QUEENSWAY WASTEWATER TREATMENT FACILITY 2023 ANNUAL REPORT

2023 Annual Effluent Monitoring Report

Prepared for:

British Columbia Ministry of
Environment & Climate Change Strategy
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Regional District of
Kitimat-Stikine

Executive Summary

Queensway Wastewater Treatment Facility (the Facility) is a Class 1 municipal wastewater treatment facility producing a Class C effluent. The facility is located approximately 3 kilometres down Queensway Drive, south of the City of Terrace, and provides secondary treatment of septic effluent from residential and commercial sources in Electoral Area E from Queensway, Churchill, and the Thornhill Commercial Core areas. The facilities authorised works include a two-cell aerated lagoon system, twin exfiltration basins, a flow measurement facility, and an outfall. The facility is authorised under permit number 12645 (the Permit) through the Ministry of Environment and Climate Change Canada (ENV) and includes authorisation to discharge to ground through the twin exfiltration beds (site reference discharge E220346), and to the Skeena River side channel via the outfall during flood stages of the Skeena River (site reference discharge E220347).

The quality of effluent discharged to the exfiltration beds was monitored monthly under the effluent monitoring program. Effluent monitoring was not completed in May during flood conditions of the Skeena River, and a non-compliance report was submitted to ENV for this incident.

The TSS limits of the Municipal Wastewater Regulation and permit were exceeded in June and July of 2023. A non-compliance report was submitted in August discussing the incident. Further root cause analysis was performed by the Regional District of Kitimat Stikine (RDKS), including a survey of sludge depths in aeration lagoons 1 and 2. A root-cause analysis to evaluate conditions leading to the increase in TSS, and a corrective action plan to de-sludge the lagoon is included in this report.

Discharge measurements for 2023 were based on influent flow rate, and precipitation volumes observed at NAVCAN station located at the Northwest Regional Airport. The total annual influent received at the facility was 72,329.9 m^3/year, and the total annual discharge to the exfiltration basins was 109,885 m^3/year, including precipitation. The average daily influent and effluent volumes were 191.1 m^3/day and 301 m^3/day, respectively, and below the permitted average discharge limit of 800 m^3/day.

Regional District of
Kitimat-Stikine

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Regional District of Kitimat-Stikine

1 Introduction

The objectives of the Queensway Wastewater Treatment Facility 2023 Annual Report include reporting of influent flow volumes, effluent discharge estimates, review of effluent quality in comparison with the applicable criteria, effluent chemical trend analysis, and to provide recommendations. Additionally, this report includes a root-cause analysis and corrective action plan in follow-up with the non-compliance report submitted on August 25, 2023.

2 Background

The Queensway Facility (the facility) is a municipal wastewater treatment facility located approximately 3 kilometres down Queensway Drive, south of the City of Terrace, located on Block A, District Lot 8098, Range 5 Land District, lying on the west side of the British Columbia Hydro and Power Authority Right of Way. The facility was commissioned in 1994, providing secondary treatment of septic effluent from residential and commercial sources in Electoral Area E from Queensway, Churchill, and the Thornhill Commercial Core areas.

The wastewater facility collects effluent from septic tanks of residential buildings, and from the Thornhill Commercial Core, through a combined sewer system. Effluent is conveyed to the wastewater facility through an influent line where flow is measured through an influent flow meter at the facilities blower house. The blower house includes a set of blowers and a force main providing aeration to two aeration lagoons. Effluent passes from the aeration basins into a set of parallel exfiltration basins where it is discharged to the ground. An emergency overflow outfall is located from the infiltration lagoons to a side channel of the Skeena River, approximately 250 metres to the southwest. The facilities authorised works are shown in the Site Plan located in Appendix A.

A master plan for the facility was completed in 2023, which provided an assessment of the wastewater treatment facility capacity and associated sewer system capacity, taking into consideration predicted population projections for the service areas. It was determined that the wastewater system is appropriately sized for current design flows but will require significant upgrades for future buildout scenarios.

2.1 Regulatory Framework Overview

Federal Wastewater Systems Effluent Regulation

Under the Fisheries Act, the Wastewater Systems Effluent Regulation (WSER) regulates the operation and discharge of effluent from continuous and intermittent discharge wastewater systems in Canada that collect an average daily influent volume of 100 m^3 or more, and which deposit effluent to water; or where the deposit of effluent may enter water frequented by fish. Deleterious substances are defined under the Fisheries Act to include any water that contains a substance in such quantity or concentration that would alter the quality of water such that it is likely to become deleterious to fish, or fish habitat. The WSER defines effluent water containing concentrations of carbonaceous biochemical oxygen demand ($CBOD_5$)

and suspended solids (TSS) as a deleterious substance under the Fisheries Act but authorizes the deposit of deleterious substances if certain criteria are met for TSS and $CBOD_5$. For a discharge to qualify under this exemption, the average concentrations of $CBOD_5$ and TSS must be below 25 mg/L each over an averaging period.

Averaging period and effluent sampling frequency are determined by the wastewater system type and the average daily influent volume. The WSER also requires that any additional samples that are collected by the wastewater system operator, and are submitted to an accredited laboratory, must be included in the averaging calculations. TSS concentrations from the July, August, September, and October may be excluded from the averaging, provided that a hydraulic retention time (HRT) of 5 consecutive days is met.

Additionally, the regulation sets out requirements for daily influent averaging using continuous monitoring equipment, stipulates requirements for calibration and maintenance of continuous monitoring equipment, stipulates what records are required to be kept and for how long, and regulates reporting requirements. Permitting instruments under the WSER include a Temporary Bypass Authorisation which may be exercised when planned maintenance or conditions are expected to cause exceedances to the CBOD and TSS criteria. Under the WSER the Queensway Wastewater Facility is:

- a continuous discharge wastewater facility,
- required to monitor effluent monthly,
- required to monitor average influent flow rates daily, and
- must use an annual averaging period for $CBOD_5$ and TSS concentrations.

Provincial Municipal Wastewater Regulation

Under the Environmental Management Act, the Municipal Wastewater Regulation (MWR) regulates the operation and discharge of permitted municipal wastewater treatment facilities that discharge municipal effluent to ground in volumes greater than 22.7m^3/day, or that discharge municipal effluent to water. Under the MWR the facility must be classified under the Environmental Operators Certification Program (EOCP) and must be operated and maintained by persons who are certified under the EOCP. Municipal effluent is classed under the regulation as Class A, Class B, or Class C, according to the treatment objectives of the facility. The effluent class of a facility determines the applicable effluent quality requirements for BOD_5[1], TSS, fecal coliforms, turbidity and Nitrogen, the latter three of which only apply to Class A and B effluents.

Monitoring requirements including maximum criteria and frequency of sampling for discharges to ground are determined by effluent class and the maximum daily flow of the facility. Monitoring requirements for discharges to water are determined by the maximum daily flow and include toxicity monitoring to rainbow trout using a lethal dose analysis for 50% mortality. Discharges to water must also have a maximum $CBOD_5$ and TSS value of 10 mg/L under the regulation.

[1] BOD_5 is defined in the MWR as the carbonaceous 5-day biochemical oxygen demand and defined in this report as $CBOD_5$.

The facility produces a Class C effluent, meeting the criteria of secondary treatment for a lagoon system, with $CBOD_5$ of not more than 45 mg/L, and TSS of not more than 60 mg/L. The frequency of monitoring required is twice a week monitoring of flow frequency, and monthly grab samples of $CBOD_5$ and TSS. Data must be submitted to the director at minimum quarterly for a system with a maximum daily flow of $50m^3$ or greater. Discharges to water through the overflow pipe will require effluent monitoring of CBOD5, TSS, Total Phosphorous, and orthophosphate. Under the MWR the Queensway Wastewater Facility is:

- registered as a facility producing a Class C effluent,
- required to monitor effluent quality monthly,
- required to monitor the receiving environment if discharge to water occurs, and
- must monitor maximum daily flows twice weekly.

The Queensway Wastewater Facility is a Class 1 Wastewater Treatment Facility, under the Environmental Operators Certification Program (EOCP), certificate No. 406 (Appendix B). The facility has four operators certified at or above Wastewater Treatment Level 1.

Discharge Authorisation

The facility is authorised to discharge effluent in accordance with the Environmental Management Act under permit number 12645 (the Permit; Appendix C), which includes an authorisation to discharge to the ground, and an authorisation to discharge to the Skeena River side-channel during flood stages of the river. The average authorised rate of discharge is 800 m^3 per day, and the maximum authorised rate of discharge is 1,500 m^3 per day. The permit was last updated in October 2022 to amend the definition of Biochemical Oxygen Demand to mean Carbonaceous Biochemical Oxygen Demand, to match the BOD definition provided in the MWR (Appendix D).

The monitoring requirements of the permit include the effluent monitoring requirements of the MWR, which are obtained through a monthly grab sample of effluent from the outlet of the aerated lagoon (Site No. E220346) and include monthly reporting of the grab sample data. The authorisation sets additional monitoring parameters, shown in Effluent Monitoring Column of Table 1. If effluent is to be discharge to the Skeena River side-channel, pre-discharge monitoring of the Skeena River side-channel and monitoring of the receiving environment are required. Pre-discharge monitoring and receiving environment monitoring sample requirements are also shown in Table 1.

Table 1 Monitoring Programs and Program Sample Requirements for Queensway Facility, Authorisation 12645

Parameter	Sample Type	Monitoring Program		
		Effluent Monitoring	Outfall Pre-Discharge Monitoring	Receiving Environment Monitoring
Influent Flow Rate (m3/d), continuous measurement	Field	Monthly	NA	NA
Side-Channel Flow Rate	Field	NA	Twice, minimum of one week apart in typical non-flood low-flow conditions	Weekly during outfall discharge and for one month after outfall discharge
Temperature (°C)	Field	Monthly	Twice, minimum of one week apart in typical non-flood low-flow conditions	Weekly for one month after outfall discharge
Dissolved O_2 (mg/L)	Field	Monthly	Twice, minimum of one week apart in typical non-flood low-flow conditions	Weekly for one month after outfall discharge
pH	Field	Monthly	Twice, minimum of one week apart in typical non-flood low-flow conditions	Weekly for one month after outfall discharge
Total Ammonia (mg/L)	Field	Monthly	Twice, minimum of one week apart in typical non-flood low-flow conditions	Weekly for one month after outfall discharge
C-BOD_5 (mg/L)	Grab	Monthly	NA	NA
TSS (mg/L)	Grab	Monthly	NA	NA
Total Phosphorus (mg/L)	Grab	Monthly	NA	NA
Total Nitrogen (mg/L)	Grab	Monthly	Twice, minimum of one week apart in typical non-flood low-flow conditions	Sample if DO <2.0 mg/L or NH3 > 2 mg/L
Nitrate/Nitrite (mg/L)	Grab	NA	Twice, minimum of one week apart in typical non-flood low-flow conditions	Sample if DO <2.0 mg/L or NH3 > 2 mg/L
Fecal Coliform (MPN/100mL)	Grab	NA	Twice, minimum of one week apart in typical non-flood low-flow conditions	Sample if DO <2.0 mg/L or NH3 > 2 mg/L
Fecal Streptococci (MPN/100mL)	Grab	NA	Twice, minimum of one week apart in typical non-flood low-flow conditions	Sample if DO <2.0 mg/L or NH3 > 2 mg/L

3 Discharge Operations

In 2023 all effluent from the facility was discharged to the exfiltration lagoons. There was no discharge of effluent through the outfall to the Skeena River side-channel. The works were inspected regularly during the monthly effluent monitoring sample events.

Maintenance tasks of the Facility completed in 2023 included:

- daily inspection of lift stations/Doorman vault and aerator station,
- recording of influent flow rates,
- monthly oil/ filter change for the blowers,
- flushing manholes (Kulspai),
- lift station charcoal changing,
- regular cleaning of lift and aerator stations,
- weed eating around the sewer lagoons,
- snow removal of associated buildings, and
- recording of deposited solids on the lagoon base at certain locations.

3.1 Monitoring Methodology

Effluent monitoring was carried out by RDKS Works & Services EOCP wastewater technicians, and staff environmental technologist following the British Columbia Field Sampling Manual for Water and Wastewater Sampling. Samples were collected in laboratory supplied bottles by lowering a pole sampler into the effluent weir at the manhole. Samples were then transported in coolers with ice to ALS Laboratories in Burnaby, BC for analysis. Quality assurance (QA) samples consisted of Trip Blanks, Field Blanks, and Field Duplicates. Table 2 presents the regular, and QA samples included in the 2023 monitoring program.

Table 2: Quality Assurance Samples Collected during the 2023 Monitoring Program

Type of QA Sample	Total	Month Sample Submitted
Field Blank	1	October
Field Duplicate	3	June (2), November
Trip Blank	5	June, July, August, September, December
Regular Sample	12	January, February, March, April, June (2), July, August, September, October, November, December

Dissolved oxygen (DO), pH, specific conductance (SPC), and Temperature (T), were measured in the field using a YSI Pro Quatro. Ammonia was not measured in the field. pH measurements were not collected in the field from August to December but were included in the laboratory analysis. The YSI probes were calibrated in the office prior to each sampling event and recorded in a calibration log.

Influent flow rates are measured in the blower building by taking readings from the in-line flow meter at minimum twice a week. Average daily discharge is determined each month on the monitoring visit by subtracting the days since the last monitoring visit using the difference between the two flow readings from each monitoring visit to determine the average daily influent flow rate for the month.

Grab samples were collected each month in 2023, except for May when the facility was not accessible due to flooding of the Skeena River. There was a minimum of 14 days between sampling events, and a maximum of 64 days between the April and June sample. Influent flow rates were recorded for each month, including May.

3.2 Non-Compliance Reporting

During the month of May 2023, the Skeena River experienced flooding, rising from 3.9 to 11.5 metres at the nearest hydrometric data station over a period of 17 days. Typical levels during 2023 ranged from approximately 1 to 4 metres. The flooding resulted in the access to the facility being inundated by flows from the Skeena River. Due to the flooding of the access road, grab samples and monitoring were not completed during the month of June, except for influent flow rate which is monitored continuously in the aerator building. A non-compliance report was submitted on July 2, 2023.

During the month of June, the concentration of TSS from the monthly grab sample obtained on June 14, 2023, was 70.1 mg/L, which exceeded the regulatory limit of 60 mg/L. A follow-up sample was obtained on June 28, 2023. The TSS in the follow-up sample was 45.8 mg/L which was below the regulatory limit. The TSS in the July monthly grab sample obtained on July 12, 2023, was 63.8 which resulted in a second exceedance to the TSS regulatory limit. Possible reasons for the exceedance were considered with the following probable causes:

- Anaerobic conditions caused by an overgrowth of *Lemna minor* (duckweed) on the lagoons,
- A microalgae bloom that is decaying in the water column as a result of duckweed blocking sunlight required for photosynthesis,
- Excessive sludge buildup in the lagoon,
- Inadequate settling of sludge in the lagoon due to insufficient HRT contributing to short circuiting of effluent through the lagoon,
- Nutrient overload, and
- System upset due to contaminants upstream.

The monthly grab sampling on August 15, 2023, included additional analysis for BTEX, VPH, and EPH to help determine if contaminants were present in the system. A non-compliance report was submitted on August 25, 2023. A follow-up report was to be submitted including the findings of the root-cause investigation. This annual report presents the findings of the root-cause investigation and corrective action plan, detailed in section 4.3 and 4.4 of the report.

3.3 Sludge Depth Investigations

Sludge monitoring was completed on September 20, 2023, to determine the depth of accumulated solids in the two aeration lagoons. Readings were taken by lowering a Sludge Judge Sampler® from a watercraft to the bottom of the lagoon to determine sludge thickness at four locations in aeration cell 1, and eleven locations in aeration cell 2. The sludge depths for aeration cell 2 are modelled in Appendix E, to estimate the probable distribution of sludge accumulation using six equal intervals, or bands, and assuming a flat-bottomed lagoon. The sludge depths ranged from 20 cm to 101 cm, and indicated that a mound of sludge was built up along the inside corner of the lagoon. The sludge measurements taken from aeration cell 1 did not include enough data points to model the analysis, but were of an average thickness of 13.5 cm and ranged from 15 to 76 cm. The wetted depth of the aeration lagoons is 300 cm including any settled sludge. Each of the aeration lagoons have 100 cm of freeboard.

4 Data and Analysis

4.1 Influent Flow Rate and Discharge Volumes

The influent volumes are recorded continuously at the facility and are used to assess compliance with the average and maximum discharge rates. Discharge of effluent from the aeration ponds is assumed to equal influent flow rate plus precipitation over the lagoon area. Influent flow rates and the monthly precipitation measurements from the Terrace Airport NAVCAN station are presented in Table 3. Volumes of precipitation are estimated from the area of the aeration and infiltration lagoons which is approximately 25,375 m^2 in total (Aeration Bay 1: 2,916 m^2; Aeration Bay 2: 9,261 m^2; Aeration Bay 3 and 4: 6,599 m^2 each). Estimates do not include a factor for evaporation, and assume of 50% run-off from the berms into the lagoons during precipitation events.

The average monthly flow rate was determined by multiplying the average influent flow rate for each month by the number of days in each month. The average monthly flow rates were totalled to provide the averaged annual total volume. The annual total volume of influent received as the facility in 2023 was 72,329.9 m^3.

The total precipitation reported by NAVCAN for the year was 1.48 metres. The total precipitation was multiplied by the estimated area of the lagoons (25,375 m^2), to provide the annual volume of precipitation contributing to the total discharge volume. The total estimated volume of precipitation received in the aeration lagoons and infiltration basins was 37,555 m^3/year, resulting in a total estimated discharged volume of 109,885 m^3/year. This translates to an estimated daily average discharge rate of 301 m^3/day, which is below the average authorised discharge rate of 800 m^3 per day. Based on the low volumes of influent, and precipitation, and the assumption that there was no evaporation, it is unlikely that the maximum discharge rate of 1500 m^3 per day had been exceeded in 2023.

Table 3: Average Influent, Precipitation, and Discharge Volumes by Month for 2023

Date	Average Influent Flow Rate (m^3/day)	Average Monthly Flow Rate (m^3/month)	Total Precip (mm/month)
January	212.3	6,580.1	122.8
February	288.6	8,081.9	233.3
March	216.4	6,706.9	28.2
April	188.3	5,649.3	79.6
May	230.1	7,133.1	26.6
June	159.2	4,776.0	150.8
July	168.2	5,214.2	58.4
August	172.0	5,332.9	23.5
September	163.9	4,916.1	67.2
October	164.9	5,112.5	109.1
November	195.8	5,874.9	364.6
December	224.3	6,952.1	215.9
Annual Monthly Average	**191.1**	**6,027.5**	**0.123**
Annual Total	***Calculated in next column***	**72,329.9 m^3/year**	**1,480.0 mm/year (1.48 m/year)** **37,555 m^3/year**
Total Estimated Annual Discharge Volume			**109,885 m^3/year, or** **301 m^3/day**

4.2 Effluent Monitoring

The Authorisation requires the field collection of ammonia and pH values. Ammonia was analysed in the lab for each grab sample and was not collected in the field. Field measurements for pH were not collected in from January to May and was collected during only one of the grab samples obtained in June. Measurements for pH were obtained by the lab for all months, with the exception of May when no grab sample was obtained. Observations recorded during the monthly effluent monitoring visits included detailed observations and photos of the duckweed bloom on the two aeration lagoons.

TSS and $CBOD_5$ values for each grab sample are presented in Figure 1. The monthly reported concentrations in the figure include an average of values when a duplicate sample was collected. Complete lab reports, including certificate of analysis and chain of custody are provided in Appendix F. Effluent Monitoring data is presented in Appendix G. Grab samples were not obtained during the month

of May due to flood conditions of the Skeena River preventing access to the facility. The TSS concentrations from the June 14th grab sample and duplicate sample following the flood event resulted in exceedance to the 60 mg/L criteria of the MWR, with an average concentration of 74.5 mg/L. A follow-up sample was obtained on June 28th to confirm the exceedance, the TSS results of this sample resulted in an average TSS concentration of 45 mg/L, which was below the regulatory limit. The July 12th TSS concentration of the grab sample was 63.8 mg/L, resulting in a second exceedance to the TSS regulatory limit. There were no exceedances to the $CBOD_5$ regulatory limit of the MWR in 2023.

The average annual concentration for TSS was 26 mg/L, excluding measurements in July and October which were omitted in accordance with the WSER calculation methods. The annual concentration of TSS exceeded the WSER regulatory limit of 25.0 mg/L average concentration. The Annual average concentration of $CBOD_5$ was 14.2 mg/L, which was below the WSER regulatory limit of 25.0 mg/L.

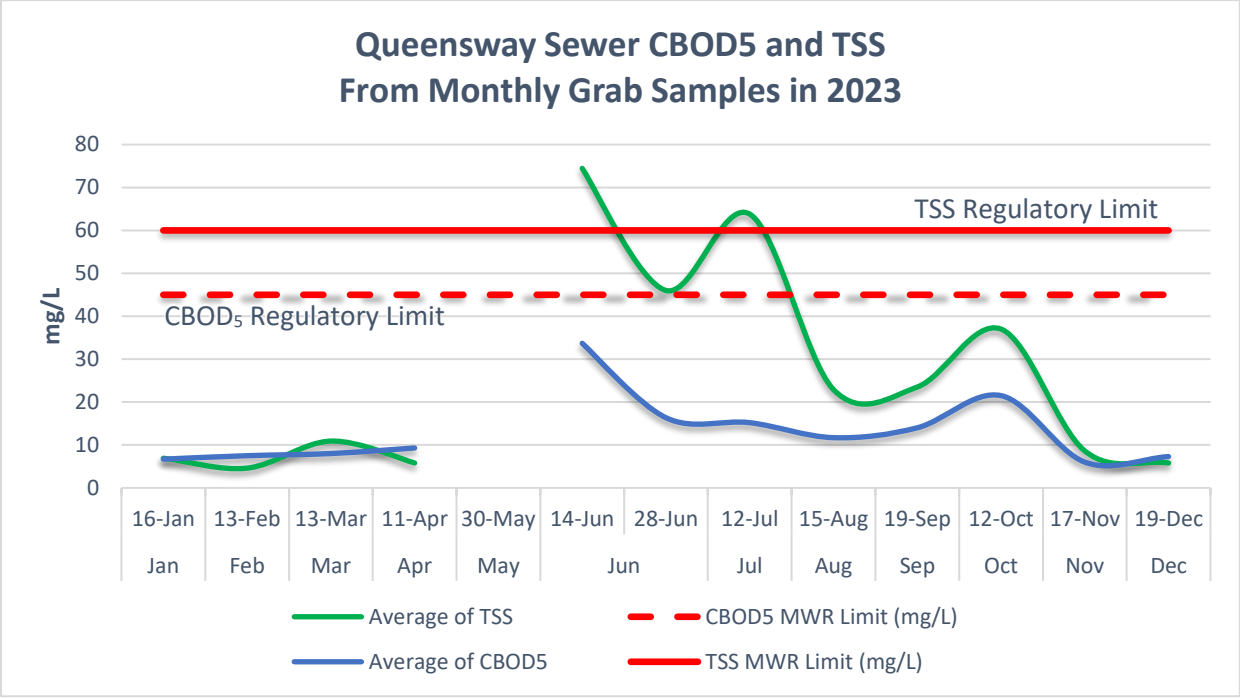


Figure 1: CBOD5 and TSS Concentrations from Queensway Wastewater Facility in 2023

4.3 Root Cause Analysis

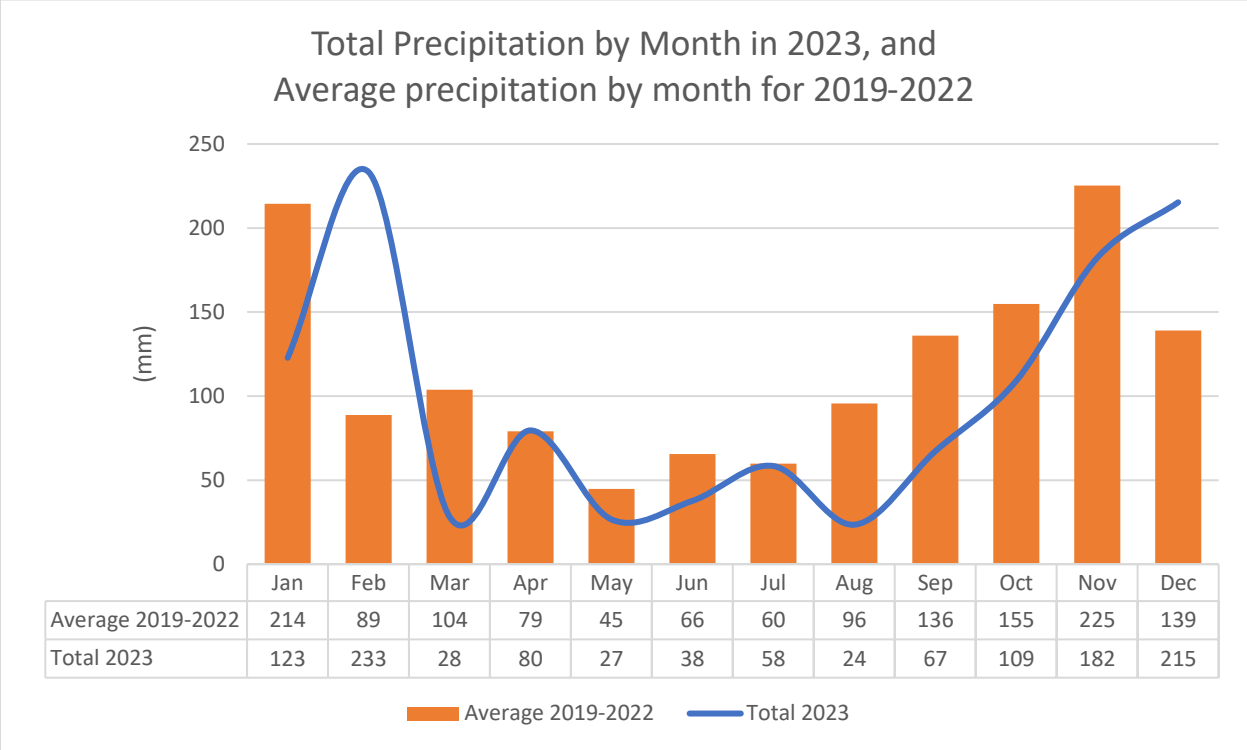
TSS concentrations in 2023 were much higher than the historical ranges from the site which resulted in two exceedances to the TSS criteria of the MWR, and an exceedance to the annual average $CBOD_5$ under the WSER. Concentration of TSS were the highest in the summer months of June, July, August, and September.

The overgrowth of duckweed observed seasonally on the surface of the aeration lagoons during the summer months is believed to be a contributing factor to the increase in TSS concentrations in the

discharged effluent. Duckweed blooms block sunlight from entering the water column, inhibiting the photosynthesis of suspended algae, and causing a die off of algae in the water column. The reduction in DO concentrations observed during the summer support this observation as a contributing factor to upset conditions. This trend has been observed in the water chemistry in the historical dataset, but the TSS concentration had maintained a level below 60 mg/L in past years.

Drought conditions were observed in 2023, and precipitation during the summer months of June, July, August and September in 2023 was lower than historical levels observed in the preceding four years. The total precipitation during these months was 187 mm, and the total average precipitation from 2019-2022 for the same months was 357 mm. In 2023 the total precipitation received was 52% of the total average precipitation received during the same months in the preceding four years[2].

The lack of precipitation over the aeration lagoons in these months is believed to be an additional input into the conditions contributing to higher strength effluent observed in 2023. Total precipitation observed in 2023 and average precipitation from 2019-2022 are provided in Figure 2. Total Precipitation by year for the months of June, July, August, and September are shown in Table 4.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average 2019-2022	214	89	104	79	45	66	60	96	136	155	225	139
Total 2023	123	233	28	80	27	38	58	24	67	109	182	215

Figure 2: Total Precipitation by Month in 2023, and Average Precipitation by Month from 2019-2022

Sludge buildup was also considered to be concern, and a sludge survey was completed (described in section 3.3). The lagoon has not had sludge removed since commissioning, and sludge levels modelled in

[2] Total Precipitation by Month retrieved from NavCan Terrace A station. Missing precipitation data for the months of May, June, July and August in 2020 taken from Terrace PCC station.

Appendix E suggest that the deposition of sludge may be contributing to shorter hydraulic retention times, and potential short-circuiting of effluent through aeration lagoon 2. Excessive sludge buildup may also be causing inadequate settlement due to a reduced water column depth above the settled sludge.

Table 4: Total Precipitation per Year from June to September

Year	Total Precipitation (June-Sept) in mm	Total Precipitation Average (June – Sept) from 2019-2022 in mm
2019	306	357
2020	378	
2021	425	
2022	318	
2023	187	

Additional sampling for BTEX, VPH, and EPH submitted on August 15, 2023, to investigate if chemical contamination of influent were influencing upset conditions resulted in non-detect values.

4.4 Corrective Action Plan

A corrective action plan includes desludging the lagoon to:

- increase HRT,
- reduce any short circuiting,
- increase available water column for settlement, and
- reduce nutrient mass in the lagoon bottom from the incomplete decomposition of duckweed that has accumulated over the years.

Budget for the desludging project has been requested, and a Request for Proposals has been issued for quotes to perform the work. Desludging works are scheduled to be completed during the summer of 2024.

5 Closure and Recommendations

Monthly grab samples were taken as required by the permit in 2023, apart from the month of May, when flood conditions prevented safe access to the facility. Effluent concentrations of TSS in 2023 were much stronger than previous years. The average annual concentration of TSS was 26.0 mg/L which exceeded the 25.0 mg/L average annual concentration of the WSER. Total TSS concentrations exceeded the 60 mg/L TSS limits of the MWR and facility permit in June and July. Drought conditions in the summer, and an accumulation of sludge deposition in the aeration lagoons, are considered to be primary contributing factors to the high TSS observed in 2023.

The total annual influent received at the facility was 72,329.9 m3/year, and the total annual discharge to the exfiltration basins was 109,885 m^3/year, including precipitation. The average daily influent and effluent volumes were 191.1 m^3/day and 301 m^3/day, respectively.

The following recommendations may be implemented to improve compliance with the applicable regulations:

- Measure ammonia levels in the field with an ammonia meter or request an amendment to the permit to remove the requirement of field measurements of ammonia.
- Collect a duplicate, field blank, and trip blank with each grab sample to meet the requirements of the BC Field Sampling Manual for Quality Control Samples.
- Calibrate the continuous monitoring equipment in the blower building once per year, in accordance with the requirements of the WSER.
- Consider implementing the pre-discharge monitoring program each spring to remain in compliance for any unplanned emergency discharge through the outfall.
- Maintain a digital log of influent readings to further refine the influent and discharge calculations required for reporting under the WSER, MWR and permit.

It is also recommended that a temporary bypass under the WSER by applied for a minimum of 45 days prior to desludging the lagoons to obtain temporary authorisation to deposit effluent which exceeds the criteria if it is expected that desludging the lagoon may lead to upset conditions that may cause a decline in effluent quality.

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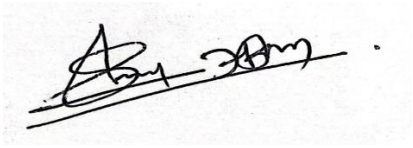

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Regional District of Kitimat-Stikine

Appendix A Site Plan

Project:

Queensway Wastewater Treatment Facility 2023 Annual Report

Regional District of
Kitimat-Stikine
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Legend:

- Site Location
- Sample Location
- Acces Road and Forcemain
- Outfall
- watercourse
- Aeration Building
- Aerated Lagoon
- Exfiltration Basin
- Parcel
- Statutory Right-of-Way

Title:

Queensway Facility Site Plan

Scale:	Projection:
7,000	NAD 1983 UTM Zone 9N
File: 5340-20-06	Date: Jan 22, 2024
Drawn: N. Lavoie Reviewed: J. Kunjumon	Figure No **Figure 1**

N:\Works & Services\Solid Waste\Mapping\solidwaste_basemapping\solidwaste_basemapping_20230823.aprx

Regional District of Kitimat-Stikine

Appendix B EOC Certification

EOCP

CERTIFICATE of CLASSIFICATION

Environmental Operators Certification Program

This is to certify that:

Queensway Wastewater Collection System

Facility No. 1511

has been classified as a

Class I WWC System

CHAIR, BOARD of DIRECTORS

PRESIDENT and CEO

Dated: July 19, 2022

At: Burnaby, BC

Valid until: July 19, 2027

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

Regional District of Kitimat-Stikine

Appendix C Permit 12645

May 23, 2017

Tracking Number: 358897
Authorization Number: 12645

REGISTERED MAIL

Regional District of Kitimat-Stikine
#300 – 4545 Lazelle Avenue
Terrace, British Columbia
V8G 4E1

Dear Permittee:

Enclosed is Amended Permit 12645 issued under the provisions of the *Environmental Management Act*. Your attention is respectfully directed to the terms and conditions outlined in the permit. An annual fee will be determined according to the Permit Fees Regulation.

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

The Director may require the Permittee to repair, alter, remove, improve or add to existing works, or to construct new works, and to submit plans and specifications for works specified in this authorization.

The Director may require the Permittee to conduct monitoring, and may specify procedures for monitoring and analysis, and procedures or requirements respecting the handling, treatment, transportation, discharge or storage of waste.
The Director may amend any requirements under this section, including requiring increased or decreased monitoring based on data submitted by the Permittee and any other data gathered in connection with this authorization.

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

Ministry of Environment
Environmental Protection Division
Regional Operations Branch
Authorizations - North
Mailing Address;
325 - 1011 4th Avenue
Prince George BC V2L 3H9
Telephone: (250) 565-6135
Facsimile: (250) 565-6629
Website: www.gov.bc.ca/env

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

Yours truly,

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

Enclosure

cc: Environment Canada
cc: Michael Gull at mgull@rdks.bc.ca

Regional District of Kitimat-Stikine

Appendix D Permit Amendment

MINISTRY OF ENVIRONMENT

PERMIT

12645

Under the Provisions of the Environmental Management Act

Regional District of Kitimat-Stikine
4678 Queensway Drive
Terrace, BC

is authorized to discharge effluent to the ground and to the Skeena River during flood stages only from a municipal sewage treatment facility located in Thornhill, near Terrace, British Columbia, subject to the requirements listed below. Contravention of any of these conditions is a violation of the *Environmental Management Act* and may lead to prosecution.

This Permit supersedes and replaces all previous versions of Permit 12645 issued under Section 14 of the *Environmental Management Act*.

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

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

1. AUTHORIZED DISCHARGES

1.1 Authorized Source

This section applies to the discharge of effluent to the exfiltration lagoon No. 3 and No. 4. The site reference number for this discharge is E220346.

1.1.1 The average authorized rate of discharge is 800 cubic metres per day.

1.1.2 The maximum authorized rate of discharge is 1,500 cubic metres per day.

Date issued: May 16, 1994
Date amended: May 23, 2017
(most recent)

Daniel P. Bings
for Director, *Environmental Management Act*
Authorizations - North
Permit Number: 12645

1.1.3 The authorized discharge period is continuous.

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

Total suspended solids	60 mg/L
5 – Day biochemical oxygen demand	45 mg/L

1.1.5 The discharge is authorized from Authorized Works, which are a two-cell aerated lagoon system, twin exfiltration lagoons, a flow measurement facility, an outfall and related appurtenances approximately located as shown on Site Plan A.

1.1.6 The location of the facilities from which the discharge originates is approximately 425 metres west north west of the north east corner of Lot 1100, Range 5, Coast District and lying on the west side of the British Columbia Hydro and Power Authority Right of Way, Plan 2640; thence: 350 metres west north west; thence: 480 metres south south west; thence: 350 metres east south east; thence: 480 metres north north east and containing 16.8 ha more or less.

The location of the point of discharge is approximately 600 metres north west of the north west corner of Plan 1940, Range 5, Coast District.

1.2 **Authorized Source**

This section applies to the discharge of effluent from the overflow outfall to the Skeena River. The site reference number for this discharge is E220347.

1.2.1 The average authorized rate of discharge is 800 cubic metres per day.

1.2.2 The maximum authorized rate of discharge is 1,500 cubic metres per day.

1.2.3 The authorized discharge period is continuous.

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

5- Day biochemical oxygen demand	45 mg/L
Total suspended solids	60 mg/L

1.2.5 The discharge is authorized from Authorized Works, which are a two-cell aerated lagoon system, twin exfiltration lagoons, a flow measurement facility, an outfall and related appurtenances approximately located as shown on Site Plan A.

1.2.6 The location of the facilities from which the discharge originates is approximately 425 metres west north west of the north east corner of Lot 1100, Range 5, Coast District and lying on the west side of the British Columbia Hydro and Power Authority Right of Way, Plan 2640; thence: 350 metres west north west; thence: 480 metres south south west; thence: 350 metres east south east; thence: 480 metres north north east and containing 16.8 ha more or less.

The location of the point of discharge is approximately 350 metres south of the treatment facility or 600 metres south east of the north west corner of Plan 1940, Range 5, Coast District.

2. GENERAL REQUIREMENTS

2.1 Maintenance of Works and Emergency Procedures

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

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

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

2.2 Bypasses

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

2.3 Receiving Environment Monitoring

The Permittee must carry out a receiving environment monitoring program attached to the 1996 amended Permit 12645. The program must consist of sampling events at selected sites and must be established by the Permittee in accordance with the written requirements of the Director, that are listed within the 1996 amended Permit 12645. Based on the results from the analyses of the above samples, the Director may extend or alter monitoring requirements of the Permittee.

2.4 Posting of Outfall

The Permittee must erect, within 90 days of the date of this authorization and maintain a sign along the alignment of the outfall above the high water mark. The sign must identify the nature of the works. The sign must have lettering at least 150 millimetres high and bear the words SEWAGE OUTFALL. The Permittee must confirm whether the wording and size of the sign is acceptable to the Director prior to installing the sign.

2.5 Fencing

The Permittee must erect, within 90 days of the date of this authorization, a fence around the sewage treatment facility and such other areas as required by the Director. The fence must consist of sturdy wire-mesh, chain-link or wooden slats at least 1.3 metres high.

2.6 Treatment Plant Sludge Wasting and Disposal

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

2.7 Exfiltration Lagoons

The Permittee must operate the rapid exfiltration lagoons such that:

(a) there is no overflow from the exfiltration to the surrounding environment, except as authorized by section 1.2 of this permit and
(b) surface drainage is diverted away from the exfiltration lagoons.

2.8 Facility Classification and Operator Certification

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

a) persons certified within and according to the program provided by the Society to the satisfaction of the Director, or
b) persons who are qualified in the safe and proper operation of the facility for the protection of the environment, as demonstrated to the satisfaction of the Director.

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

3. MONITORING REQUIREMENTS

3.1 Sampling Procedures

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

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

3.2 Analytical Procedures

The Permittee must carry out analyses in accordance with procedures described

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

3.3 Effluent Grab Sampling

The Permittee must install and maintain a sampling facility and obtain a grab sample of the effluent once each month. The samples must be taken at the outlet of the Aerated Lagoon Cell #2 (S.E.A.M. Site No. E220346). The Permittee must take due care in sampling, storing and transporting the samples to control temperature and avoid contamination, breakage, and any other factor or influence that may compromise the integrity of the samples.

3.4 Effluent Analysis

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

Parameter (units)	Sample Type	Sample Frequency	Reporting Frequency
Influent Flow Rate (m^3/ day)	Field Measurement	Continuously	Monthly
Temperature (^oC)	Field Measurement	Monthly	Monthly
Dissolved O_2 (mg/L)	Field Measurement	Monthly	Monthly
pH, pH units	Field Measurement	Monthly	Monthly
Total Ammonia (mg/L)	Field Measurement	Monthly	Monthly
BOD_5 (mg/L)	Grab	Monthly	Monthly
TSS (mg/L)	Grab	Monthly	Monthly
Total Phosphorus (mg/L)	Grab	Monthly	Monthly
Total Nitrogen (mg/L)	Grab	Monthly	Monthly

3.5 Outfall Pre–Discharge Monitoring

Prior to commencing discharge to the Skeena River via the side channel and outfall the Permittee must measure the conditions in the side channel. Grab samples must be collected during typical low flow non-flood conditions. A minimum of two (2) sets of samples must be collected with approximately a week between sets. Grab sampling locations must be the same points as those to be used for the receiving environment monitoring program described below. Field measurements must be taken for flow rate, temperature, pH, ammonia, and dissolved oxygen. Water samples from the side channel must be analysed for nitrate/ nitrite, total nitrogen, fecal coliform and fecal streptococci. Data suitably tabulated, must be submitted to the Director after completion of the pre-discharge monitoring program.

The Permittee must take due care in sampling, storing and transporting the samples to control temperature and avoid contamination, breakage, and any other factor or influence that may compromise the integrity of the samples.

3.6 Receiving Environment Monitoring

The Permittee must collect grab sample (s) from the side channel receiving discharge based on the schedule below and obtain analysis of the effluent sample (s) for the following parameters:

Parameters (units)	Upstream site	Downstream site	Sample Frequency
Side channel flow rate			Weekly during discharge and for 1 month after discharge
Temperature (^{o}C)	Field Measurement	Field Measurement	Weekly for 1 month after discharge
pH, pH units	Field Measurement	Field Measurement	Weekly for 1 month after discharge
Ammonia (mg/L)	Field Measurement	Field Measurement	Weekly for 1 month after discharge
Dissolved Oxygen (mg/L)	Field Measurement	Field Measurement	Weekly for 1 month after

			discharge
Nitrate/ Nitrite (mg/L)	Grab	Grab	Sample if D.O. <2.0 mg/L or NH_3 >2.0 mg/L
Total Nitrogen (mg/L)	Grab	Grab	Sample if D.O. <2.0 mg/L or NH_3 >2.0 mg/L
Fecal Coliform (MPN/ 100 mL)	Grab	Grab	Sample if D.O. <2.0 mg/L or NH_3 >2.0 mg/L
Fecal Streptococci (MPN/ 100 mL)	Grab	Grab	Sample if D.O. <2.0 mg/L or NH_3 >2.0 mg/L

The location of the upstream must be approximately at the B.C. Hydro Right of Way, upstream of the outfall. The location of the downstream site must be 50 – 100 metres downstream of the outfall.

The Permittee must maintain a record of maintenance and calibration steps for all devices used in the sampling program for field measurement.

4. REPORTING REQUIREMENTS

4.1 Annual Report

The Permittee must collect and maintain data of analyses and flow measurements required under this authorization for inspection when requested by Ministry staff and submit the data for the previous calendar year to the Director in a form satisfactory to the Director. The Permittee must submit data of analyses and flow measurements summarized in a report within 30 days of the subject calendar year.

The Permittee must submit all data required to be submitted under this section by email to the Ministry's Routine Environmental Reporting Submission Mailbox (RERSM) at EnvAuthorizationsReporting@gov.bc.ca or as otherwise instructed by the Director. For guidelines on how to properly name the files and email subject lines or for more information visit the Ministry website: http://www2.gov.bc.ca/gov/content/environment/waste-management/waste-discharge-authorization/data-and-report-submissions/routine-environmental-reporting-submission-mailbox

Date issued: May 16, 1994
Date amended: May 23, 2017
(most recent)

Daniel P. Bings
for Director, *Environmental Management Act*
Authorizations - North
Permit Number: 12645

4.2 Non-compliance Notification

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

4.3 Non-compliance Reporting

If the Permittee fails to comply with any of the requirements of this authorization, the Permittee must, within 30 days of such non-compliance, submit to the Director a written report that is satisfactory to the Director and includes, but is not necessarily limited to, the following:

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

The Permittee must submit all non-compliance reporting required to be submitted under this section by email to the Ministry's Compliance Reporting Submission Mailbox (CRSM) at EnvironmentalCompliance@gov.bc.ca or as otherwise instructed by the Director. For guidelines on how to report a non-compliance or for more information visit the Ministry website: http://www2.gov.bc.ca/gov/content/environment/waste-management/waste-discharge-authorization/data-and-report-submissions/non-compliance-reporting-mailbox

4.4 Non-compliance Reporting and Exceedances

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

occurred during the reporting period.

4.5 **Spill Reporting**

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

LICENCE TO PUBLISH DOCUMENT

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

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

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

d.

GLOSSARY

"**Authorized Works**" means a two-cell aerated lagoon system, twin exfiltration lagoons, a flow measurement facility, an outfall and related appurtenances as stated in Section 1.1.4.

"**Facility**" means a sewage treatment system located in Thornhill, near Terrace, British Columbia.

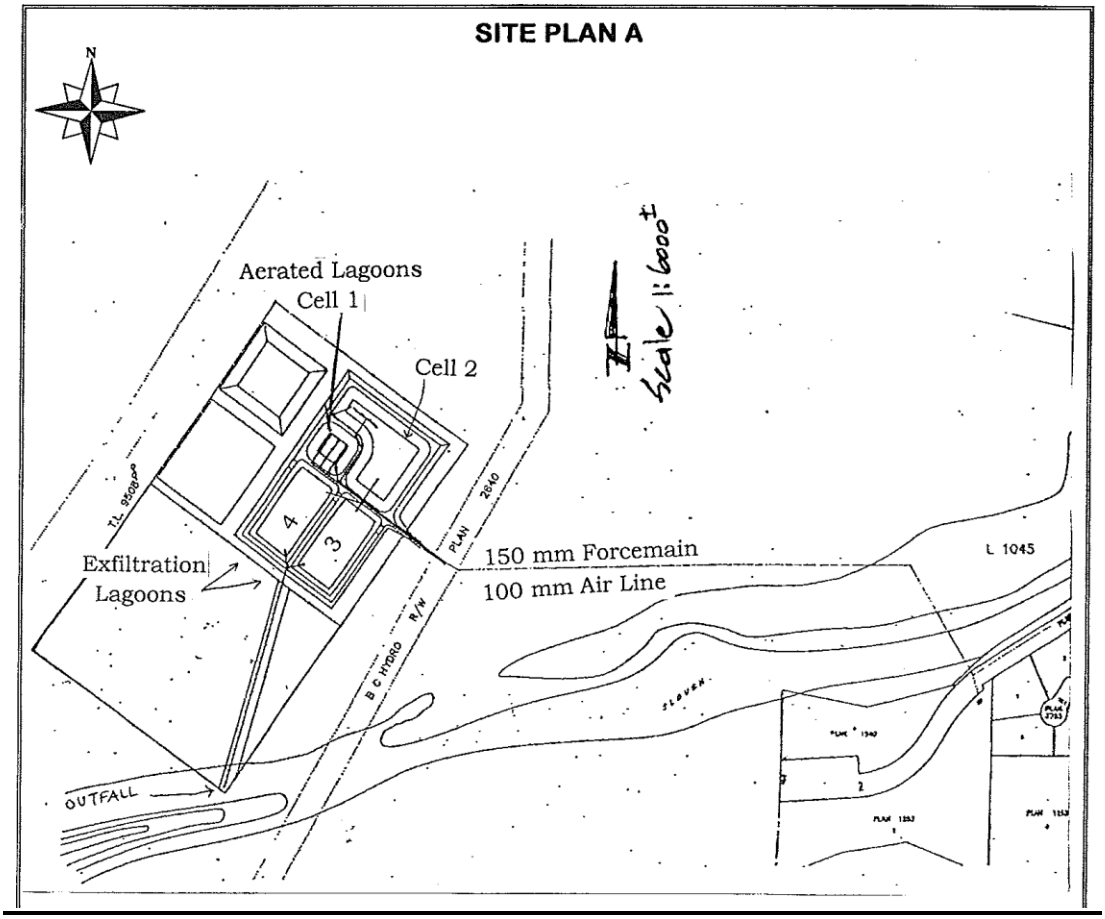
"**Province**" means Her Majesty the Queen in right of British Columbia.

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

or (iii) any order issued under the *Environmental Management Act* directed against the permittee that is related to the facility described in this authorization or the discharge of waste from that facility.

Date issued: May 16, 1994
Date amended: May 23, 2017
(most recent)

Daniel P. Bings
for Director, *Environmental Management Act*
Authorizations - North
Permit Number: 12645



Date issued: May 16, 1994
Date amended: May 23, 2017
(most recent)

Daniel P. Bings
for Director, *Environmental Management Act*
Authorizations - North
Permit Number: 12645

LOCATION MAP

Date issued: May 16, 1994
Date amended: May 23, 2017
(most recent)

Daniel P. Bings
for Director, *Environmental Management Act*
Authorizations - North
Permit Number: 12645

Regional District of Kitimat-Stikine

Appendix E Sludge Survey

Project:
Queensway Wastewater Treatment Facility 2023 Annual Report

Regional District of
Kitimat-Stikine
Suite 300 - 4545 Lazelle Avenue
Terrace, B.C. V8G 4E1

Legend:
Thickness (cm)
- 20.5 - 39.5
- 39.6 - 48
- 48.1 - 57.1
- 57.2 - 66.2
- 66.3 - 75.9
- 76 - 100.3

Title:
Queensway Facility Sludge Survey

Scale:	Projection:
600	NAD 1983 UTM Zone 9N
File: 5340-20-06	Date: Jan 22, 2024
Drawn: N. Lavoie Reviewed: R. John	Figure No **Figure 2**

Regional District of Kitimat-Stikine

Appendix F Lab Reports

CERTIFICATE OF ANALYSIS

Work Order	: **VA23A1385**	Page	: 1 of 3
Amendment	: **1**		
Client	: **Regional District of Kitimat-Stikine**	Laboratory	: Vancouver - Environmental
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 18-Jan-2023 13:15
PO	: ----	Date Analysis Commenced	: 20-Jan-2023
C-O-C number	: ----	Issue Date	: 30-Jan-2023 14:51
Sampler	: ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

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

General Comments

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

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

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

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

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

Unit	*Description*
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

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

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

Workorder Comments

Amended COA(1): Total Nitrogen data has been revised due to a lab error.

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID: Queensway Sewer	----	----	----	----
					Client sampling date / time: 16-Jan-2023 10:45	----	----	----	----
					VA23A1385-001	--------	--------	--------	--------
					Result	----	----	----	----
Physical Tests									
pH	----	E108	0.10	pH units	8.03	----	----	----	----
Solids, total suspended [TSS]	----	E160	3.0	mg/L	6.9	----	----	----	----
Anions and Nutrients									
Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	38.9	----	----	----	----
Nitrogen, total	7727-37-9	E366	0.030	mg/L	39.6	----	----	----	----
Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	5.35	----	----	----	----
Aggregate Organics									
Biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	8.4	----	----	----	----
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2.0	mg/L	6.7	----	----	----	----

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

ALS Canada Ltd.

right solutions.
right partner.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA23A1385**	Page	: 1 of 7
Amendment	: **1**		
Client	: **Regional District of Kitimat-Stikine**	Laboratory	: Vancouver - Environmental
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 18-Jan-2023 13:15
PO	: ----	Issue Date	: 30-Jan-2023 14:51
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] Queensway Sewer	E550	16-Jan-2023	----	----	----		20-Jan-2023	3 days	4 days	× EHT
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE Queensway Sewer	E555	16-Jan-2023	----	----	----		20-Jan-2023	0 hrs	95 hrs	× EHTL
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Queensway Sewer	E298	16-Jan-2023	24-Jan-2023	----	----		24-Jan-2023	28 days	8 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) Queensway Sewer	E366	16-Jan-2023	24-Jan-2023	----	----		25-Jan-2023	28 days	9 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) Queensway Sewer	E372-U	16-Jan-2023	24-Jan-2023	----	----		25-Jan-2023	28 days	9 days	✓
Physical Tests : pH by Meter										
HDPE Queensway Sewer	E108	16-Jan-2023	24-Jan-2023	----	----		24-Jan-2023	0.25 hrs	0.53 hrs	× EHTR-FM
Physical Tests : TSS by Gravimetry										
HDPE Queensway Sewer	E160	16-Jan-2023	----	----	----		24-Jan-2023	7 days	8 days	× EHT

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.

EHT: Exceeded ALS recommended hold time prior to analysis.

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	812398	1	15	6.6	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	808786	1	18	5.5	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	808992	1	3	33.3	5.0	✓
pH by Meter	E108	812136	1	13	7.6	5.0	✓
Total Nitrogen by Colourimetry	E366	812402	1	7	14.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	812399	1	12	8.3	5.0	✓
TSS by Gravimetry	E160	809810	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	812398	1	15	6.6	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	808786	1	18	5.5	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	808992	1	3	33.3	5.0	✓
pH by Meter	E108	812136	1	13	7.6	5.0	✓
Total Nitrogen by Colourimetry	E366	812402	1	7	14.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	812399	1	12	8.3	5.0	✓
TSS by Gravimetry	E160	809810	1	20	5.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	812398	1	15	6.6	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	808786	1	18	5.5	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	808992	1	3	33.3	5.0	✓
Total Nitrogen by Colourimetry	E366	812402	1	7	14.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	812399	1	12	8.3	5.0	✓
TSS by Gravimetry	E160	809810	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	812398	1	15	6.6	5.0	✓
Total Nitrogen by Colourimetry	E366	812402	1	7	14.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	812399	1	12	8.3	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Vancouver - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Nitrogen by Colourimetry	E366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Biochemical Oxygen Demand - 5 day	E550 Vancouver - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555 Vancouver - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Nitrification inhibitor is added to samples to prevent nitrogenous compounds from consuming oxygen resulting in only carbonaceous oxygen demand being reported by this method. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for Total Nitrogen in water	EP366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
Digestion for Total Phosphorus in water	EP372 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

QUALITY CONTROL REPORT

Work Order	: **VA23A1385**	Page	: 1 of 6
Amendment	: **1**		
Client	: Regional District of Kitimat-Stikine	Laboratory	: Vancouver - Environmental
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	:	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 18-Jan-2023 13:15
PO	: ----	Date Analysis Commenced	: 20-Jan-2023
C-O-C number	: ----	Issue Date	: 30-Jan-2023 14:51
Sampler	: ---- ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

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

Signatories	*Position*	*Laboratory Department*
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Vancouver Inorganics, Burnaby, British Columbia

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 809810)											
FJ2300135-002	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	6.1	5.7	0.4	Diff <2x LOR	----
Physical Tests (QC Lot: 812136)											
VA23A1226-004	Anonymous	pH	----	E108	0.10	pH units	8.10	8.00	1.24%	4%	----
Anions and Nutrients (QC Lot: 812398)											
VA23A0562-006	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0050	0.0056	0.0006	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 812399)											
VA23A0562-006	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0098	0.0084	0.0014	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 812402)											
VA23A1064-001	Anonymous	Nitrogen, total	7727-37-9	E366	0.030	mg/L	0.034	0.032	0.001	Diff <2x LOR	----
Aggregate Organics (QC Lot: 808786)											
FJ2300122-011	Anonymous	Biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0.0%	30%	----
Aggregate Organics (QC Lot: 808992)											
VA23A1277-001	Anonymous	Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2.0	mg/L	2.1	2.1	0.0%	30%	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 809810)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 812398)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 812399)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 812402)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Aggregate Organics (QCLot: 808786)						
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 808992)						
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	<2.0	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 809810)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	99.5	85.0	115	----
Physical Tests (QCLot: 812136)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Anions and Nutrients (QCLot: 812398)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	101	85.0	115	----
Anions and Nutrients (QCLot: 812399)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	90.9	80.0	120	----
Anions and Nutrients (QCLot: 812402)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	96.9	75.0	125	----
Aggregate Organics (QCLot: 808786)									
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	102	85.0	115	----
Aggregate Organics (QCLot: 808992)									
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	198 mg/L	100	85.0	115	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 812398)										
VA23A0562-007	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0980 mg/L	0.1 mg/L	98.0	75.0	125	----
Anions and Nutrients (QCLot: 812399)										
VA23A0562-007	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0488 mg/L	0.05 mg/L	97.5	70.0	130	----
Anions and Nutrients (QCLot: 812402)										
VA23A1064-002	Anonymous	Nitrogen, total	7727-37-9	E366	0.403 mg/L	0.4 mg/L	101	70.0	130	----

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17 -

Page of

Report To	Contact and company name below will appear on the final report
Company:	Regional District of Kitimat-Stikine
Contact:	Nicole Lavoie
Phone:	250-615-6100
	Company address below will appear on the final report
Street:	4545 Lazelle Avenue
City/Province:	Terrace/BC
Postal Code:	V8G4E1
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	Regional District of Kitimat-Stikine
Contact:	Nicole Lavoie

Report Format / Distribution

Select Report Format: ☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)
Quality Control (QC) Report with Report ☑ YES ☐ NO
☑ Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: enviro.dept@rdks.bc.ca
Email 2: ckerr@rdks.bc.ca; jkunjumon@rdks.bc.ca
Email 3: pmiller@rdks.bc.ca; jlacroix@rdks.bc.ca

Invoice Distribution

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: anne-maries@rdks.bc.ca
Email 2: enviro.dept@rdks.bc.ca

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] ☐ 3 day [P3-25%] ☐ 2 day [P2-50%] ☐

EMERGENCY: 1 Business day [E1 - 100%] ☐ Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs:

For tests that can not be performed according to the service level selected, you will be contacted.

Project Information

ALS Account # / Quote #: VA22-RDKS100-001
Job #: Queensway Sewer
PO / AFE:
LSD:

ALS Lab Work Order # (lab use only):

Oil and Gas Required Fields (client use)

AFE/Cost Center: | PO#
Major/Minor Code: | Routing Code:
Requisitioner:
Location:
ALS Contact: | Sampler:

Analysis Request

Indicate Filtered (F), Preserved (P) or Fil...

Environmental Division Vancouver
Work Order Reference
VA23A1385
Telephone : +1 604 253 4188

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	TSS (by Gravimetry)	Total Ammonia (P)	Total Nitrogen (by Colourimetry 0.03mg/L) (P)	Total Phosphorus (by Colourimetry 0.002 mg) (P)	Carbonaceous Biochemical Oxygen Demand	pH	BOD (5 Day)	Number of Containers
	Queensway Sewer			Effluent	R	R	R	R	R	R	R	4
	QUEENSWAY SEWER. (A)	JAN 16/23	10:45	✓								
	QUEENSWAY SEWER (B)	JAN 16/23	10:45	✓								
	QUEENSWAY SEWER (C)	JAN 16/23	10:45	✓								
	QUEENSWAY SEWER (D)	JAN 16/23	10:45	✓								
	Field Blank											

Terrace Shipping
1 Coolers — Ground ☐
___ Carboys — Air ☑
SFX ☐

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO
Are samples for human consumption/ use? ☐ YES ☑ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

~~Federal Wastewater Systems Effluent Regulations (JUN, 2012)~~

Queensway Sewer Custom Criteria for RDKS

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐
Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐
Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C: 6.6 | 7.1 | 3.3
FINAL COOLER TEMPERATURES °C:

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by: [signature]	Date: Jan 16/23	Time:	Received by: [signature]	Date: 1/18/23	Time: 1:15 PM

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION — WHITE - LABORATORY COPY — YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

SEPT 2017 FRONT

CERTIFICATE OF ANALYSIS

Work Order	: **VA23A3399**	Page	: 1 of 3
Client	: **Regional District of Kitimat-Stikine**	Laboratory	: Vancouver - Environmental
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 15-Feb-2023 14:10
PO	: ----	Date Analysis Commenced	: 16-Feb-2023
C-O-C number	: ----	Issue Date	: 24-Feb-2023 16:44
Sampler	: ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Caitlin Macey	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia

General Comments

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

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

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

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

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

Unit	*Description*
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

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

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

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID: Queensway Sewer	----	----	----	----
					Client sampling date / time: 13-Feb-2023 11:25	----	----	----	----
					VA23A3399-001	--------	--------	--------	--------
					Result	----	----	----	----
Physical Tests									
pH	----	E108	0.10	pH units	8.18	----	----	----	----
Solids, total suspended [TSS]	----	E160	3.0	mg/L	4.6	----	----	----	----
Anions and Nutrients									
Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	31.9	----	----	----	----
Nitrogen, total	7727-37-9	E366	0.030	mg/L	32.6	----	----	----	----
Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	4.05	----	----	----	----
Aggregate Organics									
Biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	7.4	----	----	----	----
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2.0	mg/L	7.5	----	----	----	----

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

ALS Canada Ltd.

right solutions.
right partner.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA23A3399**	Page	: 1 of 7
Client	: **Regional District of Kitimat-Stikine**	Laboratory	: Vancouver - Environmental
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 15-Feb-2023 14:10
PO	: ----	Issue Date	: 24-Feb-2023 16:44
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] Queensway Sewer	E550	13-Feb-2023	----	----	----		16-Feb-2023	3 days	3 days	✓
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT 3d] Queensway Sewer	E555	13-Feb-2023	----	----	----		16-Feb-2023	3 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Queensway Sewer	E298	13-Feb-2023	20-Feb-2023	----	----		22-Feb-2023	28 days	9 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) Queensway Sewer	E366	13-Feb-2023	20-Feb-2023	----	----		21-Feb-2023	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) Queensway Sewer	E372-U	13-Feb-2023	20-Feb-2023	----	----		21-Feb-2023	28 days	8 days	✓
Physical Tests : pH by Meter										
HDPE Queensway Sewer	E108	13-Feb-2023	22-Feb-2023	----	----		23-Feb-2023	0.25 hrs	23.25 hrs	× EHTR-FM
Physical Tests : TSS by Gravimetry										
HDPE Queensway Sewer	E160	13-Feb-2023	----	----	----		21-Feb-2023	7 days	8 days	× EHT

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

EHT: Exceeded ALS recommended hold time prior to analysis.

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	840142	1	20	5.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	837032	1	20	5.0	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	837558	1	9	11.1	5.0	✓
pH by Meter	E108	841686	1	20	5.0	5.0	✓
Total Nitrogen by Colourimetry	E366	840139	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	840140	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	837915	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	840142	1	20	5.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	837032	1	20	5.0	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	837558	1	9	11.1	5.0	✓
pH by Meter	E108	841686	1	20	5.0	5.0	✓
Total Nitrogen by Colourimetry	E366	840139	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	840140	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	837915	1	20	5.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	840142	1	20	5.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	837032	1	20	5.0	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	837558	1	9	11.1	5.0	✓
Total Nitrogen by Colourimetry	E366	840139	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	840140	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	837915	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	840142	1	20	5.0	5.0	✓
Total Nitrogen by Colourimetry	E366	840139	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	840140	1	20	5.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Vancouver - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Nitrogen by Colourimetry	E366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Biochemical Oxygen Demand - 5 day	E550 Vancouver - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555 Vancouver - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Nitrification inhibitor is added to samples to prevent nitrogenous compounds from consuming oxygen resulting in only carbonaceous oxygen demand being reported by this method. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for Total Nitrogen in water	EP366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
Digestion for Total Phosphorus in water	EP372 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

QUALITY CONTROL REPORT

Work Order	: **VA23A3399**	Page	: 1 of 6
Client	: Regional District of Kitimat-Stikine	Laboratory	: Vancouver - Environmental
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	:	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 15-Feb-2023 14:10
PO	: ----	Date Analysis Commenced	: 16-Feb-2023
C-O-C number	: ----	Issue Date	: 24-Feb-2023 16:46
Sampler	: ---- ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

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

Signatories	*Position*	*Laboratory Department*
Caitlin Macey	Team Leader - Inorganics	Vancouver Inorganics, Burnaby, British Columbia

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 837915)											
VA23A3255-002	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	19.0	19.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 841686)											
VA23A3446-003	Anonymous	pH	----	E108	0.10	pH units	8.11	8.11	0.00%	4%	----
Anions and Nutrients (QC Lot: 840139)											
VA23A3379-001	Anonymous	Nitrogen, total	7727-37-9	E366	0.030	mg/L	1.14	1.14	0.420%	20%	----
Anions and Nutrients (QC Lot: 840140)											
VA23A3379-001	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0079	0.0079	0.00002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 840142)											
VA23A3379-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 837032)											
VA23A3387-001	Anonymous	Biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0.0%	30%	----
Aggregate Organics (QC Lot: 837558)											
VA23A3284-001	Anonymous	Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2.0	mg/L	<2.0	<2.0	0.0%	30%	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 837915)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 840139)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 840140)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 840142)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Aggregate Organics (QCLot: 837032)						
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 837558)						
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	<2.0	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 837915)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	101	85.0	115	----
Physical Tests (QCLot: 841686)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Anions and Nutrients (QCLot: 840139)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	96.6	75.0	125	----
Anions and Nutrients (QCLot: 840140)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	95.0	80.0	120	----
Anions and Nutrients (QCLot: 840142)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	105	85.0	115	----
Aggregate Organics (QCLot: 837032)									
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	102	85.0	115	----
Aggregate Organics (QCLot: 837558)									
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	198 mg/L	102	85.0	115	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 840139)										
VA23A3385-001	Anonymous	Nitrogen, total	7727-37-9	E366	ND mg/L	20 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 840140)										
VA23A3385-001	Anonymous	Phosphorus, total	7723-14-0	E372-U	ND mg/L	0.05 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 840142)										
VA23A3385-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	MS-B

Qualifiers

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

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17 -

Page of

Report To	Contact and company name below will appear on the final report
Company:	Regional District of Kitimat-Stikine
Contact:	Nicole Lavoie
Phone:	250-615-6100
	Company address below will appear on the final report
Street:	4545 Lazelle Avenue
City/Province:	Terrace/BC
Postal Code:	V8G4E1
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	Regional District of Kitimat-Stikine
Contact:	Nicole Lavoie

Report Format / Distribution	
Select Report Format:	☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)
Quality Control (QC) Report with Report	☑ YES ☐ NO
☑ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	enviro.dept@rdks.bc.ca
Email 2	ckerr@rdks.bc.ca; jkunjumon@rdks.bc.ca
Email 3	pmiller@rdks.bc.ca; jlacroix@rdks.bc.ca

Invoice Distribution	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	anne-maries@rdks.bc.ca
Email 2	enviro.dept@rdks.bc.ca

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	VA22-RDKS100-001	AFE/Cost Center:	PO#
Job #:	Queensway Sewer	Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (lab use only):		ALS Contact:	Sampler:

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days)
- 4 day [P4-20%] ☐
- 3 day [P3-25%] ☐
- 2 day [P2-50%] ☐

EMERGENCY
- 1 Business day [E1 - 100%] ☐
- Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs:

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	TSS (by Gravimetry)	Total Ammonia	Total Nitrogen (by Colourimetry 0.03mg/L)	Total Phosphorus (by Colourimetry 0.002 mg	Carbonaceous Biochemical Oxygen Demand	pH	BOD (5 Day)	SAMPLES ON HOLD	Sample is hazardous (please provide further detail	NUMBER OF CONTAINERS
					P	P	P							
	Queensway Sewer	FEB 13/23		Effluent	R	R	R	R	R	R	R			4
	QUEENSWAY SEWER (A)	"	11:25am	✓										
	" " (B)	"	"	✓										
	" " (C)	"	"	✓										
	" " (D)	"	"	✓										
	Field Blank													

Environmental Division
Vancouver
Work Order Reference
VA23A3399

Telephone : +1 604 253 4188

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)
Are samples taken from a Regulated DW System? ☐ YES ☑ NO	Federal Wastewater Systems Effluent Regulations (JUN, 2012)
Are samples for human consumption/ use? ☐ YES ☑ NO	Queensway Sewer Custom Criteria for RDKS

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C	FINAL COOLER TEMPERATURES °C
10°	

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by: PC	Date: 14/2/23	Time: 2.10

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

SEPT 2017 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

CERTIFICATE OF ANALYSIS

Work Order	: **VA23A5375**	Page	: 1 of 3
Client	: **Regional District of Kitimat-Stikine**	Laboratory	: Vancouver - Environmental
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 13-Mar-2023 21:45
PO	: ----	Date Analysis Commenced	: 15-Mar-2023
C-O-C number	: ----	Issue Date	: 21-Mar-2023 15:12
Sampler	: ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

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

General Comments

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

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

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

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

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

Unit	*Description*
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

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

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

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID: Queensway Sewer	----	----	----	----
					Client sampling date / time: 13-Mar-2023 11:00	----	----	----	----
					VA23A5375-001	--------	--------	--------	--------
					Result	----	----	----	----
Physical Tests									
pH	----	E108	0.10	pH units	8.15	----	----	----	----
Solids, total suspended [TSS]	----	E160	3.0	mg/L	10.9	----	----	----	----
Anions and Nutrients									
Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	30.9	----	----	----	----
Nitrogen, total	7727-37-9	E366	0.030	mg/L	35.8	----	----	----	----
Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	4.07	----	----	----	----
Aggregate Organics									
Biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	8.2	----	----	----	----
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2.0	mg/L	8.0	----	----	----	----

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

ALS Canada Ltd.

right solutions.
right partner.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA23A5375**	Page	: 1 of 7
Client	: **Regional District of Kitimat-Stikine**	Laboratory	: Vancouver - Environmental
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 13-Mar-2023 21:45
PO	: ----	Issue Date	: 21-Mar-2023 15:13
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] Queensway Sewer	E550	13-Mar-2023	----	----	----		16-Mar-2023	3 days	3 days	✓
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT 3d] Queensway Sewer	E555	13-Mar-2023	----	----	----		16-Mar-2023	3 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Queensway Sewer	E298	13-Mar-2023	18-Mar-2023	----	----		19-Mar-2023	28 days	6 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) Queensway Sewer	E366	13-Mar-2023	18-Mar-2023	----	----		21-Mar-2023	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) Queensway Sewer	E372-U	13-Mar-2023	18-Mar-2023	----	----		20-Mar-2023	28 days	7 days	✓
Physical Tests : pH by Meter										
HDPE Queensway Sewer	E108	13-Mar-2023	15-Mar-2023	----	----		16-Mar-2023	0.25 hrs	19.25 hrs	× EHTR-FM
Physical Tests : TSS by Gravimetry										
HDPE Queensway Sewer	E160	13-Mar-2023	----	----	----		21-Mar-2023	7 days	8 days	× EHT

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

EHT: Exceeded ALS recommended hold time prior to analysis.

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	868164	1	3	33.3	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	865700	1	12	8.3	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	865294	1	8	12.5	5.0	✓
pH by Meter	E108	863732	1	17	5.8	5.0	✓
Total Nitrogen by Colourimetry	E366	868162	1	2	50.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	868163	1	2	50.0	5.0	✓
TSS by Gravimetry	E160	868622	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	868164	1	3	33.3	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	865700	1	12	8.3	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	865294	1	8	12.5	5.0	✓
pH by Meter	E108	863732	1	17	5.8	5.0	✓
Total Nitrogen by Colourimetry	E366	868162	1	2	50.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	868163	1	2	50.0	5.0	✓
TSS by Gravimetry	E160	868622	1	20	5.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	868164	1	3	33.3	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	865700	1	12	8.3	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	865294	1	8	12.5	5.0	✓
Total Nitrogen by Colourimetry	E366	868162	1	2	50.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	868163	1	2	50.0	5.0	✓
TSS by Gravimetry	E160	868622	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	868164	1	3	33.3	5.0	✓
Total Nitrogen by Colourimetry	E366	868162	1	2	50.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	868163	1	2	50.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Vancouver - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Nitrogen by Colourimetry	E366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Biochemical Oxygen Demand - 5 day	E550 Vancouver - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555 Vancouver - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Nitrification inhibitor is added to samples to prevent nitrogenous compounds from consuming oxygen resulting in only carbonaceous oxygen demand being reported by this method. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for Total Nitrogen in water	EP366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
Digestion for Total Phosphorus in water	EP372 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

QUALITY CONTROL REPORT

Work Order	: **VA23A5375**	Page	: 1 of 6
Client	: Regional District of Kitimat-Stikine	Laboratory	: Vancouver - Environmental
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	:	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 13-Mar-2023 21:45
PO	: ----	Date Analysis Commenced	: 15-Mar-2023
C-O-C number	: ----	Issue Date	: 21-Mar-2023 15:13
Sampler	: ---- ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

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

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

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 863732)											
WR2300176-001	Anonymous	pH	----	E108	0.10	pH units	7.54	7.56	0.265%	4%	----
Physical Tests (QC Lot: 868622)											
FJ2300545-001	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	3.5	0.5	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 868162)											
VA23A5375-001	Queensway Sewer	Nitrogen, total	7727-37-9	E366	1.50	mg/L	35.8	35.8	0.218%	20%	----
Anions and Nutrients (QC Lot: 868163)											
VA23A5375-001	Queensway Sewer	Phosphorus, total	7723-14-0	E372-U	0.200	mg/L	4.07	4.04	0.661%	20%	----
Anions and Nutrients (QC Lot: 868164)											
VA23A5375-001	Queensway Sewer	Ammonia, total (as N)	7664-41-7	E298	0.500	mg/L	30.9	29.7	4.22%	20%	----
Aggregate Organics (QC Lot: 865294)											
KS2300780-001	Anonymous	Carbonaceous biochemical oxygen demand [CBOD]	----	E555	6.0	mg/L	25.3	25.2	0.4%	30%	----
Aggregate Organics (QC Lot: 865700)											
VA23A5395-002	Anonymous	Biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 868622)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 868162)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 868163)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 868164)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Aggregate Organics (QCLot: 865294)						
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 865700)						
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 863732)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 868622)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	110	85.0	115	----
Anions and Nutrients (QCLot: 868162)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	97.2	75.0	125	----
Anions and Nutrients (QCLot: 868163)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	89.1	80.0	120	----
Anions and Nutrients (QCLot: 868164)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	99.1	85.0	115	----
Aggregate Organics (QCLot: 865294)									
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	198 mg/L	99.1	85.0	115	----
Aggregate Organics (QCLot: 865700)									
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	98.9	85.0	115	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 868162)										
VA23A5386-001	Anonymous	Nitrogen, total	7727-37-9	E366	ND mg/L	40 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 868163)										
VA23A5386-001	Anonymous	Phosphorus, total	7723-14-0	E372-U	ND mg/L	5 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 868164)										
VA23A5383-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	MS-B

Qualifiers

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

Chain of Custody (COC) / Analytical Request Form

ALS Environmental

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC Number: 17 -

Page of

Affix ALS barcode label here
(lab use only)

Report To	Contact and company name below will appear on the final report
Company:	Regional District of Kitimat-Stikine
Contact:	Nicole Lavoie
Phone:	250-615-6100
	Company address below will appear on the final report
Street:	4545 Lazelle Avenue
City/Province:	Terrace/BC
Postal Code:	V8G4E1
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	Regional District of Kitimat-Stikine
Contact:	Nicole Lavoie

Report Format / Distribution	
Select Report Format:	☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)
Quality Control (QC) Report with Report	☑ YES ☐ NO
	☑ Compare Results to Criteria on Report - provide details below if box checked
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	enviro.dept@rdks.bc.ca
Email 2	ckerr@rdks.bc.ca; jkunjumon@rdks.bc.ca
Email 3	pmiller@rdks.bc.ca; jlacroix@rdks.bc.ca

Invoice Distribution	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	anne-maries@rdks.bc.ca
Email 2	enviro.dept@rdks.bc.ca

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	VA22-RDKS100-001	AFE/Cost Center:	PO#
Job #:	Queensway Sewer	Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (lab use only):		ALS Contact:	Sampler:

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] ☐ | 3 day [P3-25%] ☐ | 2 day [P2-50%] ☐

EMERGENCY: 1 Business day [E1 - 100%] ☐ | Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs:

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	TSS (by Gravimetry)	Total Ammonia	Total Nitrogen (by Colourimetry 0.03mg/L)	Total Phosphorus (by Colourimetry 0.002 mg	Carbonaceous Biochemical Oxygen Demand	pH	BOD (5 Day)	SAMPLES ON HOLD	Sample is hazardous (please provide further detail	NUMBER OF CONTAINERS
					P	P	P							
	Queensway Sewer	MAR13/23	11:00AM	Effluent	R	R	R	R	R	R	R			4
	Field Blank													

Environmental Division
Vancouver
Work Order Reference
VA23A5375

Telephone : +1 604 253 4188

Terrace Shipping ☐ Ground ☑ Air ☐ SFX

#___ Coolers #___ Carboys

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)
Are samples taken from a Regulated DW System? ☐ YES ☑ NO	Federal Wastewater Systems Effluent Regulations (JUN, 2012)
Are samples for human consumption/ use? ☐ YES ☑ NO	Queensway Sewer Custom Criteria for RDKS

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☑ | SIF Observations Yes ☐ No ☐

Ice Packs ☑ Ice Cubes ☐ | Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
4.6	5.1			7			

SHIPMENT RELEASE (client use)		
Released by:	Date:	Time:

INITIAL SHIPMENT RECEPTION (lab use only)		
Received by:	Date:	Time:
	Mar 13/23	1230

FINAL SHIPMENT RECEPTION (lab use only)		
Received by:	Date:	Time:
	MAR-13	21:45

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

SEPT 2015 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

CERTIFICATE OF ANALYSIS

Work Order	: **VA23A7839**	Page	: 1 of 3
Client	: **Regional District of Kitimat-Stikine**	Laboratory	: Vancouver - Environmental
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 12-Apr-2023 12:30
PO	: ----	Date Analysis Commenced	: 13-Apr-2023
C-O-C number	: ----	Issue Date	: 20-Apr-2023 15:44
Sampler	: ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Brieanna Allen	Production/Validation Manager	Inorganics, Burnaby, British Columbia
Tracy Harley	Supervisor - Water Quality Instrumentation	Inorganics, Burnaby, British Columbia

General Comments

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

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

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.
Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

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

Unit	*Description*
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

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

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

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID: Queensway Sewer	----	----	----	----
					Client sampling date / time: 11-Apr-2023 10:30	----	----	----	----
					VA23A7839-001	--------	--------	--------	--------
					Result	----	----	----	----
Physical Tests									
pH	----	E108	0.10	pH units	8.10	----	----	----	----
Solids, total suspended [TSS]	----	E160	3.0	mg/L	5.8	----	----	----	----
Anions and Nutrients									
Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	30.8	----	----	----	----
Nitrogen, total	7727-37-9	E366	0.030	mg/L	31.6	----	----	----	----
Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	4.25	----	----	----	----
Aggregate Organics									
Biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	14.7	----	----	----	----
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2.0	mg/L	9.3	----	----	----	----

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

ALS Canada Ltd.

right solutions.
right partner.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA23A7839**	Page	: 1 of 7
Client	: **Regional District of Kitimat-Stikine**	Laboratory	: Vancouver - Environmental
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 12-Apr-2023 12:30
PO	: ----	Issue Date	: 20-Apr-2023 15:44
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] Queensway Sewer	E550	11-Apr-2023	----	----	----		13-Apr-2023	3 days	2 days	✓
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT 3d] Queensway Sewer	E555	11-Apr-2023	----	----	----		14-Apr-2023	3 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Queensway Sewer	E298	11-Apr-2023	17-Apr-2023	----	----		19-Apr-2023	28 days	8 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) Queensway Sewer	E366	11-Apr-2023	17-Apr-2023	----	----		18-Apr-2023	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) Queensway Sewer	E372-U	11-Apr-2023	17-Apr-2023	----	----		18-Apr-2023	28 days	7 days	✓
Physical Tests : pH by Meter										
HDPE Queensway Sewer	E108	11-Apr-2023	13-Apr-2023	----	----		14-Apr-2023	0.25 hrs	9.25 hrs	× EHTR-FM
Physical Tests : TSS by Gravimetry										
HDPE Queensway Sewer	E160	11-Apr-2023	----	----	----		17-Apr-2023	7 days	6 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	899948	1	19	5.2	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	896662	1	15	6.6	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	898171	1	16	6.2	5.0	✓
pH by Meter	E108	896829	1	17	5.8	5.0	✓
Total Nitrogen by Colourimetry	E366	900265	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	899947	1	17	5.8	5.0	✓
TSS by Gravimetry	E160	900642	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	899948	1	19	5.2	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	896662	1	15	6.6	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	898171	1	16	6.2	5.0	✓
pH by Meter	E108	896829	1	17	5.8	5.0	✓
Total Nitrogen by Colourimetry	E366	900265	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	899947	1	17	5.8	5.0	✓
TSS by Gravimetry	E160	900642	1	20	5.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	899948	1	19	5.2	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	896662	1	15	6.6	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	898171	1	16	6.2	5.0	✓
Total Nitrogen by Colourimetry	E366	900265	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	899947	1	17	5.8	5.0	✓
TSS by Gravimetry	E160	900642	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	899948	1	19	5.2	5.0	✓
Total Nitrogen by Colourimetry	E366	900265	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	899947	1	17	5.8	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Vancouver - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Nitrogen by Colourimetry	E366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Biochemical Oxygen Demand - 5 day	E550 Vancouver - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555 Vancouver - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Nitrification inhibitor is added to samples to prevent nitrogenous compounds from consuming oxygen resulting in only carbonaceous oxygen demand being reported by this method. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for Total Nitrogen in water	EP366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
Digestion for Total Phosphorus in water	EP372 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

QUALITY CONTROL REPORT

Work Order	: **VA23A7839**	Page	: 1 of 5
Client	: Regional District of Kitimat-Stikine	Laboratory	: Vancouver - Environmental
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	:	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 12-Apr-2023 12:30
PO	: ----	Date Analysis Commenced	: 13-Apr-2023
C-O-C number	: ----	Issue Date	: 20-Apr-2023 15:44
Sampler	: ---- ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

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

Signatories	*Position*	*Laboratory Department*
Brieanna Allen	Production/Validation Manager	Vancouver Inorganics, Burnaby, British Columbia
Tracy Harley	Supervisor - Water Quality Instrumentation	Vancouver Inorganics, Burnaby, British Columbia

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 900642)											
KS2301113-001	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	10.8	11.2	0.4	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 899947)											
VA23A7831-003	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0282	0.0278	1.36%	20%	----
Anions and Nutrients (QC Lot: 899948)											
VA23A7839-001	Queensway Sewer	Ammonia, total (as N)	7664-41-7	E298	0.250	mg/L	30.8	31.0	0.786%	20%	----
Anions and Nutrients (QC Lot: 900265)											
VA23A7700-001	Anonymous	Nitrogen, total	7727-37-9	E366	0.030	mg/L	0.386	0.391	1.26%	20%	----
Aggregate Organics (QC Lot: 896662)											
FJ2300771-001	Anonymous	Biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	2.8	3.2	0.4	Diff <2x LOR	----
Aggregate Organics (QC Lot: 898171)											
VA23A7879-001	Anonymous	Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2.0	mg/L	<2.0	<2.0	0.0%	30%	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 900642)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 899947)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 899948)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 900265)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Aggregate Organics (QCLot: 896662)						
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 898171)						
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	<2.0	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 896829)									
pH	----	E108	----	pH units	7 pH units	99.7	98.0	102	----
Physical Tests (QCLot: 900642)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	100	85.0	115	----
Anions and Nutrients (QCLot: 899947)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	93.8	80.0	120	----
Anions and Nutrients (QCLot: 899948)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	99.6	85.0	115	----
Anions and Nutrients (QCLot: 900265)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	94.3	75.0	125	----
Aggregate Organics (QCLot: 896662)									
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	98.5	85.0	115	----
Aggregate Organics (QCLot: 898171)									
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	198 mg/L	97.9	85.0	115	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 899947)										
VA23A7831-007	Anonymous	Phosphorus, total	7723-14-0	E372-U	ND mg/L	0.05 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 899948)										
VA23A7866-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0931 mg/L	0.1 mg/L	93.1	75.0	125	----
Anions and Nutrients (QCLot: 900265)										
VA23A7800-001	Anonymous	Nitrogen, total	7727-37-9	E366	ND mg/L	0.4 mg/L	ND	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

ALS Environmental

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17 -

Page of

Report To	Contact and company name below will appear on the final report
Company:	Regional District of Kitimat-Stikine
Contact:	Nicole Lavoie
Phone:	250-615-6100
	Company address below will appear on the final report
Street:	4545 Lazelle Avenue
City/Province:	Terrace/BC
Postal Code:	V8G4E1
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	Regional District of Kitimat-Stikine
Contact:	Nicole Lavoie

Report Format / Distribution	
Select Report Format:	☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)
Quality Control (QC) Report with Report	☑ ☐ NO
☑ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	enviro.dept@rdks.bc.ca
Email 2	ckerr@rdks.bc.ca; jkunjumon@rdks.bc.ca
Email 3	pmiller@rdks.bc.ca; jlacroix@rdks.bc.ca
Invoice Distribution	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	anne-maries@rdks.bc.ca
Email 2	enviro.dept@rdks.bc.ca

Project Information	
ALS Account # / Quote #:	VA22-RDKS100-001
Job #:	Queensway Sewer
PO / AFE:	
LSD:	
ALS Lab Work Order # (lab use only):	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	
ALS Contact:	Sampler:

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] ☐ | 3 day [P3-25%] ☐ | 2 day [P2-50%] ☐

EMERGENCY: 1 Business day [E1 - 100%] ☐ | Same Day, Weekend or Statutory holiday [E2 - 200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs:

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	TSS (by Gravimetry)	Total Ammonia	Total Nitrogen (by Colourimetry 0.03mg/L)	Total Phosphorus (by Colourimetry 0.002 mg/L)	Carbonaceous Biochemical Oxygen Demand	pH	BOD (5 Day)	SAMPLES ON HOLD	Sample is hazardous (please provide further details)	NUMBER OF CONTAINERS
					P	P	P							
	Queensway Sewer ABCD	APRIL 11/23	10:30am	Effluent	R	R	R	R	R	R	R			4
	Field Blank													

Environmental Division Vancouver
Work Order Reference
VA23A7839

Telephone : +1 604 253 4188

Terrace Shipping
1 Coolers
Carboys
Ground ☐
Air ☑
SFX ☐

Drinking Water (DW) Samples[1] (client u... add on report by clicking on the drop-down list below (electronic COC only)

Are samples taken from a Regulated DW System? ☐ ☑

Are samples for human consumption/ use? ☐ ☑

... Wastewater Systems Effluent Regulations (JUN, 2012)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen	☐	SIF Observations	Yes ☐	No	☐
Ice Packs	☑	Ice Cubes ☐	Custody seal intact	Yes ☐	No ☐
Cooling Initiated	☐				

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C			
15.0	15.1	15.0				

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date: APR. 11/23	Time: 1:35PM	Received by:	Date: Apr 11/23	Time: 1:35PM	Received by: AB	Date: 04/12/23	Time: 12:30PM

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

SEPT 2017 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form.**

CERTIFICATE OF ANALYSIS

Work Order	: **VA23B3551**	Page	: 1 of 3
Client	: **Regional District of Kitimat-Stikine**	Laboratory	: Vancouver - Environmental
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 15-Jun-2023 13:00
PO	: ----	Date Analysis Commenced	: 16-Jun-2023
C-O-C number	: ----	Issue Date	: 26-Jun-2023 15:37
Sampler	: ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 3		
No. of samples analysed	: 3		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia

General Comments

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

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

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

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

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

Unit	*Description*
µS/cm	microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

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

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

Qualifiers

Qualifier	*Description*
HTDC	*Hold time exceeded for dilution or re-analysis. Reported results are consistent with initial results (tested within hold time), and are valid and defensible.*

Analytical Results

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

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: Exfiltration Lagoons 3 & 4	DUP	Travel Blank	----	----
Client sampling date / time					14-Jun-2023 10:10	14-Jun-2023 12:00	14-Jun-2023	----	----
					VA23B3551-001	**VA23B3551-002**	**VA23B3551-003**	--------	--------
					Result	Result	Result	----	----
Physical Tests									
Conductivity	----	E100/VA	2.0	µS/cm	379	378	<2.0	----	----
pH	----	E108/VA	0.10	pH units	7.48	6.99	5.55	----	----
Solids, total suspended [TSS]	----	E160/VA	3.0	mg/L	70.1	78.8	<3.0	----	----
pH @ 15°C (WSER)	----	E108A/VA	0.10	pH units	6.63	6.62	5.88	----	----
Anions and Nutrients									
Ammonia, total (as N)	7664-41-7	E298/VA	0.0050	mg/L	6.42	6.56	<0.0050	----	----
Ammonia, un-ionized (as N), 15°C (WSER)	7664-41-7	EC298/VA	0.0010	mg/L	0.0075	0.0074	<0.0010	----	----
Kjeldahl nitrogen, total [TKN]	----	E318/VA	0.050	mg/L	12.1	13.1	<0.050	----	----
Nitrate (as N)	14797-55-8	E235.NO3-L/VA	0.0050	mg/L	0.432	0.433	<0.0050	----	----
Nitrite (as N)	14797-65-0	E235.NO2-L/VA	0.0010	mg/L	15.2 HTDC	15.2 HTDC	<0.0010	----	----
Nitrogen, total	7727-37-9	E366/VA	0.030	mg/L	26.3	25.9	<0.030	----	----
Phosphorus, total	7723-14-0	E372-U/VA	0.0020	mg/L	4.20	4.16	<0.0020	----	----
Aggregate Organics									
Biochemical oxygen demand [BOD]	----	E550/VA	2.0	mg/L	76.5	79.7	<2.0	----	----
Carbonaceous biochemical oxygen demand [CBOD]	----	E555/VA	2.0	mg/L	33.1	34.3	<2.0	----	----

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

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

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA23B3551**	Page	: 1 of 11
Client	: **Regional District of Kitimat-Stikine**	Laboratory	: Vancouver - Environmental
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 15-Jun-2023 13:00
PO	: ----	Issue Date	: 26-Jun-2023 15:38
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 3		
No. of samples analysed	: 3		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] DUP	E550	14-Jun-2023	----	----	----		17-Jun-2023	3 days	3 days	✓
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] Exfiltration Lagoons 3 & 4	E550	14-Jun-2023	----	----	----		17-Jun-2023	3 days	3 days	✓
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] Travel Blank	E550	14-Jun-2023	----	----	----		17-Jun-2023	3 days	3 days	✓
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT 3d] DUP	E555	14-Jun-2023	----	----	----		16-Jun-2023	3 days	2 days	✓
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT 3d] Exfiltration Lagoons 3 & 4	E555	14-Jun-2023	----	----	----		16-Jun-2023	3 days	2 days	✓
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT 3d] Travel Blank	E555	14-Jun-2023	----	----	----		16-Jun-2023	3 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) DUP	E298	14-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
Exfiltration Lagoons 3 & 4	E298	14-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
Travel Blank	E298	14-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE										
DUP	E235.NO3-L	14-Jun-2023	17-Jun-2023	----	----		17-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE										
Exfiltration Lagoons 3 & 4	E235.NO3-L	14-Jun-2023	17-Jun-2023	----	----		17-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE										
Travel Blank	E235.NO3-L	14-Jun-2023	17-Jun-2023	----	----		17-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
DUP	E235.NO2-L	14-Jun-2023	17-Jun-2023	----	----		17-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
Exfiltration Lagoons 3 & 4	E235.NO2-L	14-Jun-2023	17-Jun-2023	----	----		17-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
Travel Blank	E235.NO2-L	14-Jun-2023	17-Jun-2023	----	----		17-Jun-2023	3 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
DUP	E318	14-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
Exfiltration Lagoons 3 & 4	E318	14-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
Travel Blank	E318	14-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid)										
DUP	E366	14-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid)										
Exfiltration Lagoons 3 & 4	E366	14-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid)										
Travel Blank	E366	14-Jun-2023	20-Jun-2023	----	----		21-Jun-2023	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
DUP	E372-U	14-Jun-2023	20-Jun-2023	----	----		22-Jun-2023	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
Exfiltration Lagoons 3 & 4	E372-U	14-Jun-2023	20-Jun-2023	----	----		22-Jun-2023	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
Travel Blank	E372-U	14-Jun-2023	20-Jun-2023	----	----		22-Jun-2023	28 days	8 days	✓
Physical Tests : Conductivity in Water										
HDPE										
DUP	E100	14-Jun-2023	17-Jun-2023	----	----		18-Jun-2023	28 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE Travel Blank	E100	14-Jun-2023	17-Jun-2023	----	----		18-Jun-2023	28 days	4 days	✓
Physical Tests : Conductivity in Water										
HDPE Exfiltration Lagoons 3 & 4	E100	14-Jun-2023	17-Jun-2023	----	----		19-Jun-2023	28 days	5 days	✓
Physical Tests : pH by Meter at 15C (WSER)										
HDPE DUP	E108A	14-Jun-2023	----	----	----		19-Jun-2023	5 days	5 days	✓
Physical Tests : pH by Meter at 15C (WSER)										
HDPE Exfiltration Lagoons 3 & 4	E108A	14-Jun-2023	----	----	----		19-Jun-2023	5 days	5 days	✓
Physical Tests : pH by Meter at 15C (WSER)										
HDPE Travel Blank	E108A	14-Jun-2023	----	----	----		19-Jun-2023	5 days	5 days	✓
Physical Tests : pH by Meter										
HDPE DUP	E108	14-Jun-2023	17-Jun-2023	----	----		18-Jun-2023	0.25 hrs	23.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE Travel Blank	E108	14-Jun-2023	17-Jun-2023	----	----		18-Jun-2023	0.25 hrs	23.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE Exfiltration Lagoons 3 & 4	E108	14-Jun-2023	17-Jun-2023	----	----		19-Jun-2023	0.25 hrs	44.25 hrs	× EHTR-FM
Physical Tests : TSS by Gravimetry										
HDPE Travel Blank	E160	14-Jun-2023	----	----	----		21-Jun-2023	7 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : TSS by Gravimetry										
HDPE										
DUP	E160	14-Jun-2023	----	----	----		21-Jun-2023	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE										
Exfiltration Lagoons 3 & 4	E160	14-Jun-2023	----	----	----		21-Jun-2023	7 days	7 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	998890	1	7	14.2	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	994350	1	20	5.0	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	993250	1	7	14.2	5.0	✓
Conductivity in Water	E100	994463	2	37	5.4	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	994465	2	36	5.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	994466	2	39	5.1	5.0	✓
pH by Meter	E108	994461	2	38	5.2	5.0	✓
pH by Meter at 15C (WSER)	E108A	996863	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	998888	1	7	14.2	5.0	✓
Total Nitrogen by Colourimetry	E366	998887	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	998889	1	13	7.6	5.0	✓
TSS by Gravimetry	E160	999836	2	40	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	998890	1	7	14.2	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	994350	1	20	5.0	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	993250	1	7	14.2	5.0	✓
Conductivity in Water	E100	994463	2	37	5.4	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	994465	2	36	5.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	994466	2	39	5.1	5.0	✓
pH by Meter	E108	994461	2	38	5.2	5.0	✓
pH by Meter at 15C (WSER)	E108A	996863	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	998888	1	7	14.2	5.0	✓
Total Nitrogen by Colourimetry	E366	998887	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	998889	1	13	7.6	5.0	✓
TSS by Gravimetry	E160	999836	2	40	5.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	998890	1	7	14.2	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	994350	1	20	5.0	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	993250	1	7	14.2	5.0	✓
Conductivity in Water	E100	994463	2	37	5.4	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	994465	2	36	5.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	994466	2	39	5.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	998888	1	7	14.2	5.0	✓
Total Nitrogen by Colourimetry	E366	998887	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	998889	1	13	7.6	5.0	✓

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Method Blanks (MB) - Continued							
TSS by Gravimetry	E160	999836	2	40	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	998890	1	7	14.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	994465	2	36	5.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	994466	2	39	5.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	998888	1	7	14.2	5.0	✓
Total Nitrogen by Colourimetry	E366	998887	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	998889	1	13	7.6	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
pH by Meter at 15C (WSER)	E108A Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at 15 ± 1°C, and is used to calculate Un-Ionized Ammonia for the federal Wastewater Systems Effluent Regulation.
TSS by Gravimetry	E160 Vancouver - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Vancouver - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Total Nitrogen by Colourimetry	E366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Biochemical Oxygen Demand - 5 day	E550 Vancouver - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555 Vancouver - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Nitrification inhibitor is added to samples to prevent nitrogenous compounds from consuming oxygen resulting in only carbonaceous oxygen demand being reported by this method. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Un-ionized Ammonia at 15°C, WSER	EC298 Vancouver - Environmental	Water	WSER 29June2012	Un-ionized Ammonia at 15C is calculated from test results for Total Ammonia and for pH at 15C, as per the federal Wastewater Systems Effluent Regulation, and is expressed in units of mg/L "as N".

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Digestion for Total Nitrogen in water	EP366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
Digestion for Total Phosphorus in water	EP372 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

QUALITY CONTROL REPORT

Work Order	: **VA23B3551**	Page	: 1 of 7
Client	: Regional District of Kitimat-Stikine	Laboratory	: Vancouver - Environmental
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	:	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 15-Jun-2023 13:00
PO	: ----	Date Analysis Commenced	: 16-Jun-2023
C-O-C number	: ----	Issue Date	: 26-Jun-2023 15:38
Sampler	: ---- ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 3		
No. of samples analysed	: 3		

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

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

Signatories	*Position*	*Laboratory Department*
Miles Gropen	Department Manager - Inorganics	Vancouver Inorganics, Burnaby, British Columbia

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 994461)											
VA23B3678-001	Anonymous	pH	----	E108	0.10	pH units	8.25	8.25	0.00%	4%	----
Physical Tests (QC Lot: 994463)											
VA23B3678-001	Anonymous	Conductivity	----	E100	2.0	µS/cm	317	317	0.00%	10%	----
Physical Tests (QC Lot: 994677)											
VA23B3684-003	Anonymous	pH	----	E108	0.10	pH units	8.16	8.16	0.00%	4%	----
Physical Tests (QC Lot: 994678)											
VA23B3684-003	Anonymous	Conductivity	----	E100	2.0	µS/cm	3060	3030	0.985%	10%	----
Physical Tests (QC Lot: 996863)											
VA23B3543-001	Anonymous	pH @ 15°C (WSER)	----	E108A	0.10	pH units	7.31	7.34	0.410%	4%	----
Physical Tests (QC Lot: 999836)											
KS2302066-001	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	131	133	1.97%	20%	----
Physical Tests (QC Lot: 999842)											
VA23B3544-001	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	92.0	90.6	1.53%	20%	----
Anions and Nutrients (QC Lot: 994465)											
VA23B3678-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 994466)											
VA23B3678-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 994681)											
VA23B3684-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	14.5	14.4	0.896%	20%	----
Anions and Nutrients (QC Lot: 994682)											
VA23B3684-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	0.0081	0.0058	0.0022	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 998887)											
VA23B3417-001	Anonymous	Nitrogen, total	7727-37-9	E366	0.600	mg/L	3.58	3.50	0.081	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 998888)											
VA23B3502-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.227	0.233	0.006	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 998889)											
VA23B3502-001	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0066	0.0066	0.00001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 998890)											
VA23B3502-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 993250)											

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Aggregate Organics (QC Lot: 993250) - continued											
VA23B3543-001	Anonymous	Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2.0	mg/L	<2.0	<2.0	0.0%	30%	----
Aggregate Organics (QC Lot: 994350)											
KS2302069-001	Anonymous	Biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 994463)						
Conductivity	----	E100	1	µS/cm	1.2	----
Physical Tests (QCLot: 994678)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 999836)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 999842)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 994465)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 994466)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 994681)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 994682)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 998887)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 998888)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 998889)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 998890)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Aggregate Organics (QCLot: 993250)						
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 994350)						
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 994461)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 994463)									
Conductivity	----	E100	1	µS/cm	146.9 µS/cm	98.6	90.0	110	----
Physical Tests (QCLot: 994677)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 994678)									
Conductivity	----	E100	1	µS/cm	146.9 µS/cm	98.9	90.0	110	----
Physical Tests (QCLot: 996863)									
pH @ 15°C (WSER)	----	E108A	----	pH units	7 pH units	101	98.0	102	----
Physical Tests (QCLot: 999836)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	92.1	85.0	115	----
Physical Tests (QCLot: 999842)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	94.7	85.0	115	----
Anions and Nutrients (QCLot: 994465)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 994466)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	97.3	90.0	110	----
Anions and Nutrients (QCLot: 994681)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 994682)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	97.9	90.0	110	----
Anions and Nutrients (QCLot: 998887)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 998888)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 998889)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	89.2	80.0	120	----
Anions and Nutrients (QCLot: 998890)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	97.7	85.0	115	----
Aggregate Organics (QCLot: 993250)									

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Aggregate Organics (QCLot: 993250) - continued									
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	198 mg/L	90.0	85.0	115	----
Aggregate Organics (QCLot: 994350)									
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	85.9	85.0	115	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Matrix Spike (MS) Report: Spike Concentration	Spike Target	Recovery (%) MS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Anions and Nutrients (QCLot: 994465)										
WR2300529-004	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	2.69 mg/L	2.5 mg/L	108	75.0	125	----
Anions and Nutrients (QCLot: 994466)										
VA23B3502-003	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.506 mg/L	0.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 994681)										
VA23B3684-002	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	13.0 mg/L	12.5 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 994682)										
VA23B3684-002	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	2.54 mg/L	2.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 998887)										
VA23B3433-001	Anonymous	Nitrogen, total	7727-37-9	E366	ND mg/L	4 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 998888)										
VA23B3502-003	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.70 mg/L	2.5 mg/L	108	70.0	130	----
Anions and Nutrients (QCLot: 998889)										
VA23B3502-003	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0454 mg/L	0.05 mg/L	90.9	70.0	130	----
Anions and Nutrients (QCLot: 998890)										
VA23B3502-003	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.194 mg/L	0.2 mg/L	96.9	75.0	125	----

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: 17 -

Affix ALS barcode label here
(lab use only)

Pag

Environmental Division
Vancouver
Work Order Reference
VA23B3551

Telephone : +1 604 253 4188

Report To	Contact and company name below will appear on the final report
Company:	Regional District of Kitimat-Stikine
Contact:	Nicole Lavoie
Phone:	250-615-6100
	Company address below will appear on the final report
Street:	4545 Lazelle Avenue
City/Province:	Terrace/BC
Postal Code:	V8G4E1
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	Regional District of Kitimat-Stikine
Contact:	Nicole Lavoie

Report Format / Distribution	
Select Report Format:	☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)
Quality Control (QC) Report with Report	☑ YES ☐ NO
☑ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	enviro.dept@rdks.bc.ca
Email 2	ckerr@rdks.bc.ca; jkunjumon@rdks.bc.ca
Email 3	pmiller@rdks.bc.ca; jlacroix@rdks.bc.ca

Invoice Distribution	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	anne-maries@rdks.bc.ca
Email 2	enviro.dept@rdks.bc.ca

Select Service Level Below - Contact your AM to

Regular [R] ☑ Standard TAT if received by 3 pm

PRIORITY (Business Days): 4 day [P4-20%] ☐ | 3 day [P3-25%] ☐ | 2 day [P2-50%] ☐

EMERGENCY: 1 Business | Same Day, V | (Laboratory

Date and Time Required for all E&P TATs:

For tests that can not be performed according to the service level selec

Analysis Re

Project Information	
ALS Account # / Quote #:	VA22-RDKS100-001
Job #:	Queensway Sewer
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (lab use only): B3551

ALS Contact: | Sampler:

Indicate Filtered (F), Preserved (P) or Filtered and

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	TSS (by Gravimetry)	Total Ammonia	Total Nitrogen (by Colourimetry 0.03mg/L)	Total Phosphorus (by Colourimetry 0.002 mg	Carbonaceous Biochemical Oxygen Demand	pH	BOD (5 Day)	Specific Conductance	Nitrate, Nitrite	TKN	SAMPLES ON HOLD	Sample is hazardous (please provide further	NUMBER OF CONTAINERS
						P	P	P									
	Exfiltration Lagoons 3 & 4	14-Jun-23	10:10	Effluent	R	R	R	R	R	R	R	R	R	R			
	DUP	14-Jun-23	12:00	Effluent	R	R	R	R	R	R	R	R	R	R			
	Travel Blank	14-Jun-23	--	Water	R	R	R	R	R	R	R	R	R	R			

Terrace Shipping
1 Coolers
____ Carboys
Ground ☐
Air ☒
SFX ☐

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)
Are samples taken from a Regulated DW System? ☐ YES ☑ NO	Federal Wastewater Systems Effluent Regulations (JUN, 2012)
Are samples for human consumption/ use? ☐ YES ☑ NO	Queensway Sewer Custom Criteria for RDKS

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ | SIF Observations Yes ☐ No ☐
Ice Packs ☑ | Ice Cubes ☐ | Custody seal intact Yes ☐ No ☐
Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
19.0	18.2						

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: Hannah Shenton	Date: June 14th 2023	Time:	Received by: M.K.	Date: June 14/23	Time: 11:30	Received by: AB	Date: 06/15/23	Time: 8AM

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

SEPT 2017 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

CERTIFICATE OF ANALYSIS

Work Order	: **VA23B4947**	Page	: 1 of 3
Amendment	: **1**		
Client	: **Regional District of Kitimat-Stikine**	Laboratory	: ALS Environmental - Vancouver
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 29-Jun-2023 12:45
PO	: ----	Date Analysis Commenced	: 01-Jul-2023
C-O-C number	: ----	Issue Date	: 18-Aug-2023 10:31
Sampler	: ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Brieanna Allen	Production/Validation Manager	Inorganics, Burnaby, British Columbia
Tracy Harley	Supervisor - Water Quality Instrumentation	Inorganics, Burnaby, British Columbia

General Comments

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

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

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

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

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

Unit	*Description*
µS/cm	microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

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

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

Accreditation

Accreditation	*Description*	*Laboratory*	*Address*
A	CALA ISO/IEC 17025:2017	VA ALS Environmental - Vancouver	8081 Lougheed Highway, Burnaby, BC

Applicable accreditations are indicated in the Method/Lab column as superscripts.

Workorder Comments

Amended COA(1): Conductivity data has been added for all samples.

Qualifiers

Qualifier	*Description*
BODP	*BOD dilution results differed by more than 30% RPD. Precision of reported BOD result may be less than usual.*

Analytical Results

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

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID: Exfiltration Lagoons 3 & 4	DUP	----	----	----
						Client sampling date / time: 28-Jun-2023 11:20	28-Jun-2023 11:15	----	----	----
						VA23B4947-001	VA23B4947-002	--------	--------	--------
						Result	Result	----	----	----
Physical Tests										
Conductivity	----	E100/VA	A	2.0	µS/cm	355	358	----	----	----
pH	----	E108/VA	A	0.10	pH units	8.48	8.28	----	----	----
Solids, total suspended [TSS]	----	E160/VA	A	3.0	mg/L	45.8	46.2	----	----	----
pH @ 15°C (WSER)	----	E108A/VA	A	0.10	pH units	7.60	7.59	----	----	----
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/VA	A	0.0050	mg/L	0.895	0.921	----	----	----
Ammonia, un-ionized (as N), 15°C (WSER)	7664-41-7	EC298/VA		0.0010	mg/L	0.0096	0.0097	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318/VA	A	0.050	mg/L	7.85	7.27	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3-L/VA	A	0.0050	mg/L	3.16	1.22	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2-L/VA	A	0.0010	mg/L	4.00	5.59	----	----	----
Nitrogen, total	7727-37-9	E366/VA	A	0.030	mg/L	11.6	11.3	----	----	----
Phosphorus, total	7723-14-0	E372-U/VA	A	0.0020	mg/L	3.98	4.09	----	----	----
Aggregate Organics										
Biochemical oxygen demand [BOD]	----	E550/VA	A	2.0	mg/L	105 BODP	98.4 BODP	----	----	----
Carbonaceous biochemical oxygen demand [CBOD]	----	E555/VA	A	2.0	mg/L	16.2	16.5	----	----	----

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

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

ALS Canada Ltd.

right solutions.
right partner.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA23B4947**	Page	: 1 of 9
Amendment	: 1		
Client	: **Regional District of Kitimat-Stikine**	Laboratory	: ALS Environmental - Vancouver
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 29-Jun-2023 12:45
PO	: ----	Issue Date	: 18-Aug-2023 10:31
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers occur - please see following pages for full details.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] DUP	E550	28-Jun-2023	----	----	----		01-Jul-2023	3 days	3 days	✓
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] Exfiltration Lagoons 3 & 4	E550	28-Jun-2023	----	----	----		01-Jul-2023	3 days	3 days	✓
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT 3d] DUP	E555	28-Jun-2023	----	----	----		01-Jul-2023	3 days	3 days	✓
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT 3d] Exfiltration Lagoons 3 & 4	E555	28-Jun-2023	----	----	----		01-Jul-2023	3 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) DUP	E298	28-Jun-2023	03-Jul-2023	28 days	5 days	✓	04-Jul-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Exfiltration Lagoons 3 & 4	E298	28-Jun-2023	03-Jul-2023	28 days	5 days	✓	04-Jul-2023	28 days	6 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE DUP	E235.NO3-L	28-Jun-2023	01-Jul-2023	3 days	3 days	✓	07-Jul-2023	3 days	9 days	× EHT

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE										
Exfiltration Lagoons 3 & 4	E235.NO3-L	28-Jun-2023	01-Jul-2023	3 days	3 days	✓	07-Jul-2023	3 days	9 days	× EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
DUP	E235.NO2-L	28-Jun-2023	01-Jul-2023	3 days	3 days	✓	07-Jul-2023	3 days	9 days	× EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
Exfiltration Lagoons 3 & 4	E235.NO2-L	28-Jun-2023	01-Jul-2023	3 days	3 days	✓	07-Jul-2023	3 days	9 days	× EHT
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
DUP	E318	28-Jun-2023	03-Jul-2023	28 days	5 days	✓	04-Jul-2023	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
Exfiltration Lagoons 3 & 4	E318	28-Jun-2023	03-Jul-2023	28 days	5 days	✓	04-Jul-2023	28 days	6 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid)										
DUP	E366	28-Jun-2023	03-Jul-2023	28 days	5 days	✓	05-Jul-2023	28 days	7 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid)										
Exfiltration Lagoons 3 & 4	E366	28-Jun-2023	03-Jul-2023	28 days	5 days	✓	05-Jul-2023	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
DUP	E372-U	28-Jun-2023	03-Jul-2023	28 days	5 days	✓	06-Jul-2023	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
Exfiltration Lagoons 3 & 4	E372-U	28-Jun-2023	03-Jul-2023	28 days	5 days	✓	06-Jul-2023	28 days	8 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE DUP	E100	28-Jun-2023	17-Aug-2023	28 days	50 days	× EHT	17-Aug-2023	28 days	50 days	× EHT
Physical Tests : Conductivity in Water										
HDPE Exfiltration Lagoons 3 & 4	E100	28-Jun-2023	17-Aug-2023	28 days	50 days	× EHT	17-Aug-2023	28 days	50 days	× EHT
Physical Tests : pH by Meter at 15C (WSER)										
HDPE DUP	E108A	28-Jun-2023	----	----	----		04-Jul-2023	5 days	6 days	× EHT
Physical Tests : pH by Meter at 15C (WSER)										
HDPE Exfiltration Lagoons 3 & 4	E108A	28-Jun-2023	----	----	----		04-Jul-2023	5 days	6 days	× EHT
Physical Tests : pH by Meter										
HDPE Exfiltration Lagoons 3 & 4	E108	28-Jun-2023	01-Jul-2023	0.25 hrs	73 hrs	× EHTR-FM	04-Jul-2023	0.25 hrs	138 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE DUP	E108	28-Jun-2023	01-Jul-2023	0.25 hrs	73 hrs	× EHTR-FM	04-Jul-2023	0.25 hrs	139 hrs	× EHTR-FM
Physical Tests : TSS by Gravimetry										
HDPE DUP	E160	28-Jun-2023	----	----	----		04-Jul-2023	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE Exfiltration Lagoons 3 & 4	E160	28-Jun-2023	----	----	----		04-Jul-2023	7 days	7 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

EHT: Exceeded ALS recommended hold time prior to analysis.

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	1020571	1	9	11.1	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	1019688	1	17	5.8	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	1019807	1	13	7.6	5.0	✓
Conductivity in Water	E100	1089768	0	2	0.0	5.0	×
Nitrate in Water by IC (Low Level)	E235.NO3-L	1019718	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1019719	1	20	5.0	5.0	✓
pH by Meter	E108	1019714	1	20	5.0	5.0	✓
pH by Meter at 15C (WSER)	E108A	1021931	1	13	7.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1020573	1	5	20.0	5.0	✓
Total Nitrogen by Colourimetry	E366	1020570	1	8	12.5	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1020574	1	5	20.0	5.0	✓
TSS by Gravimetry	E160	1022537	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	1020571	1	9	11.1	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	1019688	1	17	5.8	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	1019807	1	13	7.6	5.0	✓
Conductivity in Water	E100	1089768	1	2	50.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1019718	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1019719	1	20	5.0	5.0	✓
pH by Meter	E108	1019714	1	20	5.0	5.0	✓
pH by Meter at 15C (WSER)	E108A	1021931	1	13	7.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1020573	1	5	20.0	5.0	✓
Total Nitrogen by Colourimetry	E366	1020570	1	8	12.5	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1020574	1	5	20.0	5.0	✓
TSS by Gravimetry	E160	1022537	1	20	5.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	1020571	1	9	11.1	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	1019688	1	17	5.8	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	1019807	1	13	7.6	5.0	✓
Conductivity in Water	E100	1089768	1	2	50.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1019718	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1019719	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1020573	1	5	20.0	5.0	✓
Total Nitrogen by Colourimetry	E366	1020570	1	8	12.5	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1020574	1	5	20.0	5.0	✓

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Method Blanks (MB) - Continued							
TSS by Gravimetry	E160	1022537	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	1020571	1	9	11.1	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1019718	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1019719	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1020573	1	5	20.0	5.0	✓
Total Nitrogen by Colourimetry	E366	1020570	1	8	12.5	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1020574	1	5	20.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 ALS Environmental - Vancouver	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 ALS Environmental - Vancouver	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
pH by Meter at 15C (WSER)	E108A ALS Environmental - Vancouver	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at 15 ± 1°C, and is used to calculate Un-Ionized Ammonia for the federal Wastewater Systems Effluent Regulation.
TSS by Gravimetry	E160 ALS Environmental - Vancouver	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L ALS Environmental - Vancouver	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L ALS Environmental - Vancouver	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 ALS Environmental - Vancouver	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 ALS Environmental - Vancouver	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Total Nitrogen by Colourimetry	E366 ALS Environmental - Vancouver	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Biochemical Oxygen Demand - 5 day	E550 ALS Environmental - Vancouver	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555 ALS Environmental - Vancouver	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Nitrification inhibitor is added to samples to prevent nitrogenous compounds from consuming oxygen resulting in only carbonaceous oxygen demand being reported by this method. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Un-ionized Ammonia at 15°C, WSER	EC298 ALS Environmental - Vancouver	Water	WSER 29June2012	Un-ionized Ammonia at 15C is calculated from test results for Total Ammonia and for pH at 15C, as per the federal Wastewater Systems Effluent Regulation, and is expressed in units of mg/L "as N".

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 ALS Environmental - Vancouver	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 ALS Environmental - Vancouver	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Digestion for Total Nitrogen in water	EP366 ALS Environmental - Vancouver	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
Digestion for Total Phosphorus in water	EP372 ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

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QUALITY CONTROL REPORT

Work Order	: **VA23B4947**	Page	: 1 of 6
Amendment	: **1**		
Client	: Regional District of Kitimat-Stikine	Laboratory	: ALS Environmental - Vancouver
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	:	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 29-Jun-2023 12:45
PO	: ----	Date Analysis Commenced	: 01-Jul-2023
C-O-C number	: ----	Issue Date	: 18-Aug-2023 10:31
Sampler	: ---- ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

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

Signatories	*Position*	*Laboratory Department*
Brieanna Allen	Production/Validation Manager	Vancouver Inorganics, Burnaby, British Columbia
Tracy Harley	Supervisor - Water Quality Instrumentation	Vancouver Inorganics, Burnaby, British Columbia

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 1019714)											
VA23B5083-001	Anonymous	pH	----	E108	0.10	pH units	7.98	7.99	0.125%	4%	----
Physical Tests (QC Lot: 1021931)											
VA23B4717-001	Anonymous	pH @ 15°C (WSER)	----	E108A	0.10	pH units	7.39	7.38	0.135%	4%	----
Physical Tests (QC Lot: 1022537)											
KS2302287-001	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	11.0	13.0	2.0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1019718)											
VA23B5083-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	2.14	2.13	0.407%	20%	----
Anions and Nutrients (QC Lot: 1019719)											
VA23B5083-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0136	0.0129	4.57%	20%	----
Anions and Nutrients (QC Lot: 1020570)											
KS2302259-001	Anonymous	Nitrogen, total	7727-37-9	E366	3.00	mg/L	48.6	50.3	3.47%	20%	----
Anions and Nutrients (QC Lot: 1020571)											
VA23B4848-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.500	mg/L	35.5	34.1	4.18%	20%	----
Anions and Nutrients (QC Lot: 1020573)											
VA23B4848-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.50	mg/L	39.3	39.0	0.681%	20%	----
Anions and Nutrients (QC Lot: 1020574)											
VA23B4848-001	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.200	mg/L	5.72	5.87	2.55%	20%	----
Aggregate Organics (QC Lot: 1019688)											
KS2302287-001	Anonymous	Biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 1019807)											
VA23B4845-001	Anonymous	Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2.0	mg/L	<2.0	<2.0	0.0%	30%	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 1022537)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 1089768)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Anions and Nutrients (QCLot: 1019718)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1019719)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 1020570)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 1020571)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1020573)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 1020574)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Aggregate Organics (QCLot: 1019688)						
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 1019807)						
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	<2.0	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1019714)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 1021931)									
pH @ 15°C (WSER)	----	E108A	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 1022537)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	92.0	85.0	115	----
Physical Tests (QCLot: 1089768)									
Conductivity	----	E100	1	µS/cm	146.9 µS/cm	95.6	90.0	110	----
Anions and Nutrients (QCLot: 1019718)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 1019719)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	97.7	90.0	110	----
Anions and Nutrients (QCLot: 1020570)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	99.0	75.0	125	----
Anions and Nutrients (QCLot: 1020571)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	92.9	85.0	115	----
Anions and Nutrients (QCLot: 1020573)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	94.4	75.0	125	----
Anions and Nutrients (QCLot: 1020574)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	94.3	80.0	120	----
Aggregate Organics (QCLot: 1019688)									
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	91.2	85.0	115	----
Aggregate Organics (QCLot: 1019807)									
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	198 mg/L	89.7	85.0	115	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 1019718)										
VA23B5083-002	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	2.48 mg/L	2.5 mg/L	99.3	75.0	125	----
Anions and Nutrients (QCLot: 1019719)										
VA23B5083-002	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.498 mg/L	0.5 mg/L	99.5	75.0	125	----
Anions and Nutrients (QCLot: 1020570)										
VA23B4848-001	Anonymous	Nitrogen, total	7727-37-9	E366	ND mg/L	0.4 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 1020571)										
VA23B4865-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	MS-B
Anions and Nutrients (QCLot: 1020573)										
VA23B4865-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	233 mg/L	2.5 mg/L	93.1	70.0	130	----
Anions and Nutrients (QCLot: 1020574)										
VA23B4865-001	Anonymous	Phosphorus, total	7723-14-0	E372-U	ND mg/L	0.05 mg/L	ND	70.0	130	----

Qualifiers

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

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 17 -

Page of

Report To	Contact and company name below will appear on the final report	Report Format / Distribution	Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)
Company:	Regional District of Kitimat-Stikine	Select Report Format: ☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)	Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply
Contact:	Nicole Lavoie	Quality Control (QC) Report with Report ☑ YES ☐ NO	PRIORITY (Business Days): 4 day [P4-20%] ☐
Phone:	250-615-6100	☑ Compare Results to Criteria on Report - provide details below if box checked	3 day [P3-25%] ☐
	Company address below will appear on the final report	Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	2 day [P2-50%] ☐
Street:	4545 Lazelle Avenue	Email 1 or Fax: enviro.dept@rdks.bc.ca	EMERGENCY: 1 Business day [E1 - 100%] ☐
City/Province:	Terrace/BC	Email 2: ckerr@rdks.bc.ca; jkunjumon@rdks.bc.ca	E2 -200% ☐
Postal Code:	V8G4E1	Email 3: pmiller@rdks.bc.ca; jlacroix@rdks.bc.ca	Date and Time Required for all E&P TA
Invoice To	Same as Report To ☑ YES ☐ NO	Invoice Distribution	For tests that can not be performed according to t
	Copy of Invoice with Report ☑ YES ☐ NO	Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	
Company:	Regional District of Kitimat-Stikine	Email 1 or Fax: anne-maries@rdks.bc.ca	
Contact:	Nicole Lavoie	Email 2: enviro.dept@rdks.bc.ca	

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	VA22-RDKS100-001	AFE/Cost Center:	PO#
Job #:	Queensway Sewer	Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	

ALS Lab Work Order # (lab use only):

ALS Contact:

Sampler:

Indicate Filtered (F), Preserved

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	TSS (by Gravimetry)	Total Ammonia	Total Nitrogen (by Colourimetry 0.03mg/L)	Total Phosphorus (by Colourimetry 0.002 mg	Carbonaceous Biochemical Oxygen Demand	pH	BOD (5 Day)	Specific Conductance	Nitrate, Nitrite	TKN	SAMPLES ON HOLD	Sample is hazardous (please provide further detail	NUMBER OF CONTAINERS
					P	P	P										
	~~Exfiltration Lagoons 3 & 4~~	~~28/06/23~~	~~11:20~~	~~Effluent~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~			~~3~~
	DUP	28/06/23	11:15	Effluent	R	R	R	R	R	R	R	R	R	R			3

Terrace Shipping
1 Coolers
____ Carboys
Ground ☐
Air ☒
SFX ☐

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)
Are samples taken from a Regulated DW System? ☐ YES ☑ NO	Federal Wastewater Systems Effluent Regulations (JUN, 2012)
Are samples for human consumption/ use? ☐ YES ☑ NO	Queensway Sewer Custom Criteria for RDKS

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice Packs ☒ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
19.9	21.4						8°

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: P. MILLER	Date: 28/06/23	Time:	Received by: M.K	Date: June 28/23	Time: 11:50	Received by: RD	Date: June 29, 23	Time: 12:45pm

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

SEPT 2017 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

Environmental Division
Vancouver
Work Order Reference
VA23B4947
Telephone : +1 604 253 4188

CERTIFICATE OF ANALYSIS

Work Order	: **VA23B6028**	Page	: 1 of 4
Client	: **Regional District of Kitimat-Stikine**	Laboratory	: ALS Environmental - Vancouver
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 13-Jul-2023 13:20
PO	: ----	Date Analysis Commenced	: 13-Jul-2023
C-O-C number	: ----	Issue Date	: 20-Jul-2023 15:55
Sampler	: ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

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

General Comments

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

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

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

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

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

Unit	*Description*
µS/cm	microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

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

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

Qualifiers

Qualifier	*Description*
SP	*Sample was preserved at the laboratory.*

Analytical Results

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

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	Exfiltration Lagoons 3&4	----	----	----	----
					Client sampling date / time	12-Jul-2023 11:16	----	----	----	----
					VA23B6028-001	--------	--------	--------	--------	--------
					Result	----	----	----	----
Physical Tests										
Conductivity	----	E100/VA	2.0	µS/cm		350	----	----	----	----
pH	----	E108/VA	0.10	pH units		7.93	----	----	----	----
Solids, total suspended [TSS]	----	E160/VA	3.0	mg/L		63.8	----	----	----	----
pH @ 15°C (WSER)	----	E108A/VA	0.10	pH units		7.30	----	----	----	----
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/VA	0.0050	mg/L		1.87	----	----	----	----
Ammonia, un-ionized (as N), 15°C (WSER)	7664-41-7	EC298/VA	0.0010	mg/L		0.0101	----	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318/VA	0.050	mg/L		6.39	----	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3-L/VA	0.0050	mg/L		0.0455	----	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2-L/VA	0.0010	mg/L		0.944	----	----	----	----
Nitrogen, total	7727-37-9	E366/VA	0.030	mg/L		9.61	----	----	----	----
Phosphorus, total	7723-14-0	E372-U/VA	0.0020	mg/L		4.43	----	----	----	----
Aggregate Organics										
Biochemical oxygen demand [BOD]	----	E550/VA	2.0	mg/L		85.2	----	----	----	----
Carbonaceous biochemical oxygen demand [CBOD]	----	E555/VA	2.0	mg/L		15.2	----	----	----	----

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

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

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Travel Blank	----	----	----	----
					Client sampling date / time	12-Jul-2023 00:00	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		VA23B6028-002	--------	--------	--------	--------
						Result	----	----	----	----
Physical Tests										
Conductivity	----	E100/VA	2.0	µS/cm		<2.0	----	----	----	----
pH	----	E108/VA	0.10	pH units		5.15	----	----	----	----
Solids, total suspended [TSS]	----	E160/VA	3.0	mg/L		<3.0	----	----	----	----
pH @ 15°C (WSER)	----	E108A/VA	0.10	pH units		5.62	----	----	----	----
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/VA	0.0050	mg/L		<0.0050	----	----	----	----
Ammonia, un-ionized (as N), 15°C (WSER)	7664-41-7	EC298/VA	0.0010	mg/L		<0.0010	----	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318/VA	0.050	mg/L		<0.050	----	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3-L/VA	0.0050	mg/L		<0.0050	----	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2-L/VA	0.0010	mg/L		<0.0010	----	----	----	----
Nitrogen, total	7727-37-9	E366/VA	0.030	mg/L		<0.030	----	----	----	----
Phosphorus, total	7723-14-0	E372-U/VA	0.0020	mg/L		<0.0020 SP	----	----	----	----
Aggregate Organics										
Biochemical oxygen demand [BOD]	----	E550/VA	2.0	mg/L		<2.0	----	----	----	----
Carbonaceous biochemical oxygen demand [CBOD]	----	E555/VA	2.0	mg/L		<2.0	----	----	----	----

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

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

ALS Canada Ltd.

right solutions.
right partner.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA23B6028**	Page	: 1 of 9
Client	: **Regional District of Kitimat-Stikine**	Laboratory	: ALS Environmental - Vancouver
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 13-Jul-2023 13:20
PO	: ----	Issue Date	: 20-Jul-2023 15:56
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d]										
Exfiltration Lagoons 3&4	E550	12-Jul-2023	----	----	----		13-Jul-2023	3 days	1 days	✓
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d]										
Travel Blank	E550	12-Jul-2023	----	----	----		13-Jul-2023	3 days	1 days	✓
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT 3d]										
Travel Blank	E555	12-Jul-2023	----	----	----		13-Jul-2023	3 days	1 days	✓
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT 3d]										
Exfiltration Lagoons 3&4	E555	12-Jul-2023	----	----	----		15-Jul-2023	3 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
Exfiltration Lagoons 3&4	E298	12-Jul-2023	17-Jul-2023	28 days	5 days	✓	18-Jul-2023	23 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (lab preserved)										
Travel Blank	E298	12-Jul-2023	13-Jul-2023	3 days	1 days	✓	15-Jul-2023	28 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE										
Exfiltration Lagoons 3&4	E235.NO3-L	12-Jul-2023	15-Jul-2023	3 days	3 days	✓	15-Jul-2023	0 days	0 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE										
Travel Blank	E235.NO3-L	12-Jul-2023	15-Jul-2023	3 days	3 days	✓	15-Jul-2023	0 days	0 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
Exfiltration Lagoons 3&4	E235.NO2-L	12-Jul-2023	15-Jul-2023	3 days	3 days	✓	15-Jul-2023	0 days	0 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
Travel Blank	E235.NO2-L	12-Jul-2023	15-Jul-2023	3 days	3 days	✓	15-Jul-2023	0 days	0 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
Exfiltration Lagoons 3&4	E318	12-Jul-2023	17-Jul-2023	28 days	5 days	✓	18-Jul-2023	23 days	1 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (lab preserved)										
Travel Blank	E318	12-Jul-2023	14-Jul-2023	3 days	2 days	✓	16-Jul-2023	28 days	1 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid)										
Exfiltration Lagoons 3&4	E366	12-Jul-2023	17-Jul-2023	28 days	5 days	✓	19-Jul-2023	23 days	2 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (lab preserved)										
Travel Blank	E366	12-Jul-2023	13-Jul-2023	3 days	1 days	✓	14-Jul-2023	28 days	1 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
Exfiltration Lagoons 3&4	E372-U	12-Jul-2023	17-Jul-2023	28 days	5 days	✓	19-Jul-2023	23 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (lab preserved)										
Travel Blank	E372-U	12-Jul-2023	13-Jul-2023	3 days	1 days	✓	14-Jul-2023	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE Exfiltration Lagoons 3&4	E100	12-Jul-2023	15-Jul-2023	28 days	3 days	✓	16-Jul-2023	25 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE Travel Blank	E100	12-Jul-2023	15-Jul-2023	28 days	3 days	✓	16-Jul-2023	25 days	1 days	✓
Physical Tests : pH by Meter at 15C (WSER)										
HDPE Exfiltration Lagoons 3&4	E108A	12-Jul-2023	----	----	----		14-Jul-2023	5 days	2 days	✓
Physical Tests : pH by Meter at 15C (WSER)										
HDPE Travel Blank	E108A	12-Jul-2023	----	----	----		14-Jul-2023	5 days	2 days	✓
Physical Tests : pH by Meter										
HDPE Travel Blank	E108	12-Jul-2023	15-Jul-2023	19 hrs	0.25 hrs	× EHTR-FM	16-Jul-2023	-69.41 hrs	19 hrs	× UCP
Physical Tests : pH by Meter										
HDPE Exfiltration Lagoons 3&4	E108	12-Jul-2023	15-Jul-2023	19 hrs	0.25 hrs	× EHTR-FM	16-Jul-2023	-73.15 hrs	19 hrs	× UCP
Physical Tests : TSS by Gravimetry										
HDPE Exfiltration Lagoons 3&4	E160	12-Jul-2023	----	----	----		19-Jul-2023	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE Travel Blank	E160	12-Jul-2023	----	----	----		19-Jul-2023	7 days	7 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

Rec. HT: ALS recommended hold time (see units).

UCP: Unsuitable Container and/or Preservative used (invalidates standard hold time). Maximum hold time of zero applied. Test results may be biased low / unreliable, and may not meet regulatory requirements.

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	1037795	2	28	7.1	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	1037971	1	11	9.0	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	1038039	2	27	7.4	5.0	✓
Conductivity in Water	E100	1040560	1	8	12.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1040551	1	13	7.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1040552	1	15	6.6	5.0	✓
pH by Meter	E108	1040559	1	13	7.6	5.0	✓
pH by Meter at 15C (WSER)	E108A	1038526	1	3	33.3	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1040076	2	11	18.1	5.0	✓
Total Nitrogen by Colourimetry	E366	1037796	2	13	15.3	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1037793	2	19	10.5	5.0	✓
TSS by Gravimetry	E160	1046341	1	17	5.8	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	1037795	2	28	7.1	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	1037971	1	11	9.0	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	1038039	2	27	7.4	5.0	✓
Conductivity in Water	E100	1040560	1	8	12.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1040551	1	13	7.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1040552	1	15	6.6	5.0	✓
pH by Meter	E108	1040559	1	13	7.6	5.0	✓
pH by Meter at 15C (WSER)	E108A	1038526	1	3	33.3	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1040076	2	11	18.1	5.0	✓
Total Nitrogen by Colourimetry	E366	1037796	2	13	15.3	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1037793	2	19	10.5	5.0	✓
TSS by Gravimetry	E160	1046341	1	17	5.8	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	1037795	2	28	7.1	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	1037971	1	11	9.0	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	1038039	2	27	7.4	5.0	✓
Conductivity in Water	E100	1040560	1	8	12.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1040551	1	13	7.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1040552	1	15	6.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1040076	2	11	18.1	5.0	✓
Total Nitrogen by Colourimetry	E366	1037796	2	13	15.3	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1037793	2	19	10.5	5.0	✓

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Method Blanks (MB) - Continued							
TSS by Gravimetry	E160	1046341	1	17	5.8	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	1037795	2	28	7.1	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1040551	1	13	7.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1040552	1	15	6.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1040076	2	11	18.1	5.0	✓
Total Nitrogen by Colourimetry	E366	1037796	2	13	15.3	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1037793	2	19	10.5	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 ALS Environmental - Vancouver	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 ALS Environmental - Vancouver	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
pH by Meter at 15C (WSER)	E108A ALS Environmental - Vancouver	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at 15 ± 1°C, and is used to calculate Un-Ionized Ammonia for the federal Wastewater Systems Effluent Regulation.
TSS by Gravimetry	E160 ALS Environmental - Vancouver	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L ALS Environmental - Vancouver	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L ALS Environmental - Vancouver	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 ALS Environmental - Vancouver	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 ALS Environmental - Vancouver	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Total Nitrogen by Colourimetry	E366 ALS Environmental - Vancouver	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Biochemical Oxygen Demand - 5 day	E550 ALS Environmental - Vancouver	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555 ALS Environmental - Vancouver	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Nitrification inhibitor is added to samples to prevent nitrogenous compounds from consuming oxygen resulting in only carbonaceous oxygen demand being reported by this method. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Un-ionized Ammonia at 15°C, WSER	EC298 ALS Environmental - Vancouver	Water	WSER 29June2012	Un-ionized Ammonia at 15C is calculated from test results for Total Ammonia and for pH at 15C, as per the federal Wastewater Systems Effluent Regulation, and is expressed in units of mg/L "as N".

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 ALS Environmental - Vancouver	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 ALS Environmental - Vancouver	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Digestion for Total Nitrogen in water	EP366 ALS Environmental - Vancouver	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
Digestion for Total Phosphorus in water	EP372 ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

QUALITY CONTROL REPORT

Work Order	: **VA23B6028**	Page	: 1 of 9
Client	: Regional District of Kitimat-Stikine	Laboratory	: ALS Environmental - Vancouver
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	:	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 13-Jul-2023 13:20
PO	: ----	Date Analysis Commenced	: 13-Jul-2023
C-O-C number	: ----	Issue Date	: 20-Jul-2023 15:55
Sampler	: ---- ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

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

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

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 1038526)											
VA23B6028-001	Exfiltration Lagoons 3&4	pH @ 15°C (WSER)	----	E108A	0.10	pH units	7.30	7.34	0.546%	4%	----
Physical Tests (QC Lot: 1040559)											
VA23B5993-001	Anonymous	pH	----	E108	0.10	pH units	7.92	7.93	0.126%	4%	----
Physical Tests (QC Lot: 1040560)											
VA23B5993-001	Anonymous	Conductivity	----	E100	2.0	µS/cm	114	117	2.51%	10%	----
Physical Tests (QC Lot: 1046341)											
VA23B5922-002	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	12.2	12.4	0.2	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1037793)											
FJ2301698-009	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1037795)											
FJ2301698-009	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1037796)											
VA23B5933-001	Anonymous	Nitrogen, total	7727-37-9	E366	0.600	mg/L	8.44	8.31	1.58%	20%	----
Anions and Nutrients (QC Lot: 1040076)											
KS2302505-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.887	0.901	1.55%	20%	----
Anions and Nutrients (QC Lot: 1040551)											
VA23B5993-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1040552)											
VA23B5993-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1042817)											
VA23B6008-001	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.200	mg/L	6.01	6.43	6.83%	20%	----
Anions and Nutrients (QC Lot: 1042818)											
VA23B5979-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0977	0.0918	6.21%	20%	----
Anions and Nutrients (QC Lot: 1042819)											
VA23B6008-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.50	mg/L	31.8	32.4	1.75%	20%	----
Anions and Nutrients (QC Lot: 1042820)											
VA23B5979-001	Anonymous	Nitrogen, total	7727-37-9	E366	0.600	mg/L	15.7	15.4	1.79%	20%	----
Aggregate Organics (QC Lot: 1037971)											
VA23B6033-001	Anonymous	Biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 1038039)											

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Aggregate Organics (QC Lot: 1038039) - continued											
VA23B6016-006	Anonymous	Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2.0	mg/L	<2.0	<2.0	0.0%	30%	----
Aggregate Organics (QC Lot: 1040471)											
VA23B5931-001	Anonymous	Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2.0	mg/L	<2.0	<2.0	0.0%	30%	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 1040560)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 1046341)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 1037793)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 1037795)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1037796)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 1040076)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 1040551)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1040552)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 1042817)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 1042818)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1042819)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 1042820)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Aggregate Organics (QCLot: 1037971)						
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 1038039)						
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 1040471)						
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	<2.0	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1038526)									
pH @ 15°C (WSER)	----	E108A	----	pH units	7 pH units	101	98.0	102	----
Physical Tests (QCLot: 1040559)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 1040560)									
Conductivity	----	E100	1	µS/cm	146.9 µS/cm	98.4	90.0	110	----
Physical Tests (QCLot: 1046341)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	88.7	85.0	115	----
Anions and Nutrients (QCLot: 1037793)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	90.9	80.0	120	----
Anions and Nutrients (QCLot: 1037795)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	90.0	85.0	115	----
Anions and Nutrients (QCLot: 1037796)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	99.8	75.0	125	----
Anions and Nutrients (QCLot: 1040076)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	97.3	75.0	125	----
Anions and Nutrients (QCLot: 1040551)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 1040552)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 1042817)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	91.9	80.0	120	----
Anions and Nutrients (QCLot: 1042818)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	92.5	85.0	115	----
Anions and Nutrients (QCLot: 1042819)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	98.4	75.0	125	----
Anions and Nutrients (QCLot: 1042820)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	97.5	75.0	125	----
Aggregate Organics (QCLot: 1037971)									
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	95.8	85.0	115	----
Aggregate Organics (QCLot: 1038039)									

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	LCS Recovery (%)	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Aggregate Organics (QCLot: 1038039) - continued									
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	198 mg/L	98.3	85.0	115	----
Aggregate Organics (QCLot: 1040471)									
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	198 mg/L	92.0	85.0	115	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Matrix Spike (MS) Report: Spike Concentration	Spike Target	Recovery (%) MS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Anions and Nutrients (QCLot: 1037793)										
KS2302493-013	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0448 mg/L	0.05 mg/L	89.6	70.0	130	----
Anions and Nutrients (QCLot: 1037795)										
KS2302493-013	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0945 mg/L	0.1 mg/L	94.5	75.0	125	----
Anions and Nutrients (QCLot: 1037796)										
VA23B5970-001	Anonymous	Nitrogen, total	7727-37-9	E366	0.387 mg/L	0.4 mg/L	96.7	70.0	130	----
Anions and Nutrients (QCLot: 1040076)										
VA23B5835-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	24.1 mg/L	2.5 mg/L	96.6	70.0	130	----
Anions and Nutrients (QCLot: 1040551)										
VA23B5993-002	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	2.64 mg/L	2.5 mg/L	106	75.0	125	----
Anions and Nutrients (QCLot: 1040552)										
VA23B5993-002	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.526 mg/L	0.5 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 1042817)										
VA23B6016-001	Anonymous	Phosphorus, total	7723-14-0	E372-U	ND mg/L	0.05 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 1042818)										
VA23B5996-007	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0956 mg/L	0.1 mg/L	95.6	75.0	125	----
Anions and Nutrients (QCLot: 1042819)										
VA23B6021-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.51 mg/L	2.5 mg/L	100	70.0	130	----
Anions and Nutrients (QCLot: 1042820)										
VA23B6008-001	Anonymous	Nitrogen, total	7727-37-9	E366	ND mg/L	20 mg/L	ND	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 17 -

Page of

Report To	Contact and company name below will appear on the final report
Company:	Regional District of Kitimat-Stikine
Contact:	Nicole Lavoie
Phone:	250-615-6100
	Company address below will appear on the final report
Street:	4545 Lazelle Avenue
City/Province:	Terrace/BC
Postal Code:	V8G4E1
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	Regional District of Kitimat-Stikine
Contact:	Nicole Lavoie

Report Format / Distribution	
Select Report Format:	☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)
Quality Control (QC) Report with Report	☑ YES ☐ NO
☑ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	enviro.dept@rdks.bc.ca
Email 2	ckerr@rdks.bc.ca; jkunjumon@rdks.bc.ca
Email 3	pmiller@rdks.bc.ca; jlacroix@rdks.bc.ca
Invoice Distribution	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	anne-maries@rdks.bc.ca
Email 2	enviro.dept@rdks.bc.ca

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	VA22-RDKS100-001	AFE/Cost Center:	PO#
Job #:	Queensway Sewer	Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (lab use only):		ALS Contact:	Sampler:

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] ☐ | 3 day [P3-25%] ☐ | 2 day [P2-50%] ☐

EMERGENCY: 1 Business day [E1 - 100%] ☐ | Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs:

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	TSS (by Gravimetry)	Total Ammonia	Total Nitrogen (by Colourimetry 0.03mg/L)	Total Phosphorus (by Colourimetry 0.002 mg	Carbonaceous Biochemical Oxygen Demand	pH	BOD (5 Day)	Specific Conductance	Nitrate, Nitrite	TKN	SAMPLES ON HOLD	Sample is hazardous (please provide further detail	NUMBER OF CONTAINERS
					P	P	P										
	Exfiltration Lagoons 3 & 4	12-Jul-23	11:16	Effluent	R	R	R	R	R	R	R	R	R	R			
	Travel Blank	12-Jul-23	--	Water	R	R	R	R	R	R	R	R	R	R			

Terrace Shipping
1 Coolers
____ Carboys
Ground ☐
Air ☑
SFX ☐

Environmental Division
Vancouver
Work Order Reference
VA23B6028

Telephone: +1 604 253 4188

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)
Are samples taken from a Regulated DW System? ☐ YES ☑ NO	Federal Wastewater Systems Effluent Regulations (JUN, 2012)
Are samples for human consumption/ use? ☐ YES ☑ NO	Queensway Sewer Custom Criteria for RDKS

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ | SIF Observations Yes ☐ No ☐

Ice Packs ☑ | Ice Cubes ☐ | Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
18.2	17.5			12			

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: Harpreet Ahuntov	Date: July 12th, 2023	Time:	Received by: M.K.	Date: July 12/23	Time: 12:30	Received by:	Date: 07/13/23	Time: 13:20

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

SEPT 2017 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

CERTIFICATE OF ANALYSIS

Work Order	: **VA23B9013**	Page	: 1 of 5
Client	: **Regional District of Kitimat-Stikine**	Laboratory	: ALS Environmental - Vancouver
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 16-Aug-2023 12:30
PO	: ----	Date Analysis Commenced	: 17-Aug-2023
C-O-C number	: ----	Issue Date	: 23-Aug-2023 10:22
Sampler	: ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Cindy Tang	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Kate Dimitrova	Supervisor - Inorganic	Inorganics, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Inorganics, Burnaby, British Columbia
Leon Yang	Analsyt	Inorganics, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia

General Comments

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

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

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.
Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

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

Unit	*Description*
µg/L	micrograms per litre
µS/cm	microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

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

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

Analytical Results

Sub-Matrix: Effluent (Matrix: Water)					Client sample ID	Exfiltration Lagoons 3 & 4	----	----	----	----
					Client sampling date / time	15-Aug-2023 11:46	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		VA23B9013-001	--------	--------	--------	--------
						Result	----	----	----	----
Physical Tests										
Conductivity	----	E100/VA	2.0	µS/cm		474	----	----	----	----
pH	----	E108/VA	0.10	pH units		7.20	----	----	----	----
Solids, total suspended [TSS]	----	E160/VA	3.0	mg/L		22.9	----	----	----	----
pH @ 15°C (WSER)	----	E108A/VA	0.10	pH units		7.43	----	----	----	----
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/VA	0.0050	mg/L		12.9	----	----	----	----
Ammonia, un-ionized (as N), 15°C (WSER)	7664-41-7	EC298/VA	0.0010	mg/L		0.0940	----	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318/VA	0.050	mg/L		16.3	----	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3-L/VA	0.0050	mg/L		<0.0050	----	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2-L/VA	0.0010	mg/L		<0.0010	----	----	----	----
Nitrogen, total	7727-37-9	E366/VA	0.030	mg/L		16.2	----	----	----	----
Phosphorus, total	7723-14-0	E372-U/VA	0.0020	mg/L		5.29	----	----	----	----
Aggregate Organics										
Biochemical oxygen demand [BOD]	----	E550/VA	2.0	mg/L		50.4	----	----	----	----
Carbonaceous biochemical oxygen demand [CBOD]	----	E555/VA	2.0	mg/L		11.7	----	----	----	----
Volatile Organic Compounds [Fuels]										
Benzene	71-43-2	E611A/VA	0.50	µg/L		<0.50	----	----	----	----
Ethylbenzene	100-41-4	E611A/VA	0.50	µg/L		<0.50	----	----	----	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611A/VA	0.50	µg/L		<0.50	----	----	----	----
Styrene	100-42-5	E611A/VA	0.50	µg/L		<0.50	----	----	----	----
Toluene	108-88-3	E611A/VA	0.50	µg/L		<0.50	----	----	----	----
Xylene, m+p-	179601-23-1	E611A/VA	0.40	µg/L		<0.40	----	----	----	----
Xylene, o-	95-47-6	E611A/VA	0.30	µg/L		<0.30	----	----	----	----
Xylenes, total	1330-20-7	E611A/VA	0.50	µg/L		<0.50	----	----	----	----
Hydrocarbons										
EPH (C10-C19)	----	E601A/VA	250	µg/L		<250	----	----	----	----
EPH (C19-C32)	----	E601A/VA	250	µg/L		<250	----	----	----	----

Analytical Results

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

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: Exfiltration Lagoons 3 & 4	----	----	----	----
					Client sampling date / time: 15-Aug-2023 11:46	----	----	----	----
					VA23B9013-001	--------	--------	--------	--------
					Result	----	----	----	----
Hydrocarbons									
VHw (C6-C10)	----	E581.VH+F1/VA	100	µg/L	<100	----	----	----	----
VPHw	----	EC580A/VA	100	µg/L	<100	----	----	----	----
Hydrocarbons Surrogates									
Bromobenzotrifluoride, 2- (EPH surrogate)	392-83-6	E601A/VA	1.0	%	108	----	----	----	----
Dichlorotoluene, 3,4-	95-75-0	E581.VH+F1/VA	1.0	%	115	----	----	----	----
Volatile Organic Compounds Surrogates									
Bromofluorobenzene, 4-	460-00-4	E611A/VA	1.0	%	90.8	----	----	----	----
Difluorobenzene, 1,4-	540-36-3	E611A/VA	1.0	%	105	----	----	----	----

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

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

Analytical Results

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

Analyte	CAS Number	Method/Lab	LOR	Unit	Travel Blank	----	----	----	----
Client sampling date / time					15-Aug-2023 00:00	----	----	----	----
					VA23B9013-002	--------	--------	--------	--------
					Result	----	----	----	----
Physical Tests									
Conductivity	----	E100/VA	2.0	µS/cm	<2.0	----	----	----	----
pH	----	E108/VA	0.10	pH units	5.21	----	----	----	----
Solids, total suspended [TSS]	----	E160/VA	3.0	mg/L	<3.0	----	----	----	----
pH @ 15°C (WSER)	----	E108A/VA	0.10	pH units	5.93	----	----	----	----
Anions and Nutrients									
Ammonia, total (as N)	7664-41-7	E298/VA	0.0050	mg/L	<0.0050	----	----	----	----
Ammonia, un-ionized (as N), 15°C (WSER)	7664-41-7	EC298/VA	0.0010	mg/L	<0.0010	----	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318/VA	0.050	mg/L	<0.050	----	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3-L/VA	0.0050	mg/L	<0.0050	----	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2-L/VA	0.0010	mg/L	<0.0010	----	----	----	----
Nitrogen, total	7727-37-9	E366/VA	0.030	mg/L	<0.030	----	----	----	----
Phosphorus, total	7723-14-0	E372-U/VA	0.0020	mg/L	<0.0020	----	----	----	----
Aggregate Organics									
Biochemical oxygen demand [BOD]	----	E550/VA	2.0	mg/L	<2.0	----	----	----	----
Carbonaceous biochemical oxygen demand [CBOD]	----	E555/VA	2.0	mg/L	<2.0	----	----	----	----

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

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

ALS Canada Ltd.

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA23B9013**	Page	: 1 of 11
Client	: **Regional District of Kitimat-Stikine**	Laboratory	: ALS Environmental - Vancouver
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 16-Aug-2023 12:30
PO	: ----	Issue Date	: 23-Aug-2023 10:22
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d]										
Exfiltration Lagoons 3 & 4	E550	15-Aug-2023	----	----	----		17-Aug-2023	3 days	2 days	✓
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d]										
Travel Blank	E550	15-Aug-2023	----	----	----		17-Aug-2023	3 days	2 days	✓
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT 3d]										
Exfiltration Lagoons 3 & 4	E555	15-Aug-2023	----	----	----		17-Aug-2023	3 days	2 days	✓
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT 3d]										
Travel Blank	E555	15-Aug-2023	----	----	----		17-Aug-2023	3 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
Exfiltration Lagoons 3 & 4	E298	15-Aug-2023	20-Aug-2023	28 days	5 days	✓	21-Aug-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (lab preserved)										
Travel Blank	E298	15-Aug-2023	18-Aug-2023	3 days	3 days	✓	18-Aug-2023	28 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE										
Exfiltration Lagoons 3 & 4	E235.NO3-L	15-Aug-2023	17-Aug-2023	3 days	2 days	✓	17-Aug-2023	3 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE										
Travel Blank	E235.NO3-L	15-Aug-2023	17-Aug-2023	3 days	2 days	✓	17-Aug-2023	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
Exfiltration Lagoons 3 & 4	E235.NO2-L	15-Aug-2023	17-Aug-2023	3 days	2 days	✓	17-Aug-2023	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
Travel Blank	E235.NO2-L	15-Aug-2023	17-Aug-2023	3 days	2 days	✓	17-Aug-2023	3 days	2 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
Exfiltration Lagoons 3 & 4	E318	15-Aug-2023	20-Aug-2023	28 days	5 days	✓	21-Aug-2023	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (lab preserved)										
Travel Blank	E318	15-Aug-2023	18-Aug-2023	3 days	3 days	✓	19-Aug-2023	28 days	1 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid)										
Exfiltration Lagoons 3 & 4	E366	15-Aug-2023	20-Aug-2023	28 days	5 days	✓	21-Aug-2023	28 days	6 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (lab preserved)										
Travel Blank	E366	15-Aug-2023	18-Aug-2023	3 days	3 days	✓	18-Aug-2023	28 days	0 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
Exfiltration Lagoons 3 & 4	E372-U	15-Aug-2023	20-Aug-2023	28 days	5 days	✓	22-Aug-2023	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (lab preserved)										
Travel Blank	E372-U	15-Aug-2023	18-Aug-2023	3 days	3 days	✓	21-Aug-2023	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
Exfiltration Lagoons 3 & 4	E601A	15-Aug-2023	22-Aug-2023	14 days	7 days	✓	22-Aug-2023	40 days	0 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate)										
Exfiltration Lagoons 3 & 4	E581.VH+F1	15-Aug-2023	20-Aug-2023	14 days	5 days	✓	21-Aug-2023	14 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE										
Exfiltration Lagoons 3 & 4	E100	15-Aug-2023	17-Aug-2023	28 days	2 days	✓	17-Aug-2023	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE										
Travel Blank	E100	15-Aug-2023	17-Aug-2023	28 days	2 days	✓	17-Aug-2023	28 days	2 days	✓
Physical Tests : pH by Meter at 15C (WSER)										
HDPE										
Exfiltration Lagoons 3 & 4	E108A	15-Aug-2023	----	----	----		17-Aug-2023	5 days	2 days	✓
Physical Tests : pH by Meter at 15C (WSER)										
HDPE										
Travel Blank	E108A	15-Aug-2023	----	----	----		17-Aug-2023	5 days	2 days	✓
Physical Tests : pH by Meter										
HDPE										
Travel Blank	E108	15-Aug-2023	17-Aug-2023	0.25 hrs	38 hrs	× EHTR-FM	17-Aug-2023	0.25 hrs	38 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE										
Exfiltration Lagoons 3 & 4	E108	15-Aug-2023	17-Aug-2023	0.25 hrs	41 hrs	× EHTR-FM	17-Aug-2023	0.25 hrs	42 hrs	× EHTR-FM
Physical Tests : TSS by Gravimetry										
HDPE										
Exfiltration Lagoons 3 & 4	E160	15-Aug-2023	----	----	----		21-Aug-2023	7 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : TSS by Gravimetry										
HDPE										
Travel Blank	E160	15-Aug-2023	----	----	----		21-Aug-2023	7 days	6 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate)										
Exfiltration Lagoons 3 & 4	E611A	15-Aug-2023	20-Aug-2023	14 days	5 days	✓	21-Aug-2023	14 days	6 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	1091786	2	11	18.1	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	1089756	1	20	5.0	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	1091072	1	12	8.3	5.0	✓
BTEX by Headspace GC-MS	E611A	1094506	1	4	25.0	5.0	✓
Conductivity in Water	E100	1089123	1	12	8.3	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1089125	1	12	8.3	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1089126	1	12	8.3	5.0	✓
pH by Meter	E108	1089122	1	12	8.3	5.0	✓
pH by Meter at 15C (WSER)	E108A	1089242	1	3	33.3	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1091791	2	11	18.1	5.0	✓
Total Nitrogen by Colourimetry	E366	1091784	2	3	66.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1091785	2	5	40.0	5.0	✓
TSS by Gravimetry	E160	1095645	1	13	7.6	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	1094505	1	4	25.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	1091786	2	11	18.1	5.0	✓
BC PHCs - EPH by GC-FID	E601A	1096413	1	9	11.1	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	1089756	1	20	5.0	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	1091072	1	12	8.3	5.0	✓
BTEX by Headspace GC-MS	E611A	1094506	1	4	25.0	5.0	✓
Conductivity in Water	E100	1089123	1	12	8.3	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1089125	1	12	8.3	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1089126	1	12	8.3	5.0	✓
pH by Meter	E108	1089122	1	12	8.3	5.0	✓
pH by Meter at 15C (WSER)	E108A	1089242	1	3	33.3	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1091791	2	11	18.1	5.0	✓
Total Nitrogen by Colourimetry	E366	1091784	2	3	66.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1091785	2	5	40.0	5.0	✓
TSS by Gravimetry	E160	1095645	1	13	7.6	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	1094505	1	4	25.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	1091786	2	11	18.1	5.0	✓
BC PHCs - EPH by GC-FID	E601A	1096413	1	9	11.1	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	1089756	1	20	5.0	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	1091072	1	12	8.3	5.0	✓

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Method Blanks (MB) - Continued							
BTEX by Headspace GC-MS	E611A	1094506	1	4	25.0	5.0	✓
Conductivity in Water	E100	1089123	1	12	8.3	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1089125	1	12	8.3	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1089126	1	12	8.3	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1091791	2	11	18.1	5.0	✓
Total Nitrogen by Colourimetry	E366	1091784	2	3	66.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1091785	2	5	40.0	5.0	✓
TSS by Gravimetry	E160	1095645	1	13	7.6	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	1094505	1	4	25.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	1091786	2	11	18.1	5.0	✓
BTEX by Headspace GC-MS	E611A	1094506	1	4	25.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1089125	1	12	8.3	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1089126	1	12	8.3	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1091791	2	11	18.1	5.0	✓
Total Nitrogen by Colourimetry	E366	1091784	2	3	66.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1091785	2	5	40.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	1094505	1	4	25.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 ALS Environmental - Vancouver	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 ALS Environmental - Vancouver	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
pH by Meter at 15C (WSER)	E108A ALS Environmental - Vancouver	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at 15 ± 1°C, and is used to calculate Un-Ionized Ammonia for the federal Wastewater Systems Effluent Regulation.
TSS by Gravimetry	E160 ALS Environmental - Vancouver	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L ALS Environmental - Vancouver	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L ALS Environmental - Vancouver	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 ALS Environmental - Vancouver	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 ALS Environmental - Vancouver	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Total Nitrogen by Colourimetry	E366 ALS Environmental - Vancouver	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Biochemical Oxygen Demand - 5 day	E550 ALS Environmental - Vancouver	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555 ALS Environmental - Vancouver	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Nitrification inhibitor is added to samples to prevent nitrogenous compounds from consuming oxygen resulting in only carbonaceous oxygen demand being reported by this method. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
VH and F1 by Headspace GC-FID	E581.VH+F1 ALS Environmental - Vancouver	Water	BC MOE Lab Manual / CCME PHC in Soil - Tier 1 (mod)	Volatile Hydrocarbons (VH and F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law. Analytical methods for CCME Petroleum Hydrocarbons (PHCs) are validated to comply fully with the Reference Method for the Canada-Wide Standard for PHC. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
BC PHCs - EPH by GC-FID	E601A ALS Environmental - Vancouver	Water	BC MOE Lab Manual	Sample extracts are analyzed by GC-FID for BC hydrocarbon fractions.
BTEX by Headspace GC-MS	E611A ALS Environmental - Vancouver	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Un-ionized Ammonia at 15°C, WSER	EC298 ALS Environmental - Vancouver	Water	WSER 29June2012	Un-ionized Ammonia at 15C is calculated from test results for Total Ammonia and for pH at 15C, as per the federal Wastewater Systems Effluent Regulation, and is expressed in units of mg/L "as N".
VPH: VH-BTEX-Styrene	EC580A ALS Environmental - Vancouver	Water	BC MOE Lab Manual (VPH in Water and Solids) (mod)	Volatile Petroleum Hydrocarbons (VPH) is calculated as follows: VPHw = Volatile Hydrocarbons (VH6-10) minus benzene, toluene, ethylbenzene, xylenes (BTEX) and styrene.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 ALS Environmental - Vancouver	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 ALS Environmental - Vancouver	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Digestion for Total Nitrogen in water	EP366 ALS Environmental - Vancouver	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
Digestion for Total Phosphorus in water	EP372 ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
VOCs Preparation for Headspace Analysis	EP581 ALS Environmental - Vancouver	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 ALS Environmental - Vancouver	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

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QUALITY CONTROL REPORT

Work Order	: **VA23B9013**	Page	: 1 of 10
Client	: Regional District of Kitimat-Stikine	Laboratory	: ALS Environmental - Vancouver
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	:	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 16-Aug-2023 12:30
PO	: ----	Date Analysis Commenced	: 17-Aug-2023
C-O-C number	: ----	Issue Date	: 23-Aug-2023 10:22
Sampler	: ---- ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

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

Signatories	*Position*	*Laboratory Department*
Cindy Tang	Team Leader - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Vancouver Organics, Burnaby, British Columbia
Kate Dimitrova	Supervisor - Inorganic	Vancouver Inorganics, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Vancouver Inorganics, Burnaby, British Columbia
Leon Yang	Analsyt	Vancouver Inorganics, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 1089122)											
VA23B9030-003	Anonymous	pH	----	E108	0.10	pH units	7.66	7.70	0.521%	4%	----
Physical Tests (QC Lot: 1089123)											
VA23B9030-003	Anonymous	Conductivity	----	E100	2.0	µS/cm	2780	2780	0.00%	10%	----
Physical Tests (QC Lot: 1089242)											
VA23B9013-001	Exfiltration Lagoons 3 & 4	pH @ 15°C (WSER)	----	E108A	0.10	pH units	7.43	7.47	0.537%	4%	----
Physical Tests (QC Lot: 1095645)											
VA23B8818-001	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	8.7	9.1	0.4	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1089125)											
VA23B9030-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1089126)											
VA23B9030-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1091784)											
VA23B8768-001	Anonymous	Nitrogen, total	7727-37-9	E366	15.0	mg/L	117	120	3.12	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1091785)											
VA23B9013-002	Travel Blank	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1091786)											
VA23B8784-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	7.5 µg/L	0.0070	0.0005	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1091791)											
VA23B8768-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	10.0	mg/L	145	144	1.01%	20%	----
Anions and Nutrients (QC Lot: 1094140)											
VA23B9013-001	Exfiltration Lagoons 3 & 4	Nitrogen, total	7727-37-9	E366	0.600	mg/L	16.2	16.4	1.62%	20%	----
Anions and Nutrients (QC Lot: 1094141)											
VA23B9013-001	Exfiltration Lagoons 3 & 4	Phosphorus, total	7723-14-0	E372-U	0.200	mg/L	5.29	5.24	0.817%	20%	----
Anions and Nutrients (QC Lot: 1094142)											
VA23B9013-001	Exfiltration Lagoons 3 & 4	Ammonia, total (as N)	7664-41-7	E298	0.250	mg/L	12.9	12.2	5.26%	20%	----
Anions and Nutrients (QC Lot: 1094143)											
VA23B9013-001	Exfiltration Lagoons 3 & 4	Kjeldahl nitrogen, total [TKN]	----	E318	0.250	mg/L	16.3	16.2	0.682%	20%	----
Aggregate Organics (QC Lot: 1089756)											
FJ2302021-002	Anonymous	Biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 1091072)											

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Aggregate Organics (QC Lot: 1091072) - continued											
VA23B9013-002	Travel Blank	Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2.0	mg/L	<2.0	<2.0	0.0%	30%	----
Volatile Organic Compounds (QC Lot: 1094506)											
VA23B9013-001	Exfiltration Lagoons 3 & 4	Benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1094505)											
VA23B9013-001	Exfiltration Lagoons 3 & 4	VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0.0%	30%	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 1089123)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 1095645)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 1089125)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1089126)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 1091784)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 1091785)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 1091786)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1091791)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 1094140)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 1094141)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 1094142)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1094143)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Aggregate Organics (QCLot: 1089756)						
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 1091072)						
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	<2.0	----
Volatile Organic Compounds (QCLot: 1094506)						
Benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
Ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	<0.50	----
Styrene	100-42-5	E611A	0.5	µg/L	<0.50	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 1094506) - continued						
Toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
Xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 1094505)						
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----
Hydrocarbons (QCLot: 1096413)						
EPH (C10-C19)	----	E601A	250	µg/L	<250	----
EPH (C19-C32)	----	E601A	250	µg/L	<250	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1089122)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 1089123)									
Conductivity	----	E100	1	µS/cm	146.9 µS/cm	103	90.0	110	----
Physical Tests (QCLot: 1089242)									
pH @ 15°C (WSER)	----	E108A	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 1095645)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	88.8	85.0	115	----
Anions and Nutrients (QCLot: 1089125)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 1089126)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	97.6	90.0	110	----
Anions and Nutrients (QCLot: 1091784)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	98.3	75.0	125	----
Anions and Nutrients (QCLot: 1091785)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	93.0	80.0	120	----
Anions and Nutrients (QCLot: 1091786)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	93.1	85.0	115	----
Anions and Nutrients (QCLot: 1091791)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 1094140)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 1094141)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	90.1	80.0	120	----
Anions and Nutrients (QCLot: 1094142)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	95.8	85.0	115	----
Anions and Nutrients (QCLot: 1094143)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	98.0	75.0	125	----
Aggregate Organics (QCLot: 1089756)									
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	91.8	85.0	115	----
Aggregate Organics (QCLot: 1091072)									

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Aggregate Organics (QCLot: 1091072) - continued									
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	198 mg/L	89.4	85.0	115	----
Volatile Organic Compounds (QCLot: 1094506)									
Benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	99.3	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	98.6	70.0	130	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	100 µg/L	106	70.0	130	----
Styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	92.6	70.0	130	----
Toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	95.3	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	105	70.0	130	----
Xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	98.6	70.0	130	----
Hydrocarbons (QCLot: 1094505)									
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	6310 µg/L	83.4	70.0	130	----
Hydrocarbons (QCLot: 1096413)									
EPH (C10-C19)	----	E601A	250	µg/L	6491 µg/L	111	70.0	130	----
EPH (C19-C32)	----	E601A	250	µg/L	3363 µg/L	109	70.0	130	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 1089125)										
VA23B9030-002	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	2.56 mg/L	2.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 1089126)										
VA23B9030-002	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.492 mg/L	0.5 mg/L	98.5	75.0	125	----
Anions and Nutrients (QCLot: 1091784)										
VA23B9013-002	Travel Blank	Nitrogen, total	7727-37-9	E366	0.394 mg/L	0.4 mg/L	98.4	70.0	130	----
Anions and Nutrients (QCLot: 1091785)										
YL2301039-001	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0444 mg/L	0.05 mg/L	88.9	70.0	130	----
Anions and Nutrients (QCLot: 1091786)										
VA23B9013-002	Travel Blank	Ammonia, total (as N)	7664-41-7	E298	0.0981 mg/L	0.1 mg/L	98.1	75.0	125	----
Anions and Nutrients (QCLot: 1091791)										
VA23B8784-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.49 mg/L	2.5 mg/L	99.5	70.0	130	----
Anions and Nutrients (QCLot: 1094140)										
VA23B9013-001	Exfiltration Lagoons 3 & 4	Nitrogen, total	7727-37-9	E366	ND mg/L	0.4 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 1094141)										
VA23B9013-001	Exfiltration Lagoons 3 & 4	Phosphorus, total	7723-14-0	E372-U	ND mg/L	5 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 1094142)										
VA23B9093-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	MS-B
Anions and Nutrients (QCLot: 1094143)										
VA23B9093-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	12.9 mg/L	2.5 mg/L	104	70.0	130	----
Volatile Organic Compounds (QCLot: 1094506)										
YL2301046-001	Anonymous	Benzene	71-43-2	E611A	102 µg/L	100 µg/L	102	60.0	140	----
		Ethylbenzene	100-41-4	E611A	98.6 µg/L	100 µg/L	98.6	60.0	140	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	105 µg/L	100 µg/L	105	60.0	140	----
		Styrene	100-42-5	E611A	94.5 µg/L	100 µg/L	94.5	60.0	140	----
		Toluene	108-88-3	E611A	95.9 µg/L	100 µg/L	95.9	60.0	140	----
		Xylene, m+p-	179601-23-1	E611A	208 µg/L	200 µg/L	104	60.0	140	----
		Xylene, o-	95-47-6	E611A	99.3 µg/L	100 µg/L	99.3	60.0	140	----
Hydrocarbons (QCLot: 1094505)										

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Hydrocarbons (QCLot: 1094505) - continued										
YL2301050-001	Anonymous	VHw (C6-C10)	----	E581.VH+F1	4950 µg/L	6310 µg/L	78.5	60.0	140	----

Qualifiers

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

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 17 -

Page of

Report To	Contact and company name below will appear on the final report	Report Format / Distribution		Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)	
Company:	Regional District of Kitimat-Stikine	Select Report Format:	☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)	Regular [R]	☑ Standard TAT if received by 3 pm - business days - no surcharges apply
Contact:	Nicole Lavoie	Quality Control (QC) Report with Report	☑ YES ☐ NO	PRIORITY (Business Days)	4 day [P4-20%] ☒
Phone:	250-615-6100	☑ Compare Results to Criteria on Report - provide details below if box checked			3 day [P3-25%] ☐
	Company address below will appear on the final report	Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX		2 day [P2-50%] ☐
Street:	4545 Lazelle Avenue	Email 1 or Fax	enviro.dept@rdks.bc.ca	EMERGENCY	1 Business day [E1 - 100%] ☐
City/Province:	Terrace/BC	Email 2	ckerr@rdks.bc.ca; jkunjumon@rdks.bc.ca		Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐
Postal Code:	V8G4E1	Email 3	pmiller@rdks.bc.ca; jlacroix@rdks.bc.ca	Date and Time Required for all E&P TATs:	
Invoice To	Same as Report To ☑ YES ☐ NO	Invoice Distribution		For tests that can not be performed according to the service level selected, you will be contacted.	
	Copy of Invoice with Report ☑ YES ☐ NO	Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX		
Company:	Regional District of Kitimat-Stikine	Email 1 or Fax	anne-maries@rdks.bc.ca		
Contact:	Nicole Lavoie	Email 2	enviro.dept@rdks.bc.ca		

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	VA22-RDKS100-001	AFE/Cost Center:	PO#
Job #:	Queensway Sewer	Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (lab use only):	B9013	ALS Contact:	Sampler:

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	TSS (by Gravimetry)	Total Ammonia	Total Nitrogen (by Colourimetry 0.03mg/L)	Total Phosphorus (by Colourimetry 0.002 mg	Carbonaceous Biochemical Oxygen Demand	pH	BOD (5 Day)	Specific Conductance	Nitrate, Nitrite	TKN	BTEX/VPH	EPH				SAMPLES ON HOLD	Sample is hazardous (please provide further detail	NUMBER OF CONTAINERS
						P	P	P							P	P						
	Exfiltration Lagoons 3 & 4	15-Aug-23	11:46	Effluent	R	R	R	R	R	R	R	R	R	R	R	R						
	Travel Blank	15-Aug-23	—	Water	R	R	R	R	R	R	R	R	R	R								

Terrace Shipping
1 Coolers Ground ☐
___ Carboys Air ☒
SFX ☐

Environmental Division
Vancouver
Work Order Reference
VA23B9013

Telephone : +1 604 253 4188

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)
Are samples taken from a Regulated DW System? ☐ YES ☑ NO	Federal Wastewater Systems Effluent Regulations (JUN, 2012)
Are samples for human consumption/ use? ☐ YES ☑ NO	Queensway Sewer Custom Criteria for RDKS

SAMPLE CONDITION AS RECE

Frozen ☐ SIF Observations Yes ☐ No ☐
Ice Packs ☑ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐
Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
15.4	17.3			17			

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
Hannah Clinton	August 15/23		M.R	Aug. 15/23	12:30	AB	8/16/23	12:30

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

SEPT 2017 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

CERTIFICATE OF ANALYSIS

Work Order	: **VA23C2499**	Page	: 1 of 3
Client	: **Regional District of Kitimat-Stikine**	Laboratory	: ALS Environmental - Vancouver
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 21-Sep-2023 12:15
PO	: ----	Date Analysis Commenced	: 22-Sep-2023
C-O-C number	: ----	Issue Date	: 03-Oct-2023 16:26
Sampler	: ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

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

General Comments

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

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

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

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

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

Unit	*Description*
µS/cm	microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

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

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

Workorder Comments

Sample(s)001 & 002: EPH and B.TEX vials Containers were not received at laboratory, but requested on Chain of Custody / analytical request form; subsample cannot be obtained from other containers to meet request. The requested analysis cannont be performed.

Analytical Results

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

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: Exfiltration Lagoons 3 & 4	Travel Blank	----	----	----
Client sampling date / time					19-Sep-2023 12:30	19-Sep-2023 00:00	----	----	----
					VA23C2499-001	VA23C2499-002	--------	--------	--------
					Result	Result	----	----	----
Physical Tests									
Conductivity	----	E100/VA	2.0	µS/cm	546	<2.0	----	----	----
pH	----	E108/VA	0.10	pH units	7.95	5.55	----	----	----
Solids, total suspended [TSS]	----	E160/VA	3.0	mg/L	23.5	<3.0	----	----	----
Anions and Nutrients									
Ammonia, total (as N)	7664-41-7	E298/VA	0.0050	mg/L	23.8	<0.0050	----	----	----
Kjeldahl nitrogen, total [TKN]	----	EC318/VA	0.050	mg/L	26.9	<0.050	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3-L/VA	0.0050	mg/L	0.0207	<0.0050	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2-L/VA	0.0010	mg/L	0.0719	<0.0010	----	----	----
Nitrogen, total	7727-37-9	E366/VA	0.030	mg/L	27.0	<0.030	----	----	----
Phosphorus, total	7723-14-0	E372-U/VA	0.0020	mg/L	5.86	<0.0020	----	----	----
Nitrate + Nitrite (as N)	----	EC235.N+N/VA	0.0032	mg/L	0.0926	<0.0051	----	----	----
Aggregate Organics									
Biochemical oxygen demand [BOD]	----	E550/VA	2.0	mg/L	119	<2.0	----	----	----
Carbonaceous biochemical oxygen demand [CBOD]	----	E555/VA	2.0	mg/L	14.0	<2.0	----	----	----

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

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

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA23C2499**	Page	: 1 of 9
Client	: **Regional District of Kitimat-Stikine**	Laboratory	: ALS Environmental - Vancouver
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 21-Sep-2023 12:15
PO	: ----	Issue Date	: 03-Oct-2023 16:27
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers occur - please see following pages for full details.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] Exfiltration Lagoons 3 & 4	E550	19-Sep-2023	----	----	----		22-Sep-2023	3 days	3 days	✓
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] Travel Blank	E550	19-Sep-2023	----	----	----		22-Sep-2023	3 days	3 days	✓
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT 3d] Exfiltration Lagoons 3 & 4	E555	19-Sep-2023	----	----	----		22-Sep-2023	3 days	3 days	✓
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT 3d] Travel Blank	E555	19-Sep-2023	----	----	----		22-Sep-2023	3 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Exfiltration Lagoons 3 & 4	E298	19-Sep-2023	27-Sep-2023	28 days	8 days	✓	29-Sep-2023	28 days	10 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (lab preserved) Travel Blank	E298	19-Sep-2023	22-Sep-2023	3 days	3 days	✓	29-Sep-2023	28 days	7 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE Exfiltration Lagoons 3 & 4	E235.NO3-L	19-Sep-2023	22-Sep-2023	3 days	3 days	✓	22-Sep-2023	3 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE										
Travel Blank	E235.NO3-L	19-Sep-2023	22-Sep-2023	3 days	3 days	✓	22-Sep-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
Exfiltration Lagoons 3 & 4	E235.NO2-L	19-Sep-2023	22-Sep-2023	3 days	3 days	✓	22-Sep-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
Travel Blank	E235.NO2-L	19-Sep-2023	22-Sep-2023	3 days	3 days	✓	22-Sep-2023	3 days	3 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid)										
Exfiltration Lagoons 3 & 4	E366	19-Sep-2023	27-Sep-2023	28 days	8 days	✓	27-Sep-2023	28 days	8 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (lab preserved)										
Travel Blank	E366	19-Sep-2023	22-Sep-2023	3 days	3 days	✓	25-Sep-2023	28 days	3 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
Exfiltration Lagoons 3 & 4	E372-U	19-Sep-2023	27-Sep-2023	28 days	8 days	✓	29-Sep-2023	28 days	10 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (lab preserved)										
Travel Blank	E372-U	19-Sep-2023	22-Sep-2023	3 days	3 days	✓	25-Sep-2023	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE										
Exfiltration Lagoons 3 & 4	E100	19-Sep-2023	22-Sep-2023	28 days	3 days	✓	22-Sep-2023	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE										
Travel Blank	E100	19-Sep-2023	22-Sep-2023	28 days	3 days	✓	22-Sep-2023	28 days	3 days	✓

Matrix: **Water**

Evaluation: ✗ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter										
HDPE										
Travel Blank	E108	19-Sep-2023	22-Sep-2023	0.25 hrs	70 hrs	✗ EHTR-FM	22-Sep-2023	0.25 hrs	71 hrs	✗ EHTR-FM
Physical Tests : pH by Meter										
HDPE										
Exfiltration Lagoons 3 & 4	E108	19-Sep-2023	22-Sep-2023	0.25 hrs	73 hrs	✗ EHTR-FM	22-Sep-2023	0.25 hrs	73 hrs	✗ EHTR-FM
Physical Tests : TSS by Gravimetry										
HDPE										
Exfiltration Lagoons 3 & 4	E160	19-Sep-2023	----	----	----		26-Sep-2023	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE										
Travel Blank	E160	19-Sep-2023	----	----	----		26-Sep-2023	7 days	7 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	1155417	2	21	9.5	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	1148765	1	20	5.0	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	1149334	1	19	5.2	5.0	✓
Conductivity in Water	E100	1148692	1	14	7.1	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1148696	1	12	8.3	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1148697	1	10	10.0	5.0	✓
pH by Meter	E108	1148691	1	17	5.8	5.0	✓
Total Nitrogen by Colourimetry	E366	1155419	2	10	20.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1155416	2	15	13.3	5.0	✓
TSS by Gravimetry	E160	1155106	1	16	6.2	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	1155417	2	21	9.5	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	1148765	1	20	5.0	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	1149334	1	19	5.2	5.0	✓
Conductivity in Water	E100	1148692	1	14	7.1	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1148696	1	12	8.3	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1148697	1	10	10.0	5.0	✓
pH by Meter	E108	1148691	1	17	5.8	5.0	✓
Total Nitrogen by Colourimetry	E366	1155419	2	10	20.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1155416	2	15	13.3	5.0	✓
TSS by Gravimetry	E160	1155106	1	16	6.2	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	1155417	2	21	9.5	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	1148765	1	20	5.0	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	1149334	1	19	5.2	5.0	✓
Conductivity in Water	E100	1148692	1	14	7.1	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1148696	1	12	8.3	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1148697	1	10	10.0	5.0	✓
Total Nitrogen by Colourimetry	E366	1155419	2	10	20.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1155416	2	15	13.3	5.0	✓
TSS by Gravimetry	E160	1155106	1	16	6.2	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	1155417	1	21	4.7	5.0	×
Nitrate in Water by IC (Low Level)	E235.NO3-L	1148696	1	12	8.3	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1148697	1	10	10.0	5.0	✓

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Matrix Spikes (MS) - Continued							
Total Nitrogen by Colourimetry	E366	1155419	1	10	10.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1155416	2	15	13.3	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 ALS Environmental - Vancouver	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 ALS Environmental - Vancouver	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 ALS Environmental - Vancouver	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L ALS Environmental - Vancouver	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L ALS Environmental - Vancouver	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 ALS Environmental - Vancouver	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Nitrogen by Colourimetry	E366 ALS Environmental - Vancouver	Water	Chinchilla Scientific Nitrate Method, 2011	Following digestion, total nitrogen is is determined colourimetrically using a discrete analyzer utilizing the vanadium chloride reduction method. This method of analysis is approved under US EPA 40 CFR Part 136 (May 2021).
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Biochemical Oxygen Demand - 5 day	E550 ALS Environmental - Vancouver	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555 ALS Environmental - Vancouver	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Nitrification inhibitor is added to samples to prevent nitrogenous compounds from consuming oxygen resulting in only carbonaceous oxygen demand being reported by this method. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N ALS Environmental - Vancouver	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Total Kjeldahl Nitrogen (Calculation)	EC318 ALS Environmental - Vancouver	Water	BC MOE LABORATORY MANUAL (2005)	Total Kjeldahl Nitrogen is a calculated parameter. Total Kjeldahl Nitrogen (calc) = Total Nitrogen - [Nitrite (as N) + Nitrate (as N)].

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 ALS Environmental - Vancouver	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for Total Nitrogen in water	EP366 ALS Environmental - Vancouver	Water	APHA 4500-P J (mod)	Samples for total nitrogen analysis are digested using a heated persulfate digestion. Nitrogen compounds are converted to nitrate in this digestion.
Digestion for Total Phosphorus in water	EP372 ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

QUALITY CONTROL REPORT

Work Order	: **VA23C2499**	Page	: 1 of 6
Client	: Regional District of Kitimat-Stikine	Laboratory	: ALS Environmental - Vancouver
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	:	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 21-Sep-2023 12:15
PO	: ----	Date Analysis Commenced	: 22-Sep-2023
C-O-C number	: ----	Issue Date	: 03-Oct-2023 16:27
Sampler	: ---- ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

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

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

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 1148691)											
VA23C2205-004	Anonymous	pH	----	E108	0.10	pH units	7.31	7.32	0.137%	4%	----
Physical Tests (QC Lot: 1148692)											
VA23C2205-004	Anonymous	Conductivity	----	E100	2.0	µS/cm	56.0	55.7	0.537%	10%	----
Physical Tests (QC Lot: 1155106)											
KS2303575-001	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	<3.0	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1148696)											
KS2303561-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	<0.0250	<0.0250	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1148697)											
KS2303561-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1148825)											
VA23C2499-002	Travel Blank	Nitrogen, total	7727-37-9	E366	0.030	mg/L	<0.030	<0.030	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1148826)											
VA23C1990-001	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0128	0.0123	0.0006	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1148827)											
VA23C2499-002	Travel Blank	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1155416)											
FJ2302442-001	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.200	mg/L	4.68	4.88	4.20%	20%	----
Anions and Nutrients (QC Lot: 1155417)											
FJ2302442-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0928	0.0931	0.394%	20%	----
Anions and Nutrients (QC Lot: 1155419)											
KS2303575-001	Anonymous	Nitrogen, total	7727-37-9	E366	0.030	mg/L	0.170	0.171	0.001	Diff <2x LOR	----
Aggregate Organics (QC Lot: 1148765)											
VA23C2329-001	Anonymous	Biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	2.4	<2.0	0.4	Diff <2x LOR	----
Aggregate Organics (QC Lot: 1149334)											
VA23C2499-002	Travel Blank	Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2.0	mg/L	<2.0	<2.0	0.0%	30%	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 1148692)						
Conductivity	----	E100	1	µS/cm	1.1	----
Physical Tests (QCLot: 1155106)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 1148696)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1148697)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 1148825)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 1148826)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 1148827)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1155416)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 1155417)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1155419)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Aggregate Organics (QCLot: 1148765)						
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 1149334)						
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	<2.0	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1148691)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 1148692)									
Conductivity	----	E100	1	µS/cm	146.9 µS/cm	96.1	90.0	110	----
Physical Tests (QCLot: 1155106)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	92.5	85.0	115	----
Anions and Nutrients (QCLot: 1148696)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 1148697)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	98.3	90.0	110	----
Anions and Nutrients (QCLot: 1148825)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	96.2	75.0	125	----
Anions and Nutrients (QCLot: 1148826)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	96.5	80.0	120	----
Anions and Nutrients (QCLot: 1148827)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	87.0	85.0	115	----
Anions and Nutrients (QCLot: 1155416)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	90.9	80.0	120	----
Anions and Nutrients (QCLot: 1155417)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	105	85.0	115	----
Anions and Nutrients (QCLot: 1155419)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	98.0	75.0	125	----
Aggregate Organics (QCLot: 1148765)									
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	104	85.0	115	----
Aggregate Organics (QCLot: 1149334)									
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	198 mg/L	96.5	85.0	115	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 1148696)										
VA23C2041-022	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	124 mg/L	125 mg/L	99.0	75.0	125	----
Anions and Nutrients (QCLot: 1148697)										
VA23C2041-022	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	23.8 mg/L	25 mg/L	95.1	75.0	125	----
Anions and Nutrients (QCLot: 1148826)										
VA23C1990-002	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0484 mg/L	0.05 mg/L	96.9	70.0	130	----
Anions and Nutrients (QCLot: 1155416)										
FJ2302442-002	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0456 mg/L	0.05 mg/L	91.3	70.0	130	----
Anions and Nutrients (QCLot: 1155417)										
FJ2302442-002	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.102 mg/L	0.1 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 1155419)										
KS2303575-002	Anonymous	Nitrogen, total	7727-37-9	E366	0.392 mg/L	0.4 mg/L	98.0	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 17 -

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

Page of

Report To	Contact and company name below will appear on the final report
Company:	Regional District of Kitimat-Stikine
Contact:	Nicole Lavoie
Phone:	250-615-6100
	Company address below will appear on the final report
Street:	4545 Lazelle Avenue
City/Province:	Terrace/BC
Postal Code:	V8G4E1
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	Regional District of Kitimat-Stikine
Contact:	Nicole Lavoie

Report Format / Distribution	
Select Report Format:	☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)
Quality Control (QC) Report with Report	☑ YES ☐ NO
☑ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	enviro.dept@rdks.bc.ca
Email 2	ckerr@rdks.bc.ca; jkunjumon@rdks.bc.ca
Email 3	pmiller@rdks.bc.ca; jlacroix@rdks.bc.ca
Invoice Distribution	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	anne-maries@rdks.bc.ca
Email 2	enviro.dept@rdks.bc.ca

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	VA22-RDKS100-001	AFE/Cost Center:	PO#
Job #:	Queensway Sewer	Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (lab use only):	C2499	ALS Contact:	Sampler:

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days):
- 4 day [P4-20%] ☐
- 3 day [P3-25%] ☐
- 2 day [P2-50%] ☐

EMERGENCY:
- 1 Business day [E1 - 100%] ☐
- Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs:

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	TSS (by Gravimetry)	Total Ammonia	Total Nitrogen (by Colourimetry 0.03mg/L)	Total Phosphorus (by Colourimetry 0.002 mg	Carbonaceous Biochemical Oxygen Demand	pH	BOD (5 Day)	Specific Conductance	Nitrate, Nitrite	TKN	BTEX/VPH	EPH				SAMPLES ON HOLD	Sample is hazardous (please provide further detail	NUMBER OF CONTAINERS
					P	P	P	P							P	P						
	Exfiltration Lagoons 3 & 4	19-Sep-23	12:30	Effluent	R	R	R	R	R	R	R	R	R	R	R	R						
	Travel Blank	19-Sep-23	-	Water	R	R	R	R	R	R	R	R	R	R	R	R						

Terrace Shipping
1 Coolers
___ Carboys
Ground ☐
Air ☒
SFX ☐

Environmental Division
Vancouver
Work Order Reference
VA23C2499

Telephone : +1 604 253 1188

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on (electronic COC only)
Are samples taken from a Regulated DW System? ☐ YES ☑ NO	Federal Wastewater Systems Effluent Regulations (JUN, 2012)
Are samples for human consumption/ use? ☐ YES ☑ NO	Queensway Sewer Custom Criteria for RDKS

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen	☐	SIF Observations	Yes ☐	No	☐
Ice Packs	☑	Ice Cubes ☐	Custody seal intact	Yes ☐	No ☐
Cooling Initiated	☐				

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
5.5	5.6						12 C

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: Hannah Skinner	Date: Sept. 20.2023	Time:	Received by: CC	Date: 9-20-23	Time: 17:00	Received by: SP	Date: 21/9/23	Time: 12:15pm

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

SEPT 2017 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

CERTIFICATE OF ANALYSIS

Work Order	: **VA23C4565**	Page	: 1 of 3
Client	: **Regional District of Kitimat-Stikine**	Laboratory	: ALS Environmental - Vancouver
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 13-Oct-2023 13:30
PO	: ----	Date Analysis Commenced	: 14-Oct-2023
C-O-C number	: ----	Issue Date	: 24-Oct-2023 12:51
Sampler	: ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Courtney Cox	Analsyt	Inorganics, Burnaby, British Columbia
Kate Dimitrova	Supervisor - Inorganic	Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia

General Comments

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

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

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

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

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

Unit	*Description*
µS/cm	microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

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

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

Qualifiers

Qualifier	*Description*
BODP	*BOD dilution results differed by more than 30% RPD. Precision of reported BOD result may be less than usual.*

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	F1	Field Blank	----	----	----
				Client sampling date / time	12-Oct-2023 10:20	12-Oct-2023 10:20	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	VA23C4565-001	VA23C4565-002	--------	--------	--------
					Result	Result	----	----	----
Physical Tests									
Conductivity	----	E100/VA	2.0	µS/cm	572	<2.0	----	----	----
pH	----	E108/VA	0.10	pH units	7.70	6.26	----	----	----
Solids, total suspended [TSS]	----	E160/VA	3.0	mg/L	37.0	<3.0	----	----	----
Anions and Nutrients									
Ammonia, total (as N)	7664-41-7	E298/VA	0.0050	mg/L	29.6	<0.0050	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318/VA	0.050	mg/L	29.7	<0.050	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3-L/VA	0.0050	mg/L	0.0812	<0.0050	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2-L/VA	0.0010	mg/L	0.427	<0.0010	----	----	----
Nitrogen, total	7727-37-9	E366/VA	0.030	mg/L	29.0	<0.030	----	----	----
Phosphorus, total	7723-14-0	E372-U/VA	0.0020	mg/L	5.64	<0.0020	----	----	----
Aggregate Organics									
Biochemical oxygen demand [BOD]	----	E550/VA	2.0	mg/L	163	<2.0	----	----	----
Carbonaceous biochemical oxygen demand [CBOD]	----	E555/VA	2.0	mg/L	21.5 BODP	<2.0	----	----	----

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

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

ALS Canada Ltd.

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA23C4565**	Page	: 1 of 9
Client	: **Regional District of Kitimat-Stikine**	Laboratory	: ALS Environmental - Vancouver
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 13-Oct-2023 13:30
PO	: ----	Issue Date	: 24-Oct-2023 12:52
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] F1	E550	12-Oct-2023	----	----	----		15-Oct-2023	3 days	3 days	✓
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] Field Blank	E550	12-Oct-2023	----	----	----		15-Oct-2023	3 days	3 days	✓
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT 3d] F1	E555	12-Oct-2023	----	----	----		15-Oct-2023	3 days	3 days	✓
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT 3d] Field Blank	E555	12-Oct-2023	----	----	----		15-Oct-2023	3 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) F1	E298	12-Oct-2023	19-Oct-2023	28 days	7 days	✓	21-Oct-2023	28 days	9 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (lab preserved) Field Blank	E298	12-Oct-2023	14-Oct-2023	3 days	2 days	✓	16-Oct-2023	28 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE F1	E235.NO3-L	12-Oct-2023	15-Oct-2023	3 days	3 days	✓	15-Oct-2023	3 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE										
Field Blank	E235.NO3-L	12-Oct-2023	15-Oct-2023	3 days	3 days	✓	15-Oct-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
F1	E235.NO2-L	12-Oct-2023	15-Oct-2023	3 days	3 days	✓	15-Oct-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
Field Blank	E235.NO2-L	12-Oct-2023	15-Oct-2023	3 days	3 days	✓	15-Oct-2023	3 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
F1	E318	12-Oct-2023	19-Oct-2023	28 days	7 days	✓	20-Oct-2023	28 days	8 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (lab preserved)										
Field Blank	E318	12-Oct-2023	14-Oct-2023	3 days	2 days	✓	17-Oct-2023	28 days	3 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid)										
F1	E366	12-Oct-2023	19-Oct-2023	28 days	7 days	✓	20-Oct-2023	28 days	8 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (lab preserved)										
Field Blank	E366	12-Oct-2023	14-Oct-2023	3 days	2 days	✓	16-Oct-2023	28 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
F1	E372-U	12-Oct-2023	19-Oct-2023	28 days	7 days	✓	20-Oct-2023	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (lab preserved)										
Field Blank	E372-U	12-Oct-2023	14-Oct-2023	3 days	2 days	✓	16-Oct-2023	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE F1	E100	12-Oct-2023	15-Oct-2023	28 days	3 days	✓	15-Oct-2023	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE Field Blank	E100	12-Oct-2023	15-Oct-2023	28 days	3 days	✓	15-Oct-2023	28 days	3 days	✓
Physical Tests : pH by Meter										
HDPE F1	E108	12-Oct-2023	15-Oct-2023	0.25 hrs	73 hrs	× EHTR-FM	15-Oct-2023	0.25 hrs	74 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE Field Blank	E108	12-Oct-2023	15-Oct-2023	0.25 hrs	73 hrs	× EHTR-FM	15-Oct-2023	0.25 hrs	74 hrs	× EHTR-FM
Physical Tests : TSS by Gravimetry										
HDPE F1	E160	12-Oct-2023	----	----	----		19-Oct-2023	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE Field Blank	E160	12-Oct-2023	----	----	----		19-Oct-2023	7 days	7 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	1185373	2	26	7.6	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	1186074	1	8	12.5	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	1186072	1	9	11.1	5.0	✓
Conductivity in Water	E100	1186252	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1186257	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1186258	1	20	5.0	5.0	✓
pH by Meter	E108	1186251	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1185374	2	11	18.1	5.0	✓
Total Nitrogen by Colourimetry	E366	1185372	2	14	14.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1185371	2	28	7.1	5.0	✓
TSS by Gravimetry	E160	1193373	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	1185373	2	26	7.6	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	1186074	1	8	12.5	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	1186072	1	9	11.1	5.0	✓
Conductivity in Water	E100	1186252	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1186257	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1186258	1	20	5.0	5.0	✓
pH by Meter	E108	1186251	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1185374	2	11	18.1	5.0	✓
Total Nitrogen by Colourimetry	E366	1185372	2	14	14.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1185371	2	28	7.1	5.0	✓
TSS by Gravimetry	E160	1193373	1	20	5.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	1185373	2	26	7.6	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	1186074	1	8	12.5	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	1186072	1	9	11.1	5.0	✓
Conductivity in Water	E100	1186252	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1186257	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1186258	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1185374	2	11	18.1	5.0	✓
Total Nitrogen by Colourimetry	E366	1185372	2	14	14.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1185371	2	28	7.1	5.0	✓
TSS by Gravimetry	E160	1193373	1	20	5.0	5.0	✓
Matrix Spikes (MS)							

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Matrix Spikes (MS) - Continued							
Ammonia by Fluorescence	E298	1185373	2	26	7.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1186257	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1186258	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1185374	2	11	18.1	5.0	✓
Total Nitrogen by Colourimetry	E366	1185372	2	14	14.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1185371	2	28	7.1	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 ALS Environmental - Vancouver	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 ALS Environmental - Vancouver	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 ALS Environmental - Vancouver	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L ALS Environmental - Vancouver	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L ALS Environmental - Vancouver	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 ALS Environmental - Vancouver	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 ALS Environmental - Vancouver	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Total Nitrogen by Colourimetry	E366 ALS Environmental - Vancouver	Water	Chinchilla Scientific Nitrate Method, 2011	Following digestion, total nitrogen is is determined colourimetrically using a discrete analyzer utilizing the vanadium chloride reduction method. This method of analysis is approved under US EPA 40 CFR Part 136 (May 2021).
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Biochemical Oxygen Demand - 5 day	E550 ALS Environmental - Vancouver	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555 ALS Environmental - Vancouver	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Nitrification inhibitor is added to samples to prevent nitrogenous compounds from consuming oxygen resulting in only carbonaceous oxygen demand being reported by this method. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 ALS Environmental - Vancouver	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 ALS Environmental - Vancouver	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Digestion for Total Nitrogen in water	EP366 ALS Environmental - Vancouver	Water	APHA 4500-P J (mod)	Samples for total nitrogen analysis are digested using a heated persulfate digestion. Nitrogen compounds are converted to nitrate in this digestion.
Digestion for Total Phosphorus in water	EP372 ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

QUALITY CONTROL REPORT

Work Order	: **VA23C4565**	Page	: 1 of 6
Client	: Regional District of Kitimat-Stikine	Laboratory	: ALS Environmental - Vancouver
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	:	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 13-Oct-2023 13:30
PO	: ----	Date Analysis Commenced	: 14-Oct-2023
C-O-C number	: ----	Issue Date	: 24-Oct-2023 12:51
Sampler	: ---- ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

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

Signatories	*Position*	*Laboratory Department*
Courtney Cox	Analsyt	Vancouver Inorganics, Burnaby, British Columbia
Kate Dimitrova	Supervisor - Inorganic	Vancouver Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Vancouver Inorganics, Burnaby, British Columbia

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 1186251)											
VA23C4484-003	Anonymous	pH	----	E108	0.10	pH units	7.20	7.21	0.139%	4%	----
Physical Tests (QC Lot: 1186252)											
VA23C4484-003	Anonymous	Conductivity	----	E100	2.0	µS/cm	3410	3400	0.294%	10%	----
Physical Tests (QC Lot: 1193373)											
VA23C4493-004	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	152	149	1.72%	20%	----
Anions and Nutrients (QC Lot: 1185371)											
FJ2302707-001	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0077	0.0076	0.00004	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1185372)											
VA23C4504-001	Anonymous	Nitrogen, total	7727-37-9	E366	0.030	mg/L	<0.030	<0.030	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1185373)											
FJ2302707-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0074	0.0072	0.0002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1185374)											
FJ2302707-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.147	0.119	0.028	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1186257)											
VA23C4484-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0500	mg/L	4.32	4.30	0.385%	20%	----
Anions and Nutrients (QC Lot: 1186258)											
VA23C4484-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1194321)											
KS2304017-007	Anonymous	Nitrogen, total	7727-37-9	E366	0.030	mg/L	<0.030	<0.030	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1194323)											
KS2303950-005	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0250	mg/L	1.22	1.23	1.01%	20%	----
Anions and Nutrients (QC Lot: 1194327)											
KS2303950-005	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.200	mg/L	2.29	2.27	0.653%	20%	----
Anions and Nutrients (QC Lot: 1194328)											
VA23C4507-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.150	0.137	0.012	Diff <2x LOR	----
Aggregate Organics (QC Lot: 1186072)											
WR2301298-001	Anonymous	Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2.0	mg/L	<2.0	<2.0	0.0%	30%	----
Aggregate Organics (QC Lot: 1186074)											
VA23C4379-003	Anonymous	Biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 1186252)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 1193373)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 1185371)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 1185372)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 1185373)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1185374)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 1186257)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1186258)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 1194321)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 1194323)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1194327)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 1194328)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Aggregate Organics (QCLot: 1186072)						
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 1186074)						
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1186251)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 1186252)									
Conductivity	----	E100	1	µS/cm	146.9 µS/cm	98.3	90.0	110	----
Physical Tests (QCLot: 1193373)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	90.9	85.0	115	----
Anions and Nutrients (QCLot: 1185371)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	90.8	80.0	120	----
Anions and Nutrients (QCLot: 1185372)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	96.1	75.0	125	----
Anions and Nutrients (QCLot: 1185373)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	97.0	85.0	115	----
Anions and Nutrients (QCLot: 1185374)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 1186257)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 1186258)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 1194321)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	95.5	75.0	125	----
Anions and Nutrients (QCLot: 1194323)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	109	85.0	115	----
Anions and Nutrients (QCLot: 1194327)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	91.9	80.0	120	----
Anions and Nutrients (QCLot: 1194328)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	92.6	75.0	125	----
Aggregate Organics (QCLot: 1186072)									
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	198 mg/L	104	85.0	115	----
Aggregate Organics (QCLot: 1186074)									
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	104	85.0	115	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 1185371)										
VA23C4493-001	Anonymous	Phosphorus, total	7723-14-0	E372-U	ND mg/L	0.05 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 1185372)										
VA23C4504-002	Anonymous	Nitrogen, total	7727-37-9	E366	0.413 mg/L	0.4 mg/L	103	70.0	130	----
Anions and Nutrients (QCLot: 1185373)										
VA23C4114-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.100 mg/L	0.1 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 1185374)										
VA23C4504-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.58 mg/L	2.5 mg/L	103	70.0	130	----
Anions and Nutrients (QCLot: 1186257)										
VA23C4484-002	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	12.8 mg/L	12.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 1186258)										
VA23C4484-002	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	2.56 mg/L	2.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 1194321)										
VA23C4519-001	Anonymous	Nitrogen, total	7727-37-9	E366	0.403 mg/L	0.4 mg/L	101	70.0	130	----
Anions and Nutrients (QCLot: 1194323)										
KS2304017-007	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.110 mg/L	0.1 mg/L	110	75.0	125	----
Anions and Nutrients (QCLot: 1194327)										
KS2304017-007	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0468 mg/L	0.05 mg/L	93.6	70.0	130	----
Anions and Nutrients (QCLot: 1194328)										
VA23C4565-001	F1	Kjeldahl nitrogen, total [TKN]	----	E318	ND mg/L	2.5 mg/L	ND	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 17 -

Page of

Report To	Contact and company name below will appear on the final report
Company:	Regional District of Kitimat-Stikine
Contact:	Nicole Lavoie
Phone:	250-615-6100
	Company address below will appear on the final report
Street:	4545 Lazelle Avenue
City/Province:	Terrace/BC
Postal Code:	V8G4E1
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	Regional District of Kitimat-Stikine
Contact:	Nicole Lavoie

Report Format / Distribution	
Select Report Format:	☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)
Quality Control (QC) Report with Report	☑ YES ☐ NO
☑ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	enviro.dept@rdks.bc.ca
Email 2	ckerr@rdks.bc.ca; jkunjumon@rdks.bc.ca
Email 3	pmiller@rdks.bc.ca; jlacroix@rdks.bc.ca

Invoice Distribution	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	anne-maries@rdks.bc.ca
Email 2	enviro.dept@rdks.bc.ca

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	VA22-RDKS100-001	AFE/Cost Center:	PO#
Job #:	Queensway Sewer	Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (lab use only):		ALS Contact:	Sampler:

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days)
- 4 day [P4-20%] ☐
- 3 day [P3-25%] ☐
- 2 day [P2-50%] ☐

EMERGENCY
- 1 Business day [E1 - 100%] ☐
- Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs:

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	TSS (by Gravimetry)	Total Ammonia	Total Nitrogen (by Colourimetry 0.03mg/L)	Total Phosphorus (by Colourimetry 0.002 mg/L)	Carbonaceous Biochemical Oxygen Demand	pH	BOD (5 Day)	Specific Conductance	Nitrate, Nitrite	TKN	SAMPLES ON HOLD	Sample is hazardous (please provide further detail)	NUMBER OF CONTAINERS
						P	P	P					P	P			
	F1	12-Oct-23	10:20	Water	R	R	R	R	R	R	R	R	R	R			
	Field Blank	12-Oct-23	--	Water	R	R	R	R	R	R	R	R	R	R			

Environmental Division
Vancouver
Work Order Reference
VA23C4565

Telephone : +1 604 253 4188

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)
Are samples taken from a Regulated DW System? ☐ YES ☑ NO	Federal Wastewater Systems Effluent Regulations (JUN, 2012)
Are samples for human consumption/ use? ☐ YES ☑ NO	Queensway Sewer Custom Criteria for RDKS

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐
Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐
Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
11.6	13.1						

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:
	October 12, 2023			10-12-23	11AM	

Rcvd jc 13Oct23 5 °C 1330pm ice

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

CERTIFICATE OF ANALYSIS

Work Order	: **VA23C7867**	Page	: 1 of 3
Client	: **Regional District of Kitimat-Stikine**	Laboratory	: ALS Environmental - Vancouver
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 18-Nov-2023 12:50
PO	: ----	Date Analysis Commenced	: 19-Nov-2023
C-O-C number	: ----	Issue Date	: 27-Nov-2023 17:14
Sampler	: ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Brieanna Allen	Production/Validation Manager	Inorganics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Inorganics, Burnaby, British Columbia

General Comments

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

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

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

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

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

Unit	*Description*
µS/cm	microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

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

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

Analytical Results

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

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: F1	DUP	----	----	----
					Client sampling date / time: 17-Nov-2023 10:40	17-Nov-2023 12:00	----	----	----
					VA23C7867-001	VA23C7867-002	--------	--------	--------
					Result	Result	----	----	----
Physical Tests									
Conductivity	----	E100/VA	2.0	µS/cm	613	615	----	----	----
pH	----	E108/VA	0.10	pH units	8.08	8.09	----	----	----
Solids, total suspended [TSS]	----	E160/VA	3.0	mg/L	8.0	9.2	----	----	----
Anions and Nutrients									
Ammonia, total (as N)	7664-41-7	E298/VA	0.0050	mg/L	32.3	34.3	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318/VA	0.050	mg/L	35.6	35.8	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3-L/VA	0.0050	mg/L	0.186	0.184	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2-L/VA	0.0010	mg/L	0.634	0.637	----	----	----
Nitrogen, total	7727-37-9	E366/VA	0.030	mg/L	36.7	37.9	----	----	----
Phosphorus, total	7723-14-0	E372-U/VA	0.0020	mg/L	5.27	5.61	----	----	----
Aggregate Organics									
Biochemical oxygen demand [BOD]	----	E550/VA	2.0	mg/L	66.3	60.1	----	----	----
Carbonaceous biochemical oxygen demand [CBOD]	----	E555/VA	2.0	mg/L	6.1	5.9	----	----	----

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

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

ALS Canada Ltd.

right solutions.
right partner.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA23C7867**	Page	: 1 of 9
Client	: **Regional District of Kitimat-Stikine**	Laboratory	: ALS Environmental - Vancouver
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 18-Nov-2023 12:50
PO	: ----	Issue Date	: 27-Nov-2023 17:14
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times* Rec	*Holding Times* Actual	*Eval*	*Analysis Date*	*Holding Times* Rec	*Holding Times* Actual	*Eval*
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] DUP	E550	17-Nov-2023	----	----	----		19-Nov-2023	3 days	2 days	✓
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] F1	E550	17-Nov-2023	----	----	----		19-Nov-2023	3 days	2 days	✓
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT 3d] DUP	E555	17-Nov-2023	----	----	----		19-Nov-2023	3 days	2 days	✓
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT 3d] F1	E555	17-Nov-2023	----	----	----		19-Nov-2023	3 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) F1	E298	17-Nov-2023	23-Nov-2023	28 days	6 days	✓	25-Nov-2023	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (lab preserved) DUP	E298	17-Nov-2023	20-Nov-2023	3 days	3 days	✓	23-Nov-2023	28 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE DUP	E235.NO3-L	17-Nov-2023	19-Nov-2023	3 days	2 days	✓	19-Nov-2023	3 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE										
F1	E235.NO3-L	17-Nov-2023	19-Nov-2023	3 days	2 days	✓	19-Nov-2023	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
DUP	E235.NO2-L	17-Nov-2023	19-Nov-2023	3 days	2 days	✓	19-Nov-2023	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
F1	E235.NO2-L	17-Nov-2023	19-Nov-2023	3 days	2 days	✓	19-Nov-2023	3 days	2 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
F1	E318	17-Nov-2023	23-Nov-2023	28 days	6 days	✓	24-Nov-2023	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (lab preserved)										
DUP	E318	17-Nov-2023	20-Nov-2023	3 days	3 days	✓	22-Nov-2023	28 days	2 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid)										
F1	E366	17-Nov-2023	23-Nov-2023	28 days	6 days	✓	24-Nov-2023	28 days	7 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (lab preserved)										
DUP	E366	17-Nov-2023	20-Nov-2023	3 days	3 days	✓	22-Nov-2023	28 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
F1	E372-U	17-Nov-2023	23-Nov-2023	28 days	6 days	✓	24-Nov-2023	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (lab preserved)										
DUP	E372-U	17-Nov-2023	20-Nov-2023	3 days	3 days	✓	21-Nov-2023	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE DUP	E100	17-Nov-2023	19-Nov-2023	28 days	2 days	✓	20-Nov-2023	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE F1	E100	17-Nov-2023	19-Nov-2023	28 days	2 days	✓	20-Nov-2023	28 days	3 days	✓
Physical Tests : pH by Meter										
HDPE DUP	E108	17-Nov-2023	19-Nov-2023	0.25 hrs	51 hrs	× EHTR-FM	20-Nov-2023	0.25 hrs	66 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE F1	E108	17-Nov-2023	19-Nov-2023	0.25 hrs	53 hrs	× EHTR-FM	20-Nov-2023	0.25 hrs	67 hrs	× EHTR-FM
Physical Tests : TSS by Gravimetry										
HDPE DUP	E160	17-Nov-2023	----	----	----		22-Nov-2023	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE F1	E160	17-Nov-2023	----	----	----		22-Nov-2023	7 days	5 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	1244425	2	34	5.8	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	1243736	1	12	8.3	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	1243738	1	2	50.0	5.0	✓
Conductivity in Water	E100	1244013	1	14	7.1	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1244001	1	18	5.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1244002	1	19	5.2	5.0	✓
pH by Meter	E108	1244012	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1244426	2	27	7.4	5.0	✓
Total Nitrogen by Colourimetry	E366	1244423	2	26	7.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1244424	2	34	5.8	5.0	✓
TSS by Gravimetry	E160	1248353	1	19	5.2	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	1244425	2	34	5.8	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	1243736	1	12	8.3	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	1243738	1	2	50.0	5.0	✓
Conductivity in Water	E100	1244013	1	14	7.1	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1244001	1	18	5.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1244002	1	19	5.2	5.0	✓
pH by Meter	E108	1244012	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1244426	2	27	7.4	5.0	✓
Total Nitrogen by Colourimetry	E366	1244423	2	26	7.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1244424	2	34	5.8	5.0	✓
TSS by Gravimetry	E160	1248353	1	19	5.2	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	1244425	2	34	5.8	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	1243736	1	12	8.3	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	1243738	1	2	50.0	5.0	✓
Conductivity in Water	E100	1244013	1	14	7.1	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1244001	1	18	5.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1244002	1	19	5.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1244426	2	27	7.4	5.0	✓
Total Nitrogen by Colourimetry	E366	1244423	2	26	7.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1244424	2	34	5.8	5.0	✓
TSS by Gravimetry	E160	1248353	1	19	5.2	5.0	✓
Matrix Spikes (MS)							

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Matrix Spikes (MS) - Continued							
Ammonia by Fluorescence	E298	1244425	2	34	5.8	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1244001	1	18	5.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1244002	1	19	5.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1244426	2	27	7.4	5.0	✓
Total Nitrogen by Colourimetry	E366	1244423	2	26	7.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1244424	2	34	5.8	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 ALS Environmental - Vancouver	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 ALS Environmental - Vancouver	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 ALS Environmental - Vancouver	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L ALS Environmental - Vancouver	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L ALS Environmental - Vancouver	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 ALS Environmental - Vancouver	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 ALS Environmental - Vancouver	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Total Nitrogen by Colourimetry	E366 ALS Environmental - Vancouver	Water	Chinchilla Scientific Nitrate Method, 2011	Following digestion, total nitrogen is is determined colourimetrically using a discrete analyzer utilizing the vanadium chloride reduction method. This method of analysis is approved under US EPA 40 CFR Part 136 (May 2021).
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Biochemical Oxygen Demand - 5 day	E550 ALS Environmental - Vancouver	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555 ALS Environmental - Vancouver	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Nitrification inhibitor is added to samples to prevent nitrogenous compounds from consuming oxygen resulting in only carbonaceous oxygen demand being reported by this method. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 ALS Environmental - Vancouver	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 ALS Environmental - Vancouver	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Digestion for Total Nitrogen in water	EP366 ALS Environmental - Vancouver	Water	APHA 4500-P J (mod)	Samples for total nitrogen analysis are digested using a heated persulfate digestion. Nitrogen compounds are converted to nitrate in this digestion.
Digestion for Total Phosphorus in water	EP372 ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

QUALITY CONTROL REPORT

Work Order	: **VA23C7867**	Page	: 1 of 6
Client	: Regional District of Kitimat-Stikine	Laboratory	: ALS Environmental - Vancouver
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	:	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 18-Nov-2023 12:50
PO	: ----	Date Analysis Commenced	: 19-Nov-2023
C-O-C number	: ----	Issue Date	: 27-Nov-2023 17:14
Sampler	: ---- ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

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

Signatories	*Position*	*Laboratory Department*
Brieanna Allen	Production/Validation Manager	Vancouver Inorganics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Inorganics, Burnaby, British Columbia

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 1244012)											
WR2301489-003	Anonymous	pH	----	E108	0.10	pH units	7.56	7.59	0.396%	4%	----
Physical Tests (QC Lot: 1244013)											
WR2301489-003	Anonymous	Conductivity	----	E100	2.0	µS/cm	893	892	0.112%	10%	----
Physical Tests (QC Lot: 1248353)											
VA23C7837-001	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	14.6	15.2	0.6	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1244001)											
WR2301489-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0500	mg/L	<0.0500	<0.0500	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1244002)											
WR2301489-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1244423)											
VA23C7267-003	Anonymous	Nitrogen, total	7727-37-9	E366	0.030	mg/L	0.364	0.362	0.731%	20%	----
Anions and Nutrients (QC Lot: 1244424)											
VA23C7267-003	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0155	0.0151	0.0003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1244425)											
VA23C7267-003	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0109	0.0124	0.0014	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1244426)											
VA23C7301-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	1.16	1.21	4.93%	20%	----
Anions and Nutrients (QC Lot: 1249276)											
VA23C7865-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.476	0.395	0.081	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1249277)											
VA23C7865-001	Anonymous	Nitrogen, total	7727-37-9	E366	0.150	mg/L	4.34	4.39	1.07%	20%	----
Anions and Nutrients (QC Lot: 1249278)											
VA23C7793-016	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0044	0.0045	0.0001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1249279)											
VA23C7793-016	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0746	0.0752	0.844%	20%	----
Aggregate Organics (QC Lot: 1243736)											
VA23C7834-001	Anonymous	Biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 1243738)											
VA23C7867-001	F1	Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2.0	mg/L	6.1	5.9	3.3%	30%	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 1244013)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 1248353)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 1244001)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1244002)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 1244423)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 1244424)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 1244425)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1244426)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 1249276)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 1249277)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 1249278)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 1249279)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Aggregate Organics (QCLot: 1243736)						
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 1243738)						
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	<2.0	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1244012)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 1244013)									
Conductivity	----	E100	1	µS/cm	146.9 µS/cm	98.5	90.0	110	----
Physical Tests (QCLot: 1248353)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	107	85.0	115	----
Anions and Nutrients (QCLot: 1244001)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 1244002)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	99.9	90.0	110	----
Anions and Nutrients (QCLot: 1244423)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	109	75.0	125	----
Anions and Nutrients (QCLot: 1244424)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	90.8	80.0	120	----
Anions and Nutrients (QCLot: 1244425)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	97.4	85.0	115	----
Anions and Nutrients (QCLot: 1244426)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	97.8	75.0	125	----
Anions and Nutrients (QCLot: 1249276)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	98.3	75.0	125	----
Anions and Nutrients (QCLot: 1249277)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	99.4	75.0	125	----
Anions and Nutrients (QCLot: 1249278)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	87.5	80.0	120	----
Anions and Nutrients (QCLot: 1249279)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	95.9	85.0	115	----
Aggregate Organics (QCLot: 1243736)									
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	94.3	85.0	115	----
Aggregate Organics (QCLot: 1243738)									
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	198 mg/L	97.3	85.0	115	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 1244001)										
WR2301489-002	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	25.5 mg/L	25 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 1244002)										
WR2301489-002	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	5.03 mg/L	5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 1244423)										
VA23C7267-004	Anonymous	Nitrogen, total	7727-37-9	E366	0.368 mg/L	0.4 mg/L	92.0	70.0	130	----
Anions and Nutrients (QCLot: 1244424)										
VA23C7267-004	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0453 mg/L	0.05 mg/L	90.6	70.0	130	----
Anions and Nutrients (QCLot: 1244425)										
VA23C7267-004	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0936 mg/L	0.1 mg/L	93.6	75.0	125	----
Anions and Nutrients (QCLot: 1244426)										
VA23C7301-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.42 mg/L	2.5 mg/L	96.6	70.0	130	----
Anions and Nutrients (QCLot: 1249276)										
VA23C7866-012	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.51 mg/L	2.5 mg/L	100	70.0	130	----
Anions and Nutrients (QCLot: 1249277)										
VA23C7867-001	F1	Nitrogen, total	7727-37-9	E366	ND mg/L	0.4 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 1249278)										
VA23C7793-017	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0452 mg/L	0.05 mg/L	90.4	70.0	130	----
Anions and Nutrients (QCLot: 1249279)										
VA23C7793-017	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0913 mg/L	0.1 mg/L	91.3	75.0	125	----

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 17 -

Page of

Report To	Contact and company name below will appear on the final report
Company:	Regional District of Kitimat-Stikine
Contact:	Nicole Lavoie
Phone:	250-615-6100
	Company address below will appear on the final report
Street:	4545 Lazelle Avenue
City/Province:	Terrace/BC
Postal Code:	V8G4E1
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	Regional District of Kitimat-Stikine
Contact:	Nicole Lavoie

Report Format / Distribution	
Select Report Format:	☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)
Quality Control (QC) Report with Report	☑ YES ☐ NO
☑ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	enviro.dept@rdks.bc.ca
Email 2	ckerr@rdks.bc.ca; jkunjumon@rdks.bc.ca
Email 3	pmiller@rdks.bc.ca; jlacroix@rdks.bc.ca

Invoice Distribution	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	anne-maries@rdks.bc.ca
Email 2	enviro.dept@rdks.bc.ca

Project Information	
ALS Account # / Quote #:	VA22-RDKS100-001
Job #:	Queensway Sewer
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)		
AFE/Cost Center:		PO#
Major/Minor Code:		Routing Code:
Requisitioner:		
Location:		

ALS Lab Work Order # (lab use only):

ALS Contact:

Sampler:

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days)
- 4 day [P4-20%] ☐
- 3 day [P3-25%] ☐
- 2 day [P2-50%] ☐

EMERGENCY
- 1 Business day [E1 - 100%] ☐
- Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs:

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	TSS (by Gravimetry)	Total Ammonia	Total Nitrogen (by Colourimetry 0.03mg/L)	Total Phosphorus (by Colourimetry 0.002 mg	Carbonaceous Biochemical Oxygen Demand	pH	BOD (5 Day)	Specific Conductance	Nitrate, Nitrite	TKN						SAMPLES ON HOLD	Sample is hazardous (please provide further detail	NUMBER OF CONTAINERS
						P	P	P					P	P								
	F1	17-Nov-23	10:40	Water	R	R	R	R	R	R	R	R	R	R								
	DUP	17-Nov-23	12:00	Water	R	R	R	R	R	R	R	R	R	R								

Terrace Shipping
#1 Coolers
#___ Carboys
Ground ☐
Air ☒
SFX ☐

Environmental Division
Vancouver
Work Order Reference
VA23C7867

Telephone : +1 604 253 4188

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-d (electronic COC only)
Are samples taken from a Regulated DW System? ☐ YES ☑ NO	Federal Wastewater Systems Effluent Regulations (JUN, 2012)
Are samples for human consumption/ use? ☐ YES ☑ NO	Queensway Sewer Custom Criteria for RDKS

E CONDITION AS RECEIVED (lab use only)

SIF Observations Yes ☐ No ☐

Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C		FINAL COOLER TEMPERATURES °C	
6.6	6.6		

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINA
Released by: Hannah Shuter	Date: Nov. 17.2023	Time:	Received by:	Date: 11-17-23	Time: 3pm	Received by:

Rcvd jr 18Nov23 2°C 12:50 ice pk

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - rep

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

CERTIFICATE OF ANALYSIS

Work Order	: **VA23D0582**	Page	: 1 of 3
Client	: **Regional District of Kitimat-Stikine**	Laboratory	: ALS Environmental - Vancouver
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 20-Dec-2023 12:55
PO	: ----	Date Analysis Commenced	: 21-Dec-2023
C-O-C number	: ----	Issue Date	: 29-Dec-2023 09:39
Sampler	: ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

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

General Comments

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

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

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

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

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

Unit	*Description*
µS/cm	microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

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

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

Analytical Results

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

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	F1	Travel blank	----	----	----
					Client sampling date / time	19-Dec-2023 11:45	19-Dec-2023 00:00	----	----	----
						VA23D0582-001	VA23D0582-002	--------	--------	--------
						Result	Result	----	----	----
Physical Tests										
Conductivity	----	E100/VA	2.0	µS/cm		604	<2.0	----	----	----
pH	----	E108/VA	0.10	pH units		7.98	5.55	----	----	----
Solids, total suspended [TSS]	----	E160/VA	3.0	mg/L		5.8	<3.0	----	----	----
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/VA	0.0050	mg/L		33.7	<0.0050	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318/VA	0.050	mg/L		34.2	<0.050	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3-L/VA	0.0050	mg/L		0.490	<0.0050	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2-L/VA	0.0010	mg/L		0.0720	<0.0010	----	----	----
Nitrogen, total	7727-37-9	E366/VA	0.030	mg/L		36.4	<0.030	----	----	----
Phosphorus, total	7723-14-0	E372-U/VA	0.0020	mg/L		5.40	<0.0020	----	----	----
Aggregate Organics										
Biochemical oxygen demand [BOD]	----	E550/VA	2.0	mg/L		30.1	<2.0	----	----	----
Carbonaceous biochemical oxygen demand [CBOD]	----	E555/VA	2.0	mg/L		7.3	<2.0	----	----	----

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

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

ALS Canada Ltd.

right solutions.
right partner.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA23D0582**	Page	: 1 of 9
Client	: **Regional District of Kitimat-Stikine**	Laboratory	: ALS Environmental - Vancouver
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 20-Dec-2023 12:55
PO	: ----	Issue Date	: 29-Dec-2023 09:39
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times* Rec	*Holding Times* Actual	*Eval*	*Analysis Date*	*Holding Times* Rec	*Holding Times* Actual	*Eval*
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] F1	E550	19-Dec-2023	----	----	----		22-Dec-2023	3 days	3 days	✓
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] Travel blank	E550	19-Dec-2023	----	----	----		22-Dec-2023	3 days	3 days	✓
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT 3d] F1	E555	19-Dec-2023	----	----	----		22-Dec-2023	3 days	3 days	✓
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT 3d] Travel blank	E555	19-Dec-2023	----	----	----		22-Dec-2023	3 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) F1	E298	19-Dec-2023	22-Dec-2023	28 days	3 days	✓	25-Dec-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (lab preserved) Travel blank	E298	19-Dec-2023	22-Dec-2023	3 days	3 days	✓	25-Dec-2023	28 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE Travel blank	E235.NO3-L	19-Dec-2023	22-Dec-2023	3 days	2 days	✓	22-Dec-2023	3 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE										
F1	E235.NO3-L	19-Dec-2023	22-Dec-2023	3 days	3 days	✓	22-Dec-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
Travel blank	E235.NO2-L	19-Dec-2023	22-Dec-2023	3 days	2 days	✓	22-Dec-2023	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
F1	E235.NO2-L	19-Dec-2023	22-Dec-2023	3 days	3 days	✓	22-Dec-2023	3 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
F1	E318	19-Dec-2023	22-Dec-2023	28 days	3 days	✓	23-Dec-2023	28 days	4 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (lab preserved)										
Travel blank	E318	19-Dec-2023	22-Dec-2023	3 days	3 days	✓	23-Dec-2023	28 days	1 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid)										
F1	E366	19-Dec-2023	22-Dec-2023	28 days	3 days	✓	23-Dec-2023	28 days	4 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (lab preserved)										
Travel blank	E366	19-Dec-2023	22-Dec-2023	3 days	3 days	✓	23-Dec-2023	28 days	1 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
F1	E372-U	19-Dec-2023	22-Dec-2023	28 days	3 days	✓	28-Dec-2023	28 days	9 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (lab preserved)										
Travel blank	E372-U	19-Dec-2023	22-Dec-2023	3 days	3 days	✓	28-Dec-2023	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE Travel blank	E100	19-Dec-2023	22-Dec-2023	28 days	2 days	✓	22-Dec-2023	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE F1	E100	19-Dec-2023	22-Dec-2023	28 days	3 days	✓	22-Dec-2023	28 days	3 days	✓
Physical Tests : pH by Meter										
HDPE Travel blank	E108	19-Dec-2023	22-Dec-2023	0.25 hrs	59 hrs	× EHTR-FM	22-Dec-2023	0.25 hrs	62 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE F1	E108	19-Dec-2023	22-Dec-2023	0.25 hrs	62 hrs	× EHTR-FM	22-Dec-2023	0.25 hrs	66 hrs	× EHTR-FM
Physical Tests : TSS by Gravimetry										
HDPE F1	E160	19-Dec-2023	----	----	----		21-Dec-2023	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE Travel blank	E160	19-Dec-2023	----	----	----		21-Dec-2023	7 days	2 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	1286886	1	18	5.5	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	1287114	1	5	20.0	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	1287291	1	8	12.5	5.0	✓
Conductivity in Water	E100	1286393	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1286380	1	18	5.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1286383	1	17	5.8	5.0	✓
pH by Meter	E108	1286392	1	14	7.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1286887	1	7	14.2	5.0	✓
Total Nitrogen by Colourimetry	E366	1286891	1	4	25.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1286885	1	11	9.0	5.0	✓
TSS by Gravimetry	E160	1285904	1	10	10.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	1286886	1	18	5.5	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	1287114	1	5	20.0	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	1287291	1	8	12.5	5.0	✓
Conductivity in Water	E100	1286393	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1286380	1	18	5.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1286383	1	17	5.8	5.0	✓
pH by Meter	E108	1286392	1	14	7.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1286887	1	7	14.2	5.0	✓
Total Nitrogen by Colourimetry	E366	1286891	1	4	25.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1286885	1	11	9.0	5.0	✓
TSS by Gravimetry	E160	1285904	1	10	10.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	1286886	1	18	5.5	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	1287114	1	5	20.0	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	1287291	1	8	12.5	5.0	✓
Conductivity in Water	E100	1286393	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1286380	1	18	5.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1286383	1	17	5.8	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1286887	1	7	14.2	5.0	✓
Total Nitrogen by Colourimetry	E366	1286891	1	4	25.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1286885	1	11	9.0	5.0	✓
TSS by Gravimetry	E160	1285904	1	10	10.0	5.0	✓
Matrix Spikes (MS)							

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Matrix Spikes (MS) - Continued							
Ammonia by Fluorescence	E298	1286886	1	18	5.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1286380	1	18	5.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1286383	1	17	5.8	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1286887	1	7	14.2	5.0	✓
Total Nitrogen by Colourimetry	E366	1286891	1	4	25.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1286885	1	11	9.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 ALS Environmental - Vancouver	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 ALS Environmental - Vancouver	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 ALS Environmental - Vancouver	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Nitrite in Water by IC (Low Level)	E235.NO2-L ALS Environmental - Vancouver	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L ALS Environmental - Vancouver	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 ALS Environmental - Vancouver	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 ALS Environmental - Vancouver	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Total Nitrogen by Colourimetry	E366 ALS Environmental - Vancouver	Water	Chinchilla Scientific Nitrate Method, 2011	Following digestion, total nitrogen is is determined colourimetrically using a discrete analyzer utilizing the vanadium chloride reduction method. This method of analysis is approved under US EPA 40 CFR Part 136 (May 2021).
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Biochemical Oxygen Demand - 5 day	E550 ALS Environmental - Vancouver	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555 ALS Environmental - Vancouver	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Nitrification inhibitor is added to samples to prevent nitrogenous compounds from consuming oxygen resulting in only carbonaceous oxygen demand being reported by this method. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 ALS Environmental - Vancouver	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 ALS Environmental - Vancouver	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Digestion for Total Nitrogen in water	EP366 ALS Environmental - Vancouver	Water	APHA 4500-P J (mod)	Samples for total nitrogen analysis are digested using a heated persulfate digestion. Nitrogen compounds are converted to nitrate in this digestion.
Digestion for Total Phosphorus in water	EP372 ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

QUALITY CONTROL REPORT

Work Order	: **VA23D0582**	Page	: 1 of 6
Client	: Regional District of Kitimat-Stikine	Laboratory	: ALS Environmental - Vancouver
Contact	: Nicole Lavoie	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	:	Telephone	: +1 604 253 4188
Project	: Queensway Sewer	Date Samples Received	: 20-Dec-2023 12:55
PO	: ----	Date Analysis Commenced	: 21-Dec-2023
C-O-C number	: ----	Issue Date	: 29-Dec-2023 09:39
Sampler	: ---- ----		
Site	: ----		
Quote number	: VA22-RDKS100-001		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

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

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

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 1285904)											
VA23D0511-009	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	125	132	5.14%	20%	----
Physical Tests (QC Lot: 1286392)											
VA23D0556-001	Anonymous	pH	----	E108	0.10	pH units	8.26	8.25	0.121%	4%	----
Physical Tests (QC Lot: 1286393)											
VA23D0556-001	Anonymous	Conductivity	----	E100	1.0	µS/cm	422	421	0.237%	10%	----
Anions and Nutrients (QC Lot: 1286380)											
VA23D0556-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1286383)											
VA23D0556-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0046	0.0049	0.0003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1286885)											
VA23D0674-001	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0021	<0.0020	0.0001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1286886)											
VA23D0650-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.100	mg/L	5.65	5.61	0.755%	20%	----
Anions and Nutrients (QC Lot: 1286887)											
VA23D0582-001	F1	Kjeldahl nitrogen, total [TKN]	----	E318	0.500	mg/L	34.2	33.8	1.31%	20%	----
Anions and Nutrients (QC Lot: 1286891)											
VA23D0297-001	Anonymous	Nitrogen, total	7727-37-9	E366	1.50	mg/L	43.0	44.8	4.09%	20%	----
Aggregate Organics (QC Lot: 1287114)											
VA23D0666-003	Anonymous	Biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 1287291)											
KS2304883-001	Anonymous	Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2.0	mg/L	<2.0	<2.0	0.0%	30%	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 1285904)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 1286393)						
Conductivity	----	E100	1	µS/cm	1.1	----
Anions and Nutrients (QCLot: 1286380)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1286383)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 1286885)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 1286886)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1286887)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 1286891)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Aggregate Organics (QCLot: 1287114)						
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 1287291)						
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	<2.0	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1285904)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	91.3	85.0	115	----
Physical Tests (QCLot: 1286392)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 1286393)									
Conductivity	----	E100	1	µS/cm	146.9 µS/cm	101	90.0	110	----
Anions and Nutrients (QCLot: 1286380)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 1286383)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 1286885)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	98.3	80.0	120	----
Anions and Nutrients (QCLot: 1286886)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	102	85.0	115	----
Anions and Nutrients (QCLot: 1286887)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	92.1	75.0	125	----
Anions and Nutrients (QCLot: 1286891)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	106	75.0	125	----
Aggregate Organics (QCLot: 1287114)									
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	102	85.0	115	----
Aggregate Organics (QCLot: 1287291)									
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	198 mg/L	103	85.0	115	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 1286380)										
VA23D0556-002	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	13.1 mg/L	12.5 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 1286383)										
VA23D0556-002	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	2.72 mg/L	2.5 mg/L	109	75.0	125	----
Anions and Nutrients (QCLot: 1286885)										
VA23D0674-002	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0488 mg/L	0.05 mg/L	97.6	70.0	130	----
Anions and Nutrients (QCLot: 1286886)										
VA23D0650-002	Anonymous	Ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 1286887)										
VA23D0582-002	Travel blank	Kjeldahl nitrogen, total [TKN]	----	E318	2.18 mg/L	2.5 mg/L	87.2	70.0	130	----
Anions and Nutrients (QCLot: 1286891)										
VA23D0488-001	Anonymous	Nitrogen, total	7727-37-9	E366	0.387 mg/L	0.4 mg/L	96.7	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com
Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17 -
Page of

Report To	Contact and company name below will appear on the final report
Company:	Regional District of Kitimat-Stikine
Contact:	Nicole Lavoie
Phone:	250-615-6100
	~~Company address below will appear on the final report~~
Street:	4545 Lazelle Avenue
City/Province:	Terrace/BC
Postal Code:	V8G4E1
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	Regional District of Kitimat-Stikine
Contact:	Nicole Lavoie

Report Format / Distribution

Select Report Format: ☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)
Quality Control (QC) Report with Report ☑ YES ☐ NO
☑ Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax	enviro.dept@rdks.bc.ca
Email 2	ckerr@rdks.bc.ca; jkunjumon@rdks.bc.ca
Email 3	pmiller@rdks.bc.ca; jlacroix@rdks.bc.ca

Invoice Distribution

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax	anne-maries@rdks.bc.ca
Email 2	enviro.dept@rdks.bc.ca

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] ☐ | 3 day [P3-25%] ☐ | 2 day [P2-50%] ☐

EMERGENCY: 1 Business day [E1 - 100%] ☐ | Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs:

For tests that can not be performed according to the service level selected, you will be contacted.

Project Information

ALS Account # / Quote #:	VA22-RDKS100-001
Job #:	Queensway Sewer
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (lab use only):

ALS Contact:

Sampler:

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	TSS (by Gravimetry)	Total Ammonia	Total Nitrogen (by Colourimetry 0.03mg/L)	Total Phosphorus (by Colourimetry 0.002 mg	Carbonaceous Biochemical Oxygen Demand	pH	BOD (5 Day)	Specific Conductance	Nitrate, Nitrite	TKN	SAMPLES ON HOLD	Sample is hazardous (please provide further detail	NUMBER OF CONTAINERS
					P	P	P						P	P			
	F1	19-Dec-23	11:45	Water	R	R	R	R	R	R	R	R	R	R			
	Travel Blank	19-Dec-23	—	Water	R	R	R	R	R	R	R	R	R	R			

Environmental Division
Vancouver
Work Order Reference
VA23D0582

Telephone : +1 604 253 4188

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

Federal Wastewater Systems Effluent Regulations (JUN, 2012)

Queensway Sewer Custom Criteria for RDKS

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ | SIF Observations Yes ☐ No ☐
Ice Packs ☑ Ice Cubes ☐ | Custody seal intact Yes ☐ No ☐
Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
6.3	8.7			5°			

SHIPMENT RELEASE (client use)

Released by: Hannah Clinton Date: Dec 19. 2023 Time:

INITIAL SHIPMENT RECEPTION (lab use only)

Received by: Date: 12-19-23 Time: 1PM

FINAL SHIPMENT RECEPTION (lab use only)

Received by: AS Date: 12/20/23 Time: 12:57pm

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

SEPT 2017 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

Regional District of Kitimat-Stikine

Appendix G Data Table

Regional District of Kitimat-Stikine

Table 5: Sample Lab Chemistry and Field Collected Data

		Laboratory Chemistry												Field Collected Data			
Date (2023)	Sample Type	TSS mg/L	TSS (WSER) mg/L	$CBOD_5$ mg/L	BOD_5 mg/L	SPC µS/cm	TKN mg/L	NH_3 mg/L	NO_3 mg/L	NO_2 mg/L	N-Total mg/L	pH -	P-Total mg/L	DO mg/L	SPC µS/cm	pH -	Temp °C
Jan-16	Grab	6.9	6.9	6.7	8.4	*NC*	*NC*	38.9	*NC*	*NC*	39.6	8.03	5.35	2.5	*NC*	*NC*	3.9
Feb-13	Grab	4.6	4.6	7.5	7.4	*NC*	*NC*	31.9	*NC*	*NC*	32.6	8.18	4.05	7.4	*NC*	*NC*	1.9
Mar-13	Grab	10.9	10.9	8	8.2	*NC*	*NC*	30.9	*NC*	*NC*	35.8	8.15	4.07	3.7	*NC*	*NC*	4.7
Apr-11	Grab	5.8	5.8	9.3	14.7	*NC*	*NC*	30.8	*NC*	*NC*	31.6	8.1	4.25	7.5	*NC*	*NC*	8.1
May-31	None	*NC*	*NC*	*NC*	*NC*	*NC*	*NC*	*NC*	*NC*	*NC*	*NC*	*NC*	*NC*	*NC*	*NC*	*NC*	*NC*
Jun-14	Grab	**70.1**	70.1	33.1	76.5	379	12.1	6.42	0.432	15.2	26.3	7.48	4.2	0.15	417.6	*NC*	19.1
Jun-14*	Dup	**78.8**	78.8	34.3	79.7	378	13.1	6.56	0.433	15.2	25.9	6.99	4.16	*NC*	*NC*	*NC*	*NC*
Jun-28	Grab	45.8	45.8	16.2	105	355	7.85	0.895	3.16	4	11.6	8.48	3.98	1.9	*NC*	6.43	20.4
Jun-28	Dup	46.2	46.2	16.5	98.4	358	7.27	0.921	1.22	5.59	11.3	8.28	4.09	*NC*	*NC*	*NC*	*NC*
Jul-12	Grab	**63.8**	**OMIT**	15.2	85.2	350	6.39	1.87	0.0455	0.944	9.61	7.93	4.43	0.14	*NC*	6.87	19.9
Aug-15	Grab	22.9	22.9	11.7	50.4	474	16.3	12.9	0.005	0.001	16.2	7.2	5.29	0.13	464.7	6.88	17.9
Sep-19	Grab	23.5	23.5	14	119	546	26.9	23.8	0.0207	0.0719	27	7.95	5.86	0.07	563	7.02	13.5
Oct-12	Grab	37	**OMIT**	21.5	163	572	29.7	29.6	0.0812	0.427	29	7.7	5.64	2.01	586	7.21	13.6
Nov-17	Grab	8	8	6.1	66.3	613	35.6	32.3	0.186	0.634	36.7	8.08	5.27	6.42	628	7.33	4.7
Nov-17	Dup	9.2	9.2	5.9	60.1	615	35.8	34.3	0.184	0.637	37.9	8.09	5.61	*NC*	*NC*	*NC*	*NC*
Dec-19	Grab	5.8	5.8	7.3	30.1	604	34.2	33.7	0.49	0.072	36.4	7.98	5.4	8.98	643	7.9	3.6
	Average	29.3	**26.0**	14.2	64.8	476.7	20.5	21.1	0.6	3.9	27.2	7.9	4.8	3.4	550.4	7.1	10.9

*Extra Sample Collected in June
TSS = Total Suspended Solids
SPC = Specific Conductance
TKN = Total Kjeldahl Nitrogen
NO3 = Nitrate

CBOD5 = Carbonaceous Biochemical Oxygen Demand
BOD5 = Biochemical Oxygen Demand
NH3 = Ammonia as Total Nitrogen
N02 = Nitrite
P-Total = Total Phosphorous

NH3 = Ammonia (as total N)
N-Total = Total Nitrogen
DO = Dissolved Oxygen
Exceedance to the MWR
Exceedance to the WSER

Regional District of
Kitimat-Stikine