITY CONTROL RESULTS**

**REPORTED TO** Lake Country, District of (Wastewater)

Final Effluent- PE14651

WORK ORDER REPORTED

21F2947 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	Qualifie
Anions, Batch B1F2762									
Blank (B1F2762-BLK1)			Prepared	d: 2021-06-2	25, Analyze	d: 2021-0	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	d: 2021-06-2	25, Analyze	d: 2021-0	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			
Ammonia, Total (as N)  Blank (B1F2822-BLK2)	< 0.050	0.050 mg/L	Prepared	d: 2021-06-2	24, Analyze	d: 2021-(	06-24		
Blank (B1F2822-BLK2)			Prepared	d: 2021-06-2	24, Analyze	d: 2021-0	06-24		
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
Blank (B1F2822-BLK3)			Prepared	d: 2021-06-2	24, Analyze	d: 2021-0	06-24		
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
LCS (B1F2822-BS1)			Prepared	d: 2021-06-2	24, Analyze	d: 2021-0	06-24		
Ammonia, Total (as N)	1.02	0.050 mg/L	1.00		102	90-115			
LCS (B1F2822-BS2)			Prepared	d: 2021-06-2	24, Analyze	d: 2021-0	06-24		
Ammonia, Total (as N)	1.00	0.050 mg/L	1.00		100	90-115			
LCS (B1F2822-BS3)			Prepared	d: 2021-06-2	24, Analyze	d: 2021-0	06-24		
Ammonia, Total (as N)	1.03	0.050 mg/L	1.00		103	90-115			
General Parameters, Batch B1F28	343								
Serierari arameters, Buten Bir 20									

2.0 mg/L

< 20



	ke Country, Dist nal Effluent- PE1	•	ater)			WORK REPOR	ORDER RTED	21F2 2021	947 -06-30	13:04
Analyte		Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Ba	atch B1F2843, Co	ontinued								
LCS (B1F2843-BS1)				Prepared	: 2021-06-2	4, Analyze	ed: 2021-0	6-29		
BOD, 5-day Carbonaceous	<b>S</b>	176	35.6 mg/L	180		98	85-115			
Duplicate (B1F2843-DU	IP1)	Sou	rce: 21F2947-01	Prenared	: 2021-06-2	4 Analyze	.d. 2021 <b>-</b> 0	6-29		
BOD, 5-day Carbonaceous	-	< 4.3	2.0 mg/L	Ticparca	< 4.3	T, Allalyzo	u. 2021-0	0-23	20	
General Parameters, Ba					•					
Blank (B1F2869-BLK1)				Prepared	: 2021-06-2	4, Analyze	d: 2021-0	6-28		
Phosphorus, Total (as P)		< 0.0050	0.0050 mg/L							
Blank (B1F2869-BLK2)				Prepared	: 2021-06-2	4. Analvze	ed: 2021-0	6-28		
Phosphorus, Total (as P)		< 0.0050	0.0050 mg/L	<u>'</u>		<u>, , , , , , , , , , , , , , , , , , , </u>				
LCS (B1F2869-BS1)			<u> </u>	Prenared	: 2021-06-2	4 Analyze	.d. 2021-0	6-28		
Phosphorus, Total (as P)		0.105	0.0050 mg/L	0.100	. 2021 00 2	105	85-115	0 20		
		0.100	0.0000 mg/L		. 0004 00 0			0.00		
LCS (B1F2869-BS2)		0.405	0.0050 "		: 2021-06-2			6-28		
Phosphorus, Total (as P)		0.105	0.0050 mg/L	0.100		105	85-115			
General Parameters, Bank (B1F2924-BLK1)				Prepared	: 2021-06-2	5, Analyze	ed: 2021-0	6-25		
Alkalinity, Total (as CaCO3	)	< 1.0	1.0 mg/L							
Alkalinity, Phenolphthalein	· ,	< 1.0	1.0 mg/L							
Alkalinity, Bicarbonate (as Alkalinity, Carbonate (as C		< 1.0 < 1.0	1.0 mg/L 1.0 mg/L							
Alkalinity, Hydroxide (as Ca	· · · · · · · · · · · · · · · · · · ·	< 1.0	1.0 mg/L							
Blank (B1F2924-BLK2)	,		<u> </u>	Prepared	: 2021-06-2	5, Analyze	ed: 2021-0	6-25		
Alkalinity, Total (as CaCO3	)	< 1.0	1.0 mg/L							
Alkalinity, Phenolphthalein	·	< 1.0	1.0 mg/L							
Alkalinity, Bicarbonate (as	<u> </u>	< 1.0	1.0 mg/L							
Alkalinity, Carbonate (as Calla Alkalinity, Hydroxide (as Calla Alkalinity, Hydroxide)	· · · · · · · · · · · · · · · · · · ·	< 1.0 < 1.0	1.0 mg/L 1.0 mg/L							
LCS (B1F2924-BS1)		. 1.0	1.0 mg/L	Prepared	: 2021-06-2	5, Analyze	ed: 2021-0	6-25		
Alkalinity, Total (as CaCO3	)	104	1.0 mg/L	100		104	80-120			
LCS (B1F2924-BS2)			<u> </u>		: 2021-06-2			6-25		
Alkalinity, Total (as CaCO3	)	104	1.0 mg/L	100	. 2021-00-2	104	80-120	0-20		
Reference (B1F2924-SF	,	107	o mg/L		: 2021-06-2			6-25		
pH	XIVI I J	7.03	0.10 pH units	7.01	. 2021-00-2	100	98-102	0-23		
		1.00	0.10 pri units		. 0004 22 7			0.05		
Reference (B1F2924-SF	RM2)			•	: 2021-06-2			6-25		
General Parameters, B		7.02	0.10 pH units	7.01	: 2021-06-2	100 5 Analyze	98-102	6-25		
Blank (B1F2943-BLK1)		< 2.0	2.0 mg/l	Fiehaiea	. 2021-00-2	.o, Analyze	u. ∠U∠ I-U	0-23		
Solids, Total Suspended		< 2.0	2.0 mg/L							
Blank (B1F2943-BLK2)				Prepared	: 2021-06-2	5, Analyze	ed: 2021-0	6-25		
Solids, Total Suspended		< 2.0	2.0 mg/L							



REPORTED TO PROJECT	Lake Country Final Effluent	, District of (Wastewa - PE14651	iter)			WORK REPOR	ORDER RTED	21F2 2021	2947  -06-30	13:04
Analyte		Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameter	s, Batch B1F29	43, Continued								
LCS (B1F2943-BS	1)			Prepared	d: 2021-06-2	25, Analyze	ed: 2021-0	06-25		
Solids, Total Suspend	led	101	5.0 mg/L	100		101	85-115			
LCS (B1F2943-BS	2)			Prepared	d: 2021-06-2	25, Analyze	ed: 2021-0	06-25		
Solids, Total Suspend	led	112	5.0 mg/L	100		112	85-115			
General Parameter Blank (B1F3314-B	.,	14		Prepared	d: 2021-06-2	29, Analyze	ed: 2021-0	06-30		
Nitrogen, Total Kjelda	hl	< 0.050	0.050 mg/L							
Blank (B1F3314-B	LK2)			Prepared	d: 2021-06-2	29, Analyze	ed: 2021-0	6-30		
Nitrogen, Total Kjelda	hl	< 0.050	0.050 mg/L							
LCS (B1F3314-BS	1)			Prepared	d: 2021-06-2	29, Analyze	ed: 2021-0	6-30		
Nitrogen, Total Kjelda	hl	0.990	0.050 mg/L	1.00		99	85-115			
LCS (B1F3314-BS	2)			Prepared	d: 2021-06-2	29, Analyze	ed: 2021-0	06-30		
Nitrogen, Total Kjelda	hl	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

**PO NUMBER** 104395-10-9007

PROJECT Final Effluent- PE14651
PROJECT INFO Lake Country WWTP

WORK ORDER 21F0327

**RECEIVED / TEMP** 2021-06-01 11:46 / 7.7°C

**REPORTED** 2021-06-08 16:52 **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



We've Got Chemistry



Ahead of the Curve



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.

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.

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

M whit



	Country, District of (\ Effluent- PE14651	<i>N</i> astewater)		WORK ORDER REPORTED	21F0327 2021-06-0	8 16:52
Analyte		Result	RL	Units	Analyzed	Qualifier
Final Effluent (E233626)	(21F0327-01)   Matr	ix: Wastewater   Sa	ampled: 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	3)	210	1.0	mg/L	2021-06-08	
Alkalinity, Phenolphthalein	·	< 1.0		mg/L	2021-06-08	
Alkalinity, Bicarbonate (as	· · · · · · · · · · · · · · · · · · ·	210		mg/L	2021-06-08	
Alkalinity, Carbonate (as C	<u> </u>	< 1.0		mg/L	2021-06-08	
Alkalinity, Hydroxide (as C		< 1.0		mg/L	2021-06-08	
Ammonia, Total (as N)		0.255	0.050		2021-06-03	
BOD, 5-day Carbonaceou	IS	18.0		mg/L	2021-06-08	
Nitrogen, Total Kjeldahl		2.37	0.050	mg/L	2021-06-07	
pH		7.97		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 Parameter	's					
Coliforms, Total		> 242000	1	MPN/100 mL	2021-06-02	
Coliforms, Fecal		164000		MPN/100 mL	2021-06-02	
Duplicate (21F0327-02)    Anions	Matrix: Water   San	npled: 2021-06-01 ′	10:00			
Chloride		101		mg/L	2021-06-03	
Nitrate (as N)		1.18	0.010		2021-06-03	
A 114 14 / A 15		< 0.010	0.010	mg/L	2021-06-03	
Nitrite (as N)						
Phosphate (as P)		0.0282	0.0050		2021-06-03	
· · · · · · · · · · · · · · · · · · ·					2021-06-03	
Phosphate (as P)				mg/L	2021-06-03 N/A	
Phosphate (as P)  Calculated Parameters		0.0282	0.0050	mg/L		
Phosphate (as P)  Calculated Parameters  Nitrate+Nitrite (as N)		0.0282 1.18	0.0050	mg/L	N/A	
Phosphate (as P)  Calculated Parameters  Nitrate+Nitrite (as N)  Nitrogen, Total	3)	0.0282 1.18	0.0050 0.0100 0.100	mg/L	N/A	
Phosphate (as P)  Calculated Parameters  Nitrate+Nitrite (as N)  Nitrogen, Total  General Parameters		0.0282 1.18 3.48	0.0050 0.0100 0.100	mg/L mg/L mg/L	N/A N/A	
Phosphate (as P)  Calculated Parameters  Nitrate+Nitrite (as N)  Nitrogen, Total  General Parameters  Alkalinity, Total (as CaCO	n (as CaCO3)	0.0282 1.18 3.48	0.0050 0.0100 0.100 1.0	mg/L mg/L mg/L	N/A N/A 2021-06-08	
Phosphate (as P)  Calculated Parameters  Nitrate+Nitrite (as N)  Nitrogen, Total  General Parameters  Alkalinity, Total (as CaCO3  Alkalinity, Phenolphthalein	n (as CaCO3) c CaCO3)	0.0282 1.18 3.48 202 < 1.0	0.0050 0.0100 0.100 1.0 1.0 1.0	mg/L mg/L mg/L mg/L mg/L	N/A N/A 2021-06-08 2021-06-08	



REPORTED TO PROJECT  Lake Country, District Final Effluent- PE146	,		WORK ORDER REPORTED	21F0327 2021-06-0	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	
рН	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 10:1	15			
Chloride	< 0.10	0.10	mg/L	2021-06-03	
Nitrate (as N)	< 0.010		mg/L	2021-06-03	
Nitrite (as N)	< 0.010		mg/L	2021-06-03	
Phosphate (as P)	< 0.0050	0.0050		2021-06-03	
Calculated Parameters	0.0000	0.0000			
Nitrate+Nitrite (as N)	< 0.0100	0.0100	ma/l	N/A	
Nitrogen, Total	< 0.0500	0.0500		N/A	
General Parameters				-	
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L	2021-06-08	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0		mg/L	2021-06-08	
Alkalinity, Bicarbonate (as CaCO3)	< 1.0		mg/L	2021-06-08	
Alkalinity, Carbonate (as CaCO3)	< 1.0		mg/L	2021-06-08	
Alkalinity, Hydroxide (as CaCO3)	< 1.0		mg/L	2021-06-08	
Ammonia, Total (as N)	< 0.050		mg/L	2021-06-03	
BOD, 5-day Carbonaceous	< 5.8		mg/L	2021-06-08	
Nitrogen, Total Kjeldahl	< 0.050		mg/L	2021-06-07	
pH	5.90		pH units	2021-06-08	HT2
Phosphorus, Total (as P)	< 0.0050	0.0050		2021-06-07	
Solids, Total Suspended	< 3.3		mg/L	2021-06-07	
Microbiological Parameters					
Coliforms, Total	< 1	1	MPN/100 mL	2021-06-02	
Coliforms, Fecal	< 1		MPN/100 mL	2021-06-02	
Travel Blank (21F0327-04)   Matrix: Wate	er   Sampled: 2021-06-01 10				
Anions					
Chloride	< 0.10	0.10	mg/L	2021-06- <u>03</u>	



REPORTED TO Lake Country, District of (Wastewater)

PROJECT Final Effluent- PE14651 REPORTED

**WORK ORDER** 21F0327 **REPORTED** 2021-06-08 16:52

Analyte	Result	RL	Units	Analyzed	Qualifie
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)

PROJECT Final Effluent- PE14651

WORK ORDER
REPORTED

21F0327

2021-06-08 16:52

Analysis Description	Method Ref.	Technique A	ccredited	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 Ac	id) ✓	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.



REPORTED TO Lake Country, District of (Wastewater)

PROJECT Final Effluent- PE14651

WORK ORDER REPORTED

21F0327 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	l: 2021-06-0	3, Analyze	ed: 2021-0	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	l: 2021-06-0	3, Analyze	ed: 2021-0	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	l: 2021-06-0	3, Analyze	ed: 2021-0	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	l: 2021-06-0	3, Analyze	ed: 2021-0	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	l: 2021-06-0	3, Analyze	ed: 2021-0	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	l: 2021-06-0	3, Analyze	ed: 2021-0	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			



REPORTED TO PROJECT	Lake Country, Distr Final Effluent- PE1	•	ater)			WORK (		21F0 2021	)327 I-06-08	16:52
Analyte		Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters,	Batch B1F0402, Co	ntinued								
Blank (B1F0402-BLI	<b>(1)</b>			Prepared	2021-06-03	, Analyzed	d: 2021 <b>-</b> 0	6-03		
Ammonia, Total (as N)		< 0.050	0.050 mg/L							
Blank (B1F0402-BLI	<b>(2</b> )			Prepared	2021-06-03	, Analyzed	d: 2021-0	6-03		
Ammonia, Total (as N)		< 0.050	0.050 mg/L							
LCS (B1F0402-BS1)				Prepared	2021-06-03	, Analyzed	d: 2021-0	6-03		
Ammonia, Total (as N)		1.02	0.050 mg/L	1.00		102	90-115			
LCS (B1F0402-BS2)				Prepared	2021-06-03	, Analyzed	d: 2021-0	6-03		
Ammonia, Total (as N)		1.04	0.050 mg/L	1.00		104	90-115			
General Parameters,	Batch B1F0443									
Blank (B1F0443-BLI	<b>K</b> 1)			Prepared	2021-06-03	, Analyzed	d: 2021 <b>-</b> 0	6-08		
BOD, 5-day Carbonace	eous	< 2.0	2.0 mg/L							
LCS (B1F0443-BS1)				Prepared	2021-06-03	, Analyzed	d: 2021-0	6-08		
BOD, 5-day Carbonace	ous	178	48.5 mg/L	180		99	85-115			
Nitrogen, Total Kjeldahl  Blank (B1F0687-BLI	(2)	< 0.050	0.050 mg/L	Prepared	2021-06-05	, Analyzed	d: 2021-0	6-07		
Nitrogen, Total Kjeldahl	•	< 0.050	0.050 mg/L			, , <u>,</u>				
LCS (B1F0687-BS1)				Prepared	2021-06-05	, Analyzed	d: 2021-0	6-07		
Nitrogen, Total Kjeldahl		1.13	0.050 mg/L	1.00		113	85-115			
LCS (B1F0687-BS2)				Prepared	2021-06-05	, Analyzed	d: 2021-0	6-07		
Nitrogen, Total Kjeldahl		1.14	0.050 mg/L	1.00		114	85-115			
General Parameters,	Batch B1F0690									
Blank (B1F0690-BLI	<b>K1</b> )			Prepared	2021-06-05	, Analyzed	d: 2021-0	6-07		
Ź		< 0.0050	0.0050 mg/L	Prepared	2021-06-05	, Analyzed	d: 2021-0	6-07		
Blank (B1F0690-BLI	P)	< 0.0050	0.0050 mg/L	-	2021-06-05					
Blank (B1F0690-BLI Phosphorus, Total (as F	C2)	< 0.0050 < 0.0050	0.0050 mg/L 0.0050 mg/L	-						
Blank (B1F0690-BLI Phosphorus, Total (as F Blank (B1F0690-BLI	(2) (2)			Prepared		, Analyzed	i: 2021-0	6-07		
Blank (B1F0690-BLI Phosphorus, Total (as F Blank (B1F0690-BLI Phosphorus, Total (as F	<b>(2)</b>			Prepared	2021-06-05	, Analyzed	i: 2021-0	6-07		
Blank (B1F0690-BLI Phosphorus, Total (as F Blank (B1F0690-BLI Phosphorus, Total (as F LCS (B1F0690-BS1)	(2) (2) (2)	< 0.0050	0.0050 mg/L	Prepared Prepared 0.100	2021-06-05	, Analyzed , Analyzed	d: 2021-0 d: 2021-0 85-115	6-07 6-07		
Blank (B1F0690-BLI Phosphorus, Total (as F Blank (B1F0690-BLI Phosphorus, Total (as F LCS (B1F0690-BS1) Phosphorus, Total (as F	(2) (2) (2)	< 0.0050	0.0050 mg/L	Prepared Prepared 0.100	2021-06-05	, Analyzed , Analyzed	d: 2021-0 d: 2021-0 85-115	6-07 6-07		
Blank (B1F0690-BLI Phosphorus, Total (as F Blank (B1F0690-BLI Phosphorus, Total (as F LCS (B1F0690-BS1) Phosphorus, Total (as F LCS (B1F0690-BS2)	(2) (2) (2) (2)	< 0.0050	0.0050 mg/L 0.0050 mg/L	Prepared 0.100 Prepared	2021-06-05	, Analyzed , Analyzed 109 , Analyzed	d: 2021-0 d: 2021-0 85-115 d: 2021-0	6-07 6-07		
Blank (B1F0690-BLI Phosphorus, Total (as Blank (B1F0690-BLI Phosphorus, Total (as BLCS (B1F0690-BS1) Phosphorus, Total (as BLCS (B1F0690-BS2) Phosphorus, Total (as BLCS (B1F0690-BS2)	S(2) S(2) S(3) S(3) S(4) S(5) S(5) S(6) S(6) S(7) S(7) S(7) S(7) S(7) S(7) S(7) S(7	< 0.0050	0.0050 mg/L 0.0050 mg/L	Prepared 0.100 Prepared 0.100	2021-06-05	, Analyzed , Analyzed 109 , Analyzed	d: 2021-0 d: 2021-0 85-115 d: 2021-0 85-115	6-07 6-07		
Blank (B1F0690-BLI Phosphorus, Total (as F Blank (B1F0690-BLI Phosphorus, Total (as F LCS (B1F0690-BS1) Phosphorus, Total (as F LCS (B1F0690-BS2) Phosphorus, Total (as F General Parameters,	S) S) S) Batch B1F0735 S(2)	< 0.0050	0.0050 mg/L 0.0050 mg/L	Prepared 0.100 Prepared 0.100	2021-06-05	, Analyzed , Analyzed 109 , Analyzed	d: 2021-0 d: 2021-0 85-115 d: 2021-0 85-115	6-07 6-07		
Blank (B1F0690-BLI Phosphorus, Total (as F Blank (B1F0690-BLI Phosphorus, Total (as F LCS (B1F0690-BS1) Phosphorus, Total (as F LCS (B1F0690-BS2) Phosphorus, Total (as F General Parameters, Blank (B1F0735-BLI	(2) (2) (2) (2) (3) (3) (4) (4) (5) (6) (7) (8) (8) (9) (9) (9) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1	< 0.0050 0.109 0.109	0.0050 mg/L  0.0050 mg/L  0.0050 mg/L	Prepared 0.100 Prepared 0.100 Prepared	2021-06-05	, Analyzed 109 , Analyzed 109 , Analyzed	d: 2021-0 d: 2021-0 85-115 d: 2021-0 85-115	6-07 6-07 6-07		



REPORTED TO Lake Country, Disc PROJECT Final Effluent- PE	•	ter)			WORK REPOR	ORDER	2021-06-08 16:52		
Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifie
General Parameters, Batch B1F0735, Co	ontinued								
LCS (B1F0735-BS2)			Prepared	l: 2021-06-0	7, Analyze	d: 2021-0	6-07		
Solids, Total Suspended	96.0	10.0 mg/L	100		96	85-115			
LCS (B1F0735-BS3)			Prepared	l: 2021-06-0	)7, Analyze	d: 2021-0	6-07		
Solids, Total Suspended	102	10.0 mg/L	100		102	85-115			
General Parameters, Batch B1F0864									
Blank (B1F0864-BLK1)			Prepared	l: 2021-06-0	08, Analyze	d: 2021-0	6-08		
Alkalinity, Total (as CaCO3)	< 1.0	1.0 mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0 mg/L							
Alkalinity, Bicarbonate (as CaCO3)  Alkalinity, Carbonate (as CaCO3)	< 1.0 < 1.0	1.0 mg/L 1.0 mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0 mg/L							
Blank (B1F0864-BLK2)			Prepared	l: 2021-06-0	)8 Analyze	d· 2021-0	6-08		
Alkalinity, Total (as CaCO3)	< 1.0	1.0 mg/L	1 Toparoc	2021 00 0	70,7 thaiy20	G. 2021 0			
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	l: 2021-06-0	08, Analyze	d: 2021-0	6-08		
Alkalinity, Total (as CaCO3)	104	1.0 mg/L	100		104	80-120			
LCS (B1F0864-BS2)			Prepared	l: 2021-06-0	08, Analyze	d: 2021-0	6-08		
Alkalinity, Total (as CaCO3)	105	1.0 mg/L	100		105	80-120			
Reference (B1F0864-SRM1)			Prepared	l: 2021-06-0	08, Analyze	d: 2021-0	6-08		
pH	7.03	0.10 pH units	7.01		100	98-102			
Reference (B1F0864-SRM2)			Prepared	l: 2021-06-0	08, Analyze	d: 2021-0	6-08		
pH	7.03	0.10 pH units	7.01		100	98-102			
Microbiological Parameters, Batch B1F	0268								
Blank (B1F0268-BLK1)			Prepared	l: 2021-06-0	)2, Analyze	d: 2021-0	6-02		
Coliforms, Total	< 1	1 MPN/100	mL						
Blank (B1F0268-BLK2)			Prepared	l: 2021-06-0	)2, Analyze	d: 2021-0	6-02		
Coliforms, Fecal	< 1	1 MPN/100	mL						
Blank (B1F0268-BLK3)			Prepared	l: 2021-06-0	)2, Analyze	d: 2021-0	6-02		
Coliforms, Fecal	< 1	1 MPN/100	mL						
Blank (B1F0268-BLK4)			Prepared	I: 2021-06-0	)2, Analyze	d: 2021-0	6-02		
Coliforms, Total	< 1	1 MPN/100							
Duplicate (B1F0268-DUP3)	Sour	ce: 21F0327-01	Prepared	l: 2021-06-0	)2, Analvze	d: 2021-0	6-02		
Coliforms, Fecal	242000	1 MPN/100		164000	,,		38	80	
Duplicate (B1F0268-DUP4)		ce: 21F0327-01		l: 2021-06-0	)2 Analyza	d- 2021-0			
Dupinoate (Dili 0200-DUF 4)	Jour	00. Z II 00ZI-0 I	i ispaiet	ZUZ 1-UU-(	, miaiyze	u. 2021-0	0-02		





21F0326

## **CERTIFICATE OF ANALYSIS**

REPORTED TO Lake Country, District of (Wastewater)

4062 Beaver Lake Rd

LAKE COUNTRY, BC V4V 1T5

ATTENTION Davin Larsen

PO NUMBER 104395-10-9007
PROJECT Raw Influent- PE14651
PROJECT INFO Lake Country WWTP

RECEIVED / TEMP 2021-06-01 11:46 / 7.7°C REPORTED 2021-06-09 14:25 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

We've Got Chemistry



**WORK ORDER** 

Ahead of the Curve



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.

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.

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 M what



**REPORTED TO** Lake Country, District of (Wastewater)

PROJECT Raw Influent- PE14651

WORK ORDER REPORTED

21F0326 2021-06-09 14:25

Analyte	Result	RL	Units	Analyzed	Qualifie
Raw Influent (E233627) (21F0326-01)   Ma	trix: Wastewater   Sample	d: 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	
рН	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)

PROJECT Raw Influent- PE14651

WORK ORDER
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21F0326

2021-06-09 14:25

Analysis Description	Method Ref.	Technique A	ccredited	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 Ac	id) ✓	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.



**REPORTED TO** Lake Country, District of (Wastewater)

PROJECT Raw Influent- PE14651

WORK ORDER REPORTED

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

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

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

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifie
Anions, Batch B1F0364									
Blank (B1F0364-BLK1)			Prepared	l: 2021-06-0	3, Analyze	d: 2021-0	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	l: 2021-06-0	3, Analyze	d: 2021-0	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	l: 2021-06-0	3, Analyze	d: 2021-0	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	l: 2021-06-0	3, Analyze	d: 2021-0	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	l: 2021-06-0	3, Analyze	d: 2021-0	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	l: 2021-06-0	3, Analyze	d: 2021-0	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

		Prepared: 202	21-06-03, Analyze	ed: 2021-06-08	
< 2.0	2.0 mg/L				
		Prepared: 202	21-06-03, Analyze	ed: 2021-06-08	
169	50.5 mg/L	180	94	85-115	
	<del></del>		< 2.0 2.0 mg/L  Prepared: 202	< 2.0 2.0 mg/L  Prepared: 2021-06-03, Analyze	Prepared: 2021-06-03, Analyzed: 2021-06-08



	ike Country, Distr aw Influent- PE14	•	ater)					21F0326 2021-06-09 14:25			
Analyte		Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, B	atch B1F0443										
Blank (B1F0443-BLK1)	)				Prepared	I: 2021-06-0	03, Analyze	ed: 2021-	06-08		
BOD, 5-day Carbonaceou	s	< 2.0	2.0	mg/L	•						
LCS (B1F0443-BS1)					Prepared	I: 2021-06-0	03, Analyze	ed: 2021-	06-08		
BOD, 5-day Carbonaceou	S	178	48.5	mg/L	180		99	85-115			
General Parameters, B	atch B1F0576										
Blank (B1F0576-BLK1)	)				Prepared	I: 2021-06-0	04, Analyze	ed: 2021-	06-05		
Nitrogen, Total Kjeldahl		< 0.050	0.050	mg/L							
Blank (B1F0576-BLK2)	)				Prepared	I: 2021-06-0	04, Analyze	ed: 2021-	06-05		
Nitrogen, Total Kjeldahl		< 0.050	0.050	mg/L							
LCS (B1F0576-BS1)					Prepared	I: 2021-06-0	04, Analyze	ed: 2021-	06-05		
Nitrogen, Total Kjeldahl		0.917	0.050	mg/L	1.00		92	85-115			
LCS (B1F0576-BS2)					Prepared	I: 2021-06-0	04, Analyze	ed: 2021-	06-05		
Nitrogen, Total Kjeldahl		0.917	0.050	mg/L	1.00		92	85-115			
General Parameters, B	atch B1F0690										
Blank (B1F0690-BLK1)	1				Prepared	I: 2021-06-0	05, Analyze	ed: 2021-	06-07		
Phosphorus, Total (as P)		< 0.0050	0.0050	mg/L							
Blank (B1F0690-BLK2)	1				Prepared	I: 2021-06-0	05, Analyze	ed: 2021-	06-07		
Phosphorus, Total (as P)		< 0.0050	0.0050	mg/L							
LCS (B1F0690-BS1)					Prepared	I: 2021-06-0	05, Analyze	ed: 2021-	06-07		
Phosphorus, Total (as P)		0.109	0.0050	mg/L	0.100		109	85-115			
LCS (B1F0690-BS2)					Prepared	I: 2021-06-0	05, Analyze	ed: 2021-	06-07		
Phosphorus, Total (as P)		0.109	0.0050	mg/L	0.100		109	85-115			
General Parameters, B	atch B1F0735										
Blank (B1F0735-BLK2)	)				Prepared	I: 2021-06-0	07, Analyze	ed: 2021-	06-07		
Solids, Total Suspended		< 3.3	3.3	mg/L							
Blank (B1F0735-BLK3)	1				Prepared	I: 2021-06-0	07, Analyze	ed: 2021-	06-07		
Solids, Total Suspended		< 3.3	3.3	mg/L							
LCS (B1F0735-BS2)					Prepared	I: 2021-06-0	07, Analyze	ed: 2021-	06-07		
Solids, Total Suspended		96.0	10.0	mg/L	100		96	85-115			
LCS (B1F0735-BS3)					Prepared	I: 2021-06-0	07, Analyze	ed: 2021-	06-07		
Solids, Total Suspended		102	10.0	mg/L	100		102	85-115			
General Parameters, B	atch B1F0759										
Blank (B1F0759-BLK1)	<u> </u>				Prepared	I: 2021-06-0	07, Analyze	ed: 2021-	06-07		
Ammonia, Total (as N)		< 0.050	0.050	mg/L							
Blank (B1F0759-BLK2)	)				Prepared	I: 2021-06-0	07, Analyze	ed: 2021-	06-07		
Ammonia, Total (as N)		< 0.050	0.050	mg/L							



	ake Country, District of aw Influent- PE1465	`			WORK ORDER REPORTED		21F0326 2021-06-09 14:		14:25	
Analyte		Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, E	Batch B1F0759, Contin	ued								
Blank (B1F0759-BLK3	)			Prepared	l: 2021-06-0	7, Analyze	ed: 2021-0	06-07		
Ammonia, Total (as N)		< 0.050	0.050 mg/L							
Blank (B1F0759-BLK4	)			Prepared	l: 2021-06-0	7, Analyze	ed: 2021-0	06-07		
Ammonia, Total (as N)		< 0.050	0.050 mg/L							
LCS (B1F0759-BS1)				Prepared	l: 2021-06-0	7, Analyze	ed: 2021-0	06-07		
Ammonia, Total (as N)		0.965	0.050 mg/L	1.00		96	90-115			
LCS (B1F0759-BS2)			-	Prepared	l: 2021-06-0	7, Analyze	ed: 2021-0	06-07		
Ammonia, Total (as N)		0.935	0.050 mg/L	1.00		94	90-115			
LCS (B1F0759-BS3)			-	Prepared	l: 2021-06-0	7, Analyze	ed: 2021-0	06-07		
Ammonia, Total (as N)		0.936	0.050 mg/L	1.00		94	90-115			
LCS (B1F0759-BS4)			-	Prepared	l: 2021-06-0	7, Analyze	ed: 2021-0	06-07		
Ammonia, Total (as N)		0.974	0.050 mg/L	1.00		97	90-115			
General Parameters, E				Prepared	l: 2021-06-0	9, Analyze	ed: 2021-0	06-09		
Alkalinity, Total (as CaCO	3)	< 1.0	1.0 mg/L							
Alkalinity, Phenolphthaleir	ı (as CaCO3)	< 1.0	1.0 mg/L							
Alkalinity, Bicarbonate (as		< 1.0	1.0 mg/L							
Alkalinity, Carbonate (as 0	CaCO3)	< 1.0	1.0 mg/L							
Alkalinity, Hydroxide (as C	CaCO3)	< 1.0	1.0 mg/L							
LCS (B1F1014-BS1)				Prepared	l: 2021-06-0	9, Analyze	ed: 2021-0	06-09		
Alkalinity, Total (as CaCO	3)	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

**PO NUMBER** 104395-10-9007

PROJECT Final Effluent- PE14651
PROJECT INFO Lake Country WWTP

WORK ORDER 21G0977

**RECEIVED / TEMP** 2021-07-08 14:39 / 20.0°C

**REPORTED** 2021-07-19 15:26 **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

We've Got Chemistry



Ahead of the Curve



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.

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.

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 M what



	untry, District of (Wastewater) uent- PE14651		WORK ORDER REPORTED	21G0977 2021-07-1	9 15:26
Analyte	Result	RL	Units	Analyzed	Qualifier
Final Effluent (E233626) (21	G0977-01)   Matrix: Wastewater   Samp	led: 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		N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	185	1.0	mg/L	2021-07-13	
Alkalinity, Phenolphthalein (as			mg/L	2021-07-13	
Alkalinity, Bicarbonate (as Cat	·		mg/L	2021-07-13	
Alkalinity, Carbonate (as CaCo	•		mg/L	2021-07-13	
Alkalinity, Hydroxide (as CaCC	<u> </u>		mg/L	2021-07-13	
Ammonia, Total (as N)	0.139	0.050		2021-07-10	
BOD, 5-day Carbonaceous	< 5.4		mg/L	2021-07-19	HT1
Nitrogen, Total Kjeldahl	2.00	0.050		2021-07-14	
pH	7.75		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)   Ma	atrix: Water   Sampled: 2021-07-08 10:1	5			
Chloride	108	0.10	mg/L	2021-07-11	
Nitrate (as N)	2.10	0.010		2021-07-11	
Nitrite (as N)	0.061	0.010		2021-07-11	
Phosphate (as P)	0.0325	0.0050		2021-07-11	
Calculated Parameters					
				N1/A	
Nitrate+Nitrite (as N)	2 16	0.0100	ma/L	N/A	
Nitrate+Nitrite (as N) Nitrogen, Total	2.16 4.19	0.0100		N/A N/A	
Nitrate+Nitrite (as N) Nitrogen, Total  General Parameters	2.16 4.19	0.0100 0.100		N/A N/A	
Nitrogen, Total  General Parameters	4.19	0.100	mg/L	N/A	
Nitrogen, Total  General Parameters  Alkalinity, Total (as CaCO3)	4.19 185	0.100	mg/L	N/A 2021-07-13	
Nitrogen, Total  General Parameters  Alkalinity, Total (as CaCO3)  Alkalinity, Phenolphthalein (as	4.19  185 CaCO3) < 1.0	0.100 1.0 1.0	mg/L mg/L	N/A 2021-07-13 2021-07-13	
Nitrogen, Total  General Parameters  Alkalinity, Total (as CaCO3)	4.19  185 CaCO3) < 1.0 CO3) 185	0.100 1.0 1.0 1.0	mg/L	N/A 2021-07-13	



REPORTED TO Lake Country, District PROJECT Final Effluent- PE1465	•		WORK ORDER REPORTED	21G0977 2021-07-19 15:26		
Analyte	Result	RL	Units	Analyzed	Qualifie	
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		mg/L	2021-07-19	HT1	
Nitrogen, Total Kjeldahl	2.02	0.050		2021-07-14		
pH	7.78		pH units	2021-07-13	HT2	
Phosphorus, Total (as P)	0.334	0.0050	·	2021-07-14		
Solids, Total Suspended	3.0		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		
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						
Allcolinity Total (an CaCCO)	4.0					
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L	2021-07-13		
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0 < 1.0		mg/L mg/L	2021-07-13 2021-07-13		
		1.0				
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0 1.0	mg/L	2021-07-13		
Alkalinity, Phenolphthalein (as CaCO3)  Alkalinity, Bicarbonate (as CaCO3)	< 1.0 < 1.0	1.0 1.0 1.0	mg/L mg/L	2021-07-13 2021-07-13		
Alkalinity, Phenolphthalein (as CaCO3)  Alkalinity, Bicarbonate (as CaCO3)  Alkalinity, Carbonate (as CaCO3)	< 1.0 < 1.0 < 1.0	1.0 1.0 1.0	mg/L mg/L mg/L mg/L	2021-07-13 2021-07-13 2021-07-13		
Alkalinity, Phenolphthalein (as CaCO3)  Alkalinity, Bicarbonate (as CaCO3)  Alkalinity, Carbonate (as CaCO3)  Alkalinity, Hydroxide (as CaCO3)	< 1.0 < 1.0 < 1.0 < 1.0	1.0 1.0 1.0 1.0 0.050	mg/L mg/L mg/L mg/L	2021-07-13 2021-07-13 2021-07-13 2021-07-13	HT1	
Alkalinity, Phenolphthalein (as CaCO3)  Alkalinity, Bicarbonate (as CaCO3)  Alkalinity, Carbonate (as CaCO3)  Alkalinity, Hydroxide (as CaCO3)  Ammonia, Total (as N)	< 1.0 < 1.0 < 1.0 < 1.0 < 0.050	1.0 1.0 1.0 1.0 0.050	mg/L mg/L mg/L mg/L mg/L mg/L	2021-07-13 2021-07-13 2021-07-13 2021-07-13 2021-07-10	HT1	
Alkalinity, Phenolphthalein (as CaCO3) Alkalinity, Bicarbonate (as CaCO3) Alkalinity, Carbonate (as CaCO3) Alkalinity, Hydroxide (as CaCO3) Ammonia, Total (as N) BOD, 5-day Carbonaceous	< 1.0 < 1.0 < 1.0 < 1.0 < 0.050 < 5.4	1.0 1.0 1.0 1.0 0.050 2.0 0.050	mg/L mg/L mg/L mg/L mg/L mg/L	2021-07-13 2021-07-13 2021-07-13 2021-07-13 2021-07-10 2021-07-19	HT1	
Alkalinity, Phenolphthalein (as CaCO3)  Alkalinity, Bicarbonate (as CaCO3)  Alkalinity, Carbonate (as CaCO3)  Alkalinity, Hydroxide (as CaCO3)  Ammonia, Total (as N)  BOD, 5-day Carbonaceous  Nitrogen, Total Kjeldahl	< 1.0 < 1.0 < 1.0 < 1.0 < 0.050 < 5.4 < 0.050	1.0 1.0 1.0 1.0 0.050 2.0 0.050	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	2021-07-13 2021-07-13 2021-07-13 2021-07-13 2021-07-10 2021-07-19 2021-07-14		
Alkalinity, Phenolphthalein (as CaCO3)  Alkalinity, Bicarbonate (as CaCO3)  Alkalinity, Carbonate (as CaCO3)  Alkalinity, Hydroxide (as CaCO3)  Ammonia, Total (as N)  BOD, 5-day Carbonaceous  Nitrogen, Total Kjeldahl  pH	< 1.0 < 1.0 < 1.0 < 1.0 < 0.050 < 5.4 < 0.050 5.56	1.0 1.0 1.0 1.0 0.050 2.0 0.050 0.10 0.0050	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	2021-07-13 2021-07-13 2021-07-13 2021-07-13 2021-07-10 2021-07-19 2021-07-14 2021-07-13		
Alkalinity, Phenolphthalein (as CaCO3) Alkalinity, Bicarbonate (as CaCO3) Alkalinity, Carbonate (as CaCO3) Alkalinity, Hydroxide (as CaCO3) Ammonia, Total (as N) BOD, 5-day Carbonaceous Nitrogen, Total Kjeldahl pH Phosphorus, Total (as P)	< 1.0 < 1.0 < 1.0 < 1.0 < 0.050 < 5.4 < 0.050 5.56 < 0.0050	1.0 1.0 1.0 1.0 0.050 2.0 0.050 0.10 0.0050	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	2021-07-13 2021-07-13 2021-07-13 2021-07-10 2021-07-10 2021-07-19 2021-07-14 2021-07-13 2021-07-14		
Alkalinity, Phenolphthalein (as CaCO3) Alkalinity, Bicarbonate (as CaCO3) Alkalinity, Carbonate (as CaCO3) Alkalinity, Hydroxide (as CaCO3) Ammonia, Total (as N) BOD, 5-day Carbonaceous Nitrogen, Total Kjeldahl pH Phosphorus, Total (as P) Solids, Total Suspended	< 1.0 < 1.0 < 1.0 < 1.0 < 0.050 < 5.4 < 0.050 5.56 < 0.0050	1.0 1.0 1.0 1.0 0.050 2.0 0.050 0.10 0.0050 2.0	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	2021-07-13 2021-07-13 2021-07-13 2021-07-10 2021-07-10 2021-07-19 2021-07-14 2021-07-13 2021-07-14		

Anions

Chloride < 0.10 0.10 mg/L 2021-07-11

Travel Blank (21G0977-04) | Matrix: Water | Sampled: 2021-07-08 10:15



**REPORTED TO** Lake Country, District of (Wastewater)

PROJECT Final Effluent- PE14651

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

Analyte	Result	RL	Units	Analyzed	Qualifie
Travel Blank (21G0977-04)   Matrix: Water	r   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)

PROJECT Final Effluent- PE14651

WORK ORDER REPORTED 21G0977

2021-07-19 15:26

Analysis Description	Method Ref.	Technique A	ccredited	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 Ac	sid) ✓	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.



REPORTED TO Lake Country, District of (Wastewater)

PROJECT Final Effluent- PE14651

WORK ORDER REPORTED

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

- Method Blank (Blk): A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup)**: An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- Blank Spike (BS): A sample of known concentration which undergoes processing identical to that carried out for test samples, 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	I: 2021-07-1	1, Analyze	d: 2021-0	)7-11		
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	I: 2021-07-1	1, Analyze	d: 2021-0	7-11		
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	I: 2021-07-1	1, Analyze	d: 2021-(	7-11		
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	I: 2021-07-1	1, Analyze	d: 2021-0	7-11		
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: 202	1-07-10, Analyz	ed: 2021-07-10	)	
Ammonia, Total (as N)	< 0.050	0.050 mg/L					
Blank (B1G0986-BLK2)			Prepared: 202	1-07-10, Analyz	ed: 2021-07-10	1	
Ammonia, Total (as N)	< 0.050	0.050 mg/L					
Blank (B1G0986-BLK3)			Prepared: 202	1-07-10, Analyz	ed: 2021-07-10	1	
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		



-		Lake Country, District of (Wastewater) Final Effluent- PE14651				WORK ORDER REPORTED		R 21G0977 2021-07-19 15		15:26
Analyte		Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifie
General Parameters, I	Batch B1G0986, Cont	inued								
LCS (B1G0986-BS2)				Prepared	: 2021-07-1	0. Analvze	ed: 2021-0	7-10		
Ammonia, Total (as N)		0.904	0.050 mg/L	1.00		90	90-115			
					: 2021-07-1	0 Apolyzo		7 10		
LCS (B1G0986-BS3) Ammonia, Total (as N)		0.933	0.050 mg/L	1.00	. 2021-07-1	93	90-115	7-10		
Duplicate (B1G0986-D	OUP2)		ırce: 21G0977-04	Prepared	2021-07-1	0, Analyze	ed: 2021-0	7-10		
Ammonia, Total (as N)		< 0.050	0.050 mg/L		< 0.050				15	
Matrix Spike (B1G098	6-MS2)	Sou	ırce: 21G0977-04	Prepared	2021-07-1	0, Analyze	ed: 2021-0	7-10		
Ammonia, Total (as N)		0.306	0.050 mg/L	0.250	< 0.050	116	75-125			
General Parameters, I	Batch B1G1014									
Blank (B1G1014-BLK	1)			Prepared	: 2021-07-1	4, Analyze	ed: 2021-0	7-19		
BOD, 5-day Carbonaceo	ıs	< 2.0	2.0 mg/L							
LCS (B1G1014-BS1)				Prepared	: 2021-07-1	4 Analyze	ed: 2021-0	7-19		
BOD, 5-day Carbonaceou	IS .	194	45.4 mg/L	180	2021071	108	85-115	7 10		
General Parameters, I Blank (B1G1230-BLK' Nitrogen, Total Kjeldahl		< 0.050	0.050 mg/L	Prepared	: 2021-07-1	3, Analyze	ed: 2021-0	7-14		
		10.000	0.000 Hig/L	D 1	0004 07 4	0. Al	-1-0004-0	7 4 4		
Blank (B1G1230-BLK	2)	4.0.050	0.050//	Prepared	2021-07-1	3, Analyze	ea: 2021-0	17-14		
Nitrogen, Total Kjeldahl		< 0.050	0.050 mg/L							
LCS (B1G1230-BS1)				· · · · · · · · · · · · · · · · · · ·	2021-07-1			7-14		
Nitrogen, Total Kjeldahl		1.00	0.050 mg/L	1.00		100	85-115			
LCS (B1G1230-BS2)				Prepared	2021-07-1	3, Analyze	ed: 2021-0	7-14		
Nitrogen, Total Kjeldahl		1.00	0.050 mg/L	1.00		100	85-115			
General Parameters, I	Batch B1G1273									
Blank (B1G1273-BLK	1)			Prepared	2021-07-1	3, Analyze	ed: 2021-0	7-13		
Alkalinity, Total (as CaCO	,	< 1.0	1.0 mg/L							
Alkalinity, Phenolphthalei	_ ` /	< 1.0	1.0 mg/L							
	· C•CO3/									
Alkalinity, Bicarbonate (as		< 1.0	1.0 mg/L							
Alkalinity, Carbonate (as	CaCO3)	< 1.0	1.0 mg/L							
Alkalinity, Carbonate (as Alkalinity, Hydroxide (as C	CaCO3) CaCO3)			Prenared	· 2021_07_1	3 Analyza	ad: 2021-0	7-13		
Alkalinity, Carbonate (as Alkalinity, Hydroxide (as Blank (B1G1273-BLK2	CaCO3) CaCO3)	< 1.0 < 1.0	1.0 mg/L 1.0 mg/L	Prepared	: 2021-07-1	3, Analyze	ed: 2021-0	7-13		
Alkalinity, Carbonate (as Alkalinity, Hydroxide (as C	CaCO3) CaCO3) 2)	< 1.0	1.0 mg/L 1.0 mg/L 1.0 mg/L	Prepared	: 2021-07-1	3, Analyze	ed: 2021-0	7-13		
Alkalinity, Carbonate (as Alkalinity, Hydroxide (as Carbonate (as Garbanate (Blank (B1G1273-BLK)) Alkalinity, Total (as Caco	CaCO3) CaCO3)  2) 3) n (as CaCO3)	< 1.0 < 1.0	1.0 mg/L 1.0 mg/L	Prepared	: 2021-07-1	3, Analyze	ed: 2021-0	7-13		
Alkalinity, Carbonate (as Alkalinity, Hydroxide (as Carbonate (as Carbonate), Total (as CacCarbonate), Phenolphthalei, Alkalinity, Bicarbonate (as Alkalinity, Carbonate (as Alkalinity, Carbonate)	CaCO3) CaCO3)  2) 3) n (as CaCO3) s CaCO3) CaCO3)	< 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0	1.0 mg/L 1.0 mg/L 1.0 mg/L 1.0 mg/L 1.0 mg/L 1.0 mg/L	Prepared	: 2021-07-1	3, Analyze	ed: 2021-0	7-13		
Alkalinity, Carbonate (as Alkalinity, Hydroxide (as CBlank (B1G1273-BLK)) Alkalinity, Total (as CaCO Alkalinity, Phenolphthalei Alkalinity, Bicarbonate (as	CaCO3) CaCO3)  2) 3) n (as CaCO3) s CaCO3) CaCO3)	< 1.0 < 1.0 < 1.0 < 1.0 < 1.0	1.0 mg/L 1.0 mg/L 1.0 mg/L 1.0 mg/L 1.0 mg/L	Prepared	: 2021-07-1	3, Analyze	ed: 2021-0	7-13		
Alkalinity, Carbonate (as Alkalinity, Hydroxide (as CBlank (B1G1273-BLK)) Alkalinity, Total (as CaCOAlkalinity, Phenolphthalei Alkalinity, Bicarbonate (as Alkalinity, Carbonate (as	CaCO3) CaCO3)  2)  3) n (as CaCO3) s CaCO3) CaCO3) CaCO3)	< 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0 < 1.0	1.0 mg/L 1.0 mg/L 1.0 mg/L 1.0 mg/L 1.0 mg/L 1.0 mg/L		: 2021-07-1					
Alkalinity, Carbonate (as Alkalinity, Hydroxide (as Caco Alkalinity, Total (as Caco Alkalinity, Phenolphthalei Alkalinity, Bicarbonate (as Alkalinity, Carbonate (as Alkalinity, Hydroxide (as Caco Blank (B1G1273-BLK))	CaCO3) CaCO3)  2)  3) n (as CaCO3) s CaCO3) CaCO3) CaCO3)	<1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0	1.0 mg/L							
Alkalinity, Carbonate (as Alkalinity, Hydroxide (as Caco Alkalinity, Total (as Caco Alkalinity, Phenolphthalei Alkalinity, Bicarbonate (as Alkalinity, Carbonate (as Alkalinity, Hydroxide (as Caco Blank (B1G1273-BLK))  Alkalinity, Total (as Caco Alkalinity, Phenolphthalei	CaCO3) CaCO3)  2)  3) n (as CaCO3) caCO3) CaCO3) CaCO3) CaCO3)  3) n (as CaCO3)	<1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0	1.0 mg/L							
Alkalinity, Carbonate (as Alkalinity, Hydroxide (as Caco Alkalinity, Total (as Caco Alkalinity, Phenolphthalei Alkalinity, Bicarbonate (as Alkalinity, Carbonate (as Alkalinity, Hydroxide (as Caco Blank (B1G1273-BLK)).  Alkalinity, Total (as Caco Alkalinity, Total (as Caco Blank (B1G1273-BLK)).	CaCO3) CaCO3) CaCO3)  3) n (as CaCO3) CaCO3) CaCO3) CaCO3) 3) n (as CaCO3)	<1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0	1.0 mg/L							



REPORTED TO PROJECT	Lake Country, Distr Final Effluent- PE1		iter)			WORK REPOR	ORDER TED	21G 2021	0977 -07-19	15:26
Analyte		Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameter	s, Batch B1G1273, Co	ontinued								
LCS (B1G1273-BS	1)			Prepared	: 2021-07-1	3, Analyze	d: 2021-0	7-13		
Alkalinity, Total (as Ca	aCO3)	105	1.0 mg/L	100		105	80-120			
LCS (B1G1273-BS	2)			Prepared	: 2021-07-1	3, Analyze	d: 2021-0	7-13		
Alkalinity, Total (as Ca	aCO3)	106	1.0 mg/L	100		106	80-120			
LCS (B1G1273-BS	3)			Prepared	: 2021-07-1	3, Analyze	d: 2021-0	7-13		
Alkalinity, Total (as Ca	aCO3)	105	1.0 mg/L	100		105	80-120			
Reference (B1G12	73-SRM1)			Prepared	: 2021-07-1	3, Analyze	d: 2021-0	7-13		
pН	·	7.02	0.10 pH units	7.01		100	98-102			
Reference (B1G12	73-SRM2)			Prepared	: 2021-07-1	3, Analyze	d: 2021-0	7-13		
pH	•	7.02	0.10 pH units	7.01		100	98-102			
Reference (B1G12	73-SRM3)			Prepared	: 2021-07-1	3, Analyze	d: 2021-0	7-13		
pH	,	7.02	0.10 pH units	7.01		100	98-102			.,
General Parameter	s, Batch B1G1281									
Blank (B1G1281-B	· · · · · · · · · · · · · · · · · · ·			Prepared	: 2021-07-1	3, Analyze	d: 2021-0	7-14		
Phosphorus, Total (as	s P)	< 0.0050	0.0050 mg/L							
LCS (B1G1281-BS	2)			Prepared	: 2021-07-1	3, Analyze		7-14		
Phosphorus, Total (as	s P)	0.108	0.0050 mg/L	0.100		108	85-115			
General Parameter	s, Batch B1G1300									
Blank (B1G1300-B	LK1)			Prepared	: 2021-07-1	4, Analyze	d: 2021-0	7-14		
Solids, Total Suspend	led	< 2.0	2.0 mg/L							
Blank (B1G1300-B	LK2)			Prepared	: 2021-07-1	4, Analyze	d: 2021-0	7-14		_
Solids, Total Suspend	led	< 2.0	2.0 mg/L							
LCS (B1G1300-BS	1)			Prepared	: 2021-07-1	4, Analyze	d: 2021-0	7-14		
Solids, Total Suspend	led	109	5.0 mg/L	100		109	85-115			
LCS (B1G1300-BS	2)			Prepared	: 2021-07-1	4, Analyze	d: 2021-0	7-14		
Solids, Total Suspend	led	86.5	5.0 mg/L	100		86	85-115			
General Parameter	s, Batch B1G1427									
Blank (B1G1427-B	LK1)			Prepared	: 2021-07-1	5, Analyze	d: 2021-0	7-15		
Solids, Total Suspend	led	< 2.0	2.0 mg/L							
Blank (B1G1427-B	LK2)			Prepared	: 2021-07-1	5, Analyze	d: 2021-0	7-15		
Solids, Total Suspend	led	< 2.0	2.0 mg/L							
LCS (B1G1427-BS	1)			Prepared	: 2021-07-1	5, Analyze	d: 2021-0	7-15		
Solids, Total Suspend	led	93.5	5.0 mg/L	100		94	85-115			
LCS (B1G1427-BS	2)			Prepared	: 2021-07-1	5, Analyze	d: 2021-0	7-15		
Solids, Total Suspend	led	92.0	5.0 mg/L	100		92	85-115			

Microbiological Parameters, Batch B1G0935



REPORTED TOLake Country, District of (Wastewater)WORK ORDER21G0977PROJECTFinal Effluent- PE14651REPORTED2021-07-19 15:26

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Microbiological Parameters, Batch B	1G0935, Continued								
Blank (B1G0935-BLK1)			Prepared	l: 2021-07-0	9, Analyze	d: 2021-0	7-09		
Coliforms, Total	< 1	1 MPN/100	mL						
Blank (B1G0935-BLK2)			Prepared	l: 2021-07-0	9, Analyze	d: 2021-0	7-09		
Coliforms, Total	< 1	1 MPN/100	mL						
Blank (B1G0935-BLK3)			Prepared	l: 2021-07-0	9, Analyze	d: 2021-0	7-09		
Coliforms, Total	< 1	1 MPN/100	mL						
Blank (B1G0935-BLK4)			Prepared	l: 2021-07-0	9, Analyze	d: 2021-0	7-09		
Coliforms, Total	< 1	1 MPN/100	mL						
Blank (B1G0935-BLK5)			Prepared	l: 2021-07-0	9, Analyze	d: 2021-0	7-09		
Coliforms, Total	< 1	1 MPN/100	mL						
Blank (B1G0935-BLK6)			Prepared	l: 2021-07-0	9, Analyze	d: 2021-0	7-09		
Coliforms, Fecal	< 1	1 MPN/100	mL						
Blank (B1G0935-BLK7)			Prepared	l: 2021-07-0	9, Analyze	d: 2021-0	07-09		
Coliforms, Fecal	< 1	1 MPN/100	mL						
Blank (B1G0935-BLK8)			Prepared	l: 2021-07-0	9, Analyze	d: 2021-0	07-09		
Coliforms, Fecal	< 1	1 MPN/100	mL						
Duplicate (B1G0935-DUP3)	Source	: 21G0977-03	Prepared	l: 2021-07-0	9, Analyze	d: 2021-0	7-09		
Coliforms, Total	< 1	1 MPN/100	mL	3				80	MIC29

### QC Qualifiers:

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





21G0975

## **CERTIFICATE OF ANALYSIS**

REPORTED TO Lake Country, District of (Wastewater)

4062 Beaver Lake Rd

LAKE COUNTRY, BC V4V 1T5

ATTENTION Davin Larsen

 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

We've Got Chemistry



**WORK ORDER** 

Ahead of the Curve



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.

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.

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 M undhad



**REPORTED TO** Lake Country, District of (Wastewater)

PROJECT Raw Influent- PE14651

WORK ORDER REPORTED

0.050 mg/L

0.0050 mg/L

0.10 pH units

2.0 mg/L

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2021-07-14

2021-07-13

2021-07-14

2021-07-14

HT2

Analyte	Result	RL	Units	Analyzed	Qualifier
Raw Influent (E233627) (21G0975-01)   Ma	atrix: Wastewater   Sample	l: 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

### Sample Qualifiers:

Nitrogen, Total Kjeldahl

Phosphorus, Total (as P)

Solids, Total Suspended

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.

82.2

7.69

9.08

270



## APPENDIX 1: SUPPORTING INFORMATION

**REPORTED TO** Lake Country, District of (Wastewater)

PROJECT Raw Influent- PE14651

WORK ORDER REPORTED 21G0975 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 Ad	cid) ✓	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.



Ammonia, Total (as N)

# **APPENDIX 2: QUALITY CONTROL RESULTS**

**REPORTED TO** Lake Country, District of (Wastewater) **PROJECT** 

Raw Influent- PE14651

**WORK ORDER REPORTED** 

21G0975 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	: 2021-07-1	1, Analyze	ed: 2021-0	7-11		
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	: 2021-07-1	1, Analyze	ed: 2021-0	7-11		
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	: 2021-07-1	1, Analyze	ed: 2021-0	7-11		
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	: 2021-07-1	1, Analyze	ed: 2021-0	7-11		
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	: 2021-07-0	9. Analvze	ed: 2021-0	07-14		
General Parameters, Batch B1G0892  Blank (B1G0892-BLK1)  BOD, 5-day	< 2.0	2.0 mg/L	Prepared	: 2021-07-0	9, Analyze	ed: 2021-0	)7-14		
Blank (B1G0892-BLK1)	< 2.0	2.0 mg/L		: 2021-07-0 : 2021-07-0					
Blank (B1G0892-BLK1) BOD, 5-day	< 2.0 171	2.0 mg/L 55.2 mg/L							
Blank (B1G0892-BLK1) BOD, 5-day LCS (B1G0892-BS1)	-		Prepared		9, Analyze	ed: 2021-(			
Blank (B1G0892-BLK1)  BOD, 5-day  LCS (B1G0892-BS1)  BOD, 5-day	-		Prepared		9, Analyze	ed: 2021-( 85-115	)7-14		
Blank (B1G0892-BLK1) BOD, 5-day  LCS (B1G0892-BS1) BOD, 5-day  General Parameters, Batch B1G0986	-		Prepared	: 2021-07-0	9, Analyze	ed: 2021-( 85-115	)7-14		

0.050 mg/L

< 0.050



	Country, District of (Wastewa Ifluent- PE14651	ater)			WORK REPOR	ORDER RTED		0975 I-07-19	15:36
Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifie
General Parameters, Batch	B1G0986, Continued								
Blank (B1G0986-BLK3)			Prepared	: 2021-07-1	0, Analyze	ed: 2021-	07-10		
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
LCS (B1G0986-BS1)			Prenared	: 2021-07-1	0 Analyze	d· 2021-	07-10		
Ammonia, Total (as N)	0.919	0.050 mg/L	1.00	. 2021 07 1	92	90-115	01 10		
	0.010	0.000g/_		. 0004 07 4			07.40		
LCS (B1G0986-BS2)	0.004	0.050	•	: 2021-07-1			37-10		
Ammonia, Total (as N)	0.904	0.050 mg/L	1.00		90	90-115			
LCS (B1G0986-BS3)			Prepared	: 2021-07-1	0, Analyze	ed: 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	: 2021-07-1	4, Analyze	ed: 2021-	07-19		
BOD, 5-day Carbonaceous	< 2.0	2.0 mg/L							
LCS (B1G1014-BS1)		-	Prenared	: 2021-07-1	4 Analyze	d· 2021-	∩7 <sub>-</sub> 10		
BOD, 5-day Carbonaceous	194	45.4 mg/L	180	. 2021-07-1	108	85-115	57-15		
General Parameters, Batch	B1G1230								
Blank (B1G1230-BLK1)			Prepared	: 2021-07-1	3, Analyze	ed: 2021-	07-14		
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							
Blank (B1G1230-BLK2)			Prepared	: 2021-07-1	3, Analyze	ed: 2021-	07-14		
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							
LCS (B1G1230-BS1)			Prepared	: 2021-07-1	3 Analyze	ed: 2021-	07-14		
Nitrogen, Total Kjeldahl	1.00	0.050 mg/L	1.00	. 2021 07 1	100	85-115	07 14		
	1.00	0.000 1119/2		0004.07.4			27.44		
LCS (B1G1230-BS2)			•	: 2021-07-1			07-14		
Nitrogen, Total Kjeldahl	1.00	0.050 mg/L	1.00		100	85-115			
General Parameters, Batch Blank (B1G1273-BLK1)	B1G1273		Prepared	: 2021-07-1	3 Analyze	ed: 2021-	07-13		
Alkalinity, Total (as CaCO3)	< 1.0	1.0 mg/L			, ,		· · · · · · · · · · · · · · · · · · ·		
Alkalinity, Phenolphthalein (as C		1.0 mg/L							
Alkalinity, Bicarbonate (as CaCC	•	1.0 mg/L							
Alkalinity, Carbonate (as CaCO3	<i>'</i>	1.0 mg/L							
Alkalinity, Hydroxide (as CaCO3	< 1.0	1.0 mg/L							
Blank (B1G1273-BLK2)			Prepared	: 2021-07-1	3, Analyze	ed: 2021-	07-13		
Alkalinity, Total (as CaCO3)	< 1.0	1.0 mg/L							
Alkalinity, Phenolphthalein (as C		1.0 mg/L							
Alkalinity, Bicarbonate (as CaCC Alkalinity, Carbonate (as CaCC)	,	1.0 mg/L 1.0 mg/L							
Alkalinity, Hydroxide (as CaCO3	*	1.0 mg/L							
Blank (B1G1273-BLK3)	,	<u> </u>	Prenared	: 2021-07-1	3 Analyza	d· 2021_	07-13		
Alkalinity, Total (as CaCO3)	< 1.0	1.0 mg/L	i iopaieu	. 2021-01-1	o, raidiy2t	.a. 2021=	01 10		
Alkalinity, Phenolphthalein (as C		1.0 mg/L							
Alkalinity, Bicarbonate (as CaCC	<u>'</u>	1.0 mg/L							
Alkalinity, Carbonate (as CaCO3	<u>'</u>	1.0 mg/L							
Alkalinity, Hydroxide (as CaCO3									



REPORTED TO PROJECT	Lake Country, District of (Wastewater) Raw Influent- PE14651					WORK (		15:36		
Analyte		Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameter	rs, Batch B1G1273, Conti	nued								
LCS (B1G1273-BS	51)			Prepared	l: 2021-07-13	, Analyze	d: 2021-(	07-13		
Alkalinity, Total (as C	aCO3)	105	1.0 mg/L	100		105	80-120			
LCS (B1G1273-BS	<b>32</b> )			Prepared	l: 2021-07-13	, Analyze	d: 2021-(	07-13		
Alkalinity, Total (as C	aCO3)	106	1.0 mg/L	100		106	80-120			
LCS (B1G1273-BS	53)			Prepared	l: 2021-07-13	, Analyze	d: 2021-(	07-13		
Alkalinity, Total (as C	aCO3)	105	1.0 mg/L	100		105	80-120			
Reference (B1G12	273-SRM1)			Prepared	l: 2021-07-13	, Analyze	d: 2021-(	7-13		
pH	,	7.02	0.10 pH units	7.01		100	98-102			
Reference (B1G12	273-SRM2)			Prepared	l: 2021-07-13	, Analyze	d: 2021-(	7-13		
pH	,	7.02	0.10 pH units	7.01		100	98-102			
Reference (B1G12	273-SRM3)			Prepared	l: 2021-07-13	. Analvze	d: 2021-(	07-13		
pH		7.02	0.10 pH units	7.01		100	98-102			
General Parameter Blank (B1G1281-B Phosphorus, Total (a	•	< 0.0050	0.0050 mg/L	Prepared	l: 2021-07-13	, Analyze	d: 2021-0	)7-14		
	,	< 0.0050	0.0050 Hig/L							
LCS (B1G1281-BS	52)							7 4 4		
Dhaanhamia Tatal (a	- D)	0.400	0.0050//		l: 2021-07-13	•		)7-14		
Phosphorus, Total (a	,	0.108	0.0050 mg/L	0.100	I: 2021-07-13	, Analyzed 108	d: 2021-( 85-115	)7-14		
General Parameter	rs, Batch B1G1300	0.108	0.0050 mg/L	0.100		108	85-115			
General Parameter Blank (B1G1300-B	rs, Batch B1G1300 BLK1)	< 2.0	-	0.100	l: 2021-07-13	108	85-115			
General Parameter Blank (B1G1300-B Solids, Total Suspend	rs, Batch B1G1300 BLK1) ded		0.0050 mg/L 2.0 mg/L	0.100	l: 2021-07-14	108 , Analyzed	85-115 d: 2021-(	)7-14		
General Parameter Blank (B1G1300-B Solids, Total Suspend	rs, Batch B1G1300 BLK1) ded BLK2)		2.0 mg/L	0.100		108 , Analyzed	85-115 d: 2021-(	)7-14		
General Parameter Blank (B1G1300-B Solids, Total Suspend Blank (B1G1300-B Solids, Total Suspend	rs, Batch B1G1300  BLK1) ded  BLK2) ded	< 2.0	-	0.100  Prepared	l: 2021-07-14 l: 2021-07-14	, Analyzed	85-115 d: 2021-( d: 2021-(	07-14 07-14		
General Parameter Blank (B1G1300-B Solids, Total Suspend Blank (B1G1300-B Solids, Total Suspend LCS (B1G1300-BS	rs, Batch B1G1300  BLK1)  ded  BLK2)  ded	< 2.0	2.0 mg/L 2.0 mg/L	0.100  Prepared	l: 2021-07-14	, Analyzed	85-115 d: 2021-( d: 2021-(	07-14 07-14		
General Parameter Blank (B1G1300-B Solids, Total Suspend Blank (B1G1300-B Solids, Total Suspend	rs, Batch B1G1300  BLK1) ded  BLK2) ded	< 2.0 < 2.0	2.0 mg/L	O.100  Prepared  Prepared  100	l: 2021-07-14 l: 2021-07-14	, Analyzed , Analyzed , Analyzed	85-115 d: 2021-( d: 2021-( d: 2021-( 85-115	)7-14 )7-14 )7-14		





21H0588

## **CERTIFICATE OF ANALYSIS**

REPORTED TO Lake Country, District of (Wastewater)

4062 Beaver Lake Rd

LAKE COUNTRY, BC V4V 1T5

ATTENTION Davin Larsen WORK ORDER

 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

PROJECTFinal Effluent- PE14651REPORTED2021-08-26 08:49PROJECT INFOLake Country WWTPCOC NUMBER44413.40725

#### 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

We've Got Chemistry



Ahead of the Curve



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.

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.

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 M undhad



**REPORTED TO** Lake Country, District of (Wastewater)

# **TEST RESULTS**

PROJECT Final Effluent- PE1465	,		REPORTED	2021-08-2	6 08:49
Analyte	Result	RL	Units	Analyzed	Qualifie
Final Effluent (E233626) (21H0588-01)   M	atrix: Wastewater   Sampl	ed: 2021-08-05 09:50			
Anions					
Chloride	106	0.10	mg/L	2021-08-07	
Nitrate (as N)	0.609	0.010		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	ma/L	N/A	
Nitrogen, Total	2.35	0.100		N/A	
General Parameters					
	404	1.0	ma/l	2021-08-06	
Alkalinity, Total (as CaCO3)  Alkalinity, Phenolphthalein (as CaCO3)	<b>194</b> < 1.0		mg/L mg/L	2021-08-06	
Alkalinity, Bicarbonate (as CaCO3)	194		mg/L	2021-08-06	
Alkalinity, Carbonate (as CaCO3)	< 1.0		mg/L	2021-08-06	
Alkalinity, Hydroxide (as CaCO3)	< 1.0		mg/L	2021-08-06	
Ammonia, Total (as N)	0.091	0.050		2021-08-06	
BOD, 5-day Carbonaceous	< 6.4		mg/L	2021-08-11	
Nitrogen, Total Kjeldahl	1.70	0.050		2021-08-10	
pH	7.90		pH units	2021-08-06	HT2
Phosphorus, Total (as P)	0.224	0.0050	·	2021-08-10	
Solids, Total Suspended	< 3.3		mg/L	2021-08-10	
Microbiological Parameters					
Coliforms, Total	242000	1	MPN/100 mL	2021-08-06	
Coliforms, Fecal	24800		MPN/100 mL	2021-08-06	
Travel Blank (21H0588-02)   Matrix: Water	r   Sampled: 2021-08-05 09	:50			
Chloride	< 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		N/A	
Nitrogen, Total	< 0.0500	0.0500	mg/L	N/A	
General Parameters					
	< 1.0	1.0	mg/L	2021-08-06	
Alkalinity, Total (as CaCO3)	< 1.0				
Alkalinity, Total (as CaCO3)  Alkalinity, Phenolphthalein (as CaCO3)	< 1.0		mg/L	2021-08-06	
		1.0	mg/L mg/L	2021-08-06 2021-08-06	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0 1.0			

**WORK ORDER** 

21H0588



# **TEST RESULTS**

**REPORTED TO** Lake Country, District of (Wastewater)

PROJECT Final Effluent- PE14651

WORK ORDER REPORTED

1 MPN/100 mL

21H0588

**ORTED** 2021-08-26 08:49

2021-08-06

Analyte	Result	RL	Units	Analyzed	Qualifier
Travel Blank (21H0588-02)   Matrix:	Water   Sampled: 2021-08-05 0	9:50, 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	

### Sample Qualifiers:

Coliforms, Fecal

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

< 1



## APPENDIX 1: SUPPORTING INFORMATION

**REPORTED TO** Lake Country, District of (Wastewater)

PROJECT Final Effluent- PE14651

WORK ORDER
REPORTED

21H0588

2021-08-26 08:49

Analysis Description	Method Ref.	Technique A	ccredited	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 Ac	sid) ✓	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.



**PROJECT** 

## **APPENDIX 2: QUALITY CONTROL RESULTS**

**REPORTED TO** Lake Country, District of (Wastewater)

Final Effluent- PE14651

WORK ORDER REPORTED

21H0588 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	I: 2021-08-0	6, Analyze	d: 2021-0	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	I: 2021-08-0	7, Analyze	d: 2021-0	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	I: 2021-08-0	6, Analyze	d: 2021-0	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	I: 2021-08-0	7, Analyze	d: 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	



REPORTED TO Lake Country, Distri PROJECT Final Effluent- PE14	•	ater)			WORK REPOR	ORDER RTED		0588  -08-26	08:49
Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifie
General Parameters, Batch B1H0612, Cor	ntinued								
Blank (B1H0612-BLK2), Continued			Prepared	l: 2021-08-0	06, Analyze	d: 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	l: 2021-08-0	06, Analyze	d: 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	l: 2021-08-0	6, Analyze	d: 2021-	08-06		
Alkalinity, Total (as CaCO3)	106	1.0 mg/L	100		106	80-120			
LCS (B1H0612-BS2)			Prepared	l: 2021-08-0	06, Analyze	d: 2021-	08-06		
Alkalinity, Total (as CaCO3)	107	1.0 mg/L	100		107	80-120			
LCS (B1H0612-BS3)			Prepared	l: 2021-08-0	06, Analyze	d: 2021-	08-06		
Alkalinity, Total (as CaCO3)	104	1.0 mg/L	100		104	80-120			
Reference (B1H0612-SRM1)			Prepared	l: 2021-08-0	)6, Analyze	ed: 2021-	08-06		
рН	7.01	0.10 pH units	7.01		100	98-102			
Reference (B1H0612-SRM2)			Prepared	l: 2021-08-0	)6 Analyze	d· 2021-	08-06		
pH	7.01	0.10 pH units	7.01		100	98-102			
Reference (B1H0612-SRM3)		•	Prepared	l: 2021-08-0	)6 Analyze	.d· 2021-	08-06		
pH	7.01	0.10 pH units	7.01	2021 00 0	100	98-102			
General Parameters, Batch B1H0623	-		-						
Blank (B1H0623-BLK1)			Prepared	l: 2021-08-0	)6. Analvze	d: 2021-	08-06		
Ammonia, Total (as N)	< 0.050	0.050 mg/L			,				
Blank (B1H0623-BLK2)			Prepared	l: 2021-08-0	)6 Analyze	.d· 2021-	08-06		
Ammonia, Total (as N)	< 0.050	0.050 mg/L	rioparoa	2021 00 0	70,7 thaiy20				
· ·	0.000	0.000 mg/2	Droparad	I. 2021 00 0	Analyza	d: 2021	no ne		
LCS (B1H0623-BS1) Ammonia, Total (as N)	0.956	0.050 mg/L	1.00	l: 2021-08-0	96	90-115	00-00		
· ·	0.930	0.030 Hig/L					20.00		
LCS (B1H0623-BS2)	0.052	0.050 mg/l		l: 2021-08-0			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	l: 2021-08-0	06, Analyze	d: 2021-	08-11		
BOD, 5-day Carbonaceous	< 2.0	2.0 mg/L							
LCS (B1H0632-BS1)			Prepared	l: 2021-08-0	)6, Analyze	d: 2021-	08-11		
BOD, 5-day Carbonaceous	163	53.3 mg/L	180		91	85-115			
General Parameters, Batch B1H0807									
Blank (B1H0807-BLK1)			Prepared	l: 2021-08-0	)9, Analvze	ed: 2021-	08-10		
	< 0.050				-,				



PROJECT	Final Effluent- PE	strict of (Wastewa E14651	ater)			WORK REPOR	_	21H0 2021	)588  -08-26	08:49
Analyte		Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters	s, Batch B1H0807,	Continued								
Blank (B1H0807-B	LK2)			Prepared	I: 2021-08-0	9, Analyze	d: 2021-0	8-10		
Nitrogen, Total Kjelda	hl	< 0.050	0.050 mg/L							
LCS (B1H0807-BS	1)			Prepared	I: 2021-08-0	9, Analyze	d: 2021-0	8-10		
Nitrogen, Total Kjelda	hl	0.888	0.050 mg/L	1.00		89	85-115			
LCS (B1H0807-BS	2)			Prepared	I: 2021-08-0	9, Analyze	d: 2021 <b>-</b> 0	8-10		
Nitrogen, Total Kjelda	,	0.894	0.050 mg/L	1.00		89	85-115			
General Parameter Blank (B1H0835-B				Prepared	I: 2021-08-0	9, Analyze	d: 2021-0	08-10		
Phosphorus, Total (as	; P)	< 0.0050	0.0050 mg/L							
LCS (B1H0835-BS	1)			Prepared	I: 2021-08-0	9, Analyze	d: 2021-0	8-10		
Phosphorus, Total (as	s P)	0.106	0.0050 mg/L	0.100		106	85-115			
General Parameters				Prepared	l: 2021-08-1	0, Analyze	d: 2021-0	08-10		
	LK1)	< 2.0	2.0 mg/L	Prepared	l: 2021-08-1	0, Analyze	d: 2021-0	08-10		
Blank (B1H0868-B	LK1)	< 2.0	2.0 mg/L		l: 2021-08-1 l: 2021-08-1					
Blank (B1H0868-B Solids, Total Suspend	LK1) led LK2)	< 2.0 < 2.0	2.0 mg/L 2.0 mg/L							
Blank (B1H0868-B Solids, Total Suspend Blank (B1H0868-B	LK1) led LK2)			Prepared		0, Analyze	d: 2021-0	08-10		
Blank (B1H0868-B Solids, Total Suspend Blank (B1H0868-B Solids, Total Suspend	LK1) led  LK2) led			Prepared	l: 2021-08-1	0, Analyze	d: 2021-0	08-10		
Blank (B1H0868-B Solids, Total Suspend Blank (B1H0868-B Solids, Total Suspend LCS (B1H0868-BS Solids, Total Suspend	LK1) led  LK2) led  1)	< 2.0	2.0 mg/L	Prepared	l: 2021-08-1 l: 2021-08-1	0, Analyze 0, Analyze	d: 2021-0 d: 2021-0 85-115	)8-10 )8-10		
Solids, Total Suspend Blank (B1H0868-B Solids, Total Suspend LCS (B1H0868-BS	LK1) led  LK2) led  1) led	< 2.0	2.0 mg/L	Prepared	l: 2021-08-1	0, Analyze 0, Analyze	d: 2021-0 d: 2021-0 85-115	)8-10 )8-10		
Blank (B1H0868-B Solids, Total Suspend Blank (B1H0868-B Solids, Total Suspend LCS (B1H0868-BS Solids, Total Suspend LCS (B1H0868-BS Solids, Total Suspend	LK1) led  LK2) led  1) led  2) led  rameters, Batch B1	< 2.0 85.7 91.0	2.0 mg/L 3.3 mg/L	Prepared 100 Prepared 100	I: 2021-08-1 I: 2021-08-1 I: 2021-08-1	0, Analyze 0, Analyze 86 0, Analyze 91	d: 2021-0 d: 2021-0 85-115 d: 2021-0 85-115	08-10 08-10 08-10		
Blank (B1H0868-B Solids, Total Suspend Blank (B1H0868-B Solids, Total Suspend LCS (B1H0868-BS Solids, Total Suspend LCS (B1H0868-BS Solids, Total Suspend Microbiological Pate Blank (B1H0578-B	LK1) led  LK2) led  1) led  2) led  rameters, Batch B1	< 2.0 85.7 91.0	2.0 mg/L 3.3 mg/L 3.3 mg/L	Prepared 100 Prepared 100 Prepared	l: 2021-08-1 l: 2021-08-1	0, Analyze 0, Analyze 86 0, Analyze 91	d: 2021-0 d: 2021-0 85-115 d: 2021-0 85-115	08-10 08-10 08-10		
Blank (B1H0868-B Solids, Total Suspend Blank (B1H0868-B Solids, Total Suspend LCS (B1H0868-BS Solids, Total Suspend LCS (B1H0868-BS Solids, Total Suspend Microbiological Pat Blank (B1H0578-B	LK1) led  LK2) led  1) led  2) led  rameters, Batch B1	< 2.0 85.7 91.0	2.0 mg/L  3.3 mg/L  3.3 mg/L	Prepared 100 Prepared 100 Prepared 100	I: 2021-08-1 I: 2021-08-1 I: 2021-08-1	0, Analyze 0, Analyze 86 0, Analyze 91	d: 2021-0 d: 2021-0 85-115 d: 2021-0 85-115	08-10 08-10 08-10		
Blank (B1H0868-B Solids, Total Suspend Blank (B1H0868-B Solids, Total Suspend LCS (B1H0868-BS Solids, Total Suspend LCS (B1H0868-BS Solids, Total Suspend Microbiological Pate Blank (B1H0578-B	LK1) led LK2) led 11) led 22) led rameters, Batch B1 LK1)	< 2.0 85.7 91.0 <b>H0578</b>	2.0 mg/L 3.3 mg/L 3.3 mg/L	Prepared 100 Prepared 100 Prepared 100 Prepared mL mL	I: 2021-08-1 I: 2021-08-1 I: 2021-08-1	0, Analyze 0, Analyze 86 0, Analyze 91	d: 2021-0 d: 2021-0 85-115 d: 2021-0 85-115 d: 2021-0	08-10 08-10 08-10		
Blank (B1H0868-B Solids, Total Suspend Blank (B1H0868-B Solids, Total Suspend LCS (B1H0868-BS Solids, Total Suspend LCS (B1H0868-BS) Solids, Total Suspend Microbiological Pair Blank (B1H0578-B Coliforms, Total Coliforms, Fecal	LK1) led LK2) led 11) led 22) led rameters, Batch B1 LK1)	< 2.0 85.7 91.0 <b>H0578</b>	2.0 mg/L  3.3 mg/L  3.3 mg/L	Prepared 100 Prepared 100 Prepared mL mL Prepared	I: 2021-08-1 I: 2021-08-1 I: 2021-08-1 I: 2021-08-0	0, Analyze 0, Analyze 86 0, Analyze 91	d: 2021-0 d: 2021-0 85-115 d: 2021-0 85-115 d: 2021-0	08-10 08-10 08-10		





## **CERTIFICATE OF ANALYSIS**

REPORTED TO Lake Country, District of (Wastewater)

4062 Beaver Lake Rd

LAKE COUNTRY, BC V4V 1T5

ATTENTION Davin Larsen

**PO NUMBER** 104395-10-9007

PROJECT Raw Influent- PE14651
PROJECT INFO Lake Country WWTP

WORK ORDER 21H0586

**RECEIVED / TEMP** 2021-08-05 13:01 / 19.0°C

**REPORTED** 2021-08-12 15:59 **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



We've Got Chemistry



Ahead of the Curve



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.

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.

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 M what



## **TEST RESULTS**

Lake Country, District of (Wastewater) **REPORTED TO** 

Raw Influent- PE14651 **PROJECT** 

**WORK ORDER REPORTED** 

21H0586 2021-08-12 15:59

Analyte	Result	RL	Units	Analyzed	Qualifier
Raw Influent (E233627) (21H0586-	01)   Matrix: Wastewater   Sampled: 202	21-08-05 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)

PROJECT Raw Influent- PE14651

WORK ORDER REPORTED 21H0586

2021-08-12 15:59

Analysis Description	Method Ref.	Technique A	ccredited	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 Ac	cid) ✓	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.



**REPORTED TO** Lake Country, District of (Wastewater) **PROJECT** 

Raw Influent- PE14651

**WORK ORDER REPORTED** 

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

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

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

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B1H0591									
Blank (B1H0591-BLK1)			Prepared	l: 2021-08-0	6, Analyze	d: 2021-0	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	l: 2021-08-0	7, Analyze	d: 2021-0	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	l: 2021-08-0	6, Analyze	d: 2021-0	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	l: 2021-08-0	7, Analyze	d: 2021-0	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	
Blank (B1H0612-BLK2)  Alkalinity, Total (as CaCO3)	< 1.0	1.0 mg/L	Prepared: 2021-08-06, Analyzed: 2021-08-06	
	< 1.0 < 1.0	1.0 mg/L 1.0 mg/L	Prepared: 2021-08-06, Analyzed: 2021-08-06	
Alkalinity, Total (as CaCO3)			Prepared: 2021-08-06, Analyzed: 2021-08-06	
Alkalinity, Total (as CaCO3) Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0 mg/L	Prepared: 2021-08-06, Analyzed: 2021-08-06	



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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifie
General Parameters, Batch B1H0612, C	ontinued								
Blank (B1H0612-BLK3)			Prepared:	2021-08-0	6, Analyze	ed: 2021-0	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) Alkalinity, Carbonate (as CaCO3)	< 1.0 < 1.0	1.0 mg/L 1.0 mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0 mg/L							
LCS (B1H0612-BS1)		<u> </u>	Prepared:	2021-08-0	6. Analyze	ed: 2021-0	08-06		
Alkalinity, Total (as CaCO3)	106	1.0 mg/L	100		106	80-120			
LCS (B1H0612-BS2)		-	Prepared:	2021-08-0	6, Analyze	ed: 2021-0	08-06		
Alkalinity, Total (as CaCO3)	107	1.0 mg/L	100		107	80-120			
LCS (B1H0612-BS3)			Prepared:	2021-08-0	6, Analyze	ed: 2021-0	08-06		
Alkalinity, Total (as CaCO3)	104	1.0 mg/L	100		104	80-120			
Reference (B1H0612-SRM1)			Prepared:	2021-08-0	მ, Analyze	ed: 2021-0	08-06		
рН	7.01	0.10 pH units	7.01		100	98-102			
Reference (B1H0612-SRM2)			Prepared:	2021-08-0	6, Analyze	ed: 2021-0	08-06		
11	7.01	0.10 pH units	7.01		100	98-102			
рн		•							
	7.01	0.10 pH units	Prepared: 7.01	2021-08-00	6, Analyze	ed: 2021-( 98-102	08-06		
Reference (B1H0612-SRM3) pH  General Parameters, Batch B1H0631  Blank (B1H0631-BLK1)	7.01	0.10 pH units	7.01	2021-08-00	100	98-102			
Reference (B1H0612-SRM3) pH  General Parameters, Batch B1H0631  Blank (B1H0631-BLK1)  BOD, 5-day		·	7.01 Prepared:	2021-08-06	100 6, Analyze	98-102 ed: 2021-0	)8-11		
Reference (B1H0612-SRM3)  pH  General Parameters, Batch B1H0631  Blank (B1H0631-BLK1)	7.01	0.10 pH units	7.01 Prepared:		100 6, Analyze	98-102 ed: 2021-0	)8-11		
Reference (B1H0612-SRM3) pH  General Parameters, Batch B1H0631  Blank (B1H0631-BLK1)  BOD, 5-day  LCS (B1H0631-BS1)  BOD, 5-day  General Parameters, Batch B1H0632  Blank (B1H0632-BLK1)	7.01 < 2.0 176	0.10 pH units  2.0 mg/L  60.0 mg/L	7.01  Prepared:  Prepared: 180	2021-08-06	100 6, Analyze 6, Analyze 98	98-102 ed: 2021-( ed: 2021-( 85-115	08-11 08-11		
Reference (B1H0612-SRM3) pH  General Parameters, Batch B1H0631 Blank (B1H0631-BLK1) BOD, 5-day LCS (B1H0631-BS1) BOD, 5-day  General Parameters, Batch B1H0632 Blank (B1H0632-BLK1) BOD, 5-day Carbonaceous	7.01 < 2.0	0.10 pH units	7.01 Prepared: Prepared: 180 Prepared:	2021-08-06 2021-08-06 2021-08-06	100 6, Analyze 98 98 6, Analyze	98-102 ed: 2021-( ed: 2021-( 85-115 ed: 2021-(	08-11 08-11 08-11		
Reference (B1H0612-SRM3) pH  General Parameters, Batch B1H0631  Blank (B1H0631-BLK1) BOD, 5-day  LCS (B1H0631-BS1) BOD, 5-day  General Parameters, Batch B1H0632  Blank (B1H0632-BLK1) BOD, 5-day Carbonaceous  LCS (B1H0632-BS1)	7.01 < 2.0 176	0.10 pH units  2.0 mg/L  60.0 mg/L	7.01 Prepared: Prepared: 180 Prepared:	2021-08-06 2021-08-06	100 6, Analyze 98 98 6, Analyze	98-102 ed: 2021-( ed: 2021-( 85-115 ed: 2021-(	08-11 08-11 08-11		
Reference (B1H0612-SRM3) pH  General Parameters, Batch B1H0631  Blank (B1H0631-BLK1) BOD, 5-day  LCS (B1H0631-BS1) BOD, 5-day  General Parameters, Batch B1H0632  Blank (B1H0632-BLK1) BOD, 5-day Carbonaceous  LCS (B1H0632-BS1) BOD, 5-day Carbonaceous	7.01 < 2.0 176	0.10 pH units  2.0 mg/L  60.0 mg/L  2.0 mg/L	Prepared: Prepared: 180  Prepared: Prepared:	2021-08-06 2021-08-06 2021-08-06	100 6, Analyze 98 6, Analyze 6, Analyze	98-102 ed: 2021-( ed: 2021-( 85-115 ed: 2021-( ed: 2021-(	08-11 08-11 08-11		
Reference (B1H0612-SRM3) pH  General Parameters, Batch B1H0631  Blank (B1H0631-BLK1) BOD, 5-day  LCS (B1H0631-BS1) BOD, 5-day  General Parameters, Batch B1H0632  Blank (B1H0632-BLK1) BOD, 5-day Carbonaceous  LCS (B1H0632-BS1) BOD, 5-day Carbonaceous  General Parameters, Batch B1H0782	7.01 < 2.0 176	0.10 pH units  2.0 mg/L  60.0 mg/L  2.0 mg/L	7.01  Prepared: Prepared: 180  Prepared: Prepared: 180	2021-08-06 2021-08-06 2021-08-06 2021-08-06	100 6, Analyze 98 6, Analyze 9, Analyze 91	98-102 ed: 2021-( ed: 2021-( 85-115 ed: 2021-( ed: 2021-( 85-115	08-11 08-11 08-11		
Reference (B1H0612-SRM3) pH  General Parameters, Batch B1H0631  Blank (B1H0631-BLK1)  BOD, 5-day  LCS (B1H0631-BS1)  BOD, 5-day  General Parameters, Batch B1H0632  Blank (B1H0632-BLK1)  BOD, 5-day Carbonaceous  LCS (B1H0632-BS1)  BOD, 5-day Carbonaceous  General Parameters, Batch B1H0782	7.01 < 2.0 176	0.10 pH units  2.0 mg/L  60.0 mg/L  2.0 mg/L	7.01  Prepared: Prepared: 180  Prepared: Prepared: 180	2021-08-06 2021-08-06 2021-08-06	100 6, Analyze 98 6, Analyze 9, Analyze 91	98-102 ed: 2021-( ed: 2021-( 85-115 ed: 2021-( ed: 2021-( 85-115	08-11 08-11 08-11		
Reference (B1H0612-SRM3) pH  General Parameters, Batch B1H0631 Blank (B1H0631-BLK1) BOD, 5-day  LCS (B1H0631-BS1) BOD, 5-day  General Parameters, Batch B1H0632 Blank (B1H0632-BLK1) BOD, 5-day Carbonaceous  LCS (B1H0632-BS1) BOD, 5-day Carbonaceous  General Parameters, Batch B1H0782 Blank (B1H0782-BLK1) BOD, 5-day Carbonaceous	7.01  < 2.0  176  < 2.0  163	0.10 pH units  2.0 mg/L  60.0 mg/L  2.0 mg/L	7.01  Prepared: Prepared: 180  Prepared: 180  Prepared:	2021-08-06 2021-08-06 2021-08-06 2021-08-06	100 6, Analyze 98 6, Analyze 91 9, Analyze	98-102 ed: 2021-( ed: 2021-( 85-115 ed: 2021-( 85-115	08-11 08-11 08-11 08-11		
Reference (B1H0612-SRM3) pH  General Parameters, Batch B1H0631 Blank (B1H0631-BLK1) BOD, 5-day LCS (B1H0631-BS1) BOD, 5-day  General Parameters, Batch B1H0632 Blank (B1H0632-BLK1) BOD, 5-day Carbonaceous LCS (B1H0632-BS1) BOD, 5-day Carbonaceous General Parameters, Batch B1H0782 Blank (B1H0782-BLK1) Ammonia, Total (as N) Blank (B1H0782-BLK2)	7.01  < 2.0  176  < 2.0  163	0.10 pH units  2.0 mg/L  60.0 mg/L  2.0 mg/L	7.01  Prepared: Prepared: 180  Prepared: 180  Prepared:	2021-08-06 2021-08-06 2021-08-06 2021-08-06	100 6, Analyze 98 6, Analyze 91 9, Analyze	98-102 ed: 2021-( ed: 2021-( 85-115 ed: 2021-( 85-115	08-11 08-11 08-11 08-11		
Reference (B1H0612-SRM3) pH  General Parameters, Batch B1H0631  Blank (B1H0631-BLK1) BOD, 5-day  LCS (B1H0631-BS1) BOD, 5-day  General Parameters, Batch B1H0632  Blank (B1H0632-BLK1) BOD, 5-day Carbonaceous  LCS (B1H0632-BS1) BOD, 5-day Carbonaceous  General Parameters, Batch B1H0782  Blank (B1H0782-BLK1)  Ammonia, Total (as N)  Blank (B1H0782-BLK2)  Ammonia, Total (as N)	7.01  < 2.0  176  < 2.0  163  < 0.050	0.10 pH units  2.0 mg/L  60.0 mg/L  53.3 mg/L  0.050 mg/L	7.01  Prepared: Prepared: 180  Prepared: 180  Prepared: Prepared:	2021-08-06 2021-08-06 2021-08-06 2021-08-06	100 6, Analyze 98 6, Analyze 91 9, Analyze	98-102 ed: 2021-( ed: 2021-( 85-115 ed: 2021-( 85-115 ed: 2021-( ed: 2021-( ed: 2021-(	08-11 08-11 08-11 08-11 08-09		
Reference (B1H0612-SRM3) pH  General Parameters, Batch B1H0631  Blank (B1H0631-BLK1) BOD, 5-day  LCS (B1H0631-BS1) BOD, 5-day  General Parameters, Batch B1H0632  Blank (B1H0632-BLK1) BOD, 5-day Carbonaceous  LCS (B1H0632-BS1) BOD, 5-day Carbonaceous  General Parameters, Batch B1H0782  Blank (B1H0782-BLK1)  Ammonia, Total (as N)  Blank (B1H0782-BLK2)  Ammonia, Total (as N)	7.01  < 2.0  176  < 2.0  163  < 0.050	0.10 pH units  2.0 mg/L  60.0 mg/L  53.3 mg/L  0.050 mg/L	7.01  Prepared: Prepared: 180  Prepared: 180  Prepared: Prepared:	2021-08-06 2021-08-06 2021-08-06 2021-08-06 2021-08-06	100 6, Analyze 98 6, Analyze 91 9, Analyze	98-102 ed: 2021-( ed: 2021-( 85-115 ed: 2021-( 85-115 ed: 2021-( ed: 2021-( ed: 2021-(	08-11 08-11 08-11 08-11 08-09		
Reference (B1H0612-SRM3) pH  General Parameters, Batch B1H0631  Blank (B1H0631-BLK1) BOD, 5-day  LCS (B1H0631-BS1) BOD, 5-day  General Parameters, Batch B1H0632  Blank (B1H0632-BLK1) BOD, 5-day Carbonaceous  LCS (B1H0632-BS1) BOD, 5-day Carbonaceous  General Parameters, Batch B1H0782  Blank (B1H0782-BLK1)  Ammonia, Total (as N)  Blank (B1H0782-BLK2)  Ammonia, Total (as N)  Blank (B1H0782-BLK3)  Ammonia, Total (as N)	7.01  < 2.0  176  < 2.0  163  < 0.050  < 0.050	0.10 pH units  2.0 mg/L  60.0 mg/L  2.0 mg/L  0.050 mg/L	Prepared: Prepared: Prepared: Prepared: Prepared: Prepared: Prepared: Prepared:	2021-08-06 2021-08-06 2021-08-06 2021-08-06 2021-08-06	100 6, Analyze 98 6, Analyze 91 9, Analyze 9, Analyze	98-102 ed: 2021-( ed: 2021-( 85-115 ed: 2021-( 85-115 ed: 2021-( ed: 2021-( ed: 2021-(	08-11 08-11 08-11 08-11 08-09 08-09		
Reference (B1H0612-SRM3) pH  General Parameters, Batch B1H0631  Blank (B1H0631-BLK1) BOD, 5-day  LCS (B1H0631-BS1) BOD, 5-day  General Parameters, Batch B1H0632  Blank (B1H0632-BLK1) BOD, 5-day Carbonaceous  LCS (B1H0632-BS1) BOD, 5-day Carbonaceous  General Parameters, Batch B1H0782  Blank (B1H0782-BLK1)  Ammonia, Total (as N)  Blank (B1H0782-BLK2)  Ammonia, Total (as N)  Blank (B1H0782-BLK3)	7.01  < 2.0  176  < 2.0  163  < 0.050  < 0.050	0.10 pH units  2.0 mg/L  60.0 mg/L  2.0 mg/L  0.050 mg/L	Prepared: Prepared: Prepared: Prepared: Prepared: Prepared: Prepared: Prepared:	2021-08-06 2021-08-06 2021-08-06 2021-08-06 2021-08-06 2021-08-06	100 6, Analyze 98 6, Analyze 91 9, Analyze 9, Analyze	98-102 ed: 2021-( ed: 2021-( 85-115 ed: 2021-( 85-115 ed: 2021-( ed: 2021-( ed: 2021-(	08-11 08-11 08-11 08-11 08-09 08-09		
Reference (B1H0612-SRM3) pH  General Parameters, Batch B1H0631  Blank (B1H0631-BLK1) BOD, 5-day  LCS (B1H0631-BS1) BOD, 5-day  General Parameters, Batch B1H0632  Blank (B1H0632-BLK1) BOD, 5-day Carbonaceous  LCS (B1H0632-BS1) BOD, 5-day Carbonaceous  General Parameters, Batch B1H0782  Blank (B1H0782-BLK1)  Ammonia, Total (as N)  Blank (B1H0782-BLK2)  Ammonia, Total (as N)  Blank (B1H0782-BLK3)  Ammonia, Total (as N)  LCS (B1H0782-BS1)	7.01  < 2.0  176  < 2.0  163  < 0.050  < 0.050  < 0.050	0.10 pH units  2.0 mg/L  60.0 mg/L  2.0 mg/L  53.3 mg/L  0.050 mg/L  0.050 mg/L	7.01  Prepared: Prepared: 180  Prepared: 180  Prepared: 180  Prepared: Prepared: Prepared: 1.00	2021-08-06 2021-08-06 2021-08-06 2021-08-06 2021-08-06 2021-08-06	100 6, Analyze 98 6, Analyze 98 6, Analyze 91 9, Analyze 9, Analyze 9, Analyze	98-102 ed: 2021-( 85-115 ed: 2021-( 85-115 ed: 2021-( 85-115 ed: 2021-( 90-115	08-11 08-11 08-11 08-11 08-09 08-09 08-09		



REPORTED TO PROJECT	Lake Country, District of Raw Influent- PE14651	,	ater)			_	WORK ORDER REPORTED			15:59
Analyte		Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters	, Batch B1H0782, Contin	ued								
LCS (B1H0782-BS3	)			Prepared	: 2021-08-0	9, Analyze	d: 2021-0	08-09		
Ammonia, Total (as N)		0.907	0.050 mg/L	1.00		91	90-115			
General Parameters	, Batch B1H0807									
Blank (B1H0807-BL	.K1)			Prepared	: 2021-08-0	9, Analyze	d: 2021-0	08-10		
Nitrogen, Total Kjeldah	l .	< 0.050	0.050 mg/L	•		•				
Blank (B1H0807-BL	K2)			Prepared	: 2021-08-0	9, Analyze	d: 2021-0	08-10		
Nitrogen, Total Kjeldah	l	< 0.050	0.050 mg/L							
LCS (B1H0807-BS1	)			Prepared	: 2021-08-0	9, Analyze	d: 2021-0	08-10		
Nitrogen, Total Kjeldah	l	0.888	0.050 mg/L	1.00		89	85-115			
LCS (B1H0807-BS2	)			Prepared	: 2021-08-0	9, Analyze	d: 2021-0	08-10		
Nitrogen, Total Kjeldah	<i>,</i> I	0.894	0.050 mg/L	1.00		89	85-115			
General Parameters Blank (B1H0835-BL				Prepared	: 2021-08-0	9, Analyze	d: 2021-0	08-10		
Phosphorus, Total (as	P)	< 0.0050	0.0050 mg/L							
LCS (B1H0835-BS1	)			Prepared	: 2021-08-0	9, Analyze	d: 2021-0	08-10		
Phosphorus, Total (as	P)	0.106	0.0050 mg/L	0.100		106	85-115			
General Parameters	, Batch B1H0868									
Blank (B1H0868-BL	K1)			Prepared	: 2021-08-1	0, Analyze	d: 2021-0	08-10		
Solids, Total Suspende	ed	< 2.0	2.0 mg/L	-						
Blank (B1H0868-BL	K2)			Prepared	: 2021-08-1	0, Analyze	d: 2021-0	08-10		
Solids, Total Suspende	ed	< 2.0	2.0 mg/L	•						
LCS (B1H0868-BS1	)			Prepared	: 2021-08-1	0, Analyze	d: 2021-0	08-10		
Solids, Total Suspende	ed	85.7	3.3 mg/L	100		86	85-115			
LCS (B1H0868-BS2	)			Prepared	: 2021-08-1	0, Analyze	d: 2021-(	08-10		
Solids, Total Suspende	·	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

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We've Got Chemistry



Ahead of the Curve



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.

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.

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 A what



# **TEST RESULTS**

Final Effluent (E233626) (2111211-01)   Matrix: Wastewater   Sampled: 2021-09-08 11:00  Anions  Chloride 96.6 0.10 mg/L 2021-09-11  Nitrate (as N) 0.049 0.010 mg/L 2021-09-11  Nitrate (as N) 0.049 0.010 mg/L 2021-09-11  Nitrate (as N) 0.048 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  Nitrogen, Total (as CaCO3) 182 1.0 mg/L 2021-09-13  Alkalinity, Phenolphthaliani (as CaCO3) 1.0 1.0 mg/L 2021-09-13  Alkalinity, Phenolphthaliani (as CaCO3) 1.0 1.0 mg/L 2021-09-13  Alkalinity, Phenolphthaliani (as CaCO3) 1.0 1.0 mg/L 2021-09-13  Alkalinity, Hydroxide (as CaCO3) 1.0 1.0 mg/L 2021-09-13  Mitrogen, Total (as N) 0.682 0.050 mg/L 2021-09-13  HTPhosphorus, Total (as N) 0.301 0.0050 mg/L 2021-09-13  Mitroplotological Parameters  Coliforms, Feal 19400 1.1 MPN/100 mL 2021-09-09  Coliforms, Feal 19400 0.010 mg/L 2021-09-11  Nitrate (as N) 0.010 0.010 mg/L 2021-09-11  Nitrate (as N) 0.0010 0.010 mg/L 2021-09-11  Nitrate (as N) 0.0000 0.000 mg/L 2021-09-11  Nitrate (as N) 0.0000 0.000 mg/L 2021-09-11  Nitrate (as N) 0.0000 0.000 mg/L 2021-09-11  Nitrate (as N) 0.0000 0.0000 mg/L 2021-09-11  Nitrate (as N) 0.0000 0.00	REPORTED TO PROJECT	Lake Country, District of Final Effluent- PE1465	·		WORK ORDER REPORTED	21I1211 2021-09-1	5 14:10	
Chloride	Analyte		Result	RL	Units	Analyzed	Qualifier	
Chloride         96.6         0.10 mg/L         2021-09-11           Nitrate (as N)         2.30         0.010 mg/L         2021-09-11           Nitrate (as N)         0.049         0.010 mg/L         2021-09-11           Phosphate (as P)         0.0458         0.0050 mg/L         2021-09-11           Calculated Parameters           Nitrate -Nitrite (as N)         2.35         0.0100 mg/L         N/A           Nitrate -Nitrite (as N)         2.35         0.0100 mg/L         N/A           Calculated Parameters           Alkalinity, Total (as CaCO3)         182         1.0 mg/L         2021-09-13           Alkalinity, Total (as CaCO3)         182         1.0 mg/L         2021-09-13           Alkalinity, Carbonate (as CaCO3)         4.10         1.0 mg/L         2021-09-13           Alkalinity, Phydroxide (as CaCO3)         4.10         1.0 mg/L         2021-09-13	Final Effluent (E2	233626) (21l1211-01)   Ma	trix: Wastewater   Sample	d: 2021-09-08 11:00				
Nitrate (as N)	Anions							
Nitride (as N)	Chloride		96.6	0.10	ma/L	2021-09-11		
Nitrite (as N)	Nitrate (as N)		2.30			2021-09-11		
Phosphate (as P)			0.049			2021-09-11		
Nitrate+Nitrite (as N)   2.35   0.0100 mg/L N/A   Nitrogen, Total   4.72   0.100 mg/L N/A   Nitrogen, Total (as CaCO3)   482   1.0 mg/L 2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2021-09-13   2			0.0158					
Nitrogen, Total   4.72	Calculated Parame	eters						
Alkalinity, Total (as CaCO3)	Nitrate+Nitrite (as	N)	2.35	0.0100	mg/L	N/A		
Alkalinity, Total (as CaCO3)	Nitrogen, Total	,	4.72			N/A		
Alkalinity, Phenolphthalein (as CaCO3) < 1.0	General Parameter	's						
Alkalinity, Phenolphthalein (as CaCO3) < 1.0	Alkalinity, Total (as	s CaCO3)	182	1.0	ma/L	2021-09-13		
Alkalinity, Bicarbonate (as CaCO3)		· · · · · · · · · · · · · · · · · · ·						
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  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  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 (2111211-02)   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  Phosphate (as P) < 0.050 0.050 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 0.010 mg/L 2021-09-11  Calculated Parameters  Nitrate+Nitrite (as N) < 0.0100 0.010 mg/L N/A  Nitrogen, Total < 0.0500 0.0500 mg/L N/A  Nitrogen, Total < 0.0500 0.0500 mg/L N/A  Nitrogen, Total < 0.0500 0.0500 mg/L N/A  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, 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 HT 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 (2111211-02)   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  Nitrite (as R) < 0.010 0.010 mg/L 2021-09-11  Calculated Parameters  Nitrate+Nitrite (as N) < 0.0100 0.0050 mg/L 2021-09-11  Calculated Parameters  Nitrate+Nitrite (as N) < 0.0100 0.0100 mg/L 2021-09-11  Alkalinity, Total (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, 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, Carbonate (as CaCO3) < 1.0 1.0 mg/L 2021-09-13  Alkalinity, Carbonate (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         HT           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           Field Blank (2111211-02)   Matrix: Water   Sampled: 2021-09-08 11:03           Anions           Chloride         < 0.10		, ,						
BOD, 5-day Carbonaceous		,						
Nitrogen, Total Kjeldahl   2.37   0.050 mg/L   2021-09-14     ph   7.92   0.10 ph units   2021-09-13   HT     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	<u></u>	· · · · · · · · · · · · · · · · · · ·						
pH         7.92         0.10 pH units         2021-09-13 pH         HT           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 (2111211-02)   Matrix: Water   Sampled: 2021-09-08 11:03           Anions           Chloride         < 0.10								
Phosphorus, Total (as P)   0.301   0.0050 mg/L   2021-09-13			7.92				HT2	
Solids, Total Suspended   4.0   2.0 mg/L   2021-09-13		(as P)			•			
Coliforms, Total 155000 1 MPN/100 mL 2021-09-09 Coliforms, Fecal 19400 1 MPN/100 mL 2021-09-09  Field Blank (2111211-02)   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, 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, Carbonate (as CaCO3) < 1.0 1.0 mg/L 2021-09-13 Alkalinity, Carbonate (as CaCO3) < 1.0 1.0 mg/L 2021-09-13		` '	4.0			2021-09-13		
Coliforms, Fecal         19400         1 MPN/100 mL         2021-09-09           Field Blank (2111211-02)   Matrix: Water   Sampled: 2021-09-08 11:03           Anions           Chloride         < 0.10	Microbiological Pa	rameters			-			
Coliforms, Fecal         19400         1 MPN/100 mL         2021-09-09           Field Blank (2111211-02)   Matrix: Water   Sampled: 2021-09-08 11:03           Anions           Chloride         < 0.10	Coliforms Total		155000	1	MPN/100 ml	2021-09-09		
Field Blank (2111211-02)   Matrix: Water   Sampled: 2021-09-08 11:03           Anions         Chloride         < 0.10								
Nitrate (as N)         < 0.010	Anions	211-02)   Matrix: Water						
Nitrite (as N)         < 0.010         0.010 mg/L         2021-09-11           Phosphate (as P)         < 0.0050								
Phosphate (as P)         < 0.0050								
Calculated Parameters         Nitrate+Nitrite (as N)       < 0.0100								
Nitrate+Nitrite (as N)         < 0.0100	Pnospnate (as P)		< 0.0050	0.0050	rng/L	2021-09-11		
Nitrogen, Total         < 0.0500         0.0500         mg/L         N/A           General Parameters           Alkalinity, Total (as CaCO3)         < 1.0	Calculated Parame	eters						
General Parameters         Alkalinity, Total (as CaCO3)       < 1.0	Nitrate+Nitrite (as	N)	< 0.0100	0.0100	mg/L	N/A		
Alkalinity, Total (as CaCO3)       < 1.0	Nitrogen, Total	_	< 0.0500	0.0500	mg/L	N/A		
Alkalinity, Phenolphthalein (as CaCO3)       < 1.0	General Parameter	rs						
Alkalinity, Bicarbonate (as CaCO3)       < 1.0	Alkalinity, Total (as	s CaCO3)	< 1.0	1.0	mg/L	2021-09-13		
Alkalinity, Bicarbonate (as CaCO3)       < 1.0		·	< 1.0			2021-09-13		
Alkalinity, Carbonate (as CaCO3) < 1.0 1.0 mg/L 2021-09-13			< 1.0					
			< 1.0					
,, , , , = ==,			< 1.0			2021-09-13		



# **TEST RESULTS**

**REPORTED TO** Lake Country, District of (Wastewater)

PROJECT Final Effluent- PE14651

**WORK ORDER** 2111211 **REPORTED** 2021-09

1 MPN/100 mL

2021-09-15 14:10

2021-09-09

Analyte	Result	RL	Units	Analyzed	Qualifier
Field Blank (2111211-02)   Matrix: V	Vater   Sampled: 2021-09-0	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	

### Sample Qualifiers:

Coliforms, Fecal

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

< 1



## **APPENDIX 1: SUPPORTING INFORMATION**

**REPORTED TO** Lake Country, District of (Wastewater)

PROJECT Final Effluent- PE14651

WORK ORDER
REPORTED

2111211

2021-09-15 14:10

Analysis Description	Method Ref.	Technique A	ccredited	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 Ac	id) ✓	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.



**REPORTED TO** Lake Country, District of (Wastewater) **PROJECT** 

Final Effluent- PE14651

**WORK ORDER REPORTED** 

2111211 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 B1l1011									
Blank (B1I1011-BLK1)			Prepared	I: 2021-09-1	I0, Analyze	d: 2021-0	9-10		
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	I: 2021-09-1	I1, Analyze	d: 2021-0	9-11		
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	I: 2021-09-1	I0, Analyze	d: 2021-0	9-10		
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	I: 2021-09-1	I1, Analyze	d: 2021-0	9-11		
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		



REPORTED TO Lake Country, Final Effluent-	District of (Wastewa PE14651	ater)			WORK REPOR	ORDER TED	21I1: 2021	211 -09-15	14:10
Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1I1019	9, Continued								
Blank (B1I1019-BLK5)			Prepared	: 2021-09-1	0, Analyze	d: 2021-09	9-10		
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
LCS (B1I1019-BS1)			Prepared	: 2021-09-1	0, Analyze	d: 2021-09	9-10		
Ammonia, Total (as N)	0.917	0.050 mg/L	1.00		92	90-115			
LCS (B1I1019-BS2)			Prepared	: 2021-09-1	0, Analyze	d: 2021-09	9-10		
Ammonia, Total (as N)	0.912	0.050 mg/L	1.00		91	90-115			
LCS (B1I1019-BS3)			Prepared	: 2021-09-1	0, Analyze	d: 2021-09	9-10		
Ammonia, Total (as N)	0.922	0.050 mg/L	1.00		92	90-115			
LCS (B1I1019-BS4)			Prepared	: 2021-09-1	0, Analyze	d: 2021-09	9-10		
Ammonia, Total (as N)	0.901	0.050 mg/L	1.00		90	90-115			
LCS (B1I1019-BS5)			Prepared	: 2021-09-1	0. Analvze	d: 2021-09	9-10		
Ammonia, Total (as N)	0.929	0.050 mg/L	1.00		93	90-115			
General Parameters, Batch B1I1096	6			0004 00 4			. 45		
Blank (B1I1096-BLK1)	< 2.0	2.0 mg/l	Prepared	: 2021-09-1	u, Anaiyze	a: 2021-09	9-15		
BOD, 5-day Carbonaceous	< 2.0	2.0 mg/L							
LCS (B1I1096-BS1)	104	2.0 ma/l		: 2021-09-1			9-15		
BOD, 5-day Carbonaceous	184	2.0 mg/L	180		102	85-115			
General Parameters, Batch B1I1274	1								
Blank (B1I1274-BLK1)			Prepared	: 2021-09-1	3, Analyze	d: 2021-09	9-13		
Solids, Total Suspended	< 2.0	2.0 mg/L							
Blank (B1l1274-BLK2)			Prepared	: 2021-09-1	3, Analyze	d: 2021-09	9-13		
Solids, Total Suspended	< 2.0	2.0 mg/L	,		•				
LCS (B1I1274-BS1)			Prepared	: 2021-09-1	3, Analyze	d: 2021-09	9-13		
Solids, Total Suspended	97.0	5.0 mg/L	100		97	85-115			
LCS (B1I1274-BS2)			Prepared	: 2021-09-1	3, Analyze	d: 2021-09	9-13		
Solids, Total Suspended	92.5	5.0 mg/L	100		92	85-115			
General Parameters, Batch B1l1276	5								
Blank (B1l1276-BLK1)			Prepared	: 2021-09-1	3, Analyze	d: 2021-09	9-13		
Phosphorus, Total (as P)	< 0.0050	0.0050 mg/L							
Blank (B1l1276-BLK2)			Prepared	: 2021-09-1	3, Analyze	d: 2021-09	9-13		
Phosphorus, Total (as P)	< 0.0050	0.0050 mg/L							
LCS (B1I1276-BS1)			Prepared	: 2021-09-1	3, Analyze	d: 2021-09	9-13		
Phosphorus, Total (as P)	0.105	0.0050 mg/L	0.100		105	85-115			
LCS (B1I1276-BS2)			Prepared	: 2021-09-1	3, Analyze	d: 2021-09	9-13		
Phosphorus, Total (as P)	0.106	0.0050 mg/L	0.100		106	85-115			

General Parameters, Batch B1I1329



•	D TO Lake Country, District of (Wastewater) Final Effluent- PE14651							1211 21-09-15 14:10		
Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier	
General Parameters, Batch B1l1329, Con	tinued									
Blank (B1l1329-BLK1)			Prepared	: 2021-09-1	3, Analyze	ed: 2021-	09-14			
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L								
Blank (B1I1329-BLK2)			Prepared	: 2021-09-1	3. Analyze	ed: 2021-0	09-14			
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L	1 Toparou	2021 00 1	0,7 mary 20	JG. 2021	00 11			
LCS (B1I1329-BS1)		<u> </u>	Propared	: 2021-09-1	2 Analyz	nd: 2021 i	00 14			
Nitrogen, Total Kjeldahl	1.00	0.050 mg/L	1.00	. 2021-09-1	3, Allaly26	85-115	J9-14			
·	1.00	0.030 Hig/L								
LCS (B1I1329-BS2)				2021-09-1			09-14			
Nitrogen, Total Kjeldahl	1.00	0.050 mg/L	1.00		100	85-115				
Duplicate (B1I1329-DUP2)	Sou	rce: 21l1211-01	Prepared	2021-09-1	3, Analyze	ed: 2021-0	09-14			
Nitrogen, Total Kjeldahl	2.35	0.050 mg/L		2.37			< 1	15		
Matrix Spike (B1I1329-MS2)	Sou	rce: 21l1211-01	Prepared	2021-09-1	3, Analyze	ed: 2021-	09-14			
Nitrogen, Total Kjeldahl	6.48	0.200 mg/L	4.00	2.37	103	65-135				
General Parameters, Batch B1l1371				0004.00.4						
Blank (B1I1371-BLK1)			Prepared	2021-09-1	3, Analyze	ed: 2021-0	09-13			
Alkalinity, Total (as CaCO3)	1.7	1.0 mg/L								
Alkalinity, Phenolphthalein (as CaCO3)  Alkalinity, Bicarbonate (as CaCO3)	< 1.0 1.7	1.0 mg/L 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)	11.0	1.0 mg/L	Prepared	: 2021-09-1	3, Analyze	ed: 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	: 2021-09-1	3. Analyze	ed: 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	2021-09-1	3, Analyze	ed: 2021-	09-13			
Alkalinity, Total (as CaCO3)	109	1.0 mg/L	100		109	80-120				
LCS (B1I1371-BS2)			Prepared	: 2021-09-1	3. Analyze	ed: 2021-	09-13			
Alkalinity, Total (as CaCO3)	109	1.0 mg/L	100		109	80-120				
LCS (B1I1371-BS3)		. J		: 2021-09-1			na_13			
Alkalinity, Total (as CaCO3)	109	1.0 mg/L	100	. 202 1-09-1	109	80-120	09-10			
· · · · · · · · · · · · · · · · · · ·	103	1.0 mg/L		2024 00 4			nn 12			
Reference (B1I1371-SRM1)	7.00	0.40 -11 3		2021-09-1			J <del>J</del> -13			
pH	7.00	0.10 pH units	7.01	. 2024 22 1	100	98-102	00.40			
Reference (B1I1371-SRM2)				2021-09-1			J9-13			
рН	7.01	0.10 pH units	7.01		100	98-102				
Reference (B1I1371-SRM3)				2021-09-1	3, Analyze		09-13			
рН	7.00	0.10 pH units	7.01		100	98-102				



Coliforms, Fecal

Coliforms, Total

Blank (B1I0927-BLK2)

# **APPENDIX 2: QUALITY CONTROL RESULTS**

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REPORTED TO PROJECT	Lake Country, Distri Final Effluent- PE14	•	ter)			WORK REPOR		21I12 2021	211 -09-15	14:10
Analyte		Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Microbiological Pa	arameters, Batch B1l09	27								
Blank (B110927-B	LK1)			Prepared	I: 2021-09-0	)9. Analvze	d: 2021-0	9-09		

1 MPN/100 mL

1 MPN/100 mL

Prepared: 2021-09-09, Analyzed: 2021-09-09





## **CERTIFICATE OF ANALYSIS**

REPORTED TO Lake Country, District of (Wastewater)

4062 Beaver Lake Rd

LAKE COUNTRY, BC V4V 1T5

ATTENTION Davin Larsen WORK ORDER 2111206

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

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.

#### 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

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 M undbud



# **TEST RESULTS**

**REPORTED TO** Lake Country, District of (Wastewater)

PROJECT Raw Influent- PE14651

WORK ORDER REPORTED

2111206

2021-09-15 15:06

Analyte	Result	RL	Units	Analyzed	Qualifi
Raw Influent (E233627) (21I1206-01)   Mat	rix: Wastewater   Sample	d: 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	
рН	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)

PROJECT Raw Influent- PE14651

WORK ORDER
REPORTED

2111206

2021-09-15 15:06

Analysis Description	Method Ref.	Technique A	ccredited	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 Ac	cid) ✓	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.



**REPORTED TO** Lake Country, District of (Wastewater)

PROJECT Raw Influent- PE14651

WORK ORDER REPORTED 21I1206 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	Qualifie
Anions, Batch B1l1011									
Blank (B1I1011-BLK1)			Prepared	I: 2021-09-1	0, Analyze	d: 2021-0	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	I: 2021-09-1	1, Analyze	d: 2021-0	9-11		
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	I: 2021-09-1	0, Analyze	d: 2021-0	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	I: 2021-09-1	1, Analyze	d: 2021-0	9-11		
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	



	ke Country, District of (Waste w Influent- PE14651	water)			WORK REPOR	ORDER RTED		206  -09-15	15:06
Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Ba	atch B1l1019, Continued								
LCS (B1I1019-BS1)			Prepared	: 2021-09-1	0, Analyze	ed: 2021-	09-10		
Ammonia, Total (as N)	0.917	0.050 mg/L	1.00		92	90-115			
LCS (B1I1019-BS2)			Prepared	: 2021-09-1	0, Analyze	ed: 2021-	09-10		
Ammonia, Total (as N)	0.912	0.050 mg/L	1.00		91	90-115			
LCS (B1I1019-BS3)			Prepared	: 2021-09-1	0, Analyze	ed: 2021-	09-10		
Ammonia, Total (as N)	0.922	0.050 mg/L	1.00		92	90-115			
LCS (B1I1019-BS4)			Prepared	: 2021-09-1	0, Analyze	ed: 2021-	09-10		
Ammonia, Total (as N)	0.901	0.050 mg/L	1.00		90	90-115			
LCS (B1I1019-BS5)			Prepared	: 2021-09-1	0, Analyze	ed: 2021-	09-10		
Ammonia, Total (as N)	0.929	0.050 mg/L	1.00		93	90-115			
General Parameters, Ba	atch B1I1095								
Blank (B1I1095-BLK1)			Prepared	: 2021-09-1	0, Analyze	ed: 2021-	09-15		
BOD, 5-day	< 2.0	2.0 mg/L							
LCS (B1I1095-BS1)			Prepared	: 2021-09-1	0, Analyze	ed: 2021-	09-15		
BOD, 5-day	182	53.9 mg/L	180		101	85-115			
General Parameters, Bank (B1I1096-BLK1)	atch B1I1096		Prepared	: 2021-09-1	0. Analyze	ed: 2021-	09-15		
BOD, 5-day Carbonaceous	s < 2.0	2.0 mg/L			0,7				
LCS (B1I1096-BS1)			Prenared	: 2021-09-1	0 Analyze	ed: 2021-	09-15		
BOD, 5-day Carbonaceous	is 184	2.0 mg/L	180	. 2021 00 1	102	85-115	00 10		
General Parameters, B	atch B1l1274		Dranarad	. 2024 00 4	2 Anglyza	od. 2021	00.42		
Blank (B1I1274-BLK1) Solids, Total Suspended	< 2.0	2.0 mg/L	Fiepaieu	: 2021-09-1	o, Allalyze	eu. 2021-	09-13		
	. 2.0	2.0 1119/2	Droparad	. 2021 00 1	2 Apolyzo	A. 2021	00 12		
Blank (B1I1274-BLK2) Solids, Total Suspended	< 2.0	2.0 mg/L	Prepared	: 2021-09-1	s, Analyze	a. 2021-	09-13		
•	. 2.0	2.0 1119/2	Dronorod	. 2021 00 1	2 Analyza	.d. 2021	00.12		
LCS (B1I1274-BS1) Solids, Total Suspended	97.0	5.0 mg/L	100	: 2021-09-1	97	85-115	09-13		
	97.0	3.0 Hig/L		. 2024 00 4			00.42		
LCS (B1I1274-BS2) Solids, Total Suspended	92.5	5.0 mg/L	100	: 2021-09-1	3, Anaiyze	85-115	09-13		
General Parameters, Ba		3.0 Hig/L	100		92	03-113			
Blank (B1I1276-BLK1)			Prepared	: 2021-09-1	3, Analyze	ed: 2021-	09-13		
Phosphorus, Total (as P)	< 0.0050	0.0050 mg/L							
Blank (B1I1276-BLK2)			Prepared	: 2021-09-1	3, Analyze	ed: 2021-	09-13		
Phosphorus, Total (as P)	< 0.0050	0.0050 mg/L							
LCS (B1I1276-BS1)			Prepared	: 2021-09-1	3, Analyze	ed: 2021-	09-13		
Phosphorus, Total (as P)	0.105	0.0050 mg/L	0.100		105	85-115			



REPORTED TO Lake Country, Distr PROJECT Raw Influent- PE14	•	ater)			WORK REPOR	ORDER RTED		206  -09-15	15:06
Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B1l1276, Cor	ntinued								
LCS (B1I1276-BS2)			Prepared	I: 2021-09-1	I3. Analvze	ed: 2021-0	09-13		
Phosphorus, Total (as P)	0.106	0.0050 mg/L	0.100		106	85-115			
General Parameters, Batch B1l1329									
Blank (B1I1329-BLK1)			Prepared	I: 2021-09-1	I3, Analyze	ed: 2021-0	09-14		
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							
Blank (B1I1329-BLK2)			Prepared	I: 2021-09-1	I3, Analyze	ed: 2021-0	09-14		
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L			<u>-, , , , , , , , , , , , , , , , , , , </u>				
LCS (B1I1329-BS1)			Prenared	I: 2021-09-1	I3 Analyze	ed: 2021-0	09-14		
Nitrogen, Total Kjeldahl	1.00	0.050 mg/L	1.00		100	85-115			
LCS (B1I1329-BS2)		· · · · · · · · · · · ·		I: 2021-09-1			19_14		
Nitrogen, Total Kjeldahl	1.00	0.050 mg/L	1.00	1. 2021-09-1	100	85-115	73-14		
General Parameters, Batch B1l1371									
Blank (B1I1371-BLK1)			Prepared	I: 2021-09-1	I3, Analyze	ed: 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	I: 2021-09-1	I3, Analyze	ed: 2021-0	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	I: 2021-09-1	I3, Analyze	ed: 2021-0	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	I: 2021-09-1	I3, Analyze	ed: 2021-0	09-13		
Alkalinity, Total (as CaCO3)	109	1.0 mg/L	100		109	80-120			
LCS (B1I1371-BS2)			Prepared	I: 2021-09-1	I3, Analyze	ed: 2021-0	09-13		
Alkalinity, Total (as CaCO3)	109	1.0 mg/L	100		109	80-120			
LCS (B1I1371-BS3)			Prepared	I: 2021-09-1	I3, Analyze	ed: 2021-0	09-13		
Alkalinity, Total (as CaCO3)	109	1.0 mg/L	100		109	80-120			
Reference (B1I1371-SRM1)			Prepared	I: 2021-09-1	I3, Analyze	ed: 2021-0	09-13		
рН	7.00	0.10 pH units	7.01		100	98-102			
Reference (B1I1371-SRM2)			Prepared	I: 2021-09-1	I3, Analyze	ed: 2021-0	09-13		
pH	7.01	0.10 pH units	7.01		100	98-102			
Reference (B1I1371-SRM3)				I: 2021-09-1			19-13		
pH	7.00	0.10 pH units	7.01	202 1-03-1	100	98-102	JU-1U		
- Pi i	7.00	o. to pri utilits	1.01		100	30-102			



REPORTED TO PROJECT

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





21J0561

## **CERTIFICATE OF ANALYSIS**

REPORTED TO Lake Country, District of (Wastewater)

4062 Beaver Lake Rd

LAKE COUNTRY, BC V4V 1T5

ATTENTION Davin Larsen WORK ORDER

**PO NUMBER** 104395-10-9007 **RECEIVED / TEMP** 2021-10-06 11:40 / 19.3°C

PROJECTFinal Effluent- PE14651REPORTED2021-10-14 15:07PROJECT INFOLake Country WWTPCOC NUMBER44474.35644

#### 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

We've

We've Got Chemistry

31

Ahead of the Curve



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.

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.

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 M undhad



# **TEST RESULTS**

	ake Country, District o inal Effluent- PE14651	•		WORK ORDER REPORTED	21J0561 2021-10-1	4 15:07
Analyte		Result	RL	Units	Analyzed	Qualifier
Final Effluent (E2330	626) (21J0561-01)   Ma	atrix: Wastewater   Sampl	ed: 2021-10-05 10:15			
Anions						
Chloride		112	0.10	mg/L	2021-10-11	
Nitrate (as N)		1.48	0.010		2021-10-11	HT1
Nitrite (as N)		0.032	0.010		2021-10-11	HT1
Phosphate (as P)		0.0180	0.0050		2021-10-11	HT1
Calculated Parameters	S					
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 Ca	aCO3)	184	1.0	mg/L	2021-10-07	
Alkalinity, Phenolphth	· · · · · · · · · · · · · · · · · · ·	< 1.0		mg/L	2021-10-07	
Alkalinity, Bicarbonate		184		mg/L	2021-10-07	
Alkalinity, Carbonate (	<u> </u>	< 1.0		mg/L	2021-10-07	
Alkalinity, Hydroxide (	· · · · · · · · · · · · · · · · · · ·	< 1.0		mg/L	2021-10-07	
Ammonia, Total (as N		0.094	0.050		2021-10-07	
BOD, 5-day Carbonad	•	< 4.6		mg/L	2021-10-12	
Nitrogen, Total Kjelda		1.66	0.050		2021-10-12	
pH	<u> </u>	7.74		pH units	2021-10-07	HT2
Phosphorus, Total (as	s P)	0.243	0.0050	•	2021-10-14	
Solids, Total Suspend	•	< 2.0		mg/L	2021-10-08	
Microbiological Param						
Coliforms, Total		242000	1	MPN/100 mL	2021-10-06	
		242000		MPN/100 mL	2021-10-06	
Coliforms, Fecal		2.2000				
Coliforms, Fecal	02)   Matrix: Water   Sa	ampled: 2021-10-05 10:17	,			
Coliforms, Fecal  Duplicate (21J0561-6	02)   Matrix: Water   Sa		0.10	mg/L	2021-10-11	
Coliforms, Fecal  Duplicate (21J0561-6  Anions	02)   Matrix: Water   Sa	ampled: 2021-10-05 10:17			2021-10-11 2021-10-11	HT1
Coliforms, Fecal  Duplicate (21J0561-6  Anions Chloride	02)   Matrix: Water   Sa	ampled: 2021-10-05 10:17	0.10	mg/L		HT1 HT1
Coliforms, Fecal  Duplicate (21J0561-6  Anions Chloride Nitrate (as N)	02)   Matrix: Water   Sa	ampled: 2021-10-05 10:17 113 1.49	0.10 0.010	mg/L mg/L	2021-10-11	
Coliforms, Fecal  Duplicate (21J0561-6  Anions Chloride Nitrate (as N) Nitrite (as N)		ampled: 2021-10-05 10:17 113 1.49 0.034	0.10 0.010 0.010	mg/L mg/L	2021-10-11 2021-10-11	HT1
Coliforms, Fecal  Duplicate (21J0561-4  Anions Chloride Nitrate (as N) Nitrite (as N) Phosphate (as P)  Calculated Parameters		ampled: 2021-10-05 10:17 113 1.49 0.034	0.10 0.010 0.010	mg/L mg/L mg/L	2021-10-11 2021-10-11	HT1
Coliforms, Fecal  Duplicate (21J0561-4  Anions Chloride Nitrate (as N) Nitrite (as N) Phosphate (as P)		ampled: 2021-10-05 10:17 113 1.49 0.034 0.0161	0.10 0.010 0.010 0.0050	mg/L mg/L mg/L mg/L	2021-10-11 2021-10-11 2021-10-11	HT1
Coliforms, Fecal  Duplicate (21J0561-4  Anions Chloride Nitrate (as N) Nitrite (as N) Phosphate (as P)  Calculated Parameters Nitrate+Nitrite (as N)		ampled: 2021-10-05 10:17  113 1.49 0.034 0.0161 1.53	0.10 0.010 0.010 0.0050	mg/L mg/L mg/L mg/L	2021-10-11 2021-10-11 2021-10-11 N/A	HT1
Coliforms, Fecal  Duplicate (21J0561-4  Anions Chloride Nitrate (as N) Nitrite (as N) Phosphate (as P)  Calculated Parameters Nitrate+Nitrite (as N) Nitrogen, Total  General Parameters	S	ampled: 2021-10-05 10:17  113 1.49 0.034 0.0161 1.53	0.10 0.010 0.015 0.0050 0.0100 0.0500	mg/L mg/L mg/L mg/L	2021-10-11 2021-10-11 2021-10-11 N/A	HT1
Coliforms, Fecal  Duplicate (21J0561-1)  Anions Chloride Nitrate (as N) Nitrite (as N) Phosphate (as P)  Calculated Parameters Nitrate+Nitrite (as N) Nitrogen, Total  General Parameters Alkalinity, Total (as Calculated Parameters)	aCO3)	113 1.49 0.034 0.0161 1.53 2.97	0.10 0.010 0.010 0.0050 0.0100 0.0500	mg/L mg/L mg/L mg/L mg/L mg/L	2021-10-11 2021-10-11 2021-10-11 N/A N/A 2021-10-07	HT1
Coliforms, Fecal  Duplicate (21J0561-4  Anions Chloride Nitrate (as N) Nitrite (as N) Phosphate (as P)  Calculated Parameters Nitrate+Nitrite (as N) Nitrogen, Total  General Parameters Alkalinity, Total (as Callalalalala	aCO3) alein (as CaCO3)	113 1.49 0.034 0.0161 1.53 2.97	0.10 0.010 0.010 0.0050 0.0100 0.0500	mg/L mg/L mg/L mg/L mg/L mg/L mg/L	2021-10-11 2021-10-11 2021-10-11 N/A N/A	HT1
Coliforms, Fecal  Duplicate (21J0561-1)  Anions Chloride Nitrate (as N) Nitrite (as N) Phosphate (as P)  Calculated Parameters Nitrate+Nitrite (as N) Nitrogen, Total  General Parameters Alkalinity, Total (as Calculated Parameters)	aCO3) alein (as CaCO3) e (as CaCO3)	113 1.49 0.034 0.0161  1.53 2.97	0.10 0.010 0.010 0.0050 0.0100 0.0500 1.0 1.0	mg/L mg/L mg/L mg/L mg/L mg/L	2021-10-11 2021-10-11 2021-10-11 N/A N/A 2021-10-07	HT1



# **TEST 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	Analyzed	Qualifier
Duplicate (21J0561-02)   Matrix: Wat	ter   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	
рН	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)

PROJECT Final Effluent- PE14651

WORK ORDER

21J0561

**REPORTED** 2021-10-14 15:07

Analysis Description	Method Ref.	Technique A	ccredited	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 Ac	d) <b>√</b>	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.



Blank (B1J0759-BLK1)

Blank (B1J0759-BLK2)

Ammonia, Total (as N)

Ammonia, Total (as N)

## **APPENDIX 2: QUALITY CONTROL RESULTS**

REPORTED TO Lake Country, District of (Wastewater)

PROJECT Final Effluent- PE14651

WORK ORDER REPORTED 21J0561 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, 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	Qualifie
Anions, Batch B1J0868									
Blank (B1J0868-BLK1)			Prepared	l: 2021-10-1	1, Analyze	d: 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	l: 2021-10-1	2, Analyze	d: 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	l: 2021-10-1	1, Analyze	d: 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	l: 2021-10-1	2, Analyze	d: 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	l: 2021-10-1	2, Analyze	d: 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			

0.050 mg/L

0.050 mg/L

< 0.050

< 0.050

Prepared: 2021-10-07, Analyzed: 2021-10-07

Prepared: 2021-10-07, Analyzed: 2021-10-07



	Lake Country, Distri Final Effluent- PE14	•	ter)			WORK (		21J0 2021	561 -10-14	15:07
Analyte		Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifie
General Parameters,	Batch B1J0759, Con	tinued								
Blank (B1J0759-BLF	K3)			Prepared	: 2021-10-07	, Analyze	d: 2021-1	0-07		
Ammonia, Total (as N)	•	< 0.050	0.050 mg/L	·		<u> </u>				
Blank (B1J0759-BL	K4)			Prepared	: 2021-10-07	7 Analyze	d: 2021-1	0-07		
Ammonia, Total (as N)	,	< 0.050	0.050 mg/L			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				
Blank (B1J0759-BL	K5)			Drenared	: 2021-10-07	7 Analyze	d: 2021_1	0-07		
Ammonia, Total (as N)	(C)	< 0.050	0.050 mg/L	i iepaieu	. 2021-10-01	, Allalyze	u. 2021-	0-07		
	(CO)	0.000	0.000g, _	Droporod	. 2021 10 0	7 Analyza	4. 2024 4	0.07		
Ammonia Total (og NI)	<b>N</b> 6)	< 0.050	0.050 mg/l	Prepared	: 2021-10-07	, Analyze	J. 2021-1	0-07		
Ammonia, Total (as N)		< 0.030	0.050 mg/L							
LCS (B1J0759-BS1)		2.000	0.050 #	•	: 2021-10-07	· ·		0-07		
Ammonia, Total (as N)		0.996	0.050 mg/L	1.00		100	90-115			
LCS (B1J0759-BS2)				· · · · · · · · · · · · · · · · · · ·	: 2021-10-07			0-07		
Ammonia, Total (as N)		0.985	0.050 mg/L	1.00		98	90-115			
LCS (B1J0759-BS3)				Prepared	: 2021-10-07	, Analyze	d: 2021-1	0-07		
Ammonia, Total (as N)		0.984	0.050 mg/L	1.00		98	90-115			
LCS (B1J0759-BS4)				Prepared	: 2021-10-07	, Analyze	d: 2021-1	0-07		
Ammonia, Total (as N)		0.976	0.050 mg/L	1.00		98	90-115			
LCS (B1J0759-BS5)				Prepared	: 2021-10-07	, Analyze	d: 2021-1	0-07		
Ammonia, Total (as N)		0.990	0.050 mg/L	1.00		99	90-115			
LCS (B1J0759-BS6)				Prepared	: 2021-10-07	, Analyze	d: <b>2021-</b> 1	0-07		
Ammonia, Total (as N)		0.986	0.050 mg/L	1.00		99	90-115			
General Parameters,	Batch B1J0905									
Blank (B1J0905-BL	K1)			Prepared	: 2021-10-07	, Analyze	d: <b>2021-</b> 1	0-12		
BOD, 5-day Carbonace	eous	< 2.0	2.0 mg/L							
LCS (B1J0905-BS1)				Prepared	: 2021-10-07	, Analyze	d: 2021-1	0-12		
BOD, 5-day Carbonace	eous	179	38.7 mg/L	180		99	85-115			
General Parameters,	Batch B1J0912									
Blank (B1J0912-BL	K1)			Prepared	: 2021-10-07	, Analyze	d: 2021-1	0-07		
Alkalinity, Total (as CaC		< 1.0	1.0 mg/L							
Alkalinity, Phenolphthal Alkalinity, Bicarbonate (	,	< 1.0 < 1.0	1.0 mg/L 1.0 mg/L							
•	· · · · · · · · · · · · · · · · · · ·	< 1.0	1.0 mg/L							
Alkalinity, Carbonate (a										
	s CaCO3)	< 1.0	1.0 mg/L							
Alkalinity, Hydroxide (as		< 1.0	1.0 Hig/L	Prepared	: 2021-10-07	, Analyze	d: 2021-1	0-07		
Alkalinity, Hydroxide (as Blank (B1J0912-BL) Alkalinity, Total (as CaC	<b>K2)</b>	< 1.0	1.0 mg/L	Prepared	: 2021-10-07	, Analyze	d: 2021-1	0-07		
Alkalinity, Hydroxide (a: Blank (B1J0912-BLk Alkalinity, Total (as CaC Alkalinity, Phenolphthal	CO3) lein (as CaCO3)	< 1.0 < 1.0	1.0 mg/L 1.0 mg/L	Prepared	: 2021-10-07	<sup>7</sup> , Analyze	d: 2021-1	0-07		
Blank (B1J0912-BLk Alkalinity, Total (as CaC Alkalinity, Phenolphthal Alkalinity, Bicarbonate (	CO3) lein (as CaCO3) (as CaCO3)	< 1.0	1.0 mg/L 1.0 mg/L 1.0 mg/L	Prepared	: 2021-10-07	7, Analyzed	d: 2021-1	0-07		
Alkalinity, Hydroxide (as Blank (B1J0912-BLk Alkalinity, Total (as CaC Alkalinity, Phenolphthal Alkalinity, Bicarbonate (a Alkalinity, Carbonate (a	CO3) lein (as CaCO3) (as CaCO3) is CaCO3)	< 1.0 < 1.0 < 1.0	1.0 mg/L 1.0 mg/L	Prepared	: 2021-10-07	<sup>7</sup> , Analyze	d: 2021-1	0-07		
Alkalinity, Hydroxide (as Blank (B1J0912-BL) Alkalinity, Total (as CaC Alkalinity, Phenolphthal Alkalinity, Bicarbonate (a Alkalinity, Carbonate (a Alkalinity, Hydroxide (as	CO3) lein (as CaCO3) (as CaCO3) s CaCO3) s CaCO3)	< 1.0 < 1.0 < 1.0 < 1.0	1.0 mg/L 1.0 mg/L 1.0 mg/L 1.0 mg/L		: 2021-10-07 : 2021-10-07					
Alkalinity, Hydroxide (as Blank (B1J0912-BL) Alkalinity, Total (as CaC	K2) CO3) lein (as CaCO3) (as CaCO3) as CaCO3) as CaCO3) S CaCO3) CO3)	< 1.0 < 1.0 < 1.0 < 1.0	1.0 mg/L 1.0 mg/L 1.0 mg/L 1.0 mg/L							



REPORTED TO PROJECT	Lake Country, Dis Final Effluent- PE	•	ater)			WORK REPOR	ORDER RTED		)561 1-10-14	15:07
Analyte		Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameter	rs, Batch B1J0912, C	ontinued								
Blank (B1J0912-B	LK3), Continued			Prepared	l: 2021-10-0	7, Analyze	ed: 2021-	10-07		
Alkalinity, Carbonate	'	< 1.0	1.0 mg/L							
Alkalinity, Hydroxide	(as CaCO3)	< 1.0	1.0 mg/L							
LCS (B1J0912-BS	•				l: 2021-10-0	•		10-07		
Alkalinity, Total (as C	aCO3)	107	1.0 mg/L	100		107	80-120			
LCS (B1J0912-BS	•			Prepared	l: 2021-10-0		ed: 2021-	10-07		
Alkalinity, Total (as C	aCO3)	108	1.0 mg/L	100		108	80-120			
LCS (B1J0912-BS	3)			Prepared	l: 2021-10-0	7, Analyze	ed: 2021-	10-07		
Alkalinity, Total (as C	aCO3)	108	1.0 mg/L	100		108	80-120			
Reference (B1J09	12-SRM1)			Prepared	l: 2021-10-0	7, Analyze	ed: 2021-	10-07		
pH		6.99	0.10 pH units	7.01		100	98-102			
Reference (B1J09	12-SRM2)			Prepared	l: 2021-10-0	7, Analyze	ed: 2021-	10-07		
рН		7.00	0.10 pH units	7.01		100	98-102			
Reference (B1J09	12-SRM3)			Prepared	l: 2021-10-0	7, Analyze	ed: 2021-	10-07		
рН		6.99	0.10 pH units	7.01		100	98-102			
Solids, Total Suspend Blank (B1J0959-B	LK2)	< 2.0	2.0 mg/L	Prepared	l: 2021-10-0	8, Analyze	ed: 2021-	10-08		
Solids, Total Suspend	,	< 2.0	2.0 mg/L	Prepared	1: 2021-10-0	8, Analyze	ed: 2021-	10-08		
			2.0g/2	Droporos	I. 2021 10 0	0 Apolyzo	d. 2021 :	10.00		
LCS (B1J0959-BS Solids, Total Suspend	•	96.0	10.0 mg/L	100	I: 2021-10-0	96	85-115	10-06		
		30.0	10.0 mg/L		1. 2024 40 0			10.00		
Solids, Total Suspend	•	106	10.0 mg/L	100	l: 2021-10-0	8, Anaiyze	85-115	10-08		
General Parameter Blank (B1J1017-B	rs, Batch B1J1017 LK1)		Ţ.	Prepared	l: 2021-10-0	8, Analyze		10-12		
Nitrogen, Total Kjelda	ahl	< 0.050	0.050 mg/L							
Blank (B1J1017-B	LK2)			Prepared	l: 2021-10-0	8, Analyze	ed: 2021-	10-12		
Nitrogen, Total Kjelda	ahl	< 0.050	0.050 mg/L							
LCS (B1J1017-BS	1)			Prepared	l: 2021-10-0	8, Analyze	ed: 2021-	10-12		
Nitrogen, Total Kjelda	ahl	1.01	0.050 mg/L	1.00		101	85-115			
LCS (B1J1017-BS	2)			Prepared	l: 2021-10-0	8, Analyze	ed: 2021-	10-12		
Nitrogen, Total Kjelda	ahl	1.01	0.050 mg/L	1.00		101	85-115			
General Parameter	rs, Batch B1J1250									
Blank (B1J1250-B	LK1)			Prepared	l: 2021-10-1	2, Analyze	ed: 2021-	10-13		
Phosphorus, Total (a:	•	< 0.0050	0.0050 mg/L			<u> </u>				
Blank (B1J1250-B	LK2)			Prepared	l: 2021-10-1	2, Analvze	ed: 2021-	10-13		
Phosphorus, Total (as		< 0.0050	0.0050 mg/L	F 00		,,				



REPORTED TO PROJECT	Final Effluent- F	District of (Wastewa PE14651	ater)			WORK REPOR	_		-10-14	15:07
Analyte		Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifie
General Paramete	rs, Batch B1J1250,	Continued								
Blank (B1J1250-E	BLK3)			Prepared	d: 2021-10-1	I2, Analyze	d: 2021-	10-14		
Phosphorus, Total (a	ıs P)	< 0.0050	0.0050 mg/L							
LCS (B1J1250-BS	31)			Prepared	d: 2021-10-1	I2, Analyze	d: 2021-	10-14		
Phosphorus, Total (a	as P)	0.0977	0.0050 mg/L	0.100		98	85-115			
LCS (B1J1250-BS	(2)			Prepared	d: 2021-10-1	I2, Analyze	d: 2021-1	10-13		
Phosphorus, Total (a	•	0.105	0.0050 mg/L	0.100		105	85-115			
LCS (B1J1250-BS	(3)			Prepared	d: 2021-10-1	12 Analyze	ed: 2021-1	10-14		
Phosphorus, Total (a	•	0.101	0.0050 mg/L	0.100		101	85-115			
<i>Microbiological Pa</i> Blank (B1J0698-E	arameters, Batch B BLK1)	1J0698		Prepared	d: 2021-10-0	06, Analyze	ed: 2021-1	10-06		
Microbiological Pa	arameters, Batch B	1J0698								
· ·	·	21 <b>J0698</b>	1 MPN/10		d: 2021-10-0	06, Analyze	ed: 2021-1	10-06		
Blank (B1J0698-E	·		1 MPN/10 1 MPN/10	) mL	d: 2021-10-0	06, Analyze	ed: 2021-1	10-06		
Blank (B1J0698-E	BLK1)	<1		0 mL 0 mL	i: 2021-10-0					
Blank (B1J0698-E Coliforms, Total Coliforms, Fecal	BLK1)	<1		0 mL 0 mL Prepared						
Blank (B1J0698-E Coliforms, Total Coliforms, Fecal Blank (B1J0698-E	BLK1)	<1 <1	1 MPN/10	0 mL 0 mL Prepared						
Blank (B1J0698-E Coliforms, Total Coliforms, Fecal Blank (B1J0698-E Coliforms, Total	BLK1)	<1 <1	1 MPN/100	O mL O mL Prepared O mL O mL O mL		06, Analyze	ed: 2021-	10-06		
Blank (B1J0698-E Coliforms, Total Coliforms, Fecal Blank (B1J0698-E Coliforms, Total Coliforms, Fecal	BLK1)	<1 <1	1 MPN/100	O mL O mL Prepared O mL O mL O mL O mL Prepared	i: 2021-10-C	06, Analyze	ed: 2021-	10-06		
Blank (B1J0698-E Coliforms, Total Coliforms, Fecal Blank (B1J0698-E Coliforms, Total Coliforms, Fecal Blank (B1J0698-E	BLK1)	<1 <1 <1 <1	1 MPN/100 1 MPN/100 1 MPN/100	O mL O mL Prepared O mL O mL O mL O mL Prepared	i: 2021-10-C	06, Analyze	ed: 2021-	10-06		
Blank (B1J0698-E Coliforms, Total Coliforms, Fecal Blank (B1J0698-E Coliforms, Total Coliforms, Fecal Blank (B1J0698-E Coliforms, Total	BLK2) BLK3)	<1 <1 <1 <1 <1	1 MPN/100 1 MPN/100 1 MPN/100 1 MPN/100	O mL	i: 2021-10-C	06, Analyze 06, Analyze	ed: 2021-7	10-06 10-06		
Blank (B1J0698-E Coliforms, Total Coliforms, Fecal Blank (B1J0698-E Coliforms, Total Coliforms, Fecal Blank (B1J0698-E Coliforms, Total Coliforms, Total Coliforms, Fecal	BLK2) BLK3)	<1 <1 <1 <1 <1	1 MPN/100 1 MPN/100 1 MPN/100 1 MPN/100	O mL	i: 2021-10-0 i: 2021-10-0	06, Analyze 06, Analyze	ed: 2021-7	10-06 10-06		
Blank (B1J0698-E Coliforms, Total Coliforms, Fecal Blank (B1J0698-E Coliforms, Total Coliforms, Fecal Blank (B1J0698-E Coliforms, Total Coliforms, Fecal Blank (B1J0698-E	BLK2) BLK3)	<1 <1 <1 <1 <1	1 MPN/100 1 MPN/100 1 MPN/100 1 MPN/100 1 MPN/100	O mL	i: 2021-10-0 i: 2021-10-0	06, Analyze 06, Analyze	ed: 2021-7	10-06 10-06		
Blank (B1J0698-E Coliforms, Total Coliforms, Fecal Blank (B1J0698-E Coliforms, Total Coliforms, Fecal Blank (B1J0698-E Coliforms, Total Coliforms, Total Coliforms, Fecal Blank (B1J0698-E Coliforms, Total	BLK2) BLK3)	<1 <1 <1 <1 <1 <1	1 MPN/100  1 MPN/100  1 MPN/100  1 MPN/100  1 MPN/100  1 MPN/100	O mL	i: 2021-10-0 i: 2021-10-0	06, Analyze 06, Analyze 06, Analyze	ed: 2021-1	10-06 10-06		
Blank (B1J0698-E Coliforms, Total Coliforms, Fecal Blank (B1J0698-E Coliforms, Total Coliforms, Fecal Blank (B1J0698-E Coliforms, Total Coliforms, Total Coliforms, Fecal Blank (B1J0698-E Coliforms, Total Coliforms, Total	BLK2) BLK3)	<1 <1 <1 <1 <1 <1	1 MPN/100  1 MPN/100  1 MPN/100  1 MPN/100  1 MPN/100  1 MPN/100	O mL	i: 2021-10-0 i: 2021-10-0 i: 2021-10-0	06, Analyze 06, Analyze 06, Analyze	ed: 2021-1	10-06 10-06		
Blank (B1J0698-E Coliforms, Total Coliforms, Fecal Blank (B1J0698-E Coliforms, Total Coliforms, Fecal Blank (B1J0698-E Coliforms, Total Coliforms, Total Coliforms, Fecal Blank (B1J0698-E Coliforms, Total Coliforms, Total Coliforms, Total Blank (B1J0698-E Blank (B1J0698-E	BLK2) BLK3)	<1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <	1 MPN/100	O mL	i: 2021-10-0 i: 2021-10-0 i: 2021-10-0	06, Analyze 06, Analyze 06, Analyze	ed: 2021-1	10-06 10-06		
Blank (B1J0698-E Coliforms, Total Coliforms, Fecal Blank (B1J0698-E Coliforms, Total Coliforms, Fecal Blank (B1J0698-E Coliforms, Total Coliforms, Total Coliforms, Fecal Blank (B1J0698-E Coliforms, Total Coliforms, Total Coliforms, Total Coliforms, Total Coliforms, Fecal Blank (B1J0698-E Coliforms, Total	BLK2) BLK3) BLK4)	<1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <	1 MPN/100	O mL	i: 2021-10-0 i: 2021-10-0 i: 2021-10-0	06, Analyze 06, Analyze 06, Analyze	ed: 2021-1 ed: 2021-1 ed: 2021-1	10-06 10-06 10-06		
Blank (B1J0698-E Coliforms, Total Coliforms, Fecal Blank (B1J0698-E Coliforms, Total Coliforms, Fecal Blank (B1J0698-E Coliforms, Total Coliforms, Fecal Blank (B1J0698-E Coliforms, Total Coliforms, Total Coliforms, Fecal Blank (B1J0698-E Coliforms, Fecal Blank (B1J0698-E Coliforms, Total Coliforms, Fecal	BLK2) BLK3) BLK4)	<1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <	1 MPN/100  1 MPN/100	O mL	d: 2021-10-0 d: 2021-10-0 d: 2021-10-0 d: 2021-10-0	06, Analyze 06, Analyze 06, Analyze	ed: 2021-1 ed: 2021-1 ed: 2021-1	10-06 10-06 10-06	80	





### **CERTIFICATE OF ANALYSIS**

REPORTED TO Lake Country, District of (Wastewater)

4062 Beaver Lake Rd

LAKE COUNTRY, BC V4V 1T5

ATTENTION Davin Larsen

PO NUMBER 104395-10-9007
PROJECT Raw Influent- PE14651
PROJECT INFO Lake Country WWTP

WORK ORDER 21J0560

**RECEIVED / TEMP** 2021-10-05 11:40 / 19.3°C **REPORTED** 2021-10-13 16:15

**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

We've Got Chemistry



Ahead of the Curve



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.

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.

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 M what



## **TEST RESULTS**

**REPORTED TO** Lake Country, District of (Wastewater)

PROJECT Raw Influent- PE14651

WORK ORDER

21J0560

**REPORTED** 2021-10-13 16:15

Analyte	Result	RL	Units	Analyzed	Qualific
Raw Influent (E233627) (21J0560-01)   Ma	trix: Wastewater   Sampled	l: 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	
рН	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)

PROJECT Raw Influent- PE14651

WORK ORDER

21J0560

**REPORTED** 2021-10-13 16:15

<b>Analysis Description</b>	Method Ref.	Technique A	ccredited	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 Act	d) <b>√</b>	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.



**REPORTED TO** Lake Country, District of (Wastewater) **PROJECT** 

Raw Influent- PE14651

**WORK ORDER REPORTED** 

21J0560 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	l: 2021-10-1	I1, Analyze	d: 2021-1	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	l: 2021-10-1	I2, Analyze	d: 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	l: 2021-10-1	I1, Analyze	d: 2021-1	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	l: 2021-10-1	I2, Analyze	d: 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	l: 2021-10-1	12, Analyze	d: 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		D 1 - ( 7



REPORTED TO Lake Country, I ROJECT Raw Influent- P		District of (Wastewater) PE14651							21J0560 2021-10-13 16:1		
Analyte		Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifie	
General Parameters, Ba	tch B1J0759, Co	ntinued									
Blank (B1J0759-BLK5)				Prepared	2021-10-0	7, Analyze	ed: 2021-1	10-07			
Ammonia, Total (as N)		< 0.050	0.050 mg/L								
Blank (B1J0759-BLK6)				Prepared	2021-10-0	7, Analyze	ed: 2021-1	10-07			
Ammonia, Total (as N)		< 0.050	0.050 mg/L	·							
LCS (B1J0759-BS1)				Prepared	2021-10-0	7, Analyze	ed: 2021-1	10-07			
Ammonia, Total (as N)		0.996	0.050 mg/L	1.00		100	90-115				
LCS (B1J0759-BS2)			-	Prepared	2021-10-0	7 Analyze	ed: 2021-1	10-07			
Ammonia, Total (as N)		0.985	0.050 mg/L	1.00		98	90-115				
					2021 10 0	7 Apolyzo		10.07			
LCS (B1J0759-BS3) Ammonia, Total (as N)		0.984	0.050 mg/L	1.00	2021-10-0	98	90-115	10-07			
		0.304	0.030 Hig/L		0004 40 0			10.07			
LCS (B1J0759-BS4)		0.070	0.050	-	2021-10-0			10-07			
Ammonia, Total (as N)		0.976	0.050 mg/L	1.00		98	90-115				
LCS (B1J0759-BS5)					2021-10-0			10-07			
Ammonia, Total (as N)		0.990	0.050 mg/L	1.00		99	90-115				
				Droporod	2021-10-0	7 Analyze	ed: 2021-1	0-07			
Ammonia, Total (as N)		0.986	0.050 mg/L	1.00	2021-10-0	99	90-115				
· · · · · · · · · · · · · · · · · · ·	tch B1J0904	0.986	0.050 mg/L	1.00	2021-10-0	99	90-115				
Ammonia, Total (as N)  General Parameters, Ba	tch B1J0904	0.986 < 2.0	0.050 mg/L 2.0 mg/L	1.00		99	90-115				
Ammonia, Total (as N)  General Parameters, Ba  Blank (B1J0904-BLK1)	tch B1J0904		Ü	1.00 Prepared	2021-10-0	99 7, Analyze	90-115 ed: 2021-1	0-12			
Ammonia, Total (as N)  General Parameters, Ba  Blank (B1J0904-BLK1)  BOD, 5-day	tch B1J0904		Ü	1.00 Prepared		99 7, Analyze	90-115 ed: 2021-1	0-12			
Ammonia, Total (as N)  General Parameters, Ba  Blank (B1J0904-BLK1)  BOD, 5-day  LCS (B1J0904-BS1)  BOD, 5-day  General Parameters, Ba  Blank (B1J0905-BLK1)  BOD, 5-day Carbonaceous		< 2.0	2.0 mg/L	Prepared Prepared 180  Prepared	2021-10-0	99 7, Analyze 97 97 7, Analyze	90-115 ed: 2021-1 ed: 2021-1 85-115 ed: 2021-1	10-12 10-12			
Ammonia, Total (as N)  General Parameters, Ba  Blank (B1J0904-BLK1)  BOD, 5-day  LCS (B1J0904-BS1)  BOD, 5-day  General Parameters, Ba  Blank (B1J0905-BLK1)	ntch B1J0905	< 2.0 175	2.0 mg/L 57.0 mg/L	Prepared Prepared 180  Prepared	2021-10-0	99 7, Analyze 97 97 7, Analyze	90-115 ed: 2021-1 ed: 2021-1 85-115 ed: 2021-1	10-12 10-12			
Ammonia, Total (as N)  General Parameters, Ba  Blank (B1J0904-BLK1)  BOD, 5-day  LCS (B1J0904-BS1)  BOD, 5-day  General Parameters, Ba  Blank (B1J0905-BLK1)  BOD, 5-day Carbonaceous  LCS (B1J0905-BS1)	tch B1J0905	< 2.0 175 < 2.0	2.0 mg/L 57.0 mg/L 2.0 mg/L	Prepared 180  Prepared 180  Prepared 180	2021-10-0	99 7, Analyze 97 7, Analyze 7, Analyze 7, Analyze 99	90-115 ed: 2021-7 ed: 2021-7 85-115 ed: 2021-7 ed: 2021-7	0-12   0-12   0-12			
Ammonia, Total (as N)  General Parameters, Ba  Blank (B1J0904-BLK1)  BOD, 5-day  LCS (B1J0904-BS1)  BOD, 5-day  General Parameters, Ba  Blank (B1J0905-BLK1)  BOD, 5-day Carbonaceous  LCS (B1J0905-BS1)  BOD, 5-day Carbonaceous  General Parameters, Ba  Blank (B1J0912-BLK1)  Alkalinity, Total (as CaCO3)	otch B1J0905	< 2.0 175 < 2.0 179	2.0 mg/L 57.0 mg/L 2.0 mg/L 38.7 mg/L	Prepared 180  Prepared 180  Prepared 180	2021-10-0	99 7, Analyze 97 7, Analyze 7, Analyze 7, Analyze 99	90-115 ed: 2021-7 ed: 2021-7 85-115 ed: 2021-7 ed: 2021-7	0-12   0-12   0-12			
Ammonia, Total (as N)  General Parameters, Ba  Blank (B1J0904-BLK1)  BOD, 5-day  LCS (B1J0904-BS1)  BOD, 5-day  General Parameters, Ba  Blank (B1J0905-BLK1)  BOD, 5-day Carbonaceous  LCS (B1J0905-BS1)  BOD, 5-day Carbonaceous  General Parameters, Ba  Blank (B1J0912-BLK1)  Alkalinity, Total (as CaCO3)  Alkalinity, Phenolphthalein (	otch B1J0905  otch B1J0912  as CaCO3)	< 2.0 175 < 2.0 179 < 1.0 < 1.0 < 1.0	2.0 mg/L 57.0 mg/L 2.0 mg/L 38.7 mg/L 1.0 mg/L 1.0 mg/L	Prepared 180  Prepared 180  Prepared 180	2021-10-0	99 7, Analyze 97 7, Analyze 7, Analyze 7, Analyze 99	90-115 ed: 2021-7 ed: 2021-7 85-115 ed: 2021-7 ed: 2021-7	0-12   0-12   0-12			
Ammonia, Total (as N)  General Parameters, Ba  Blank (B1J0904-BLK1)  BOD, 5-day  LCS (B1J0904-BS1)  BOD, 5-day  General Parameters, Ba  Blank (B1J0905-BLK1)  BOD, 5-day Carbonaceous  LCS (B1J0905-BS1)  BOD, 5-day Carbonaceous  General Parameters, Ba  Blank (B1J0912-BLK1)  Alkalinity, Total (as CaCO3)	atch B1J0905  atch B1J0912  as CaCO3) CaCO3)	< 2.0 175 < 2.0 179	2.0 mg/L 57.0 mg/L 2.0 mg/L 38.7 mg/L	Prepared 180  Prepared 180  Prepared 180	2021-10-0	99 7, Analyze 97 7, Analyze 97 7, Analyze 99	90-115 ed: 2021-7 ed: 2021-7 85-115 ed: 2021-7 ed: 2021-7	0-12   0-12   0-12			
Ammonia, Total (as N)  General Parameters, Ba  Blank (B1J0904-BLK1)  BOD, 5-day  LCS (B1J0904-BS1)  BOD, 5-day  General Parameters, Ba  Blank (B1J0905-BLK1)  BOD, 5-day Carbonaceous  LCS (B1J0905-BS1)  BOD, 5-day Carbonaceous  General Parameters, Ba  Blank (B1J0912-BLK1)  Alkalinity, Total (as CaCO3)  Alkalinity, Phenolphthalein (Alkalinity, Bicarbonate (as CaCO3)	atch B1J0905  atch B1J0912  as CaCO3)  acCO3)	< 2.0  175  < 2.0  179  < 1.0  < 1.0  < 1.0  < 1.0	2.0 mg/L  57.0 mg/L  2.0 mg/L  38.7 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L	Prepared 180  Prepared 180  Prepared 180	2021-10-0	99 7, Analyze 97 7, Analyze 97 7, Analyze 99	90-115 ed: 2021-7 ed: 2021-7 85-115 ed: 2021-7 ed: 2021-7	0-12   0-12   0-12			
Ammonia, Total (as N)  General Parameters, Ba  Blank (B1J0904-BLK1)  BOD, 5-day  LCS (B1J0904-BS1)  BOD, 5-day  General Parameters, Ba  Blank (B1J0905-BLK1)  BOD, 5-day Carbonaceous  LCS (B1J0905-BS1)  BOD, 5-day Carbonaceous  General Parameters, Ba  Blank (B1J0912-BLK1)  Alkalinity, Total (as CaCO3)  Alkalinity, Phenolphthalein ( Alkalinity, Bicarbonate (as CaCA)  Alkalinity, Carbonate (as CaCA)	atch B1J0905  atch B1J0912  as CaCO3)  acCO3)	< 2.0  175  < 2.0  179  < 1.0  < 1.0  < 1.0  < 1.0  < 1.0	2.0 mg/L  57.0 mg/L  2.0 mg/L  38.7 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L	1.00  Prepared  Prepared  180  Prepared  180  Prepared	2021-10-0	99 7, Analyze 97 7, Analyze 97 7, Analyze 99 7, Analyze	90-115 ed: 2021-1 ed: 2021-1 ed: 2021-1 ed: 2021-1 ed: 2021-1 ed: 2021-1	10-12 10-12 10-12			
Ammonia, Total (as N)  General Parameters, Ba  Blank (B1J0904-BLK1)  BOD, 5-day  LCS (B1J0904-BS1)  BOD, 5-day  General Parameters, Ba  Blank (B1J0905-BLK1)  BOD, 5-day Carbonaceous  LCS (B1J0905-BS1)  BOD, 5-day Carbonaceous  General Parameters, Ba  Blank (B1J0912-BLK1)  Alkalinity, Total (as CaCO3)  Alkalinity, Phenolphthalein (as CaClatalinity, Bicarbonate (as CaClatalinity, Hydroxide (as CaClatalinity, Hydroxide)	as CaCO3) CaCO3) CO3)	< 2.0  175  < 2.0  179  < 1.0  < 1.0  < 1.0  < 1.0  < 1.0	2.0 mg/L  57.0 mg/L  2.0 mg/L  38.7 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L	1.00  Prepared  Prepared  180  Prepared  180  Prepared	2021-10-0 2021-10-0 2021-10-0 2021-10-0	99 7, Analyze 97 7, Analyze 97 7, Analyze 99 7, Analyze	90-115 ed: 2021-1 ed: 2021-1 ed: 2021-1 ed: 2021-1 ed: 2021-1 ed: 2021-1	10-12 10-12 10-12			
Ammonia, Total (as N)  General Parameters, Ba  Blank (B1J0904-BLK1)  BOD, 5-day  LCS (B1J0904-BS1)  BOD, 5-day  General Parameters, Ba  Blank (B1J0905-BLK1)  BOD, 5-day Carbonaceous  LCS (B1J0905-BS1)  BOD, 5-day Carbonaceous  General Parameters, Ba  Blank (B1J0912-BLK1)  Alkalinity, Total (as CaCO3)  Alkalinity, Hydroxide (as Ca  Alkalinity, Hydroxide (as Ca  Blank (B1J0912-BLK2)  Alkalinity, Total (as CaCO3)  Alkalinity, Total (as CaCO3)  Alkalinity, Total (as CaCO3)  Alkalinity, Total (as CaCO3)	as CaCO3) CO3) Cas CaCO3)	< 2.0  175  < 2.0  179  < 1.0  < 1.0  < 1.0  < 1.0  < 1.0  < 1.0	2.0 mg/L  57.0 mg/L  2.0 mg/L  38.7 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L	1.00  Prepared  Prepared  180  Prepared  180  Prepared	2021-10-0 2021-10-0 2021-10-0 2021-10-0	99 7, Analyze 97 7, Analyze 97 7, Analyze 99 7, Analyze	90-115 ed: 2021-1 ed: 2021-1 ed: 2021-1 ed: 2021-1 ed: 2021-1 ed: 2021-1	10-12 10-12 10-12			
Ammonia, Total (as N)  General Parameters, Ba  Blank (B1J0904-BLK1)  BOD, 5-day  LCS (B1J0904-BS1)  BOD, 5-day  General Parameters, Ba  Blank (B1J0905-BLK1)  BOD, 5-day Carbonaceous  LCS (B1J0905-BS1)  BOD, 5-day Carbonaceous  General Parameters, Ba  Blank (B1J0912-BLK1)  Alkalinity, Total (as CaCO3)  Alkalinity, Phenolphthalein (Alkalinity, Hydroxide (as CaCI)  Alkalinity, Hydroxide (as CaCI)  Alkalinity, Hydroxide (as CaCI)  Alkalinity, Total (as CaCO3)  Alkalinity, Total (as CaCO3)	as CaCO3) Cas CaCO3) Cas CaCO3) Cas CaCO3) Cas CaCO3) Cas CaCO3)	< 2.0  175  < 2.0  179  < 1.0  < 1.0  < 1.0  < 1.0  < 1.0  < 1.0	2.0 mg/L  57.0 mg/L  2.0 mg/L  38.7 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L  1.0 mg/L	1.00  Prepared  Prepared  180  Prepared  180  Prepared	2021-10-0 2021-10-0 2021-10-0 2021-10-0	99 7, Analyze 97 7, Analyze 97 7, Analyze 99 7, Analyze	90-115 ed: 2021-1 ed: 2021-1 ed: 2021-1 ed: 2021-1 ed: 2021-1 ed: 2021-1	10-12 10-12 10-12			



REPORTED TO PROJECT	Lake Country, Dis Raw Influent- PE1	•	ater)			WORK REPOR	ORDER TED		560 -10-13	16:15
Analyte		Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifie
General Parameters	s, Batch B1J0912, C	ontinued								
Blank (B1J0912-BL	.K3)			Prepared	: 2021-10-07	, Analyze	ed: 2021-	10-07		
Alkalinity, Total (as Ca	CO3)	< 1.0	1.0 mg/L							
Alkalinity, Phenolphtha		< 1.0	1.0 mg/L							
Alkalinity, Bicarbonate Alkalinity, Carbonate (	· ,	< 1.0 < 1.0	1.0 mg/L 1.0 mg/L							
Alkalinity, Carbonate (		< 1.0	1.0 mg/L							
				Droparad	. 2021 10 07	7 Apolyzo	d: 2021 :	10.07		
Alkalinity, Total (as Ca	•	107	1.0 mg/l	100	: 2021-10-07	107	80-120	10-07		
		107	1.0 mg/L		2224 42 2			40.07		
LCS (B1J0912-BS2	•				: 2021-10-07			10-07		
Alkalinity, Total (as Ca	CO3)	108	1.0 mg/L	100		108	80-120			
LCS (B1J0912-BS3	)			Prepared	: 2021-10-07	, Analyze	d: 2021-	10-07		
Alkalinity, Total (as Ca	CO3)	108	1.0 mg/L	100		108	80-120			
Reference (B1J091	2-SRM1)			Prepared	: 2021-10-07	, Analyze	d: 2021-	10-07		
рН		6.99	0.10 pH units	7.01		100	98-102			
Reference (B1J091	2-SRM2)			Prepared	: 2021-10-07	' Analyze	d: 2021-	10-07		
pH	2-OR(III2)	7.00	0.10 pH units	7.01	. 2021 10 01	100	98-102			
	2 CDM2\				. 2021 10 07			10.07		
Reference (B1J091	2-3KW3)	6.99	0.10 pH units	7.01	: 2021-10-07	100	98-102	10-07		
Blank (B1J0959-BL Solids, Total Suspend		< 2.0	2.0 mg/L	Prepared	: 2021-10-08	3, Analyze	ed: 2021-	10-08		
		<b>\ 2.0</b>	2.0 Hig/L	Dranarad	. 2021 10 00	Apolyzo	٠ ١٠٥٥ ،	10.00		
Blank (B1J0959-BL Solids, Total Suspend	•	< 2.0	2.0 mg/L	Fiepaieu	: 2021-10-08	o, Allalyze	u. 2021-	10-00		
, ,		. 2.0	2.0 mg/L	Droparad	. 2021 10 00	Apolyzo	d: 2021 :	10.00		
LCS (B1J0959-BS1 Solids, Total Suspend	•	96.0	10.0 mg/L	100	: 2021-10-08	96	85-115	10-06		
		90.0	10.0 Hig/L		. 2024 40 00			10.00		
LCS (B1J0959-BS2	•	106	10.0 mg/l	Prepared 100	: 2021-10-08		85-115	10-08		
Solids, Total Suspend	eu	106	10.0 mg/L	100		106	05-115			
General Parameters				D '	. 0004 40 00	) A 1	1.0004	10.40		
Blank (B1J1017-BL	•	< 0.0E0	0.050 ~~"	Prepared	: 2021-10-08	s, Analyze	a: 2021-	10-12		
Nitrogen, Total Kjeldal		< 0.050	0.050 mg/L	D :	. 0004 40 00	) A 1	-1. 0004	10.40		
Blank (B1J1017-BL	· ·	40.050	0.050	Prepared	: 2021-10-08	s, Analyze	d: 2021-	10-12		
Nitrogen, Total Kjeldal		< 0.050	0.050 mg/L							
LCS (B1J1017-BS1	•				: 2021-10-08			10-12		
Nitrogen, Total Kjeldal	nl .	1.01	0.050 mg/L	1.00		101	85-115			
LCS (B1J1017-BS2	)			Prepared	: 2021-10-08	3, Analyze	d: 2021-	10-12		
Nitrogen, Total Kjeldal	nl .	1.01	0.050 mg/L	1.00		101	85-115			
General Parameters	s, Batch B1J1186									
Blank (B1J1186-BL	K1)			Prepared	: 2021-10-12	2, Analyze	d: 2021-	10-12		
Phosphorus, Total (as	P)	< 0.0050	0.0050 mg/L							
									Р	age 6 of



REPORTED TO PROJECT	, , ,					WORK ORDER REPORTED		21J0560 2021-10-13		
Analyte		Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameter	rs, Batch B1J11	86, Continued								
Blank (B1J1186-B	LK2)			Prepared	d: 2021-10-1	12, Analyze	d: 2021-1	10-12		
Phosphorus, Total (a	s P)	< 0.0050	0.0050 mg/L							
Blank (B1J1186-B	LK3)			Prepared	d: 2021-10-	12, Analyze	d: 2021-	10-12		
Phosphorus, Total (a	s P)	< 0.0050	0.0050 mg/L							
LCS (B1J1186-BS	1)			Prepared	d: 2021-10-	12, Analyze	d: 2021-	10-12		
Phosphorus, Total (a	s P)	0.101	0.0050 mg/L	0.100		101	85-115			
LCS (B1J1186-BS	3)			Prepared	d: 2021-10-	12, Analyze	d: 2021-	10-12		
Phosphorus, Total (a	s P)	0.0993	0.0050 mg/L	0.100		99	85-115			





### **CERTIFICATE OF ANALYSIS**

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.

REPORTED TO Lake Country, District of (Wastewater)

4062 Beaver Lake Rd

LAKE COUNTRY, BC V4V 1T5

**ATTENTION** Davin Larsen **WORK ORDER** 21K0053

2021-11-01 11:36 / 17.1°C

Final Effluent- PE14651 **REPORTED** 2021-11-08 16:22 **PROJECT** Lake Country WWTP 44501.41216 **PROJECT INFO COC NUMBER** 

#### Introduction:

**PO NUMBER** 

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

We've Got Chemistry

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

Ahead of the Curve

**RECEIVED / TEMP** 

Through research, regulation knowledge, and instrumentation, are your analytical centre the technical knowledge you 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

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

I what



# **TEST RESULTS**

PROJECT Lake Country, District of Final Effluent- PE1465	` '		WORK ORDER REPORTED	21K0053 2021-11-0	8 16:22
Analyte	Result	RL	Units	Analyzed	Qualifier
Final Effluent (E233626) (21K0053-01)   M	atrix: Wastewater   Sampl	ed: 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		N/A	
Nitrogen, Organic	1.43	0.0500		N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	183	1.0	mg/L	2021-11-05	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0		mg/L	2021-11-05	
Alkalinity, Bicarbonate (as CaCO3)	183		mg/L	2021-11-05	
Alkalinity, Carbonate (as CaCO3)	< 1.0		mg/L	2021-11-05	
Alkalinity, Hydroxide (as CaCO3)	< 1.0		mg/L	2021-11-05	
Ammonia, Total (as N)	0.528		mg/L	2021-11-04	
BOD, 5-day Carbonaceous	4.9		mg/L	2021-11-08	
Nitrogen, Total Kjeldahl	1.96		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		MPN/100 mL	2021-11-01	
Field Blank (21K0053-02)   Matrix: Waster Anions	water   Sampled: 2021-11-	01 10:30			
Chloride	< 0.10	0.10	mg/L	2021-11-03	
Nitrate (as N)	< 0.010		mg/L	2021-11-03	
Nitrite (as N)	< 0.010		mg/L	2021-11-03	
Phosphate (as P)	< 0.0050	0.0050		2021-11-03	
Calculated Parameters	0.0000	0.0000	9/ =		
Nitrate+Nitrite (as N)	< 0.0100	0.0100	mg/L	N/A	
Nitrogen, Total	< 0.0500	0.0500		N/A	
Nitrogen, Organic	< 0.0500	0.0500		N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	< 1.0	1 ∩	mg/L	2021-11-05	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0		mg/L	2021-11-05	
Alkalinity, Bicarbonate (as CaCO3)	< 1.0		mg/L	2021-11-05	
/ inclinity, bloatbollate (as eaces)	- 1.0	1.0	mg/L	2021-11-03	



# **TEST RESULTS**

**REPORTED TO** Lake Country, District of (Wastewater)

PROJECT Final Effluent- PE14651

WORK ORDER

21K0053

**REPORTED** 2021-11-08 16:22

Analyte	Result	RL	Units	Analyzed	Qualifie
Field Blank (21K0053-02)   Matrix: Was	tewater   Sampled: 2021-11-0	1 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)

PROJECT Final Effluent- PE14651

WORK ORDER
REPORTED

21K0053

TED 2021-11-08 16:22

Analysis Description	Method Ref.	Technique A	ccredited	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 Ac	d) ✓	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.



**REPORTED TO** Lake Country, District of (Wastewater) **PROJECT** 

Final Effluent- PE14651

**WORK ORDER REPORTED** 

21K0053 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	l: 2021-11-0	3, Analyze	d: 2021-1	11-08		
BOD, 5-day Carbonaceous	< 2.0	2.0 mg/L							
LCS (B1K0493-BS1)			Prepared	l: 2021-11-0	3, Analyze	d: 2021-1	11-08		
BOD, 5-day Carbonaceous	202	39.3 mg/L	180		112	85-115			
Duplicate (B1K0493-DUP1)	Sou	rce: 21K0053-02	Prepared	l: 2021-11-0	3, Analyze	d: 2021-1	11-08		
BOD, 5-day Carbonaceous	< 4.7	2.0 mg/L	· · · · · · · · · · · · · · · · · · ·	< 4.7	<u> </u>			20	
General Parameters, Batch B1K0566 Blank (B1K0566-BLK1)			Prepared	l: 2021-11-(	)4, Analyze	d: <b>2021-</b> 1	11-04		
Ammonia, Total (as N)	< 0.050	0.050 mg/L			. ,				
Blank (B1K0566-BLK2)		-	Prepared	l: 2021-11-0	)4, Analyze	d: 2021-1	11-04		
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
Blank (B1K0566-BLK3)			Prepared	l: 2021-11-0	)4, Analyze	d: 2021-1	11-04		
Ammonia, Total (as N)	< 0.050	0.050 mg/L	•		•				
LCS (B1K0566-BS1)			Prepared	l: 2021-11-0	)4, Analyze	d: 2021-1	11-04		
Ammonia, Total (as N)	0.964	0.050 mg/L	1.00		96	90-115			
LCS (B1K0566-BS2)			Prepared	l: 2021-11-0	)4, Analyze	d: 2021-1	11-04		
Ammonia, Total (as N)	0.986	0.050 mg/L	1.00		99	90-115			
LCS (B1K0566-BS3)			Prepared	l: 2021-11-0	)4, Analyze	d: 2021-1	11-04		
Ammonia, Total (as N)	1.01	0.050 mg/L	1.00		101	90-115			
General Parameters, Batch B1K0611			Dua	L 2024 44 6	)	J. 0004	14 02		
Blank (B1K0611-BLK1) Solids, Total Suspended	< 2.0	2.0 mg/l	Prepared	l: 2021-11-0	ര, Anaiyze	a: 2021-1	11-03		
	< 2.0	2.0 mg/L							
LCS (B1K0611-BS1)		40.0 "	•	l: 2021-11-0			11-03		
Solids, Total Suspended	94.0	10.0 mg/L	100		94	85-115			



REPORTED TO Lake Country, Distr PROJECT Final Effluent- PE1	•	iter)			WORK REPOR	ORDER TED		0053 I-11-08	16:22
Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifie
General Parameters, Batch B1K0688									
Blank (B1K0688-BLK1)			Prepared	: 2021-11-0	4. Analyze	d: 2021-1	1-05		
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L			., <b>,</b>				
<u> </u>			D	. 0004 44 0	4 A l	1.0004.4	4.05		
Blank (B1K0688-BLK2)	. 0.050	0.050	Prepared	: 2021-11-0	4, Anaiyze	a: 2021-1	1-05		
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							
LCS (B1K0688-BS1)			Prepared	: 2021-11-0	4, Analyze	d: 2021-1	1-05		
Nitrogen, Total Kjeldahl	0.963	0.050 mg/L	1.00		96	85-115			
LCS (B1K0688-BS2)			Prepared	: 2021-11-0	4, Analyze	d: 2021-1	1-05		
Nitrogen, Total Kjeldahl	0.941	0.050 mg/L	1.00		94	85-115			
General Parameters, Batch B1K0770									
Blank (B1K0770-BLK1)			Prepared	: 2021-11-0	5, Analyze	d: 2021-1	1-05		
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	: 2021-11-0	5, Analyze	d: 2021-1	1-05		
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	: 2021-11-0	5, Analyze	d: 2021-1	1-05		
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	: 2021-11-0	5, Analyze	d: 2021-1	1-05		
Alkalinity, Total (as CaCO3)	109	1.0 mg/L	100		109	80-120			
LCS (B1K0770-BS2)			Prepared	: 2021-11-0	5, Analyze	d: 2021-1	1-05		
Alkalinity, Total (as CaCO3)	107	1.0 mg/L	100		107	80-120			
			Dropared	. 2021 11 0	E Analyzo		1.05		
LCS (B1K0770-BS3)	100	1.0 ma/l		: 2021-11-0			1-05		
Alkalinity, Total (as CaCO3)	109	1.0 mg/L	100		109	80-120			
Reference (B1K0770-SRM1)			Prepared	: 2021-11-0	5, Analyze	d: 2021-1	1-05		
рН	7.00	0.10 pH units	7.01		100	98-102			
Reference (B1K0770-SRM2)			Prepared	: 2021-11-0	5, Analyze	d: 2021-1	1-05		
pH	7.00	0.10 pH units	7.01		100	98-102			
				. 2024 44 2			1.05		
Reference (B1K0770-SRM3)	7.00	0.40 11 "		: 2021-11-0			1-05		
рН	7.00	0.10 pH units	7.01		100	98-102			
General Parameters, Batch B1K0937			Б.	. 0004 44 =		J. 0004	4.00		
Blank (B1K0937-BLK1)			Prepared	: 2021-11-0	8, Analyze	d: 2021 <b>-</b> 1	1-08		



REPORTED TO PROJECT	Lake Count Final Effluer	ry, District of (Wastewa nt- PE14651	ter)			WORK REPOR	ORDER TED		0053 -11-08	16:22
Analyte		Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters	s, Batch B1K0	937, Continued								
Blank (B1K0937-B	LK2)			Prepared	: 2021-11-0	8, Analyze	d: 2021-1	11-08		
Phosphorus, Total (as	: P)	< 0.0050	0.0050 mg/L							
Blank (B1K0937-B	LK3)			Prepared	: 2021-11-0	8, Analyze	d: 2021-1	11-08		
Phosphorus, Total (as	s P)	< 0.0050	0.0050 mg/L							
LCS (B1K0937-BS	1)			Prepared	: 2021-11-0	8, Analyze	d: 2021-1	11-08		
Phosphorus, Total (as	s P)	0.113	0.0050 mg/L	0.100		113	85-115			
LCS (B1K0937-BS	2)			Prepared	: 2021-11-0	8, Analyze	d: 2021-1	11-08		
Phosphorus, Total (as	s P)	0.109	0.0050 mg/L	0.100		109	85-115			
LCS (B1K0937-BS	3)			Prepared	: 2021-11-0	8, Analyze	d: 2021-1	11-08		
Phosphorus, Total (as	s P)	0.108	0.0050 mg/L	0.100		108	85-115			
Microbiological Par	ŕ	ch B1K0211		Prepared	: 2021-11-0	1, Analyze	d: <b>2021-</b> 1	11-01		
Coliforms, Total		< 1	1 MPN/100	mL						
Blank (B1K0211-B	LK2)			Prepared	: 2021-11-0	1, Analyze	d: 2021-1	11-01		
Coliforms, Fecal		< 1	1 MPN/100	mL						





## **CERTIFICATE OF ANALYSIS**

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.

REPORTED TO Lake Country, District of (Wastewater)

4062 Beaver Lake Rd

LAKE COUNTRY, BC V4V 1T5

**ATTENTION** Davin Larsen **WORK ORDER** 21K0052

2021-11-01 11:36 / 17.1°C

Raw Influent- PE14651 **REPORTED** 2021-11-08 16:22 **PROJECT** Lake Country WWTP 44501.41216 **PROJECT INFO COC NUMBER** 

#### Introduction:

**PO NUMBER** 

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

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opportunities to support you.

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

Ahead of the Curve

**RECEIVED / TEMP** 

Through research, regulation knowledge, and instrumentation, are your analytical centre the technical knowledge you 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 I whatherst



## **TEST RESULTS**

**REPORTED TO** Lake Country, District of (Wastewater)

PROJECT Raw Influent- PE14651

WORK ORDER REPORTED

21K0052 2021-11-08 16:22

Analyte	Result	RL	Units	Analyzed	Qualifie
Raw Influent (E233627) (21K0052-01)   Ma	trix: 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)

PROJECT Raw Influent- PE14651

WORK ORDER REPORTED 21K0052

2021-11-08 16:22

<b>Analysis Description</b>	Method Ref.	Technique A	ccredited	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 Ac	id) ✓	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.



**REPORTED TO** Lake Country, District of (Wastewater)

PROJECT Raw Influent- PE14651

WORK ORDER REPORTED

21K0052 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, 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	: 2021-11-0	3, Analyze	d: 2021-1	11-08		
BOD, 5-day	< 2.0	2.0 mg/L							
LCS (B1K0491-BS1)			Prepared	: 2021-11-0	3, Analyze	d: 2021-1	11-08		
BOD, 5-day	202	44.1 mg/L	180		112	85-115			
General Parameters, Batch B1K0493									
Blank (B1K0493-BLK1)			Prepared	: 2021-11-0	3, Analyze	d: 2021-1	11-08		
BOD, 5-day Carbonaceous	< 2.0	2.0 mg/L							
LCS (B1K0493-BS1)			Prepared	: 2021-11-0	3, Analyze	d: 2021-1	11-08		
BOD, 5-day Carbonaceous	202	39.3 mg/L	180		112	85-115			
General Parameters, Batch B1K0566 Blank (B1K0566-BLK1)			Prepared	: 2021-11-0	4, Analyze	d: 2021-1	11-04		
Ammonia, Total (as N)	< 0.050	0.050 mg/L							
Blank (B1K0566-BLK2)			Prepared	: 2021-11-0	4, Analyze	d: 2021-1	11-04		
Ammonia, Total (as N)	< 0.050	0.050 mg/L	Prepared	: 2021-11-0	4, Analyze	d: 2021-1	11-04		
· ,	< 0.050	0.050 mg/L		: 2021-11-0 : 2021-11-0					
Ammonia, Total (as N)	< 0.050 < 0.050	0.050 mg/L 0.050 mg/L							
Ammonia, Total (as N)  Blank (B1K0566-BLK3)		Ţ.	Prepared		4, Analyze	d: 2021-′	11-04		
Ammonia, Total (as N)  Blank (B1K0566-BLK3)  Ammonia, Total (as N)		Ţ.	Prepared	: 2021-11-0	4, Analyze	d: 2021-′	11-04		
Ammonia, Total (as N)  Blank (B1K0566-BLK3)  Ammonia, Total (as N)  LCS (B1K0566-BS1)	< 0.050	0.050 mg/L	Prepared	: 2021-11-0	4, Analyze 4, Analyze	d: 2021-1 d: 2021-1 90-115	11-04		
Ammonia, Total (as N)  Blank (B1K0566-BLK3)  Ammonia, Total (as N)  LCS (B1K0566-BS1)  Ammonia, Total (as N)	< 0.050	0.050 mg/L	Prepared	: 2021-11-0 : 2021-11-0	4, Analyze 4, Analyze	d: 2021-1 d: 2021-1 90-115	11-04		
Ammonia, Total (as N)  Blank (B1K0566-BLK3)  Ammonia, Total (as N)  LCS (B1K0566-BS1)  Ammonia, Total (as N)  LCS (B1K0566-BS2)	< 0.050	0.050 mg/L 0.050 mg/L	Prepared 1.00 Prepared 1.00	: 2021-11-0 : 2021-11-0	4, Analyze 4, Analyze 96 4, Analyze	d: 2021-7 d: 2021-7 90-115 d: 2021-7 90-115	11-04 11-04		

General Parameters, Batch B1K0611



REPORTED TO PROJECT	Lake Country, Dist Raw Influent- PE1	•	ter)			WORK REPOR	ORDER TED	21K( 2021	0052 I-11-08	16:22
Analyte		Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters	s, Batch B1K0611, Co	ontinued								
Blank (B1K0611-BL	_K1)			Prepared	: 2021-11-0	3, Analyze	d: 2021-1	1-03		
Solids, Total Suspende	ed	< 2.0	2.0 mg/L	-						
LCC /D4K0644 DC4	1			Droporod	. 2021 11 0	2 Analyzo	4. 2021 1	1 02		
LCS (B1K0611-BS1 Solids, Total Suspende	•	94.0	10.0 mg/L	100	: 2021-11-0	3, Arialyze 94	85-115	1-03		
General Parameters	s. Batch B1K0688									
Blank (B1K0688-Bl				Prepared	: 2021-11-0	4. Analvze	d: 2021-1	1-05		
Nitrogen, Total Kjeldal	-	< 0.050	0.050 mg/L			-, <u>,-</u> -				
				Prenared	: 2021-11-0	4 Analyza	d. 2021 1	1_05		
Blank (B1K0688-BL Nitrogen, Total Kjeldal		< 0.050	0.050 mg/L	гтератец	. 2021-11-0	→, AnalyZe	u. ZUZ I-I	1-00		
		2.200		Prenared	: 2021-11-0	4 Analyza	d. 2021 1	1_05		
LCS (B1K0688-BS1 Nitrogen, Total Kjeldal	•	0.963	0.050 mg/L	1.00	. 2021-11-0	4, Analyze 96	85-115	1-00		
		0.903	0.030 Hig/L							
LCS (B1K0688-BS2	2)				: 2021-11-0			1-05		
Nitrogen, Total Kjeldal	<u>nl</u>	0.941	0.050 mg/L	1.00		94	85-115			
General Parameters				Danasa	. 0004 44 0	Г A l	٦. ٥٥٥٨ ٨	4.05		
Alkalinity Total (as Co		< 1.0	1.0 mg/l	Prepared	: 2021-11-0	5, Ariaiyze	u. 2021-1	1-05		
Alkalinity, Total (as Ca Alkalinity, Phenolphtha		< 1.0	1.0 mg/L 1.0 mg/L							
Alkalinity, Bicarbonate		< 1.0	1.0 mg/L							
Alkalinity, Carbonate (	· ,	< 1.0	1.0 mg/L							
Alkalinity, Hydroxide (a	as CaCO3)	< 1.0	1.0 mg/L							
Blank (B1K0770-Bl	_K2)			Prepared	: 2021-11-0	5, Analyze	d: 2021-1	1-05		
Alkalinity, Total (as Ca		< 1.0	1.0 mg/L	•		· ·				
Alkalinity, Phenolphtha		< 1.0	1.0 mg/L							
Alkalinity, Bicarbonate		< 1.0	1.0 mg/L							
Alkalinity, Carbonate (	· ' '	< 1.0	1.0 mg/L							
Alkalinity, Hydroxide (a	· · · · · · · · · · · · · · · · · · ·	< 1.0	1.0 mg/L							
Blank (B1K0770-Bl	_K3)			Prepared	: 2021-11-0	5. Analyze	d: 2021-1	1-05		
Alkalinity, Total (as Ca		< 1.0	1.0 mg/L			0,7				
Alkalinity, Phenolphtha		< 1.0	1.0 mg/L							
Alkalinity, Bicarbonate	, ,	< 1.0	1.0 mg/L							
Alkalinity, Carbonate (	· /	< 1.0	1.0 mg/L							
Alkalinity, Hydroxide (a		< 1.0	1.0 mg/L							
LCS (B1K0770-BS1	,  }		J	Prepared	: 2021-11-0	5 Analyze	d· 2021-1	1-05		
Alkalinity, Total (as Ca	•	109	1.0 mg/L	100	. 2021 11 0	109	80-120			
LCS (B1K0770-BS2		100	1.0 mg/L		: 2021-11-0			1_05		
Alkalinity, Total (as Ca	•	107	1.0 mg/L	100	. 2021-11-0	107	80-120	1-03		
		101	1.0 Hig/L		. 2024 44 0			1 05		
LCS (B1K0770-BS3 Alkalinity, Total (as Ca	-	109	1.0 mg/L	100	: 2021-11-0	5, Anaiyze 109	d: 2021-1 80-120	1-00		
		109	1.0 Hig/L		. 2024 44 2			1 05		
Reference (B1K077	ru-SKM1)	7.00	0.40		: 2021-11-0			1-05		
pH		7.00	0.10 pH units	7.01		100	98-102			
Reference (B1K077	70-SRM2)				: 2021-11-0			1-05		
pН		7.00	0.10 pH units	7.01		100	98-102			



REPORTED TO PROJECT	Lake Country, Raw Influent- I	District of (Wastew PE14651	ater)				WORK ORDER REPORTED		21K0052 2021-11-08 1	
Analyte		Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameter	rs, Batch B1K077	0, Continued								
Reference (B1K07	70-SRM3)			Prepared	l: 2021-11-0	)5, Analyze	d: 2021-1	11-05		
pH		7.00	0.10 pH units	7.01		100	98-102			
General Parameter	rs, Batch B1K093	7								
Blank (B1K0937-B	BLK1)			Prepared	I: 2021-11-0	)8, Analyze	d: 2021-1	11-08		
Phosphorus, Total (a	s P)	< 0.0050	0.0050 mg/L							
Blank (B1K0937-B	BLK2)			Prepared	l: 2021-11-0	)8, Analyze	d: 2021-1	11-08		
Phosphorus, Total (a	s P)	< 0.0050	0.0050 mg/L							
Blank (B1K0937-B	BLK3)			Prepared	I: 2021-11-0	08, Analyze	d: 2021-1	11-08		
Phosphorus, Total (a	s P)	< 0.0050	0.0050 mg/L							
LCS (B1K0937-BS	31)			Prepared	l: 2021-11-0	)8, Analyze	d: 2021-1	11-08		
Phosphorus, Total (a	s P)	0.113	0.0050 mg/L	0.100		113	85-115			
LCS (B1K0937-BS	52)			Prepared	I: 2021-11-0	08, Analyze	d: 2021-1	11-08		
Phosphorus, Total (a	s P)	0.109	0.0050 mg/L	0.100		109	85-115			
LCS (B1K0937-BS	3)			Prepared	l: 2021-11-0	08, Analyze	d: 2021-1	11-08		
Phosphorus, Total (a	s P)	0.108	0.0050 mg/L	0.100		108	85-115			





## **CERTIFICATE OF ANALYSIS**

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.

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

PROJECTFinal Effluent- PE14651REPORTED2021-12-14 15:22PROJECT INFOLake Country WWTPCOC NUMBER44537.42003

#### 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

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 A what



# **TEST RESULTS**

REPORTED TO Lake Country, Dist PROJECT Final Effluent- PE1	rict of (Wastewater) 4651		WORK ORDER REPORTED	21L1019 2021-12-1	4 15:22
Analyte	Result	RL	Units	Analyzed	Qualifier
Final Effluent (E233626) (21L1019-01	)   Matrix: Wastewater   Sample	d: 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		mg/L	2021-12-08	
Alkalinity, Bicarbonate (as CaCO3)	169		mg/L	2021-12-08	
Alkalinity, Carbonate (as CaCO3)	< 1.0		mg/L	2021-12-08	
Alkalinity, Hydroxide (as CaCO3)	< 1.0		mg/L	2021-12-08	
Ammonia, Total (as N)	1.40	0.050		2021-12-09	
BOD, 5-day Carbonaceous	< 7.2		mg/L	2021-12-13	
Nitrogen, Total Kjeldahl	3.04	0.050		2021-12-10	
pH	7.55		pH units	2021-12-08	HT2
Phosphorus, Total (as P)	0.356	0.0050	·	2021-12-13	
Solids, Total Suspended	4.8		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: Wate Anions	er   Sampled: 2021-12-07 11:25				
Chloride	108		mg/L	2021-12-08	
Nitrate (as N)	1.94	0.010		2021-12-08	
Nitrite (as N)	0.123	0.010		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	
				2024 42 00	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2021-12-08	
Alkalinity, Phenolphthalein (as CaCO3)  Alkalinity, Bicarbonate (as CaCO3)	< 1.0 172		mg/L	2021-12-08	



## **TEST RESULTS**

**Analyte** 

**REPORTED TO** Lake Country, District of (Wastewater)

PROJECT Final Effluent- PE14651

WORK ORDER REPORTED 21L1019 2021-12-14 15:22

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	
рН	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)

PROJECT Final Effluent- PE14651

WORK ORDER

21L1019

**REPORTED** 2021-12-14 15:22

Analysis Description	Method Ref.	Technique A	ccredited	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 Ac	sid) ✓	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.

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Duplicate (B1L0916-DUP1)

BOD, 5-day Carbonaceous

## **APPENDIX 2: QUALITY CONTROL RESULTS**

REPORTED TO Lake Country, District of (Wastewater)

PROJECT Final Effluent- PE14651

WORK ORDER REPORTED

21L1019 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	Qualifie
Anions, Batch B1L0818									
Blank (B1L0818-BLK1)			Prepared	d: 2021-12-0	08, Analyze	d: 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	d: 2021-12-0	08, Analyze	d: 2021-1	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			
Alkalinity, Total (as CaCO3)	< 1.0	1.0 mg/L	•		, <u>,</u>				
Blank (B1L0866-BLK1)	< 1.0	1.0 mg/l		d: 2021-12-0	· · · · · · · · · · · · · · · · · · ·				
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	d: 2021-12-0	08, Analyze	d: 2021-1	12-08		
Alkalinity, Total (as CaCO3)	102	1.0 mg/L	100		102	80-120			
Reference (B1L0866-SRM1)			Prepared	d: 2021-12-0	08, Analyze	d: 2021-	12-08		
рН	7.00	0.10 pH units	7.01		100	98-102			
General Parameters, Batch B1L0916									
Blank (B1L0916-BLK1)			Prepared	d: 2021-12-0	)8, Analyze	ed: 2021-	12-13		
BOD, 5-day Carbonaceous	< 2.0	2.0 mg/L			·				
LCS (B1L0916-BS1)			Prepared	d: 2021-12-0	08, Analyze	ed: 2021-	12-13		
BOD, 5-day Carbonaceous	194	39.8 mg/L	180		108	85-115			

Prepared: 2021-12-08, Analyzed: 2021-12-13

< 7.2

Source: 21L1019-01

2.0 mg/L

< 4.8



REPORTED TO PROJECT	Lake Country, Distr Final Effluent- PE1	•	ater)			WORK REPOR			019 -12-14	15:22
Analyte		Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifie
General Parameters	s, Batch B1L0992									
Blank (B1L0992-BL	LK1)			Prepared	: 2021-12-09	, Analyze	d: 2021-	12-09		
Ammonia, Total (as N	)	< 0.050	0.050 mg/L							
Blank (B1L0992-Bl	LK2)			Prepared	: 2021-12-09	, Analyze	d: 2021-	12-09		
Ammonia, Total (as N	)	< 0.050	0.050 mg/L	•						
Blank (B1L0992-Bl	LK3)			Prepared	: 2021-12-09	, Analyze	d: 2021-	12-09		
Ammonia, Total (as N	)	< 0.050	0.050 mg/L	·		•				
LCS (B1L0992-BS1	1)			Prepared	: 2021-12-09	, Analyze	d: 2021-	12-09		
Ammonia, Total (as N	•	0.974	0.050 mg/L	1.00		97	90-115			
LCS (B1L0992-BS2	2)			Prepared	: 2021-12-09	, Analyze	d: 2021-	12-09		
Ammonia, Total (as N	·	0.992	0.050 mg/L	1.00		99	90-115			
LCS (B1L0992-BS3	3)			Prepared	: 2021-12-09	. Analyze	d: 2021-	12-09		
Ammonia, Total (as N	•	0.984	0.050 mg/L	1.00		98	90-115			
LCS (B1L1123-BS1 Nitrogen, Total Kjeldal	•	1.04	0.050 mg/L	Prepared:	: 2021-12-09	, Analyze	d: 2021- 85-115	12-10		
General Parameters				Drongrad	: 2021-12-10	Anglyzo	d. 2021 <i>:</i>	12 10		
Blank (B1L1178-BL Solids, Total Suspend	,	< 2.0	2.0 mg/L	Fiepaieu	. 2021-12-10	, Allalyze	u. 2021-	12-10		
			g/_	Propared	. 2021 12 10	Analyzo	d. 2021 <i>:</i>	12 10		
Blank (B1L1178-BL Solids, Total Suspend	,	< 2.0	2.0 mg/L	Fiepaieu	: 2021-12-10	, Analyze	u. 2021-	12-10		
			g/_	Propared	: 2021-12-10	Analyzo	d. 2021 <i>:</i>	12 10		
LCS (B1L1178-BS1 Solids, Total Suspend	•	90.0	10.0 mg/L	100	. 2021-12-10	90	85-115	12-10		
LCS (B1L1178-BS2					: 2021-12-10			12_10		
Solids, Total Suspend	•	96.0	10.0 mg/L	100	. 2021-12-10	96	85-115	12-10		
General Parameters Blank (B1L1392-Bl			Ü		: 2021-12-13	s, Analyze		12-13		
Phosphorus, Total (as	s P)	< 0.0050	0.0050 mg/L							
LCS (B1L1392-BS1	1)			Prepared	: 2021-12-13	, Analyze	d: 2021-	12-13		
Phosphorus, Total (as	; P)	0.101	0.0050 mg/L	0.100		101	85-115			
-	rameters, Batch B1L0	741			0004.45.5			40.07		
Blank (B1L0741-BL	LK1)		A MONIZO	-	: 2021-12-07	, Analyze	a: 2021-	12-07		
Coliforms, Total		< 1	1 MPN/100							
Blank (B1L0741-BL	LK2)				: 2021-12-07	, Analyze	d: 2021-	12-07		
Coliforms, Total		< 1	1 MPN/100	) mL						



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	Source	% REC	REC	% RPD RPD	Qualifier
			Lovol	Pocult	,	Limit	Limit	4

Microbiological Doromotoro	Batab Bal 0744 Continued
Microbiological Parameters.	Batch B1LU/41. 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**

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.

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

PROJECTRaw Influent- PE14651REPORTED2021-12-14 15:33PROJECT INFOLake Country WWTPCOC NUMBER44537.42003

#### 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

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 M what



# **TEST RESULTS**

**REPORTED TO** Lake Country, District of (Wastewater)

PROJECT Raw Influent- PE14651

WORK ORDER REPORTED

21L1016 2021-12-14 15:33

Analyte	Result	RL	Units	Analyzed	Qualifie
Raw Influent (E233627) (21L1016-01)   Ma	trix: Wastewater   Sample	d: 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)

PROJECT Raw Influent- PE14651

WORK ORDER

21L1016

**REPORTED** 2021-12-14 15:33

Analysis Description	Method Ref.	Technique A	ccredited	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 Ac	id) ✓	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.



**PROJECT** 

### **APPENDIX 2: QUALITY CONTROL RESULTS**

**REPORTED TO** Lake Country, District of (Wastewater)

Raw Influent- PE14651

WORK ORDER REPORTED

21L1016 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	d: 2021-12-0	08, Analyze	d: 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	d: 2021-12-0	)8, Analyze	d: 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								
All II II II I I I I O OOO)	1.0	4.0								

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	3	60		1	10	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0 mg/L	<	1.0			10	
Alkalinity, Bicarbonate (as CaCO3)	364	1.0 mg/L	3	60		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	
рН	7.84	0.10 pH units	7.	83		< 1	4	
Reference (B1L0866-SRM1)			Prepared: 202	1-12-08, Analyz	ed: 2021-12	2-08		
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



REPORTED TO Lake Country, Dis PROJECT Raw Influent- PE1		•	ater)			WORK REPOR		21L1016 2021-12-14 15:33		
Analyte		Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameter	s, Batch B1L0915, Con	tinued								
LCS (B1L0915-BS	1)			Prepared	: 2021-12-0	8, Analyze	ed: 2021-1	12-13		
BOD, 5-day		193	50.1 mg/L	180		107	85-115			
General Parameter	s, Batch B1L0916									
Blank (B1L0916-B	LK1)			Prepared	: 2021-12-0	8, Analyze	ed: 2021-1	12-13		
BOD, 5-day Carbona	ceous	< 2.0	2.0 mg/L							
LCS (B1L0916-BS	1)			Prepared	: 2021-12-0	8, Analyze	ed: 2021-1	12-13		
BOD, 5-day Carbona	ceous	194	39.8 mg/L	180		108	85-115			
General Parameter	s, Batch B1L0992									
Blank (B1L0992-B	LK1)			Prepared	: 2021-12-0	9, Analyze	ed: 2021-1	12-09		
Ammonia, Total (as N	•	< 0.050	0.050 mg/L	•						
Blank (B1L0992-B	LK2)			Prepared	: 2021-12-0	9, Analyze	ed: 2021-1	12-09		
Ammonia, Total (as N	I)	< 0.050	0.050 mg/L			-				
Blank (B1L0992-B	LK3)			Prepared	: 2021-12-0	9, Analyze	ed: 2021-1	12-09		
Ammonia, Total (as N	1)	< 0.050	0.050 mg/L							
LCS (B1L0992-BS	1)			Prepared	: 2021-12-0	9, Analyze	ed: 2021-1	12-09		
Ammonia, Total (as N	1)	0.974	0.050 mg/L	1.00		97	90-115			
LCS (B1L0992-BS	2)			Prepared	: 2021-12-0	9, Analyze	ed: 2021-1	12-09		
Ammonia, Total (as N	1)	0.992	0.050 mg/L	1.00		99	90-115			
LCS (B1L0992-BS	3)			Prepared	: 2021-12-0	9, Analyze	ed: 2021-1	12-09		
Ammonia, Total (as N	1)	0.984	0.050 mg/L	1.00		98	90-115			
General Parameter	s, Batch B1L1123									
Blank (B1L1123-Bl	LK1)			Prepared	: 2021-12-0	9, Analyze	ed: 2021-1	12-10		
Nitrogen, Total Kjelda	ıhl	< 0.050	0.050 mg/L	·		•				
LCS (B1L1123-BS	1)			Prepared	: 2021-12-0	9, Analyze	ed: 2021-1	12-10		
Nitrogen, Total Kjelda	·	1.04	0.050 mg/L	1.00		104	85-115			
General Parameter	s, Batch B1L1178									
Blank (B1L1178-B	LK1)			Prepared	: 2021-12-1	0, Analyze	ed: 2021-1	12-10		
Solids, Total Suspend		< 2.0	2.0 mg/L	•		-				
Blank (B1L1178-B	LK2)			Prepared	: 2021-12-1	0, Analyze	ed: 2021-1	12-10		
Solids, Total Suspend	•	< 2.0	2.0 mg/L	•						
LCS (B1L1178-BS	1)			Prepared	: 2021-12-1	0, Analyze	ed: 2021-1	12-10		
Solids, Total Suspend	•	90.0	10.0 mg/L	100		90	85-115			
LCS (B1L1178-BS)	2)			Prepared	: 2021-12-1	0, Analyze	ed: 2021-1	12-10		
Solids, Total Suspend	•	96.0	10.0 mg/L	100		96	85-115			

General Parameters, Batch B1L1392



REPORTED TO Lake Country, Dis PROJECT Raw Influent- PE		•	trict of (Wastewater) 4651			WORK REPOR	ORDER TED	21L1 2021	15:33	
Analyte		Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameter Blank (B1L1392-B	,	2, Continued		Prepared	l: 2021-12-1	13 Analyze	d· 2021-1	12-13		
Phosphorus, Total (a	,	< 0.0050	0.0050 mg/L			. 0, 7				
LCS (B1L1392-BS1)				Prepared: 2021-12-13, Analyzed: 2021-12-13						
Phosphorus, Total (a	s 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

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**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 <u>250</u>-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: <u>EnvironmentalCompliance@gov.bc.ca</u>

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]:

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**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.

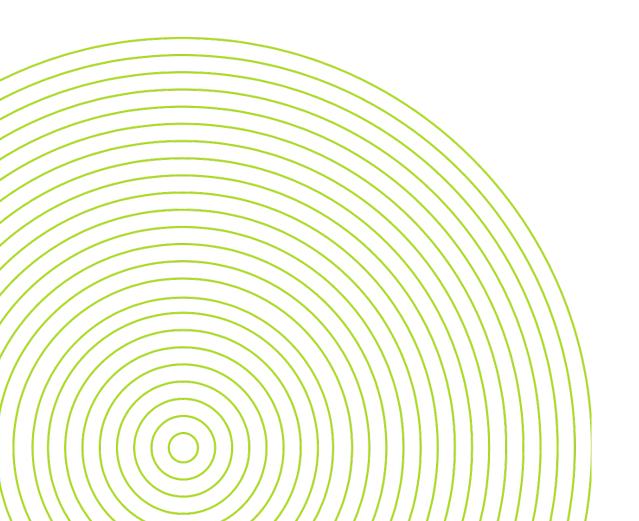
Note: This form is intended to facilitate communication regarding non-compliance events between authorisation holders and the ministry. Submission of this form by an authorization holder does not constitute an inspection or a finding of non-compliance in accordance with ministry compliance and enforcement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



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				
Site	Description	Groundwater Depth	Water Quality			
MW-2	Background (up-gradient) well	Monthly				
MW-18	Down-gradient within treatment plant boundary	Continuous	Once in the spring and fall for the following parameters: sodium, chloride, conductance, ammonia, nitrate/nitrite, TKN,			
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				
Н1	10050 McCarthy Road					
H2	10101A Konschuh Road		total nitrogen, total			
H3	9989 Bottom Wood Lake Road	Not required	phosphorus, orthophosphorus, pH and <i>E. coli</i> .			
H4	10101B Konschuh Road					
H5	9815 McCarthy Road					
Н6	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

DATE: March 7, 2022 FILE: 1577.0022.01 PAGE: 2 of 10

SUBJECT: Review of 2021 Groundwater Data

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.

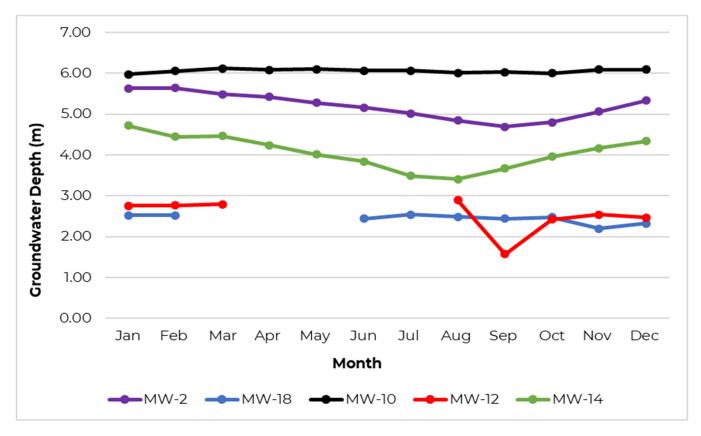


Figure 2.1: Groundwater Depths – Monthly Readings

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.

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SUBJECT: Review of 2021 Groundwater Data

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.

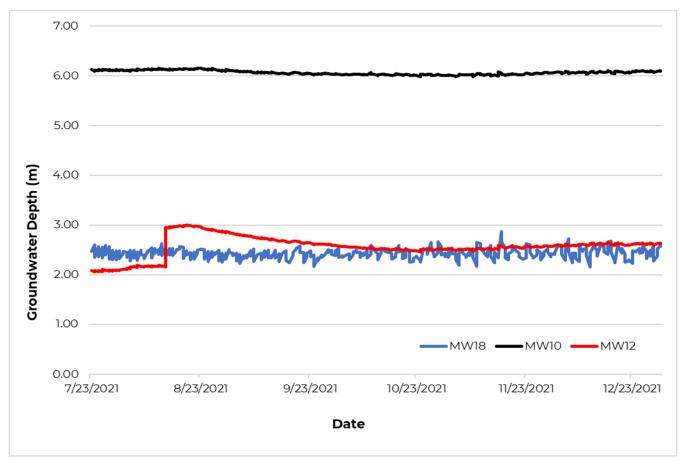


Figure 2.2: Groundwater Depths - Data Logger Information

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SUBJECT: Review of 2021 Groundwater Data

#### 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 22<sup>nd</sup> and the fall samples were taken on September 20<sup>th</sup>, 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					
Parameter	Offics	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	
рН	pH units	8.08	-	8.01	-	7.84	
E. coli	MPN/100 mL	-	-	-	-	-	

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SUBJECT: Review of 2021 Groundwater Data

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** 

Davamatav	Units	Location					
Parameter		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	
На	pH units	7.98	7.97	7.88	7.75	7.93	
Faecal Coliforms	MPN/100 mL	< ]	< 1	15	770	< ]	

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  $\mu$ S/cm for the most sensitive crops to 5,000  $\mu$ S/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  $\leq$  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.

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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.

Location Guideline **Parameter** Units 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) 5.0 to 9.5 (irrigation) рΗ pH units Faecal MPN/100 0 (livestock in closely Coliforms mL confined conditions with no water treatment)

**Table 3.3: Guideline Comparison** 

#### 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 14<sup>th</sup>) were taken before the parameters and locations were confirmed in the amended operational certificate. The fall samples were taken on October 7<sup>th</sup>. 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.

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**Table 3.4: Summary of Spring Data** 

Dawawaataw	Units	Location						
Parameter		MW-2	H1	H2	Н3	H4	Н5	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
рН	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						
Parameter		MW-2	H1	H2	Н3	H4	Н5	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
рН	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

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SUBJECT: Review of 2021 Groundwater Data

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).

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

**Table 3.6: Guideline Comparison** 

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

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SUBJECT: Review of 2021 Groundwater Data

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:
   <u>environmentalcompliance@gov.bc.ca</u>, 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.Bío. Water and Wastewater Specialist

/jq





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.



Scale:

Coordinate System: NAD 1983 UTM Zone 11N

1:9,500

Data Sources:

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

1577.0103.01 Project #: CR Author:

Checked: Status:

2021 / 6 / 3

**URBAN**systems