QUEENSWAY SEWER 2022 ANNUAL REPORT

2022 Annual Report

Prepared for:
British Columbia Ministry of
Environment & Climate Change Strategy
EnvAuthorizationsReporting@gov.bc.ca

Prepared by:
Regional District of Kitimat-Stikine
Suite 300 - 4545 Lazelle Avenue
Terrace, BC V8G 4E1

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Regional District of
Kitimat-Stikine

Executive Summary

Queensway Sewer (the Facility) is a Class 1 municipal wastewater treatment facility producing a Class 3 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 Authorisation) 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).

In October 2022 the RDKS obtained an amendment to the Authorisation to change BOD_5 to C-BOD_5. The amendment was requested to align the Authorisation with the Municipal Wastewater Regulation (MWR), which defines BOD_5 as carbonaceous 5-day biochemical demand. The amendment was granted on October 31, 2022 and replaces the terms 5-day biochemical oxygen demand (BOD_5) with 5-day carbonaceous biochemical oxygen demand (C-BOD_5) in the authorisation.

The quality of effluent discharged to the exfiltration beds was monitored monthly under the effluent monitoring program. Effluent monitoring was not completed in June during flood conditions of the Skeena River, and a non-compliance report was submitted to ENV for this incident. The Authorisation includes limits for C-BOD5, and TSS of 45mg/L and 60 mg/L respectively. During 2022 the C-BOD_5 and TSS concentrations were below the limits of the Authorisation. In 2022 discharge was limited to the exfiltration beds, and the Outfall Pre-Discharge Monitoring Program, and Receiving Environment Monitoring Program, were not completed.

During the first half of 2022, the concentration of Nitrogen at the Facility had been measured through Total Kjeldahl Nitrogen (TKN) analysis. TKN does not include nitrites or nitrates, the resulting nitrogen components of the nitrification of ammonia, and underrepresents true Total Nitrogen (TN) concentrations at the facility because it omits the nitrogen concentration of all ammonia that has completed the nitrification cycle in the aeration lagoons. TN analysis was added to the monthly effluent monitoring analysis in July 2022.

Discharge measurements for 2022 were based on influent flow rate, and precipitation volumes observed at the Northwest Regional Airport. The total discharge for 2022 was estimated at 99,754.5 m^3, based on an average discharge rate of 273.3 m^3 per day, which is below the authorised annual average discharge limit of 800 m^3 per day.

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Kitimat-Stikine

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1 Introduction

Queensway Sewer (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 facilities authorised works include a two-cell aerated lagoon system, twin exfiltration basins, a flow measurement facility, and an outfall, shown in Figure 1.

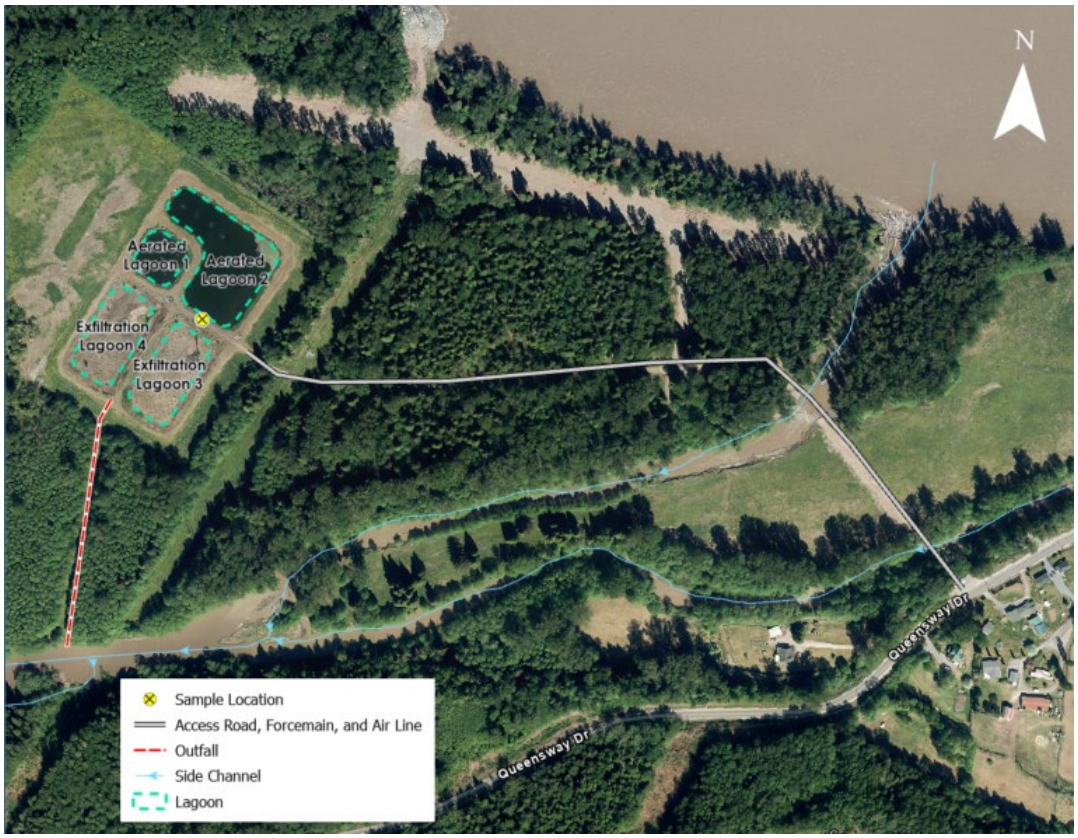

Figure 1: Queensway Sewer Facility, Orthoimagery Dated May 2019

1.1 Regulatory Framework

Wastewater Systems Effluent Regulation

The Wastewater Systems Effluent Regulation (WSER) regulates the discharge of effluent from wastewater systems in Canada that deposit a deleterious substance to water, or where the deposit of a deleterious substance may enter water frequented by fish. The WSER requires annual reporting of CBOD, and TSS averages, with limits of 25 mg/L for each.

Municipal Wastewater Regulation

Municipal effluent of wastewater treatment facilities is defined under the Municipal Wastewater Regulation (MWR) as Class A, Class B, or Class C, based on the treatment objectives. The Queensway Sewer produces a Class C effluent, meeting the criteria of secondary treatment for a lagoon system, with BOD_5 (defined in the MWR as the carbonaceous 5-day biochemical oxygen demand) of not more than 45 mg/L, and TSS of not more than 60 mg/L.

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

Monitoring requirements for discharge to ground for Class C effluent are set under s.86 of the MWR and include twice a week monitoring of flow frequency, and monthly grab samples of C-BOD_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. C-BOD_5 must be 45 mg/L or below, and TSS must be 60 mg/L (lagoon system) or below. There are no requirements under the MWR for Class C effluent facilities, to measure fecal coliforms, turbidity, or nitrogen.

Discharge Authorisation

The Permit for Queensway Sewer authorisation, permit number 12645 (the authorisation; Appendix B), through the Ministry of Environment and Climate Change Canada (ENV), and 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 monitoring requirements of the authorisation include those of s.86, which are obtained through a monthly grab sample of effluent from the outlet of the aerated lagoon (Site No. E220346), and monthly reporting of the grab sample data. The authorisation sets additional monthly 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.

In October 2022 the RDKS obtained an amendment to the authorisation to change BOD_5 to C-BOD_5. The amendment was requested to align the Authorisation with the MWR, which defines BOD_5 as *carbonaceous 5-day biochemical demand*. The amendment was granted on October 31, 2022 (APPENDIX C) and replaces the terms 5-day biochemical oxygen demand (BOD_5) with 5-day carbonaceous biochemical oxygen demand (C-BOD_5).

This amendment aligns the Authorisation with the MWR by allowing the RDKS to measure compliance with the authorisation using C-BOD_5 instead of BOD_5, the latter of which had caused non-compliance

events on a seasonal basis despite the facility meeting the regulatory limits of the MWR for secondary treatment lagoons.

Table 1 Monitoring Programs and Program Sample Requirements for Queensway Sewer Authorisation

Parameter	Sample Type	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

2 Discharge Operations

During 2022 effluent monitoring requirements were met for each month, with the exception of June when high water flood conditions of the Skeena River prevented RDKS staff from safely accessing the facility. Discharge of effluent during the year was restricted to the exfiltration lagoons. Pre-discharge monitoring was not completed in 2022 and no discharge of effluent through the outfall to the Skeena River side-channel occurred. The works were inspected regularly during the monthly effluent monitoring sample events.

2.1 Monitoring Methodology

Effluent monitoring was carried out by RDKS Works & Services EOCP wastewater technicians, following the British Columbia Field Sampling Manual for Water and Wastewater Sampling. Samples were collected in laboratory supplied bottles by collecting effluent from the weir outfall. Samples were then transported in coolers with ice to the laboratory for analysis. The RDKS used Norlabs from January to May, and ALS Laboratories from August to December. No duplicate or quality assurance samples were collected during 2022.

Dissolved oxygen, pH, and Temperature 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 use at each sampling event.

2.2 Non-Compliance

During the month of June 2022, the Skeena River experienced flooding with the closest hydrometric data station recording between 6.5 and 11 metres over the month, resulting in water levels 3.7 to 7.3 metres higher than the 2021 average of 3.7 metres. The flooding resulted in the access to the Queensway Sewer 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, with the exception of influent flow rate which is monitored continuously in the aerator building. A non-compliance report was submitted on July 25, 2022 (APPENDIX D).

Figure 2: Side channel of the Skeena River that must be crossed to access the Facility, taken June 6, 2022

3 Data and Analysis

3.1 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 monthly precipitation measurements from the Terrace Airport NAVCAN station are presented in Table 2. Volumes of precipitation are estimated from the area of the aeration lagoons which is approximately 12,700 m^2. Estimates do not include a factor for evaporation.

Table 2: Average Influent, Precipitation, and Discharge Volumes by Month for 2022

Date	Average Influent Flow Rate (m^3/d)	Average Precip (mm/d)	Average Volume of Precip (m3/d)	Discharge Volume (m^3/day)
January 24, 2022	274.28	5.2	66.4	340.7
February 14, 2022	319.61	5.4	68.9	388.5
March 15, 2022	247.61	4.4	55.7	303.3
April 20, 2022	238.8	4.1	52.6	291.4
May 8, 2022	201.9	2.2	27.6	229.5
June, 2022	242.29	3.6	45.2	287.5
July 18, 2022	223.72	2.4	30.5	254.2
August 15, 2022	180.7	2.1	27.0	207.7
September 26, 2022	175.31	2.4	30.1	205.4
October 14, 2022	166.75	6.1	77.8	244.5
November 14, 2022	202.28	5.5	70.1	272.4
December 12, 2022	223.25	2.5	31.6	254.8
Annual Average	**224.7**	**3.8**	**48.6**	**273.3**

The average discharge rate, calculated as average influent flow rate plus the average rate of precipitation, was 273.3 m^3 per day. This was below the average authorised discharge rate of 800 m^3 per day. Based on the low volumes of influent, precipitation, and discharge, it is unlikely that the maximum discharge rate of 800 m^3 per day had been exceeded.

3.2 Effluent Monitoring Data

Effluent Monitoring data is presented in Table 3. Total Kjeldahl Nitrogen (TKN), defined as ammonia and organic nitrogen, was included in the analysis until May 2022. From July to December TKN was replaced with Total Nitrogen (TN), defined as TKN, plus nitrates and nitrites, to conform with the authorisation requirements of TN analysis in the monthly grab samples. In the nitrification cycle ammonia is reduced to nitrites, and then to nitrates. Because TKN does not include nitrites and nitrates, the historical data set underrepresents the true TN concentrations, as all ammonia that has undergone nitrification is omitted in the TKN concentration. Complete lab reports, including certificate of analysis and chain of custody are provided in Appendix E.

During 2022, C-BOD_5 and TSS were both below the regulatory limits of 45 mg/L and 60 mg/L respectively, except for June when a grab sample was not collected. C-BOD_5 and TSS concentrations are presented in Figure 3. Average C-BOD_5, and TSS were below the WSER regulatory limits of 25 mg/L.

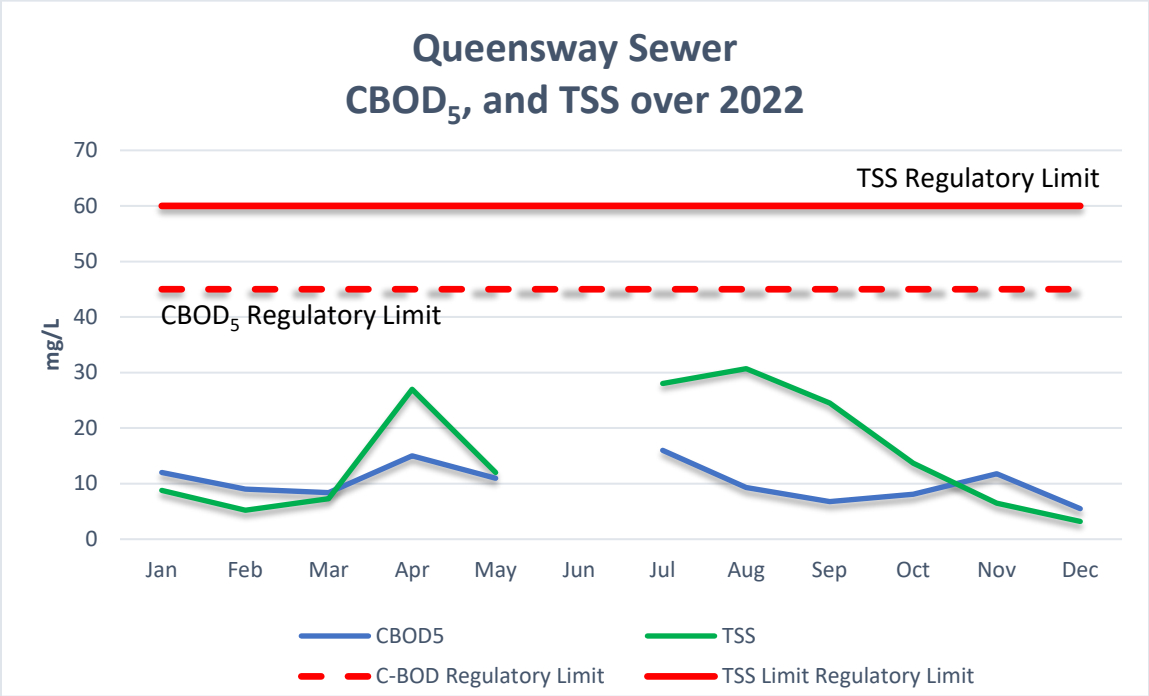

Figure 3: CBOD5 and TSS Concentrations at Queensway Sewer During 2022

The Authorisation requires the field collection ammonia and pH. Ammonia was analysed in the lab for each grab sample and was not collected in the field. pH was analysed in the lab for each grab sample except September, and pH was not collected in the field from August to December, resulting in no pH value for September.

C-BOD_5 exceeded BOD_5 in October and November. Collecting duplicate and Quality Assurance samples may help determine if this was a result of sample collection and handling in the field or was possibly a result of the oxidation of heterotrophic organisms from the nitrification inhibiter used at the lab (Muirhead, et al. 2006).

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Table 3: Field and Grab Sample Data for Queensway Sewer

Date	TSS mg/L	$CBOD_5$ mg/L	BOD_5 mg/L	TP mg/L	TN mg/L	TKN mg/L	NH3 mg/L	SPC µS/cm	DO mg/L	pH Field	pH Lab	Temp °C Field
January 24, 2022	8.8	12	16	4.09	NC	33.5	29.7	293	5.7	7.47	7.1	0.6
February 14, 2022	5.2	9	11	3.26	NC	21.5	25.4	256	10.4	7.14	7.14	1.4
March 15, 2022	7.3	8.4	13	2.77	NC	25.4	25	281	10.8	7.66	7.3	4.6
April 20, 2022	27	15	36	3.53	NC	24.8	23	329	14.5	8.01	7.8	10.1
May 8, 2022	12	11	23	3.36	NC	28.3	23.5	373	11.3	7.93	7.4	14
June, 2022	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
July 18, 2022	28	16	92	3.34	NC	15.6	9.32	423	14.1	7.52	7.52	18.9
August 15, 2022	30.7	9.3	25.9	3.8	12.8	NC	11	NC	2.1	NC	8.32	19.7
September 26, 2022	24.5	6.8	16.9	4.47	29.4	NC	25.4	NC	0.9	NC	NC	13.9
October 14, 2022	13.7	8.1	7.8	4.71	31.8	NC	34.4	NC	1.8	NC	7.76	9.2
November 14, 2022	6.5	11.8	6.1	4.87	34.8	NC	33.5	NC	12.5	NC	7.95	3.7
December 12, 2022	3.2	5.5	5.6	5.63	39.6	NC	35.8	NC	6.9	NC	8.12	2
Average	15.17	10.26										

NC = Not Collected
TSS = Total Suspended Solids
$CBOD_5$ = 5-Day Carbonaceous Biochemical Oxygen Demand
BOD_5 = 5-Day Biochemical Oxygen Demand
TP = Total Phosphorous
TN = Total Nitrogen
TKN = Total Kjeldahl Nitrogen
NH3 = Ammonia
SPC = Specific Conductance
DO = Dissolved Oxygen

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4 Closure and Recommendations

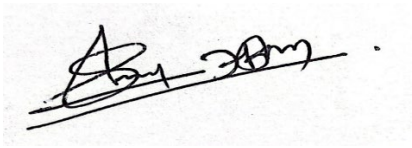
Monthly effluent monitoring and effluent quality met the limits of the MWR and the Authorisation with C-BOD_5 below 45 mg/L, and TSS below 60 mg/L except for June, where grab samples were not obtained due to high flows. Annual averages of CBOD and TSS are below the WSER limit of 25 mg/L each.

The Facility was out of conformance with the authorisation for TN, pH and ammonia measurements for the monthly effluent monitoring program. The analysis of TN will be continued, and pH and ammonia r an amendment to the authorisation will be requested to change the sample type from field measurement to grab sample for pH and ammonia. Nitrites, nitrates, and TKN will be included in future analysis will help interpret the efficiency of the nitrification cycle. This may be especially helpful during the summer months when BOD_5 far exceeds $CBOD_5$, which implies a heavy nitrogen input into the lagoons during the summer. Looking at the nitrification cycle will also allow an interpretation of nitrification during the winter months, when temperatures are lower and biological activity is reduced.

Collection of duplicate samples, field blanks, and trip blanks as part of the monthly effluent monitoring program will be implemented to further align the sampling methodology with the BC Field Sampling Manual for Water and Wastewater sampling and may assist in determining the cause of $CBOD_5$ concentrations exceeding BOD_5 concentrations.

Document prepared by:

Document reviewed by:



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5 References

British Columbia Ministry of Environment and Climate Change Strategy. 2013. *British Columbia Field Sampling Manual Part E: Water and Wastewater Sampling.* https://www2.gov.bc.ca/assets/gov/environment/research-monitoring-and-reporting/monitoring/emre/bc_field_sampling_manual_part_e.pdf.

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Kitimat-Stikine

Appendix A EOC Certifcation

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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

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Appendix B Permit 12645

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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

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.

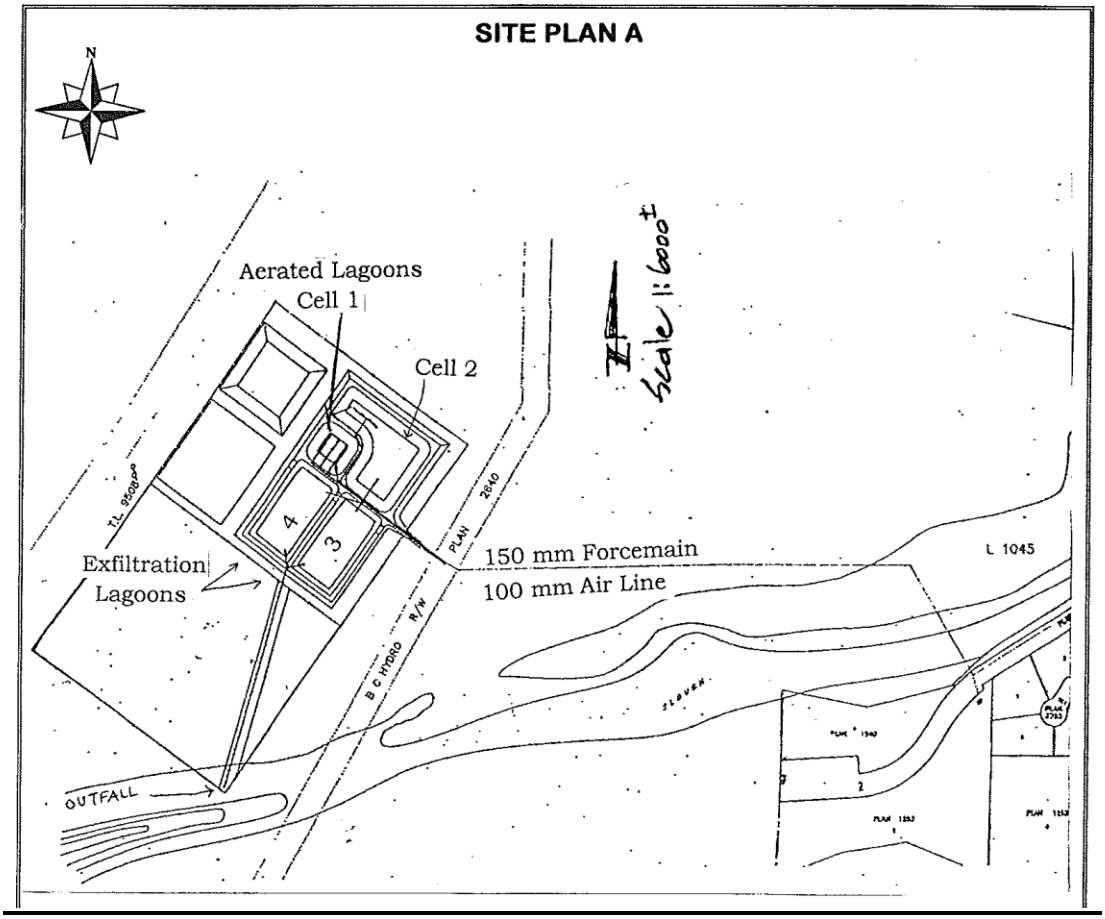
"**Province**" means Her Majesty the Queen in right of British Columbia.

"**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

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Appendix C Permit Amendment

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October 31, 2022

Tracking Number: 418893
Authorization Number: 12645

REGIONAL DISTRICT OF KITIMAT-STIKINE
300 4545 LAZELLE AVENUE
TERRACE, BC
V8G 4E1

Dear REGIONAL DISTRICT OF KITIMAT-STIKINE,

RE: Your application for an Authorization amendment under the *Environmental Management Act.*

In response to your email correspondence dated October 14, 2022, and pursuant to Section 16 of the *Environmental Management Act*, I hereby consent to an amendment of Permit 12645 sections 1.1.4, 1.2.4, and 3.4 to replace 5-day biochemical oxygen demand (BOD_5) with 5-day carbonaceous biochemical oxygen demand ($C\text{-}BOD_5$).

Please note that although a revised Authorization Document has not been produced at this time a copy of this letter is being placed on the Authorization file, as an addendum to the Authorization, to formally reflect the change.

This Authorization 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 Authorization is issued pursuant to the provisions of the Environmental Management Act to ensure compliance with Section 120(3) of that statute, which makes it an offence to discharge waste, from a prescribed industry or activity, without proper authorization. It is also the responsibility of the permittee to ensure that all activities conducted under this authorization are carried out with regard to the rights of third parties, and comply with other applicable legislation that may be in force.

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

Administration of this permit will be carried out by staff from the regional office. Plans, data and reports pertinent to the permit are to be submitted to the Regional Director, Environmental Protection, at EnvAuthorizationsReporting@gov.bc.ca.

Yours truly,

Karen Moores, P.Ag.,
for Director Environmental Management Act
Section Head, Authorizations North, Municipal Section
Environmental Protection Division
Ministry of Environment and Climate Change Strategy
email: Karen.Moores@gov.bc.ca

ENCL: None

Appendix D Non-Compliance Report

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Regional District of
Kitimat-Stikine

300-4545 Lazelle Avenue
Terrace, B.C. V8G 4E1
Tel 250-615-6100
Fax 250-635-9222

Our File No. 5340 20 06

To: EnvironmentalCompliance@gov.bc.ca
Attention: Non-compliance Report for Authorization #12645
No Monitoring Data

From: Nicole Lavoie, Environmental Coordinator, nlavoie@rdks.bc.ca

Date: July 25, 2022

Re: **12645 No Monitoring Data**

Date of Non-Compliance: June 1 to June 30, 2022

Location of Non-compliance: 4678 Queensway Drive, Terrace BC

Nature of Non-compliance: Under authorization 12645 section 3.3 and 3.4 for the Queensway Sewer Facility (Figure 1), the Regional District of Kitimat-Stikine (RDKS) is required to collect grab samples from the outlet of Aerated Lagoon B to be analyzed for total ammonia, BOD_5, total phosphorus and total nitrogen, and to field monitor the effluent for pH, DO, temperature and influent flow rate.

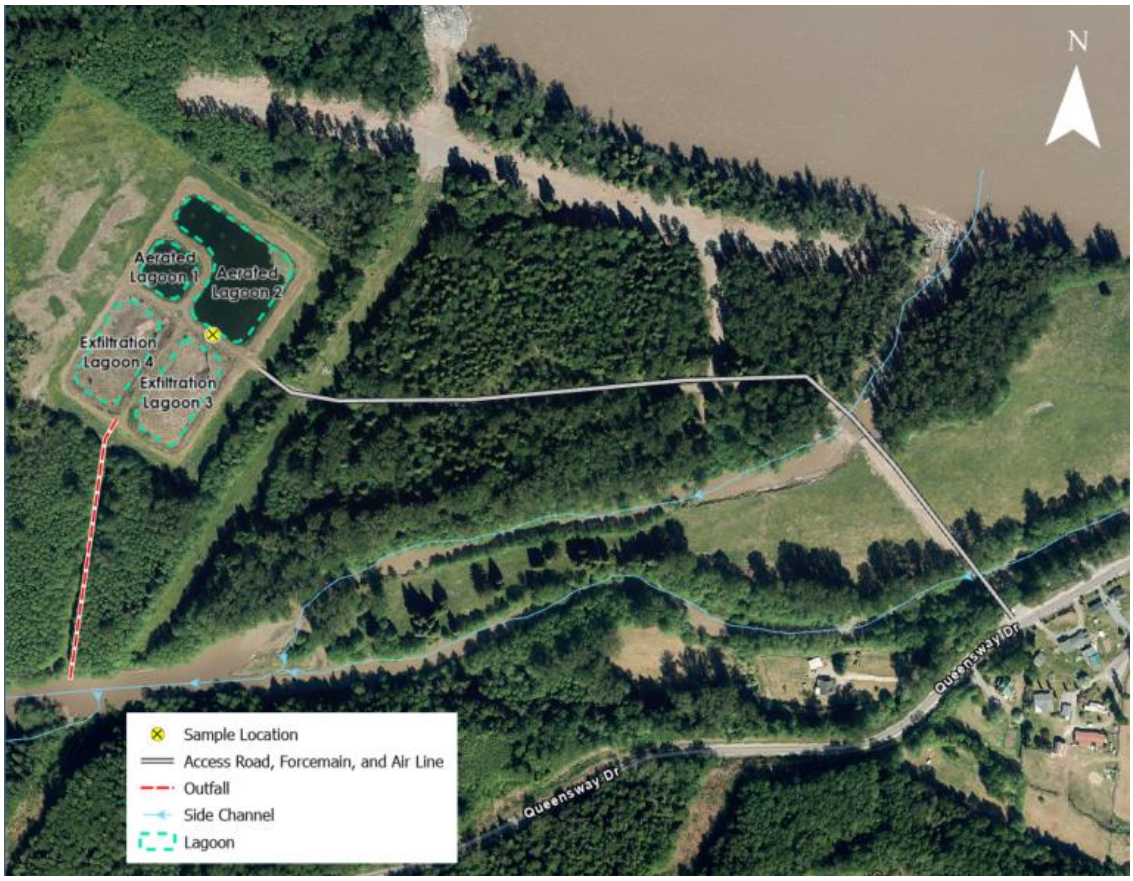


Figure 1 Queensway Sewer Facility, showing the access road and side channels, orthoimagery dated May 2019.

Regional District of Kitimat-Stikine

300-4545 Lazelle Avenue
Terrace, B.C. V8G 4E1
Tel 250-615-6100
Fax 250-635-9222

The Queensway Sewer Facility is located along the Skeena River and is accessed by a road which crosses a side channel of the Skeena River (Figure 2). During the month of June 2022, the Skeena River experienced flooding with the closest hydrometric data station recording between 6.5 and 11 metres over the month, resulting in water levels 3.7 to 7.3 metres higher than the 2021 average of 3.7 metres. The flooding resulted in the access to the Queensway Sewer Facility being inundated by flows from the Skeena River. The lagoons were not breached by the flooding.

Figure 2: Side channel of the Skeena River that must be crossed to access the Queensway Sewer Facility. Photo taken June 6, 2022

Due to the flooding of the access road, grab samples and monitoring were not completed during the month of June, with the exception of influent flow rate which is monitored continuously in the aerator building, resulting in non-compliance with the authorization. Under the authorisation, the RDKS is required to submit non-compliance reporting within 30 days of non-compliance events.

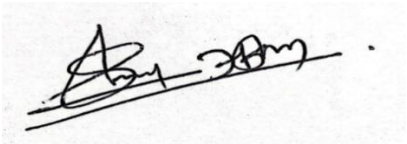
Action to be taken: Influent flow rate for the month of June will be recorded and included in the 2022 annual report. Monthly sampling and monitoring will continue in July, as per the requirements of the authorisation.

Prepared by:

Nicole Lavoie

Nicole Lavoie, B.Tech.
Environmental Services Coordinator
Regional District of Kitimat-Stikine
300 – 4545 Lazelle Avenue
Terrace, BC V8G 4E1
nlavoie@rdks.bc.ca

Reviewed by:



Jobin Kunjumon, B. Tech, EOCP WD 1, WT 1
Operations Manager
Regional District of Kitimat-Stikine
300 – 4545 Lazelle Avenue
Terrace, BC V8G 4E1
jkunjumon@rdks.bc.ca

Appendix E Lab Reports

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ANALYTICAL REPORT

Regional District of Kitimat Stikine
300 - 4545 Lazelle Avenue
Terrace BC, V8G 4E1
nlavoie@rdks.bc.ca

Project: Queensway
Project Number: -
Project Manager: Nicole Lavoie

Work Order: N22A101

RECEIVED: 25-Jan-2022

REPORTED: 31-May-2022

All analyses were performed in accordance with standard procedures published by BC MoE, Health Canada, Environment Canada, the American Public Health Association, or the US EPA.

Northern Laboratories (2010) Ltd.

Jesse Newton
Laboratory Manager

ANALYTICAL REPORT

Regional District of Kitimat Stikine **Work Order:** N22A101

LAB #			**N22A101-01**
SAMPLED DATE			**24-Jan-22**
SAMPLED TIME			**13:50**
SAMPLE ID			**Queensway Sewer**
	MRL	***Units***	
General Parameters (Water)			
pH	*1.0*	*pH units*	**7.1**
Biochemical Oxygen Demand / BOD	*4.0*	*mg/L*	**16**
Carbonaceous Biochemical Oxygen Demand / CBOD	*4.0*	*mg/L*	**12**
Solids, Total Suspended / TSS	*1.0*	*mg/L*	**8.8**
Ammonia (total as N)	*0.03*	*mg/L*	**29.7**
Nitrogen, Total Kjeldahl	*0.500*	*mg/L*	**33.5**
Phosphorus (total)	*0.05*	*mg/L*	**4.09**
Field Data (Water)			
Conductivity (field)	*1.0*	*uS/cm*	**293**
Dissolved Oxygen (field)	*0.10*	*mg/L*	**5.70**
pH (field)	*1.00*	-	**7.47**
Temperature (field)	*0.0*	°C	**0.6**

Glossary of Terms

MRL	Method Reporting Limit
°C	Degrees Celsius
mg/L	Milligrams per Litre
pH units	pH units
uS/cm	Micro Siemens per centimeter

ANALYTICAL REPORT

Regional District of Kitimat Stikine
300 - 4545 Lazelle Avenue
Terrace BC, V8G 4E1
nlavoie@rdks.bc.ca

Project: Queensway
Project Number: -
Project Manager: Nicole Lavoie

Work Order: N22B065

RECEIVED: 15-Feb-2022

REPORTED: 31-May-2022

All analyses were performed in accordance with standard procedures published by BC MoE, Health Canada, Environment Canada, the American Public Health Association, or the US EPA.

Northern Laboratories (2010) Ltd.

Jesse Newton
Laboratory Manager

ANALYTICAL REPORT

Regional District of Kitimat Stikine **Work Order:** N22B065

LAB #			**N22B065-01**
SAMPLED DATE			**14-Feb-22**
SAMPLED TIME			**11:15**
SAMPLE ID			**Queensway Sewer**
	MRL	***Units***	
General Parameters (Water)			
pH	*1.0*	*pH units*	**7.3**
Biochemical Oxygen Demand / BOD	*4.0*	*mg/L*	**11**
Carbonaceous Biochemical Oxygen Demand / CBOD	*4.0*	*mg/L*	**9.0**
Solids, Total Suspended / TSS	*1.0*	*mg/L*	**5.2 [1]**
Ammonia (total as N)	*0.03*	*mg/L*	**25.4**
Nitrogen, Total Kjeldahl	*0.500*	*mg/L*	**21.5**
Phosphorus (total)	*0.05*	*mg/L*	**3.26**
Field Data (Water)			
Conductivity (field)	*1.0*	*uS/cm*	**256**
Dissolved Oxygen (field)	*0.10*	*mg/L*	**10.4**
pH (field)	*1.00*	-	**7.14**
Temperature (field)	*0.0*	°C	**1.4**

Special Notes

1 = Sample was analyzed outside of the recommended holding time.

Glossary of Terms

MRL	Method Reporting Limit
°C	Degrees Celsius
mg/L	Milligrams per Litre
pH units	pH units
uS/cm	Micro Siemens per centimeter

ANALYTICAL REPORT

Regional District of Kitimat Stikine
300 - 4545 Lazelle Avenue
Terrace BC, V8G 4E1
nlavoie@rdks.bc.ca

Project: Queensway
Project Number: -
Project Manager: Nicole Lavoie

Work Order: N22C088

RECEIVED: 15-Mar-2022

REPORTED: 31-May-2022

All analyses were performed in accordance with standard procedures published by BC MoE, Health Canada, Environment Canada, the American Public Health Association, or the US EPA.

Northern Laboratories (2010) Ltd.

Jesse Newton
Laboratory Manager

ANALYTICAL REPORT

Regional District of Kitimat Stikine **Work Order:** N22C088

LAB #			**N22C088-01**
SAMPLED DATE			**14-Mar-22**
SAMPLED TIME			**12:00**
SAMPLE ID			**Queensway Sewer**
	MRL	***Units***	
General Parameters (Water)			
pH	*1.0*	*pH units*	**7.3**
Biochemical Oxygen Demand / BOD	*4.0*	*mg/L*	**13**
Carbonaceous Biochemical Oxygen Demand / CBOD	*4.0*	*mg/L*	**8.4**
Solids, Total Suspended / TSS	*1.0*	*mg/L*	**7.3**
Ammonia (total as N)	*0.03*	*mg/L*	**25.0**
Phosphorus (total)	*0.05*	*mg/L*	**2.77**
Field Data (Water)			
Conductivity (field)	*1.0*	*uS/cm*	**281**
Dissolved Oxygen (field)	*0.10*	*mg/L*	**10.8**
pH (field)	*1.00*	-	**7.66**
Temperature (field)	*0.0*	*°C*	**4.6**

Glossary of Terms

MRL	Method Reporting Limit
°C	Degrees Celsius
mg/L	Milligrams per Litre
pH units	pH units
uS/cm	Micro Siemens per centimeter

ANALYTICAL REPORT

Regional District of Kitimat Stikine
300 - 4545 Lazelle Avenue
Terrace BC, V8G 4E1
nlavoie@rdks.bc.ca

Project: Queensway
Project Number: -
Project Manager: Nicole Lavoie

Work Order: N22D084

RECEIVED: 20-Apr-2022

REPORTED: 31-May-2022

All analyses were performed in accordance with standard procedures published by BC MoE, Health Canada, Environment Canada, the American Public Health Association, or the US EPA.

Northern Laboratories (2010) Ltd.

Jesse Newton
Laboratory Manager

ANALYTICAL REPORT

Regional District of Kitimat Stikine **Work Order:** N22D084

		MRL	Units	
LAB #				**N22D084-01**
SAMPLED DATE				**19-Apr-22**
SAMPLED TIME				**11:10**
SAMPLE ID				**Queensway Sewer**
General Parameters (Water)				
pH		1.0	pH units	**7.8**
Biochemical Oxygen Demand / BOD		4.0	mg/L	**36**
Carbonaceous Biochemical Oxygen Demand / CBOD		4.0	mg/L	**15**
Solids, Total Suspended / TSS		1.0	mg/L	**27**
Ammonia (total as N)		0.03	mg/L	**23.0 [1]**
Nitrogen, Total Kjeldahl		0.500	mg/L	**24.8**
Phosphorus (total)		0.05	mg/L	**3.53**
Field Data (Water)				
Conductivity (field)		1.0	uS/cm	**329**
Dissolved Oxygen (field)		0.10	mg/L	**14.5**
pH (field)		1.00	-	**8.01**
Temperature (field)		0.0	°C	**10.1**

Special Notes

1 = Sample was analyzed outside of the recommended holding time.

Glossary of Terms

MRL	Method Reporting Limit
°C	Degrees Celsius
mg/L	Milligrams per Litre
pH units	pH units
uS/cm	Micro Siemens per centimeter

ANALYTICAL REPORT

Regional District of Kitimat Stikine
300 - 4545 Lazelle Avenue
Terrace BC, V8G 4E1
nlavoie@rdks.bc.ca

Project: Queensway
Project Number: -
Project Manager: Nicole Lavoie

Work Order: N22E048

RECEIVED: 10-May-2022

REPORTED: 31-May-2022

All analyses were performed in accordance with standard procedures published by BC MoE, Health Canada, Environment Canada, the American Public Health Association, or the US EPA.

Northern Laboratories (2010) Ltd.

Jesse Newton
Laboratory Manager

ANALYTICAL REPORT

Regional District of Kitimat Stikine **Work Order:** N22E048

		MRL	Units	
LAB #				**N22E048-01**
SAMPLED DATE				**09-May-22**
SAMPLED TIME				**11:30**
SAMPLE ID				**Queensway Sewer**
General Parameters (Water)				
pH		1.0	pH units	**7.4**
Biochemical Oxygen Demand / BOD		4.0	mg/L	**23**
Carbonaceous Biochemical Oxygen Demand / CBOD		4.0	mg/L	**11**
Solids, Total Suspended / TSS		1.0	mg/L	**12**
Ammonia (total as N)		0.03	mg/L	**23.5**
Nitrogen, Total Kjeldahl		0.500	mg/L	**28.3**
Phosphorus (total)		0.05	mg/L	**3.36**
Field Data (Water)				
Conductivity (field)		1.0	uS/cm	**373**
Dissolved Oxygen (field)		0.10	mg/L	**11.3**
pH (field)		1.00	-	**7.93**
Temperature (field)		0.0	°C	**14.0**

Glossary of Terms

MRL	Method Reporting Limit
°C	Degrees Celsius
mg/L	Milligrams per Litre
pH units	pH units
uS/cm	Micro Siemens per centimeter

ANALYTICAL REPORT

Regional District of Kitimat Stikine
300 - 4545 Lazelle Avenue
Terrace BC, V8G 4E1
nlavoie@rdks.bc.ca

Project: Queensway
Project Number: -
Project Manager: Nicole Lavoie

Work Order: N22G100

RECEIVED: 19-Jul-2022

REPORTED: 09-Aug-2022

All analyses were performed in accordance with standard procedures published by BC MoE, Health Canada, Environment Canada, the American Public Health Association, or the US EPA.

Northern Laboratories (2010) Ltd.

Jesse Newton
Laboratory Manager

ANALYTICAL REPORT

Regional District of Kitimat Stikine **Work Order:** N22G100

	MRL	Units	
LAB #			**N22G100-01**
SAMPLED DATE			**18-Jul-22**
SAMPLED TIME			**13:00**
SAMPLE ID			**Queensway Sewer**
General Parameters (Water)			
pH	1.0	pH units	**6.8**
Biochemical Oxygen Demand / BOD	4.0	mg/L	**92**
Carbonaceous Biochemical Oxygen Demand / CBOD	4.0	mg/L	**16**
Solids, Total Suspended / TSS	1.0	mg/L	**28**
Ammonia (total as N)	0.03	mg/L	**9.32**
Nitrogen, Total Kjeldahl	0.500	mg/L	**15.6**
Phosphorus (total)	0.05	mg/L	**3.34**
Field Data (Water)			
Conductivity (field)	1.0	uS/cm	**423**
Dissolved Oxygen (field)	0.10	mg/L	**14.1**
pH (field)	1.00	-	**7.52**
Temperature (field)	0.0	°C	**18.9**

Glossary of Terms

MRL	Method Reporting Limit
°C	Degrees Celsius
mg/L	Milligrams per Litre
pH units	pH units
uS/cm	Micro Siemens per centimeter

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **VA22B9190**	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	: 16-Aug-2022 22:20
PO	: ----	Date Analysis Commenced	: 18-Aug-2022
C-O-C number	: ----	Issue Date	: 26-Aug-2022 16:17
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*
Cindy Tang	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Ophelia Chiu	Department Manager - Organics	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**)				Client sample ID	**Queensway Sewer System**	**----**	**----**	**----**	**----**
				Client sampling date / time	15-Aug-2022 10:00	----	----	----	----
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**VA22B9190-001**	**--------**	**--------**	**--------**	**--------**
					Result	----	----	----	----
Physical Tests									
pH	----	E108	0.10	pH units	8.32	----	----	----	----
solids, total suspended [TSS]	----	E160	3.0	mg/L	30.7	----	----	----	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	11.0	----	----	----	----
nitrogen, total	7727-37-9	E366	0.030	mg/L	12.8	----	----	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	3.80	----	----	----	----
Aggregate Organics									
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	25.9	----	----	----	----
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.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA22B9190**	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	: 16-Aug-2022 22:20
PO	: ----	Issue Date	: 26-Aug-2022 16:17
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 System	E550	15-Aug-2022	----	----	----		18-Aug-2022	3 days	3 days	✓
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT 3d]										
Queensway Sewer System	E555	15-Aug-2022	----	----	----		18-Aug-2022	3 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
Queensway Sewer System	E298	15-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	9 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid)										
Queensway Sewer System	E366	15-Aug-2022	24-Aug-2022	----	----		25-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
Queensway Sewer System	E372-U	15-Aug-2022	24-Aug-2022	----	----		25-Aug-2022	28 days	10 days	✓
Physical Tests : pH by Meter										
HDPE										
Queensway Sewer System	E108	15-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	0.25 hrs	2.12 hrs	× EHTR-FM
Physical Tests : TSS by Gravimetry										
HDPE										
Queensway Sewer System	E160	15-Aug-2022	----	----	----		20-Aug-2022	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	615887	1	17	5.8	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	608748	1	13	7.6	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	609061	1	11	9.0	5.0	✓
pH by Meter	E108	614341	1	15	6.6	5.0	✓
Total Nitrogen by Colourimetry	E366	615888	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	615889	1	16	6.2	5.0	✓
TSS by Gravimetry	E160	610965	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	615887	1	17	5.8	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	608748	1	13	7.6	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	609061	1	11	9.0	5.0	✓
pH by Meter	E108	614341	1	15	6.6	5.0	✓
Total Nitrogen by Colourimetry	E366	615888	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	615889	1	16	6.2	5.0	✓
TSS by Gravimetry	E160	610965	1	20	5.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	615887	1	17	5.8	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	608748	1	13	7.6	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	609061	1	11	9.0	5.0	✓
Total Nitrogen by Colourimetry	E366	615888	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	615889	1	16	6.2	5.0	✓
TSS by Gravimetry	E160	610965	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	615887	1	17	5.8	5.0	✓
Total Nitrogen by Colourimetry	E366	615888	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	615889	1	16	6.2	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.
Digestion for Total Nitrogen in water	EP366	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.

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

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **VA22B9190**	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	: 16-Aug-2022 22:20
PO	: ----	Date Analysis Commenced	: 18-Aug-2022
C-O-C number	: ----	Issue Date	: 26-Aug-2022 16:17
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*
Cindy Tang	Team Leader - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Ophelia Chiu	Department Manager - Organics	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: 610965)											
FJ2202184-002	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	<3.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 614341)											
VA22B7558-001	Anonymous	pH	----	E108	0.10	pH units	7.86	7.93	0.887%	4%	----
Anions and Nutrients (QC Lot: 615887)											
VA22B9104-001	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: 615888)											
VA22B9190-001	Queensway Sewer System	nitrogen, total	7727-37-9	E366	0.600	mg/L	12.8	13.5	5.33%	20%	----
Anions and Nutrients (QC Lot: 615889)											
VA22B9190-001	Queensway Sewer System	phosphorus, total	7723-14-0	E372-U	0.100	mg/L	3.80	3.96	4.18%	20%	----
Aggregate Organics (QC Lot: 608748)											
VA22B8614-003	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	4.4	4.5	2.2%	30%	----
Aggregate Organics (QC Lot: 609061)											
WR2200862-003	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: 610965)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 615887)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 615888)						
nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 615889)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Aggregate Organics (QCLot: 608748)						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 609061)						
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: 610965)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	89.8	85.0	115	----
Physical Tests (QCLot: 614341)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Anions and Nutrients (QCLot: 615887)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	103	85.0	115	----
Anions and Nutrients (QCLot: 615888)									
nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 615889)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	92.0	80.0	120	----
Aggregate Organics (QCLot: 608748)									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	103	85.0	115	----
Aggregate Organics (QCLot: 609061)									
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: 615887)										
VA22B9190-001	Queensway Sewer System	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: 615888)										
VA22B9205-001	Anonymous	nitrogen, total	7727-37-9	E366	0.406 mg/L	0.4 mg/L	102	70.0	130	----
Anions and Nutrients (QCLot: 615889)										
VA22B9205-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0492 mg/L	0.05 mg/L	98.4	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
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: VA22 - RDKS100-001

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): 9190

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)	Ammonia (by Fluorescence)	Total Nitrogen (by Colourimetry 0.03mg/L)	Total Phosphorus (by Colourimetry 0.002 mg/L)	Biochemical Oxygen Demand (5 day 2 mg/L)	CBOD	pH	SAMPLES ON HOLD	Sample is hazardous (please provide further detail)	NUMBER OF CONTAINERS
					P	P	P							
	QUEENSWAY SEWER SYSTEM.	AUG 15/22	10:00am	Effluent	✓	✓	✓	✓	✓	✓	✓			
	Field Blank													

Environmental Division Vancouver

Work Order Reference

VA22B9190

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)

British Columbia Approved and Working Water Quality Guidelines (MAY, 2015)

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			
10.8				3.5			

SHIPMENT RELEASE (client use)

Released by: Date: AUG. 15 2022 Time: 10:35

INITIAL SHIPMENT RECEPTION (lab use only)

Received by: Chris Date: 15 Aug 22 Time: 1620

FINAL SHIPMENT RECEPTION (lab use only)

Received by: RJ Date: Aug-16 Time: 2220

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

SEP1 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**.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **VA22C3716**	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	: 30-Sep-2022 11:55
PO	: ----	Date Analysis Commenced	: 01-Oct-2022
C-O-C number	: ----	Issue Date	: 17-Oct-2022 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*
Caitlin Macey	Team Leader - Inorganics	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

<: 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): cBOD data has been added.

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID: QUEENSWAY SEWER SYSTEM	----	----	----	----
					Client sampling date / time: 26-Sep-2022 12:00	----	----	----	----
					VA22C3716-001	--------	--------	--------	--------
					Result	----	----	----	----
Physical Tests									
solids, total suspended [TSS]	----	E160	3.0	mg/L	24.5	----	----	----	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	25.4	----	----	----	----
nitrogen, total	7727-37-9	E366	0.030	mg/L	29.4	----	----	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	4.47	----	----	----	----
Aggregate Organics									
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	16.9	----	----	----	----
carbonaceous biochemical oxygen demand [CBOD]	----	E555	2.0	mg/L	6.8	----	----	----	----

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA22C3716**	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	: 30-Sep-2022 11:55
PO	: ----	Issue Date	: 17-Oct-2022 15:12
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 SYSTEM	E550	26-Sep-2022	----	----	----		01-Oct-2022	3 days	5 days	✗ EHTR
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT 3d]										
QUEENSWAY SEWER SYSTEM	E555	26-Sep-2022	----	----	----		12-Oct-2022	3 days	16 days	✗ EHTR
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
QUEENSWAY SEWER SYSTEM	E298	26-Sep-2022	04-Oct-2022	----	----		09-Oct-2022	28 days	13 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid)										
QUEENSWAY SEWER SYSTEM	E366	26-Sep-2022	04-Oct-2022	----	----		05-Oct-2022	28 days	9 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
QUEENSWAY SEWER SYSTEM	E372-U	26-Sep-2022	04-Oct-2022	----	----		05-Oct-2022	28 days	9 days	✓
Physical Tests : TSS by Gravimetry										
HDPE										
QUEENSWAY SEWER SYSTEM	E160	26-Sep-2022	----	----	----		03-Oct-2022	7 days	7 days	✓

Legend & Qualifier Definitions

EHTR: Exceeded ALS recommended hold time prior to sample receipt.

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	679307	1	19	5.2	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	675761	1	20	5.0	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	692367	1	3	33.3	5.0	✓
Total Nitrogen by Colourimetry	E366	679306	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	679308	1	19	5.2	5.0	✓
TSS by Gravimetry	E160	677536	1	10	10.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	679307	1	19	5.2	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	675761	1	20	5.0	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	692367	1	3	33.3	5.0	✓
Total Nitrogen by Colourimetry	E366	679306	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	679308	1	19	5.2	5.0	✓
TSS by Gravimetry	E160	677536	1	10	10.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	679307	1	19	5.2	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	675761	1	20	5.0	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	692367	1	3	33.3	5.0	✓
Total Nitrogen by Colourimetry	E366	679306	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	679308	1	19	5.2	5.0	✓
TSS by Gravimetry	E160	677536	1	10	10.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	679307	1	19	5.2	5.0	✓
Total Nitrogen by Colourimetry	E366	679306	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	679308	1	19	5.2	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
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.
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	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
	Vancouver - Environmental			

QUALITY CONTROL REPORT

Work Order	: **VA22C3716**	Page	: 1 of 4
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	: 30-Sep-2022 11:55
PO	: ----	Date Analysis Commenced	: 01-Oct-2022
C-O-C number	: ----	Issue Date	: 17-Oct-2022 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 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
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: 677536)											
VA22C3158-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	112	118	5.22%	20%	----
Anions and Nutrients (QC Lot: 679306)											
VA22C3438-001	Anonymous	nitrogen, total	7727-37-9	E366	0.030	mg/L	0.088	0.086	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 679307)											
FJ2202696-003	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0064	0.0072	0.0008	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 679308)											
FJ2202696-003	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 675761)											
FJ2202792-001	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0.0%	30%	----
Aggregate Organics (QC Lot: 692367)											
VA22C4426-001	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: 677536)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 679306)						
nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 679307)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 679308)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Aggregate Organics (QCLot: 675761)						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 692367)						
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: 677536)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	98.5	85.0	115	----
Anions and Nutrients (QCLot: 679306)									
nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 679307)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	91.6	85.0	115	----
Anions and Nutrients (QCLot: 679308)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	83.9	80.0	120	----
Aggregate Organics (QCLot: 675761)									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	97.3	85.0	115	----
Aggregate Organics (QCLot: 692367)									
carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	198 mg/L	105	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: 679306)										
VA22C3713-001	Anonymous	nitrogen, total	7727-37-9	E366	1.92 mg/L	2 mg/L	96.1	70.0	130	----
Anions and Nutrients (QCLot: 679307)										
VA22C3713-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0911 mg/L	0.1 mg/L	91.1	75.0	125	----
Anions and Nutrients (QCLot: 679308)										
VA22C3438-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0474 mg/L	0.05 mg/L	94.9	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)	Ammonia (by Fluorescence)	Total Nitrogen (by Colourimetry 0.03mg/L)	Total Phosphorus (by Colourimetry 0.002 mg	Biochemical Oxygen Demand (5 day 2 mg/L)	SAMPLES ON HOLD	Sample is hazardous (please provide further details)	NUMBER OF CONTAINERS
					P	P	P					
1	QUEENSWAY SEWER SYSTEM	26 09 22	12:00	Effluent	✓	✓	✓	✓	✓			1
	Field Blank											

Environmental Division
Vancouver
Work Order Reference
VA22C3716

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	British Columbia Approved and Working Water Quality Guidelines (MAY, 2015)
Are samples for human consumption/ use? ☐ YES ☑ NO	

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			
5.3							11

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: Hannah Shinton	Date: Sept. 28. 2022	Time:	Received by: Chris	Date: 26 Sep 22	Time: 1600	Received by:	Date: 9/30/22	Time: 11:55

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

8EPT 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	: **VA22C5829**	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	: 25-Oct-2022 21:30
PO	: ----	Date Analysis Commenced	: 27-Oct-2022
C-O-C number	: ----	Issue Date	: 03-Nov-2022 14:31
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: 24-Oct-2022 10:00	----	----	----	----
					VA22C5829-001	--------	--------	--------	--------
					Result	----	----	----	----
Physical Tests									
pH	----	E108	0.10	pH units	7.76	----	----	----	----
solids, total suspended [TSS]	----	E160	3.0	mg/L	13.7	----	----	----	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	34.4	----	----	----	----
nitrogen, total	7727-37-9	E366	0.030	mg/L	31.8	----	----	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	4.71	----	----	----	----
Aggregate Organics									
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	7.8	----	----	----	----
carbonaceous biochemical oxygen demand [CBOD]	----	E555	2.0	mg/L	8.1	----	----	----	----

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

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA22C5829**	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	: 25-Oct-2022 21:30
PO	: ----	Issue Date	: 03-Nov-2022 14:31
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	24-Oct-2022	----	----	----		27-Oct-2022	3 days	3 days	✓
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT 3d] QUEENSWAY SEWER	E555	24-Oct-2022	----	----	----		27-Oct-2022	3 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) QUEENSWAY SEWER	E298	24-Oct-2022	28-Oct-2022	----	----		01-Nov-2022	28 days	8 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) QUEENSWAY SEWER	E366	24-Oct-2022	28-Oct-2022	----	----		01-Nov-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) QUEENSWAY SEWER	E372-U	24-Oct-2022	28-Oct-2022	----	----		29-Oct-2022	28 days	5 days	✓
Physical Tests : pH by Meter										
HDPE QUEENSWAY SEWER	E108	24-Oct-2022	01-Nov-2022	----	----		01-Nov-2022	0.25 hrs	1.32 hrs	× EHTR-FM
Physical Tests : TSS by Gravimetry										
HDPE QUEENSWAY SEWER	E160	24-Oct-2022	----	----	----		27-Oct-2022	7 days	3 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	720599	1	10	10.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	717340	1	20	5.0	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	718238	1	4	25.0	5.0	✓
pH by Meter	E108	725296	1	13	7.6	5.0	✓
Total Nitrogen by Colourimetry	E366	720600	1	4	25.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	720598	1	7	14.2	5.0	✓
TSS by Gravimetry	E160	718105	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	720599	1	10	10.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	717340	1	20	5.0	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	718238	1	4	25.0	5.0	✓
pH by Meter	E108	725296	1	13	7.6	5.0	✓
Total Nitrogen by Colourimetry	E366	720600	1	4	25.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	720598	1	7	14.2	5.0	✓
TSS by Gravimetry	E160	718105	1	20	5.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	720599	1	10	10.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	717340	1	20	5.0	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	718238	1	4	25.0	5.0	✓
Total Nitrogen by Colourimetry	E366	720600	1	4	25.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	720598	1	7	14.2	5.0	✓
TSS by Gravimetry	E160	718105	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	720599	1	10	10.0	5.0	✓
Total Nitrogen by Colourimetry	E366	720600	1	4	25.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	720598	1	7	14.2	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.

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QUALITY CONTROL REPORT

Work Order	: **VA22C5829**	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	: 25-Oct-2022 21:30
PO	: ----	Date Analysis Commenced	: 27-Oct-2022
C-O-C number	: ----	Issue Date	: 03-Nov-2022 14:27
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: 718105)											
KS2204050-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	10.7	9.7	1.0	Diff <2x LOR	----
Physical Tests (QC Lot: 725296)											
VA22C5966-001	Anonymous	pH	----	E108	0.10	pH units	7.00	7.02	0.285%	4%	----
Anions and Nutrients (QC Lot: 720598)											
VA22C5829-001	QUEENSWAY SEWER	phosphorus, total	7723-14-0	E372-U	0.200	mg/L	4.71	4.61	2.07%	20%	----
Anions and Nutrients (QC Lot: 720599)											
KS2204124-001	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: 720600)											
KS2204124-001	Anonymous	nitrogen, total	7727-37-9	E366	0.030	mg/L	0.166	0.174	0.007	Diff <2x LOR	----
Aggregate Organics (QC Lot: 717340)											
FJ2203032-001	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0.0%	30%	----
Aggregate Organics (QC Lot: 718238)											
VA22C6011-001	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: 718105)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 720598)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 720599)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 720600)						
nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Aggregate Organics (QCLot: 717340)						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 718238)						
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: 718105)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	92.5	85.0	115	----
Physical Tests (QCLot: 725296)									
pH	----	E108	----	pH units	7 pH units	99.8	98.0	102	----
Anions and Nutrients (QCLot: 720598)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	93.8	80.0	120	----
Anions and Nutrients (QCLot: 720599)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	98.3	85.0	115	----
Anions and Nutrients (QCLot: 720600)									
nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	101	75.0	125	----
Aggregate Organics (QCLot: 717340)									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	96.0	85.0	115	----
Aggregate Organics (QCLot: 718238)									
carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	198 mg/L	97.5	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: 720598)										
VA22C5962-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0474 mg/L	0.05 mg/L	94.9	70.0	130	----
Anions and Nutrients (QCLot: 720599)										
KS2204128-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0942 mg/L	0.1 mg/L	94.2	75.0	125	----
Anions and Nutrients (QCLot: 720600)										
KS2204128-001	Anonymous	nitrogen, total	7727-37-9	E366	0.397 mg/L	0.4 mg/L	99.4	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

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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 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)	Ammonia (by Fluorescence)	Total Nitrogen (by Colourimetry 0.03mg/L)	Total Phosphorus (by Colourimetry 0.002 mg	Biochemical Oxygen Demand (5 day 2 mg/L)	SAMPLES ON HOLD	Sample is hazardous (please provide further detail	NUMBER OF CONTAINERS
	QUEENSWAY SEWER. (A)	OCT.24/22	108	Effluent								
	QUEENSWAY SEWER. (B)	OCT.24/22										
	QUEENSWAY SEWER. (C)	OCT24/22										
	Field Blank											

P P P

Environmental Division
Vancouver
Work Order Reference
VA22C5829

Telephone : +1 604 253 4188

Terrace Shipping
1 Coolers
Carbouys
Ground ☐
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)

British Columbia Approved and Working Water Quality Guidelines (MAY, 2015)

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
	9

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date: OCT. 24/2022	Time:	Received by:	Date: Oct. 24/22	Time: 2:25	Received by: RJ	Date: OCT 25	Time: 2130

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	: **VA22C7659**	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-Nov-2022 12:10
PO	: ----	Date Analysis Commenced	: 16-Nov-2022
C-O-C number	: ----	Issue Date	: 24-Nov-2022 16:45
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: **Effluent**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID: Queensway Sewer	----	----	----	----
					Client sampling date / time: 14-Nov-2022 11:30	----	----	----	----
					VA22C7659-001	--------	--------	--------	--------
					Result	----	----	----	----
Physical Tests									
pH	----	E108	0.10	pH units	7.95	----	----	----	----
solids, total suspended [TSS]	----	E160	3.0	mg/L	6.5	----	----	----	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	33.5	----	----	----	----
nitrogen, total	7727-37-9	E366	0.030	mg/L	34.8	----	----	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	4.87	----	----	----	----
Aggregate Organics									
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	6.1	----	----	----	----
carbonaceous biochemical oxygen demand [CBOD]	----	E555	2.0	mg/L	11.8	----	----	----	----

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	: **VA22C7659**	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-Nov-2022 12:10
PO	: ----	Issue Date	: 24-Nov-2022 16:45
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	14-Nov-2022	----	----	----		16-Nov-2022	3 days	2 days	✓
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT 3d] Queensway Sewer	E555	14-Nov-2022	----	----	----		17-Nov-2022	3 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Queensway Sewer	E298	14-Nov-2022	20-Nov-2022	----	----		23-Nov-2022	28 days	9 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) Queensway Sewer	E366	14-Nov-2022	20-Nov-2022	----	----		22-Nov-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) Queensway Sewer	E372-U	14-Nov-2022	20-Nov-2022	----	----		22-Nov-2022	28 days	8 days	✓
Physical Tests : pH by Meter										
HDPE Queensway Sewer	E108	14-Nov-2022	16-Nov-2022	----	----		16-Nov-2022	0.25 hrs	4.25 hrs	× EHTR-FM
Physical Tests : TSS by Gravimetry										
HDPE Queensway Sewer	E160	14-Nov-2022	----	----	----		17-Nov-2022	7 days	3 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	750475	1	14	7.1	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	745243	1	17	5.8	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	747896	1	9	11.1	5.0	✓
pH by Meter	E108	745543	1	5	20.0	5.0	✓
Total Nitrogen by Colourimetry	E366	750473	1	13	7.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	750474	1	17	5.8	5.0	✓
TSS by Gravimetry	E160	745993	1	18	5.5	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	750475	1	14	7.1	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	745243	1	17	5.8	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	747896	1	9	11.1	5.0	✓
pH by Meter	E108	745543	1	5	20.0	5.0	✓
Total Nitrogen by Colourimetry	E366	750473	1	13	7.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	750474	1	17	5.8	5.0	✓
TSS by Gravimetry	E160	745993	1	18	5.5	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	750475	1	14	7.1	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	745243	1	17	5.8	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	747896	1	9	11.1	5.0	✓
Total Nitrogen by Colourimetry	E366	750473	1	13	7.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	750474	1	17	5.8	5.0	✓
TSS by Gravimetry	E160	745993	1	18	5.5	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	750475	1	14	7.1	5.0	✓
Total Nitrogen by Colourimetry	E366	750473	1	13	7.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	750474	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	: **VA22C7659**	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-Nov-2022 12:10
PO	: ----	Date Analysis Commenced	: 16-Nov-2022
C-O-C number	: ----	Issue Date	: 24-Nov-2022 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*
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: 745543)											
VA22C7655-001	Anonymous	pH	----	E108	0.10	pH units	8.01	7.97	0.501%	4%	----
Physical Tests (QC Lot: 745993)											
VA22C7627-008	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	<3.0	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 750473)											
KS2204340-001	Anonymous	nitrogen, total	7727-37-9	E366	1.50	mg/L	31.9	32.3	1.09%	20%	----
Anions and Nutrients (QC Lot: 750474)											
VA22C7659-001	Queensway Sewer	phosphorus, total	7723-14-0	E372-U	0.200	mg/L	4.87	4.91	0.802%	20%	----
Anions and Nutrients (QC Lot: 750475)											
VA22C7659-001	Queensway Sewer	ammonia, total (as N)	7664-41-7	E298	0.250	mg/L	33.5	33.7	0.487%	20%	----
Aggregate Organics (QC Lot: 745243)											
FJ2203188-002	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	10.8	11.1	2.7%	30%	----
Aggregate Organics (QC Lot: 747896)											
KS2204315-001	Anonymous	carbonaceous biochemical oxygen demand [CBOD]	----	E555	2.0	mg/L	5.2	5.0	3.9%	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: 745993)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 750473)						
nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 750474)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 750475)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Aggregate Organics (QCLot: 745243)						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 747896)						
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: 745543)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 745993)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	101	85.0	115	----
Anions and Nutrients (QCLot: 750473)									
nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	96.2	75.0	125	----
Anions and Nutrients (QCLot: 750474)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	92.6	80.0	120	----
Anions and Nutrients (QCLot: 750475)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	104	85.0	115	----
Aggregate Organics (QCLot: 745243)									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	97.9	85.0	115	----
Aggregate Organics (QCLot: 747896)									
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: 750473)										
KS2204342-001	Anonymous	nitrogen, total	7727-37-9	E366	ND mg/L	4 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 750474)										
VA22C7683-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0458 mg/L	0.05 mg/L	91.7	70.0	130	----
Anions and Nutrients (QCLot: 750475)										
VA22C7683-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.105 mg/L	0.1 mg/L	105	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	☑ ☐ 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):	VA22C7659	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
	Queensway Sewer (A)	14/11/22	11:30am	Effluent	R	R	R	R	R	R	R			3
	QUEENSWAY SEWER (B)	14/11/22	11:30AM	"										
	QUEENSWAY SEWER (E)	14/11/22	11:30AM	"										
	Field Blank													

Environmental Division Vancouver
Work Order Reference
VA22C7659
Telephone : +1 604 253 4188

Terrace Shipping
#1 Coolers
#___ Carbouys
Ground ☐
Air ☑
SFX ☐

Drinking Water (DW) Samples[1] (client use) ... 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? ☐ ☑

Federal 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			
8.1						3	

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date: NOV 14/22	Time: 1116	Received by:	Date: NOV 14/22	Time: 1116	Received by: ice pk JC	Date: NOV 15 2022	Time: 1210pm

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	: **VA22D0099**	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-Dec-2022 21:20
PO	: ----	Date Analysis Commenced	: 15-Dec-2022
C-O-C number	: ----	Issue Date	: 22-Dec-2022 16:34
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

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: 12-Dec-2022 10:15	----	----	----	----
					VA22D0099-001	--------	--------	--------	--------
					Result	----	----	----	----
Physical Tests									
pH	----	E108	0.10	pH units	8.12	----	----	----	----
solids, total suspended [TSS]	----	E160	3.0	mg/L	3.2	----	----	----	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	35.8	----	----	----	----
nitrogen, total	7727-37-9	E366	0.030	mg/L	39.6	----	----	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	5.63	----	----	----	----
Aggregate Organics									
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	5.6	----	----	----	----
carbonaceous biochemical oxygen demand [CBOD]	----	E555	2.0	mg/L	5.5	----	----	----	----

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	: **VA22D0099**	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-Dec-2022 21:20
PO	: ----	Issue Date	: 22-Dec-2022 16:34
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	12-Dec-2022	----	----	----		15-Dec-2022	3 days	3 days	✓
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT 3d] Queensway Sewer	E555	12-Dec-2022	----	----	----		15-Dec-2022	3 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Queensway Sewer	E298	12-Dec-2022	17-Dec-2022	----	----		20-Dec-2022	28 days	8 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) Queensway Sewer	E366	12-Dec-2022	17-Dec-2022	----	----		22-Dec-2022	28 days	10 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) Queensway Sewer	E372-U	12-Dec-2022	17-Dec-2022	----	----		19-Dec-2022	28 days	7 days	✓
Physical Tests : pH by Meter										
HDPE Queensway Sewer	E108	12-Dec-2022	15-Dec-2022	----	----		15-Dec-2022	0.25 hrs	9.25 hrs	× EHTR-FM
Physical Tests : TSS by Gravimetry										
HDPE Queensway Sewer	E160	12-Dec-2022	----	----	----		17-Dec-2022	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	782247	1	12	8.3	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	780297	1	18	5.5	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	779407	1	7	14.2	5.0	✓
pH by Meter	E108	779510	1	17	5.8	5.0	✓
Total Nitrogen by Colourimetry	E366	782251	1	7	14.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	782249	1	9	11.1	5.0	✓
TSS by Gravimetry	E160	779113	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	782247	1	12	8.3	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	780297	1	18	5.5	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	779407	1	7	14.2	5.0	✓
pH by Meter	E108	779510	1	17	5.8	5.0	✓
Total Nitrogen by Colourimetry	E366	782251	1	7	14.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	782249	1	9	11.1	5.0	✓
TSS by Gravimetry	E160	779113	1	20	5.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	782247	1	12	8.3	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	780297	1	18	5.5	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	779407	1	7	14.2	5.0	✓
Total Nitrogen by Colourimetry	E366	782251	1	7	14.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	782249	1	9	11.1	5.0	✓
TSS by Gravimetry	E160	779113	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	782247	1	12	8.3	5.0	✓
Total Nitrogen by Colourimetry	E366	782251	1	7	14.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	782249	1	9	11.1	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
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	: **VA22D0099**	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	: 12-Dec-2022 21:20
PO	: ----	Date Analysis Commenced	: 15-Dec-2022
C-O-C number	: ----	Issue Date	: 22-Dec-2022 16:34
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

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: 779113)											
FJ2203466-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	<3.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 779510)											
VA22D0002-003	Anonymous	pH	----	E108	0.10	pH units	7.30	7.27	0.412%	4%	----
Anions and Nutrients (QC Lot: 782247)											
FJ2203463-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0591	0.0609	3.01%	20%	----
Anions and Nutrients (QC Lot: 782249)											
KS2204710-005	Anonymous	phosphorus, total	7723-14-0	E372-U	0.200	mg/L	2.43	2.84	15.6%	20%	----
Anions and Nutrients (QC Lot: 782251)											
VA22D0099-001	Queensway Sewer	nitrogen, total	7727-37-9	E366	1.50	mg/L	39.6	39.3	0.831%	20%	----
Aggregate Organics (QC Lot: 779407)											
KS2204674-001	Anonymous	carbonaceous biochemical oxygen demand [CBOD]	----	E555	2.0	mg/L	4.7	5.1	8.2%	30%	----
Aggregate Organics (QC Lot: 780297)											
KS2204679-003	Anonymous	biochemical oxygen demand [BOD]	----	E550	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: 779113)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 782247)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 782249)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 782251)						
nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Aggregate Organics (QCLot: 779407)						
carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 780297)						
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: 779113)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	90.3	85.0	115	----
Physical Tests (QCLot: 779510)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Anions and Nutrients (QCLot: 782247)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	100	85.0	115	----
Anions and Nutrients (QCLot: 782249)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	90.2	80.0	120	----
Anions and Nutrients (QCLot: 782251)									
nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	95.5	75.0	125	----
Aggregate Organics (QCLot: 779407)									
carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	198 mg/L	103	85.0	115	----
Aggregate Organics (QCLot: 780297)									
biochemical oxygen demand [BOD]	----	E550	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: 782247)										
FJ2203463-002	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: 782249)										
KS2204711-001	Anonymous	phosphorus, total	7723-14-0	E372-U	ND mg/L	0.05 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 782251)										
VA22D0160-001	Anonymous	nitrogen, total	7727-37-9	E366	ND mg/L	20 mg/L	ND	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 17 -

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ALS Environmental

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

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

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)	Ammonia (by Fluorescence)	Total Nitrogen (by Colourimetry 0.03mg/L)	Total Phosphorus (by Colourimetry 0.002 mg/L)	Carbonaceous Biochemical Oxygen Demand	pH	SAMPLES ON HOLD	Sample is hazardous (please provide further detail)	NUMBER OF CONTAINERS
					P	P	P						
	Queensway Sewer	12-Dec-22	10:15	Effluent	R	R	R	R	R	R			3
	Field Blank												

Environmental Division Vancouver
Work Order Reference
VA22D0099

Telephone : +1 604 253 4188

Terrace Shipping
#1 Coolers
#___ Carbouys
Ground ☐
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

...ria to add on report by clicking on the drop-down list below (electronic COC only)

British Columbia Approved and Working Water Quality Guidelines (MAY, 2015)

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			
3.0	2.8	2.5		6			

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: Hannah Shuttor	Date: December 12th 2022	Time:	Received by:	Date: Dec 12/22	Time: 1217	Received by: RJ	Date: Dec-12	Time: 2120

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**.