



Saskatoon

112 - 112 Research Drive
Saskatoon, SK S7N 3R3
Canada

www.okc-sk.com

Memorandum

To: Jenyfer Mosquera – Permitting Specialist - Water and Waste, Agnico Eagle Mines Ltd.

From: Jared Robertson, Senior Geochemist

Cc: Colleen Prather – Agnico Eagle Mines Ltd.; John Dockrey – Lorax Environmental Services Ltd.; Lyndsey Thorson – Okane Consultants

Our ref: 948-021-013

Date: 20/09/2022

Re: **Meliadine ACLC Kinetic Testing Summary Memorandum**

Introduction

Okane Consultants (Okane) conducted a kinetic testing program for tailings and waste rock materials from the Meliadine Extension in Nunavut, Canada for Agnico Eagle Mines Ltd. (Agnico Eagle). Kinetic testing was performed using Okane's Advanced Customizable Leach Columns (ACLCs), which are engineered columns with automated monitoring systems that aim to approximate the simulation of field conditions in a laboratory setting while providing flexibility to control a range of variables. The program was initiated on December 1, 2020 and was completed on January 13, 2022. Objectives of the kinetic test work were to:

- 1) Assess the metal leaching trends and loading rates of the tailings and various waste rock materials;
- 2) Measure the intrinsic oxidation rates (IORs) of the tailings and waste rock materials;
- 3) Calculate the lag time for acid generation of the tailings and waste rock materials; and

- 4) Determine the salinity rinsing rates for rock containing saline connate water from underground workings.

This memorandum presents a summary of the methodology of the kinetic testing program as well as factual results for the metal leaching trends, loading rates, IORs, lag time to acid generation, and salinity rinsing rates for the waste rock columns. Results from kinetic testing were transferred to Lorax Environmental for further analysis and will be incorporated into the geochemical characterization of the Meliadine Extension.

Methods

One tailings sample and 10 waste rock samples were chosen for kinetic testing (Table 1). The tailings sample was sourced from the underground Tiriganiaq deposit and is characterized as non-potentially acid generating (NPAG). The waste rock lithologies tested consist of potentially acid generating (PAG) iron formation (IF-PAG), NPAG iron formation (IF-NPAG), PAG sedimentary rock (SED-PAG), NPAG sedimentary rock (SED-NPAG), NPAG gabbro (GAB-NPAG), and NPAG F-Zone (FZONE-NPAG). Two additional waste rock columns were filled with IF-PAG and SED-PAG with connate water from the underground mine workings used as influent. Two columns were filled with run of mine (ROM) low-grade ore from the underground Tiriganiaq deposit to determine the time at which residual salinity is rinsed from the rock under field conditions.

The ACLCs simulate unsaturated leaching conditions of mine waste materials. A representative photo of the ACLC columns is shown in Figure 1. The ACLCs were operated in two phases: Phase 1 was operated under closed conditions (no gas flow, closed to atmosphere) to determine the oxidation rates by O₂ consumption (Table 2) and Phase 2 was operated under atmospheric conditions to simulate mineral weathering under field conditions (Table 3). Weekly wetting events were performed to simulate leaching of waste rock and tailings. A second set of O₂ consumption measurements (described as Phase 1 Trial 2) was conducted at the end of the kinetic testing (Table 4). Influent water was added at a rate of 250 mL/week (equivalent to approximately 700 mm/year net percolation (NP)). Temperatures were controlled at 10 °C (the operational minimum of the ACLCs).

Table 1: Column lithologies and purposes.

Sample ID	Deposit	Lithology and ABA Class	Source	Purpose
01-TSF	Tiriganiaq	NPAG Tiriganiaq Paste Backfill	Tailings Storage Facility	Paste tailings loading rates
02-IF-PAG	Discovery	PAG Iron Formation	Underground	Determine lag time to ARD
03-SED-PAG	Discovery	PAG Sedimentary Rock	Open Pit	Determine lag time to ARD
04-GAB-NPAG	Discovery	NPAG Gabbro	Open Pit	Potential cover material
05-SED-NPAG	Discovery	NPAG Sedimentary Rock	Open Pit	Potential cover material
06-IF-NPAG	Discovery	NPAG Iron Formation	Open Pit	Potential cover material
07-IF-PAG-CW	Discovery	PAG Iron Formation	Underground	Impact of connate water on rock weathering
08-SED-PAG-CW	Discovery	PAG Sedimentary Rock	Open Pit	Impact of connate water on rock weathering
09-FZONE-NPAG	F Zone	NPAG F-Zone Rock	Open Pit	Potential cover material
10-ROM-SR1	Tiriganiaq	Low Grade Ore	Underground	Salt rinsing duration
11-ROM-SR2	Tiriganiaq	Low Grade Ore	Underground	Salt rinsing duration



Figure 1: Photograph of the ACLCs.

Table 2: Operational parameters for Phase 1 – Closed conditions

Parameter	Value
Temperature	10 °C
Gas Composition	Initially atmospheric prior to closing the column
Gas Flow Rate	0 L/min
Test Duration	4 to 6 weeks
Headspace Gas Sampling	5 samples/week for O ₂ and CO ₂
Influent Water Composition	<ul style="list-style-type: none"> • Connate water (07-IF-PAG-CW and 08-SED-PAG-CW) or sterilized deionized (DI) water (all other columns) • A pulse of bromide tracer (as KBr) was added to the influent at a concentration of 25 mg/L Br to test the homogeneity and assumption of plug flow of each column. Columns 7 and 8 had 2500 mg/L Br added
Wetting Event Frequency	Weekly
Wetting Event Volume	250 mL/week (equivalent to approximately 700 mm/year net percolation)
Weekly Leachate Sampling	<ul style="list-style-type: none"> • pH • Electrical conductivity (EC) • Oxidation-reduction potential (ORP) • SO₄²⁻ • Br (until breakthrough and return to baseline)
Monthly Leachate Sampling (in addition to weekly analytes)	<ul style="list-style-type: none"> • Alkalinity • Major ions • Trace metals • Nutrients (N species and phosphate) • Total cyanide (T-CN) and weak acid dissociable cyanide (WAD-CN) (01-TSF column only)
Other	Columns were sealed after the first wetting event. Water was recycled in a closed loop for the duration of Phase 1 to prevent the transfer of atmospheric gas into the column during wetting events

Table 3: Operational parameters for Phase 2 – Atmospheric conditions

Parameter	Value
Temperature	10 °C
Gas Composition	Atmospheric (21% O ₂)
Gas Flow Rate	0.02 – 0.04 L/min
Test Duration	58 weeks for Column 1, 38 weeks for Columns 2 – 9, and 13 weeks for Columns 10 & 11.
Headspace Gas Sampling	Outlet gas (O ₂ and CO ₂) concentrations were monitored continuously by a Quantek 902D analyzer
Influent Water Composition	Connate water (07-IF-PAG-CW and 08-SED-PAG-CW) or sterilized deionized (DI) water (all other columns)
Wetting Event Frequency	Weekly
Wetting Event Volume	250 mL/week (equivalent to approximately 700 mm/year net percolation)
Weekly Leachate Sampling	<ul style="list-style-type: none"> • pH • Electrical conductivity (EC) • Oxidation-reduction potential (ORP) • SO₄²⁻ • Br⁻ (until breakthrough and return to baseline)
Monthly Leachate Sampling (in addition to weekly analytes)	<ul style="list-style-type: none"> • Alkalinity • Major ions • Dissolved trace metals • Nutrients (Nitrogen species and PO₄²⁻) • Total cyanide (T-CN) and weak acid dissociable cyanide (WAD-CN) (01-TSF column only)
Other	Columns were free draining (water was not recycled)

Table 4: Timeline of kinetic testing.

Date	Columns Involved	Event
December 1, 2020	1	Column loaded
December 11, 2020	1	First wetting event
December 11, 2020	1	Phase 1 (trial 1) initiated
January 12, 2021	2 – 11	Columns loaded
January 15, 2021	1	Phase 1 (trial 1) finished; Phase 2 begins
January 15, 2021	2 – 11	First wetting event
January 15, 2021	2 – 9	Phase 1 (trial 1) initiated
February 18, 2021	2 – 9	Phase 1 (trial 1) finished; Phase 2 begins
February 25, 2021	1 – 9	Br tracer added to influent
October 10, 2021	1 – 9	Phase 1 (trial 2) initiated
November 1, 2021	2 – 9	Phase 1 (trial 2) finished
November 4, 2021	2 – 11	Columns deconstructed
December 23, 2021	1	Phase 1 (trial 2) finished
January 13, 2022	1	Column deconstructed

Tailings Kinetic Geochemistry

The leachate trends for key parameters and analytes are presented in this section. Complete leachate chemistry is provided in Appendix A. The leachate pH values for the tailings column (01-TSF) were circumneutral for the duration of the experiment, ranging from 6.7 to 7.5 and with a slow but gradual increase with time (Figure 2). Electrical conductivity (EC) values rapidly decreased from 98.5 mS/cm as the initial saline pore water was flushed from the material (Figure 3). The leachate EC temporarily increased between weeks 10 and 16. This increase in EC was attributed to either the presence of a low-permeability tailings mass within the column that took longer to wet-up and flush its initial constituents, or the development of a localized zone of positive pore water pressures created during pore-gas extraction during Phase 1 of testing, resulting in a delayed flushing of high EC water from near the mid-column sampling port. The EC approached a steady value around 3.0 mS/cm after week 30.

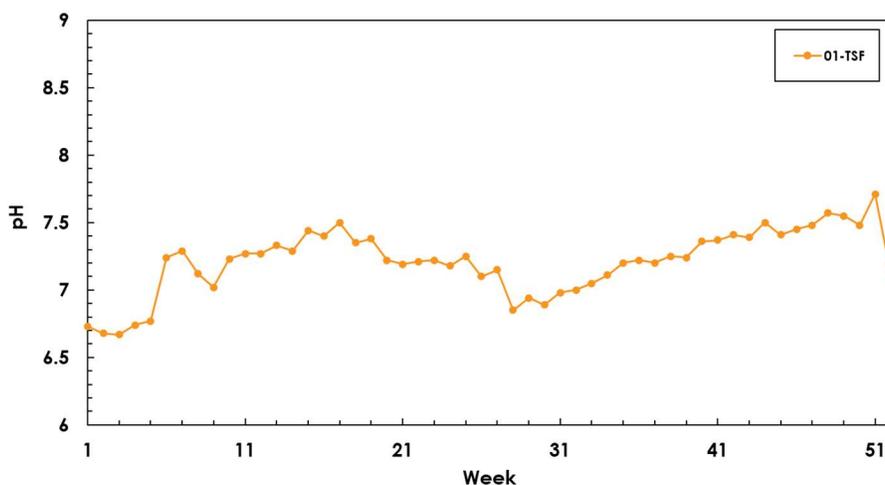


Figure 2: Column 01-TSF leachate pH values throughout the duration of kinetic testing.

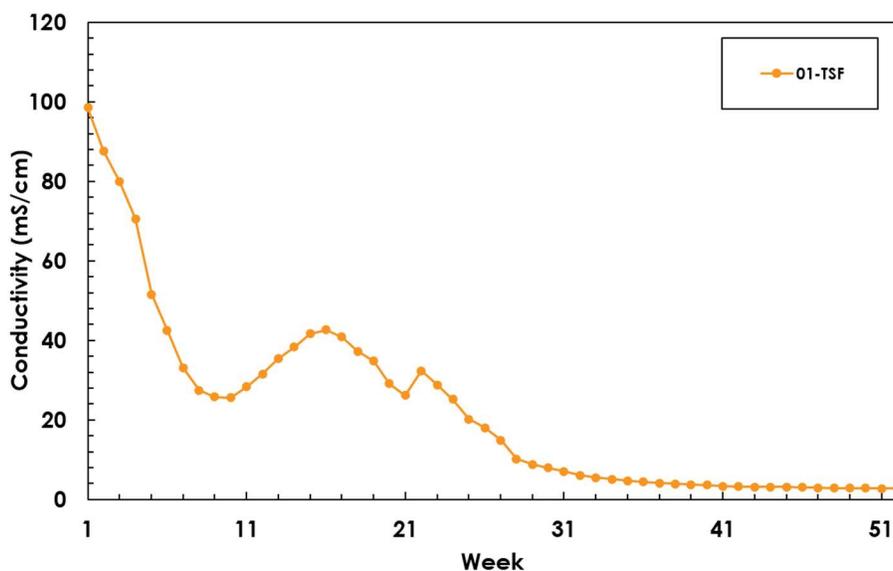


Figure 3: Column 01-TSF leachate EC values throughout the duration of kinetic testing.

Total alkalinity and SO_4 concentrations followed the EC trends and ranged between 135 and 376 mg/L (as CaCO_3) and 143 and 18,300 mg/L, respectively (Figure 4 and Figure 5). Two anomalously high SO_4 concentrations reported at weeks 23 and 25 are attributed to interferences in the analytical process resulting from the high salinity of the leachate. Chloride concentrations rapidly decreased from 16,900 mg/L at the beginning of testing, increased at the same time as EC, and gradually decreased to below the detection limit of 10 mg/L at week 48 as the initial salinity was completely flushed from the material (Figure 6). Arsenic concentrations rapidly decreased from 4.11 mg/L at the beginning of testing, slightly increased to 0.65 mg/L at week 24 and decreased to a final concentration of 0.10 mg/L (Figure 7).

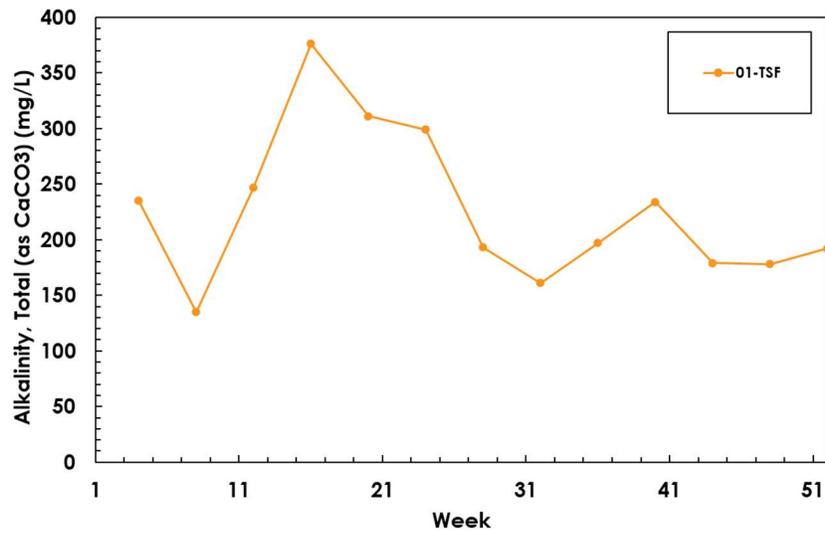


Figure 4: Column 01-TSF leachate total alkalinity concentrations throughout the duration of kinetic testing.

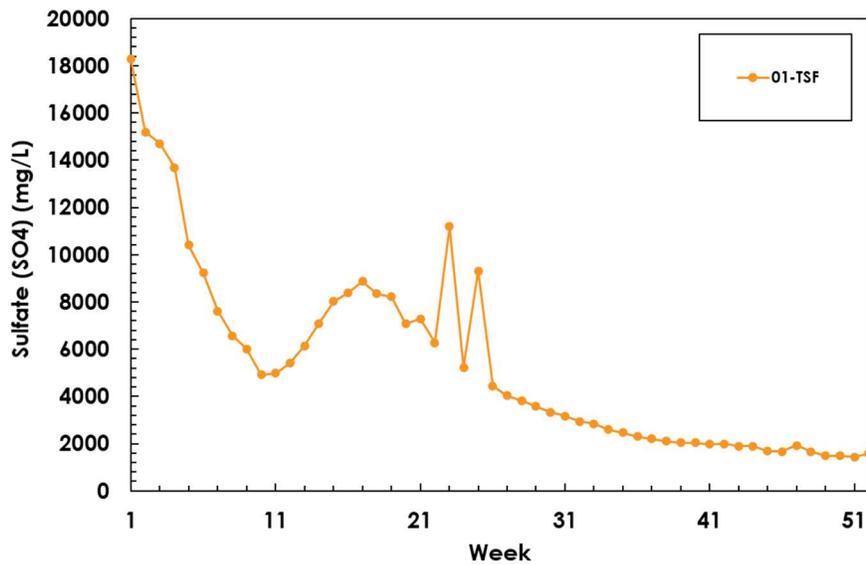


Figure 5: Column 01-TSF leachate SO₄ concentrations throughout the duration of kinetic testing.

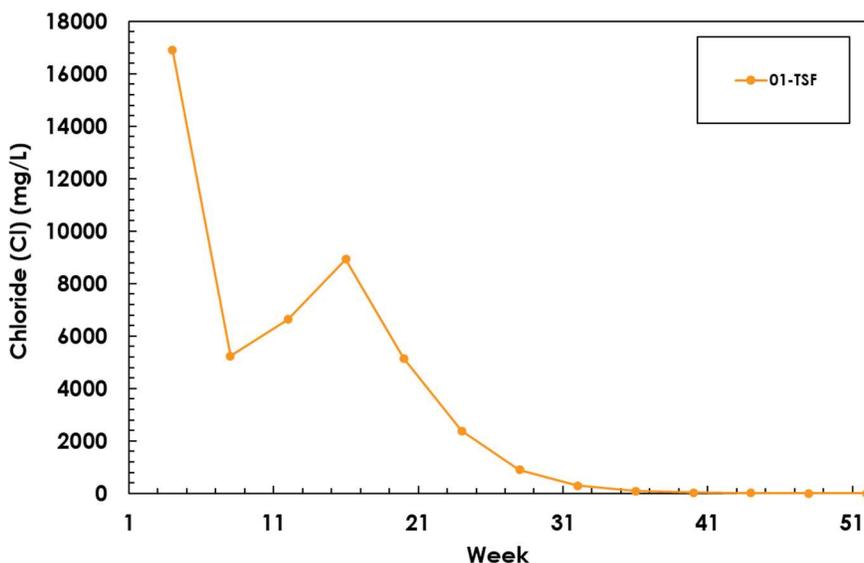


Figure 6: Column 01-TSF leachate Cl⁻ concentrations throughout the duration of kinetic testing.

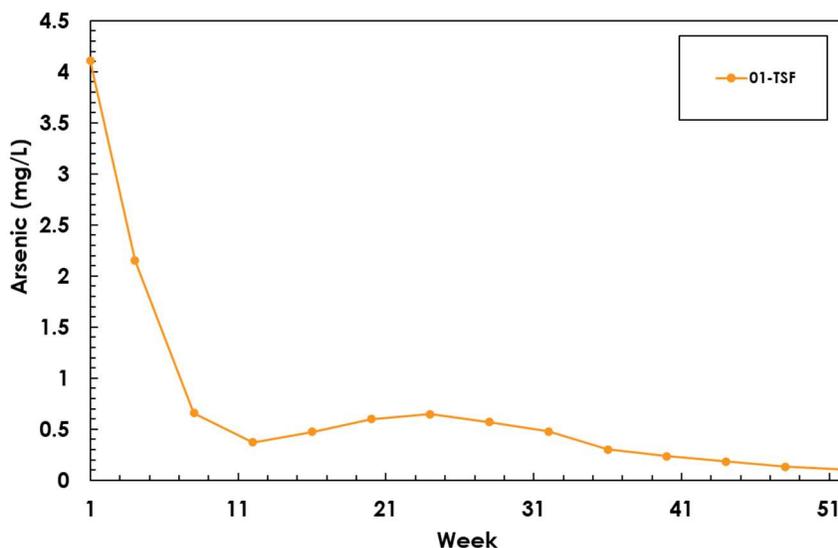


Figure 7: Column 01-TSF leachate As concentrations throughout the duration of kinetic testing

Waste Rock Kinetic Geochemistry

The leachate results for key parameters for waste rock columns 02-IF-PAG, 03-SED-PAG, 04-GAB-NPAG, 05-SED-NPAG, 06-IF-NPAG, and 09-FZONE-NPAG are presented here. Complete leachate chemistry is provided in Appendix A. Results for the salinity rinsing columns (10-ROM-SR1 and 11-ROM-SR2) are presented in a separate section, along with the columns using connate water as the influent (07-IF-PAG-

CW and 08-SED-PAG-CW), which are compared against columns with duplicate waste rock materials using DI water as influent (02-IF-PAG and 03-SED-PAG).

The leachate pH values for all waste rock columns leached by DI water was slightly alkaline (pH values between 7.4 and 8.7) throughout the duration of kinetic testing. The EC in all waste rock column leachate followed a similar trend of slightly increasing EC in the first few weeks of testing as soluble salts were flushed, followed by a gradual decrease to stable values (0.32 to 0.48 mS/cm) around week 23 (Figure 9). Column 04-GAB-NPAG had notably higher alkalinity compared to the other columns with a maximum concentration of 244 mg/L (as CaCO₃). Total alkalinity concentrations decreased throughout the experiment, but stabilized toward the end of testing (Figure 10).

Chloride concentrations rapidly decreased immediately after testing began; the final Cl concentrations of all waste rock columns converged to approximately 5 mg/L at week 36 (Figure 11), indicating that conservative constituents were completely flushed around this time.

Sulfate concentrations are an indicator of both flushing of soluble oxidation products and ongoing oxidation of sulfides. Sulfate concentrations were initially elevated as soluble salts were flushed. A second peak in sulfate concentrations occurred in several columns around week 30 as a result of enclosure temperature control issues during the summer months causing oxidation rates to increase. Temperatures peaked near 20 °C during weeks 24 and 27.

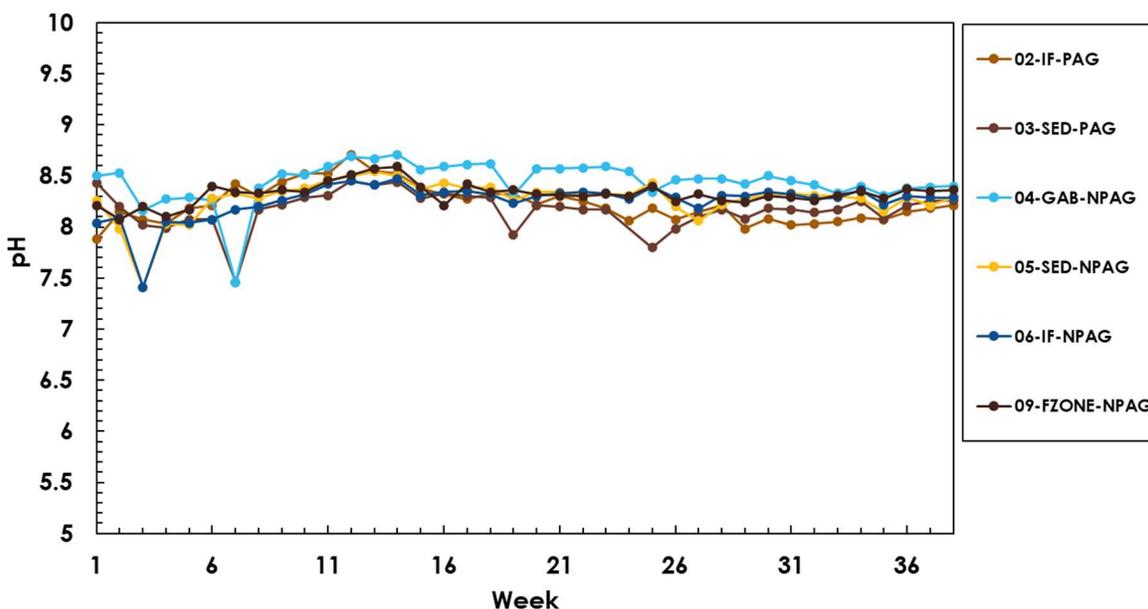


Figure 8: Leachate pH trends for waste rock Columns 02-IF-PAG, 03-SED-PAG, 04-GAB-NPAG, 05-SED-NPAG, 06-IF-NPAG, and 09-FZONE-NPAG throughout the duration of kinetic testing.

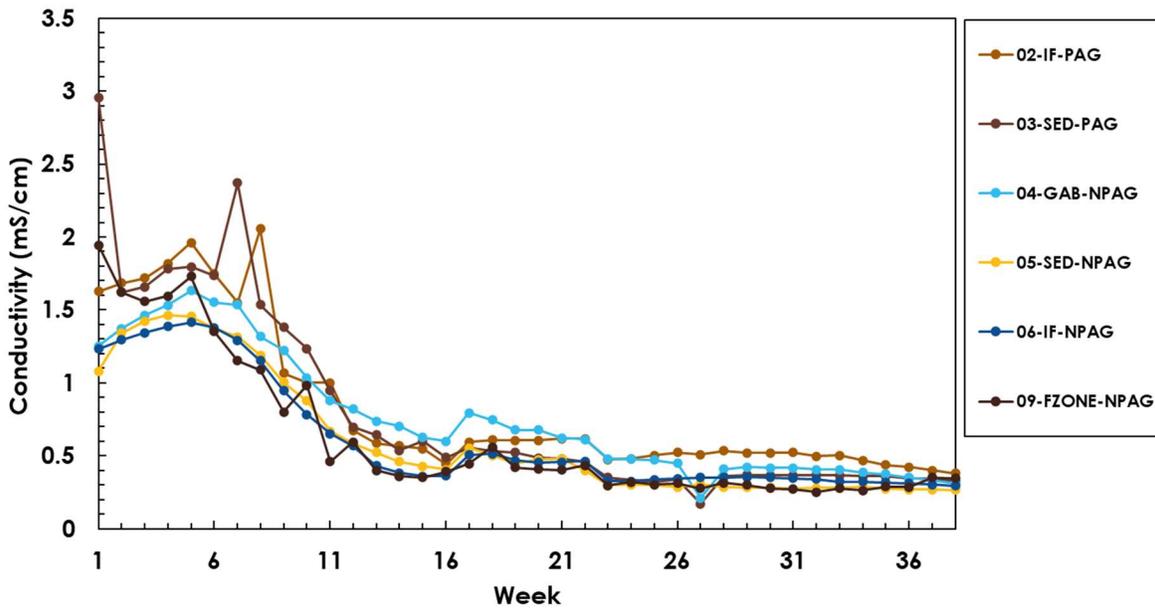


Figure 9: Leachate EC trends for waste rock Columns 02-IF-PAG, 03-SED-PAG, 04-GAB-NPAG, 05-SED-NPAG, 06-IF-NPAG, and 09-FZONE-NPAG throughout the duration of kinetic testing.

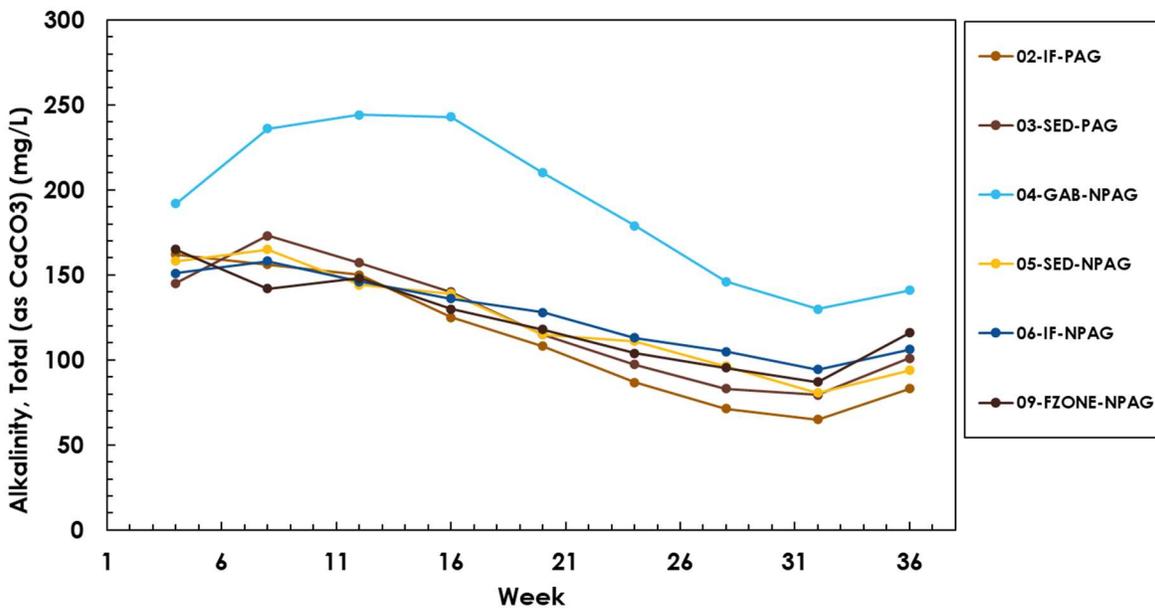


Figure 10: Leachate total alkalinity concentration trends for waste rock Columns 02-IF-PAG, 03-SED-PAG, 04-GAB-NPAG, 05-SED-NPAG, 06-IF-NPAG, and 09-FZONE-NPAG throughout the duration of kinetic testing.

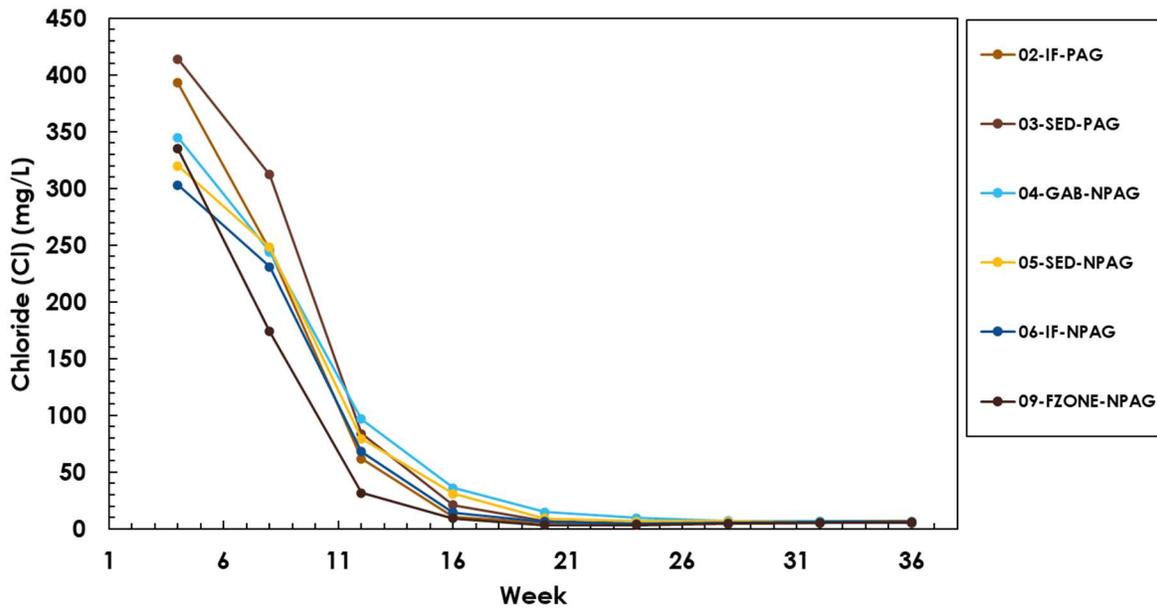


Figure 11: Leachate Cl⁻ concentration trends for waste rock Columns 02-IF-PAG, 03-SED-PAG, 04-GAB-NPAG, 05-SED-NPAG, 06-IF-NPAG, and 09-FZONE-NPAG throughout the duration of kinetic testing.

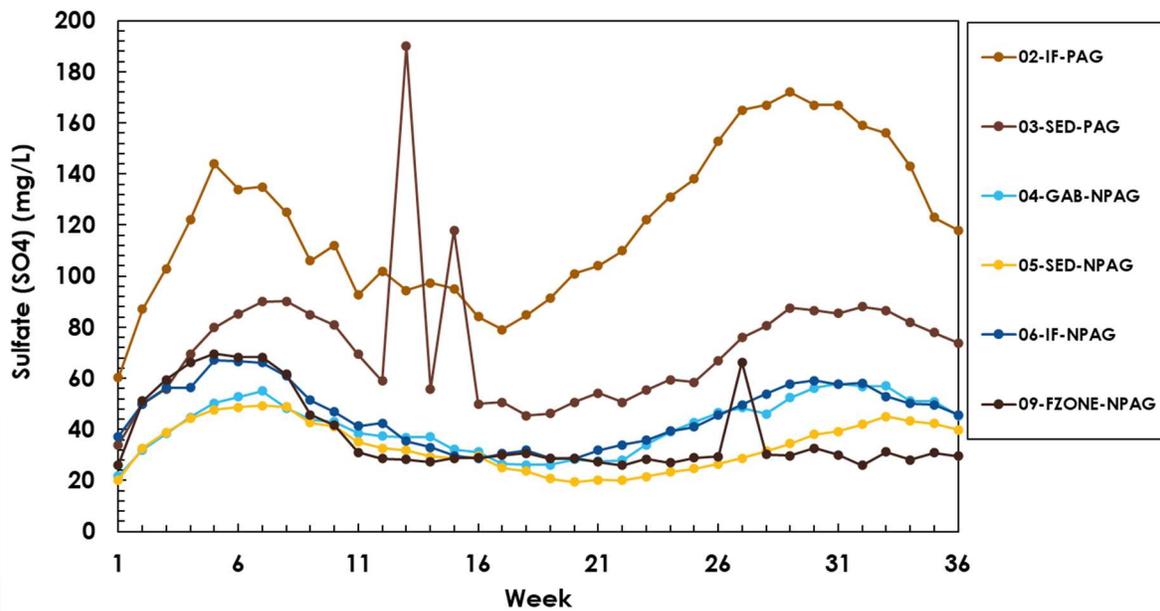


Figure 12: Leachate SO₄ concentration trends for waste rock Columns 02-IF-PAG, 03-SED-PAG, 04-GAB-NPAG, 05-SED-NPAG, 06-IF-NPAG, and 09-FZONE-NPAG throughout the duration of kinetic testing.

Leachate As concentrations increased from the initial flushing concentrations throughout kinetic testing for 04-GAB-NPAG and 05-SED-NPAG but were relatively stable for all other waste rock with concentrations between 0.0005 and 0.0043 mg/L (Figure 13).

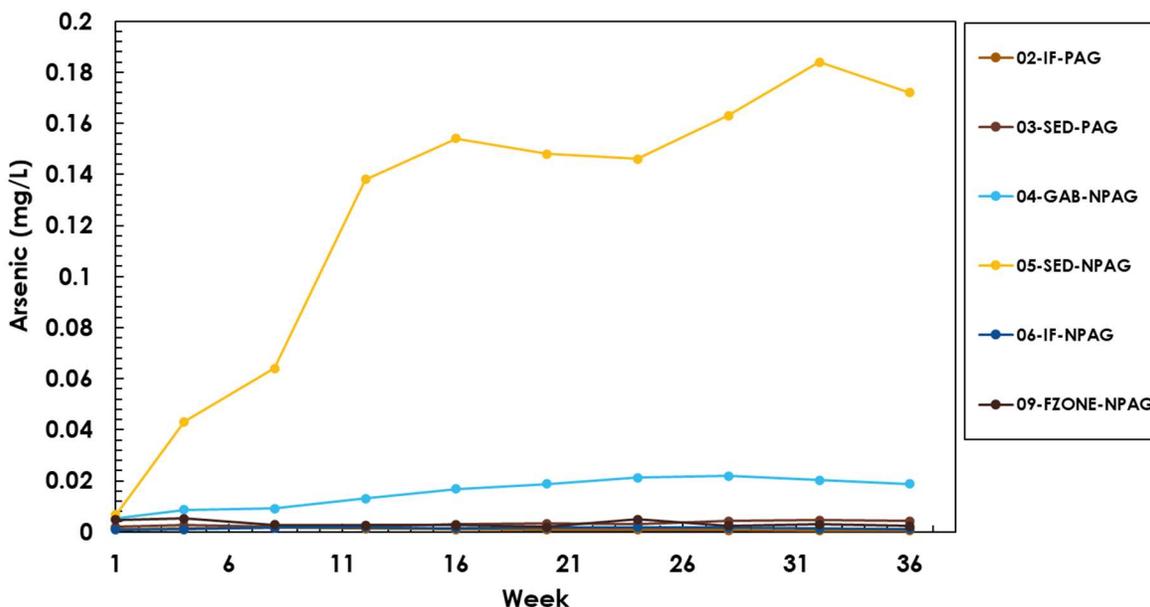


Figure 13: Leachate As concentration trends for waste rock Columns 02-IF-PAG, 03-SED-PAG, 04-GAB-NPAG, 05-SED-NPAG, 06-IF-NPAG, and 09-FZONE-NPAG throughout the duration of kinetic testing.

Column 05-SED-NPAG had the highest leachate As concentrations with a maximum concentration of 0.184 mg/L. The bulk chemistry of the 05-SED-NPAG waste rock material did not contain significantly greater As in the solid phase. It is expected that an anomalous As-bearing mineral that is not representative of the bulk NPAG Sediments material was included in the column material. Subsamples from several locations of the 05-SED-NPAG column were collected, homogenized, and submitted to Queen's University's Facility for Isotope Research for mineral liberation analysis (MLA). Arsenic-rich mineral phases were targeted in the analysis.

The majority of As in the 05-SED-NPAG sample was associated with arsenopyrite, which is a characteristic As-bearing phase in the waste rock. Several grains of gersdorffite (NiAs₂) were identified, however, and could be the source of elevated As leaching. Additional MLA analysis of the NPAG Sediments material and other rock types to confirm the relative abundance of gersdorffite would provide additional support for attributing gersdorffite as the source of the non-representative As leaching rates from this material. The complete MLA data is provided in Appendix D.

Leaching Effects of Connate Water vs. DI Water

The purpose of 07-IF-PAG-CW and 08-SED-PAG-CW was to determine the effects that connate water from the underground mine workings has on mineral weathering within waste rock relative to DI water used in traditional kinetic tests. Here, the results from 02-IF-PAG and 03-SED-PAG (DI water used as influent) are compared against 07-IF-PAG-CW and 08-SED-PAG-CW (connate water influent), which have the same respective lithologies.

The connate water is characterized as being saline (EC = 74.2 mS/cm, TDS = 57,700 mg/L), circumneutral (pH = 7.2) with low alkalinity (37.7 mg/L as CaCO₃), high Ca and SO₄ concentrations (1,730 and 2,600 mg/L, respectively), and very high Na and Cl concentrations (17,400 and 33,100 mg/L, respectively). The concentrations of Cd, Ni, and As in the influent connate water were 0.00092 mg/L, <0.025 mg/L, and <0.005 mg/L, respectively.

The leachate pH values of 07-IF-PAG-CW and 08-SED-PAG-CW (pH = 7.0 to 7.5) were roughly one pH unit lower than 02-IF-PAG and 03-SED-PAG (pH = 7.8 to 8.7) were stable (Figure 14). The pH differences are potentially due to decreased carbonate dissolution resulting from the high Ca and Mg concentrations of the connate water. The range of leachate EC values of 07-IF-PAG-CW and 08-SED-PAG-CW (55.6 to 81.2 mS/cm) were nearly two orders of magnitude greater than the range of 02-IF-PAG and 03-SED-PAG EC values (2.95 to 0.17 mS/cm) and gradually increased throughout kinetic testing, whereas the leachate EC of 02-IF-PAG and 03-SED-PAG decreased (Figure 15).

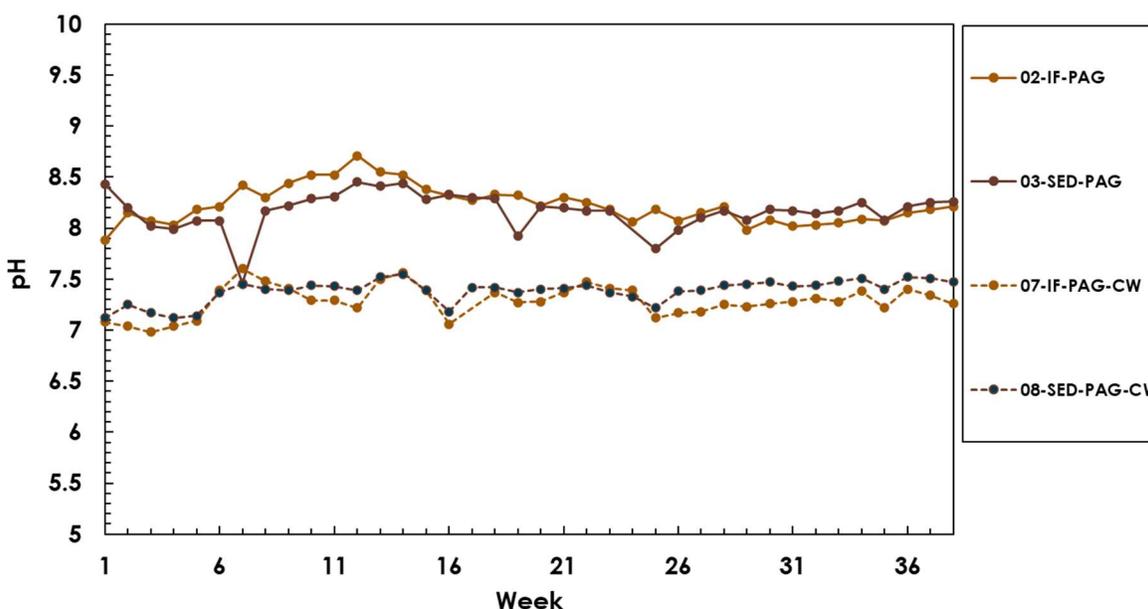


Figure 14: Leachate pH trends for waste rock 02-IF-PAG, 03-SED-PAG, 07-IF-PAG-CW, and 08-SED-PAG-CW throughout the duration of kinetic testing. CW = Connate Water.

Sulfate concentrations in 07-IF-PAG-CW and 08-SED-PAG-CW leachate increased throughout kinetic testing (2,600 to 3,600 mg/L; Figure 16) and were greater than SO₄ concentrations in the influent connate water (2,600 mg/L). Sulfate concentrations from 02-IF-PAG and 03-SED-PAG generally increased throughout testing ranging from 34 to 172 mg/L.

The mobility of divalent metals from the waste rock were affected by the connate water, whereas oxyanion species (e.g., As) were less affected. Both Ni and Cd concentrations from 07-IF-PAG-CW and 08-SED-PAG-CW were roughly 2 orders of magnitude greater than 02-IF-PAG and 03-SED-PAG and showed a stable trend, whereas Ni and Cd concentrations from 02-IF-PAG and 03-SED-PAG gradually decreased throughout kinetic testing (Figure 17 and Figure 18).

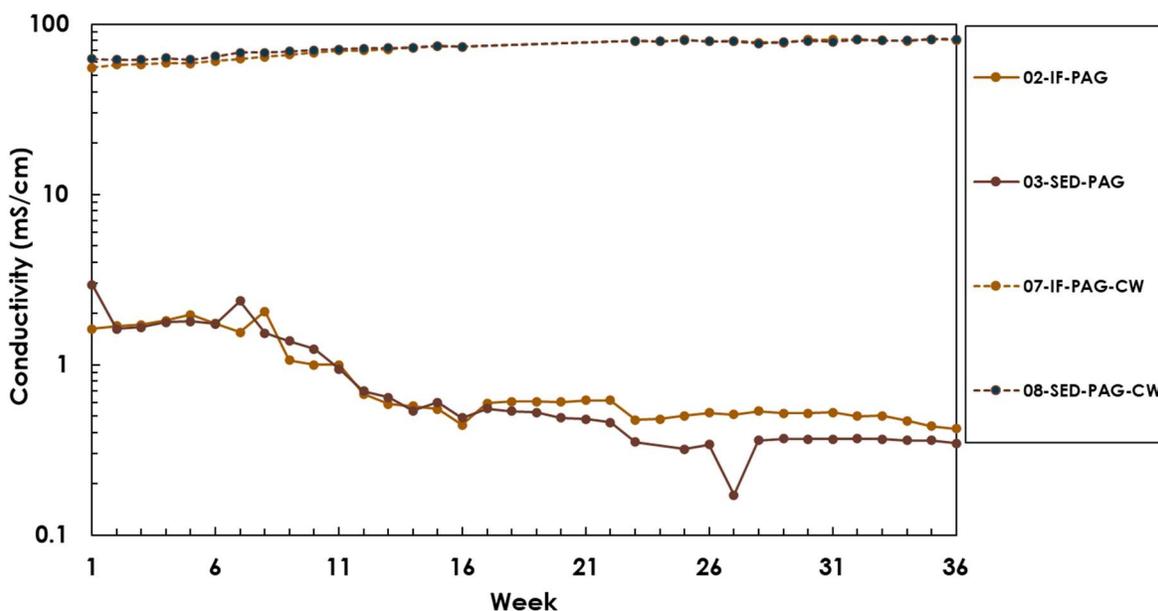


Figure 15: Leachate EC trends for waste rock 02-IF-PAG, 03-SED-PAG, 07-IF-PAG-CW, and 08-SED-PAG-CW throughout the duration of kinetic testing. CW = Connate Water.

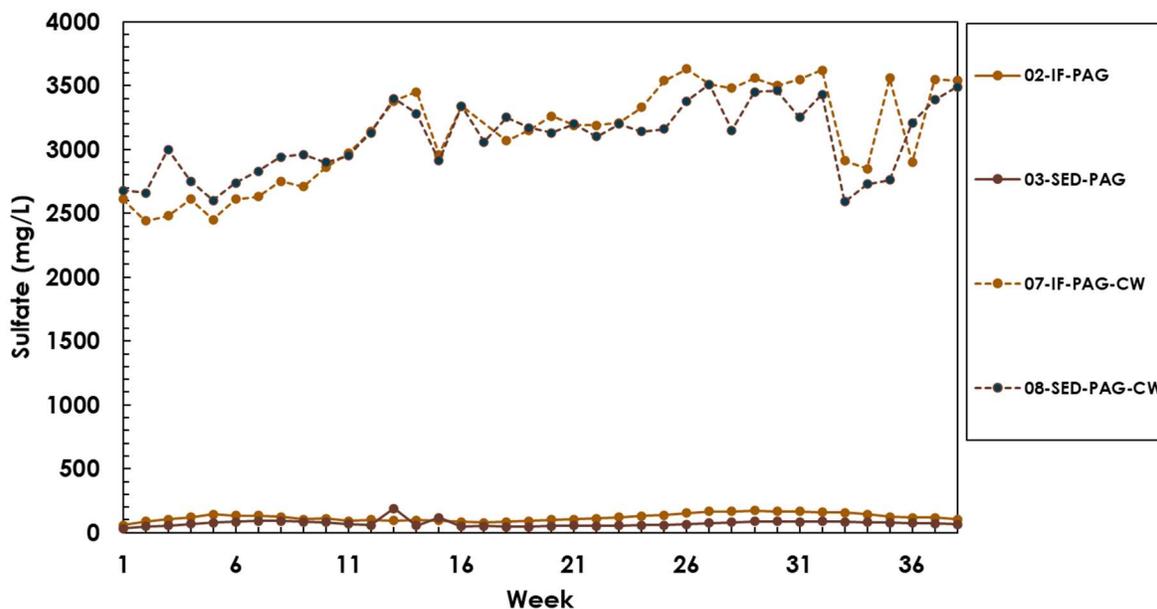


Figure 16: Leachate SO₄ concentration trends for waste rock 02-IF-PAG, 03-SED-PAG, 07-IF-PAG-CW, and 08-SED-PAG-CW throughout the duration of kinetic testing. CW = Connate Water.

Arsenic concentrations in leachate from 07-IF-PAG-CW and 08-SED-PAG-CW were generally below the detection limit of 0.005 and 0.01 mg/L for the entirety of kinetic testing, although the detection limits were raised because of the high TDS of the leachate. Arsenic concentrations in leachate from 03-SED-PAG gradually rose to a maximum of 0.0045 mg/L at week 32, whereas concentrations from 02-IF-PAG decreased to a minimum value of 0.0005 mg/L at the end of kinetic testing (Figure 19).

Cadmium and Ni had greater mobility in 07-IF-PAG-CW and 08-SED-PAG-CW than their DI water counterparts possibly due to decreased adsorption at the lower leachate pH, adsorption competition by SO₄, and complexation with SO₄ and other ligands present in the connate water. Arsenic was less affected at the leachate pH of the connate water columns because As forms oxyanion species that adsorb more strongly at lower pH.

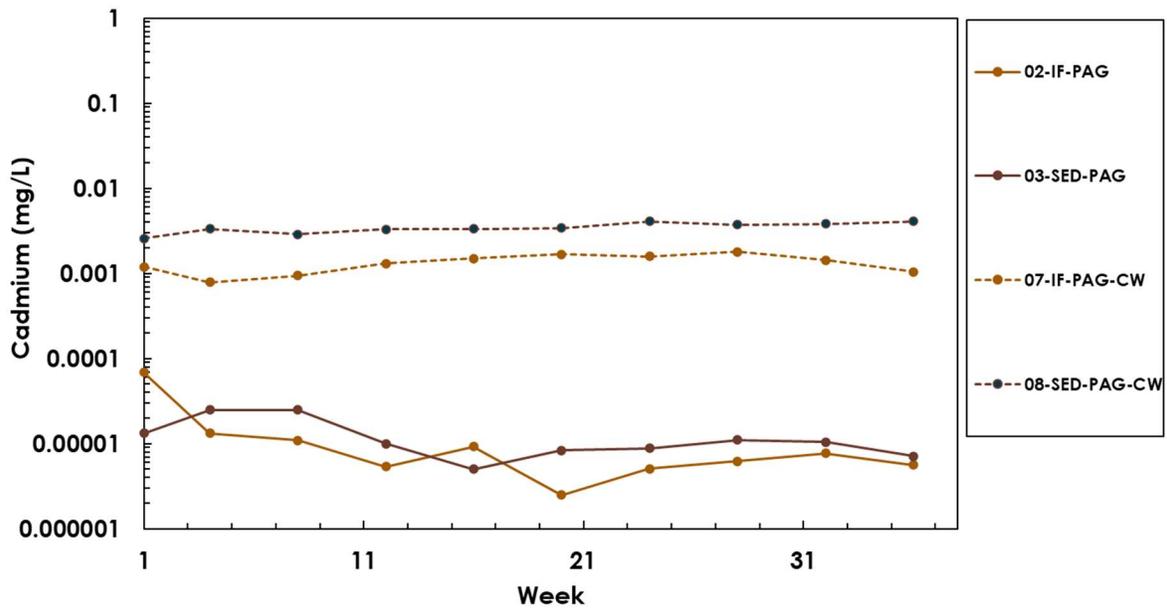


Figure 17: Leachate Cd concentration trends for waste rock 02-IF-PAG, 03-SED-PAG, 07-IF-PAG-CW, and 08-SED-PAG-CW throughout the duration of kinetic testing. CW = Connate Water.

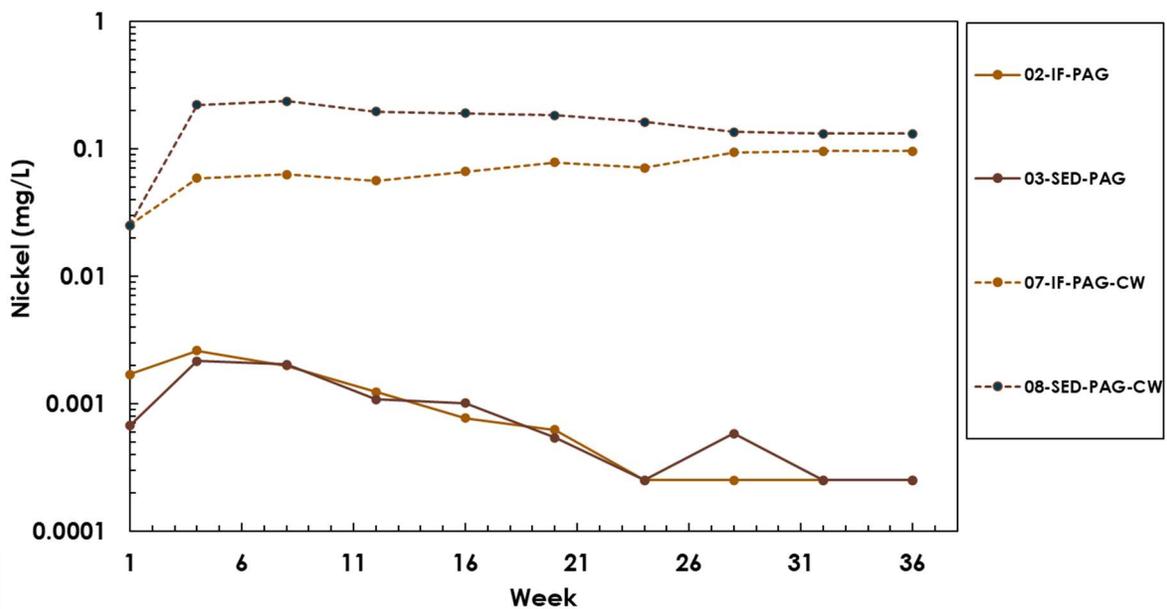


Figure 18: Leachate Ni concentration trends for waste rock 02-IF-PAG, 03-SED-PAG, 07-IF-PAG-CW, and 08-SED-PAG-CW throughout the duration of kinetic testing. CW = Connate Water.

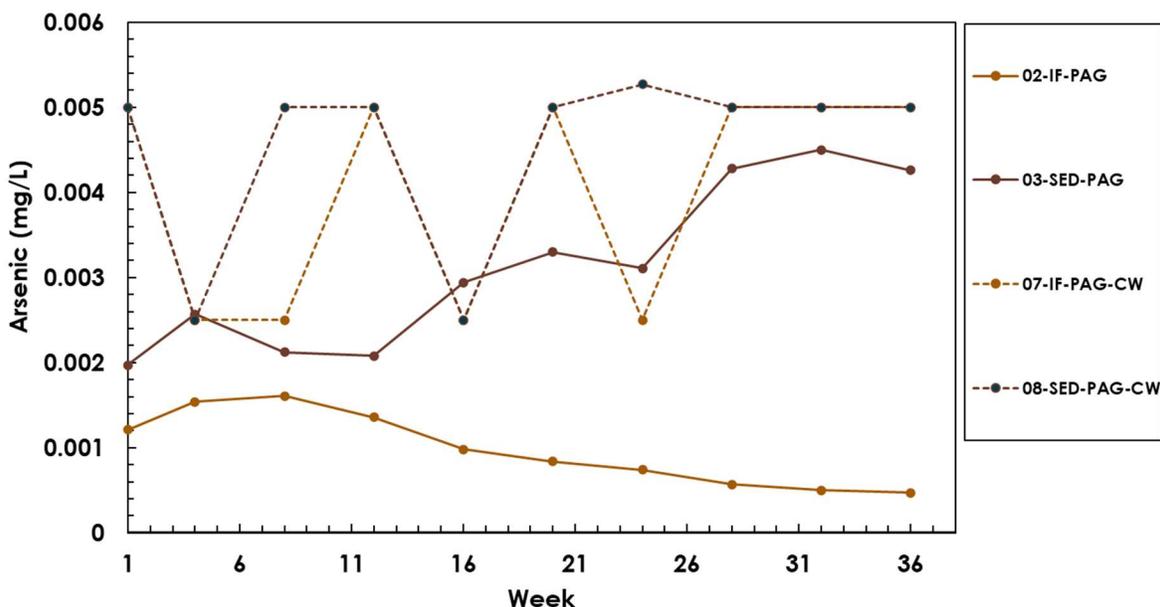


Figure 19: Leachate As concentration trends for waste rock 02-IF-PAG, 03-SED-PAG, 07-IF-PAG-CW, and 08-SED-PAG-CW throughout the duration of kinetic testing. CW = Connate Water.

Salinity Rinsing Columns

The purpose of the salinity rinsing columns (10-ROM-SR1 and 11-ROM-SR2) was to determine the rate that residual salinity is rinsed from the crushed ore under field conditions. Influent water was added at a higher rate than the other columns (0.6 L/week) to accelerate the flushing process. Electrical conductivity, Cl, and Na (proxies for salinity) were plotted against the total number of pore volumes flushed (Figure 20, Figure 21, and Figure 22).

The concentrations of EC, Cl, and Na decreased throughout testing for both 10-ROM-SR1 and 11-ROM-SR2, however each material type exhibited unique trends. Assuming plug flow conditions in the columns, the salinity rinsing rate of 11-ROM-SR2 was greater than 10-ROM-SR1, potentially due to the greater fines content (23% passing 0.15 mm for 11-ROM-SR2 compared to 15% for 10-ROM-SR1) and therefore a greater particle surface area requiring flushing. Leachate from 10-ROM-SR1 had initially high salinity concentrations that rapidly decreased during the first three pore volume flushes and began to stabilize after four flushes were achieved. Leachate salinity concentrations from 11-ROM-SR2 decreased more gradually during the first seven pore volume flushes. Concentrations began to stabilize around eight flushes. These results indicate that several pore volume flushes are required to flush stored salinity from ROM waste rock.

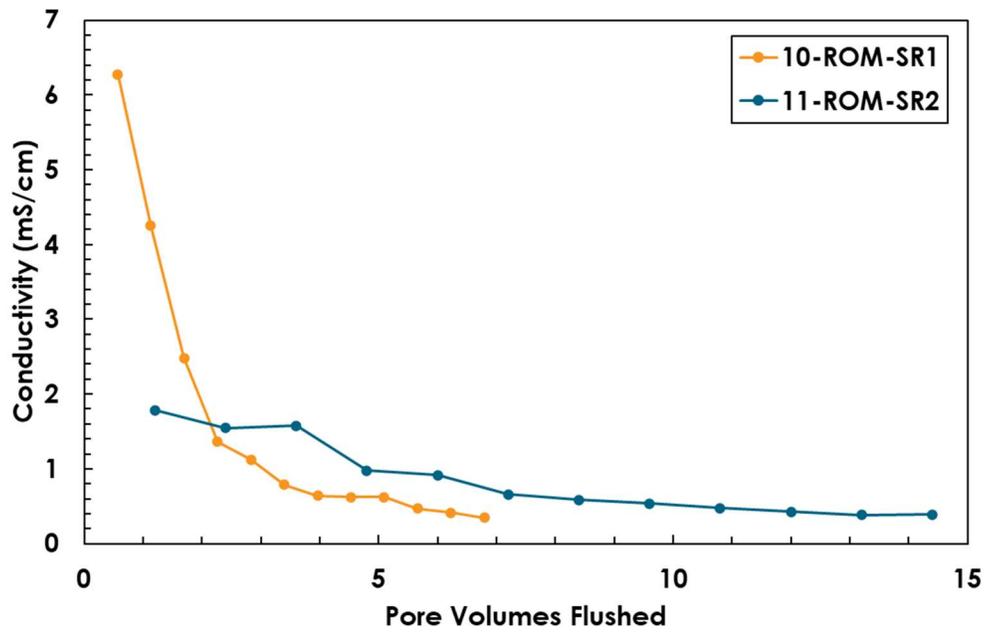


Figure 20: Leachate EC trends plotted against the number of pore volumes flushed for 10-ROM-SR1 and 11-ROM-SR2.

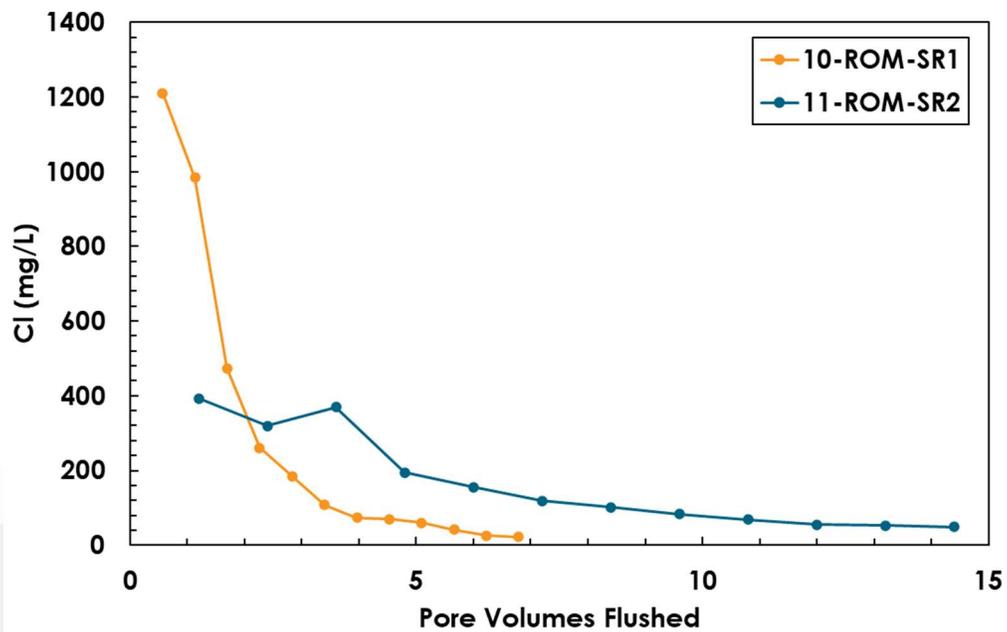


Figure 21: Leachate Cl⁻ concentration trends plotted against the number of pore volumes flushed for 10-ROM-SR1 and 11-ROM-SR2.

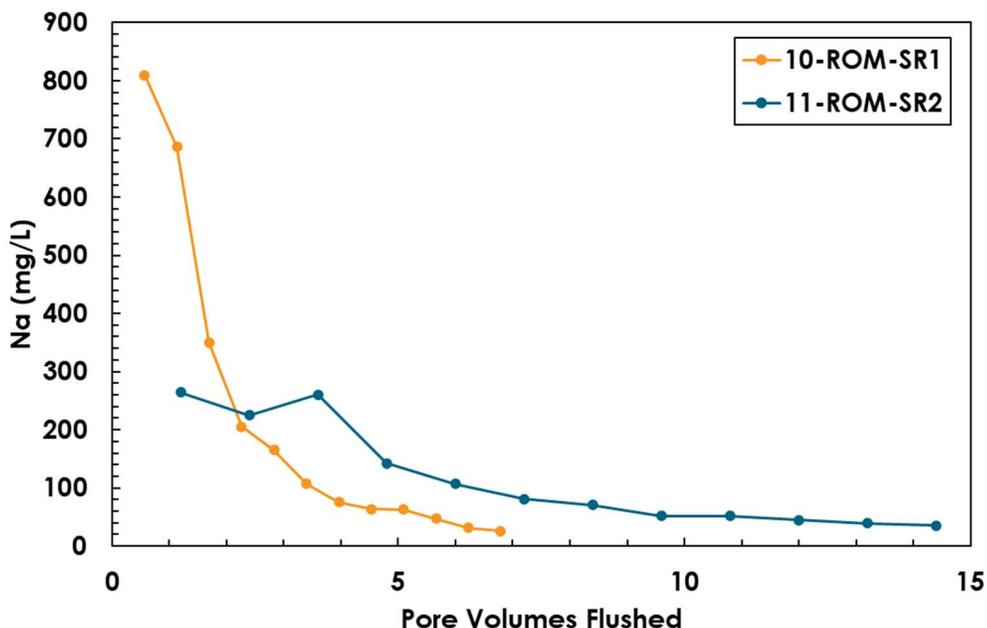


Figure 22: Leachate Na concentration trends plotted against the number of pore volumes flushed for 10-ROM-SR1 and 11-ROM-SR2.

Loading Rates

The loading rates for each analyte were calculated for the tailings and waste rock columns. Loading rates were calculated by dividing the cumulative load at the end of kinetic testing by the mass of material in the column and the total time elapsed (Table 5). The loading rates were not scaled up and represent the temperature (10 °C), equivalent net percolation (700 mm/year), and particle size distribution present in the columns. Scaling factors were not applied to these values because the loading rates may be applied under a range of physical conditions that require different scaling factors to be applied. Loading rates for the connate water columns were adjusted by subtracting the solute loads of the connate water itself from the leachate loads.

Sulfate, Cl, and F loading rates were greatest from 01-TSF. Additionally, metal release rates of As, Cd, Cr, Co, Cu, Pb, Mn, Ni, and Se were elevated from 01-TSF relative to waste rock samples, which is attributed to the combination of elevated sulfide content and finer-textured properties of the tailings.

Loading rates of several metals from the connate water columns were elevated compared to the duplicate columns leached by DI water, and included As, Cd, Co, Cu, Pb, Mn, Ni, and Zn. While As (any

oxyanion in solution) was elevated in the connate water leached columns, divalent metal loading rates were typically one to two orders of magnitude greater. The elevated loading rates of divalent metals was attributed to decreased pH causing less adsorption and increased aqueous complexation due to the high salinity of the connate water.

Table 5: Loading rates for selected analytes (mg/kg/wk).

Column	01-TSF	02-IF-PAG	03-SED-PAG	04-GAB-NPAG	05-SED-NPAG	06-IF-NPAG	07-IF-PAG-CW	08-SED-PAG-CW	09-FZONE-NPAG
SO ₄	1.35E+02	3.00E+00	1.69E+00	1.04E+00	8.50E-01	1.14E+00	1.31E+01	1.22E+01	9.05E-01
Cl	1.13E+02	2.45E+00	2.72E+00	2.42E+00	2.25E+00	2.05E+00	N/A	N/A	1.97E+00
F	6.76E-02	9.26E-03	1.47E-02	1.22E-02	1.71E-02	1.05E-02	N/A	N/A	1.48E-02
Al	7.51E-04	6.32E-04	1.03E-03	1.83E-03	1.79E-03	3.58E-04	7.39E-04	1.14E-03	1.32E-03
Sb	1.86E-04	1.90E-04	5.82E-05	7.28E-05	6.19E-05	3.52E-04	1.78E-04	1.57E-04	1.57E-04
As	1.72E-02	2.38E-05	7.97E-05	4.00E-04	3.24E-03	3.54E-05	1.36E-04	1.50E-04	7.81E-05
Cd	1.32E-05	2.67E-07	4.65E-07	1.33E-07	3.22E-07	1.49E-07	1.04E-05	6.50E-05	2.08E-07
Cr	2.32E-04	5.95E-05	5.63E-05	6.36E-05	5.38E-05	4.51E-05	9.32E-04	9.98E-04	7.10E-05
Co	1.99E-02	5.02E-06	4.07E-06	8.18E-06	8.29E-06	2.49E-06	1.36E-04	6.53E-04	3.76E-06
Cu	3.32E-03	5.74E-05	4.46E-05	6.79E-05	4.58E-05	3.64E-05	2.84E-04	3.10E-04	8.94E-05
Pb	2.86E-05	1.52E-06	1.56E-06	1.45E-06	1.54E-06	1.38E-06	6.82E-05	7.48E-05	8.75E-06
Mn	4.55E-02	1.36E-04	1.45E-04	2.34E-04	1.56E-04	1.24E-04	2.93E-03	1.92E-03	3.04E-04
Ni	2.97E-04	2.57E-05	2.37E-05	3.52E-05	4.46E-05	3.63E-05	1.54E-03	3.89E-03	3.97E-05
P	2.86E-02	1.31E-03	1.25E-03	1.25E-03	1.25E-03	1.25E-03	6.82E-02	7.48E-02	1.25E-03
Se	1.12E-03	3.27E-05	5.57E-05	5.68E-05	3.44E-05	3.06E-05	7.82E-05	8.49E-05	4.08E-05
Zn	5.97E-04	4.28E-04	2.31E-04	6.55E-04	5.62E-04	3.75E-04	1.04E-02	5.76E-03	6.71E-04

Loads contributed by influent connate water were subtracted from load calculations of 07-IF-PAG-CW and 08-SED-PAG-CW.
N/A – Salinity of the connate water precluded measurement of a loading rate.

Acid and Neutralization Potential Consumption

Intrinsic Oxidation Rates

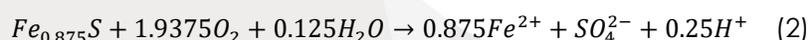
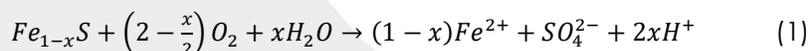
Two methods for deriving IORs for the waste rock and tailings samples were used: (1) O₂ consumption and (2) SO₄ loading rates. The complete calculations for the O₂ consumption method are provided in Appendix B. The O₂ consumption method measures the rate that O₂ is consumed in the column under sealed conditions. The SO₄ loading rate method estimates oxidation rates by the mass of SO₄ recovered in the leachate and assumes all SO₄ released results from pyrrhotite oxidation. The IORs (Table 6) can be used for modelling of oxidation processes in the waste rock and tailings.

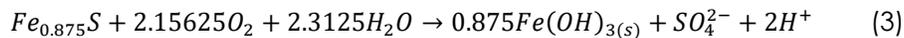
Table 6: Intrinsic oxidation rates of tailings and waste rock materials calculated from headspace O₂ consumption and SO₄ load methods.

Column ID	Deposit	Intrinsic Oxidation Rate (kg O ₂ /tonne/s)		
		O ₂ Consumption Method		SO ₄ Load Method
		Trial 1	Trial 2	
01-TSF	Tiriganiaq	1.4E-08	1.1E-08	1.7E-07
02-IF-PAG	Discovery	7.3E-09	3.7E-09	3.7E-09
03-SED-PAG	Discovery	7.2E-09	4.6E-09	2.2E-09
04-GAB-NPAG	Discovery	5.8E-09	4.6E-09	1.3E-09
05-SED-NPAG	Discovery	7.2E-09	3.6E-09	1.0E-09
06-IF-NPAG	Discovery	5.7E-09	3.6E-09	1.4E-09
07-IF-PAG-CW	Discovery	1.0E-08	3.7E-09	1.3E-08 ¹
08-SED-PAG-CW	Discovery	5.7E-09	4.5E-09	1.5E-08 ¹
09-FZONE-NPAG	F Zone	1.1E-08	4.2E-09	1.1E-09

¹ Load of sulfate from influent connate water was subtracted from the sulfate load in the leachate for this calculation. Trial 1 and Trial 2 of the O₂ consumption method measurements were performed before and after the atmospheric kinetic leaching testing, respectively.

The IORs were calculated based on the assumption that pyrrhotite and its reaction intermediates are the primary sources of O₂ consumption and SO₄ generation. The oxidation of pyrrhotite followed the reaction in Equation 1 and it was assumed *x* is equal to 0.125 (Equation 2). The resulting pyrrhotite oxidation produces Fe²⁺ and it was assumed that all Fe²⁺ oxidizes in the columns to Fe³⁺ and subsequently precipitates as Fe(OH)_{3(s)} when pH > 3.5 (Equation 3). The net oxidation of pyrrhotite and its reaction intermediates consumes 2.15625 moles of O₂ and generates 1 mole of SO₄ and 2 moles of acid.





The O₂ consumptions IORs calculated from Trial 1 were greater than those from Trial 2, likely due to freshly exposed surfaces created from crushing of the drill core. It is expected that IORs from Trial 2 are more representative of longer-term IORs than Trial 1. Trial 2 IORs are therefore used for further calculations and comparisons.

For waste rock samples, IORs measured using O₂ consumption were greater than IORs measured from the SO₄ load. This could be a result of O₂ being consumed by other processes or by attenuation of SO₄ within the columns (e.g., precipitation reactions). Waste rock flushed by connate water had greater IORs from the SO₄ load measurement despite the load from the influent connate water being subtracted from these calculations. The tailings IOR from the SO₄ load method was also greater than the O₂ consumption method, although this could be a result of an initially high load of stored SO₄ in the tailings material. Given the uncertainties of the SO₄ load, it is recommended that IORs from Trial 2 of the O₂ consumption method are used for all materials tested. Intrinsic oxidation rates were not measured for 10-ROM-SR1 and 11-ROM-SR2 as the purpose of these columns was to determine the salinity rinsing rate for ROM ore.

Neutralization Potential Depletion Time

Acid generation is assumed to occur when all available NP has been consumed, assuming that the acid potential of the sample has not been completely consumed. The depletion time of NP of the tested samples was calculated using both the IORs from the O₂ consumption method (Trial 2) and the SO₄ load method for comparison purposes.

To calculate the NP depletion time, acid generation rates and NP consumption rates (both as mg CaCO₃/t/s) were first calculated. Acid generation rates (Table 7) using the O₂ consumption IORs assumed that acid is generated following Equation 3. Alternatively, acid generation rates were also calculated using the SO₄ load in the leachate using the stoichiometry from Equation 3. Neutralization potential consumption rates were calculated using the carbonate molar ratio (CMR) method to relate the stoichiometric ratio of acid neutralization to carbonate consumption (Price, 2009)¹ by calculating the ratio of the cumulative Ca and Mg molar load to the SO₄ molar load of each material tested (Table 8).

¹ Price, A., 2009. Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials. MEND Report 1.20.1. Report prepared for MEND.

Table 7: Measured acid production and neutralization potential consumption rates.

Sample ID	Deposit	Rock Type	Acid Generation Rate (mg CaCO ₃ /t/s)		NP Consumption Rate (mg CaCO ₃ /t/s)	
			Calculated from SO ₄ Load	Calculated from O ₂ Consumption IOR	Calculated from SO ₄ Load	Calculated from O ₂ Consumption IOR
01-TSF	Tiriganiaq	Tailings	0.247	0.016	0.247	0.038
02-IF-PAG	Discovery	Iron Formation	0.005	0.005	0.005	0.005
03-SED-PAG	Discovery	Sedimentary	0.003	0.007	0.004	0.007
04-GAB-NPAG	Discovery	Gabbro	0.002	0.007	0.0018	0.008
05-SED-NPAG	Discovery	Sedimentary	0.002	0.005	0.003	0.006
06-IF-NPAG	Discovery	Iron Formation	0.002	0.005	0.003	0.006
07-IF-PAG-CW	Discovery	Iron Formation	0.019	0.005	0.019	0.005
08-SED-PAG-CW	Discovery	Sedimentary	0.022	0.007	0.022	0.007
09-FZONE-NPAG	F-Zone	Mafic Volcanic	0.002	0.006	0.0029	0.007

Table 8: Carbonate molar ratios calculated from cumulative calcium, magnesium, and sulfate loads.

Sample ID	Deposit	Carbonate Molar Ratio (mole CO ₃ / mole SO ₄)
01-TSF	Tiriganiaq	1.00*
02-IF-PAG	Discovery	1.00 [‡]
03-SED-PAG	Discovery	1.17
04-GAB-NPAG	Discovery	1.00 [‡]
05-SED-NPAG	Discovery	1.75
06-IF-NPAG	Discovery	1.49
07-IF-PAG-CW	Discovery	1.00*
08-SED-PAG-CW	Discovery	1.00*
09-FZONE-NPAG	F Zone	2.00 [‡]

* Values were assumed to be 1.00 because kinetic data contained interferences preventing calculation of the carbonate molar ratio.

[‡] Calculated values greater than 2 or less than 1 were limited to either 2 or 1 based on the expected stoichiometry of the carbonate neutralization reaction.

The mass of available NP in each column was calculated based on the modified neutralization potential (Mod-NP; Table 9) measured using the modified Sobek method² and the column-specific mass of material. The corresponding NP consumption rate and total Mod-NP in each column were used to estimate when Mod-NP would be completely consumed, and acid generation would begin (Table 10). Note that NP depletion times for NPAG materials do not mean that acid will be generated as, by definition, acid generation potential will be consumed before NP is consumed, and therefore acidic conditions will not form from NPAG materials.

Table 9: Acid base accounting characteristics of tested samples.

Sample ID	MAP (kg CaCO ₃ /t)	SAP (kg CaCO ₃ /t)	Mod-NP (kg CaCO ₃ /t)	NPR (Mod-NP/SAP)
01-TSF	-	49.7	70.8	1.6
02-IF-PAG	25	24.1	15.2	0.63
03-SED-PAG	8.1	8.13	7.4	0.91
04-GAB-NPAG	3.5	3.44	34	9.89
05-SED-NPAG	3.0	3.13	9.8	3.14
06-IF-NPAG	7.6	6.56	48	7.31
07-IF-PAG-CW	25	24.1	15.2	0.63
08-SED-PAG-CW	8.1	8.13	7.4	0.91
09-FZONE-NPAG	5.6	5.63	130	23.1

MAP – Maximum acid potential from Total-S content (Total-S wt.% × 31.25).

SAP – Sulfide acid potential is calculated from Sulphide-S (by difference) content (Sulphide-S wt.% × 31.25).

Mod-NP – Modified neutralization potential from Lorax (2022).

NPR – Net potential ratio, Mod-NP/SAP.

As with the IORs, the calculated NP depletion times were generally faster when calculated from the O₂ consumption method. Calculated depletion times from the SO₄ load method were faster for the tailings and the waste rock flushed with connate water. It is suggested that NP depletion times from the O₂ consumption method be used, due to the possibility of SO₄ that is not a direct result of oxidation in the columns interfering with the measurements in the tailings and connate water columns.

The depletion times in Table 10 are based on the time to consume NP in the specific materials tested in the columns. A statistical range of the depletion times for each rock type tested was calculated based on Mod-NP statistics of the corresponding rock type (¹ Neutralization depletion is not expected to physically occur for NPAG materials, calculations are for theoretically purposes only.

Table 11; Lorax, 2022). The statistical NP depletion was calculated for each column by dividing the 10th, 25th, median, 75th, and 95th percentile Mod-NP for each rock type by the NP consumption rate (using the

² Lawrence, R.W. and Wang, Y. 1996. Determination of Neutralization Potential for Acid Rock Drainage Prediction. MEND Project 1.16.3. July 31, 1996.

O₂ consumption method values) measured in the columns for the respective rock type (Table 7). The measured NP depletion time for all columns lies within the statistical depletion time calculated from acid base accounting statistical ranges of Mod-NP (Table 12 and Figure 23). Note that these NP depletion times are based on unscaled kinetic test results; lower temperatures under field conditions would result in longer lag times until onset of acid generation.

Table 10: Neutralization potential depletion times of tailings and waste rock materials calculated from sulfate loads and oxygen consumption measurements.

Column ID	Deposit	Rock Type	Neutralization Potential Depletion Times (years) ¹	
			Calculated from SO ₄ Load	Calculated from O ₂ Consumption
01-TSF	Tiriganiaq	Tailings	10	66
02-IF-PAG	Discovery	Iron Formation	91	96
03-SED-PAG	Discovery	Sedimentary	63	31
04-GAB-NPAG	Discovery	Gabbro	589	146
05-SED-NPAG	Discovery	Sedimentary	125	33
06-IF-NPAG	Discovery	Iron Formation	533	193
07-IF-PAG-CW	Discovery	Iron Formation	25	90
08-SED-PAG-CW	Discovery	Iron Formation	11	34
09-FZONE-NPAG	F-Zone	Mafic Volcanic	1,421	300

¹ Neutralization depletion is not expected to physically occur for NPAG materials, calculations are for theoretically purposes only.

Table 11: Acid base accounting Mod-NP statistical ranges.

Sample ID	Deposit	Rock Type	Modified-NP (kg CaCO ₃ /t)				
			10 th PCTL	25 th PCTL	Median	75 th PCTL	95 th PCTL
01-TSF	Tiriganiaq	Tailings	-	-	-	-	-
02-IF-PAG	Discovery	Iron Formation	15	18	25	34	62
03-SED-PAG	Discovery	Sedimentary	7.1	13	27	37	55
04-GAB-NPAG	Discovery	Gabbro	7.3	9.6	23	25	55
05-SED-NPAG	Discovery	Sedimentary	6.5	8.5	9.9	15	23
06-IF-NPAG	Discovery	Iron Formation	6.5	8.5	9.9	15	23
07-IF-PAG-CW	Discovery	Iron Formation	11	18	31	72	150
08-SED-PAG-CW	Discovery	Sedimentary	15	18	25	34	62
09-FZONE-NPAG	F-Zone	Volcanics	7.1	13	27	37	55

Modified-NP – modified neutralization potential from Lorax (2022).

Table 12: Statistical ranges for NP depletion times.

Sample ID	Deposit	Rock Type	Measured NP Depletion Time (Years)	Statistical NP Depletion Time (years) ¹				
				10 th PCTL	25 th PCTL	Median	75 th PCTL	95 th PCTL
01-TSF	Tiriganiaq	Tailings	66	N/A	N/A	N/A	N/A	N/A
02-IF-PAG	Discovery	Iron Formation	96	46	61	146	159	349
03-SED-PAG	Discovery	Sedimentary	31	27.2	35.6	41.5	62.8	96.4
04-GAB-NPAG	Discovery	Gabbro	146	64.3	77.2	107.2	145.9	266.0
05-SED-NPAG	Discovery	Sedimentary	33	21.7	28.4	33.1	50.2	76.9
06-IF-NPAG	Discovery	Iron Formation	193	28	52	108	149	221
07-IF-PAG-CW	Discovery	Iron Formation	90	43	57	136	147	324
08-SED-PAG-CW	Discovery	Sedimentary	34	30.0	39.3	45.7	69.3	106.3
09-FZONE-NPAG	F-Zone	Mafic Volcanics	300	25	42	72	166	347

¹ Neutralization depletion is not expected to physically occur for NPAG materials, calculations are for theoretically purposes only. Modified-NP – Modified neutralization potential from Lorax (2022).
N/A – Statistical data not available for calculation.

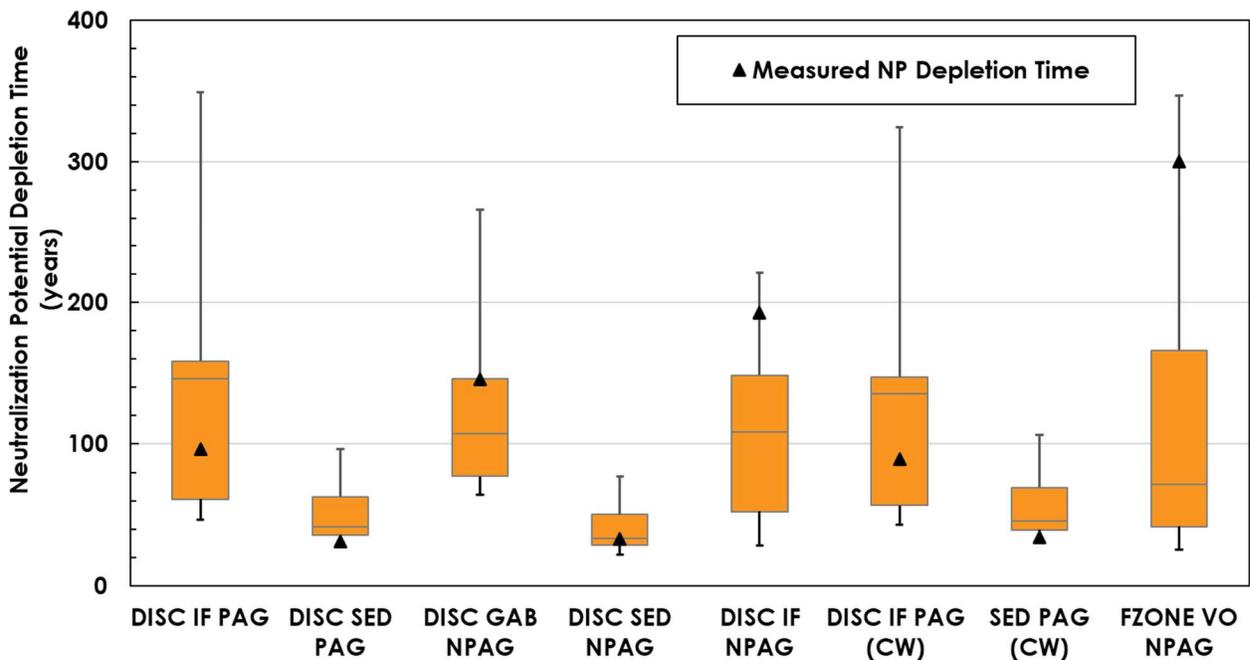


Figure 23: Box and whisker plots for NP depletion times based on the range of Mod-NP for each rock type.

Closure

We trust information provided in this memorandum is satisfactory for your requirements. Please do not hesitate to contact me at 306-713-1695 or jrobertson@okc-sk.com should you have any questions or comments.

Attachments

- Appendix A – Raw Leachate Data
- Appendix B – Oxygen Consumption
- Appendix C – Laboratory Certificates of Analyses
- Appendix D – Mineral Liberation Analysis

Appendix A

Raw Leachate Data

Appendix B

Oxygen Consumption

Intrinsic oxidation rates (IORs) based on O₂ consumption

The IORs based on O₂ consumption were calculated using O₂ headspace measurements (Table 1 to Table 9), assumptions about the tailings and waste rock material properties (Table 10 and Table 11, respectively), and the calculated pore volume (Table 12).

The mass of oxygen consumed (kg O₂/t) was calculated using the atmospheric pressure (atm), estimated gas volume (L), gas constant (L · atm/mol · K), molar mass of oxygen (g/mol), measured headspace (%), and dry mass (kg). The IOR (kg O₂/t/s) was then calculated using the elapsed time (s) and the difference in the calculated mass of oxygen consumed.

Table 1: IOR Calculations for 01-TSF

Test	Date	Time	O ₂ (%)	CO ₂ (%)	Mass O ₂ (kg O ₂ /t)	Mass O ₂ Consumed (kg O ₂ /t)	ln[O ₂]	IOR (kg O ₂ /t/s)
Trial 1-A	11-Dec-20	11:00:00 AM	20.7	0.1	0.2220	0.0000	-1.5052	-
	12-Dec-20	1:45:00 PM	20.6	0.1	0.2209	0.0011	-1.5101	1.1E-08
	14-Dec-20	11:10:00 AM	20.6	0.1	0.2209	0.0000	-1.5101	4.1E-09
	15-Dec-20	12:40:00 PM	20.6	0.1	0.2209	0.0000	-1.5101	3.0E-09
	17-Dec-20	8:30:00 AM	20.1	0.1	0.2155	0.0054	-1.5347	1.3E-08
	19-Dec-20	2:00:00 PM	20.2	0.1				
	22-Dec-20	10:25:00 AM	20.7	0.1				
	24-Dec-20	11:30:00 AM	20.7	0.1				
	31-Dec-20	9:45:00 AM	20.6	0.1				
	7-Jan-21	12:00:00 PM	20.6	0.1				
Trial 1-B	7-Jan-21	3:00:00 PM	21	0.1	0.2252	0.0000	-1.4908	-
	8-Jan-21	3:00:00 PM	20.8	0.1	0.2230	0.0021	-1.5004	2.5E-08
	12-Jan-21	12:30:00 PM	20.5	0.1	0.2198	0.0032	-1.5149	1.3E-08
	14-Jan-21	2:00:00 PM	20.4	0.1	0.2187	0.0011	-1.5198	1.1E-08
	15-Jan-21	9:30:00 AM	20.4	0.1	0.2187	0.0000	-1.5198	9.6E-09
	15-Jan-21	9:45:00 AM	20.7	0.1				
	18-Jan-21	11:20:00 AM	20.8	0.1				
Trial 1-C	19-Jan-21	12:00:00 PM	20.8	0.1	0.2230	0.0000	-1.5004	-
	20-Jan-21	2:45:00 PM	20.7	0.1	0.2220	0.0011	-1.5052	0.0000
	21-Jan-21	12:10:00 PM	20.5	0.2	0.2198	0.0021	-1.5149	0.0000
	24-Jan-21	12:30:00 PM	20.6	0.1				
	25-Jan-21	4:05:00 PM	20.7	0.2				
	26-Jan-21	11:52:00 AM	20.7	0.1				
	27-Jan-21	4:48:00 PM	20.7	0.1				
	28-Jan-21	12:00:00 PM	20.7	0.2				
Trial 2	10-Dec-21	2:36:00 PM	20.6	0.3	0.2209	0.0000	-1.5101	-
	13-Dec-21	5:33:00 PM	20.3	0.3	0.2177	0.0032	-1.5248	1.2E-08
	16-Dec-21	10:10:00 AM	20.2	0.2	0.2166	0.0011	-1.5297	8.5E-09
	20-Dec-21	12:23:00 PM	19.9	0.5	0.2134	0.0032	-1.5447	8.8E-09
	21-Dec-21	10:12:00 AM	19.5	0.6	0.2091	0.0043	-1.5650	1.3E-08
	22-Dec-21	1:53:00 PM	19.5	0.5	0.2091	0.0000	-1.5650	1.1E-08

Table 2: IOR Calculations for 02-IF-PAG

Test	Date	Time	O ₂ (%)	CO ₂ (%)	Mass O ₂ (kg O ₂ /t)	Mass O ₂ Consumed (kg O ₂ /t)	ln[O ₂]	IOR (kg O ₂ /t/s)
Trial 1-A	15-Jan-21	9:45:00 AM	20.7	0.1				
	18-Jan-21	11:20:00 AM	20.8	0.1				
	19-Jan-21	12:00:00 PM	20.8	0.1	0.2907	0.0000	-1.2354	-
	20-Jan-21	2:45:00 PM	20.6	0.1	0.2879	0.0028	-1.2451	2.9E-08
	21-Jan-21	12:12:00 PM	20.5	0.2	0.2865	0.0014	-1.2500	2.4E-08
	24-Jan-21	12:30:00 PM	20.5	0.1	0.2865	0.0000	-1.2500	9.7E-09
	25-Jan-21	4:05:00 PM	20.4	0.2	0.2851	0.0014	-1.2549	1.0E-08
	26-Jan-21	11:54:00 AM	20.5	0.1				
	27-Jan-21	4:48:00 PM	20.5	0.1				
Trial 1-B	28-Jan-21	12:00:00 PM	20.6	0.2	0.2879	-0.0014	-1.2451	-
	29-Jan-21	4:17:00 PM	20.5	0.1	0.2865	0.0014	-1.2500	1.4E-08
	2-Feb-21	2:28:00 PM	20.5	0.1	0.2865	0.0000	-1.2500	3.2E-09
	4-Feb-21	8:26:00 AM	20.3	0.1	0.2837	0.0028	-1.2598	7.1E-09
	5-Feb-21	11:45:00 AM	20.3	0.1	0.2837	0.0000	-1.2598	6.1E-09
	8-Feb-21	3:20:00 PM	20.1	0.2	0.2809	0.0028	-1.2697	7.3E-09
	11-Feb-21	2:00:00 PM	20.3	0.1				
	12-Feb-21	10:05:00 AM	20.2	0.1				
	16-Feb-21	8:46:00 AM	20.3	0.1				
Trial 2	17-Feb-21	4:59:00 PM	20.4	0.1				
	18-Feb-21	1:05:00 PM	20.3	0.1				
	7-Oct-21	10:30:00 AM	20.7	0.1				
	12-Oct-21	10:00:00 AM	20.9	0.2	0.2921	-0.0028	-1.2307	-
	14-Oct-21	10:47:00 AM	20.7	0.1	0.2893	0.0028	-1.2403	4.6E-09
	18-Oct-21	11:43:00 AM	20.6	0.2	0.2879	0.0014	-1.2451	4.4E-09
	21-Oct-21	1:47:00 AM	20.7	0.1	0.2893	-0.0014	-1.2403	2.4E-09
	25-Oct-21	3:10:00 AM	20.5	0.1	0.2865	0.0028	-1.2500	3.7E-09
	28-Oct-21	3:30:00 AM	20.7	0.2				
1-Nov-21	3:01:00 PM	20.6	0.1					

Table 3: IOR Calculations for 03-SED-PAG

Test	Date	Time	O ₂ (%)	CO ₂ (%)	Mass O ₂ (kg O ₂ /t)	Mass O ₂ Consumed (kg O ₂ /t)	ln[O ₂]	IOR (kg O ₂ /t/s)
Trial 1-A	15-Jan-21	9:50:00 AM	20.7	0.1				
	18-Jan-21	11:20:00 AM	20.8	0.1				
	19-Jan-21	12:00:00 PM	20.8	0.1	0.2893	0.0000	-1.2403	-
	20-Jan-21	2:45:00 PM	20.7	0.1	0.2879	0.0014	-1.2451	1.4E-08
	21-Jan-21	12:15:00 PM	20.6	0.2	0.2865	0.0014	-1.2500	1.6E-08
	24-Jan-21	12:30:00 PM	20.7	0.1	0.2879	-0.0014	-1.2451	3.2E-09
	25-Jan-21	4:06:00 PM	20.5	0.2	0.2851	0.0028	-1.2548	7.8E-09
	26-Jan-21	11:55:00 AM	20.7	0.1				
	27-Jan-21	4:49:00 PM	20.5	0.1				
Trial 1-B	28-Jan-21	12:01:00 PM	20.6	0.1	0.2865	-0.0014	-1.2500	-
	29-Jan-21	4:19:00 PM	20.5	0.1	0.2851	0.0014	-1.2548	1.4E-08
	2-Feb-21	2:29:00 PM	20.4	0.1	0.2837	0.0014	-1.2597	6.3E-09
	4-Feb-21	8:27:00 AM	20.3	0.1	0.2823	0.0014	-1.2646	7.0E-09
	5-Feb-21	11:47:00 AM	20.3	0.1	0.2823	0.0000	-1.2646	6.0E-09
	8-Feb-21	3:22:00 PM	20.1	0.2	0.2796	0.0028	-1.2745	7.2E-09
	11-Feb-21	2:02:00 PM	20.3	0.1				
	12-Feb-21	10:06:00 AM	20.2	0.1				
	16-Feb-21	8:47:00 AM	20.3	0.1				
Trial 2	17-Feb-21	5:00:00 PM	20.3	0.1				
	18-Feb-21	1:06:00 PM	20.2	0.1				
	7-Oct-21	10:32:00 AM	20.7	0.1				
	12-Oct-21	10:04:00 AM	21	0.2	0.2921	-0.0042	-1.2307	-
	14-Oct-21	10:48:00 AM	20.7	0.1	0.2879	0.0042	-1.2451	6.9E-09
	18-Oct-21	11:46:00 AM	20.6	0.2	0.2865	0.0014	-1.2500	5.8E-09
	21-Oct-21	1:48:00 AM	20.8	0.1	0.2893	-0.0028	-1.2403	2.4E-09
	25-Oct-21	3:12:00 AM	20.5	0.1	0.2851	0.0042	-1.2548	4.5E-09
	28-Oct-21	3:31:00 AM	20.7	0.2				
1-Nov-21	3:02:00 PM	20.7	0.1					

Table 4: IOR Calculations for 04-GAB-NPAG

Test	Date	Time	O ₂ (%)	CO ₂ (%)	Mass O ₂ (kg O ₂ /t)	Mass O ₂ Consumed (kg O ₂ /t)	ln[O ₂]	IOR (kg O ₂ /t/s)
Trial 1-A	15-Jan-21	9:50:00 AM	20.7	0.1				
	18-Jan-21	11:20:00 AM	20.9	0.1	0.2910	-0.0028	-1.2344	-
	19-Jan-21	12:00:00 PM	20.8	0.1	0.2896	0.0014	-1.2392	1.6E-08
	20-Jan-21	2:45:00 PM	20.8	0.1	0.2896	0.0000	-1.2392	7.5E-09
	21-Jan-21	12:17:00 PM	20.6	0.2	0.2868	0.0028	-1.2488	1.6E-08
	24-Jan-21	12:30:00 PM	20.8	0.1				
	25-Jan-21	4:07:00 PM	20.6	0.2				
	26-Jan-21	11:57:00 AM	20.7	0.1				
	27-Jan-21	4:50:00 PM	20.6	0.1				
Trial 1-B	28-Jan-21	12:02:00 PM	20.7	0.2	0.2882	-0.0014	-1.2440	-
	29-Jan-21	4:20:00 PM	20.6	0.1	0.2868	0.0014	-1.2488	1.4E-08
	2-Feb-21	2:30:00 PM	20.5	0.1	0.2855	0.0014	-1.2537	6.3E-09
	4-Feb-21	8:28:00 AM	20.4	0.1	0.2841	0.0014	-1.2586	7.1E-09
	5-Feb-21	11:49:00 AM	20.5	0.1	0.2855	-0.0014	-1.2537	4.0E-09
	8-Feb-21	3:24:00 PM	20.3	0.2	0.2827	0.0028	-1.2635	5.8E-09
	11-Feb-21	2:04:00 PM	20.4	0.1				
	12-Feb-21	10:07:00 AM	20.4	0.1				
	16-Feb-21	8:49:00 AM	20.4	0.1				
Trial 2	17-Feb-21	5:01:00 PM	20.5	0.1				
	18-Feb-21	1:07:00 PM	20.3	0.1				
	7-Oct-21	10:34:00 AM	20.7	0.1				
	12-Oct-21	10:08:00 AM	21.1	0.2	0.2938	-0.0056	-1.2248	-
	14-Oct-21	10:51:00 AM	20.8	0.1	0.2896	0.0042	-1.2392	6.9E-09
	18-Oct-21	11:48:00 AM	20.7	0.2	0.2882	0.0014	-1.2440	5.8E-09
	21-Oct-21	1:49:00 AM	20.8	0.1	0.2896	-0.0014	-1.2392	3.5E-09
	25-Oct-21	3:13:00 AM	20.6	0.1	0.2868	0.0028	-1.2488	4.6E-09
	28-Oct-21	3:32:00 AM	20.8	0.2				
1-Nov-21	3:03:00 PM	20.8	0.1					

Table 5: IOR Calculations for 05-SED-NPAG

Test	Date	Time	O ₂ (%)	CO ₂ (%)	Mass O ₂ (kg O ₂ /t)	Mass O ₂ Consumed (kg O ₂ /t)	ln[O ₂]	IOR (kg O ₂ /t/s)
Trial 1-A	15-Jan-21	9:50:00 AM	20.7	0.1				
	18-Jan-21	11:20:00 AM	20.9	0.1	0.2911	-0.0028	-1.2341	-
	19-Jan-21	12:00:00 PM	20.8	0.1	0.2897	0.0014	-1.2389	1.6E-08
	20-Jan-21	2:45:00 PM	20.8	0.1	0.2897	0.0000	-1.2389	7.5E-09
	21-Jan-21	12:20:00 PM	20.6	0.2	0.2869	0.0028	-1.2486	1.6E-08
	24-Jan-21	12:30:00 PM	20.6	0.1				
	25-Jan-21	4:10:00 PM	20.6	0.2				
	26-Jan-21	11:59:00 AM	20.6	0.1				
	27-Jan-21	4:51:00 PM	20.6	0.1				
Trial 1-B	28-Jan-21	12:02:00 PM	20.7	0.1	0.2883	-0.0014	-1.2437	-
	29-Jan-21	4:21:00 PM	20.6	0.1	0.2869	0.0014	-1.2486	1.4E-08
	2-Feb-21	2:31:00 PM	20.5	0.1	0.2855	0.0014	-1.2534	6.3E-09
	4-Feb-21	8:29:00 AM	20.4	0.1	0.2841	0.0014	-1.2583	7.1E-09
	5-Feb-21	11:51:00 AM	20.4	0.1	0.2841	0.0000	-1.2583	6.1E-09
	8-Feb-21	3:26:00 PM	20.2	0.2	0.2813	0.0028	-1.2682	7.2E-09
	11-Feb-21	2:06:00 PM	20.4	0.1				
	12-Feb-21	10:08:00 AM	20.4	0.1				
	16-Feb-21	8:50:00 AM	20.5	0.1				
Trial 2	17-Feb-21	5:02:00 PM	20.6	0.1				
	18-Feb-21	1:08:00 PM	20.5	0.1				
	7-Oct-21	10:36:00 AM	20.7	0.1				
	12-Oct-21	10:11:00 AM	21.1	0.2	0.2939	-0.0056	-1.2246	-
	14-Oct-21	10:52:00 AM	20.7	0.1	0.2883	0.0056	-1.2437	9.2E-09
	18-Oct-21	11:50:00 AM	20.7	0.2	0.2883	0.0000	-1.2437	5.8E-09
	21-Oct-21	1:49:00 AM	20.8	0.1	0.2897	-0.0014	-1.2389	3.5E-09
	25-Oct-21	3:14:00 AM	20.7	0.1	0.2883	0.0014	-1.2437	3.6E-09
	28-Oct-21	3:34:00 AM	20.8	0.1				
1-Nov-21	3:06:00 PM	20.9	0.1					

Table 6: IOR Calculations for 06-IF-NPAG

Test	Date	Time	O ₂ (%)	CO ₂ (%)	Mass O ₂ (kg O ₂ /t)	Mass O ₂ Consumed (kg O ₂ /t)	ln[O ₂]	IOR (kg O ₂ /t/s)
Ttrial 1-A	15-Jan-21	9:55:00 AM	20.7	0.1				
	18-Jan-21	11:20:00 AM	20.9	0.1	0.2873	-0.0027	-1.2471	-
	19-Jan-21	12:00:00 PM	20.8	0.1	0.2860	0.0014	-1.2519	1.5E-08
	20-Jan-21	2:45:00 PM	20.7	0.1	0.2846	0.0014	-1.2567	1.5E-08
	21-Jan-21	12:22:00 PM	20.6	0.2	0.2832	0.0014	-1.2616	1.6E-08
	24-Jan-21	12:30:00 PM	20.6	0.1				
	25-Jan-21	4:12:00 PM	20.6	0.2				
	26-Jan-21	12:01:00 PM	20.6	0.1				
	27-Jan-21	4:51:00 PM	20.6	0.1				
Ttrial 1-B	28-Jan-21	12:03:00 PM	20.7	0.1	0.2846	-0.0014	-1.2567	-
	29-Jan-21	4:22:00 PM	20.6	0.1	0.2832	0.0014	-1.2616	1.4E-08
	2-Feb-21	2:32:00 PM	20.5	0.1	0.2818	0.0014	-1.2665	6.2E-09
	4-Feb-21	8:30:00 AM	20.4	0.1	0.2805	0.0014	-1.2713	7.0E-09
	5-Feb-21	11:53:00 AM	20.4	0.1	0.2805	0.0000	-1.2713	6.0E-09
	8-Feb-21	3:28:00 PM	20.3	0.2	0.2791	0.0014	-1.2763	5.7E-09
	11-Feb-21	2:08:00 PM	20.5	0.1				
	12-Feb-21	10:09:00 AM	20.4	0.1				
	16-Feb-21	8:51:00 AM	20.5	0.1				
Ttrial 2	17-Feb-21	5:03:00 PM	20.5	0.1				
	18-Feb-21	1:09:00 PM	20.4	0.1				
	7-Oct-21	10:38:00 AM	20.7	0.1				
	12-Oct-21	10:14:00 AM	21.1	0.2	0.2901	-0.0055	-1.2376	-
	14-Oct-21	10:54:00 AM	20.7	0.1	0.2846	0.0055	-1.2567	9.1E-09
	18-Oct-21	11:52:00 AM	20.7	0.2	0.2846	0.0000	-1.2567	5.8E-09
	21-Oct-21	1:50:00 AM	20.8	0.1	0.2860	-0.0014	-1.2519	3.5E-09
	25-Oct-21	3:15:00 AM	20.7	0.1	0.2846	0.0014	-1.2567	3.6E-09
	28-Oct-21	3:36:00 AM	20.8	0.2				
1-Nov-21	3:07:00 PM	20.9	0.1					

Table 7: IOR Calculations for 07-IF-PAG-CW

Test	Date	Time	O ₂ (%)	CO ₂ (%)	Mass O ₂ (kg O ₂ /t)	Mass O ₂ Consumed (kg O ₂ /t)	ln[O ₂]	IOR (kg O ₂ /t/s)
Trial 1-A	15-Jan-21	9:45:00 AM	20.7	0.1				
	18-Jan-21	11:20:00 AM	20.8	0.1	0.2917	-0.0014	-1.2321	-
	19-Jan-21	12:00:00 PM	20.7	0.1	0.2903	0.0014	-1.2369	1.6E-08
	20-Jan-21	2:45:00 PM	20.5	0.1	0.2875	0.0028	-1.2466	2.3E-08
	21-Jan-21	12:25:00 PM	20.4	0.2	0.2861	0.0014	-1.2515	2.1E-08
	24-Jan-21	12:30:00 PM	20.3	0.1	0.2847	0.0014	-1.2564	1.3E-08
	25-Jan-21	4:13:00 PM	20.4	0.2				
	26-Jan-21	12:02:00 PM	20.4	0.1				
	27-Jan-21	4:52:00 PM	20.4	0.1				
Trial 1-B	28-Jan-21	12:04:00 PM	20.5	0.2	0.2875	-0.0014	-1.2466	
	29-Jan-21	4:23:00 PM	20.4	0.1	0.2861	0.0014	-1.2515	1.4E-08
	2-Feb-21	2:33:00 PM	20.3	0.1	0.2847	0.0014	-1.2564	6.4E-09
	4-Feb-21	8:31:00 AM	20	0.2	0.2805	0.0042	-1.2713	1.2E-08
	5-Feb-21	11:55:00 AM	20.1	0.2	0.2819	-0.0014	-1.2663	8.1E-09
	8-Feb-21	3:30:00 PM	19.8	0.4	0.2777	0.0042	-1.2814	1.0E-08
	11-Feb-21	2:10:00 PM	20.1	0.1				
	12-Feb-21	10:10:00 AM	20	0.1				
	16-Feb-21	8:52:00 AM	20.2	0.1				
Trial 2	17-Feb-21	5:04:00 PM	20.3	0.1				
	18-Feb-21	1:10:00 PM	20.2	0.1				
	7-Oct-21	10:40:00 AM	20.4	0.2				
	12-Oct-21	10:18:00 AM	20.8	0.3	0.2917	-0.0056	-1.2321	-
	14-Oct-21	10:56:00 AM	20.4	0.2	0.2861	0.0056	-1.2515	9.3E-09
	18-Oct-21	11:54:00 AM	20.4	0.2	0.2861	0.0000	-1.2515	5.9E-09
	21-Oct-21	1:51:00 AM	20.5	0.2	0.2875	-0.0014	-1.2466	3.6E-09
	25-Oct-21	3:16:00 AM	20.4	0.2	0.2861	0.0014	-1.2515	3.7E-09
	28-Oct-21	3:37:00 AM	20.6	0.2				
1-Nov-21	3:08:00 PM	20.6	0.1					

Table 8: IOR Calculations for 08-SED-PAG-CW

Test	Date	Time	O ₂ (%)	CO ₂ (%)	Mass O ₂ (kg O ₂ /t)	Mass O ₂ Consumed (kg O ₂ /t)	ln[O ₂]	IOR (kg O ₂ /t/s)
Trial 1-A	15-Jan-21	9:55:00 AM	20.8	0.1				
	18-Jan-21	11:20:00 AM	20.8	0.1				
	19-Jan-21	12:00:00 PM	20.8	0.1	0.2866	0.0000	-1.2498	-
	20-Jan-21	2:45:00 PM	20.7	0.1	0.2852	0.0014	-1.2546	1.4E-08
	21-Jan-21	12:26:00 PM	20.5	0.2	0.2824	0.0028	-1.2643	2.4E-08
	24-Jan-21	12:30:00 PM	20.6	0.1				
	25-Jan-21	4:15:00 PM	20.6	0.2				
	26-Jan-21	12:03:00 PM	20.6	0.1				
	27-Jan-21	4:53:00 PM	20.6	0.1				
Trial 1-B	28-Jan-21	12:05:00 PM	20.6	0.2	0.2838	0.0000	-1.2594	
	29-Jan-21	4:24:00 PM	20.5	0.1	0.2824	0.0014	-1.2643	1.4E-08
	2-Feb-21	2:34:00 PM	20.4	0.1	0.2811	0.0014	-1.2692	6.2E-09
	4-Feb-21	8:32:00 AM	20.4	0.2	0.2811	0.0000	-1.2692	4.7E-09
	5-Feb-21	11:57:00 AM	20.4	0.2	0.2811	0.0000	-1.2692	4.0E-09
	8-Feb-21	3:32:00 PM	20.2	0.3	0.2783	0.0028	-1.2791	5.7E-09
	11-Feb-21	2:12:00 PM	20.3	0.1				
	12-Feb-21	10:11:00 AM	20.3	0.1				
	16-Feb-21	8:53:00 AM	20.3	0.1				
Trial 2	17-Feb-21	5:05:00 PM	20.4	0.1				
	18-Feb-21	1:11:00 PM	20.2	0.1				
	7-Oct-21	10:42:00 AM	20.6	0.1				
	12-Oct-21	10:22:00 AM	21.1	0.2	0.2907	-0.0069	-1.2355	-
	14-Oct-21	10:57:00 AM	20.7	0.1	0.2852	0.0055	-1.2546	9.1E-09
	18-Oct-21	11:56:00 AM	20.7	0.2	0.2852	0.0000	-1.2546	5.8E-09
	21-Oct-21	1:52:00 AM	20.8	0.1	0.2866	-0.0014	-1.2498	3.5E-09
	25-Oct-21	3:17:00 AM	20.6	0.1	0.2838	0.0028	-1.2594	4.5E-09
	28-Oct-21	3:38:00 AM	20.8	0.2				
1-Nov-21	3:09:00 PM	20.8	0.1					

Table 9: IOR Calculations for 09-FZONE-NPAG

Test	Date	Time	O ₂ (%)	CO ₂ (%)	Mass O ₂ (kg O ₂ /t)	Mass O ₂ Consumed (kg O ₂ /t)	ln[O ₂]	IOR (kg O ₂ /t/s)
Trial 1-A	15-Jan-21	9:55:00 AM	20.7	0.1				
	18-Jan-21	11:20:00 AM	20.9	0.1				
	19-Jan-21	12:00:00 PM	20.9	0.1	0.2702	0.0000	-1.3086	-
	20-Jan-21	2:45:00 PM	20.7	0.1	0.2676	0.0026	-1.3182	2.7E-08
	21-Jan-21	12:30:00 PM	20.6	0.2	0.2663	0.0013	-1.3230	2.2E-08
	24-Jan-21	12:30:00 PM	20.4	0.1	0.2637	0.0026	-1.3328	1.5E-08
	25-Jan-21	4:17:00 PM	20.4	0.2				
	26-Jan-21	12:05:00 PM	20.4	0.1				
	27-Jan-21	4:56:00 PM	20.4	0.1				
	28-Jan-21	12:07:00 PM	20.5	0.2				
Trial 1-B	29-Jan-21	4:26:00 PM	20.5	0.1	0.2650	0.0000	-1.3279	-
	2-Feb-21	2:36:00 PM	20.3	0.1	0.2624	0.0026	-1.3377	7.6E-09
	4-Feb-21	8:36:00 AM	20.1	0.2	0.2599	0.0026	-1.3476	1.1E-08
	5-Feb-21	12:00:00 PM	20.2	0.2				
	8-Feb-21	3:34:00 PM	20.1	0.2				
	11-Feb-21	2:15:00 PM	20.3	0.1				
	12-Feb-21	10:12:00 AM	20.2	0.1				
	16-Feb-21	8:56:00 AM	20.2	0.1				
	17-Feb-21	5:08:00 PM	20.2	0.1				
	18-Feb-21	1:15:00 PM	20.2	0.1				
Trial 2	7-Oct-21	10:46:00 AM	20.6	0.1				
	12-Oct-21	10:24:00 AM	21.1	0.2	0.2728	-0.0065	-1.2990	-
	14-Oct-21	10:58:00 AM	20.7	0.1	0.2676	0.0052	-1.3182	8.5E-09
	18-Oct-21	11:57:00 AM	20.7	0.2	0.2676	0.0000	-1.3182	5.4E-09
	21-Oct-21	1:54:00 AM	20.8	0.1	0.2689	-0.0013	-1.3134	3.3E-09
	25-Oct-21	3:20:00 AM	20.6	0.1	0.2663	0.0026	-1.3230	4.2E-09
	28-Oct-21	3:41:00 AM	20.9	0.2				
	1-Nov-21	3:12:00 PM	20.8	0.1				

Table 10: List of assumptions for column 1 (tailings material)

Parameter	Value	Units
Column Cross Sectional Area	0.01843	m ²
Connection Cross Sectional Area	0.015393804	m ²
Assumed Placed Dry Density	1252	kg/m ³
Assumed Particle Density	2800	kg/m ³
Porosity	0.552857143	
Total Volume	14.53458913	L
Temperature	283.15	K
Gas Constant	0.082057	L · atm / mol · K
Pressure	0.989	atm

Table 11: List of assumptions for column 2 to 9

Parameter	Value	Units
Column Cross Sectional Area	0.01843	m ²
Connection Cross Sectional Area	0.015393804	m ²
Assumed Placed Dry Density	2650	kg/m ³
Temperature	283.15	K
Gas Constant	0.082057	L · atm / mol · K
Pressure	0.989	atm

Table 12: Pore volume calculations

Column ID	01-TSF	02-IF-PAG	03-SED-PAG	04-GAB-NPAG	05-SED-NPAG	06-IF-NPAG	07-IF-PAG-CW	08-SED-PAG-CW	09-FZONE-NPAG
Material Height (mm)	429	272	296	289	291	274	253	348	328
Material Volume (mL)	7906	5013	5455	5326	5363	5050	4663	6414	6045
Top Headspace Volume (mL)	6628	9522	9079	9208	9171	9485	9872	8121	8490
Porosity	0.53	0.25	0.31	0.29	0.30	0.25	0.19	0.41	0.38
VWC	0.4	0.1	0.1	0.1	0.1	0.13	0.1	0.1	0.2
VAC	0.13	0.15	0.21	0.19	0.20	0.12	0.09	0.31	0.17
Equivalent Porosity for O ₂	0.14	0.15	0.21	0.19	0.20	0.12	0.09	0.31	0.17

Appendix C

Laboratory Certificates of Analyses



O'KANE CONSULTANTS INC.
ATTN: Jared Robertson
112 - 112 Research Drive
Saskatoon SK S7N 3R3

Date Received: 07-JAN-21
Report Date: 28-JAN-21 11:48 (MT)
Version: FINAL REV. 2

Client Phone: 306-955-0702

Certificate of Analysis

Lab Work Order #: L2546323
Project P.O. #: NOT SUBMITTED
Job Reference: 948-021
C of C Numbers:
Legal Site Desc:

Comments: ADDITIONAL 25-JAN-21 09:29

Brian Morgan, B.Sc. Hons.
Client Services Manager

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ADDRESS: #819-58th St E., Saskatoon, SK S7K 6X5 Canada | Phone: +1 306 668 8370 | Fax: +1 306 668 8383
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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID	L2546323-1 LEACHATE 17-DEC-20 08:45 01_TSF_W1	L2546323-2 LEACHATE 24-DEC-20 11:15 01_TSF_W2	L2546323-3 LEACHATE 31-DEC-20 12:00 01_TSF_W3	L2546323-4 LEACHATE 07-JAN-21 12:00 01_TSF_W4	L2546323-5 LEACHATE 07-JAN-21 12:00 CONNATE_WATE R	
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)				71900	75100
	pH (pH)				7.24	7.26
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)				235	37.7
	Ammonia, Total (as N) (mg/L)				24.2 ^{DLHC}	5.3 ^{DLHC}
	Bicarbonate (HCO3) (mg/L)				287.	45.9 ^{DLM}
	Bromide (Br) (mg/L)					<500
	Carbonate (CO3) (mg/L)				<5.0	<5.0
	Chloride (Cl) (mg/L)				16900 ^{DLM}	33100 ^{DLM}
	Fluoride (F) (mg/L)				<10 ^{DLM}	<100 ^{DLM}
	Hardness (as CaCO3) (mg/L)				2930	14000
	Hydroxide (OH) (mg/L)				<5.0	<5.0
	Nitrate (as N) (mg/L)				1240 ^{DLM}	<100 ^{DLM}
	Nitrite (as N) (mg/L)				8.8 ^{DLM}	<50 ^{DLM}
	Total Kjeldahl Nitrogen (mg/L)				1470 ^{DLHC}	4.8 ^{DLM}
	Phosphorus (P)-Total (mg/L)				0.050 ^{DLM}	<0.0050
	TDS (Calculated) (mg/L)				46700	57700
	Sulfate (SO4) (mg/L)				18300 ^{DLDS}	15200 ^{DLDS}
	Cation - Anion Balance (%)				14700 ^{DLDS}	2600 ^{DLDS}
					29.1 ^{BL-INT}	3.1
Cyanides	Cyanide, Weak Acid Diss (mg/L)				<0.050 ^{DLM}	<0.0050
	Cyanide, Total (mg/L)				18.1	<0.0050
Dissolved Metals	Dissolved Metals Filtration Location				FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)				<0.10 ^{DLDS}	<0.10 ^{DLDS}
	Antimony (Sb)-Dissolved (mg/L)				0.0314 ^{DLDS}	<0.0050 ^{DLDS}
	Arsenic (As)-Dissolved (mg/L)				4.11 ^{DLDS}	<0.0050 ^{DLDS}
	Barium (Ba)-Dissolved (mg/L)				0.241 ^{DLDS}	0.115 ^{DLDS}
	Beryllium (Be)-Dissolved (mg/L)				<0.0050 ^{DLDS}	<0.0050 ^{DLDS}
	Bismuth (Bi)-Dissolved (mg/L)				<0.0025 ^{DLDS}	<0.0025 ^{DLDS}
	Boron (B)-Dissolved (mg/L)				2.80 ^{DLDS}	1.18 ^{DLDS}
	Cadmium (Cd)-Dissolved (mg/L)				0.00487 ^{DLDS}	0.00092 ^{DLDS}
	Calcium (Ca)-Dissolved (mg/L)				650 ^{DLDS}	1730 ^{DLDS}
	Cesium (Cs)-Dissolved (mg/L)				<0.00050 ^{DLDS}	0.0290 ^{DLDS}
	Chromium (Cr)-Dissolved (mg/L)				<0.0050 ^{DLDS}	<0.0050 ^{DLDS}
	Cobalt (Co)-Dissolved (mg/L)				4.56 ^{DLDS}	<0.0050 ^{DLDS}
	Copper (Cu)-Dissolved (mg/L)				1.50 ^{DLDS}	<0.010 ^{DLDS}
	Iron (Fe)-Dissolved (mg/L)				10.3 ^{DLDS}	<0.50 ^{DLDS}
	Lead (Pb)-Dissolved (mg/L)				<0.0025 ^{DLDS}	<0.0025 ^{DLDS}
	Lithium (Li)-Dissolved (mg/L)				<0.050 ^{DLDS}	0.306 ^{DLDS}

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID				
	L2546323-6 LEACHATE 07-JAN-21 12:00 BLANK				
Grouping	Analyte				
WATER					
Physical Tests	Conductivity (uS/cm)	<5.0			
	pH (pH)	5.03			
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	<5.0			
	Ammonia, Total (as N) (mg/L)	<0.050			
	Bicarbonate (HCO3) (mg/L)	<6.1			
	Bromide (Br) (mg/L)	<0.10			
	Carbonate (CO3) (mg/L)	<5.0			
	Chloride (Cl) (mg/L)	<0.50			
	Fluoride (F) (mg/L)	<0.020			
	Hardness (as CaCO3) (mg/L)	<1.0			
	Hydroxide (OH) (mg/L)	<5.0			
	Nitrate (as N) (mg/L)	<0.020			
	Nitrite (as N) (mg/L)	<0.010			
	Total Kjeldahl Nitrogen (mg/L)	<0.20			
	Phosphorus (P)-Total (mg/L)	<0.0050			
	TDS (Calculated) (mg/L)	<1.0			
	Sulfate (SO4) (mg/L)	<0.30			
	Cation - Anion Balance (%)	Low TDS			
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050			
	Cyanide, Total (mg/L)	<0.0050			
Dissolved Metals	Dissolved Metals Filtration Location	FIELD			
	Aluminum (Al)-Dissolved (mg/L)	<0.0020			
	Antimony (Sb)-Dissolved (mg/L)	<0.00010			
	Arsenic (As)-Dissolved (mg/L)	<0.00010			
	Barium (Ba)-Dissolved (mg/L)	<0.00010			
	Beryllium (Be)-Dissolved (mg/L)	<0.00010			
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050			
	Boron (B)-Dissolved (mg/L)	<0.010			
	Cadmium (Cd)-Dissolved (mg/L)	<0.0000050			
	Calcium (Ca)-Dissolved (mg/L)	<0.050			
	Cesium (Cs)-Dissolved (mg/L)	<0.000010			
	Chromium (Cr)-Dissolved (mg/L)	<0.00010			
	Cobalt (Co)-Dissolved (mg/L)	<0.00010			
	Copper (Cu)-Dissolved (mg/L)	<0.00020			
	Iron (Fe)-Dissolved (mg/L)	<0.010			
	Lead (Pb)-Dissolved (mg/L)	<0.000050			
	Lithium (Li)-Dissolved (mg/L)	<0.0010			

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L2546323-1	L2546323-2	L2546323-3	L2546323-4	L2546323-5
Description	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE
Sampled Date	17-DEC-20	24-DEC-20	31-DEC-20	07-JAN-21	07-JAN-21	07-JAN-21
Sampled Time	08:45	11:15	12:00	12:00	12:00	12:00
Client ID	01_TSF_W1	01_TSF_W2	01_TSF_W3	01_TSF_W4	01_TSF_W4	CONNATE_WATER
Grouping	Analyte					
WATER						
Dissolved Metals	Magnesium (Mg)-Dissolved (mg/L)	200 <small>DLDS</small>			235 <small>DLDS</small>	2360 <small>DLDS</small>
	Manganese (Mn)-Dissolved (mg/L)	0.799 <small>DLDS</small>			1.16 <small>DLDS</small>	0.368 <small>DLDS</small>
	Molybdenum (Mo)-Dissolved (mg/L)	1.97 <small>DLDS</small>			1.52 <small>DLDS</small>	0.0132 <small>DLDS</small>
	Nickel (Ni)-Dissolved (mg/L)	<0.025 <small>DLDS</small>			<0.025 <small>DLDS</small>	<0.025 <small>DLDS</small>
	Phosphorus (P)-Dissolved (mg/L)	<2.5 <small>DLDS</small>			<2.5 <small>DLDS</small>	<2.5 <small>DLDS</small>
	Potassium (K)-Dissolved (mg/L)	2580 <small>DLDS</small>			1510 <small>DLDS</small>	526 <small>DLDS</small>
	Rubidium (Rb)-Dissolved (mg/L)	0.211 <small>DLDS</small>			0.110 <small>DLDS</small>	0.275 <small>DLDS</small>
	Selenium (Se)-Dissolved (mg/L)	0.250 <small>DLDS</small>			0.144 <small>DLDS</small>	<0.0025 <small>DLDS</small>
	Silicon (Si)-Dissolved (mg/L)	2.9 <small>DLDS</small>			3.3 <small>DLDS</small>	<2.5 <small>DLDS</small>
	Silver (Ag)-Dissolved (mg/L)	0.401 <small>DLDS</small>			0.180 <small>DLDS</small>	<0.00050 <small>DLDS</small>
	Sodium (Na)-Dissolved (mg/L)	32300 <small>DLHC</small>			21600 <small>DLDS</small>	17400 <small>DLDS</small>
	Strontium (Sr)-Dissolved (mg/L)	3.13 <small>DLDS</small>			3.26 <small>DLDS</small>	42.9 <small>DLDS</small>
	Sulfur (S)-Dissolved (mg/L)	13800 <small>DLDS</small>			10500 <small>DLDS</small>	1280 <small>DLDS</small>
	Tellurium (Te)-Dissolved (mg/L)	<0.010 <small>DLDS</small>			<0.010 <small>DLDS</small>	<0.010 <small>DLDS</small>
	Thallium (Tl)-Dissolved (mg/L)	0.00085 <small>DLDS</small>			0.00053 <small>DLDS</small>	<0.00050 <small>DLDS</small>
	Thorium (Th)-Dissolved (mg/L)	<0.0050 <small>DLDS</small>			<0.0050 <small>DLDS</small>	<0.0050 <small>DLDS</small>
	Tin (Sn)-Dissolved (mg/L)	<0.0050 <small>DLDS</small>			<0.0050 <small>DLDS</small>	<0.0050 <small>DLDS</small>
	Titanium (Ti)-Dissolved (mg/L)	<0.015 <small>DLDS</small>			<0.015 <small>DLDS</small>	<0.015 <small>DLDS</small>
	Tungsten (W)-Dissolved (mg/L)	<0.0050 <small>DLDS</small>			<0.0050 <small>DLDS</small>	0.0085 <small>DLDS</small>
	Uranium (U)-Dissolved (mg/L)	0.00644 <small>DLDS</small>			0.0120 <small>DLDS</small>	<0.00050 <small>DLDS</small>
	Vanadium (V)-Dissolved (mg/L)	<0.025 <small>DLDS</small>			<0.025 <small>DLDS</small>	<0.025 <small>DLDS</small>
	Zinc (Zn)-Dissolved (mg/L)	<0.050 <small>DLDS</small>			<0.050 <small>DLDS</small>	<0.050 <small>DLDS</small>
	Zirconium (Zr)-Dissolved (mg/L)	<0.010 <small>DLDS</small>			<0.010 <small>DLDS</small>	<0.010 <small>DLDS</small>

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L2546323-6	LEACHATE	07-JAN-21	12:00	BLANK
Grouping	Analyte					
WATER						
Dissolved Metals	Magnesium (Mg)-Dissolved (mg/L)	<0.0050				
	Manganese (Mn)-Dissolved (mg/L)	<0.00010				
	Molybdenum (Mo)-Dissolved (mg/L)	<0.000050				
	Nickel (Ni)-Dissolved (mg/L)	<0.00050				
	Phosphorus (P)-Dissolved (mg/L)	<0.050				
	Potassium (K)-Dissolved (mg/L)	<0.050				
	Rubidium (Rb)-Dissolved (mg/L)	<0.00020				
	Selenium (Se)-Dissolved (mg/L)	<0.000050				
	Silicon (Si)-Dissolved (mg/L)	<0.050				
	Silver (Ag)-Dissolved (mg/L)	<0.000010				
	Sodium (Na)-Dissolved (mg/L)	<0.050				
	Strontium (Sr)-Dissolved (mg/L)	<0.00020				
	Sulfur (S)-Dissolved (mg/L)	<0.50				
	Tellurium (Te)-Dissolved (mg/L)	<0.00020				
	Thallium (Tl)-Dissolved (mg/L)	<0.000010				
	Thorium (Th)-Dissolved (mg/L)	<0.00010				
	Tin (Sn)-Dissolved (mg/L)	<0.00010				
	Titanium (Ti)-Dissolved (mg/L)	<0.00030				
	Tungsten (W)-Dissolved (mg/L)	<0.00010				
	Uranium (U)-Dissolved (mg/L)	<0.000010				
	Vanadium (V)-Dissolved (mg/L)	<0.00050				
	Zinc (Zn)-Dissolved (mg/L)	<0.0010				
	Zirconium (Zr)-Dissolved (mg/L)	<0.00020				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Fluoride (F)	K	L2546323-4, -5, -6
Matrix Spike	Chloride (Cl)	MS-B	L2546323-1, -2, -3, -4, -5, -6
Matrix Spike	Antimony (Sb)-Dissolved	MS-B	L2546323-1
Matrix Spike	Arsenic (As)-Dissolved	MS-B	L2546323-1
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L2546323-4, -5, -6
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L2546323-1
Matrix Spike	Boron (B)-Dissolved	MS-B	L2546323-4, -5, -6
Matrix Spike	Boron (B)-Dissolved	MS-B	L2546323-1
Matrix Spike	Cadmium (Cd)-Dissolved	MS-B	L2546323-4, -5, -6
Matrix Spike	Cadmium (Cd)-Dissolved	MS-B	L2546323-1
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L2546323-4, -5, -6
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L2546323-1
Matrix Spike	Cobalt (Co)-Dissolved	MS-B	L2546323-1
Matrix Spike	Copper (Cu)-Dissolved	MS-B	L2546323-1
Matrix Spike	Iron (Fe)-Dissolved	MS-B	L2546323-1
Matrix Spike	Lithium (Li)-Dissolved	MS-B	L2546323-4, -5, -6
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L2546323-4, -5, -6
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L2546323-1
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L2546323-4, -5, -6
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L2546323-1
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L2546323-1
Matrix Spike	Nickel (Ni)-Dissolved	MS-B	L2546323-4, -5, -6
Matrix Spike	Potassium (K)-Dissolved	MS-B	L2546323-4, -5, -6
Matrix Spike	Potassium (K)-Dissolved	MS-B	L2546323-1
Matrix Spike	Rubidium (Rb)-Dissolved	MS-B	L2546323-1
Matrix Spike	Selenium (Se)-Dissolved	MS-B	L2546323-1
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L2546323-4, -5, -6
Matrix Spike	Silver (Ag)-Dissolved	MS-B	L2546323-1
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L2546323-4, -5, -6
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L2546323-1
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L2546323-4, -5, -6
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L2546323-1
Matrix Spike	Sulfur (S)-Dissolved	MS-B	L2546323-4, -5, -6
Matrix Spike	Sulfur (S)-Dissolved	MS-B	L2546323-1
Matrix Spike	Thallium (Tl)-Dissolved	MS-B	L2546323-4, -5, -6
Matrix Spike	Uranium (U)-Dissolved	MS-B	L2546323-4, -5, -6
Matrix Spike	Uranium (U)-Dissolved	MS-B	L2546323-1
Matrix Spike	Nitrite (as N)	MS-B	L2546323-1, -2, -3, -4, -5, -6
Matrix Spike	Nitrate (as N)	MS-B	L2546323-1, -2, -3, -4, -5, -6
Matrix Spike	Sulfate (SO4)	MS-B	L2546323-1, -2, -3, -4, -5, -6

Qualifiers for Individual Parameters Listed:

Qualifier	Description
BL:INT	Balance Reviewed: Interference Or Non-Measured Component
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
K	Matrix Spike recovery outside ALS DQO due to sample matrix effects.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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Reference Information

ALK-PCT-SK	Water	Alkalinity by Auto. Titration	APHA 2320 Alkalinity
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
BR-IC-N-SK	Water	Bromide in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
CL-IC-N-SK	Water	Chloride in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
CN-T-CFA-VA	Water	Total Cyanide in water by CFA	ISO 14403:2002
This analysis is carried out using procedures adapted from ISO Method 14403:2002 "Determination of Total Cyanide using Flow Analysis (FIA and CFA)". Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.			
CN-WAD-CFA-VA	Water	Weak Acid Diss. Cyanide in water by CFA	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN I. "Weak Acid Dissociable Cyanide". Weak Acid Dissociable (WAD) cyanide is determined by in-line sample distillation with final determination by colourimetric analysis.			
EC-PCT-SK	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			
F-IC-N-SK	Water	Fluoride in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
IONBALANCE-OP03-SK	Water	Ion Balance Calculation	APHA 1030-E
MET-D-CCMS-SK	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030B / EPA 6020A
This procedure involves preliminary filtration through a 0.45 um filter followed by instrumental analysis using collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).			
NH3-F-CL	Water	Ammonia by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Weston et al.			
NO2-IC-N-SK	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-IC-N-SK	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
P-T-COL-CL	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
PH-PCT-SK	Water	pH by Meter (Automated)	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
It is recommended that this analysis be conducted in the field.			
SO4-IC-N-SK	Water	Sulfate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
TKN-F-CL	Water	Total Kjeldahl Nitrogen by Fluorescence	APHA 4500-NORG (TKN)
This analysis is carried out using procedures adapted from APHA Method 4500-Norg D. "Block Digestion and Flow Injection Analysis". Total Kjeldahl Nitrogen is determined using block digestion followed by Flow-injection analysis with fluorescence detection.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
SK	ALS ENVIRONMENTAL - SASKATOON, SASKATCHEWAN, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Reference Information

CL

ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour 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.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

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

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



CERTIFICATE OF ANALYSIS

Work Order : **SK2100207**
Client : **O'Kane Consultants Inc.**
Contact : Jared Robertson
Address : 112 - 112 Research Drive
Saskatoon SK Canada S7N 3R3
Telephone : 250 420 7010
Project : 948-021
PO : ----
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : Q83455
No. of samples received : 34
No. of samples analysed : 34

Page : 1 of 11
Laboratory : Saskatoon - Environmental
Account Manager : Brian Morgan
Address : 819 58 Street East
Saskatoon SK Canada S7K 6X5
Telephone : 1 306 221 7147
Date Samples Received : 04-Feb-2021 14:45
Date Analysis Commenced : 05-Feb-2021
Issue Date : 19-Feb-2021 18:04

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Colby Bingham	Quality Systems Coordinator	Inorganics, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Jorden Fanson	Analyst	Inorganics, Calgary, Alberta
Lian Nesbitt	Laboratory Analyst	Metals, Saskatoon, Saskatchewan
Melissa Houseman	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Melissa Houseman	Team Leader - Inorganics	Metals, Saskatoon, Saskatchewan
Naeun Kim	Analyst	Inorganics, Calgary, Alberta
Rebecca Baker	Analyst	Inorganics, Calgary, Alberta
Tracy Harley	Supervisor - Water Quality Instrumentation	Inorganics, Burnaby, British Columbia



General Comments

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

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

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

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

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

<i>Unit</i>	<i>Description</i>
-	No Unit
%	percent
µS/cm	Microsiemens per centimetre
meq/L	milliequivalents per litre
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 in reports identified as "Preliminary Report" are considered authorized for use.

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLDS	<i>Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.</i>
DLHC	<i>Detection Limit Raised: Dilution required due to high concentration of test analyte(s).</i>
DLM	<i>Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).</i>
HTA	<i>Analytical holding time was exceeded.</i>
IB:INT	<i>Ion Balance Reviewed: Imbalance is due to interference or non-measured component.</i>



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					08-SED-PAG-C W_W3	09-FZONE-NPA G_W1	09-FZONE-NPA G_W2	09-FZONE-NPA G_W3	10-ROM-SR1_ W1
Client sampling date / time					04-Feb-2021 11:00	21-Jan-2021 14:15	28-Jan-2021 14:55	04-Feb-2021 11:30	21-Jan-2021 15:00
Analyte	CAS Number	Method	LOR	Unit	SK2100207-001	SK2100207-002	SK2100207-003	SK2100207-004	SK2100207-005
					Result	Result	Result	Result	Result
Physical Tests									
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	----	----	----	----	702
conductivity	----	E100	2.0	µS/cm	----	----	----	----	4970
pH	----	E108	0.10	pH units	----	----	----	----	7.59
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	----	----	85.0
bicarbonate	71-52-3	E290	1.0	mg/L	----	----	----	----	104
carbonate	3812-32-6	E290	1.0	mg/L	----	----	----	----	<1.0
hydroxide	14280-30-9	E290	1.0	mg/L	----	----	----	----	<1.0
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	----	----	3130
Anions and Nutrients									
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	----	----	1210 ^{DLDS}
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	----	----	<0.400 ^{DLDS}
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	----	----	99.5 ^{DLDS}
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	----	----	<0.200 ^{DLDS}
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	3000 ^{DLDS}	26.1 ^{DLDS}	51.1 ^{DLDS}	59.5 ^{DLDS}	347 ^{DLDS}
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	----	----	99.5
Ion Balance									
anion sum	----	EC101	0.10	meq/L	----	----	----	----	50.2
cation sum	----	EC101	0.10	meq/L	----	----	----	----	50.1
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	----	----	0.100
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	----	----	99.8
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	----	----	0.0143 ^{DLDS}
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	----	----	0.00100 ^{DLDS}
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	----	----	0.0234 ^{DLDS}
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	----	----	0.221 ^{DLDS}
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	----	----	----	<0.000040 ^{DLDS}
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	----	----	----	<0.000100 ^{DLDS}
boron, dissolved	7440-42-8	E421	0.010	mg/L	----	----	----	----	1.22 ^{DLDS}
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	----	----	----	----	0.000101 ^{DLDS}
calcium, dissolved	7440-70-2	E421	0.050	mg/L	----	----	----	----	151 ^{DLDS}



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					08-SED-PAG-C W_W3	09-FZONE-NPA G_W1	09-FZONE-NPA G_W2	09-FZONE-NPA G_W3	10-ROM-SR1_ W1
Client sampling date / time					04-Feb-2021 11:00	21-Jan-2021 14:15	28-Jan-2021 14:55	04-Feb-2021 11:30	21-Jan-2021 15:00
Analyte	CAS Number	Method	LOR	Unit	SK2100207-001	SK2100207-002	SK2100207-003	SK2100207-004	SK2100207-005
					Result	Result	Result	Result	Result
Dissolved Metals									
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	----	----	----	----	0.000236 ^{DLDS}
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	----	----	----	----	0.0188 ^{DLDS}
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	----	----	----	----	0.00057 ^{DLDS}
copper, dissolved	7440-50-8	E421	0.00020	mg/L	----	----	----	----	0.0226 ^{DLDS}
iron, dissolved	7439-89-6	E421	0.030	mg/L	----	----	----	----	<0.060 ^{DLDS}
lead, dissolved	7439-92-1	E421	0.000050	mg/L	----	----	----	----	0.000152 ^{DLDS}
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	----	----	----	----	0.0219 ^{DLDS}
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	----	----	----	----	78.8 ^{DLDS}
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	----	----	----	----	0.0110 ^{DLDS}
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	----	----	----	----	0.0144 ^{DLDS}
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	----	----	----	----	0.00258 ^{DLDS}
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	----	----	----	----	<0.100 ^{DLDS}
potassium, dissolved	7440-09-7	E421	0.050	mg/L	----	----	----	----	35.1 ^{DLDS}
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	----	----	----	----	0.0241 ^{DLDS}
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	----	----	----	----	0.00763 ^{DLDS}
silicon, dissolved	7440-21-3	E421	0.050	mg/L	----	----	----	----	3.08 ^{DLDS}
silver, dissolved	7440-22-4	E421	0.000010	mg/L	----	----	----	----	0.000032 ^{DLDS}
sodium, dissolved	17341-25-2	E421	0.050	mg/L	----	----	----	----	810 ^{DLDS}
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	----	----	----	----	1.23 ^{DLDS}
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	----	----	----	----	135 ^{DLDS}
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	----	----	----	----	<0.00040 ^{DLDS}
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	----	----	----	----	0.000035 ^{DLDS}
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	----	----	----	----	<0.00020 ^{DLDS}
tin, dissolved	7440-31-5	E421	0.00010	mg/L	----	----	----	----	0.0246 ^{DLDS}
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	----	----	----	----	<0.00060 ^{DLDS}
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	----	----	----	----	0.00030 ^{DLDS}
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	----	----	----	----	0.00620 ^{DLDS}
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	----	----	----	----	<0.00100 ^{DLDS}
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	----	----	----	0.0066 ^{DLDS}
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	----	----	----	<0.00060 ^{DLDS}
dissolved metals filtration location	----	EP421	-	-	----	----	----	----	Field



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



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					10-ROM-SR1_ W2	10-ROM-SR1_ W3	11-ROM-SR2_ W1	11-ROM-SR2_ W2	11-ROM-SR2_ W3
Client sampling date / time					28-Jan-2021 15:12	04-Feb-2021 11:40	21-Jan-2021 15:10	28-Jan-2021 15:25	04-Feb-2021 12:00
Analyte	CAS Number	Method	LOR	Unit	SK2100207-006	SK2100207-007	SK2100207-008	SK2100207-009	SK2100207-010
					Result	Result	Result	Result	Result
Physical Tests									
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	606	352	179	168	210
conductivity	----	E100	2.0	µS/cm	4210	2360	1640	1380	1610
pH	----	E108	0.10	pH units	7.58	7.66	7.57	7.50	7.72
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	83.0	88.2	68.1	59.3	97.0
bicarbonate	71-52-3	E290	1.0	mg/L	101	108	83.1	72.3	118
carbonate	3812-32-6	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
hydroxide	14280-30-9	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	2640	1460	901	775	962
Anions and Nutrients									
chloride	16887-00-6	E235.Cl	0.50	mg/L	984 ^{DLDS}	474 ^{DLDS}	393 ^{DLDS}	319 ^{DLDS}	369 ^{DLDS}
fluoride	16984-48-8	E235.F	0.020	mg/L	<0.400 ^{DLDS}	<0.400 ^{DLDS}	<0.200 ^{DLDS}	0.102 ^{DLDS}	<0.200 ^{DLDS}
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	84.5 ^{DLDS}	46.9 ^{DLDS}	8.46 ^{DLDS}	8.50 ^{DLDS}	13.9 ^{DLDS}
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.200 ^{DLDS}	<0.200 ^{DLDS}	<0.100 ^{DLDS}	<0.050 ^{DLDS}	0.126 ^{DLDS}
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	309 ^{DLDS}	230 ^{DLDS}	94.7 ^{DLDS}	90.4 ^{DLDS}	125 ^{DLDS}
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	84.5	46.9	8.46	8.50	14.0
Ion Balance									
anion sum	----	EC101	0.10	meq/L	41.9	23.3	15.0	12.7	16.0
cation sum	----	EC101	0.10	meq/L	42.8	22.8	15.2	13.3	15.7
ion balance (cation-anion difference)	----	EC101	0.010	%	1.06	1.08	0.662	2.31	0.946
ion balance (cations/anions ratio)	----	EC101	0.010	%	102	97.8	101	105	98.1
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0161 ^{DLDS}	0.0174 ^{DLDS}	0.0261	0.0281	0.0175
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00096 ^{DLDS}	0.00091 ^{DLDS}	0.00061	0.00052	0.00048
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.0207 ^{DLDS}	0.0260 ^{DLDS}	0.00681	0.00743	0.0208
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.179 ^{DLDS}	0.0958 ^{DLDS}	0.0471	0.0419	0.0620
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000040 ^{DLDS}	<0.000040 ^{DLDS}	<0.000020	<0.000020	<0.000020
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000100 ^{DLDS}	<0.000100 ^{DLDS}	<0.000050	<0.000050	<0.000050
boron, dissolved	7440-42-8	E421	0.010	mg/L	1.26 ^{DLDS}	0.956 ^{DLDS}	0.158	0.150	0.141
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000807 ^{DLDS}	0.0000263 ^{DLDS}	0.0000336	0.0000256	0.0000366
calcium, dissolved	7440-70-2	E421	0.050	mg/L	132 ^{DLDS}	79.5 ^{DLDS}	41.3	38.9	43.5
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000197 ^{DLDS}	0.000180 ^{DLDS}	0.000045	0.000044	0.000072



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					10-ROM-SR1_ W2	10-ROM-SR1_ W3	11-ROM-SR2_ W1	11-ROM-SR2_ W2	11-ROM-SR2_ W3
Client sampling date / time					28-Jan-2021 15:12	04-Feb-2021 11:40	21-Jan-2021 15:10	28-Jan-2021 15:25	04-Feb-2021 12:00
Analyte	CAS Number	Method	LOR	Unit	SK2100207-006	SK2100207-007	SK2100207-008	SK2100207-009	SK2100207-010
					Result	Result	Result	Result	Result
Dissolved Metals									
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	0.0133 DLDS	0.00477 DLDS	0.0109	0.00878	0.00713
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00051 DLDS	0.00034 DLDS	0.00019	0.00019	0.00040
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.0167 DLDS	0.00855 DLDS	0.0122	0.00958	0.0116
iron, dissolved	7439-89-6	E421	0.030	mg/L	<0.060 DLDS	<0.060 DLDS	<0.030	<0.030	<0.030
lead, dissolved	7439-92-1	E421	0.000050	mg/L	0.000142 DLDS	0.000104 DLDS	0.000090	0.000139	0.000054
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0219 DLDS	0.0142 DLDS	0.0159	0.0149	0.0163
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	67.0 DLDS	37.4 DLDS	18.4	17.1	24.5
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	0.0113 DLDS	0.0172 DLDS	<0.00500	0.00654	0.0422
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.0133 DLDS	0.0104 DLDS	0.00965	0.00772	0.00882
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00232 DLDS	0.00230 DLDS	0.00112	0.00109	0.00222
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.100 DLDS	<0.100 DLDS	<0.050	<0.050	<0.050
potassium, dissolved	7440-09-7	E421	0.050	mg/L	33.3 DLDS	20.9 DLDS	6.77	6.49	8.17
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.0202 DLDS	0.0126 DLDS	0.00313	0.00279	0.00325
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.00552 DLDS	0.00231 DLDS	0.00381	0.00314	0.00250
silicon, dissolved	7440-21-3	E421	0.050	mg/L	3.40 DLDS	4.03 DLDS	1.68	1.85	4.23
silver, dissolved	7440-22-4	E421	0.000010	mg/L	0.000032 DLDS	<0.000020 DLDS	0.000093	0.000041	0.000012
sodium, dissolved	17341-25-2	E421	0.050	mg/L	686 DLDS	350 DLDS	264	225	260
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	1.06 DLDS	0.610 DLDS	0.346	0.302	0.247
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	122 DLDS	86.4 DLDS	37.0	33.0	43.3
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00040 DLDS	<0.00040 DLDS	<0.00020	<0.00020	<0.00020
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.000032 DLDS	0.000024 DLDS	<0.000010	<0.000010	0.000017
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00020 DLDS	<0.00020 DLDS	<0.00010	<0.00010	<0.00010
tin, dissolved	7440-31-5	E421	0.00010	mg/L	0.0211 DLDS	0.0123 DLDS	0.0187	0.0189	0.0211
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00060 DLDS	<0.00060 DLDS	<0.00030	<0.00030	<0.00030
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	0.00025 DLDS	0.00021 DLDS	0.00051	0.00038	0.00027
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.00516 DLDS	0.00380 DLDS	0.00282	0.00244	0.00281
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00100 DLDS	<0.00100 DLDS	<0.00050	<0.00050	<0.00050
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0073 DLDS	0.0034 DLDS	0.0048	0.0050	0.0089
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00060 DLDS	<0.00060 DLDS	<0.00030	<0.00030	<0.00030
dissolved metals filtration location	----	EP421	-	-	Field	Field	Field	Field	Field



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

Analytical Results

Sub-Matrix: Leachate (Matrix: Water)					Client sample ID	04-GAB-NPAG_W3	05-SED-NPAG-W1	05-SED-NPAG-W2	05-SED-NPAG-W3	06-IF-NPAG_W1
Client sampling date / time					04-Feb-2021 10:00	21-Jan-2021 13:35	28-Jan-2021 14:25	04-Feb-2021 10:05	21-Jan-2021 13:45	
Analyte	CAS Number	Method	LOR	Unit	SK2100207-011	SK2100207-012	SK2100207-013	SK2100207-014	SK2100207-015	
					Result	Result	Result	Result	Result	Result
Anions and Nutrients										
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	38.3 ^{DLDS}	20.3 ^{DLDS}	32.6 ^{DLDS}	38.8 ^{DLDS}	37.3 ^{DLDS}	

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

Analytical Results

Sub-Matrix: Leachate (Matrix: Water)					Client sample ID	06-IF-NPAG_W2	06-IF-NPAG_W3	07-IF-PAG-CW_W1	07-IF-PAG-CW_W2	07-IF-PAG-CW_W3
Client sampling date / time					28-Jan-2021 14:35	04-Feb-2021 10:15	21-Jan-2021 13:55	28-Jan-2021 14:40	04-Feb-2021 10:45	
Analyte	CAS Number	Method	LOR	Unit	SK2100207-016	SK2100207-017	SK2100207-018	SK2100207-019	SK2100207-020	
					Result	Result	Result	Result	Result	Result
Anions and Nutrients										
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	49.9 ^{DLDS}	56.4 ^{DLDS}	2610 ^{DLDS}	2440 ^{DLDS}	2480 ^{DLDS}	

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

Analytical Results

Sub-Matrix: Leachate (Matrix: Water)					Client sample ID	08-SED-PAG-C_W_W1	08-SED-PAG-C_W_W2	01_TSF_W5	01_TSF_W6	01_TSF_W7
Client sampling date / time					21-Jan-2021 14:00	28-Jan-2021 14:45	15-Jan-2021 09:30	21-Jan-2021 12:45	04-Feb-2021 13:30	
Analyte	CAS Number	Method	LOR	Unit	SK2100207-021	SK2100207-022	SK2100207-023	SK2100207-024	SK2100207-025	
					Result	Result	Result	Result	Result	Result
Anions and Nutrients										
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	2680 ^{DLDS}	2660 ^{DLDS}	10400 ^{DLDS}	9230 ^{DLDS}	7620 ^{DLDS}	

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



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					01_TSF_W8	02-IF-PAG_W1	02-IF-PAG_W2	02-IF-PAG_W3	03-SED-PAG_W 1
Client sampling date / time					04-Feb-2021 08:50	21-Jan-2021 12:55	28-Jan-2021 13:55	04-Feb-2021 09:10	21-Jan-2021 13:20
Analyte	CAS Number	Method	LOR	Unit	SK2100207-026	SK2100207-027	SK2100207-028	SK2100207-029	SK2100207-030
					Result	Result	Result	Result	Result
Physical Tests									
hardness (as CaCO3), dissolved	---	EC100	0.60	mg/L	2140	---	---	---	---
conductivity	---	E100	2.0	µS/cm	28200	---	---	---	---
pH	---	E108	0.10	pH units	7.33	---	---	---	---
alkalinity, total (as CaCO3)	---	E290	2.0	mg/L	135	---	---	---	---
bicarbonate	71-52-3	E290	1.0	mg/L	164	---	---	---	---
carbonate	3812-32-6	E290	1.0	mg/L	<1.0	---	---	---	---
hydroxide	14280-30-9	E290	1.0	mg/L	<1.0	---	---	---	---
solids, total dissolved [TDS], calculated	---	EC103	1.0	mg/L	22100	---	---	---	---
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	11.6	---	---	---	---
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	---	---	---	---
Kjeldahl nitrogen, total [TKN]	---	E318	0.200	mg/L	496 ^{DLHC}	---	---	---	---
chloride	16887-00-6	E235.Cl	0.50	mg/L	5230 ^{DLDS}	---	---	---	---
fluoride	16984-48-8	E235.F	0.020	mg/L	<4.00 ^{DLDS}	---	---	---	---
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	382 ^{DLDS}	---	---	---	---
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	3.43 ^{DLDS}	---	---	---	---
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	6560 ^{DLDS}	60.3 ^{DLDS}	87.1 ^{DLDS}	103 ^{DLDS}	34.0 ^{DLDS}
nitrate + nitrite (as N)	---	EC235.N+N	0.0500	mg/L	385	---	---	---	---
Cyanides									
cyanide, strong acid dissociable (total)	---	E333	0.0050	mg/L	1.32 ^{HTA}	---	---	---	---
cyanide, weak acid dissociable	---	E336	0.0050	mg/L	<0.100 ^{DLHC, HTA}	---	---	---	---
Ion Balance									
anion sum	---	EC101	0.10	meq/L	314	---	---	---	---
cation sum	---	EC101	0.10	meq/L	369	---	---	---	---
ion balance (cation-anion difference)	---	EC101	0.010	%	8.05 ^{IB:INT}	---	---	---	---
ion balance (cations/anions ratio)	---	EC101	0.010	%	118	---	---	---	---
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	<0.0200 ^{DLDS}	---	---	---	---
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00588 ^{DLDS}	---	---	---	---
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.657 ^{DLDS}	---	---	---	---
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0727 ^{DLDS}	---	---	---	---



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					01_TSF_W8	02-IF-PAG_W1	02-IF-PAG_W2	02-IF-PAG_W3	03-SED-PAG_W 1
Client sampling date / time					04-Feb-2021 08:50	21-Jan-2021 12:55	28-Jan-2021 13:55	04-Feb-2021 09:10	21-Jan-2021 13:20
Analyte	CAS Number	Method	LOR	Unit	SK2100207-026	SK2100207-027	SK2100207-028	SK2100207-029	SK2100207-030
					Result	Result	Result	Result	Result
Dissolved Metals									
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000400 ^{DLDS}	----	----	----	----
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.00100 ^{DLDS}	----	----	----	----
boron, dissolved	7440-42-8	E421	0.010	mg/L	1.83 ^{DLDS}	----	----	----	----
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.000425 ^{DLM}	----	----	----	----
calcium, dissolved	7440-70-2	E421	0.050	mg/L	638 ^{DLDS}	----	----	----	----
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000200 ^{DLDS}	----	----	----	----
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.0100 ^{DLDS}	----	----	----	----
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.872 ^{DLDS}	----	----	----	----
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.0831 ^{DLDS}	----	----	----	----
iron, dissolved	7439-89-6	E421	0.030	mg/L	<0.600 ^{DLDS}	----	----	----	----
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.00100 ^{DLDS}	----	----	----	----
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	<0.0200 ^{DLDS}	----	----	----	----
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	134 ^{DLDS}	----	----	----	----
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	1.06 ^{DLDS}	----	----	----	----
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.789 ^{DLDS}	----	----	----	----
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.0100 ^{DLDS}	----	----	----	----
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<1.00 ^{DLDS}	----	----	----	----
potassium, dissolved	7440-09-7	E421	0.050	mg/L	556 ^{DLDS}	----	----	----	----
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.0343 ^{DLDS}	----	----	----	----
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.0491 ^{DLDS}	----	----	----	----
silicon, dissolved	7440-21-3	E421	0.050	mg/L	4.80 ^{DLDS}	----	----	----	----
silver, dissolved	7440-22-4	E421	0.000010	mg/L	0.0340 ^{DLDS}	----	----	----	----
sodium, dissolved	17341-25-2	E421	0.050	mg/L	7150 ^{DLDS}	----	----	----	----
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	2.02 ^{DLDS}	----	----	----	----
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	4200 ^{DLDS}	----	----	----	----
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00400 ^{DLDS}	----	----	----	----
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000200 ^{DLDS}	----	----	----	----
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00200 ^{DLDS}	----	----	----	----
tin, dissolved	7440-31-5	E421	0.00010	mg/L	0.00229 ^{DLDS}	----	----	----	----
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00600 ^{DLDS}	----	----	----	----
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00200 ^{DLDS}	----	----	----	----



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					01_TSF_W8	02-IF-PAG_W1	02-IF-PAG_W2	02-IF-PAG_W3	03-SED-PAG_W 1
Client sampling date / time					04-Feb-2021 08:50	21-Jan-2021 12:55	28-Jan-2021 13:55	04-Feb-2021 09:10	21-Jan-2021 13:20
Analyte	CAS Number	Method	LOR	Unit	SK2100207-026	SK2100207-027	SK2100207-028	SK2100207-029	SK2100207-030
					Result	Result	Result	Result	Result
Dissolved Metals									
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.00806 ^{DLDS}	----	----	----	----
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.0100 ^{DLDS}	----	----	----	----
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0200 ^{DLDS}	----	----	----	----
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00600 ^{DLDS}	----	----	----	----
dissolved metals filtration location	----	EP421	-	-	Field	----	----	----	----

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

Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					03-SED-PAG_W 2	03-SED-PAG_W 3	04-GAB-NPAG_ W1	04-GAB-NPAG_ W2	----
Client sampling date / time					28-Jan-2021 14:05	04-Feb-2021 09:40	21-Jan-2021 13:30	28-Jan-2021 14:15	----
Analyte	CAS Number	Method	LOR	Unit	SK2100207-031	SK2100207-032	SK2100207-033	SK2100207-034	-----
					Result	Result	Result	Result	----
Anions and Nutrients									
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	49.9 ^{DLDS}	55.8 ^{DLDS}	21.7 ^{DLDS}	32.0 ^{DLDS}	----

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: SK2100207	Page	: 1 of 18
Client	: O'Kane Consultants Inc.	Laboratory	: Saskatoon - Environmental
Contact	: Jared Robertson	Account Manager	: Brian Morgan
Address	: 112 - 112 Research Drive Saskatoon SK Canada S7N 3R3	Address	: 819 58 Street East Saskatoon, Saskatchewan Canada S7K 6X5
Telephone	: 250 420 7010	Telephone	: 1 306 221 7147
Project	: 948-021	Date Samples Received	: 04-Feb-2021 14:45
PO	: ----	Issue Date	: 19-Feb-2021 18:04
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: Q83455		
No. of samples received	: 34		
No. of samples analysed	: 34		

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 Services number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

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

RIGHT SOLUTIONS | RIGHT PARTNER



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 15:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 15:00 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		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 01_TSF_W8	E298	04-Feb-2021	09-Feb-2021	28 days	5 days	✓	09-Feb-2021	22 days	0 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE 10-ROM-SR1_W3	E235.Cl	04-Feb-2021	----	----	----		05-Feb-2021	28 days	0 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE 01_TSF_W8	E235.Cl	04-Feb-2021	----	----	----		05-Feb-2021	28 days	1 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE 10-ROM-SR1_W1	E235.Cl	21-Jan-2021	----	----	----		05-Feb-2021	28 days	14 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE 11-ROM-SR2_W1	E235.Cl	21-Jan-2021	----	----	----		05-Feb-2021	28 days	14 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE 11-ROM-SR2_W3	E235.Cl	04-Feb-2021	----	----	----		06-Feb-2021	28 days	2 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE 10-ROM-SR1_W2	E235.Cl	28-Jan-2021	----	----	----		05-Feb-2021	28 days	7 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Chloride in Water by IC										
HDPE 11-ROM-SR2_W2	E235.Cl	28-Jan-2021	----	----	----		05-Feb-2021	28 days	7 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 10-ROM-SR1_W3	E235.F	04-Feb-2021	----	----	----		05-Feb-2021	28 days	0 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 01_TSF_W8	E235.F	04-Feb-2021	----	----	----		05-Feb-2021	28 days	1 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 10-ROM-SR1_W1	E235.F	21-Jan-2021	----	----	----		05-Feb-2021	28 days	14 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 11-ROM-SR2_W1	E235.F	21-Jan-2021	----	----	----		05-Feb-2021	28 days	14 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 11-ROM-SR2_W3	E235.F	04-Feb-2021	----	----	----		06-Feb-2021	28 days	2 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 10-ROM-SR1_W2	E235.F	28-Jan-2021	----	----	----		05-Feb-2021	28 days	7 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 11-ROM-SR2_W2	E235.F	28-Jan-2021	----	----	----		05-Feb-2021	28 days	7 days	✔
Anions and Nutrients : Nitrate in Water by IC										
HDPE 10-ROM-SR1_W3	E235.NO3	04-Feb-2021	----	----	----		05-Feb-2021	3 days	0 days	✔



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrate in Water by IC											
HDPE 01_TSF_W8	E235.NO3	04-Feb-2021	----	----	----		05-Feb-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 10-ROM-SR1_W1	E235.NO3	21-Jan-2021	----	----	----		05-Feb-2021	3 days	14 days	* EHTR	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 11-ROM-SR2_W1	E235.NO3	21-Jan-2021	----	----	----		05-Feb-2021	3 days	14 days	* EHTR	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 11-ROM-SR2_W3	E235.NO3	04-Feb-2021	----	----	----		06-Feb-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 10-ROM-SR1_W2	E235.NO3	28-Jan-2021	----	----	----		05-Feb-2021	3 days	7 days	* EHTR	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 11-ROM-SR2_W2	E235.NO3	28-Jan-2021	----	----	----		05-Feb-2021	3 days	7 days	* EHTR	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 10-ROM-SR1_W3	E235.NO2	04-Feb-2021	----	----	----		05-Feb-2021	3 days	0 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 01_TSF_W8	E235.NO2	04-Feb-2021	----	----	----		05-Feb-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 10-ROM-SR1_W1	E235.NO2	21-Jan-2021	----	----	----		05-Feb-2021	3 days	14 days	* EHTR	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Nitrite in Water by IC										
HDPE 11-ROM-SR2_W1	E235.NO2	21-Jan-2021	----	----	----		05-Feb-2021	3 days	14 days	* EHTR
Anions and Nutrients : Nitrite in Water by IC										
HDPE 11-ROM-SR2_W3	E235.NO2	04-Feb-2021	----	----	----		06-Feb-2021	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 10-ROM-SR1_W2	E235.NO2	28-Jan-2021	----	----	----		05-Feb-2021	3 days	7 days	* EHTR
Anions and Nutrients : Nitrite in Water by IC										
HDPE 11-ROM-SR2_W2	E235.NO2	28-Jan-2021	----	----	----		05-Feb-2021	3 days	7 days	* EHTR
Anions and Nutrients : Sulfate in Water by IC										
HDPE 04-GAB-NPAG_W3	E235.SO4	04-Feb-2021	----	----	----		05-Feb-2021	28 days	0 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 05-SED-NPAG-W3	E235.SO4	04-Feb-2021	----	----	----		05-Feb-2021	28 days	0 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 06-IF-NPAG_W3	E235.SO4	04-Feb-2021	----	----	----		05-Feb-2021	28 days	0 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 08-SED-PAG-CW_W3	E235.SO4	04-Feb-2021	----	----	----		05-Feb-2021	28 days	0 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 09-FZONE-NPAG_W3	E235.SO4	04-Feb-2021	----	----	----		05-Feb-2021	28 days	0 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Sulfate in Water by IC										
HDPE 10-ROM-SR1_W3	E235.S04	04-Feb-2021	----	----	----		05-Feb-2021	28 days	0 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W7	E235.S04	04-Feb-2021	----	----	----		05-Feb-2021	28 days	1 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W8	E235.S04	04-Feb-2021	----	----	----		05-Feb-2021	28 days	1 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 02-IF-PAG_W3	E235.S04	04-Feb-2021	----	----	----		05-Feb-2021	28 days	1 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 03-SED-PAG_W3	E235.S04	04-Feb-2021	----	----	----		05-Feb-2021	28 days	1 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 07-IF-PAG-CW_W3	E235.S04	04-Feb-2021	----	----	----		05-Feb-2021	28 days	1 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 05-SED-NPAG-W1	E235.S04	21-Jan-2021	----	----	----		05-Feb-2021	28 days	14 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 06-IF-NPAG_W1	E235.S04	21-Jan-2021	----	----	----		05-Feb-2021	28 days	14 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 07-IF-PAG-CW_W1	E235.S04	21-Jan-2021	----	----	----		05-Feb-2021	28 days	14 days	✔



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Sulfate in Water by IC										
HDPE 09-FZONE-NPAG_W1	E235.SO4	21-Jan-2021	----	----	----		05-Feb-2021	28 days	14 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 10-ROM-SR1_W1	E235.SO4	21-Jan-2021	----	----	----		05-Feb-2021	28 days	14 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 11-ROM-SR2_W1	E235.SO4	21-Jan-2021	----	----	----		05-Feb-2021	28 days	14 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W6	E235.SO4	21-Jan-2021	----	----	----		05-Feb-2021	28 days	15 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 02-IF-PAG_W1	E235.SO4	21-Jan-2021	----	----	----		05-Feb-2021	28 days	15 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 03-SED-PAG_W1	E235.SO4	21-Jan-2021	----	----	----		05-Feb-2021	28 days	15 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 04-GAB-NPAG_W1	E235.SO4	21-Jan-2021	----	----	----		05-Feb-2021	28 days	15 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 08-SED-PAG-CW_W1	E235.SO4	21-Jan-2021	----	----	----		05-Feb-2021	28 days	15 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 11-ROM-SR2_W3	E235.SO4	04-Feb-2021	----	----	----		06-Feb-2021	28 days	2 days	✔



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01-TSF_W5	E235.SO4	15-Jan-2021	----	----	----		05-Feb-2021	28 days	21 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 05-SED-NPAG-W2	E235.SO4	28-Jan-2021	----	----	----		05-Feb-2021	28 days	7 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 06-IF-NPAG_W2	E235.SO4	28-Jan-2021	----	----	----		05-Feb-2021	28 days	7 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 07-IF-PAG-CW_W2	E235.SO4	28-Jan-2021	----	----	----		05-Feb-2021	28 days	7 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 09-FZONE-NPAG_W2	E235.SO4	28-Jan-2021	----	----	----		05-Feb-2021	28 days	7 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 10-ROM-SR1_W2	E235.SO4	28-Jan-2021	----	----	----		05-Feb-2021	28 days	7 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 11-ROM-SR2_W2	E235.SO4	28-Jan-2021	----	----	----		05-Feb-2021	28 days	7 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 02-IF-PAG_W2	E235.SO4	28-Jan-2021	----	----	----		05-Feb-2021	28 days	8 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 03-SED-PAG_W2	E235.SO4	28-Jan-2021	----	----	----		05-Feb-2021	28 days	8 days	✔



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Sulfate in Water by IC										
HDPE 04-GAB-NPAG_W2	E235.SO4	28-Jan-2021	----	----	----		05-Feb-2021	28 days	8 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 08-SED-PAG-CW_W2	E235.SO4	28-Jan-2021	----	----	----		05-Feb-2021	28 days	8 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) 01_TSF_W8	E318	04-Feb-2021	11-Feb-2021	28 days	6 days	✓	11-Feb-2021	21 days	0 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)										
Amber glass total (sulfuric acid) 01_TSF_W8	E372-U	04-Feb-2021	09-Feb-2021	28 days	5 days	✓	09-Feb-2021	22 days	0 days	✓
Cyanides : Total Cyanide by CFA										
HDPE - total (sodium hydroxide) 01_TSF_W8	E333	04-Feb-2021	----	----	----		19-Feb-2021	14 days	15 days	* EHT
Cyanides : WAD Cyanide by CFA										
HDPE - total (sodium hydroxide) 01_TSF_W8	E336	04-Feb-2021	----	----	----		19-Feb-2021	14 days	15 days	* EHT
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 10-ROM-SR1_W2	E421	28-Jan-2021	08-Feb-2021	180 days	11 days	✓	09-Feb-2021	168 days	1 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 11-ROM-SR2_W2	E421	28-Jan-2021	08-Feb-2021	180 days	11 days	✓	09-Feb-2021	168 days	1 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 10-ROM-SR1_W1	E421	21-Jan-2021	08-Feb-2021	180 days	18 days	✓	09-Feb-2021	161 days	1 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 11-ROM-SR2_W1	E421	21-Jan-2021	08-Feb-2021	180 days	18 days	✓	09-Feb-2021	161 days	1 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 01_TSF_W8	E421	04-Feb-2021	08-Feb-2021	180 days	4 days	✓	09-Feb-2021	175 days	1 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 10-ROM-SR1_W3	E421	04-Feb-2021	08-Feb-2021	180 days	4 days	✓	09-Feb-2021	175 days	1 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 11-ROM-SR2_W3	E421	04-Feb-2021	08-Feb-2021	180 days	4 days	✓	09-Feb-2021	175 days	1 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 01_TSF_W8	E290	04-Feb-2021	----	----	----		05-Feb-2021	14 days	1 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 10-ROM-SR1_W3	E290	04-Feb-2021	----	----	----		05-Feb-2021	14 days	1 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 11-ROM-SR2_W3	E290	04-Feb-2021	----	----	----		05-Feb-2021	14 days	1 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 10-ROM-SR1_W1	E290	21-Jan-2021	----	----	----		05-Feb-2021	14 days	15 days	* EHTL	
Physical Tests : Alkalinity Species by Titration											
HDPE 11-ROM-SR2_W1	E290	21-Jan-2021	----	----	----		05-Feb-2021	14 days	15 days	* EHTL	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Alkalinity Species by Titration										
HDPE 10-ROM-SR1_W2	E290	28-Jan-2021	----	----	----		05-Feb-2021	14 days	8 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 11-ROM-SR2_W2	E290	28-Jan-2021	----	----	----		05-Feb-2021	14 days	8 days	✓
Physical Tests : Conductivity in Water										
HDPE 01_TSF_W8	E100	04-Feb-2021	----	----	----		05-Feb-2021	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 10-ROM-SR1_W3	E100	04-Feb-2021	----	----	----		05-Feb-2021	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 11-ROM-SR2_W3	E100	04-Feb-2021	----	----	----		05-Feb-2021	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 10-ROM-SR1_W1	E100	21-Jan-2021	----	----	----		05-Feb-2021	28 days	15 days	✓
Physical Tests : Conductivity in Water										
HDPE 11-ROM-SR2_W1	E100	21-Jan-2021	----	----	----		05-Feb-2021	28 days	15 days	✓
Physical Tests : Conductivity in Water										
HDPE 10-ROM-SR1_W2	E100	28-Jan-2021	----	----	----		05-Feb-2021	28 days	8 days	✓
Physical Tests : Conductivity in Water										
HDPE 11-ROM-SR2_W2	E100	28-Jan-2021	----	----	----		05-Feb-2021	28 days	8 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : pH by Meter										
HDPE 10-ROM-SR1_W2	E108	28-Jan-2021	----	----	----		05-Feb-2021	0.25 hrs	192 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 11-ROM-SR2_W2	E108	28-Jan-2021	----	----	----		05-Feb-2021	0.25 hrs	192 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 10-ROM-SR1_W3	E108	04-Feb-2021	----	----	----		05-Feb-2021	0.25 hrs	28 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 11-ROM-SR2_W3	E108	04-Feb-2021	----	----	----		05-Feb-2021	0.25 hrs	28 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 01_TSF_W8	E108	04-Feb-2021	----	----	----		05-Feb-2021	0.25 hrs	31 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 11-ROM-SR2_W1	E108	21-Jan-2021	----	----	----		05-Feb-2021	0.25 hrs	360 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 10-ROM-SR1_W1	E108	21-Jan-2021	----	----	----		05-Feb-2021	0.25 hrs	361 hrs	* EHTR-FM

Legend & Qualifier Definitions

- EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
- EHTR: Exceeded ALS recommended hold time prior to sample receipt.
- EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
- EHT: Exceeded ALS recommended hold time prior to analysis.
- Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

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

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	148610	1	9	11.1	5.0	✓
Ammonia by Fluorescence	E298	149662	1	13	7.6	5.0	✓
Chloride in Water by IC	E235.Cl	148392	1	7	14.2	5.0	✓
Conductivity in Water	E100	148609	1	9	11.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	149295	1	7	14.2	5.0	✓
Fluoride in Water by IC	E235.F	148390	1	7	14.2	5.0	✓
Nitrate in Water by IC	E235.NO3	148393	1	7	14.2	5.0	✓
Nitrite in Water by IC	E235.NO2	148391	1	7	14.2	5.0	✓
pH by Meter	E108	148608	1	10	10.0	5.0	✓
Sulfate in Water by IC	E235.SO4	148389	2	36	5.5	5.0	✓
Total Cyanide by CFA	E333	152887	1	1	100.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	149889	1	3	33.3	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	149339	1	4	25.0	5.0	✓
WAD Cyanide by CFA	E336	152886	1	1	100.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	148610	1	9	11.1	5.0	✓
Ammonia by Fluorescence	E298	149662	1	13	7.6	5.0	✓
Chloride in Water by IC	E235.Cl	148392	1	7	14.2	5.0	✓
Conductivity in Water	E100	148609	1	9	11.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	149295	1	7	14.2	5.0	✓
Fluoride in Water by IC	E235.F	148390	1	7	14.2	5.0	✓
Nitrate in Water by IC	E235.NO3	148393	1	7	14.2	5.0	✓
Nitrite in Water by IC	E235.NO2	148391	1	7	14.2	5.0	✓
pH by Meter	E108	148608	1	10	10.0	5.0	✓
Sulfate in Water by IC	E235.SO4	148389	2	36	5.5	5.0	✓
Total Cyanide by CFA	E333	152887	1	1	100.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	149889	1	3	33.3	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	149339	1	4	25.0	5.0	✓
WAD Cyanide by CFA	E336	152886	1	1	100.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	148610	1	9	11.1	5.0	✓
Ammonia by Fluorescence	E298	149662	1	13	7.6	5.0	✓
Chloride in Water by IC	E235.Cl	148392	1	7	14.2	5.0	✓
Conductivity in Water	E100	148609	1	9	11.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	149295	1	7	14.2	5.0	✓
Fluoride in Water by IC	E235.F	148390	1	7	14.2	5.0	✓
Nitrate in Water by IC	E235.NO3	148393	1	7	14.2	5.0	✓



Matrix: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
<i>Analytical Methods</i>							
Method Blanks (MB) - Continued							
Nitrite in Water by IC	E235.NO2	148391	1	7	14.2	5.0	✔
Sulfate in Water by IC	E235.SO4	148389	2	36	5.5	5.0	✔
Total Cyanide by CFA	E333	152887	1	1	100.0	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	149889	1	3	33.3	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	149339	1	4	25.0	5.0	✔
WAD Cyanide by CFA	E336	152886	1	1	100.0	5.0	✔
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	149662	1	13	7.6	5.0	✔
Chloride in Water by IC	E235.Cl	148392	1	7	14.2	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	149295	1	7	14.2	5.0	✔
Fluoride in Water by IC	E235.F	148390	1	7	14.2	5.0	✔
Nitrate in Water by IC	E235.NO3	148393	1	7	14.2	5.0	✔
Nitrite in Water by IC	E235.NO2	148391	1	7	14.2	5.0	✔
Sulfate in Water by IC	E235.SO4	148389	2	36	5.5	5.0	✔
Total Cyanide by CFA	E333	152887	0	1	0.0	5.0	✖
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	149889	1	3	33.3	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	149339	1	4	25.0	5.0	✔
WAD Cyanide by CFA	E336	152886	0	1	0.0	5.0	✖



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Saskatoon - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Saskatoon - 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.
Chloride in Water by IC	E235.Cl Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Saskatoon - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Total Kjeldahl Nitrogen is determined using block digestion followed by flow-injection analysis with fluorescence detection.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Cyanide by CFA	E333 Vancouver - Environmental	Water	ISO 14403 (mod)	Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.
WAD Cyanide by CFA	E336 Vancouver - Environmental	Water	APHA 4500-CN I (mod)	Weak Acid Dissociable (WAD) cyanide is determined by in-line sample distillation with final determination by colourimetric analysis.
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Metals in Water by CRC ICPMS	E421 Saskatoon - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Hardness (Calculated)	EC100 Saskatoon - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Ion Balance using Dissolved Metals	EC101 Saskatoon - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
TDS in Water (Calculation)	EC103 Saskatoon - Environmental	Water	APHA 1030E (mod)	Total Dissolved Solids is calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Saskatoon - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested using block digestion with Copper Sulfate Digestion Reagent.
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Dissolved Metals Water Filtration	EP421 Saskatoon - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.



QUALITY CONTROL REPORT

Work Order : **SK2100207**

Page : 1 of 11

Client : O'Kane Consultants Inc.
 Contact : Jared Robertson
 Address : 112 - 112 Research Drive
 Saskatoon SK Canada S7N 3R3
 Telephone : 250 420 7010
 Project : 948-021
 PO : ----
 C-O-C number : ----
 Sampler : ----
 Site : ----
 Quote number : Q83455
 No. of samples received : 34
 No. of samples analysed : 34

Laboratory : Saskatoon - Environmental
 Account Manager : Brian Morgan
 Address : 819 58 Street East
 Saskatoon, Saskatchewan Canada S7K 6X5
 Telephone : 1 306 221 7147
 Date Samples Received : 04-Feb-2021 14:45
 Date Analysis Commenced : 05-Feb-2021
 Issue Date : 19-Feb-2021 18:05

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 Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Colby Bingham	Quality Systems Coordinator	Inorganics, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Jorden Fanson	Analyst	Inorganics, Calgary, Alberta
Lian Nesbitt	Laboratory Analyst	Metals, Saskatoon, Saskatchewan
Melissa Houseman	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Melissa Houseman	Team Leader - Inorganics	Metals, Saskatoon, Saskatchewan
Naeun Kim	Analyst	Inorganics, Calgary, Alberta
Rebecca Baker	Analyst	Inorganics, Calgary, Alberta
Tracy Harley	Supervisor - Water Quality Instrumentation	Inorganics, Burnaby, British Columbia

Page : 2 of 11
Work Order : SK2100207
Client : O'Kane Consultants Inc.
Project : 948-021



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 Services number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

= Indicates a QC result that did not meet the ALS DQO.



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: 148608)											
SK2100211-001	Anonymous	pH	----	E108	0.10	pH units	6.67	6.68	0.174%	3%	----
Physical Tests (QC Lot: 148609)											
SK2100211-001	Anonymous	conductivity	----	E100	2.0	µS/cm	39.3	42.3	7.35%	10%	----
Physical Tests (QC Lot: 148610)											
SK2100211-001	Anonymous	alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	10.7	10.6	0.10	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 148389)											
SK2100207-005	10-ROM-SR1_W1	sulfate (as SO4)	14808-79-8	E235.SO4	6.00	mg/L	347	349	0.532%	20%	----
Anions and Nutrients (QC Lot: 148390)											
SK2100207-005	10-ROM-SR1_W1	fluoride	16984-48-8	E235.F	0.400	mg/L	<0.400	<0.400	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 148391)											
SK2100207-005	10-ROM-SR1_W1	nitrite (as N)	14797-65-0	E235.NO2	0.200	mg/L	<0.200	<0.200	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 148392)											
SK2100207-005	10-ROM-SR1_W1	chloride	16887-00-6	E235.Cl	10.0	mg/L	1210	1220	0.937%	20%	----
Anions and Nutrients (QC Lot: 148393)											
SK2100207-005	10-ROM-SR1_W1	nitrate (as N)	14797-55-8	E235.NO3	0.400	mg/L	99.5	100	0.790%	20%	----
Anions and Nutrients (QC Lot: 148627)											
SK2100211-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	1.20	1.20	0.0008	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 149339)											
SK2100195-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0040	mg/L	0.168	0.168	0.186%	20%	----
Anions and Nutrients (QC Lot: 149662)											
RG2100015-004	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.203	0.195	4.17%	20%	----
Anions and Nutrients (QC Lot: 149889)											
SK2100195-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	1.16	1.54	0.389	Diff <2x LOR	----
Cyanides (QC Lot: 152886)											
SK2100207-026	01_TSF_W8	cyanide, weak acid dissociable	----	E336	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
Cyanides (QC Lot: 152887)											
SK2100207-026	01_TSF_W8	cyanide, strong acid dissociable (total)	----	E333	0.100	mg/L	1.32	1.32	0.193%	20%	----
Dissolved Metals (QC Lot: 149295)											
SK2100207-005	10-ROM-SR1_W1	aluminum, dissolved	7429-90-5	E421	0.0020	mg/L	0.0143	0.0155	0.0012	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00020	mg/L	0.00100	0.00100	0.0000004	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00020	mg/L	0.0234	0.0229	1.77%	20%	----



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
Dissolved Metals (QC Lot: 149295) - continued											
SK2100207-005	10-ROM-SR1_W1	barium, dissolved	7440-39-3	E421	0.00020	mg/L	0.221	0.224	1.30%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000040	mg/L	<0.000040	<0.000040	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.020	mg/L	1.22	1.24	1.97%	20%	----
		cadmium, dissolved	7440-43-9	E421	0.0000100	mg/L	0.000101	0.0000843	0.0000171	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.100	mg/L	151	153	1.70%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000020	mg/L	0.000236	0.000232	1.74%	20%	----
		chromium, dissolved	7440-47-3	E421	0.00100	mg/L	0.0188	0.0192	1.93%	20%	----
		cobalt, dissolved	7440-48-4	E421	0.00020	mg/L	0.00057	0.00057	0.0000007	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00040	mg/L	0.0226	0.0227	0.786%	20%	----
		iron, dissolved	7439-89-6	E421	0.060	mg/L	<0.060	<0.060	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000100	mg/L	0.000152	0.000145	0.000007	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0020	mg/L	0.0219	0.0232	5.55%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.0100	mg/L	78.8	79.6	1.07%	20%	----
		manganese, dissolved	7439-96-5	E421	0.0100	mg/L	0.0110	0.0112	0.00013	Diff <2x LOR	----
		molybdenum, dissolved	7439-98-7	E421	0.000100	mg/L	0.0144	0.0148	2.57%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00100	mg/L	0.00258	0.00259	0.00002	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.100	mg/L	35.1	36.0	2.43%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00040	mg/L	0.0241	0.0240	0.356%	20%	----
		selenium, dissolved	7782-49-2	E421	0.000100	mg/L	0.00763	0.00749	1.96%	20%	----
		silicon, dissolved	7440-21-3	E421	0.100	mg/L	3.08	3.11	0.960%	20%	----
		silver, dissolved	7440-22-4	E421	0.000020	mg/L	0.000032	0.000030	0.000002	Diff <2x LOR	----
		sodium, dissolved	17341-25-2	E421	0.100	mg/L	810	832	2.59%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00040	mg/L	1.23	1.26	2.25%	20%	----
		sulfur, dissolved	7704-34-9	E421	1.00	mg/L	135	137	1.36%	20%	----
		tellurium, dissolved	13494-80-9	E421	0.00040	mg/L	<0.00040	<0.00040	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000020	mg/L	0.000035	0.000031	0.000004	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00020	mg/L	0.0246	0.0246	0.0137%	20%	----
		titanium, dissolved	7440-32-6	E421	0.00060	mg/L	<0.00060	<0.00060	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00020	mg/L	0.00030	0.00028	0.00002	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000020	mg/L	0.00620	0.00602	2.97%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0020	mg/L	0.0066	0.0067	0.0001	Diff <2x LOR	----

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 Work Order : SK2100207
 Client : O'Kane Consultants Inc.
 Project : 948-021



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	<i>Original Result</i>	<i>Duplicate Result</i>	<i>RPD(%) or Difference</i>	<i>Duplicate Limits</i>	<i>Qualifier</i>
Dissolved Metals (QC Lot: 149295) - continued											
SK2100207-005	10-ROM-SR1_W1	zirconium, dissolved	7440-67-7	E421	0.00060	mg/L	<0.00060	<0.00060	0	Diff <2x LOR	----



Method Blank (MB) Report

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

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 148609)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 148610)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Anions and Nutrients (QCLot: 148389)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 148390)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 148391)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 148392)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 148393)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 148627)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 149339)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 149662)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 149889)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Cyanides (QCLot: 152886)						
cyanide, weak acid dissociable	----	E336	0.002	mg/L	<0.0020	----
Cyanides (QCLot: 152887)						
cyanide, strong acid dissociable (total)	----	E333	0.002	mg/L	<0.0020	----
Dissolved Metals (QCLot: 149295)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 149295) - continued						
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	17341-25-2	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----



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 Concentration	Recovery (%) LCS	Recovery Limits (%)		Qualifier
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 148608)									
pH	----	E108	----	pH units	6.86 pH units	99.4	98.0	102	----
Physical Tests (QCLot: 148609)									
conductivity	----	E100	1	µS/cm	1000 µS/cm	98.9	90.0	110	----
Physical Tests (QCLot: 148610)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	99.3	85.0	115	----
Anions and Nutrients (QCLot: 148389)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 148390)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 148391)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 148392)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 148393)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 148627)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 149339)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.32 mg/L	102	80.0	120	----
Anions and Nutrients (QCLot: 149662)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.1 mg/L	98.8	85.0	115	----
Anions and Nutrients (QCLot: 149889)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	82.3	75.0	125	----
Cyanides (QCLot: 152886)									
cyanide, weak acid dissociable	----	E336	0.002	mg/L	0.125 mg/L	97.7	80.0	120	----
Cyanides (QCLot: 152887)									
cyanide, strong acid dissociable (total)	----	E333	0.002	mg/L	0.25 mg/L	89.3	80.0	120	----
Dissolved Metals (QCLot: 149295)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	101	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	101	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	105	80.0	120	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Dissolved Metals (QCLot: 149295) - continued									
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	96.2	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	106	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	96.4	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	98.6	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	102	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	99.6	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	103	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	99.2	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	101	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	102	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	103	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	98.0	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	105	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	99.2	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	100	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	103	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	100	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	116	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	103	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	105	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	106	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	101	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	105	80.0	120	----
sodium, dissolved	17341-25-2	E421	0.05	mg/L	50 mg/L	104	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	105	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	109	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	113	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	96.1	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	94.9	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	101	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	98.4	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	93.9	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	99.9	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	102	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	106	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	103	80.0	120	----



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: 148389)										
SK2100207-010	11-ROM-SR2_W3	sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	90.0	110	MS-B
Anions and Nutrients (QCLot: 148390)										
SK2100207-010	11-ROM-SR2_W3	fluoride	16984-48-8	E235.F	1.18 mg/L	1 mg/L	118	75.0	125	----
Anions and Nutrients (QCLot: 148391)										
SK2100207-010	11-ROM-SR2_W3	nitrite (as N)	14797-65-0	E235.NO2	0.526 mg/L	0.5 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 148392)										
SK2100207-010	11-ROM-SR2_W3	chloride	16887-00-6	E235.Cl	ND mg/L	100 mg/L	ND	75.0	125	MS-B
Anions and Nutrients (QCLot: 148393)										
SK2100207-010	11-ROM-SR2_W3	nitrate (as N)	14797-55-8	E235.NO3	ND mg/L	2.5 mg/L	ND	75.0	125	MS-B
Anions and Nutrients (QCLot: 148627)										
SK2100211-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	103 mg/L	100 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 149339)										
SK2100195-001	Anonymous	phosphorus, total	7723-14-0	E372-U	ND mg/L	0.0676 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 149662)										
RG2100015-005	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 149889)										
SK2100195-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	1.85 mg/L	2.5 mg/L	74.2	70.0	130	----
Dissolved Metals (QCLot: 149295)										
SK2100207-006	10-ROM-SR1_W2	aluminum, dissolved	7429-90-5	E421	0.225 mg/L	0.2 mg/L	112	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0192 mg/L	0.02 mg/L	96.2	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	ND mg/L	0.02 mg/L	ND	70.0	130	MS-B
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	MS-B
		beryllium, dissolved	7440-41-7	E421	0.0430 mg/L	0.04 mg/L	107	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00840 mg/L	0.01 mg/L	84.0	70.0	130	----
		boron, dissolved	7440-42-8	E421	ND mg/L	0.1 mg/L	ND	70.0	130	MS-B
		cadmium, dissolved	7440-43-9	E421	0.00365 mg/L	0.004 mg/L	91.2	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	MS-B
		cesium, dissolved	7440-46-2	E421	0.00959 mg/L	0.01 mg/L	95.9	70.0	130	----



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
Dissolved Metals (QCLot: 149295) - continued										
SK2100207-006	10-ROM-SR1_W2	chromium, dissolved	7440-47-3	E421	0.0423 mg/L	0.04 mg/L	106	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0198 mg/L	0.02 mg/L	98.8	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0182 mg/L	0.02 mg/L	90.9	70.0	130	----
		iron, dissolved	7439-89-6	E421	2.01 mg/L	2 mg/L	100	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0170 mg/L	0.02 mg/L	85.1	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.110 mg/L	0.1 mg/L	110	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	MS-B
		manganese, dissolved	7439-96-5	E421	0.0198 mg/L	0.02 mg/L	99.0	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0204 mg/L	0.02 mg/L	102	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0386 mg/L	0.04 mg/L	96.6	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	11.8 mg/L	10 mg/L	118	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	MS-B
		rubidium, dissolved	7440-17-7	E421	ND mg/L	0.02 mg/L	ND	70.0	130	MS-B
		selenium, dissolved	7782-49-2	E421	0.0400 mg/L	0.04 mg/L	100.0	70.0	130	----
		silicon, dissolved	7440-21-3	E421	11.3 mg/L	10 mg/L	113	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00365 mg/L	0.004 mg/L	91.3	70.0	130	----
		sodium, dissolved	17341-25-2	E421	ND mg/L	2 mg/L	ND	70.0	130	MS-B
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	MS-B
		sulfur, dissolved	7704-34-9	E421	ND mg/L	20 mg/L	ND	70.0	130	MS-B
		tellurium, dissolved	13494-80-9	E421	0.0362 mg/L	0.04 mg/L	90.5	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00338 mg/L	0.004 mg/L	84.6	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0191 mg/L	0.02 mg/L	95.6	70.0	130	----
		tin, dissolved	7440-31-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	MS-B
		titanium, dissolved	7440-32-6	E421	0.0457 mg/L	0.04 mg/L	114	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0190 mg/L	0.02 mg/L	95.2	70.0	130	----
		uranium, dissolved	7440-61-1	E421	ND mg/L	0.004 mg/L	ND	70.0	130	MS-B
		vanadium, dissolved	7440-62-2	E421	0.110 mg/L	0.1 mg/L	110	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.365 mg/L	0.4 mg/L	91.2	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0424 mg/L	0.04 mg/L	106	70.0	130	----

Qualifiers

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



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Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17

Page

Environmental Division
Saskatoon
Work Order Reference
SK2100207



Telephone : + 1 306 668 8370

Report To Contact and company name below will appear on the final report		Report Format / Distribution			Select Service Level Below - Contact your AM to cor													
Company:	Okane Consultants	Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL)			Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - t													
Contact:	Jared Robertson	Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			PRIORITY (Business Days)		4 day [P4-20%] <input type="checkbox"/>		EMERGENCY		1 Business da							
Phone:	1 (306) 713-1695	<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked			3 day [P3-25%] <input type="checkbox"/>		2 day [P2-50%] <input type="checkbox"/>		Same Day, We		(Laboratory of							
Company address below will appear on the final report		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			Date and Time Required for all E&P TATs:													
Street:	112-112 Research Drive	Email 1 or Fax jrobertson@oko-sk.com			For tests that can not be performed according to the service level selected,													
City/Province:	Saskatoon, SK	Email 2			Analysis Request													
Postal Code:	S7N 3R3	Email 3			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below													
Invoice To		Invoice Distribution			NUMBER OF CONTAINERS													
Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			SUSPECTED HAZARD (see Special Instructions)													
Copy of Invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Email 1 or Fax jrobertson@oko-sk.com			SAMPLES ON HOLD													
Company:		Email 2																
Contact:																		
Project Information		Oil and Gas Required Fields (client use)																
ALS Account # / Quote #: Q83455		AFE/Cost Center: PO#																
Job #: 948-021		Major/Minor Code: Routing Code:																
PO / AFE:		Requisitioner:																
LSD:		Location:																
ALS Lab Work Order # (lab use only):		ALS Contact:																
		Sampler:																
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	BR-IC-N-CL	MET-D-CCMS-SK	ROU-F-SK	SO4-IC-N-CL	CN-T-CFA-VA	CN-WAD-CFA-VA	NH3-TKN-PT							
01_TSF_W5		15-Jan-21	9:30	Leachate	1			R									Y	
01_TSF_W6		21-Jan-21	12:45	Leachate	1			R									Y	
01_TSF_W7		28-Jan-21	13:30	Leachate	1			R									Y	
01_TSF_W8		4-Feb-21	8:50	Leachate	4		R	R		R	R	R					Y	
02-IF-PAG_W1		21-Jan-21	12:55	Leachate	1			R									Y	
02-IF-PAG_W2		28-Jan-21	13:55	Leachate	1			R									Y	
02-IF-PAG_W3		4-Feb-21	9:10	Leachate	1			R									Y	
03-SED-PAG_W1		21-Jan-21	13:20	Leachate	1			R									Y	
03-SED-PAG_W2		28-Jan-21	14:05	Leachate	1			R									Y	
03-SED-PAG_W3		4-Feb-21	9:40	Leachate	1			R									Y	
04-GAB-NPAG_W1		21-Jan-21	13:30	Leachate	1			R									Y	
04-GAB-NPAG_W2		28-Jan-21	14:15	Leachate	1			R									Y	
Drinking Water (DW) Samples¹ (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)			SAMPLE CONDITION AS RECEIVED (lab use only)													
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Suspected hazards: elevated metals, potential for low levels of cyanide			Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>													
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					Ice Packs <input type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>													
		Cooling Initiated <input type="checkbox"/>																
		INITIAL COOLER TEMPERATURES °C					FINAL COOLER TEMPERATURES °C											
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)					FINAL SHIPMENT RECEPTION (lab use only)											
Released by: Jared Robertson	Date: February 4, 2021	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:							

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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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 : **SK2100266**
Client : **O'Kane Consultants Inc.**
Contact : Jared Robertson
Address : 112 - 112 Research Drive
Saskatoon SK Canada S7N 3R3
Telephone : 250 420 7010
Project : ----
PO : ----
C-O-C number : ----
Sampler : Client
Site : ----
Quote number : Q83455
No. of samples received : 11
No. of samples analysed : 11

Page : 1 of 11
Laboratory : Saskatoon - Environmental
Account Manager : Brian Morgan
Address : 819 58 Street East
Saskatoon SK Canada S7K 6X5
Telephone : 1 306 221 7147
Date Samples Received : 12-Feb-2021 11:45
Date Analysis Commenced : 12-Feb-2021
Issue Date : 22-Feb-2021 11:17

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Colby Bingham	Quality Systems Coordinator	Inorganics, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Jorden Fanson	Analyst	Inorganics, Calgary, Alberta
Katrina Chudyk	Laboratory Analyst	Inorganics, Saskatoon, Saskatchewan
Lian Nesbitt	Laboratory Analyst	Metals, Saskatoon, Saskatchewan
Melissa Houseman	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Melissa Houseman	Team Leader - Inorganics	Metals, Saskatoon, Saskatchewan
Naeun Kim	Analyst	Inorganics, Calgary, Alberta
Rebecca Baker	Analyst	Inorganics, Calgary, Alberta



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).

<i>Unit</i>	<i>Description</i>
-	No Unit
%	percent
µS/cm	Microsiemens per centimetre
meq/L	milliequivalents per litre
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 in reports identified as "Preliminary Report" are considered authorized for use.

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLCI	Detection Limit Raised: Chromatographic interference due to co-elution.
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
IB:INT	Ion Balance Reviewed: Imbalance is due to interference or non-measured component.



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					01_TSF_W9	02-IF-PAG_W4	03-SED-PAG_W 4	04-GAB-NPAG_ W4	05-SED-NPAG_ W4
Client sampling date / time					11-Feb-2021 14:25	11-Feb-2021 14:35	11-Feb-2021 15:15	11-Feb-2021 15:35	11-Feb-2021 16:05
Analyte	CAS Number	Method	LOR	Unit	SK2100266-001	SK2100266-002	SK2100266-003	SK2100266-004	SK2100266-005
					Result	Result	Result	Result	Result
Physical Tests									
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	----	86.3	103	47.1	83.0
conductivity	----	E100	2.0	µS/cm	----	1840	1770	1600	1480
pH	----	E108	0.10	pH units	----	7.96	7.92	8.11	7.99
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	162	145	192	158
bicarbonate	71-52-3	E290	1.0	mg/L	----	197	177	234	193
carbonate	3812-32-6	E290	1.0	mg/L	----	<1.0	<1.0	<1.0	<1.0
hydroxide	14280-30-9	E290	1.0	mg/L	----	<1.0	<1.0	<1.0	<1.0
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	1040	983	890	809
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	0.0947	0.0409	0.142	0.0792
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	<0.0020	<0.0020	<0.0020	<0.0020
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	0.596	0.411	0.594	0.430
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	393 ^{DLDS}	414 ^{DLDS}	345 ^{DLDS}	320 ^{DLDS}
fluoride	16984-48-8	E235.F	0.020	mg/L	----	0.375 ^{DLDS}	0.477 ^{DLDS}	0.462 ^{DLDS}	0.596 ^{DLDS}
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	0.243 ^{DLDS}	<0.100 ^{DLDS}	<0.100 ^{DLDS}	<0.040 ^{DLDS}
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	<0.050 ^{DLDS}	<0.050 ^{DLDS}	<0.050 ^{DLDS}	<0.020 ^{DLDS}
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	6020 ^{DLDS}	122 ^{DLDS}	69.6 ^{DLDS}	44.7 ^{DLDS}	44.2 ^{DLDS}
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	0.243	<0.112	<0.112	<0.0500
Ion Balance									
anion sum	----	EC101	0.10	meq/L	----	16.9	16.0	14.5	13.1
cation sum	----	EC101	0.10	meq/L	----	18.5	17.9	16.5	15.1
ion balance (cation-anion difference)	----	EC101	0.010	%	----	4.52	5.60 ^{IB:INT}	6.45 ^{IB:INT}	7.09 ^{IB:INT}
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	109	112	114	115
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	0.0104	0.0211	0.0433	0.0325
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	0.00462	0.00238	0.00305	0.00253
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	0.00154	0.00257	0.00868	0.0431
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	0.0493	0.0345	0.0289	0.0391
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	<0.000020	<0.000020	<0.000020	<0.000020
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	<0.000050	<0.000050	<0.000050	<0.000050



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					01_TSF_W9	02-IF-PAG_W4	03-SED-PAG_W4	04-GAB-NPAG_W4	05-SED-NPAG_W4
					11-Feb-2021 14:25	11-Feb-2021 14:35	11-Feb-2021 15:15	11-Feb-2021 15:35	11-Feb-2021 16:05
Analyte	CAS Number	Method	LOR	Unit	SK2100266-001	SK2100266-002	SK2100266-003	SK2100266-004	SK2100266-005
					Result	Result	Result	Result	Result
Dissolved Metals									
boron, dissolved	7440-42-8	E421	0.010	mg/L	----	0.118	0.064	0.115	0.093
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	----	0.0000132	<0.0000500 ^{DLM}	0.0000056	<0.0000500 ^{DLM}
calcium, dissolved	7440-70-2	E421	0.050	mg/L	----	18.6	21.3	10.6	16.8
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	----	0.000202	0.000080	0.000444	0.000138
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	----	0.00940	0.00955	0.0101	0.00887
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	----	0.00026	0.00036	0.00063	0.00072
copper, dissolved	7440-50-8	E421	0.00020	mg/L	----	0.00492	0.00338	0.00604	0.00377
iron, dissolved	7439-89-6	E421	0.030	mg/L	----	<0.030	<0.030	<0.030	<0.030
lead, dissolved	7439-92-1	E421	0.000050	mg/L	----	<0.000050	<0.000050	<0.000050	<0.000050
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	----	0.0110	0.0152	0.0145	0.0132
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	----	9.69	12.0	5.01	9.98
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	----	0.00852	0.00861	0.0122	0.0144
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	----	0.0109	0.0853	0.0167	0.0280
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	----	0.00259	0.00216	0.00460	0.00481
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	----	<0.050	<0.050	<0.050	<0.050
potassium, dissolved	7440-09-7	E421	0.050	mg/L	----	12.3	14.1	9.51	16.9
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	----	0.0206	0.00708	0.0101	0.0107
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	----	0.00526	0.00683	0.00637	0.00445
silicon, dissolved	7440-21-3	E421	0.050	mg/L	----	3.26	2.76	2.55	2.83
silver, dissolved	7440-22-4	E421	0.000010	mg/L	----	<0.000010	<0.000010	0.000010	<0.000010
sodium, dissolved	17341-25-2	E421	0.050	mg/L	----	379	357	352	298
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	----	0.158	0.132	0.0531	0.124
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	----	47.5	27.7	18.0	18.2
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	----	<0.00020	<0.00020	<0.00020	<0.00020
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	----	0.000015	0.000020	0.000039	0.000022
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	----	<0.00010	<0.00010	<0.00010	<0.00010
tin, dissolved	7440-31-5	E421	0.00010	mg/L	----	0.00996	0.00424	0.00330	0.00830
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	----	<0.00030	<0.00030	0.00040	<0.00030
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	----	0.00553	0.00090	0.00400	0.00278
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	----	0.0163	0.00510	0.0166	0.00869
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	----	<0.00050	<0.00050	0.00577	0.00131



Analytical Results

Sub-Matrix: Leachate

(Matrix: Water)

					Client sample ID	01_TSF_W9	02-IF-PAG_W4	03-SED-PAG_W4	04-GAB-NPAG_W4	05-SED-NPAG_W4
					Client sampling date / time	11-Feb-2021 14:25	11-Feb-2021 14:35	11-Feb-2021 15:15	11-Feb-2021 15:35	11-Feb-2021 16:05
Analyte	CAS Number	Method	LOR	Unit	SK2100266-001	SK2100266-002	SK2100266-003	SK2100266-004	SK2100266-005	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	0.0248	0.0146	0.0279	0.0320	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	<0.00030	<0.00030	<0.00030	<0.00030	
dissolved metals filtration location	----	EP421	-	-	----	Field	Field	Field	Field	

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



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					06-IF-NPAG_W4	07-IF-PAG-CW_W4	08-SED-PAG-C_W_W4	09-FZONE-NPA_G_W4	10-ROM-SR1_W4
Client sampling date / time					11-Feb-2021 16:15	11-Feb-2021 16:25	11-Feb-2021 16:35	11-Feb-2021 16:50	11-Feb-2021 17:10
Analyte	CAS Number	Method	LOR	Unit	SK2100266-006	SK2100266-007	SK2100266-008	SK2100266-009	SK2100266-010
					Result	Result	Result	Result	Result
Physical Tests									
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	101	10500	11500	119	212
conductivity	----	E100	2.0	µS/cm	1420	60300	64600	1600	1460
pH	----	E108	0.10	pH units	7.97	7.38	7.31	8.03	7.71
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	151	97.1	75.3	165	82.2
bicarbonate	71-52-3	E290	1.0	mg/L	185	118	91.9	202	100
carbonate	3812-32-6	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
hydroxide	14280-30-9	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	787	45500	49200	868	873
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0124	2.13 ^{DLM}	2.19 ^{DLM}	0.0105	3.10 ^{DLM}
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	0.0112	0.0047	0.0048	<0.0020
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	0.383	2.79 ^{DLM}	2.64 ^{DLM}	0.363	2.76 ^{DLM}
chloride	16887-00-6	E235.Cl	0.50	mg/L	303 ^{DLCI}	26000 ^{DLDS}	28000 ^{DLDS}	335 ^{DLDS}	261 ^{DLDS}
fluoride	16984-48-8	E235.F	0.020	mg/L	<0.400 ^{DLCI}	<5.00 ^{DLDS}	<5.00 ^{DLDS}	0.508 ^{DLDS}	0.162 ^{DLDS}
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.400 ^{DLCI}	<5.00 ^{DLDS}	<5.00 ^{DLDS}	<0.200 ^{DLDS}	25.0 ^{DLDS}
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.200 ^{DLCI}	<2.50 ^{DLDS}	<2.50 ^{DLDS}	<0.100 ^{DLDS}	<0.050 ^{DLDS}
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	56.4 ^{DLCI}	2610 ^{DLDS}	2750 ^{DLDS}	66.1 ^{DLDS}	153 ^{DLDS}
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	<0.447	<5.59	<5.59	<0.224	25.0
Ion Balance									
anion sum	----	EC101	0.10	meq/L	12.7	790	849	14.2	14.0
cation sum	----	EC101	0.10	meq/L	14.6	798	876	16.0	13.7
ion balance (cation-anion difference)	----	EC101	0.010	%	6.96 ^{IB:INT}	0.504	1.56	5.96 ^{IB:INT}	1.08
ion balance (cations/anions ratio)	----	EC101	0.010	%	115	101	103	113	97.8
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0039	<0.0500 ^{DLDS}	<0.0500 ^{DLDS}	0.0326	0.0191
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00351	<0.00500 ^{DLDS}	0.00593 ^{DLDS}	0.0100	0.00067
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00092	<0.00500 ^{DLDS}	<0.00500 ^{DLDS}	0.00530	0.0195
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0427	0.372 ^{DLDS}	0.310 ^{DLDS}	0.0408	0.0638
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.00100 ^{DLDS}	<0.00100 ^{DLDS}	<0.000020	<0.000020
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.00250 ^{DLDS}	<0.00250 ^{DLDS}	<0.000050	<0.000050
boron, dissolved	7440-42-8	E421	0.010	mg/L	0.132	0.826 ^{DLDS}	0.815 ^{DLDS}	0.086	0.643



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					06-IF-NPAG_W4	07-IF-PAG-CW_W4	08-SED-PAG-C_W_W4	09-FZONE-NPA_G_W4	10-ROM-SR1_W4
Client sampling date / time					11-Feb-2021 16:15	11-Feb-2021 16:25	11-Feb-2021 16:35	11-Feb-2021 16:50	11-Feb-2021 17:10
Analyte	CAS Number	Method	LOR	Unit	SK2100266-006	SK2100266-007	SK2100266-008	SK2100266-009	SK2100266-010
					Result	Result	Result	Result	Result
Dissolved Metals									
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	0.000090	0.000789 DLDS	0.00335 DLDS	0.000057	0.0000159
calcium, dissolved	7440-70-2	E421	0.050	mg/L	21.4	1410 DLDS	1540 DLDS	24.8	50.4
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000181	0.0120 DLDS	0.00891 DLDS	0.000020	0.000145
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	0.00729	<0.0250 DLDS	<0.0250 DLDS	0.0119	0.00178
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.00010	<0.00500 DLDS	0.0250 DLDS	0.00023	0.00025
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00309	0.0149 DLDS	0.0148 DLDS	0.00736	0.00428
iron, dissolved	7439-89-6	E421	0.030	mg/L	<0.030	<1.50 DLDS	<1.50 DLDS	<0.030	<0.030
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.00250 DLDS	<0.00250 DLDS	<0.000050	0.000082
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0162	0.202 DLDS	0.239 DLDS	0.0099	0.0090
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	11.6	1690 DLDS	1860 DLDS	13.8	20.9
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	<0.00500	0.329 DLDS	0.346 DLDS	0.0130	0.0300
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.0121	0.0134 DLDS	0.0447 DLDS	0.0173	0.00684
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00184	0.0588 DLDS	0.220 DLDS	0.00354	0.00150
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<2.50 DLDS	<2.50 DLDS	<0.050	<0.050
potassium, dissolved	7440-09-7	E421	0.050	mg/L	14.1	388 DLDS	416 DLDS	14.0	11.8
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.0106	0.470 DLDS	0.231 DLDS	0.00396	0.00807
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.00458	0.00551 DLDS	0.00670 DLDS	0.00587	0.00114
silicon, dissolved	7440-21-3	E421	0.050	mg/L	3.68	4.08 DLDS	3.25 DLDS	3.55	2.59
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	0.000591 DLDS	<0.000500 DLDS	<0.000010	<0.000010
sodium, dissolved	17341-25-2	E421	0.050	mg/L	280	13300 DLDS	14600 DLDS	305	205
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.161	30.2 DLDS	32.5 DLDS	0.0926	0.356
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	23.7	967 DLDS	1040 DLDS	25.4	55.4
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.0100 DLDS	<0.0100 DLDS	<0.00020	<0.00020
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.000016	<0.000500 DLDS	0.000936 DLDS	0.000020	0.000016
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00500 DLDS	<0.00500 DLDS	<0.00010	<0.00010
tin, dissolved	7440-31-5	E421	0.00010	mg/L	0.00556	<0.00500 DLDS	<0.00500 DLDS	0.0464	0.0154
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.0150 DLDS	<0.0150 DLDS	<0.00030	<0.00030
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	0.00118	<0.00500 DLDS	<0.00500 DLDS	0.00060	0.00016
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.00512	0.0330 DLDS	0.0682 DLDS	0.00308	0.00227
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.0250 DLDS	<0.0250 DLDS	0.00119	<0.00050
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0153	1.32 DLDS	0.601 DLDS	0.0052	0.0025



Analytical Results

Sub-Matrix: Leachate

(Matrix: Water)

					Client sample ID	06-IF-NPAG_W4	07-IF-PAG-CW_W4	08-SED-PAG-C W_W4	09-FZONE-NPA G_W4	10-ROM-SR1_W4
					Client sampling date / time	11-Feb-2021 16:15	11-Feb-2021 16:25	11-Feb-2021 16:35	11-Feb-2021 16:50	11-Feb-2021 17:10
Analyte	CAS Number	Method	LOR	Unit	SK2100266-006	SK2100266-007	SK2100266-008	SK2100266-009	SK2100266-010	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	<0.0150 ^{DLDS}	<0.0150 ^{DLDS}	<0.00030	<0.00030	
dissolved metals filtration location	----	EP421	-	-	Field	Field	Field	Field	Field	

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



Analytical Results

Sub-Matrix: Leachate

Client sample ID

11-ROM-SR2_W4	----	----	----	----
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(Matrix: Water)

Client sampling date / time

11-Feb-2021 17:15	----	----	----	----
----------------------	------	------	------	------

Analyte	CAS Number	Method	LOR	Unit	SK2100266-011	-----	-----	-----	-----
					Result	---	---	---	---
Physical Tests									
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	159	----	----	----	----
conductivity	----	E100	2.0	µS/cm	980	----	----	----	----
pH	----	E108	0.10	pH units	7.66	----	----	----	----
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	64.2	----	----	----	----
bicarbonate	71-52-3	E290	1.0	mg/L	78.4	----	----	----	----
carbonate	3812-32-6	E290	1.0	mg/L	<1.0	----	----	----	----
hydroxide	14280-30-9	E290	1.0	mg/L	<1.0	----	----	----	----
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	555	----	----	----	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0065	----	----	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	----	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	<0.200	----	----	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	194	----	----	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L	0.139	----	----	----	----
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	8.34	----	----	----	----
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	0.066	----	----	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	78.9	----	----	----	----
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	8.41	----	----	----	----
Ion Balance									
anion sum	----	EC101	0.10	meq/L	9.00	----	----	----	----
cation sum	----	EC101	0.10	meq/L	9.49	----	----	----	----
ion balance (cation-anion difference)	----	EC101	0.010	%	2.65	----	----	----	----
ion balance (cations/anions ratio)	----	EC101	0.010	%	105	----	----	----	----
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0258	----	----	----	----
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00038	----	----	----	----
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.0116	----	----	----	----
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0351	----	----	----	----
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	----	----	----	----
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	----	----	----	----
boron, dissolved	7440-42-8	E421	0.010	mg/L	0.160	----	----	----	----



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					11-ROM-SR2_	----	----	----	----
					W4				
					Client sampling date / time	11-Feb-2021	---	---	---
					17:15				
Analyte	CAS Number	Method	LOR	Unit	SK2100266-011	-----	-----	-----	-----
					Result	---	---	---	---
Dissolved Metals									
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	0.0000168	----	----	----	----
calcium, dissolved	7440-70-2	E421	0.050	mg/L	36.9	----	----	----	----
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000052	----	----	----	----
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	0.00191	----	----	----	----
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00039	----	----	----	----
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00343	----	----	----	----
iron, dissolved	7439-89-6	E421	0.030	mg/L	<0.030	----	----	----	----
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	----	----	----	----
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0121	----	----	----	----
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	16.2	----	----	----	----
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	0.0832	----	----	----	----
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00353	----	----	----	----
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00106	----	----	----	----
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	----	----	----	----
potassium, dissolved	7440-09-7	E421	0.050	mg/L	5.36	----	----	----	----
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00218	----	----	----	----
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000861	----	----	----	----
silicon, dissolved	7440-21-3	E421	0.050	mg/L	2.18	----	----	----	----
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	----	----	----	----
sodium, dissolved	17341-25-2	E421	0.050	mg/L	142	----	----	----	----
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.216	----	----	----	----
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	30.2	----	----	----	----
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	----	----	----	----
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	----	----	----	----
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	----	----	----	----
tin, dissolved	7440-31-5	E421	0.00010	mg/L	0.0105	----	----	----	----
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	----	----	----	----
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	0.00016	----	----	----	----
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.00104	----	----	----	----
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	----	----	----	----
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0031	----	----	----	----



Analytical Results

Sub-Matrix: Leachate
 (Matrix: Water)

					Client sample ID	11-ROM-SR2_	----	----	----	----
					Client sampling date / time	11-Feb-2021	----	----	----	----
Analyte	CAS Number	Method	LOR	Unit	SK2100266-011	-----	-----	-----	-----	-----
					Result	---	---	---	---	---
Dissolved Metals										
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	----	----	----	----	----
dissolved metals filtration location	----	EP421	-	-	Field	----	----	----	----	----

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: SK2100266	Page	: 1 of 20
Client	: O'Kane Consultants Inc.	Laboratory	: Saskatoon - Environmental
Contact	: Jared Robertson	Account Manager	: Brian Morgan
Address	: 112 - 112 Research Drive Saskatoon SK Canada S7N 3R3	Address	: 819 58 Street East Saskatoon, Saskatchewan Canada S7K 6X5
Telephone	: 250 420 7010	Telephone	: 1 306 221 7147
Project	: ----	Date Samples Received	: 12-Feb-2021 11:45
PO	: ----	Issue Date	: 22-Feb-2021 11:17
C-O-C number	: ----		
Sampler	: Client		
Site	: ----		
Quote number	: Q83455		
No. of samples received	: 11		
No. of samples analysed	: 11		

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 Services number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

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.

RIGHT SOLUTIONS | RIGHT PARTNER



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 15:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 15:00 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		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 02-IF-PAG_W4	E298	11-Feb-2021	16-Feb-2021	28 days	4 days	✓	16-Feb-2021	23 days	0 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 03-SED-PAG_W4	E298	11-Feb-2021	16-Feb-2021	28 days	4 days	✓	16-Feb-2021	23 days	0 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 04-GAB-NPAG_W4	E298	11-Feb-2021	16-Feb-2021	28 days	4 days	✓	16-Feb-2021	23 days	0 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 05-SED-NPAG_W4	E298	11-Feb-2021	16-Feb-2021	28 days	4 days	✓	16-Feb-2021	23 days	0 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 06-IF-NPAG_W4	E298	11-Feb-2021	16-Feb-2021	28 days	4 days	✓	16-Feb-2021	23 days	0 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 07-IF-PAG-CW_W4	E298	11-Feb-2021	16-Feb-2021	28 days	4 days	✓	16-Feb-2021	23 days	0 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 08-SED-PAG-CW_W4	E298	11-Feb-2021	16-Feb-2021	28 days	4 days	✓	16-Feb-2021	23 days	0 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 09-FZONE-NPAG_W4	E298	11-Feb-2021	16-Feb-2021	28 days	4 days	✓	16-Feb-2021	23 days	0 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 10-ROM-SR1_W4	E298	11-Feb-2021	16-Feb-2021	28 days	4 days	✓	16-Feb-2021	23 days	0 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 11-ROM-SR2_W4	E298	11-Feb-2021	16-Feb-2021	28 days	4 days	✓	16-Feb-2021	23 days	0 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE 09-FZONE-NPAG_W4	E235.Cl	11-Feb-2021	----	----	----		12-Feb-2021	28 days	0 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE 10-ROM-SR1_W4	E235.Cl	11-Feb-2021	----	----	----		12-Feb-2021	28 days	0 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE 11-ROM-SR2_W4	E235.Cl	11-Feb-2021	----	----	----		12-Feb-2021	28 days	0 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE 02-IF-PAG_W4	E235.Cl	11-Feb-2021	----	----	----		12-Feb-2021	28 days	1 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE 03-SED-PAG_W4	E235.Cl	11-Feb-2021	----	----	----		12-Feb-2021	28 days	1 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE 04-GAB-NPAG_W4	E235.Cl	11-Feb-2021	----	----	----		12-Feb-2021	28 days	1 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Chloride in Water by IC										
HDPE 05-SED-NPAG_W4	E235.Cl	11-Feb-2021	----	----	----		12-Feb-2021	28 days	1 days	✔
Anions and Nutrients : Chloride in Water by IC										
HDPE 06-IF-NPAG_W4	E235.Cl	11-Feb-2021	----	----	----		12-Feb-2021	28 days	1 days	✔
Anions and Nutrients : Chloride in Water by IC										
HDPE 07-IF-PAG-CW_W4	E235.Cl	11-Feb-2021	----	----	----		12-Feb-2021	28 days	1 days	✔
Anions and Nutrients : Chloride in Water by IC										
HDPE 08-SED-PAG-CW_W4	E235.Cl	11-Feb-2021	----	----	----		12-Feb-2021	28 days	1 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 09-FZONE-NPAG_W4	E235.F	11-Feb-2021	----	----	----		12-Feb-2021	28 days	0 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 10-ROM-SR1_W4	E235.F	11-Feb-2021	----	----	----		12-Feb-2021	28 days	0 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 11-ROM-SR2_W4	E235.F	11-Feb-2021	----	----	----		12-Feb-2021	28 days	0 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 02-IF-PAG_W4	E235.F	11-Feb-2021	----	----	----		12-Feb-2021	28 days	1 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 03-SED-PAG_W4	E235.F	11-Feb-2021	----	----	----		12-Feb-2021	28 days	1 days	✔



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Fluoride in Water by IC											
HDPE 04-GAB-NPAG_W4	E235.F	11-Feb-2021	----	----	----		12-Feb-2021	28 days	1 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 05-SED-NPAG_W4	E235.F	11-Feb-2021	----	----	----		12-Feb-2021	28 days	1 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 06-IF-NPAG_W4	E235.F	11-Feb-2021	----	----	----		12-Feb-2021	28 days	1 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 07-IF-PAG-CW_W4	E235.F	11-Feb-2021	----	----	----		12-Feb-2021	28 days	1 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 08-SED-PAG-CW_W4	E235.F	11-Feb-2021	----	----	----		12-Feb-2021	28 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 09-FZONE-NPAG_W4	E235.NO3	11-Feb-2021	----	----	----		12-Feb-2021	3 days	0 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 10-ROM-SR1_W4	E235.NO3	11-Feb-2021	----	----	----		12-Feb-2021	3 days	0 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 11-ROM-SR2_W4	E235.NO3	11-Feb-2021	----	----	----		12-Feb-2021	3 days	0 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 02-IF-PAG_W4	E235.NO3	11-Feb-2021	----	----	----		12-Feb-2021	3 days	1 days	✔	



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrate in Water by IC											
HDPE 03-SED-PAG_W4	E235.NO3	11-Feb-2021	----	----	----		12-Feb-2021	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 04-GAB-NPAG_W4	E235.NO3	11-Feb-2021	----	----	----		12-Feb-2021	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 05-SED-NPAG_W4	E235.NO3	11-Feb-2021	----	----	----		12-Feb-2021	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 06-IF-NPAG_W4	E235.NO3	11-Feb-2021	----	----	----		12-Feb-2021	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 07-IF-PAG-CW_W4	E235.NO3	11-Feb-2021	----	----	----		12-Feb-2021	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 08-SED-PAG-CW_W4	E235.NO3	11-Feb-2021	----	----	----		12-Feb-2021	3 days	1 days	✔	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 09-FZONE-NPAG_W4	E235.NO2	11-Feb-2021	----	----	----		12-Feb-2021	3 days	0 days	✔	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 10-ROM-SR1_W4	E235.NO2	11-Feb-2021	----	----	----		12-Feb-2021	3 days	0 days	✔	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 11-ROM-SR2_W4	E235.NO2	11-Feb-2021	----	----	----		12-Feb-2021	3 days	0 days	✔	



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrite in Water by IC											
HDPE 02-IF-PAG_W4	E235.NO2	11-Feb-2021	----	----	----		12-Feb-2021	3 days	1 days	✔	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 03-SED-PAG_W4	E235.NO2	11-Feb-2021	----	----	----		12-Feb-2021	3 days	1 days	✔	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 04-GAB-NPAG_W4	E235.NO2	11-Feb-2021	----	----	----		12-Feb-2021	3 days	1 days	✔	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 05-SED-NPAG_W4	E235.NO2	11-Feb-2021	----	----	----		12-Feb-2021	3 days	1 days	✔	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 06-IF-NPAG_W4	E235.NO2	11-Feb-2021	----	----	----		12-Feb-2021	3 days	1 days	✔	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 07-IF-PAG-CW_W4	E235.NO2	11-Feb-2021	----	----	----		12-Feb-2021	3 days	1 days	✔	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 08-SED-PAG-CW_W4	E235.NO2	11-Feb-2021	----	----	----		12-Feb-2021	3 days	1 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 09-FZONE-NPAG_W4	E235.SO4	11-Feb-2021	----	----	----		12-Feb-2021	28 days	0 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 10-ROM-SR1_W4	E235.SO4	11-Feb-2021	----	----	----		12-Feb-2021	28 days	0 days	✔	



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Sulfate in Water by IC											
HDPE 11-ROM-SR2_W4	E235.SO4	11-Feb-2021	----	----	----		12-Feb-2021	28 days	0 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 01_TSF_W9	E235.SO4	11-Feb-2021	----	----	----		12-Feb-2021	28 days	1 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 02-IF-PAG_W4	E235.SO4	11-Feb-2021	----	----	----		12-Feb-2021	28 days	1 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 03-SED-PAG_W4	E235.SO4	11-Feb-2021	----	----	----		12-Feb-2021	28 days	1 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 04-GAB-NPAG_W4	E235.SO4	11-Feb-2021	----	----	----		12-Feb-2021	28 days	1 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 05-SED-NPAG_W4	E235.SO4	11-Feb-2021	----	----	----		12-Feb-2021	28 days	1 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 06-IF-NPAG_W4	E235.SO4	11-Feb-2021	----	----	----		12-Feb-2021	28 days	1 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 07-IF-PAG-CW_W4	E235.SO4	11-Feb-2021	----	----	----		12-Feb-2021	28 days	1 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 08-SED-PAG-CW_W4	E235.SO4	11-Feb-2021	----	----	----		12-Feb-2021	28 days	1 days	✔	



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 02-IF-PAG_W4	E318	11-Feb-2021	17-Feb-2021	28 days	5 days	✔	17-Feb-2021	22 days	0 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 03-SED-PAG_W4	E318	11-Feb-2021	17-Feb-2021	28 days	5 days	✔	17-Feb-2021	22 days	0 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 04-GAB-NPAG_W4	E318	11-Feb-2021	17-Feb-2021	28 days	5 days	✔	17-Feb-2021	22 days	0 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 05-SED-NPAG_W4	E318	11-Feb-2021	17-Feb-2021	28 days	5 days	✔	17-Feb-2021	22 days	0 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 06-IF-NPAG_W4	E318	11-Feb-2021	17-Feb-2021	28 days	5 days	✔	17-Feb-2021	22 days	0 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 07-IF-PAG-CW_W4	E318	11-Feb-2021	17-Feb-2021	28 days	5 days	✔	17-Feb-2021	22 days	0 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 08-SED-PAG-CW_W4	E318	11-Feb-2021	17-Feb-2021	28 days	5 days	✔	17-Feb-2021	22 days	0 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 09-FZONE-NPAG_W4	E318	11-Feb-2021	17-Feb-2021	28 days	5 days	✔	17-Feb-2021	22 days	0 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 10-ROM-SR1_W4	E318	11-Feb-2021	17-Feb-2021	28 days	5 days	✔	17-Feb-2021	22 days	0 days	✔	



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 11-ROM-SR2_W4	E318	11-Feb-2021	17-Feb-2021	28 days	5 days	✔	17-Feb-2021	22 days	0 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 02-IF-PAG_W4	E372-U	11-Feb-2021	17-Feb-2021	28 days	5 days	✔	17-Feb-2021	22 days	0 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 03-SED-PAG_W4	E372-U	11-Feb-2021	17-Feb-2021	28 days	5 days	✔	17-Feb-2021	22 days	0 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 04-GAB-NPAG_W4	E372-U	11-Feb-2021	17-Feb-2021	28 days	5 days	✔	17-Feb-2021	22 days	0 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 05-SED-NPAG_W4	E372-U	11-Feb-2021	17-Feb-2021	28 days	5 days	✔	17-Feb-2021	22 days	0 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 06-IF-NPAG_W4	E372-U	11-Feb-2021	17-Feb-2021	28 days	5 days	✔	17-Feb-2021	22 days	0 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 07-IF-PAG-CW_W4	E372-U	11-Feb-2021	17-Feb-2021	28 days	5 days	✔	17-Feb-2021	22 days	0 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 08-SED-PAG-CW_W4	E372-U	11-Feb-2021	17-Feb-2021	28 days	5 days	✔	17-Feb-2021	22 days	0 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 09-FZONE-NPAG_W4	E372-U	11-Feb-2021	17-Feb-2021	28 days	5 days	✔	17-Feb-2021	22 days	0 days	✔	



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 10-ROM-SR1_W4	E372-U	11-Feb-2021	17-Feb-2021	28 days	5 days	✔	17-Feb-2021	22 days	0 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 11-ROM-SR2_W4	E372-U	11-Feb-2021	17-Feb-2021	28 days	5 days	✔	17-Feb-2021	22 days	0 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 02-IF-PAG_W4	E421	11-Feb-2021	16-Feb-2021	180 days	4 days	✔	18-Feb-2021	175 days	1 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 03-SED-PAG_W4	E421	11-Feb-2021	16-Feb-2021	180 days	4 days	✔	18-Feb-2021	175 days	1 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 04-GAB-NPAG_W4	E421	11-Feb-2021	16-Feb-2021	180 days	4 days	✔	18-Feb-2021	175 days	1 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 05-SED-NPAG_W4	E421	11-Feb-2021	16-Feb-2021	180 days	4 days	✔	18-Feb-2021	175 days	1 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 09-FZONE-NPAG_W4	E421	11-Feb-2021	16-Feb-2021	180 days	4 days	✔	18-Feb-2021	175 days	1 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 10-ROM-SR1_W4	E421	11-Feb-2021	16-Feb-2021	180 days	4 days	✔	18-Feb-2021	175 days	1 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 11-ROM-SR2_W4	E421	11-Feb-2021	16-Feb-2021	180 days	4 days	✔	18-Feb-2021	175 days	1 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE 08-SED-PAG-CW_W4	E290	11-Feb-2021	----	----	----		12-Feb-2021	14 days	0 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE 09-FZONE-NPAG_W4	E290	11-Feb-2021	----	----	----		12-Feb-2021	14 days	0 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE 10-ROM-SR1_W4	E290	11-Feb-2021	----	----	----		12-Feb-2021	14 days	0 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE 11-ROM-SR2_W4	E290	11-Feb-2021	----	----	----		12-Feb-2021	14 days	0 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE 02-IF-PAG_W4	E290	11-Feb-2021	----	----	----		12-Feb-2021	14 days	1 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE 03-SED-PAG_W4	E290	11-Feb-2021	----	----	----		12-Feb-2021	14 days	1 days	✔	



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			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Alkalinity Species by Titration										
HDPE 04-GAB-NPAG_W4	E290	11-Feb-2021	----	----	----		12-Feb-2021	14 days	1 days	✔
Physical Tests : Alkalinity Species by Titration										
HDPE 05-SED-NPAG_W4	E290	11-Feb-2021	----	----	----		12-Feb-2021	14 days	1 days	✔
Physical Tests : Alkalinity Species by Titration										
HDPE 06-IF-NPAG_W4	E290	11-Feb-2021	----	----	----		12-Feb-2021	14 days	1 days	✔
Physical Tests : Alkalinity Species by Titration										
HDPE 07-IF-PAG-CW_W4	E290	11-Feb-2021	----	----	----		12-Feb-2021	14 days	1 days	✔
Physical Tests : Conductivity in Water										
HDPE 08-SED-PAG-CW_W4	E100	11-Feb-2021	----	----	----		12-Feb-2021	28 days	0 days	✔
Physical Tests : Conductivity in Water										
HDPE 09-FZONE-NPAG_W4	E100	11-Feb-2021	----	----	----		12-Feb-2021	28 days	0 days	✔
Physical Tests : Conductivity in Water										
HDPE 10-ROM-SR1_W4	E100	11-Feb-2021	----	----	----		12-Feb-2021	28 days	0 days	✔
Physical Tests : Conductivity in Water										
HDPE 11-ROM-SR2_W4	E100	11-Feb-2021	----	----	----		12-Feb-2021	28 days	0 days	✔
Physical Tests : Conductivity in Water										
HDPE 02-IF-PAG_W4	E100	11-Feb-2021	----	----	----		12-Feb-2021	28 days	1 days	✔



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
Rec	Actual	Rec		Actual							
Physical Tests : Conductivity in Water											
HDPE 03-SED-PAG_W4	E100	11-Feb-2021	----	----	----		12-Feb-2021	28 days	1 days	✓	
Physical Tests : Conductivity in Water											
HDPE 04-GAB-NPAG_W4	E100	11-Feb-2021	----	----	----		12-Feb-2021	28 days	1 days	✓	
Physical Tests : Conductivity in Water											
HDPE 05-SED-NPAG_W4	E100	11-Feb-2021	----	----	----		12-Feb-2021	28 days	1 days	✓	
Physical Tests : Conductivity in Water											
HDPE 06-IF-NPAG_W4	E100	11-Feb-2021	----	----	----		12-Feb-2021	28 days	1 days	✓	
Physical Tests : Conductivity in Water											
HDPE 07-IF-PAG-CW_W4	E100	11-Feb-2021	----	----	----		12-Feb-2021	28 days	1 days	✓	
Physical Tests : pH by Meter											
HDPE 08-SED-PAG-CW_W4	E108	11-Feb-2021	----	----	----		12-Feb-2021	0.25 hrs	23 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE 09-FZONE-NPAG_W4	E108	11-Feb-2021	----	----	----		12-Feb-2021	0.25 hrs	23 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE 10-ROM-SR1_W4	E108	11-Feb-2021	----	----	----		12-Feb-2021	0.25 hrs	23 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE 11-ROM-SR2_W4	E108	11-Feb-2021	----	----	----		12-Feb-2021	0.25 hrs	23 hrs	* EHTR-FM	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : pH by Meter										
HDPE 04-GAB-NPAG_W4	E108	11-Feb-2021	----	----	----		12-Feb-2021	0.25 hrs	24 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 05-SED-NPAG_W4	E108	11-Feb-2021	----	----	----		12-Feb-2021	0.25 hrs	24 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 06-IF-NPAG_W4	E108	11-Feb-2021	----	----	----		12-Feb-2021	0.25 hrs	24 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 07-IF-PAG-CW_W4	E108	11-Feb-2021	----	----	----		12-Feb-2021	0.25 hrs	24 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 02-IF-PAG_W4	E108	11-Feb-2021	----	----	----		12-Feb-2021	0.25 hrs	25 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 03-SED-PAG_W4	E108	11-Feb-2021	----	----	----		12-Feb-2021	0.25 hrs	25 hrs	* EHTR-FM

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	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	151103	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	151547	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	151107	1	11	9.0	5.0	✓
Conductivity in Water	E100	151102	1	14	7.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	151580	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	151104	1	11	9.0	5.0	✓
Nitrate in Water by IC	E235.NO3	151108	1	11	9.0	5.0	✓
Nitrite in Water by IC	E235.NO2	151105	1	11	9.0	5.0	✓
pH by Meter	E108	151101	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	151106	1	12	8.3	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	151469	1	12	8.3	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	151697	1	16	6.2	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	151103	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	151547	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	151107	1	11	9.0	5.0	✓
Conductivity in Water	E100	151102	1	14	7.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	151580	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	151104	1	11	9.0	5.0	✓
Nitrate in Water by IC	E235.NO3	151108	1	11	9.0	5.0	✓
Nitrite in Water by IC	E235.NO2	151105	1	11	9.0	5.0	✓
pH by Meter	E108	151101	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	151106	1	12	8.3	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	151469	1	12	8.3	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	151697	1	16	6.2	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	151103	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	151547	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	151107	1	11	9.0	5.0	✓
Conductivity in Water	E100	151102	1	14	7.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	151580	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	151104	1	11	9.0	5.0	✓
Nitrate in Water by IC	E235.NO3	151108	1	11	9.0	5.0	✓
Nitrite in Water by IC	E235.NO2	151105	1	11	9.0	5.0	✓
Sulfate in Water by IC	E235.SO4	151106	1	12	8.3	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	151469	1	12	8.3	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	151697	1	16	6.2	5.0	✓



Matrix: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<i>Analytical Methods</i>							
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	151547	1	20	5.0	5.0	✔
Chloride in Water by IC	E235.Cl	151107	1	11	9.0	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	151580	1	13	7.6	5.0	✔
Fluoride in Water by IC	E235.F	151104	1	11	9.0	5.0	✔
Nitrate in Water by IC	E235.NO3	151108	1	11	9.0	5.0	✔
Nitrite in Water by IC	E235.NO2	151105	1	11	9.0	5.0	✔
Sulfate in Water by IC	E235.SO4	151106	1	12	8.3	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	151469	1	12	8.3	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	151697	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
Conductivity in Water	E100 Saskatoon - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Saskatoon - 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.
Chloride in Water by IC	E235.Cl Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Saskatoon - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Total Kjeldahl Nitrogen is determined using block digestion followed by flow-injection analysis with fluorescence detection.
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.



<i>Analytical Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Dissolved Metals in Water by CRC ICPMS	E421 Saskatoon - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Hardness (Calculated)	EC100 Saskatoon - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Ion Balance using Dissolved Metals	EC101 Saskatoon - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
TDS in Water (Calculation)	EC103 Saskatoon - Environmental	Water	APHA 1030E (mod)	Total Dissolved Solids is calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Saskatoon - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested using block digestion with Copper Sulfate Digestion Reagent.
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Saskatoon - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO ₃ .



QUALITY CONTROL REPORT

Work Order : **SK2100266**

Page : 1 of 10

Client : O'Kane Consultants Inc.
 Contact : Jared Robertson
 Address : 112 - 112 Research Drive
 Saskatoon SK Canada S7N 3R3
 Telephone : 250 420 7010
 Project : ----
 PO : ----
 C-O-C number : ----
 Sampler : Client
 Site : ----
 Quote number : Q83455
 No. of samples received : 11
 No. of samples analysed : 11

Laboratory : Saskatoon - Environmental
 Account Manager : Brian Morgan
 Address : 819 58 Street East
 Saskatoon, Saskatchewan Canada S7K 6X5
 Telephone : 1 306 221 7147
 Date Samples Received : 12-Feb-2021 11:45
 Date Analysis Commenced : 12-Feb-2021
 Issue Date : 22-Feb-2021 11:17

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 Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Colby Bingham	Quality Systems Coordinator	Inorganics, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Jorden Fanson	Analyst	Inorganics, Calgary, Alberta
Katrina Chudyk	Laboratory Analyst	Inorganics, Saskatoon, Saskatchewan
Lian Nesbitt	Laboratory Analyst	Metals, Saskatoon, Saskatchewan
Melissa Houseman	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Melissa Houseman	Team Leader - Inorganics	Metals, Saskatoon, Saskatchewan
Naeun Kim	Analyst	Inorganics, Calgary, Alberta
Rebecca Baker	Analyst	Inorganics, Calgary, Alberta

Page : 2 of 10
Work Order : SK2100266
Client : O'Kane Consultants Inc.
Project : ----



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 Services number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

= Indicates a QC result that did not meet the ALS DQO.



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: 151101)											
SK2100268-003	Anonymous	pH	----	E108	0.10	pH units	7.78	7.78	0.00884%	3%	----
Physical Tests (QC Lot: 151102)											
SK2100268-003	Anonymous	conductivity	----	E100	2.0	µS/cm	1190	1170	1.52%	10%	----
Physical Tests (QC Lot: 151103)											
SK2100268-003	Anonymous	alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	351	347	1.26%	20%	----
Anions and Nutrients (QC Lot: 151104)											
RG2100025-001	Anonymous	fluoride	16984-48-8	E235.F	0.100	mg/L	0.299	0.297	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 151105)											
RG2100025-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 151106)											
RG2100025-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	801	802	0.0722%	20%	----
Anions and Nutrients (QC Lot: 151107)											
RG2100025-001	Anonymous	chloride	16887-00-6	E235.Cl	2.50	mg/L	145	145	0.122%	20%	----
Anions and Nutrients (QC Lot: 151108)											
RG2100025-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 151469)											
RG2100026-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	1.00	mg/L	11.0	9.88	1.09	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 151547)											
CG2100139-001	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: 151697)											
RG2100025-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.200	mg/L	4.03	3.88	3.94%	20%	----
Dissolved Metals (QC Lot: 151580)											
SK2100265-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0226	0.0237	4.46%	20%	----
		antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00021	0.00020	0.00002	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00027	0.00028	0.000005	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0243	0.0238	1.75%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.010	mg/L	0.024	0.023	0.0002	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.050	mg/L	29.2	29.8	1.97%	20%	----



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
Dissolved Metals (QC Lot: 151580) - continued											
SK2100265-001	Anonymous	cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.000020	mg/L	0.00925	0.00910	1.64%	20%	----
		iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0096	0.0095	0.0001	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	16.4	16.0	1.98%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00045	0.00041	0.00004	Diff <2x LOR	----
		molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00172	0.00168	2.43%	20%	----
		nickel, dissolved	7440-02-0	E421	0.000050	mg/L	0.00168	0.00165	0.00002	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.050	mg/L	3.42	3.38	1.20%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.000020	mg/L	0.00145	0.00132	0.00012	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000456	0.000380	0.000076	Diff <2x LOR	----
		silicon, dissolved	7440-21-3	E421	0.050	mg/L	0.987	0.994	0.711%	20%	----
		silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, dissolved	17341-25-2	E421	0.050	mg/L	24.4	24.0	1.98%	20%	----
		strontium, dissolved	7440-24-6	E421	0.000020	mg/L	0.190	0.188	1.31%	20%	----
		sulfur, dissolved	7704-34-9	E421	0.50	mg/L	28.6	28.2	1.37%	20%	----
		tellurium, dissolved	13494-80-9	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.000030	mg/L	<0.000030	<0.000030	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.00117	0.00116	0.983%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0017	0.0018	0.00004	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.000030	mg/L	<0.000030	<0.000030	0	Diff <2x LOR	----



Method Blank (MB) Report

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

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 151102)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 151103)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Anions and Nutrients (QCLot: 151104)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 151105)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 151106)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 151107)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 151108)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 151469)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 151547)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 151697)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Dissolved Metals (QCLot: 151580)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 151580) - continued						
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	17341-25-2	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----



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				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 151101)									
pH	----	E108	----	pH units	6.86 pH units	99.8	98.0	102	----
Physical Tests (QCLot: 151102)									
conductivity	----	E100	1	µS/cm	1000 µS/cm	100	90.0	110	----
Physical Tests (QCLot: 151103)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	97.8	85.0	115	----
Anions and Nutrients (QCLot: 151104)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 151105)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 151106)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 151107)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 151108)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 151469)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	91.7	75.0	125	----
Anions and Nutrients (QCLot: 151547)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.1 mg/L	88.8	85.0	115	----
Anions and Nutrients (QCLot: 151697)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.32 mg/L	91.4	80.0	120	----
Dissolved Metals (QCLot: 151580)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	102	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	102	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	99.8	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	100	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	99.8	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	99.1	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	102	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	96.5	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	99.0	80.0	120	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Dissolved Metals (QCLot: 151580) - continued									
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	99.6	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	96.1	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	95.4	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	108	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	104	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	93.5	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	105	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	98.9	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	99.1	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	94.6	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	99.9	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	92.3	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	95.9	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	98.2	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	102	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	103	80.0	120	----
sodium, dissolved	17341-25-2	E421	0.05	mg/L	50 mg/L	105	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	103	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	101	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	94.3	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	98.5	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	97.7	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	96.4	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	93.4	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	103	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	106	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	97.9	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	98.4	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	95.8	80.0	120	----



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: 151104)										
SK2100266-002	02-IF-PAG_W4	fluoride	16984-48-8	E235.F	0.947 mg/L	1 mg/L	94.7	75.0	125	----
Anions and Nutrients (QCLot: 151105)										
SK2100266-002	02-IF-PAG_W4	nitrite (as N)	14797-65-0	E235.NO2	0.486 mg/L	0.5 mg/L	97.2	75.0	125	----
Anions and Nutrients (QCLot: 151106)										
SK2100266-002	02-IF-PAG_W4	sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	90.0	110	----
Anions and Nutrients (QCLot: 151107)										
SK2100266-002	02-IF-PAG_W4	chloride	16887-00-6	E235.Cl	ND mg/L	100 mg/L	ND	75.0	125	MS-B
Anions and Nutrients (QCLot: 151108)										
SK2100266-002	02-IF-PAG_W4	nitrate (as N)	14797-55-8	E235.NO3	2.57 mg/L	2.5 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 151469)										
RG2100026-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	ND mg/L	2.5 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 151547)										
CG2100139-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.105 mg/L	0.1 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 151697)										
RG2100026-001	Anonymous	phosphorus, total	7723-14-0	E372-U	ND mg/L	0.0676 mg/L	ND	70.0	130	----
Dissolved Metals (QCLot: 151580)										
SK2100265-003	Anonymous	aluminum, dissolved	7429-90-5	E421	0.200 mg/L	0.2 mg/L	99.9	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0206 mg/L	0.02 mg/L	103	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0198 mg/L	0.02 mg/L	99.2	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	MS-B
		beryllium, dissolved	7440-41-7	E421	0.0391 mg/L	0.04 mg/L	97.8	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00962 mg/L	0.01 mg/L	96.2	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.095 mg/L	0.1 mg/L	95.0	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00385 mg/L	0.004 mg/L	96.2	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	MS-B
		cesium, dissolved	7440-46-2	E421	0.00985 mg/L	0.01 mg/L	98.5	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0386 mg/L	0.04 mg/L	96.4	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0186 mg/L	0.02 mg/L	92.8	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0185 mg/L	0.02 mg/L	92.3	70.0	130	----



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
Dissolved Metals (QCLot: 151580) - continued										
SK2100265-003	Anonymous	iron, dissolved	7439-89-6	E421	1.91 mg/L	2 mg/L	95.6	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0200 mg/L	0.02 mg/L	99.8	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.0902 mg/L	0.1 mg/L	90.2	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	MS-B
		manganese, dissolved	7439-96-5	E421	0.0186 mg/L	0.02 mg/L	92.8	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0198 mg/L	0.02 mg/L	99.0	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0364 mg/L	0.04 mg/L	91.0	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	9.96 mg/L	10 mg/L	99.6	70.0	130	----
		potassium, dissolved	7440-09-7	E421	3.82 mg/L	4 mg/L	95.4	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0197 mg/L	0.02 mg/L	98.7	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0419 mg/L	0.04 mg/L	105	70.0	130	----
		silicon, dissolved	7440-21-3	E421	9.13 mg/L	10 mg/L	91.3	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00395 mg/L	0.004 mg/L	98.8	70.0	130	----
		sodium, dissolved	17341-25-2	E421	ND mg/L	2 mg/L	ND	70.0	130	MS-B
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	MS-B
		sulfur, dissolved	7704-34-9	E421	ND mg/L	20 mg/L	ND	70.0	130	MS-B
		tellurium, dissolved	13494-80-9	E421	0.0379 mg/L	0.04 mg/L	94.7	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00362 mg/L	0.004 mg/L	90.4	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0198 mg/L	0.02 mg/L	99.3	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0190 mg/L	0.02 mg/L	94.8	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0402 mg/L	0.04 mg/L	100	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0204 mg/L	0.02 mg/L	102	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.00416 mg/L	0.004 mg/L	104	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.0963 mg/L	0.1 mg/L	96.3	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.377 mg/L	0.4 mg/L	94.3	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0389 mg/L	0.04 mg/L	97.4	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

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17 -

Page 1

Environmental Division
Saskatoon
Work Order Reference
SK2100266



Telephone : + 1 308 668 8370

Report To Contact and company name below will appear on the final report		Report Format / Distribution			Select Service Level Below - Contact your AM to confirm a																		
Company:	Okane Consultants	Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL)			Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business																		
Contact:	Jared Robertson	Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			PRIORITY (Business Days)	4 day [P4-20%] <input type="checkbox"/>					EMERGENCY	1 Business day [E -											
Phone:	1 (306) 713-1695	<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked				3 day [P3-25%] <input type="checkbox"/>						Same Day, Weekend (Laboratory opening)											
Home:		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			Date and Time Required for all E&P TATs:																		
Street:		Email 1 or Fax: jrobertson@okc-sk.com			For tests that can not be performed according to the service level selected, you will be contacted.																		
City/Province:		Email 2			Analysis Request																		
Postal Code:		Email 3			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below																		
Invoice To		Invoice Distribution			NUMBER OF CONTAINERS											SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)						
Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX				F/P																	
Copy of Invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Email 1 or Fax: jrobertson@okc-sk.com																					
Company:		Email 2																					
Contact:		Oil and Gas Required Fields (client use)																					
Project Information		AFE/Cost Center:																					
ALS Account # / Quote #:		PO#																					
Job #:		Major/Minor Code:																					
PO / AFE:		Routing Code:																					
.SD:		Requisitioner:																					
ALS Lab Work Order # (lab use only):		Location:																					
		ALS Contact:																					
		Sampler:																					
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	BR-IC-N-CL	MET-D-CCMS-SK	ROU-F-SK	SO4-IC-N-CL	CN-T-CFA-VA	CN-WAD-CFA-VA	NH3-TKN-PT										
01-TSF_W9				11-Feb-21	14:25	Leachate				R										Y			
02-IF-PAG_W4				11-Feb-21	14:35	Leachate		R	R				R							Y			
03-SED-PAG_W4				11-Feb-21	15:15	Leachate		R	R				R							Y			
04-GAB-NPAG_W4				11-Feb-21	15:35	Leachate		R	R				R							Y			
05-SED-NPAG_W4				11-Feb-21	16:05	Leachate		R	R				R							Y			
06-IF-NPAG_W4				11-Feb-21	16:15	Leachate		R	R				R							Y			
07-IF-PAG-CW_W4				11-Feb-21	16:25	Leachate		R	R				R							Y			
08-SED-PAG-CW_W4				11-Feb-21	16:35	Leachate		R	R				R							Y			
09-FZONE-NPAG_W4				11-Feb-21	16:50	Leachate		R	R				R							Y			
10-ROM-SR1_W4				11-Feb-21	17:10	Leachate		R	R				R							Y			
11-ROM-SR2_W4				11-Feb-21	17:15	Leachate		R	R				R							Y			
Drinking Water (DW) Samples¹ (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)			SAMPLE CONDITION AS RECEIVED (lab use only)																		
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Suspected hazards: elevated metals, potential for low levels of cyanide			Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>																		
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					Ice Packs <input type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>																		
		Cooling Initiated <input checked="" type="checkbox"/>																					
		INITIAL COOLER TEMPERATURES °C					FINAL COOLER TEMPERATURES °C																
		10.8																					
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)																		
Released by: Jared Robertson	Date: February 12, 2021	Time:	Received by:	Date: 12-2-21	Time: 1145	Received by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:			



CERTIFICATE OF ANALYSIS

Work Order : **SK2100585**
Client : **O'Kane Consultants Inc.**
Contact : Jared Robertson
Address : 112 - 112 Research Drive
Saskatoon SK Canada S7N 3R3
Telephone : 250 420 7010
Project : 948-021
PO : ----
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : Q83455
No. of samples received : 44
No. of samples analysed : 44

Page : 1 of 29
Laboratory : Saskatoon - Environmental
Account Manager : Brian Morgan
Address : 819 58 Street East
Saskatoon SK Canada S7K 6X5
Telephone : 1 306 221 7147
Date Samples Received : 11-Mar-2021 16:55
Date Analysis Commenced : 12-Mar-2021
Issue Date : 19-Mar-2021 09:30

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
- Descriptive 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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Dwayne Bennett	Technical Specialist	Inorganics, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Jorden Fanson	Analyst	Inorganics, Calgary, Alberta
Lian Nesbitt	Laboratory Analyst	Metals, Saskatoon, Saskatchewan
Melissa Houseman	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Melissa Houseman	Team Leader - Inorganics	Metals, Saskatoon, Saskatchewan
Naeun Kim	Analyst	Inorganics, Calgary, Alberta
Nancy Cruse	Laboratory _ Supervisor	Inorganics, Saskatoon, Saskatchewan
Rebecca Baker	Analyst	Inorganics, Calgary, Alberta
Tracy Harley	Supervisor - Water Quality Instrumentation	Inorganics, Burnaby, British Columbia



General Comments

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

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

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

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

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

<i>Unit</i>	<i>Description</i>
-	No Unit
%	percent
µS/cm	Microsiemens per centimetre
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
SFP	Sample was filtered and preserved at the laboratory.



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					01_TSF_W10	01_TSF_W11	01_TSF_W12	01_TSF_W13	02-IF-PAG_W5
Client sampling date / time					18-Feb-2021 13:30	25-Feb-2021 11:00	04-Mar-2021 10:25	11-Mar-2021 13:40	18-Feb-2021 13:40
Analyte	CAS Number	Method	LOR	Unit	SK2100585-001	SK2100585-002	SK2100585-003	SK2100585-004	SK2100585-005
					Result	Result	Result	Result	Result
Physical Tests									
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	----	----	2590	----	----
conductivity	----	E100	2.0	µS/cm	----	----	31500	----	----
pH	----	E108	0.10	pH units	----	----	7.91	----	----
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	247	----	----
bicarbonate	71-52-3	E290	1.0	mg/L	----	----	301	----	----
carbonate	3812-32-6	E290	1.0	mg/L	----	----	<1.0	----	----
hydroxide	14280-30-9	E290	1.0	mg/L	----	----	<1.0	----	----
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	22400	----	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	30.7 ^{DLM}	----	----
bromide	24959-67-9	E235.Br	0.10	mg/L	----	<20.0 ^{DLDS}	<20.0 ^{DLDS}	21.6 ^{DLDS}	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	----	<0.0020	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	6630 ^{DLDS}	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	<4.00 ^{DLDS}	----	----
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	478 ^{DLDS}	----	----
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	2.90 ^{DLDS}	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	4910 ^{DLDS}	4990 ^{DLDS}	5400 ^{DLDS}	6150 ^{DLDS}	144 ^{DLDS}
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	481	----	----
Cyanides									
cyanide, strong acid dissociable (total)	----	E333	0.0050	mg/L	----	----	0.539	----	----
cyanide, weak acid dissociable	----	E336	0.0050	mg/L	----	----	0.0850	----	----
Ion Balance									
anion sum	----	EC101	0.10	meq/L	----	----	339	----	----
cation sum	----	EC101	0.10	meq/L	----	----	354	----	----
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	2.16	----	----
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	104	----	----
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	<0.0500 ^{DLDS}	----	----
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	0.00546 ^{DLDS}	----	----
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	0.373 ^{DLDS}	----	----



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					01_TSF_W10	01_TSF_W11	01_TSF_W12	01_TSF_W13	02-IF-PAG_W5
Client sampling date / time					18-Feb-2021 13:30	25-Feb-2021 11:00	04-Mar-2021 10:25	11-Mar-2021 13:40	18-Feb-2021 13:40
Analyte	CAS Number	Method	LOR	Unit	SK2100585-001	SK2100585-002	SK2100585-003	SK2100585-004	SK2100585-005
					Result	Result	Result	Result	Result
Dissolved Metals									
barium, dissolved	7440-39-3	E421	0.00010	mg/L	---	---	0.0820 ^{DLDS}	---	---
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	---	---	<0.00100 ^{DLDS}	---	---
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	---	---	<0.00250 ^{DLDS}	---	---
boron, dissolved	7440-42-8	E421	0.010	mg/L	---	---	1.74 ^{DLDS}	---	---
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	---	---	0.000776 ^{DLDS}	---	---
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	826 ^{DLDS}	---	---
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	<0.000500 ^{DLDS}	---	---
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	---	<0.0250 ^{DLDS}	---	---
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	1.07 ^{DLDS}	---	---
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	0.186 ^{DLDS}	---	---
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	<1.50 ^{DLDS}	---	---
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	<0.00250 ^{DLDS}	---	---
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	<0.0500 ^{DLDS}	---	---
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	128 ^{DLDS}	---	---
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	3.15 ^{DLDS}	---	---
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	0.469 ^{DLDS}	---	---
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	---	<0.0250 ^{DLDS}	---	---
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	<2.50 ^{DLDS}	---	---
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	541 ^{DLDS}	---	---
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	0.0545 ^{DLDS}	---	---
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	0.0568 ^{DLDS}	---	---
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	4.57 ^{DLDS}	---	---
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	0.0148 ^{DLDS}	---	---
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	6590 ^{DLDS}	---	---
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	2.87 ^{DLDS}	---	---
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	3480 ^{DLDS}	---	---
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	<0.0100 ^{DLDS}	---	---
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	<0.000500 ^{DLDS}	---	---
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	<0.00500 ^{DLDS}	---	---
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	<0.00500 ^{DLDS}	---	---
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	---	<0.0150 ^{DLDS}	---	---



Analytical Results

Sub-Matrix: Leachate

(Matrix: Water)

					Client sample ID	01_TSF_W10	01_TSF_W11	01_TSF_W12	01_TSF_W13	02-IF-PAG_W5
					Client sampling date / time	18-Feb-2021 13:30	25-Feb-2021 11:00	04-Mar-2021 10:25	11-Mar-2021 13:40	18-Feb-2021 13:40
Analyte	CAS Number	Method	LOR	Unit	SK2100585-001	SK2100585-002	SK2100585-003	SK2100585-004	SK2100585-005	
					Result	Result	Result	Result	Result	
Dissolved Metals										
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	----	----	<0.00500 ^{DLDS}	----	----	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	----	----	0.00704 ^{DLDS}	----	----	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	----	----	<0.0250 ^{DLDS}	----	----	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	----	<0.0500 ^{DLDS}	----	----	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	----	<0.0150 ^{DLDS}	----	----	
dissolved metals filtration location	----	EP421	-	-	----	----	Field	----	----	

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



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					02-IF-PAG_W6	02-IF-PAG_W7	02-IF-PAG_W8	03-SED-PAG_W 5	03-SED-PAG_W 6
Client sampling date / time					25-Feb-2021 11:05	04-Mar-2021 10:35	11-Mar-2021 13:55	18-Feb-2021 13:50	25-Feb-2021 13:05
Analyte	CAS Number	Method	LOR	Unit	SK2100585-006	SK2100585-007	SK2100585-008	SK2100585-009	SK2100585-010
					Result	Result	Result	Result	Result
Physical Tests									
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	----	----	72.2	----	----
conductivity	----	E100	2.0	µS/cm	----	----	1380	----	----
pH	----	E108	0.10	pH units	----	----	8.17	----	----
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	156	----	----
bicarbonate	71-52-3	E290	1.0	mg/L	----	----	191	----	----
carbonate	3812-32-6	E290	1.0	mg/L	----	----	<1.0	----	----
hydroxide	14280-30-9	E290	1.0	mg/L	----	----	<1.0	----	----
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	768	----	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	0.242	----	----
bromide	24959-67-9	E235.Br	0.10	mg/L	<5.00 ^{DLDS, DLM}	2.34 ^{DLDS}	2.94 ^{DLDS, DLM}	----	<1.00 ^{DLDS}
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	----	<0.0020	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	----	0.718	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	246 ^{DLDS, DLM}	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	<0.400 ^{DLDS, DLM}	----	----
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	0.479 ^{DLDS, DLM}	----	----
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	<0.200 ^{DLDS, DLM}	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	134 ^{DLDS, DLM}	135 ^{DLDS}	125 ^{DLDS, DLM}	79.9 ^{DLDS}	85.2 ^{DLDS}
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	0.479	----	----
Ion Balance									
anion sum	----	EC101	0.10	meq/L	----	----	12.7	----	----
cation sum	----	EC101	0.10	meq/L	----	----	12.9	----	----
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	0.781	----	----
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	102	----	----
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	0.0170	----	----
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	0.00621	----	----
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	0.00161	----	----
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	0.0331	----	----
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	----	<0.000020	----	----
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	----	<0.000050	----	----



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					02-IF-PAG_W6	02-IF-PAG_W7	02-IF-PAG_W8	03-SED-PAG_W 5	03-SED-PAG_W 6
Client sampling date / time					25-Feb-2021 11:05	04-Mar-2021 10:35	11-Mar-2021 13:55	18-Feb-2021 13:50	25-Feb-2021 13:05
Analyte	CAS Number	Method	LOR	Unit	SK2100585-006	SK2100585-007	SK2100585-008	SK2100585-009	SK2100585-010
					Result	Result	Result	Result	Result
Dissolved Metals									
boron, dissolved	7440-42-8	E421	0.010	mg/L	---	---	0.117	---	---
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	---	---	0.0000109	---	---
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	15.2	---	---
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	0.000130	---	---
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	---	0.00239	---	---
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	0.00074	---	---
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	0.00372	---	---
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	<0.030	---	---
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	<0.000050	---	---
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	0.0099	---	---
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	8.33	---	---
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	0.00651	---	---
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	0.0100	---	---
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	---	0.00199	---	---
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	<0.050	---	---
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	10.6	---	---
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	0.0112	---	---
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	0.00325	---	---
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	3.60	---	---
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	<0.000010	---	---
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	257	---	---
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	0.0911	---	---
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	48.3	---	---
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	<0.00020	---	---
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	0.000012	---	---
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	<0.00010	---	---
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	0.00653	---	---
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	---	<0.00030	---	---
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	---	0.00505	---	---
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	---	0.0133	---	---
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	---	<0.00050	---	---



Analytical Results

Sub-Matrix: Leachate

(Matrix: Water)

					Client sample ID	02-IF-PAG_W6	02-IF-PAG_W7	02-IF-PAG_W8	03-SED-PAG_W 5	03-SED-PAG_W 6
					Client sampling date / time	25-Feb-2021 11:05	04-Mar-2021 10:35	11-Mar-2021 13:55	18-Feb-2021 13:50	25-Feb-2021 13:05
Analyte	CAS Number	Method	LOR	Unit	SK2100585-006	SK2100585-007	SK2100585-008	SK2100585-009	SK2100585-010	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	----	0.0447	----	----	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	----	<0.00030	----	----	
dissolved metals filtration location	----	EP421	-	-	----	----	Field	----	----	

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



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					03-SED-PAG_W 7	03-SED-PAG_W 8	04-GAB-NPAG- W5	04-GAB-NPAG- W6	04-GAB-NPAG- W7
Client sampling date / time					04-Mar-2021 11:05	11-Mar-2021 14:10	18-Feb-2021 14:00	25-Feb-2021 13:20	04-Mar-2021 11:15
Analyte	CAS Number	Method	LOR	Unit	SK2100585-011	SK2100585-012	SK2100585-013	SK2100585-014	SK2100585-015
					Result	Result	Result	Result	Result
Physical Tests									
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	----	107	----	----	----
conductivity	----	E100	2.0	µS/cm	----	1540	----	----	----
pH	----	E108	0.10	pH units	----	8.18	----	----	----
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	173	----	----	----
bicarbonate	71-52-3	E290	1.0	mg/L	----	211	----	----	----
carbonate	3812-32-6	E290	1.0	mg/L	----	<1.0	----	----	----
hydroxide	14280-30-9	E290	1.0	mg/L	----	<1.0	----	----	----
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	852	----	----	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	0.0111	----	----	----
bromide	24959-67-9	E235.Br	0.10	mg/L	1.25 ^{DLDS}	1.80 ^{DLDS}	----	<0.50 ^{DLDS}	0.75 ^{DLDS}
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	0.0080	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	0.396	----	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	312 ^{DLDS}	----	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L	----	0.532 ^{DLDS}	----	----	----
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	<0.100 ^{DLDS}	----	----	----
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	<0.050 ^{DLDS}	----	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	90.0 ^{DLDS}	90.1 ^{DLDS}	50.3 ^{DLDS}	52.7 ^{DLDS}	55.1 ^{DLDS}
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	<0.112	----	----	----
Ion Balance									
anion sum	----	EC101	0.10	meq/L	----	14.2	----	----	----
cation sum	----	EC101	0.10	meq/L	----	15.0	----	----	----
ion balance (cation-anion difference)	----	EC101	0.010	%	----	2.74	----	----	----
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	106	----	----	----
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	0.0247	----	----	----
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	0.00206	----	----	----
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	0.00212	----	----	----
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	0.0326	----	----	----
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	<0.000020	----	----	----
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	<0.000050	----	----	----



Analytical Results

Sub-Matrix: Leachate

(Matrix: Water)

Client sample ID

					03-SED-PAG_W 7	03-SED-PAG_W 8	04-GAB-NPAG- W5	04-GAB-NPAG- W6	04-GAB-NPAG- W7
Client sampling date / time					04-Mar-2021 11:05	11-Mar-2021 14:10	18-Feb-2021 14:00	25-Feb-2021 13:20	04-Mar-2021 11:15
Analyte	CAS Number	Method	LOR	Unit	SK2100585-011	SK2100585-012	SK2100585-013	SK2100585-014	SK2100585-015
					Result	Result	Result	Result	Result
Dissolved Metals									
boron, dissolved	7440-42-8	E421	0.010	mg/L	---	0.085	---	---	---
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	---	<0.000050 ^{DLM}	---	---	---
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	22.8	---	---	---
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	0.000070	---	---	---
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	0.00349	---	---	---
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	0.00042	---	---	---
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	0.00246	---	---	---
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	<0.030	---	---	---
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	<0.000050	---	---	---
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	0.0192	---	---	---
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	12.2	---	---	---
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	0.0111	---	---	---
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	0.0784	---	---	---
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	0.00203	---	---	---
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	<0.050	---	---	---
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	15.7	---	---	---
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	0.00528	---	---	---
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	0.00533	---	---	---
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	3.32	---	---	---
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	<0.000010	---	---	---
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	286	---	---	---
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	0.112	---	---	---
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	35.5	---	---	---
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	<0.00020	---	---	---
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	0.000020	---	---	---
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	<0.00010	---	---	---
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	0.00389	---	---	---
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	<0.00030	---	---	---
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	0.00060	---	---	---
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	0.00595	---	---	---
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	<0.00050	---	---	---



Analytical Results

Sub-Matrix: Leachate

(Matrix: Water)

					Client sample ID	03-SED-PAG_W 7	03-SED-PAG_W 8	04-GAB-NPAG- W5	04-GAB-NPAG- W6	04-GAB-NPAG- W7
					Client sampling date / time	04-Mar-2021 11:05	11-Mar-2021 14:10	18-Feb-2021 14:00	25-Feb-2021 13:20	04-Mar-2021 11:15
Analyte	CAS Number	Method	LOR	Unit	SK2100585-011	SK2100585-012	SK2100585-013	SK2100585-014	SK2100585-015	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	0.0212	----	----	----	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	<0.00030	----	----	----	
dissolved metals filtration location	----	EP421	-	-	----	Field	----	----	----	

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



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					04-GAB-NPAG-W8	05-SED-NPAG-W5	05-SED-NPAG-W6	05-SED-NPAG-W7	05-SED-NPAG-W8
Client sampling date / time					11-Mar-2021 14:20	18-Feb-2021 14:15	25-Feb-2021 13:45	04-Mar-2021 11:40	11-Mar-2021 14:35
Analyte	CAS Number	Method	LOR	Unit	SK2100585-016	SK2100585-017	SK2100585-018	SK2100585-019	SK2100585-020
					Result	Result	Result	Result	Result
Physical Tests									
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	50.7	----	----	----	79.6
conductivity	----	E100	2.0	µS/cm	1360	----	----	----	1220
pH	----	E108	0.10	pH units	8.32	----	----	----	8.21
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	236	----	----	----	165
bicarbonate	71-52-3	E290	1.0	mg/L	287	----	----	----	202
carbonate	3812-32-6	E290	1.0	mg/L	<1.0	----	----	----	<1.0
hydroxide	14280-30-9	E290	1.0	mg/L	<1.0	----	----	----	<1.0
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	746	----	----	----	671
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0452	----	----	----	0.0571
bromide	24959-67-9	E235.Br	0.10	mg/L	1.92 ^{DLDS}	----	<0.50 ^{DLDS}	1.16 ^{DLDS}	1.74 ^{DLDS}
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	----	----	----	<0.0020
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	1.18	----	----	----	1.81
chloride	16887-00-6	E235.Cl	0.50	mg/L	244 ^{DLDS}	----	----	----	248 ^{DLDS}
fluoride	16984-48-8	E235.F	0.020	mg/L	0.434 ^{DLDS}	----	----	----	0.535 ^{DLDS}
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	0.220 ^{DLDS}	----	----	----	<0.100 ^{DLDS}
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.100 ^{DLDS}	----	----	----	<0.050 ^{DLDS}
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	48.4 ^{DLDS}	47.7 ^{DLDS}	48.7 ^{DLDS}	49.4 ^{DLDS}	48.8 ^{DLDS}
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	<0.224	----	----	----	<0.112
Ion Balance									
anion sum	----	EC101	0.10	meq/L	12.6	----	----	----	11.3
cation sum	----	EC101	0.10	meq/L	13.3	----	----	----	11.8
ion balance (cation-anion difference)	----	EC101	0.010	%	2.70	----	----	----	2.16
ion balance (cations/anions ratio)	----	EC101	0.010	%	106	----	----	----	104
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0255	----	----	----	0.0397
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00274	----	----	----	0.00200
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00909	----	----	----	0.0641
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0290	----	----	----	0.0291
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	----	----	----	<0.000020
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	----	----	----	<0.000050



Analytical Results

Sub-Matrix: Leachate

(Matrix: Water)

Client sample ID

					04-GAB-NPAG-W8	05-SED-NPAG-W5	05-SED-NPAG-W6	05-SED-NPAG-W7	05-SED-NPAG-W8
Client sampling date / time					11-Mar-2021 14:20	18-Feb-2021 14:15	25-Feb-2021 13:45	04-Mar-2021 11:40	11-Mar-2021 14:35
Analyte	CAS Number	Method	LOR	Unit	SK2100585-016	SK2100585-017	SK2100585-018	SK2100585-019	SK2100585-020
					Result	Result	Result	Result	Result
Dissolved Metals									
boron, dissolved	7440-42-8	E421	0.010	mg/L	0.131	----	----	----	0.097
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	0.000061	----	----	----	0.0000174
calcium, dissolved	7440-70-2	E421	0.050	mg/L	11.8	----	----	----	16.4
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000410	----	----	----	0.000109
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	0.00542	----	----	----	0.00379
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00082	----	----	----	0.00074
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00440	----	----	----	0.00277
iron, dissolved	7439-89-6	E421	0.030	mg/L	<0.030	----	----	----	<0.030
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	----	----	----	<0.000050
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0156	----	----	----	0.0147
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	5.15	----	----	----	9.38
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	0.0224	----	----	----	0.00942
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.0138	----	----	----	0.0236
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00302	----	----	----	0.00385
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	----	----	----	<0.050
potassium, dissolved	7440-09-7	E421	0.050	mg/L	9.41	----	----	----	14.9
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00862	----	----	----	0.00628
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.00497	----	----	----	0.00334
silicon, dissolved	7440-21-3	E421	0.050	mg/L	3.16	----	----	----	3.15
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	----	----	----	<0.000010
sodium, dissolved	17341-25-2	E421	0.050	mg/L	276	----	----	----	225
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0440	----	----	----	0.0814
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	20.4	----	----	----	19.4
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	----	----	----	<0.00020
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.000037	----	----	----	0.000018
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	----	----	----	<0.00010
tin, dissolved	7440-31-5	E421	0.00010	mg/L	0.00363	----	----	----	0.00643
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	----	----	----	<0.00030
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	0.00270	----	----	----	0.00160
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.0178	----	----	----	0.00684
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	0.00560	----	----	----	0.00141



Analytical Results

Sub-Matrix: Leachate

(Matrix: Water)

					Client sample ID	04-GAB-NPAG-W8	05-SED-NPAG_W5	05-SED-NPAG_W6	05-SED-NPAG_W7	05-SED-NPAG_W8
					Client sampling date / time	11-Mar-2021 14:20	18-Feb-2021 14:15	25-Feb-2021 13:45	04-Mar-2021 11:40	11-Mar-2021 14:35
Analyte	CAS Number	Method	LOR	Unit	SK2100585-016	SK2100585-017	SK2100585-018	SK2100585-019	SK2100585-020	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.114	----	----	----	----	0.0567
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	----	----	----	----	<0.00030
dissolved metals filtration location	----	EP421	-	-	Field	----	----	----	----	Field

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



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					06-IF-NPAG_W5	06-IF-NPAG_W6	06-IF-NPAG_W7	06-IF-NPAG_W8	07-IF-PAG-CW_W5
Client sampling date / time					18-Feb-2021 14:25	25-Feb-2021 13:50	04-Mar-2021 11:50	11-Mar-2021 15:15	18-Feb-2021
Analyte	CAS Number	Method	LOR	Unit	SK2100585-021	SK2100585-022	SK2100585-023	SK2100585-024	SK2100585-025
					Result	Result	Result	Result	Result
Physical Tests									
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	----	----	----	96.7	----
conductivity	----	E100	2.0	µS/cm	----	----	----	1180	----
pH	----	E108	0.10	pH units	----	----	----	8.17	----
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	----	158	----
bicarbonate	71-52-3	E290	1.0	mg/L	----	----	----	193	----
carbonate	3812-32-6	E290	1.0	mg/L	----	----	----	<1.0	----
hydroxide	14280-30-9	E290	1.0	mg/L	----	----	----	<1.0	----
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	----	656	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	----	0.0095	----
bromide	24959-67-9	E235.Br	0.10	mg/L	----	<0.50 ^{DLDS}	0.63 ^{DLDS}	1.56 ^{DLDS}	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	----	----	<0.0020	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	----	----	0.569	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	----	231 ^{DLDS}	----
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	----	0.403 ^{DLDS}	----
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	----	<0.100 ^{DLDS}	----
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	----	<0.050 ^{DLDS}	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	67.1 ^{DLDS}	66.6 ^{DLDS}	66.1 ^{DLDS}	61.0 ^{DLDS}	2450 ^{DLDS}
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	----	<0.112	----
Ion Balance									
anion sum	----	EC101	0.10	meq/L	----	----	----	11.0	----
cation sum	----	EC101	0.10	meq/L	----	----	----	11.4	----
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	----	1.78	----
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	----	104	----
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	----	0.0071	----
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	----	0.00565	----
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	----	0.00157	----
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	----	0.0399	----
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	----	----	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	----	----	<0.000050	----



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					06-IF-NPAG_W5	06-IF-NPAG_W6	06-IF-NPAG_W7	06-IF-NPAG_W8	07-IF-PAG-CW_W5
Client sampling date / time					18-Feb-2021 14:25	25-Feb-2021 13:50	04-Mar-2021 11:50	11-Mar-2021 15:15	18-Feb-2021
Analyte	CAS Number	Method	LOR	Unit	SK2100585-021	SK2100585-022	SK2100585-023	SK2100585-024	SK2100585-025
					Result	Result	Result	Result	Result
Dissolved Metals									
boron, dissolved	7440-42-8	E421	0.010	mg/L	---	---	---	0.141	---
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	---	---	---	0.000087	---
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	---	21.9	---
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	---	0.000150	---
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	---	---	0.00201	---
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	---	<0.00010	---
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	---	0.00209	---
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	---	<0.030	---
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	---	<0.000050	---
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	---	0.0225	---
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	---	10.2	---
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	---	0.00639	---
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	---	0.00988	---
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	---	---	0.00171	---
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	---	<0.050	---
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	---	20.2	---
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	---	0.0143	---
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	---	0.00344	---
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	---	4.12	---
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	---	<0.000010	---
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	---	205	---
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	---	0.173	---
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	---	23.5	---
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	---	<0.00020	---
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	---	0.000018	---
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	---	<0.00010	---
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	---	0.00541	---
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	---	---	<0.00030	---
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	---	---	0.00173	---
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	---	---	0.00513	---
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	---	---	<0.00050	---



Analytical Results

Sub-Matrix: Leachate

(Matrix: Water)

					Client sample ID	06-IF-NPAG_W5	06-IF-NPAG_W6	06-IF-NPAG_W7	06-IF-NPAG_W8	07-IF-PAG-CW_W5
					Client sampling date / time	18-Feb-2021 14:25	25-Feb-2021 13:50	04-Mar-2021 11:50	11-Mar-2021 15:15	18-Feb-2021
Analyte	CAS Number	Method	LOR	Unit	SK2100585-021	SK2100585-022	SK2100585-023	SK2100585-024	SK2100585-025	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	----	----	0.0409	----	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	----	----	<0.00030	----	
dissolved metals filtration location	----	EP421	-	-	----	----	----	Field	----	

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



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					07-IF-PAG-CW_ W6	07-IF-PAG-CW_ W7	07-IF-PAG-CW_ W8	08-SED-PAG-C W_W5	08-SED-PAG-C W_W6
Client sampling date / time					25-Feb-2021 14:00	04-Mar-2021 13:00	11-Mar-2021 14:55	18-Feb-2021 15:20	25-Feb-2021 14:15
Analyte	CAS Number	Method	LOR	Unit	SK2100585-026	SK2100585-027	SK2100585-028	SK2100585-029	SK2100585-030
					Result	Result	Result	Result	Result
Physical Tests									
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	----	----	11600	----	----
conductivity	----	E100	2.0	µS/cm	----	----	65700	----	----
pH	----	E108	0.10	pH units	----	----	7.48	----	----
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	69.8	----	----
bicarbonate	71-52-3	E290	1.0	mg/L	----	----	85.1	----	----
carbonate	3812-32-6	E290	1.0	mg/L	----	----	<1.0	----	----
hydroxide	14280-30-9	E290	1.0	mg/L	----	----	<1.0	----	----
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	47300	----	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	2.25 ^{DLM}	----	----
bromide	24959-67-9	E235.Br	0.10	mg/L	96.3 ^{DLDS}	122 ^{DLDS}	305 ^{DLDS}	----	101 ^{DLDS}
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	----	<0.0020	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	----	29.6 ^{DLHC}	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	27400 ^{DLDS}	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	<6.00 ^{DLDS}	----	----
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	<6.00 ^{DLDS}	----	----
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	<3.00 ^{DLDS}	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	2610 ^{DLDS}	2630 ^{DLDS}	2750 ^{DLDS}	2600 ^{DLDS}	2740 ^{DLDS}
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	<6.71	----	----
Ion Balance									
anion sum	----	EC101	0.10	meq/L	----	----	832	----	----
cation sum	----	EC101	0.10	meq/L	----	----	816	----	----
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	0.971	----	----
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	98.1	----	----
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	<0.0500 ^{DLDS}	----	----
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	<0.00500 ^{DLDS}	----	----
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	<0.00500 ^{DLDS}	----	----
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	0.248 ^{DLDS}	----	----
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	----	<0.00100 ^{DLDS}	----	----
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	----	<0.00250 ^{DLDS}	----	----



Analytical Results

Sub-Matrix: Leachate
 (Matrix: Water)

Client sample ID

					07-IF-PAG-CW_ W6	07-IF-PAG-CW_ W7	07-IF-PAG-CW_ W8	08-SED-PAG-C W_W5	08-SED-PAG-C W_W6
Client sampling date / time					25-Feb-2021 14:00	04-Mar-2021 13:00	11-Mar-2021 14:55	18-Feb-2021 15:20	25-Feb-2021 14:15
Analyte	CAS Number	Method	LOR	Unit	SK2100585-026	SK2100585-027	SK2100585-028	SK2100585-029	SK2100585-030
					Result	Result	Result	Result	Result
Dissolved Metals									
boron, dissolved	7440-42-8	E421	0.010	mg/L	---	---	0.792 ^{DLDS}	---	---
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	---	---	0.000948 ^{DLDS}	---	---
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	1570 ^{DLDS}	---	---
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	0.0124 ^{DLDS}	---	---
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	---	<0.0250 ^{DLDS}	---	---
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	<0.00500 ^{DLDS}	---	---
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	<0.0100 ^{DLDS}	---	---
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	<1.50 ^{DLDS}	---	---
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	<0.00250 ^{DLDS}	---	---
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	0.257 ^{DLDS}	---	---
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	1870 ^{DLDS}	---	---
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	0.354 ^{DLDS}	---	---
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	0.00942 ^{DLDS}	---	---
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	---	0.0627 ^{DLDS}	---	---
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	<2.50 ^{DLDS}	---	---
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	557 ^{DLDS}	---	---
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	0.537 ^{DLDS}	---	---
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	0.00311 ^{DLDS}	---	---
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	3.55 ^{DLDS}	---	---
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	0.000588 ^{DLDS}	---	---
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	13100 ^{DLDS}	---	---
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	30.8 ^{DLDS}	---	---
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	1020 ^{DLDS}	---	---
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	<0.0100 ^{DLDS}	---	---
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	<0.000500 ^{DLDS}	---	---
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	<0.00500 ^{DLDS}	---	---
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	<0.00500 ^{DLDS}	---	---
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	---	<0.0150 ^{DLDS}	---	---
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	---	<0.00500 ^{DLDS}	---	---
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	---	0.0297 ^{DLDS}	---	---
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	---	<0.0250 ^{DLDS}	---	---



Analytical Results

Sub-Matrix: Leachate

(Matrix: Water)

					Client sample ID	07-IF-PAG-CW_ W6	07-IF-PAG-CW_ W7	07-IF-PAG-CW_ W8	08-SED-PAG-C W_W5	08-SED-PAG-C W_W6
					Client sampling date / time	25-Feb-2021 14:00	04-Mar-2021 13:00	11-Mar-2021 14:55	18-Feb-2021 15:20	25-Feb-2021 14:15
Analyte	CAS Number	Method	LOR	Unit	SK2100585-026	SK2100585-027	SK2100585-028	SK2100585-029	SK2100585-030	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	----	0.266 ^{DLDS}	----	----	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	----	<0.0150 ^{DLDS}	----	----	
dissolved metals filtration location	----	EP421	-	-	----	----	Field	----	----	

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



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					08-SED-PAG-C W_W7	08-SED-PAG-C W_W8	09-FZONE-NPA G_W5	09-FZONE-NPA G_W6	09-FZONE-NPA G_W7
Client sampling date / time					04-Mar-2021 13:05	11-Mar-2021 15:05	18-Feb-2021 10:25	25-Feb-2021 14:25	04-Mar-2021 13:30
Analyte	CAS Number	Method	LOR	Unit	SK2100585-031	SK2100585-032	SK2100585-033	SK2100585-034	SK2100585-035
					Result	Result	Result	Result	Result
Physical Tests									
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	----	12500	----	----	----
conductivity	----	E100	2.0	µS/cm	----	70100	----	----	----
pH	----	E108	0.10	pH units	----	7.39	----	----	----
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	57.2	----	----	----
bicarbonate	71-52-3	E290	1.0	mg/L	----	69.8	----	----	----
carbonate	3812-32-6	E290	1.0	mg/L	----	<1.0	----	----	----
hydroxide	14280-30-9	E290	1.0	mg/L	----	<1.0	----	----	----
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	50400	----	----	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	2.83 ^{DLM}	----	----	----
bromide	24959-67-9	E235.Br	0.10	mg/L	375 ^{DLDS}	480 ^{DLDS}	----	<0.50 ^{DLDS}	2.44 ^{DLDS}
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	<0.0020	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	19.5 ^{DLHC}	----	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	29400 ^{DLDS}	----	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L	----	<6.00 ^{DLDS}	----	----	----
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	<6.00 ^{DLDS}	----	----	----
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	<3.00 ^{DLDS}	----	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	2830 ^{DLDS}	2940 ^{DLDS}	69.6 ^{DLDS}	68.2 ^{DLDS}	68.2 ^{DLDS}
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	<6.71	----	----	----
Ion Balance									
anion sum	----	EC101	0.10	meq/L	----	892	----	----	----
cation sum	----	EC101	0.10	meq/L	----	861	----	----	----
ion balance (cation-anion difference)	----	EC101	0.010	%	----	1.77	----	----	----
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	96.5	----	----	----
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	<0.100 ^{DLDS}	----	----	----
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	<0.0100 ^{DLDS}	----	----	----
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	<0.0100 ^{DLDS}	----	----	----
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	0.231 ^{DLDS}	----	----	----
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	<0.00200 ^{DLDS}	----	----	----
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	<0.00500 ^{DLDS}	----	----	----



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					08-SED-PAG-C W_W7	08-SED-PAG-C W_W8	09-FZONE-NPA G_W5	09-FZONE-NPA G_W6	09-FZONE-NPA G_W7
Client sampling date / time					04-Mar-2021 13:05	11-Mar-2021 15:05	18-Feb-2021 10:25	25-Feb-2021 14:25	04-Mar-2021 13:30
Analyte	CAS Number	Method	LOR	Unit	SK2100585-031	SK2100585-032	SK2100585-033	SK2100585-034	SK2100585-035
					Result	Result	Result	Result	Result
Dissolved Metals									
boron, dissolved	7440-42-8	E421	0.010	mg/L	---	<1.00 ^{DLDS}	---	---	---
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	---	0.00289 ^{DLDS}	---	---	---
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	1670 ^{DLDS}	---	---	---
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	0.00756 ^{DLDS}	---	---	---
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	<0.0500 ^{DLDS}	---	---	---
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	0.0285 ^{DLDS}	---	---	---
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	<0.0200 ^{DLDS}	---	---	---
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	<3.00 ^{DLDS}	---	---	---
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	<0.00500 ^{DLDS}	---	---	---
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	0.286 ^{DLDS}	---	---	---
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	2020 ^{DLDS}	---	---	---
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	<0.500 ^{DLDS}	---	---	---
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	0.0290 ^{DLDS}	---	---	---
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	0.236 ^{DLDS}	---	---	---
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	<5.00 ^{DLDS}	---	---	---
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	617 ^{DLDS}	---	---	---
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	0.210 ^{DLDS}	---	---	---
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	<0.00500 ^{DLDS}	---	---	---
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	<5.00 ^{DLDS}	---	---	---
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	0.00125 ^{DLDS}	---	---	---
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	13700 ^{DLDS}	---	---	---
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	35.6 ^{DLDS}	---	---	---
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	1080 ^{DLDS}	---	---	---
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	<0.0200 ^{DLDS}	---	---	---
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	<0.00100 ^{DLDS}	---	---	---
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	<0.0100 ^{DLDS}	---	---	---
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	<0.0100 ^{DLDS}	---	---	---
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	<0.0300 ^{DLDS}	---	---	---
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	<0.0100 ^{DLDS}	---	---	---
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	0.0484 ^{DLDS}	---	---	---
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	<0.0500 ^{DLDS}	---	---	---



Analytical Results

Sub-Matrix: Leachate

(Matrix: Water)

					Client sample ID	08-SED-PAG-C W_W7	08-SED-PAG-C W_W8	09-FZONE-NPA G_W5	09-FZONE-NPA G_W6	09-FZONE-NPA G_W7
					Client sampling date / time	04-Mar-2021 13:05	11-Mar-2021 15:05	18-Feb-2021 10:25	25-Feb-2021 14:25	04-Mar-2021 13:30
Analyte	CAS Number	Method	LOR	Unit	SK2100585-031	SK2100585-032	SK2100585-033	SK2100585-034	SK2100585-035	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	0.734 ^{DLDS}	----	----	----	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	<0.0300 ^{DLDS}	----	----	----	
dissolved metals filtration location	----	EP421	-	-	----	Field	----	----	----	

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



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					09-FZONE-NPA G_W8	10-ROM-SR1_ W5	10-ROM-SR1_ W6	10-ROM-SR1_ W7	10-ROM-SR1_ W8
Client sampling date / time					11-Mar-2021 15:15	18-Feb-2021 10:30	25-Feb-2021 14:35	04-Mar-2021 13:55	11-Mar-2021 15:25
Analyte	CAS Number	Method	LOR	Unit	SK2100585-036	SK2100585-037	SK2100585-038	SK2100585-039	SK2100585-040
					Result	Result	Result	Result	Result
Physical Tests									
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	96.5	218	154	135	132
conductivity	----	E100	2.0	µS/cm	1050	1170	811	632	636
pH	----	E108	0.10	pH units	8.18	7.93	7.95	7.94	7.92
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	142	86.5	82.4	77.9	76.5
bicarbonate	71-52-3	E290	1.0	mg/L	173	106	100	95.1	93.3
carbonate	3812-32-6	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
hydroxide	14280-30-9	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	539	736	493	378	374
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0087	----	----	----	1.54 ^{DLM}
bromide	24959-67-9	E235.Br	0.10	mg/L	2.91 ^{DLDS}	----	0.29 ^{DLDS}	0.23	0.18
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0038	----	----	----	0.0197
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	30.0 ^{DLHC}	----	----	----	0.328
chloride	16887-00-6	E235.Cl	0.50	mg/L	174 ^{DLDS}	185 ^{DLDS}	107 ^{DLDS}	73.0	70.1
fluoride	16984-48-8	E235.F	0.020	mg/L	0.665 ^{DLDS}	0.179 ^{DLDS}	0.188 ^{DLDS}	0.158	0.159
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.040 ^{DLDS}	19.5 ^{DLDS}	11.6 ^{DLDS}	7.88	7.70
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.020 ^{DLDS}	<0.050 ^{DLDS}	0.021 ^{DLDS}	0.017	0.020
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	61.5 ^{DLDS}	152 ^{DLDS}	108 ^{DLDS}	87.5	100
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	<0.0500	19.5	11.6	7.90	7.72
Ion Balance									
anion sum	----	EC101	0.10	meq/L	9.06	11.5	7.75	6.01	6.15
cation sum	----	EC101	0.10	meq/L	9.40	11.9	7.98	6.18	5.72
ion balance (cation-anion difference)	----	EC101	0.010	%	1.84	1.71	1.46	1.39	3.62
ion balance (cations/anions ratio)	----	EC101	0.010	%	104	103	103	103	93.0
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0285	----	----	----	0.0210
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00797	----	----	----	0.00050
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00279	----	----	----	0.0164
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0271	----	----	----	0.0317
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	----	----	----	<0.000020
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	----	----	----	<0.000050



Analytical Results

Sub-Matrix: Leachate

(Matrix: Water)

Client sample ID

					09-FZONE-NPA G_W8	10-ROM-SR1_ W5	10-ROM-SR1_ W6	10-ROM-SR1_ W7	10-ROM-SR1_ W8
Client sampling date / time					11-Mar-2021 15:15	18-Feb-2021 10:30	25-Feb-2021 14:35	04-Mar-2021 13:55	11-Mar-2021 15:25
Analyte	CAS Number	Method	LOR	Unit	SK2100585-036	SK2100585-037	SK2100585-038	SK2100585-039	SK2100585-040
					Result	Result	Result	Result	Result
Dissolved Metals									
boron, dissolved	7440-42-8	E421	0.010	mg/L	0.080	----	----	----	0.462
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	0.000052	----	----	----	0.000072
calcium, dissolved	7440-70-2	E421	0.050	mg/L	20.5	53.0	37.1	34.6	33.0
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000012	----	----	----	0.000099
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	0.00193	----	----	----	<0.00050
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00017	----	----	----	0.00020
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00442	----	----	----	0.00170
iron, dissolved	7439-89-6	E421	0.030	mg/L	<0.030	<0.030	<0.030	<0.030	<0.030
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	----	----	----	0.000065
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0086	----	----	----	0.0048
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	11.0	20.7	14.8	11.8	12.0
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	0.0135	0.0302	0.0246	0.0377	0.0282
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.0113	----	----	----	0.00446
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00262	----	----	----	0.00103
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	----	----	----	<0.050
potassium, dissolved	7440-09-7	E421	0.050	mg/L	11.6	13.1	9.83	7.29	7.61
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00209	----	----	----	0.00466
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.00364	----	----	----	0.000611
silicon, dissolved	7440-21-3	E421	0.050	mg/L	3.57	----	----	----	2.00
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	----	----	----	<0.000010
sodium, dissolved	17341-25-2	E421	0.050	mg/L	165	165	107	75.6	63.9
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0580	----	----	----	0.217
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	23.7	----	----	----	37.5
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	----	----	----	<0.00020
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.000011	----	----	----	<0.000010
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	----	----	----	<0.00010
tin, dissolved	7440-31-5	E421	0.00010	mg/L	0.0300	----	----	----	0.00581
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	----	----	----	<0.00030
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	0.00040	----	----	----	0.00017
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.00280	----	----	----	0.00158
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	0.00092	----	----	----	<0.00050



Analytical Results

Sub-Matrix: Leachate
 (Matrix: Water)

					Client sample ID	09-FZONE-NPA G_W8	10-ROM-SR1_ W5	10-ROM-SR1_ W6	10-ROM-SR1_ W7	10-ROM-SR1_ W8
					Client sampling date / time	11-Mar-2021 15:15	18-Feb-2021 10:30	25-Feb-2021 14:35	04-Mar-2021 13:55	11-Mar-2021 15:25
Analyte	CAS Number	Method	LOR	Unit	SK2100585-036	SK2100585-037	SK2100585-038	SK2100585-039	SK2100585-040	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0020	----	----	----	----	<0.0010
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	----	----	----	----	<0.00030
dissolved metals filtration location	----	EP421	-	-	Field	Laboratory ^{SFP}	Laboratory ^{SFP}	Laboratory ^{SFP}	Laboratory ^{SFP}	Field

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



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					11-ROM-SR2_ W5	11-ROM-SR2_ W6	11-ROM-SR2_ W7	11-ROM-SR2_ W8	----
Client sampling date / time					18-Feb-2021 10:40	25-Feb-2021 14:45	04-Mar-2021 14:05	11-Mar-2021 15:35	----
Analyte	CAS Number	Method	LOR	Unit	SK2100585-041	SK2100585-042	SK2100585-043	SK2100585-044	-----
					Result	Result	Result	Result	---
Physical Tests									
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	165	142	131	114	----
conductivity	----	E100	2.0	µS/cm	826	671	600	539	----
pH	----	E108	0.10	pH units	7.86	7.83	7.85	7.84	----
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	71.2	63.2	59.6	63.8	----
bicarbonate	71-52-3	E290	1.0	mg/L	86.9	77.1	72.8	77.8	----
carbonate	3812-32-6	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	----
hydroxide	14280-30-9	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	----
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	474	385	347	299	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	----	0.0071	----
bromide	24959-67-9	E235.Br	0.10	mg/L	----	0.36	0.30	0.24	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	----	----	<0.0020	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	----	----	4.24 ^{DLHC}	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	155 ^{DLDS}	119	102	82.8	----
fluoride	16984-48-8	E235.F	0.020	mg/L	0.085 ^{DLDS}	0.090	0.092	0.083	----
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	7.02 ^{DLDS}	5.47	4.68	3.75	----
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	0.071 ^{DLDS}	0.061	0.062	0.064	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	71.1 ^{DLDS}	63.6	63.3	59.7	----
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	7.09	5.53	4.74	3.81	----
Ion Balance									
anion sum	----	EC101	0.10	meq/L	7.79	6.34	5.73	5.13	----
cation sum	----	EC101	0.10	meq/L	8.09	6.48	5.79	4.64	----
ion balance (cation-anion difference)	----	EC101	0.010	%	1.89	1.09	0.521	5.02	----
ion balance (cations/anions ratio)	----	EC101	0.010	%	104	102	101	90.4	----
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	----	0.0225	----
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	----	0.00019	----
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	----	0.00740	----
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	----	0.0216	----
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	----	----	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	----	----	<0.000050	----



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					11-ROM-SR2_ W5	11-ROM-SR2_ W6	11-ROM-SR2_ W7	11-ROM-SR2_ W8	----
Client sampling date / time					18-Feb-2021 10:40	25-Feb-2021 14:45	04-Mar-2021 14:05	11-Mar-2021 15:35	----
Analyte	CAS Number	Method	LOR	Unit	SK2100585-041	SK2100585-042	SK2100585-043	SK2100585-044	-----
					Result	Result	Result	Result	---
Dissolved Metals									
boron, dissolved	7440-42-8	E421	0.010	mg/L	---	---	---	0.167	---
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	---	---	---	0.0000102	---
calcium, dissolved	7440-70-2	E421	0.050	mg/L	40.5	35.0	32.1	29.4	---
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	---	0.000034	---
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	---	---	<0.00050	---
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	---	0.00030	---
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	---	0.00162	---
iron, dissolved	7439-89-6	E421	0.030	mg/L	<0.030	<0.030	<0.030	<0.030	---
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	---	<0.000050	---
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	---	0.0076	---
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	15.6	13.2	12.3	10.0	---
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	0.145	0.127	0.118	0.102	---
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	---	0.00163	---
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	---	---	0.00071	---
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	---	<0.050	---
potassium, dissolved	7440-09-7	E421	0.050	mg/L	5.02	4.24	3.85	3.24	---
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	---	0.00137	---
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	---	0.000264	---
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	---	2.50	---
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	---	<0.000010	---
sodium, dissolved	17341-25-2	E421	0.050	mg/L	107	81.1	70.6	51.9	---
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	---	0.120	---
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	---	20.8	---
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	---	<0.00020	---
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	---	<0.000010	---
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	---	<0.00010	---
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	---	0.00869	---
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	---	---	<0.00030	---
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	---	---	0.00035	---
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	---	---	0.000782	---
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	---	---	<0.00050	---



Analytical Results

Sub-Matrix: Leachate (Matrix: Water)					Client sample ID	11-ROM-SR2_ W5	11-ROM-SR2_ W6	11-ROM-SR2_ W7	11-ROM-SR2_ W8	----
Client sampling date / time					18-Feb-2021 10:40	25-Feb-2021 14:45	04-Mar-2021 14:05	11-Mar-2021 15:35	----	
Analyte	CAS Number	Method	LOR	Unit	SK2100585-041	SK2100585-042	SK2100585-043	SK2100585-044	-----	
					Result	Result	Result	Result	---	
Dissolved Metals										
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	----	----	0.0141	----	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	----	----	<0.00030	----	
dissolved metals filtration location	----	EP421	-	-	Laboratory ^{SFP}	Laboratory ^{SFP}	Laboratory ^{SFP}	Field	----	

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

Descriptive Results

Sub-Matrix: Leachate		
Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
Anions and Nutrients		
E318: Kjeldahl nitrogen, total [TKN]	01_TSF_W12 - 04-Mar-2021 10:25	523.236

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: SK2100585	Page	: 1 of 36
Client	: O'Kane Consultants Inc.	Laboratory	: Saskatoon - Environmental
Contact	: Jared Robertson	Account Manager	: Brian Morgan
Address	: 112 - 112 Research Drive Saskatoon SK Canada S7N 3R3	Address	: 819 58 Street East Saskatoon, Saskatchewan Canada S7K 6X5
Telephone	: 250 420 7010	Telephone	: 1 306 221 7147
Project	: 948-021	Date Samples Received	: 11-Mar-2021 16:55
PO	: ----	Issue Date	: 19-Mar-2021 09:30
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: Q83455		
No. of samples received	: 44		
No. of samples analysed	: 44		

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 Services number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- Duplicate outliers occur - please see following pages for full details.
- Matrix Spike outliers occur - please see following pages for full details.
- 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.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Duplicate (DUP) RPDs								
Anions and Nutrients	SK2100585-003	01_TSF_W12	chloride	16887-00-6	E235.Cl	68.1 %	20%	Duplicate RPD does not meet the DQO for this test.
Anions and Nutrients	SK2100585-003	01_TSF_W12	nitrate (as N)	14797-55-8	E235.NO3	68.3 %	20%	Duplicate RPD does not meet the DQO for this test.
Anions and Nutrients	SK2100585-003	01_TSF_W12	sulfate (as SO4)	14808-79-8	E235.SO4	67.9 %	20%	Duplicate RPD does not meet the DQO for this test.
Matrix Spike (MS) Recoveries								
Anions and Nutrients	SK2100585-028	07-IF-PAG-CW_W8	fluoride	16984-48-8	E235.F	65.6 % ^K	75.0-125%	Recovery less than lower data quality objective

Result Qualifiers

Qualifier	Description
K	Matrix Spike recovery outside ALS DQO due to sample matrix effects.



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 15:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 15:00 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		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 01-TSF_W12	E298	04-Mar-2021	17-Mar-2021	28 days	13 days	✓	17-Mar-2021	14 days	0 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 02-IF-PAG_W8	E298	11-Mar-2021	17-Mar-2021	28 days	5 days	✓	17-Mar-2021	22 days	0 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 03-SED-PAG_W8	E298	11-Mar-2021	17-Mar-2021	28 days	5 days	✓	17-Mar-2021	22 days	0 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 04-GAB-NPAG-W8	E298	11-Mar-2021	17-Mar-2021	28 days	5 days	✓	17-Mar-2021	22 days	0 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 05-SED-NPAG_W8	E298	11-Mar-2021	17-Mar-2021	28 days	5 days	✓	17-Mar-2021	22 days	0 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 06-IF-NPAG_W8	E298	11-Mar-2021	17-Mar-2021	28 days	5 days	✓	17-Mar-2021	22 days	0 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 07-IF-PAG-CW_W8	E298	11-Mar-2021	17-Mar-2021	28 days	5 days	✓	17-Mar-2021	22 days	0 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 08-SED-PAG-CW_W8	E298	11-Mar-2021	17-Mar-2021	28 days	5 days	✓	17-Mar-2021	22 days	0 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 09-FZONE-NPAG_W8	E298	11-Mar-2021	17-Mar-2021	28 days	5 days	✓	17-Mar-2021	22 days	0 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 10-ROM-SR1_W8	E298	11-Mar-2021	17-Mar-2021	28 days	5 days	✓	17-Mar-2021	22 days	0 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 11-ROM-SR2_W8	E298	11-Mar-2021	17-Mar-2021	28 days	5 days	✓	17-Mar-2021	22 days	0 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 01_TSF_W13	E235.Br	11-Mar-2021	----	----	----		12-Mar-2021	28 days	1 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 02-IF-PAG_W8	E235.Br	11-Mar-2021	----	----	----		12-Mar-2021	28 days	1 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 03-SED-PAG_W8	E235.Br	11-Mar-2021	----	----	----		12-Mar-2021	28 days	1 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 04-GAB-NPAG-W8	E235.Br	11-Mar-2021	----	----	----		12-Mar-2021	28 days	1 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 05-SED-NPAG_W8	E235.Br	11-Mar-2021	----	----	----		12-Mar-2021	28 days	1 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Bromide in Water by IC											
HDPE 06-IF-NPAG_W8	E235.Br	11-Mar-2021	----	----	----		13-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 07-IF-PAG-CW_W8	E235.Br	11-Mar-2021	----	----	----		13-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 08-SED-PAG-CW_W8	E235.Br	11-Mar-2021	----	----	----		13-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 09-FZONE-NPAG_W8	E235.Br	11-Mar-2021	----	----	----		13-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 10-ROM-SR1_W8	E235.Br	11-Mar-2021	----	----	----		13-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 11-ROM-SR2_W8	E235.Br	11-Mar-2021	----	----	----		13-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 01_TSF_W11	E235.Br	25-Feb-2021	----	----	----		12-Mar-2021	28 days	15 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 02-IF-PAG_W6	E235.Br	25-Feb-2021	----	----	----		12-Mar-2021	28 days	15 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 03-SED-PAG_W6	E235.Br	25-Feb-2021	----	----	----		12-Mar-2021	28 days	15 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Bromide in Water by IC										
HDPE 04-GAB-NPAG-W6	E235.Br	25-Feb-2021	----	----	----		12-Mar-2021	28 days	15 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 05-SED-NPAG_W6	E235.Br	25-Feb-2021	----	----	----		12-Mar-2021	28 days	15 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 06-IF-NPAG_W6	E235.Br	25-Feb-2021	----	----	----		13-Mar-2021	28 days	15 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 07-IF-PAG-CW_W6	E235.Br	25-Feb-2021	----	----	----		13-Mar-2021	28 days	15 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 08-SED-PAG-CW_W6	E235.Br	25-Feb-2021	----	----	----		13-Mar-2021	28 days	15 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 09-FZONE-NPAG_W6	E235.Br	25-Feb-2021	----	----	----		13-Mar-2021	28 days	15 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 10-ROM-SR1_W6	E235.Br	25-Feb-2021	----	----	----		13-Mar-2021	28 days	15 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 11-ROM-SR2_W6	E235.Br	25-Feb-2021	----	----	----		13-Mar-2021	28 days	15 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 01_TSF_W12	E235.Br	04-Mar-2021	----	----	----		12-Mar-2021	28 days	8 days	✔



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Bromide in Water by IC											
HDPE 02-IF-PAG_W7	E235.Br	04-Mar-2021	----	----	----		12-Mar-2021	28 days	8 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 03-SED-PAG_W7	E235.Br	04-Mar-2021	----	----	----		12-Mar-2021	28 days	8 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 04-GAB-NPAG-W7	E235.Br	04-Mar-2021	----	----	----		12-Mar-2021	28 days	8 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 05-SED-NPAG_W7	E235.Br	04-Mar-2021	----	----	----		12-Mar-2021	28 days	8 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 06-IF-NPAG_W7	E235.Br	04-Mar-2021	----	----	----		13-Mar-2021	28 days	8 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 07-IF-PAG-CW_W7	E235.Br	04-Mar-2021	----	----	----		13-Mar-2021	28 days	8 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 08-SED-PAG-CW_W7	E235.Br	04-Mar-2021	----	----	----		13-Mar-2021	28 days	8 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 09-FZONE-NPAG_W7	E235.Br	04-Mar-2021	----	----	----		13-Mar-2021	28 days	8 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 10-ROM-SR1_W7	E235.Br	04-Mar-2021	----	----	----		13-Mar-2021	28 days	8 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Bromide in Water by IC											
HDPE 11-ROM-SR2_W7	E235.Br	04-Mar-2021	----	----	----		13-Mar-2021	28 days	8 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 02-IF-PAG_W8	E235.Cl	11-Mar-2021	----	----	----		12-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 03-SED-PAG_W8	E235.Cl	11-Mar-2021	----	----	----		12-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 04-GAB-NPAG-W8	E235.Cl	11-Mar-2021	----	----	----		12-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 05-SED-NPAG_W8	E235.Cl	11-Mar-2021	----	----	----		12-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 06-IF-NPAG_W8	E235.Cl	11-Mar-2021	----	----	----		13-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 07-IF-PAG-CW_W8	E235.Cl	11-Mar-2021	----	----	----		13-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 08-SED-PAG-CW_W8	E235.Cl	11-Mar-2021	----	----	----		13-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 09-FZONE-NPAG_W8	E235.Cl	11-Mar-2021	----	----	----		13-Mar-2021	28 days	1 days	✔	



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Chloride in Water by IC											
HDPE 10-ROM-SR1_W8	E235.Cl	11-Mar-2021	----	----	----		13-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 11-ROM-SR2_W8	E235.Cl	11-Mar-2021	----	----	----		13-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 10-ROM-SR1_W6	E235.Cl	25-Feb-2021	----	----	----		13-Mar-2021	28 days	15 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 11-ROM-SR2_W6	E235.Cl	25-Feb-2021	----	----	----		13-Mar-2021	28 days	15 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 10-ROM-SR1_W5	E235.Cl	18-Feb-2021	----	----	----		13-Mar-2021	28 days	22 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 11-ROM-SR2_W5	E235.Cl	18-Feb-2021	----	----	----		13-Mar-2021	28 days	22 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 01_TSF_W12	E235.Cl	04-Mar-2021	----	----	----		12-Mar-2021	28 days	8 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 10-ROM-SR1_W7	E235.Cl	04-Mar-2021	----	----	----		13-Mar-2021	28 days	8 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 11-ROM-SR2_W7	E235.Cl	04-Mar-2021	----	----	----		13-Mar-2021	28 days	8 days	✔	



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Fluoride in Water by IC											
HDPE 02-IF-PAG_W8	E235.F	11-Mar-2021	----	----	----		12-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 03-SED-PAG_W8	E235.F	11-Mar-2021	----	----	----		12-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 04-GAB-NPAG-W8	E235.F	11-Mar-2021	----	----	----		12-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 05-SED-NPAG_W8	E235.F	11-Mar-2021	----	----	----		12-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 06-IF-NPAG_W8	E235.F	11-Mar-2021	----	----	----		13-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 07-IF-PAG-CW_W8	E235.F	11-Mar-2021	----	----	----		13-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 08-SED-PAG-CW_W8	E235.F	11-Mar-2021	----	----	----		13-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 09-FZONE-NPAG_W8	E235.F	11-Mar-2021	----	----	----		13-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 10-ROM-SR1_W8	E235.F	11-Mar-2021	----	----	----		13-Mar-2021	28 days	1 days	✔	



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Fluoride in Water by IC											
HDPE 11-ROM-SR2_W8	E235.F	11-Mar-2021	----	----	----		13-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 10-ROM-SR1_W6	E235.F	25-Feb-2021	----	----	----		13-Mar-2021	28 days	15 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 11-ROM-SR2_W6	E235.F	25-Feb-2021	----	----	----		13-Mar-2021	28 days	15 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 10-ROM-SR1_W5	E235.F	18-Feb-2021	----	----	----		13-Mar-2021	28 days	22 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 11-ROM-SR2_W5	E235.F	18-Feb-2021	----	----	----		13-Mar-2021	28 days	22 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 01_TSF_W12	E235.F	04-Mar-2021	----	----	----		12-Mar-2021	28 days	8 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 10-ROM-SR1_W7	E235.F	04-Mar-2021	----	----	----		13-Mar-2021	28 days	8 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 11-ROM-SR2_W7	E235.F	04-Mar-2021	----	----	----		13-Mar-2021	28 days	8 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 02-IF-PAG_W8	E235.NO3	11-Mar-2021	----	----	----		12-Mar-2021	3 days	1 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrate in Water by IC											
HDPE 03-SED-PAG_W8	E235.NO3	11-Mar-2021	----	----	----		12-Mar-2021	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 04-GAB-NPAG-W8	E235.NO3	11-Mar-2021	----	----	----		12-Mar-2021	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 05-SED-NPAG_W8	E235.NO3	11-Mar-2021	----	----	----		12-Mar-2021	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 06-IF-NPAG_W8	E235.NO3	11-Mar-2021	----	----	----		13-Mar-2021	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 07-IF-PAG-CW_W8	E235.NO3	11-Mar-2021	----	----	----		13-Mar-2021	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 08-SED-PAG-CW_W8	E235.NO3	11-Mar-2021	----	----	----		13-Mar-2021	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 09-FZONE-NPAG_W8	E235.NO3	11-Mar-2021	----	----	----		13-Mar-2021	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 10-ROM-SR1_W8	E235.NO3	11-Mar-2021	----	----	----		13-Mar-2021	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 11-ROM-SR2_W8	E235.NO3	11-Mar-2021	----	----	----		13-Mar-2021	3 days	1 days	✔	



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Nitrate in Water by IC										
HDPE 10-ROM-SR1_W6	E235.NO3	25-Feb-2021	----	----	----		13-Mar-2021	3 days	15 days	* EHTR
Anions and Nutrients : Nitrate in Water by IC										
HDPE 11-ROM-SR2_W6	E235.NO3	25-Feb-2021	----	----	----		13-Mar-2021	3 days	15 days	* EHTR
Anions and Nutrients : Nitrate in Water by IC										
HDPE 10-ROM-SR1_W5	E235.NO3	18-Feb-2021	----	----	----		13-Mar-2021	3 days	22 days	* EHTR
Anions and Nutrients : Nitrate in Water by IC										
HDPE 11-ROM-SR2_W5	E235.NO3	18-Feb-2021	----	----	----		13-Mar-2021	3 days	22 days	* EHTR
Anions and Nutrients : Nitrate in Water by IC										
HDPE 01_TSF_W12	E235.NO3	04-Mar-2021	----	----	----		12-Mar-2021	3 days	8 days	* EHTR
Anions and Nutrients : Nitrate in Water by IC										
HDPE 10-ROM-SR1_W7	E235.NO3	04-Mar-2021	----	----	----		13-Mar-2021	3 days	8 days	* EHTR
Anions and Nutrients : Nitrate in Water by IC										
HDPE 11-ROM-SR2_W7	E235.NO3	04-Mar-2021	----	----	----		13-Mar-2021	3 days	8 days	* EHTR
Anions and Nutrients : Nitrite in Water by IC										
HDPE 02-IF-PAG_W8	E235.NO2	11-Mar-2021	----	----	----		12-Mar-2021	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 03-SED-PAG_W8	E235.NO2	11-Mar-2021	----	----	----		12-Mar-2021	3 days	1 days	✓



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrite in Water by IC											
HDPE 04-GAB-NPAG-W8	E235.NO2	11-Mar-2021	----	----	----		12-Mar-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 05-SED-NPAG_W8	E235.NO2	11-Mar-2021	----	----	----		12-Mar-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 06-IF-NPAG_W8	E235.NO2	11-Mar-2021	----	----	----		13-Mar-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 07-IF-PAG-CW_W8	E235.NO2	11-Mar-2021	----	----	----		13-Mar-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 08-SED-PAG-CW_W8	E235.NO2	11-Mar-2021	----	----	----		13-Mar-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 09-FZONE-NPAG_W8	E235.NO2	11-Mar-2021	----	----	----		13-Mar-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 10-ROM-SR1_W8	E235.NO2	11-Mar-2021	----	----	----		13-Mar-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 11-ROM-SR2_W8	E235.NO2	11-Mar-2021	----	----	----		13-Mar-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 10-ROM-SR1_W6	E235.NO2	25-Feb-2021	----	----	----		13-Mar-2021	3 days	15 days	* EHTR	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Nitrite in Water by IC										
HDPE 11-ROM-SR2_W6	E235.NO2	25-Feb-2021	----	----	----		13-Mar-2021	3 days	15 days	* EHTR
Anions and Nutrients : Nitrite in Water by IC										
HDPE 10-ROM-SR1_W5	E235.NO2	18-Feb-2021	----	----	----		13-Mar-2021	3 days	22 days	* EHTR
Anions and Nutrients : Nitrite in Water by IC										
HDPE 11-ROM-SR2_W5	E235.NO2	18-Feb-2021	----	----	----		13-Mar-2021	3 days	22 days	* EHTR
Anions and Nutrients : Nitrite in Water by IC										
HDPE 01_TSF_W12	E235.NO2	04-Mar-2021	----	----	----		12-Mar-2021	3 days	8 days	* EHTR
Anions and Nutrients : Nitrite in Water by IC										
HDPE 10-ROM-SR1_W7	E235.NO2	04-Mar-2021	----	----	----		13-Mar-2021	3 days	8 days	* EHTR
Anions and Nutrients : Nitrite in Water by IC										
HDPE 11-ROM-SR2_W7	E235.NO2	04-Mar-2021	----	----	----		13-Mar-2021	3 days	8 days	* EHTR
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W13	E235.SO4	11-Mar-2021	----	----	----		12-Mar-2021	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 02-IF-PAG_W8	E235.SO4	11-Mar-2021	----	----	----		12-Mar-2021	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 03-SED-PAG_W8	E235.SO4	11-Mar-2021	----	----	----		12-Mar-2021	28 days	1 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Sulfate in Water by IC											
HDPE 04-GAB-NPAG-W8	E235.S04	11-Mar-2021	----	----	----		12-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 05-SED-NPAG_W8	E235.S04	11-Mar-2021	----	----	----		12-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 06-IF-NPAG_W8	E235.S04	11-Mar-2021	----	----	----		13-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 07-IF-PAG-CW_W8	E235.S04	11-Mar-2021	----	----	----		13-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 08-SED-PAG-CW_W8	E235.S04	11-Mar-2021	----	----	----		13-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 09-FZONE-NPAG_W8	E235.S04	11-Mar-2021	----	----	----		13-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 10-ROM-SR1_W8	E235.S04	11-Mar-2021	----	----	----		13-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 11-ROM-SR2_W8	E235.S04	11-Mar-2021	----	----	----		13-Mar-2021	28 days	1 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 01_TSF_W11	E235.S04	25-Feb-2021	----	----	----		12-Mar-2021	28 days	15 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Sulfate in Water by IC										
HDPE 02-IF-PAG_W6	E235.S04	25-Feb-2021	----	----	----		12-Mar-2021	28 days	15 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 03-SED-PAG_W6	E235.S04	25-Feb-2021	----	----	----		12-Mar-2021	28 days	15 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 04-GAB-NPAG-W6	E235.S04	25-Feb-2021	----	----	----		12-Mar-2021	28 days	15 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 05-SED-NPAG_W6	E235.S04	25-Feb-2021	----	----	----		12-Mar-2021	28 days	15 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 06-IF-NPAG_W6	E235.S04	25-Feb-2021	----	----	----		13-Mar-2021	28 days	15 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 07-IF-PAG-CW_W6	E235.S04	25-Feb-2021	----	----	----		13-Mar-2021	28 days	15 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 08-SED-PAG-CW_W6	E235.S04	25-Feb-2021	----	----	----		13-Mar-2021	28 days	15 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 09-FZONE-NPAG_W6	E235.S04	25-Feb-2021	----	----	----		13-Mar-2021	28 days	15 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 10-ROM-SR1_W6	E235.S04	25-Feb-2021	----	----	----		13-Mar-2021	28 days	15 days	✔



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Sulfate in Water by IC										
HDPE 11-ROM-SR2_W6	E235.S04	25-Feb-2021	----	----	----		13-Mar-2021	28 days	15 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W10	E235.S04	18-Feb-2021	----	----	----		12-Mar-2021	28 days	22 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 02-IF-PAG_W5	E235.S04	18-Feb-2021	----	----	----		12-Mar-2021	28 days	22 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 03-SED-PAG_W5	E235.S04	18-Feb-2021	----	----	----		12-Mar-2021	28 days	22 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 04-GAB-NPAG_W5	E235.S04	18-Feb-2021	----	----	----		12-Mar-2021	28 days	22 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 05-SED-NPAG_W5	E235.S04	18-Feb-2021	----	----	----		12-Mar-2021	28 days	22 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 06-IF-NPAG_W5	E235.S04	18-Feb-2021	----	----	----		13-Mar-2021	28 days	22 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 08-SED-PAG-CW_W5	E235.S04	18-Feb-2021	----	----	----		13-Mar-2021	28 days	22 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 09-FZONE-NPAG_W5	E235.S04	18-Feb-2021	----	----	----		13-Mar-2021	28 days	22 days	✔



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Sulfate in Water by IC											
HDPE 10-ROM-SR1_W5	E235.SO4	18-Feb-2021	----	----	----		13-Mar-2021	28 days	22 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 11-ROM-SR2_W5	E235.SO4	18-Feb-2021	----	----	----		13-Mar-2021	28 days	22 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 07-IF-PAG-CW_W5	E235.SO4	18-Feb-2021	----	----	----		13-Mar-2021	28 days	23 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 01_TSF_W12	E235.SO4	04-Mar-2021	----	----	----		12-Mar-2021	28 days	8 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 02-IF-PAG_W7	E235.SO4	04-Mar-2021	----	----	----		12-Mar-2021	28 days	8 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 03-SED-PAG_W7	E235.SO4	04-Mar-2021	----	----	----		12-Mar-2021	28 days	8 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 04-GAB-NPAG-W7	E235.SO4	04-Mar-2021	----	----	----		12-Mar-2021	28 days	8 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 05-SED-NPAG_W7	E235.SO4	04-Mar-2021	----	----	----		12-Mar-2021	28 days	8 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 06-IF-NPAG_W7	E235.SO4	04-Mar-2021	----	----	----		13-Mar-2021	28 days	8 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec Actual		Eval	Analysis Date	Holding Times Rec Actual		Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE 07-IF-PAG-CW_W7	E235.SO4	04-Mar-2021	----	----	----		13-Mar-2021	28 days	8 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 08-SED-PAG-CW_W7	E235.SO4	04-Mar-2021	----	----	----		13-Mar-2021	28 days	8 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 09-FZONE-NPAG_W7	E235.SO4	04-Mar-2021	----	----	----		13-Mar-2021	28 days	8 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 10-ROM-SR1_W7	E235.SO4	04-Mar-2021	----	----	----		13-Mar-2021	28 days	8 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 11-ROM-SR2_W7	E235.SO4	04-Mar-2021	----	----	----		13-Mar-2021	28 days	8 days	✔
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) 01_TSF_W12	E318	04-Mar-2021	15-Mar-2021	28 days	10 days	✔	15-Mar-2021	17 days	0 days	✔
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) 02-IF-PAG_W8	E318	11-Mar-2021	15-Mar-2021	28 days	3 days	✔	15-Mar-2021	24 days	0 days	✔
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) 03-SED-PAG_W8	E318	11-Mar-2021	15-Mar-2021	28 days	3 days	✔	15-Mar-2021	24 days	0 days	✔
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) 04-GAB-NPAG-W8	E318	11-Mar-2021	15-Mar-2021	28 days	3 days	✔	15-Mar-2021	24 days	0 days	✔



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 05-SED-NPAG_W8	E318	11-Mar-2021	15-Mar-2021	28 days	3 days	✔	15-Mar-2021	24 days	0 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 06-IF-NPAG_W8	E318	11-Mar-2021	15-Mar-2021	28 days	3 days	✔	15-Mar-2021	24 days	0 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 07-IF-PAG-CW_W8	E318	11-Mar-2021	15-Mar-2021	28 days	3 days	✔	15-Mar-2021	24 days	0 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 08-SED-PAG-CW_W8	E318	11-Mar-2021	15-Mar-2021	28 days	3 days	✔	15-Mar-2021	24 days	0 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 09-FZONE-NPAG_W8	E318	11-Mar-2021	15-Mar-2021	28 days	3 days	✔	15-Mar-2021	24 days	0 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 10-ROM-SR1_W8	E318	11-Mar-2021	15-Mar-2021	28 days	3 days	✔	15-Mar-2021	24 days	0 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 11-ROM-SR2_W8	E318	11-Mar-2021	15-Mar-2021	28 days	3 days	✔	15-Mar-2021	24 days	0 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 01_TSF_W12	E372-U	04-Mar-2021	17-Mar-2021	28 days	12 days	✔	17-Mar-2021	15 days	0 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 02-IF-PAG_W8	E372-U	11-Mar-2021	17-Mar-2021	28 days	5 days	✔	17-Mar-2021	22 days	0 days	✔	



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 03-SED-PAG_W8	E372-U	11-Mar-2021	17-Mar-2021	28 days	5 days	✔	17-Mar-2021	22 days	0 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 04-GAB-NPAG-W8	E372-U	11-Mar-2021	17-Mar-2021	28 days	5 days	✔	17-Mar-2021	22 days	0 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 05-SED-NPAG_W8	E372-U	11-Mar-2021	17-Mar-2021	28 days	5 days	✔	17-Mar-2021	22 days	0 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 06-IF-NPAG_W8	E372-U	11-Mar-2021	17-Mar-2021	28 days	5 days	✔	17-Mar-2021	22 days	0 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 07-IF-PAG-CW_W8	E372-U	11-Mar-2021	17-Mar-2021	28 days	5 days	✔	17-Mar-2021	22 days	0 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 08-SED-PAG-CW_W8	E372-U	11-Mar-2021	17-Mar-2021	28 days	5 days	✔	17-Mar-2021	22 days	0 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 09-FZONE-NPAG_W8	E372-U	11-Mar-2021	17-Mar-2021	28 days	5 days	✔	17-Mar-2021	22 days	0 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 10-ROM-SR1_W8	E372-U	11-Mar-2021	17-Mar-2021	28 days	5 days	✔	17-Mar-2021	22 days	0 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 11-ROM-SR2_W8	E372-U	11-Mar-2021	17-Mar-2021	28 days	5 days	✔	17-Mar-2021	22 days	0 days	✔	



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Cyanides : Total Cyanide by CFA										
UV inhibited HDPE - total (sodium hydroxide) 01_TSF_W12	E333	04-Mar-2021	----	----	----		18-Mar-2021	14 days	13 days	✔
Cyanides : WAD Cyanide by CFA										
UV inhibited HDPE - total (sodium hydroxide) 01_TSF_W12	E336	04-Mar-2021	----	----	----		18-Mar-2021	14 days	13 days	✔
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE 10-ROM-SR1_W7	E421	04-Mar-2021	15-Mar-2021	180 days	10 days	✔	15-Mar-2021	169 days	0 days	✔
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE 11-ROM-SR2_W7	E421	04-Mar-2021	15-Mar-2021	180 days	10 days	✔	15-Mar-2021	169 days	0 days	✔
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 01_TSF_W12	E421	04-Mar-2021	15-Mar-2021	180 days	11 days	✔	15-Mar-2021	168 days	0 days	✔
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE 10-ROM-SR1_W6	E421	25-Feb-2021	15-Mar-2021	180 days	17 days	✔	15-Mar-2021	162 days	0 days	✔
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE 11-ROM-SR2_W6	E421	25-Feb-2021	15-Mar-2021	180 days	17 days	✔	15-Mar-2021	162 days	0 days	✔
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE 10-ROM-SR1_W5	E421	18-Feb-2021	15-Mar-2021	180 days	25 days	✔	15-Mar-2021	154 days	0 days	✔
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE 11-ROM-SR2_W5	E421	18-Feb-2021	15-Mar-2021	180 days	25 days	✔	15-Mar-2021	154 days	0 days	✔



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 02-IF-PAG_W8	E421	11-Mar-2021	15-Mar-2021	180 days	3 days	✔	15-Mar-2021	176 days	0 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 03-SED-PAG_W8	E421	11-Mar-2021	15-Mar-2021	180 days	3 days	✔	15-Mar-2021	176 days	0 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 04-GAB-NPAG-W8	E421	11-Mar-2021	15-Mar-2021	180 days	3 days	✔	15-Mar-2021	176 days	0 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 05-SED-NPAG_W8	E421	11-Mar-2021	15-Mar-2021	180 days	3 days	✔	15-Mar-2021	176 days	0 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 06-IF-NPAG_W8	E421	11-Mar-2021	15-Mar-2021	180 days	3 days	✔	15-Mar-2021	176 days	0 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 07-IF-PAG-CW_W8	E421	11-Mar-2021	15-Mar-2021	180 days	3 days	✔	15-Mar-2021	176 days	0 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 08-SED-PAG-CW_W8	E421	11-Mar-2021	15-Mar-2021	180 days	3 days	✔	15-Mar-2021	176 days	0 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 09-FZONE-NPAG_W8	E421	11-Mar-2021	15-Mar-2021	180 days	3 days	✔	15-Mar-2021	176 days	0 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 10-ROM-SR1_W8	E421	11-Mar-2021	15-Mar-2021	180 days	3 days	✔	15-Mar-2021	176 days	0 days	✔	



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 11-ROM-SR2_W8	E421	11-Mar-2021	15-Mar-2021	180 days	3 days	✔	15-Mar-2021	176 days	0 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE 02-IF-PAG_W8	E290	11-Mar-2021	----	----	----		12-Mar-2021	14 days	1 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE 03-SED-PAG_W8	E290	11-Mar-2021	----	----	----		12-Mar-2021	14 days	1 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE 04-GAB-NPAG-W8	E290	11-Mar-2021	----	----	----		12-Mar-2021	14 days	1 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE 05-SED-NPAG_W8	E290	11-Mar-2021	----	----	----		12-Mar-2021	14 days	1 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE 06-IF-NPAG_W8	E290	11-Mar-2021	----	----	----		12-Mar-2021	14 days	1 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE 07-IF-PAG-CW_W8	E290	11-Mar-2021	----	----	----		12-Mar-2021	14 days	1 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE 08-SED-PAG-CW_W8	E290	11-Mar-2021	----	----	----		12-Mar-2021	14 days	1 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE 09-FZONE-NPAG_W8	E290	11-Mar-2021	----	----	----		12-Mar-2021	14 days	1 days	✔	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Physical Tests : Alkalinity Species by Titration											
HDPE 10-ROM-SR1_W8	E290	11-Mar-2021	----	----	----		12-Mar-2021	14 days	1 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 11-ROM-SR2_W8	E290	11-Mar-2021	----	----	----		12-Mar-2021	14 days	1 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 10-ROM-SR1_W6	E290	25-Feb-2021	----	----	----		12-Mar-2021	14 days	15 days	* EHTR	
Physical Tests : Alkalinity Species by Titration											
HDPE 11-ROM-SR2_W6	E290	25-Feb-2021	----	----	----		12-Mar-2021	14 days	15 days	* EHTR	
Physical Tests : Alkalinity Species by Titration											
HDPE 10-ROM-SR1_W5	E290	18-Feb-2021	----	----	----		12-Mar-2021	14 days	22 days	* EHTR	
Physical Tests : Alkalinity Species by Titration											
HDPE 11-ROM-SR2_W5	E290	18-Feb-2021	----	----	----		12-Mar-2021	14 days	22 days	* EHTR	
Physical Tests : Alkalinity Species by Titration											
HDPE 01_TSF_W12	E290	04-Mar-2021	----	----	----		12-Mar-2021	14 days	8 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 10-ROM-SR1_W7	E290	04-Mar-2021	----	----	----		12-Mar-2021	14 days	8 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 11-ROM-SR2_W7	E290	04-Mar-2021	----	----	----		12-Mar-2021	14 days	8 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Physical Tests : Conductivity in Water											
HDPE 02-IF-PAG_W8	E100	11-Mar-2021	----	----	----		12-Mar-2021	28 days	1 days	✔	
Physical Tests : Conductivity in Water											
HDPE 03-SED-PAG_W8	E100	11-Mar-2021	----	----	----		12-Mar-2021	28 days	1 days	✔	
Physical Tests : Conductivity in Water											
HDPE 04-GAB-NPAG-W8	E100	11-Mar-2021	----	----	----		12-Mar-2021	28 days	1 days	✔	
Physical Tests : Conductivity in Water											
HDPE 05-SED-NPAG_W8	E100	11-Mar-2021	----	----	----		12-Mar-2021	28 days	1 days	✔	
Physical Tests : Conductivity in Water											
HDPE 06-IF-NPAG_W8	E100	11-Mar-2021	----	----	----		12-Mar-2021	28 days	1 days	✔	
Physical Tests : Conductivity in Water											
HDPE 07-IF-PAG-CW_W8	E100	11-Mar-2021	----	----	----		12-Mar-2021	28 days	1 days	✔	
Physical Tests : Conductivity in Water											
HDPE 08-SED-PAG-CW_W8	E100	11-Mar-2021	----	----	----		12-Mar-2021	28 days	1 days	✔	
Physical Tests : Conductivity in Water											
HDPE 09-FZONE-NPAG_W8	E100	11-Mar-2021	----	----	----		12-Mar-2021	28 days	1 days	✔	
Physical Tests : Conductivity in Water											
HDPE 10-ROM-SR1_W8	E100	11-Mar-2021	----	----	----		12-Mar-2021	28 days	1 days	✔	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Physical Tests : Conductivity in Water											
HDPE 11-ROM-SR2_W8	E100	11-Mar-2021	----	----	----		12-Mar-2021	28 days	1 days	✓	
Physical Tests : Conductivity in Water											
HDPE 10-ROM-SR1_W6	E100	25-Feb-2021	----	----	----		12-Mar-2021	28 days	15 days	✓	
Physical Tests : Conductivity in Water											
HDPE 11-ROM-SR2_W6	E100	25-Feb-2021	----	----	----		12-Mar-2021	28 days	15 days	✓	
Physical Tests : Conductivity in Water											
HDPE 10-ROM-SR1_W5	E100	18-Feb-2021	----	----	----		12-Mar-2021	28 days	22 days	✓	
Physical Tests : Conductivity in Water											
HDPE 11-ROM-SR2_W5	E100	18-Feb-2021	----	----	----		12-Mar-2021	28 days	22 days	✓	
Physical Tests : Conductivity in Water											
HDPE 01_TSF_W12	E100	04-Mar-2021	----	----	----		12-Mar-2021	28 days	8 days	✓	
Physical Tests : Conductivity in Water											
HDPE 10-ROM-SR1_W7	E100	04-Mar-2021	----	----	----		12-Mar-2021	28 days	8 days	✓	
Physical Tests : Conductivity in Water											
HDPE 11-ROM-SR2_W7	E100	04-Mar-2021	----	----	----		12-Mar-2021	28 days	8 days	✓	
Physical Tests : pH by Meter											
HDPE 10-ROM-SR1_W7	E108	04-Mar-2021	----	----	----		12-Mar-2021	0.25 hrs	193 hrs	* EHTR-FM	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Physical Tests : pH by Meter											
HDPE 11-ROM-SR2_W7	E108	04-Mar-2021	----	----	----		12-Mar-2021	0.25 hrs	193 hrs	*	EHTR-FM
Physical Tests : pH by Meter											
HDPE 01_TSF_W12	E108	04-Mar-2021	----	----	----		12-Mar-2021	0.25 hrs	197 hrs	*	EHTR-FM
Physical Tests : pH by Meter											
HDPE 06-IF-NPAG_W8	E108	11-Mar-2021	----	----	----		12-Mar-2021	0.25 hrs	24 hrs	*	EHTR-FM
Physical Tests : pH by Meter											
HDPE 07-IF-PAG-CW_W8	E108	11-Mar-2021	----	----	----		12-Mar-2021	0.25 hrs	24 hrs	*	EHTR-FM
Physical Tests : pH by Meter											
HDPE 08-SED-PAG-CW_W8	E108	11-Mar-2021	----	----	----		12-Mar-2021	0.25 hrs	24 hrs	*	EHTR-FM
Physical Tests : pH by Meter											
HDPE 09-FZONE-NPAG_W8	E108	11-Mar-2021	----	----	----		12-Mar-2021	0.25 hrs	24 hrs	*	EHTR-FM
Physical Tests : pH by Meter											
HDPE 10-ROM-SR1_W8	E108	11-Mar-2021	----	----	----		12-Mar-2021	0.25 hrs	24 hrs	*	EHTR-FM
Physical Tests : pH by Meter											
HDPE 11-ROM-SR2_W8	E108	11-Mar-2021	----	----	----		12-Mar-2021	0.25 hrs	24 hrs	*	EHTR-FM
Physical Tests : pH by Meter											
HDPE 02-IF-PAG_W8	E108	11-Mar-2021	----	----	----		12-Mar-2021	0.25 hrs	25 hrs	*	EHTR-FM



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : pH by Meter										
HDPE 03-SED-PAG_W8	E108	11-Mar-2021	----	----	----		12-Mar-2021	0.25 hrs	25 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 04-GAB-NPAG-W8	E108	11-Mar-2021	----	----	----		12-Mar-2021	0.25 hrs	25 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 05-SED-NPAG_W8	E108	11-Mar-2021	----	----	----		12-Mar-2021	0.25 hrs	25 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 10-ROM-SR1_W6	E108	25-Feb-2021	----	----	----		12-Mar-2021	0.25 hrs	361 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 11-ROM-SR2_W6	E108	25-Feb-2021	----	----	----		12-Mar-2021	0.25 hrs	361 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 10-ROM-SR1_W5	E108	18-Feb-2021	----	----	----		12-Mar-2021	0.25 hrs	533 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 11-ROM-SR2_W5	E108	18-Feb-2021	----	----	----		12-Mar-2021	0.25 hrs	533 hrs	* EHTR-FM

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
 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	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	162513	1	18	5.5	5.0	✔
Ammonia by Fluorescence	E298	164684	1	13	7.6	5.0	✔
Bromide in Water by IC	E235.Br	162468	3	35	8.5	5.0	✔
Chloride in Water by IC	E235.Cl	162471	3	32	9.3	5.0	✔
Conductivity in Water	E100	162512	1	20	5.0	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	163454	2	34	5.8	5.0	✔
Fluoride in Water by IC	E235.F	162469	3	31	9.6	5.0	✔
Nitrate in Water by IC	E235.NO3	162472	3	31	9.6	5.0	✔
Nitrite in Water by IC	E235.NO2	162470	3	31	9.6	5.0	✔
pH by Meter	E108	162511	1	20	5.0	5.0	✔
Sulfate in Water by IC	E235.SO4	162467	3	58	5.1	5.0	✔
Total Cyanide by CFA	E333	163365	1	14	7.1	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	163122	1	20	5.0	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	163565	2	28	7.1	5.0	✔
WAD Cyanide by CFA	E336	163366	1	14	7.1	5.0	✔
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	162513	1	18	5.5	5.0	✔
Ammonia by Fluorescence	E298	164684	1	13	7.6	5.0	✔
Bromide in Water by IC	E235.Br	162468	3	35	8.5	5.0	✔
Chloride in Water by IC	E235.Cl	162471	3	32	9.3	5.0	✔
Conductivity in Water	E100	162512	1	20	5.0	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	163454	2	34	5.8	5.0	✔
Fluoride in Water by IC	E235.F	162469	3	31	9.6	5.0	✔
Nitrate in Water by IC	E235.NO3	162472	3	31	9.6	5.0	✔
Nitrite in Water by IC	E235.NO2	162470	3	31	9.6	5.0	✔
pH by Meter	E108	162511	1	20	5.0	5.0	✔
Sulfate in Water by IC	E235.SO4	162467	3	58	5.1	5.0	✔
Total Cyanide by CFA	E333	163365	1	14	7.1	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	163122	1	20	5.0	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	163565	2	28	7.1	5.0	✔
WAD Cyanide by CFA	E336	163366	1	14	7.1	5.0	✔
Method Blanks (MB)							
Alkalinity Species by Titration	E290	162513	1	18	5.5	5.0	✔
Ammonia by Fluorescence	E298	164684	1	13	7.6	5.0	✔
Bromide in Water by IC	E235.Br	162468	3	35	8.5	5.0	✔
Chloride in Water by IC	E235.Cl	162471	3	32	9.3	5.0	✔
Conductivity in Water	E100	162512	1	20	5.0	5.0	✔



Matrix: **Water**

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
<i>Analytical Methods</i>							
Method Blanks (MB) - Continued							
Dissolved Metals in Water by CRC ICPMS	E421	163454	2	34	5.8	5.0	✓
Fluoride in Water by IC	E235.F	162469	3	31	9.6	5.0	✓
Nitrate in Water by IC	E235.NO3	162472	3	31	9.6	5.0	✓
Nitrite in Water by IC	E235.NO2	162470	3	31	9.6	5.0	✓
Sulfate in Water by IC	E235.SO4	162467	3	58	5.1	5.0	✓
Total Cyanide by CFA	E333	163365	1	14	7.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	163122	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	163565	2	28	7.1	5.0	✓
WAD Cyanide by CFA	E336	163366	1	14	7.1	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	164684	1	13	7.6	5.0	✓
Bromide in Water by IC	E235.Br	162468	3	35	8.5	5.0	✓
Chloride in Water by IC	E235.Cl	162471	3	32	9.3	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	163454	2	34	5.8	5.0	✓
Fluoride in Water by IC	E235.F	162469	3	31	9.6	5.0	✓
Nitrate in Water by IC	E235.NO3	162472	3	31	9.6	5.0	✓
Nitrite in Water by IC	E235.NO2	162470	3	31	9.6	5.0	✓
Sulfate in Water by IC	E235.SO4	162467	3	58	5.1	5.0	✓
Total Cyanide by CFA	E333	163365	1	14	7.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	163122	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	163565	2	28	7.1	5.0	✓
WAD Cyanide by CFA	E336	163366	1	14	7.1	5.0	✓



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Saskatoon - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Saskatoon - 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.
Bromide in Water by IC	E235.Br Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC	E235.Cl Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Saskatoon - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Total Kjeldahl Nitrogen is determined using block digestion followed by flow-injection analysis with fluorescence detection.
Total Cyanide by CFA	E333 Vancouver - Environmental	Water	ISO 14403 (mod)	Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.
WAD Cyanide by CFA	E336 Vancouver - Environmental	Water	APHA 4500-CN I (mod)	Weak Acid Dissociable (WAD) cyanide is determined by in-line sample distillation with final determination by colourimetric analysis.
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Metals in Water by CRC ICPMS	E421 Saskatoon - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Hardness (Calculated)	EC100 Saskatoon - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Ion Balance using Dissolved Metals	EC101 Saskatoon - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
TDS in Water (Calculation)	EC103 Saskatoon - Environmental	Water	APHA 1030E (mod)	Total Dissolved Solids is calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Saskatoon - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested using block digestion with Copper Sulfate Digestion Reagent.



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Saskatoon - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.



QUALITY CONTROL REPORT

Work Order : SK2100585

Page : 1 of 18

Client : O'Kane Consultants Inc.
Contact : Jared Robertson
Address : 112 - 112 Research Drive
Saskatoon SK Canada S7N 3R3
Telephone : 250 420 7010
Project : 948-021
PO : ----
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : Q83455
No. of samples received : 44
No. of samples analysed : 44

Laboratory : Saskatoon - Environmental
Account Manager : Brian Morgan
Address : 819 58 Street East
Saskatoon, Saskatchewan Canada S7K 6X5
Telephone : 1 306 221 7147
Date Samples Received : 11-Mar-2021 16:55
Date Analysis Commenced : 12-Mar-2021
Issue Date : 19-Mar-2021 09:30

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 Percentage Difference (RPD) and Acceptance Limits
● Matrix Spike (MS) Report; Recovery and Acceptance Limits
● Reference Material (RM) Report; Recovery and Acceptance Limits
● Method Blank (MB) Report; Recovery and Acceptance Limits
● Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

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.

Table with 3 columns: Signatories, Position, Laboratory Department. Lists names like Dwayne Bennett, Hedy Lai, Jordan Fanson, Lian Nesbitt, Melissa Houseman, Naeun Kim, Nancy Cruse, Rebecca Baker, Tracy Harley and their respective roles and departments.

Page : 2 of 18
Work Order : SK2100585
Client : O'Kane Consultants Inc.
Project : 948-021



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 Services number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

= Indicates a QC result that did not meet the ALS DQO.



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: 162511)											
RG2100051-001	Anonymous	pH	----	E108	0.10	pH units	7.45	7.44	0.134%	3%	----
Physical Tests (QC Lot: 162512)											
RG2100051-001	Anonymous	conductivity	----	E100	2.0	µS/cm	2670	2690	0.746%	10%	----
Physical Tests (QC Lot: 162513)											
RG2100051-001	Anonymous	alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	52.0	51.7	0.594%	20%	----
Anions and Nutrients (QC Lot: 162467)											
SK2100585-003	01_TSF_W12	sulfate (as SO4)	14808-79-8	E235.SO4	60.0	mg/L	5400	2660	67.9%	20%	----
Anions and Nutrients (QC Lot: 162468)											
SK2100585-003	01_TSF_W12	bromide	24959-67-9	E235.Br	20.0	mg/L	<20.0	<10.0	10.0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 162469)											
SK2100585-003	01_TSF_W12	fluoride	16984-48-8	E235.F	4.00	mg/L	<4.00	<2.00	2.00	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 162470)											
SK2100585-003	01_TSF_W12	nitrite (as N)	14797-65-0	E235.NO2	2.00	mg/L	2.90	1.35	1.56	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 162471)											
SK2100585-003	01_TSF_W12	chloride	16887-00-6	E235.Cl	100	mg/L	6630	3260	68.1%	20%	----
Anions and Nutrients (QC Lot: 162472)											
SK2100585-003	01_TSF_W12	nitrate (as N)	14797-55-8	E235.NO3	4.00	mg/L	478	235	68.3%	20%	----
Anions and Nutrients (QC Lot: 162473)											
SK2100585-024	06-IF-NPAG_W8	sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	61.0	60.9	0.0847%	20%	----
Anions and Nutrients (QC Lot: 162474)											
SK2100585-024	06-IF-NPAG_W8	bromide	24959-67-9	E235.Br	0.50	mg/L	1.56	1.55	0.007	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 162475)											
SK2100585-024	06-IF-NPAG_W8	fluoride	16984-48-8	E235.F	0.100	mg/L	0.403	0.388	0.014	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 162476)											
SK2100585-024	06-IF-NPAG_W8	nitrite (as N)	14797-65-0	E235.NO2	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 162477)											
SK2100585-024	06-IF-NPAG_W8	chloride	16887-00-6	E235.Cl	2.50	mg/L	231	231	0.108%	20%	----
Anions and Nutrients (QC Lot: 162478)											
SK2100585-024	06-IF-NPAG_W8	nitrate (as N)	14797-55-8	E235.NO3	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 162638)											
SK2100585-044	11-ROM-SR2_W8	fluoride	16984-48-8	E235.F	0.020	mg/L	0.083	0.086	0.003	Diff <2x LOR	----



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
Anions and Nutrients (QC Lot: 162639)											
SK2100585-044	11-ROM-SR2_W8	nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	0.064	0.060	0.005	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 162640)											
SK2100585-044	11-ROM-SR2_W8	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	59.7	60.3	1.06%	20%	----
Anions and Nutrients (QC Lot: 162641)											
SK2100585-044	11-ROM-SR2_W8	chloride	16887-00-6	E235.Cl	0.50	mg/L	82.8	83.5	0.818%	20%	----
Anions and Nutrients (QC Lot: 162642)											
SK2100585-044	11-ROM-SR2_W8	nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	3.75	3.83	2.07%	20%	----
Anions and Nutrients (QC Lot: 162643)											
SK2100585-044	11-ROM-SR2_W8	bromide	24959-67-9	E235.Br	0.10	mg/L	0.24	0.24	0.007	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 163122)											
CG2100337-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.982	0.952	3.10%	20%	----
Anions and Nutrients (QC Lot: 163565)											
CG2100344-003	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 163566)											
SK2100585-016	04-GAB-NPAG-W8	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 164684)											
CG2100329-015	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Cyanides (QC Lot: 163365)											
VA21A4600-001	Anonymous	cyanide, strong acid dissociable (total)	----	E333	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Cyanides (QC Lot: 163366)											
VA21A4600-001	Anonymous	cyanide, weak acid dissociable	----	E336	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 163454)											
RG2100051-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0020	mg/L	0.0078	0.0092	0.0013	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00020	mg/L	0.00328	0.00335	2.02%	20%	----
		barium, dissolved	7440-39-3	E421	0.00020	mg/L	0.188	0.189	0.514%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000040	mg/L	<0.000040	<0.000040	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.020	mg/L	0.757	0.782	3.20%	20%	----
		cadmium, dissolved	7440-43-9	E421	0.0000100	mg/L	<0.0000100	<0.0000100	0	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.100	mg/L	249	255	2.32%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000020	mg/L	0.000144	0.000144	0.0000005	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.00100	mg/L	0.00109	<0.00100	0.00009	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00020	mg/L	0.00022	0.00022	0.000005	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00040	mg/L	0.00270	0.00270	0.000003	Diff <2x LOR	----



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
Dissolved Metals (QC Lot: 163454) - continued											
RG2100051-001	Anonymous	iron, dissolved	7439-89-6	E421	0.060	mg/L	<0.060	<0.060	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0020	mg/L	0.170	0.162	5.00%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.0100	mg/L	119	121	2.12%	20%	----
		manganese, dissolved	7439-96-5	E421	0.0100	mg/L	1.53	1.53	0.388%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000100	mg/L	0.00856	0.00847	0.985%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00100	mg/L	0.00353	0.00369	0.00016	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	0.100	mg/L	3.28	3.46	5.23%	20%	----
		potassium, dissolved	7440-09-7	E421	0.100	mg/L	14.2	15.2	7.19%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00040	mg/L	0.00268	0.00252	0.00015	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.000100	mg/L	0.0709	0.0734	3.45%	20%	----
		silicon, dissolved	7440-21-3	E421	0.100	mg/L	17.1	17.7	3.23%	20%	----
		silver, dissolved	7440-22-4	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		sodium, dissolved	17341-25-2	E421	0.100	mg/L	222	227	2.03%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00040	mg/L	1.41	1.44	1.85%	20%	----
		sulfur, dissolved	7704-34-9	E421	1.00	mg/L	507	530	4.44%	20%	----
		tellurium, dissolved	13494-80-9	E421	0.00040	mg/L	<0.00040	<0.00040	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00060	mg/L	<0.00060	<0.00060	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00020	mg/L	0.00060	0.00062	0.00002	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000020	mg/L	0.000143	0.000142	0.0000008	Diff <2x LOR	----
		vanadium, dissolved	7440-62-2	E421	0.00100	mg/L	0.0168	0.0175	3.89%	20%	----
		zinc, dissolved	7440-66-6	E421	0.0020	mg/L	0.0032	0.0036	0.0004	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00040	mg/L	<0.00040	<0.00040	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 163455)											
SK2100585-036	09-FZONE-NPAG_W8	aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0285	0.0300	5.20%	20%	----
		antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00797	0.00796	0.128%	20%	----
		arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00279	0.00281	0.728%	20%	----
		barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0271	0.0270	0.272%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.010	mg/L	0.080	0.077	0.002	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000052	0.0000055	0.0000004	Diff <2x LOR	----



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
Dissolved Metals (QC Lot: 163455) - continued											
SK2100585-036	09-FZONE-NPAG_W8	calcium, dissolved	7440-70-2	E421	0.050	mg/L	20.5	20.2	1.61%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000012	0.000010	0.000002	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.00050	mg/L	0.00193	0.00198	0.00004	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00017	0.00018	0.000004	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00442	0.00431	2.59%	20%	----
		iron, dissolved	7439-89-6	E421	0.030	mg/L	<0.030	<0.030	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0086	0.0078	0.0008	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	11.0	10.7	1.92%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00500	mg/L	0.0135	0.0132	0.00028	Diff <2x LOR	----
		molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.0113	0.0111	2.34%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00262	0.00261	0.000005	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.050	mg/L	11.6	11.2	3.24%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00209	0.00204	2.41%	20%	----
		selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.00364	0.00365	0.0535%	20%	----
		silicon, dissolved	7440-21-3	E421	0.050	mg/L	3.57	3.34	6.42%	20%	----
		silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, dissolved	17341-25-2	E421	0.050	mg/L	165	160	2.80%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0580	0.0564	2.79%	20%	----
		sulfur, dissolved	7704-34-9	E421	0.50	mg/L	23.7	22.6	4.68%	20%	----
		tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.000011	0.000011	0.0000007	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00010	mg/L	0.0300	0.0295	1.75%	20%	----
		titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	0.00040	0.00039	0.000007	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.00280	0.00286	2.33%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	0.00092	0.00091	0.000006	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0020	0.0022	0.0002	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----



Method Blank (MB) Report

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

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 162512)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 162513)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Anions and Nutrients (QCLot: 162467)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 162468)						
bromide	24959-67-9	E235.Br	0.1	mg/L	<0.10	----
Anions and Nutrients (QCLot: 162469)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 162470)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 162471)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 162472)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 162473)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 162474)						
bromide	24959-67-9	E235.Br	0.1	mg/L	<0.10	----
Anions and Nutrients (QCLot: 162475)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 162476)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 162477)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 162478)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 162638)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 162639)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 162640)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 162641)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	---
Anions and Nutrients (QCLot: 162642)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	---
Anions and Nutrients (QCLot: 162643)						
bromide	24959-67-9	E235.Br	0.1	mg/L	<0.10	---
Anions and Nutrients (QCLot: 163122)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	---
Anions and Nutrients (QCLot: 163565)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	---
Anions and Nutrients (QCLot: 163566)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	---
Anions and Nutrients (QCLot: 164684)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	---
Cyanides (QCLot: 163365)						
cyanide, strong acid dissociable (total)	----	E333	0.002	mg/L	<0.0020	---
Cyanides (QCLot: 163366)						
cyanide, weak acid dissociable	----	E336	0.002	mg/L	<0.0020	---
Dissolved Metals (QCLot: 163454)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	---
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	---
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	---
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	---
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	---
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	---
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	---
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	---
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	---
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	---
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	---
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	---
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	---
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	---
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	---
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	---
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	---
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	---



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 163454) - continued						
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	17341-25-2	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Dissolved Metals (QCLot: 163455)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 163455) - continued						
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	17341-25-2	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----



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				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 162511)									
pH	----	E108	----	pH units	6.86 pH units	100	98.0	102	----
Physical Tests (QCLot: 162512)									
conductivity	----	E100	1	µS/cm	1000 µS/cm	98.6	90.0	110	----
Physical Tests (QCLot: 162513)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	98.6	85.0	115	----
Anions and Nutrients (QCLot: 162467)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 162468)									
bromide	24959-67-9	E235.Br	0.1	mg/L	0.5 mg/L	104	85.0	115	----
Anions and Nutrients (QCLot: 162469)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 162470)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 162471)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 162472)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 162473)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 162474)									
bromide	24959-67-9	E235.Br	0.1	mg/L	0.5 mg/L	104	85.0	115	----
Anions and Nutrients (QCLot: 162475)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	99.2	90.0	110	----
Anions and Nutrients (QCLot: 162476)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 162477)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 162478)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 162638)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	97.9	90.0	110	----
Anions and Nutrients (QCLot: 162639)									



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 162639) - continued									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	99.7	90.0	110	----
Anions and Nutrients (QCLot: 162640)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 162641)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	99.1	90.0	110	----
Anions and Nutrients (QCLot: 162642)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	99.2	90.0	110	----
Anions and Nutrients (QCLot: 162643)									
bromide	24959-67-9	E235.Br	0.1	mg/L	0.5 mg/L	93.9	85.0	115	----
Anions and Nutrients (QCLot: 163122)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	78.0	75.0	125	----
Anions and Nutrients (QCLot: 163565)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.32 mg/L	97.6	80.0	120	----
Anions and Nutrients (QCLot: 163566)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.32 mg/L	88.5	80.0	120	----
Anions and Nutrients (QCLot: 164684)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.1 mg/L	91.7	85.0	115	----
Cyanides (QCLot: 163365)									
cyanide, strong acid dissociable (total)	----	E333	0.002	mg/L	0.25 mg/L	97.4	80.0	120	----
Cyanides (QCLot: 163366)									
cyanide, weak acid dissociable	----	E336	0.002	mg/L	0.125 mg/L	107	80.0	120	----
Dissolved Metals (QCLot: 163454)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	98.6	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	96.3	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	102	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	98.8	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	93.7	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	95.2	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	93.5	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	101	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	97.4	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	91.7	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	101	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	98.3	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	97.3	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 163454) - continued									
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	104	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	93.2	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	98.3	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	102	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	101	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	96.2	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	98.1	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	104	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	97.3	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	95.7	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	98.5	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	103	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	95.1	80.0	120	----
sodium, dissolved	17341-25-2	E421	0.05	mg/L	50 mg/L	103	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	102	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	97.9	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	90.5	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	94.1	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	92.5	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	93.9	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	96.6	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	95.4	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	86.6	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	101	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	102	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	99.2	80.0	120	----
Dissolved Metals (QCLot: 163455)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	107	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	96.0	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	103	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	98.8	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	102	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	96.2	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	97.2	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	101	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	99.9	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	91.6	80.0	120	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Dissolved Metals (QCLot: 163455) - continued									
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	101	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	95.8	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	102	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	95.8	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	111	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	101	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	100	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	98.0	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	98.1	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	110	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	99.4	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	98.4	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	97.3	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	110	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	96.5	80.0	120	----
sodium, dissolved	17341-25-2	E421	0.05	mg/L	50 mg/L	101	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	102	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	110	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	92.9	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	94.2	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	90.6	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	93.4	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	96.2	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	97.9	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	84.6	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	101	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	101	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	101	80.0	120	----



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: 162467)										
SK2100585-008	02-IF-PAG_W8	sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	90.0	110	----
Anions and Nutrients (QCLot: 162468)										
SK2100585-008	02-IF-PAG_W8	bromide	24959-67-9	E235.Br	ND mg/L	0.5 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 162469)										
SK2100585-008	02-IF-PAG_W8	fluoride	16984-48-8	E235.F	0.861 mg/L	1 mg/L	86.1	75.0	125	----
Anions and Nutrients (QCLot: 162470)										
SK2100585-008	02-IF-PAG_W8	nitrite (as N)	14797-65-0	E235.NO2	0.550 mg/L	0.5 mg/L	110	75.0	125	----
Anions and Nutrients (QCLot: 162471)										
SK2100585-008	02-IF-PAG_W8	chloride	16887-00-6	E235.Cl	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 162472)										
SK2100585-008	02-IF-PAG_W8	nitrate (as N)	14797-55-8	E235.NO3	2.74 mg/L	2.5 mg/L	110	75.0	125	----
Anions and Nutrients (QCLot: 162473)										
SK2100585-028	07-IF-PAG-CW_W8	sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	90.0	110	----
Anions and Nutrients (QCLot: 162474)										
SK2100585-028	07-IF-PAG-CW_W8	bromide	24959-67-9	E235.Br	ND mg/L	0.5 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 162475)										
SK2100585-028	07-IF-PAG-CW_W8	fluoride	16984-48-8	E235.F	0.656 mg/L	1 mg/L	65.6	75.0	125	K
Anions and Nutrients (QCLot: 162476)										
SK2100585-028	07-IF-PAG-CW_W8	nitrite (as N)	14797-65-0	E235.NO2	ND mg/L	0.5 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 162477)										
SK2100585-028	07-IF-PAG-CW_W8	chloride	16887-00-6	E235.Cl	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 162478)										
SK2100585-028	07-IF-PAG-CW_W8	nitrate (as N)	14797-55-8	E235.NO3	3.03 mg/L	2.5 mg/L	121	75.0	125	----
Anions and Nutrients (QCLot: 162638)										
SK2100580-002	Anonymous	fluoride	16984-48-8	E235.F	1.01 mg/L	1 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 162639)										
SK2100580-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.508 mg/L	0.5 mg/L	102	75.0	125	----



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: 162640)										
SK2100580-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	102 mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 162641)										
SK2100580-002	Anonymous	chloride	16887-00-6	E235.Cl	101 mg/L	100 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 162642)										
SK2100580-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	2.51 mg/L	2.5 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 162643)										
SK2100580-002	Anonymous	bromide	24959-67-9	E235.Br	0.53 mg/L	0.5 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 163122)										
CG2100337-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.06 mg/L	2.5 mg/L	82.6	70.0	130	----
Anions and Nutrients (QCLot: 163565)										
CG2100344-003	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0529 mg/L	0.0676 mg/L	78.2	70.0	130	----
Anions and Nutrients (QCLot: 163566)										
SK2100585-020	05-SED-NPAG_W8	phosphorus, total	7723-14-0	E372-U	0.0654 mg/L	0.0676 mg/L	96.7	70.0	130	----
Anions and Nutrients (QCLot: 164684)										
CG2100329-015	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0785 mg/L	0.1 mg/L	78.5	75.0	125	----
Cyanides (QCLot: 163365)										
VA21A4600-001	Anonymous	cyanide, strong acid dissociable (total)	----	E333	0.222 mg/L	0.25 mg/L	88.9	75.0	125	----
Cyanides (QCLot: 163366)										
VA21A4600-001	Anonymous	cyanide, weak acid dissociable	----	E336	0.133 mg/L	0.125 mg/L	106	75.0	125	----
Dissolved Metals (QCLot: 163454)										
SK2100591-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.194 mg/L	0.2 mg/L	97.2	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0188 mg/L	0.02 mg/L	94.0	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0212 mg/L	0.02 mg/L	106	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0370 mg/L	0.04 mg/L	92.5	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00934 mg/L	0.01 mg/L	93.4	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.090 mg/L	0.1 mg/L	89.9	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00382 mg/L	0.004 mg/L	95.5	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.00910 mg/L	0.01 mg/L	91.0	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0393 mg/L	0.04 mg/L	98.3	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0186 mg/L	0.02 mg/L	92.8	70.0	130	----
		copper, dissolved	7440-50-8	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----



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
Dissolved Metals (QCLot: 163454) - continued										
SK2100591-001	Anonymous	iron, dissolved	7439-89-6	E421	1.92 mg/L	2 mg/L	96.2	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0186 mg/L	0.02 mg/L	92.9	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.0905 mg/L	0.1 mg/L	90.5	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	0.0193 mg/L	0.02 mg/L	96.6	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0194 mg/L	0.02 mg/L	97.1	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0355 mg/L	0.04 mg/L	88.8	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	11.4 mg/L	10 mg/L	114	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0192 mg/L	0.02 mg/L	95.9	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0465 mg/L	0.04 mg/L	116	70.0	130	----
		silicon, dissolved	7440-21-3	E421	ND mg/L	10 mg/L	ND	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00342 mg/L	0.004 mg/L	85.6	70.0	130	----
		sodium, dissolved	17341-25-2	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0387 mg/L	0.04 mg/L	96.8	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00364 mg/L	0.004 mg/L	91.0	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0200 mg/L	0.02 mg/L	100	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0182 mg/L	0.02 mg/L	91.2	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0381 mg/L	0.04 mg/L	95.3	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0198 mg/L	0.02 mg/L	99.1	70.0	130	----
		uranium, dissolved	7440-61-1	E421	ND mg/L	0.004 mg/L	ND	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.0988 mg/L	0.1 mg/L	98.8	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.370 mg/L	0.4 mg/L	92.6	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0395 mg/L	0.04 mg/L	98.8	70.0	130	----
Dissolved Metals (QCLot: 163455)										
SK2100597-005	Anonymous	aluminum, dissolved	7429-90-5	E421	0.208 mg/L	0.2 mg/L	104	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0188 mg/L	0.02 mg/L	94.1	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0208 mg/L	0.02 mg/L	104	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0357 mg/L	0.04 mg/L	89.3	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00835 mg/L	0.01 mg/L	83.5	70.0	130	----
		boron, dissolved	7440-42-8	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00373 mg/L	0.004 mg/L	93.2	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----



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
Dissolved Metals (QCLot: 163455) - continued										
SK2100597-005	Anonymous	cesium, dissolved	7440-46-2	E421	0.00915 mg/L	0.01 mg/L	91.5	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0411 mg/L	0.04 mg/L	103	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0194 mg/L	0.02 mg/L	97.1	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0180 mg/L	0.02 mg/L	89.8	70.0	130	----
		iron, dissolved	7439-89-6	E421	2.09 mg/L	2 mg/L	104	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0168 mg/L	0.02 mg/L	83.9	70.0	130	----
		lithium, dissolved	7439-93-2	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0201 mg/L	0.02 mg/L	100	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0368 mg/L	0.04 mg/L	92.0	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	12.4 mg/L	10 mg/L	124	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0197 mg/L	0.02 mg/L	98.7	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0460 mg/L	0.04 mg/L	115	70.0	130	----
		silicon, dissolved	7440-21-3	E421	10.8 mg/L	10 mg/L	108	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00311 mg/L	0.004 mg/L	77.9	70.0	130	----
		sodium, dissolved	17341-25-2	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0372 mg/L	0.04 mg/L	92.9	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00336 mg/L	0.004 mg/L	84.0	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0185 mg/L	0.02 mg/L	92.7	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0187 mg/L	0.02 mg/L	93.7	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0424 mg/L	0.04 mg/L	106	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0191 mg/L	0.02 mg/L	95.5	70.0	130	----
		uranium, dissolved	7440-61-1	E421	ND mg/L	0.004 mg/L	ND	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.105 mg/L	0.1 mg/L	105	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.366 mg/L	0.4 mg/L	91.5	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0421 mg/L	0.04 mg/L	105	70.0	130	----

Qualifiers

Qualifier	Description
K	Matrix Spike recovery outside ALS DQO due to sample matrix effects.



CERTIFICATE OF ANALYSIS

Work Order : **SK2100888**
Client : **O'Kane Consultants Inc.**
Contact : Jared Robertson
Address : 112 - 112 Research Drive
 Saskatoon SK Canada S7N 3R3
Telephone : 250 420 7010
Project : 948-021
PO : ----
C-O-C number : ----
Sampler : Client
Site : ----
Quote number : Q83455
No. of samples received : 44
No. of samples analysed : 44

Page : 1 of 29
Laboratory : Saskatoon - Environmental
Account Manager : Brian Morgan
Address : 819 58 Street East
 Saskatoon SK Canada S7K 6X5
Telephone : 1 306 221 7147
Date Samples Received : 08-Apr-2021 15:45
Date Analysis Commenced : 09-Apr-2021
Issue Date : 19-Apr-2021 10:13

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Dwayne Bennett	Technical Specialist	Inorganics, Saskatoon, Saskatchewan
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Jorden Fanson	Analyst	Inorganics, Calgary, Alberta
Lian Nesbitt	Laboratory Analyst	Metals, Saskatoon, Saskatchewan
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Melissa Houseman	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Melissa Houseman	Team Leader - Inorganics	Metals, Saskatoon, Saskatchewan
Naeun Kim	Analyst	Inorganics, Calgary, Alberta
Rebecca Baker	Analyst	Inorganics, Calgary, Alberta
Tracy Harley	Supervisor - Water Quality Instrumentation	Inorganics, Burnaby, British Columbia



General Comments

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

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

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

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

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

<i>Unit</i>	<i>Description</i>
-	No Unit
%	percent
µS/cm	Microsiemens per centimetre
meq/L	milliequivalents per litre
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.

Sample Comments

<i>Sample</i>	<i>Client Id</i>	<i>Comment</i>
SK2100888-001	01_TSF_W14	Minimal sample provided for all samples, some past hold time

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
SFP	Sample was filtered and preserved at the laboratory.



Analytical Results

Sub-Matrix: Water					Client sample ID	01_TSF_W14	01_TSF_W15	01_TSF_W16	01_TSF_W17	02_IF_PAG_W9
(Matrix: Water)					Client sampling date / time	18-Mar-2021 13:45	25-Mar-2021 14:45	01-Apr-2021 12:55	08-Apr-2021 13:40	18-Mar-2021 13:45
Analyte	CAS Number	Method	LOR	Unit	SK2100888-001	SK2100888-002	SK2100888-003	SK2100888-004	SK2100888-005	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	----	2250	----	----	
conductivity	----	E100	2.0	µS/cm	----	----	43100	----	----	
pH	----	E108	0.10	pH units	----	----	7.85	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	376	----	----	
bicarbonate	71-52-3	E290	1.0	mg/L	----	----	459	----	----	
carbonate	3812-32-6	E290	1.0	mg/L	----	----	<1.0	----	----	
hydroxide	14280-30-9	E290	1.0	mg/L	----	----	<1.0	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	32300	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	46.5	----	----	
bromide	24959-67-9	E235.Br	0.10	mg/L	25.5	25.7	23.6	24.9	2.67	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	----	<0.0020	----	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	----	1220	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	8930	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	<1.00 ^{DLDS}	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	654	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	3.04	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	7090	8020	8380	8880	106	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	657	----	----	
Cyanides										
cyanide, strong acid dissociable (total)	----	E333	0.0050	mg/L	----	----	2.56	----	----	
cyanide, weak acid dissociable	----	E336	0.0050	mg/L	----	----	0.0881	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	----	481	----	----	
cation sum	----	EC101	0.10	meq/L	----	----	511	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	3.02	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	106	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	<0.0500 ^{DLDS}	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	0.00724	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	01_TSF_W14	01_TSF_W15	01_TSF_W16	01_TSF_W17	02_IF_PAG_W9
Client sampling date / time					18-Mar-2021 13:45	25-Mar-2021 14:45	01-Apr-2021 12:55	08-Apr-2021 13:40	18-Mar-2021 13:45	
Analyte	CAS Number	Method	LOR	Unit	SK2100888-001	SK2100888-002	SK2100888-003	SK2100888-004	SK2100888-005	
					Result	Result	Result	Result	Result	
Dissolved Metals										
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	---	---	0.474	---	---	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	---	---	0.0773	---	---	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	---	---	<0.00100 ^{DLDS}	---	---	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	---	---	<0.00250 ^{DLDS}	---	---	
boron, dissolved	7440-42-8	E421	0.010	mg/L	---	---	1.74	---	---	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	---	---	0.000602	---	---	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	692	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	<0.000500 ^{DLDS}	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	---	<0.0250 ^{DLDS}	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	1.66	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	0.0642	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	<1.50 ^{DLDS}	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	<0.00250 ^{DLDS}	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	<0.0500 ^{DLDS}	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	126	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	5.11	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	0.764	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	---	<0.0250 ^{DLDS}	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	<2.50 ^{DLDS}	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	744	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	0.0735	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	0.0807	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	4.68	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	0.0154	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	10200	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	3.25	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	5300	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	<0.0100 ^{DLDS}	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	<0.000500 ^{DLDS}	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	<0.00500 ^{DLDS}	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	<0.00500 ^{DLDS}	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	01_TSF_W14	01_TSF_W15	01_TSF_W16	01_TSF_W17	02_IF_PAG_W9
Client sampling date / time					18-Mar-2021 13:45	25-Mar-2021 14:45	01-Apr-2021 12:55	08-Apr-2021 13:40	18-Mar-2021 13:45	
Analyte	CAS Number	Method	LOR	Unit	SK2100888-001	SK2100888-002	SK2100888-003	SK2100888-004	SK2100888-005	
					Result	Result	Result	Result	Result	
Dissolved Metals										
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	----	----	<0.0150 ^{DLDS}	----	----	----
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	----	----	<0.00500 ^{DLDS}	----	----	----
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	----	----	0.0101	----	----	----
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	----	----	<0.0250 ^{DLDS}	----	----	----
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	----	<0.0500 ^{DLDS}	----	----	----
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	----	<0.0150 ^{DLDS}	----	----	----
dissolved metals filtration location	----	EP421	-	-	----	----	Field	----	----	----

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	02_IF_PAG_W1 0	02_IF_PAG_W1 1	02_IF_PAG_W1 2	03-SED-PAG_W 9	03-SED-PAG_W 10
Client sampling date / time					25-Mar-2021 14:45	01-Apr-2021 12:55	08-Apr-2021 13:45	18-Mar-2021 13:45	25-Mar-2021 14:45	
Analyte	CAS Number	Method	LOR	Unit	SK2100888-006 Result	SK2100888-007 Result	SK2100888-008 Result	SK2100888-009 Result	SK2100888-010 Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	----	42.9	----	----	
conductivity	----	E100	2.0	µS/cm	----	----	717	----	----	
pH	----	E108	0.10	pH units	----	----	8.24	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	150	----	----	
bicarbonate	71-52-3	E290	1.0	mg/L	----	----	183	----	----	
carbonate	3812-32-6	E290	1.0	mg/L	----	----	<1.0	----	----	
hydroxide	14280-30-9	E290	1.0	mg/L	----	----	<1.0	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	427	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	0.0819	----	----	
bromide	24959-67-9	E235.Br	0.10	mg/L	2.79	1.88	1.63	2.26	2.26	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	----	<0.0020	----	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	----	0.320	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	61.7	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	0.501	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	0.145	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	<0.050 ^{DLM}	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	112	92.6	102	85.0	80.8	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	0.145	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	----	6.90	----	----	
cation sum	----	EC101	0.10	meq/L	----	----	7.21	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	2.20	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	104	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	0.0251	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	0.0141	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	0.00136	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	0.0188	----	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	----	<0.000020	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	----	<0.000050	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	02_IF_PAG_W1 0	02_IF_PAG_W1 1	02_IF_PAG_W1 2	03-SED-PAG_W 9	03-SED-PAG_W 10
Client sampling date / time					25-Mar-2021 14:45	01-Apr-2021 12:55	08-Apr-2021 13:45	18-Mar-2021 13:45	25-Mar-2021 14:45	
Analyte	CAS Number	Method	LOR	Unit	SK2100888-006 Result	SK2100888-007 Result	SK2100888-008 Result	SK2100888-009 Result	SK2100888-010 Result	
Dissolved Metals										
boron, dissolved	7440-42-8	E421	0.010	mg/L	---	---	0.100	---	---	
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	---	---	0.000054	---	---	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	10.1	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	0.000073	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	---	<0.00050	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	0.00020	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	0.00258	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	<0.030	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	0.00264	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	0.0061	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	4.29	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	<0.00500	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	0.0102	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	---	0.00123	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	<0.050	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	6.50	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	0.00515	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	0.000974	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	3.27	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	<0.000010	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	142	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	0.0514	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	39.0	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	<0.00020	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	<0.000010	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	<0.00010	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	0.00616	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	---	<0.00030	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	---	0.00522	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	---	0.0132	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	---	<0.00050	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	02_IF_PAG_W1 0	02_IF_PAG_W1 1	02_IF_PAG_W1 2	03-SED-PAG_W 9	03-SED-PAG_W 10
Client sampling date / time					25-Mar-2021 14:45	01-Apr-2021 12:55	08-Apr-2021 13:45	18-Mar-2021 13:45	25-Mar-2021 14:45	
Analyte	CAS Number	Method	LOR	Unit	SK2100888-006	SK2100888-007	SK2100888-008	SK2100888-009	SK2100888-010	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	----	0.0164	----	----	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	----	<0.00030	----	----	
dissolved metals filtration location	----	EP421	-	-	----	----	Field	----	----	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	03-SED-PAG_W 11	03-SED_PAG_ W12	04-GAB-NPAG_ W9	04-GAB-NPAG_ W10	04-GAB-NPAG_ W11
Client sampling date / time					01-Mar-2021 12:55	08-Apr-2021 14:00	18-Mar-2021 13:45	25-Mar-2021 14:45	01-Apr-2021 12:55	
Analyte	CAS Number	Method	LOR	Unit	SK2100888-011	SK2100888-012	SK2100888-013	SK2100888-014	SK2100888-015	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	56.6	----	----	----	
conductivity	----	E100	2.0	µS/cm	----	721	----	----	----	
pH	----	E108	0.10	pH units	----	8.24	----	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	157	----	----	----	
bicarbonate	71-52-3	E290	1.0	mg/L	----	192	----	----	----	
carbonate	3812-32-6	E290	1.0	mg/L	----	<1.0	----	----	----	
hydroxide	14280-30-9	E290	1.0	mg/L	----	<1.0	----	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	412	----	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	0.0145	----	----	----	
bromide	24959-67-9	E235.Br	0.10	mg/L	2.02	1.64	2.15	2.11	1.82	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	<0.0020	----	----	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	<0.200	----	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	83.8	----	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	0.797	----	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	<0.020	----	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	<0.010	----	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	69.4	59.0	44.0	42.9	38.6	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	<0.0500	----	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	6.77	----	----	----	
cation sum	----	EC101	0.10	meq/L	----	7.38	----	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	4.31	----	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	109	----	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	0.0351	----	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	0.00225	----	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	0.00208	----	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	0.0148	----	----	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	<0.000020	----	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	<0.000050	----	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	03-SED-PAG_W 11	03-SED_PAG_ W12	04-GAB-NPAG_ W9	04-GAB-NPAG_ W10	04-GAB-NPAG_ W11
Client sampling date / time					01-Mar-2021 12:55	08-Apr-2021 14:00	18-Mar-2021 13:45	25-Mar-2021 14:45	01-Apr-2021 12:55	
Analyte	CAS Number	Method	LOR	Unit	SK2100888-011	SK2100888-012	SK2100888-013	SK2100888-014	SK2100888-015	
					Result	Result	Result	Result	Result	
Dissolved Metals										
boron, dissolved	7440-42-8	E421	0.010	mg/L	---	0.071	---	---	---	
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	---	<0.0000200 ^{DLM}	---	---	---	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	11.8	---	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	0.000039	---	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	0.00059	---	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	0.00010	---	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	0.00153	---	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	<0.030	---	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	<0.000050	---	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	0.0107	---	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	6.59	---	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	<0.00500	---	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	0.0511	---	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	0.00108	---	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	<0.050	---	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	11.0	---	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	0.00301	---	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	0.00221	---	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	2.99	---	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	<0.000010	---	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	137	---	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	0.0583	---	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	23.3	---	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	<0.00020	---	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	0.000012	---	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	<0.00010	---	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	0.00384	---	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	<0.00030	---	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	0.00054	---	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	0.00534	---	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	<0.00050	---	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	03-SED-PAG_W 11	03-SED_PAG_ W12	04-GAB-NPAG_ W9	04-GAB-NPAG_ W10	04-GAB-NPAG_ W11
Client sampling date / time					01-Mar-2021 12:55	08-Apr-2021 14:00	18-Mar-2021 13:45	25-Mar-2021 14:45	01-Apr-2021 12:55	
Analyte	CAS Number	Method	LOR	Unit	SK2100888-011	SK2100888-012	SK2100888-013	SK2100888-014	SK2100888-015	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	0.0060	----	----	----	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	<0.00030	----	----	----	
dissolved metals filtration location	----	EP421	-	-	----	Field	----	----	----	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	04-GAB-NPAG_ W12	05-SED-NPAG_ W9	05-SED-NPAG_ W10	05-SED-NPAG_ W11	05-SED-NPAG_ W12
Client sampling date / time					08-Apr-2021 14:15	18-Mar-2021 13:45	25-Mar-2021 14:45	01-Apr-2021 12:55	08-Apr-2021 14:30	
Analyte	CAS Number	Method	LOR	Unit	SK2100888-016	SK2100888-017	SK2100888-018	SK2100888-019	SK2100888-020	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	29.0	----	----	----	45.4	
conductivity	----	E100	2.0	µS/cm	857	----	----	----	607	
pH	----	E108	0.10	pH units	8.47	----	----	----	8.25	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	244	----	----	----	144	
bicarbonate	71-52-3	E290	1.0	mg/L	288	----	----	----	176	
carbonate	3812-32-6	E290	1.0	mg/L	5.2	----	----	----	<1.0	
hydroxide	14280-30-9	E290	1.0	mg/L	<1.0	----	----	----	<1.0	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	491	----	----	----	348	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.156	----	----	----	0.0403	
bromide	24959-67-9	E235.Br	0.10	mg/L	1.66	1.98	2.11	1.77	1.57	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	----	----	----	<0.0020	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	0.508	----	----	----	<0.200	
chloride	16887-00-6	E235.Cl	0.50	mg/L	96.7	----	----	----	79.4	
fluoride	16984-48-8	E235.F	0.020	mg/L	0.594	----	----	----	0.897	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.040 ^{DLDS}	----	----	----	<0.020	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.020 ^{DLDS}	----	----	----	<0.010	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	37.4	42.7	41.2	35.1	32.7	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	<0.0500	----	----	----	<0.0500	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	8.41	----	----	----	5.84	
cation sum	----	EC101	0.10	meq/L	8.84	----	----	----	6.24	
ion balance (cation-anion difference)	----	EC101	0.010	%	2.49	----	----	----	3.31	
ion balance (cations/anions ratio)	----	EC101	0.010	%	105	----	----	----	107	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0466	----	----	----	0.0586	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00293	----	----	----	0.00238	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.0130	----	----	----	0.138	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0155	----	----	----	0.0152	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	----	----	----	<0.000020	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	----	----	----	<0.000050	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	04-GAB-NPAG_ W12	05-SED-NPAG_ W9	05-SED-NPAG_ W10	05-SED-NPAG_ W11	05-SED-NPAG_ W12
Client sampling date / time					08-Apr-2021 14:15	18-Mar-2021 13:45	25-Mar-2021 14:45	01-Apr-2021 12:55	08-Apr-2021 14:30	
Analyte	CAS Number	Method	LOR	Unit	SK2100888-016	SK2100888-017	SK2100888-018	SK2100888-019	SK2100888-020	
					Result	Result	Result	Result	Result	
Dissolved Metals										
boron, dissolved	7440-42-8	E421	0.010	mg/L	0.104	----	----	----	0.075	
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	<0.000050	----	----	----	0.000094	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	6.52	----	----	----	9.80	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000362	----	----	----	0.000062	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	0.00191	----	----	----	0.00085	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00030	----	----	----	0.00040	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00291	----	----	----	0.00178	
iron, dissolved	7439-89-6	E421	0.030	mg/L	<0.030	----	----	----	<0.030	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	----	----	----	0.000054	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0090	----	----	----	0.0079	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	3.10	----	----	----	5.09	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	0.00732	----	----	----	<0.00500	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.0114	----	----	----	0.0176	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00143	----	----	----	0.00236	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	----	----	----	<0.050	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	6.13	----	----	----	9.16	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00583	----	----	----	0.00330	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.00276	----	----	----	0.00139	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	2.97	----	----	----	2.78	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	----	----	----	<0.000010	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	186	----	----	----	117	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0230	----	----	----	0.0429	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	15.4	----	----	----	12.6	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	----	----	----	<0.00020	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.000027	----	----	----	0.000010	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	----	----	----	<0.00010	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	0.00412	----	----	----	0.00604	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	----	----	----	<0.00030	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	0.00187	----	----	----	0.00126	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.0218	----	----	----	0.00685	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	0.00750	----	----	----	0.00189	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	04-GAB-NPAG_ W12	05-SED-NPAG_ W9	05-SED-NPAG_ W10	05-SED-NPAG_ W11	05-SED-NPAG_ W12
Client sampling date / time					08-Apr-2021 14:15	18-Mar-2021 13:45	25-Mar-2021 14:45	01-Apr-2021 12:55	08-Apr-2021 14:30	
Analyte	CAS Number	Method	LOR	Unit	SK2100888-016	SK2100888-017	SK2100888-018	SK2100888-019	SK2100888-020	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0244	----	----	----	0.0145	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	----	----	----	<0.00030	
dissolved metals filtration location	----	EP421	-	-	Field	----	----	----	Field	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	06-IF-NPAG_W9	06-IF-NPAG_W1 0	06-IF-NPAG_W1 1	06-IF-NPAG_W1 2	07-IF-PAG-CW_ W9
Client sampling date / time					18-Mar-2021 13:45	25-Mar-2021 14:45	01-Apr-2021 12:55	08-Apr-2021 14:35	18-Mar-2021 13:45	
Analyte	CAS Number	Method	LOR	Unit	SK2100888-021	SK2100888-022	SK2100888-023	SK2100888-024	SK2100888-025	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	----	----	54.9	----	
conductivity	----	E100	2.0	µS/cm	----	----	----	585	----	
pH	----	E108	0.10	pH units	----	----	----	8.25	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	----	146	----	
bicarbonate	71-52-3	E290	1.0	mg/L	----	----	----	178	----	
carbonate	3812-32-6	E290	1.0	mg/L	----	----	----	<1.0	----	
hydroxide	14280-30-9	E290	1.0	mg/L	----	----	----	<1.0	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	----	345	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	----	0.0555	----	
bromide	24959-67-9	E235.Br	0.10	mg/L	2.11	2.38	2.13	1.94	347	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	----	----	<0.0020	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	----	----	0.225	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	----	67.9	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	----	0.475	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	----	<0.100 ^{DLM}	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	----	<0.050 ^{DLM}	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	51.4	46.9	41.4	42.4	2710	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	----	<0.112	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	----	----	5.74	----	
cation sum	----	EC101	0.10	meq/L	----	----	----	5.99	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	----	2.13	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	----	104	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	----	0.0096	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	----	0.0208	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	----	0.00182	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	----	0.0227	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	----	----	<0.000020	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	----	----	<0.000050	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	06-IF-NPAG_W9	06-IF-NPAG_W1 0	06-IF-NPAG_W1 1	06-IF-NPAG_W1 2	07-IF-PAG-CW_ W9
Client sampling date / time					18-Mar-2021 13:45	25-Mar-2021 14:45	01-Apr-2021 12:55	08-Apr-2021 14:35	18-Mar-2021 13:45	
Analyte	CAS Number	Method	LOR	Unit	SK2100888-021	SK2100888-022	SK2100888-023	SK2100888-024	SK2100888-025	
					Result	Result	Result	Result	Result	
Dissolved Metals										
boron, dissolved	7440-42-8	E421	0.010	mg/L	---	---	---	0.112	---	
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	---	---	---	<0.000050	---	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	---	13.4	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	---	0.000067	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	---	---	0.00055	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	---	<0.00010	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	---	0.00157	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	---	<0.030	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	---	<0.000050	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	---	0.0140	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	---	5.20	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	---	<0.00500	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	---	0.00831	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	---	---	0.00118	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	---	<0.050	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	---	14.2	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	---	0.00996	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	---	0.000915	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	---	3.69	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	---	<0.000010	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	---	104	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	---	0.111	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	---	15.9	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	---	<0.00020	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	---	0.000010	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	---	<0.00010	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	---	0.00579	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	---	---	<0.00030	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	---	---	0.00202	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	---	---	0.00577	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	---	---	<0.00050	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	06-IF-NPAG_W9	06-IF-NPAG_W1 0	06-IF-NPAG_W1 1	06-IF-NPAG_W1 2	07-IF-PAG-CW_ W9
Client sampling date / time					18-Mar-2021 13:45	25-Mar-2021 14:45	01-Apr-2021 12:55	08-Apr-2021 14:35	18-Mar-2021 13:45	
Analyte	CAS Number	Method	LOR	Unit	SK2100888-021	SK2100888-022	SK2100888-023	SK2100888-024	SK2100888-025	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	----	----	0.0134	----	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	----	----	<0.00030	----	
dissolved metals filtration location	----	EP421	-	-	----	----	----	Field	----	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	07-IF-PAG-CW_ W10	07-IF-PAG-CW_ W11	07-IF-PAG-CW_ W12	08-SED-PAG-C W_W9	08-SED-PAG-C W_W10
Client sampling date / time					25-Mar-2021 14:45	01-Apr-2021 12:55	08-Apr-2021 14:45	18-Mar-2021 13:45	25-Mar-2021 14:45	
Analyte	CAS Number	Method	LOR	Unit	SK2100888-026	SK2100888-027	SK2100888-028	SK2100888-029	SK2100888-030	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	----	11700	----	----	
conductivity	----	E100	2.0	µS/cm	----	----	73300	----	----	
pH	----	E108	0.10	pH units	----	----	7.44	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	66.5	----	----	
bicarbonate	71-52-3	E290	1.0	mg/L	----	----	81.2	----	----	
carbonate	3812-32-6	E290	1.0	mg/L	----	----	<1.0	----	----	
hydroxide	14280-30-9	E290	1.0	mg/L	----	----	<1.0	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	53700	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	3.55	----	----	
bromide	24959-67-9	E235.Br	0.10	mg/L	353	323	297	472	426	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	----	<0.0020	----	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	----	3.92	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	31700	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	<6.00 ^{DLDS}	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	<6.00 ^{DLDS}	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	<3.00 ^{DLDS}	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	2860	2970	3140	2960	2900	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	<6.71	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	----	961	----	----	
cation sum	----	EC101	0.10	meq/L	----	----	893	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	3.67	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	92.9	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	<0.100 ^{DLDS}	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	<0.0100 ^{DLDS}	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	<0.0100 ^{DLDS}	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	0.208	----	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	----	<0.00200 ^{DLDS}	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	----	<0.00500 ^{DLDS}	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	07-IF-PAG-CW_ W10	07-IF-PAG-CW_ W11	07-IF-PAG-CW_ W12	08-SED-PAG-C W_W9	08-SED-PAG-C W_W10
Client sampling date / time					25-Mar-2021 14:45	01-Apr-2021 12:55	08-Apr-2021 14:45	18-Mar-2021 13:45	25-Mar-2021 14:45	
Analyte	CAS Number	Method	LOR	Unit	SK2100888-026	SK2100888-027	SK2100888-028	SK2100888-029	SK2100888-030	
					Result	Result	Result	Result	Result	
Dissolved Metals										
boron, dissolved	7440-42-8	E421	0.010	mg/L	---	---	<1.00 ^{DLDS}	---	---	
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	---	---	0.00131	---	---	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	1530	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	0.0155	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	---	<0.0500 ^{DLDS}	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	<0.0100 ^{DLDS}	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	<0.0200 ^{DLDS}	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	<3.00 ^{DLDS}	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	<0.00500 ^{DLDS}	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	0.232	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	1920	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	<0.500 ^{DLDS}	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	0.00734	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	---	0.0558	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	<5.00 ^{DLDS}	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	571	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	0.507	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	<0.00500 ^{DLDS}	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	<5.00 ^{DLDS}	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	0.00216	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	14800	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	34.7	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	1100	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	<0.0200 ^{DLDS}	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	<0.00100 ^{DLDS}	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	<0.0100 ^{DLDS}	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	<0.0100 ^{DLDS}	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	---	<0.0300 ^{DLDS}	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	---	<0.0100 ^{DLDS}	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	---	0.0201	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	---	<0.0500 ^{DLDS}	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	07-IF-PAG-CW_ W10	07-IF-PAG-CW_ W11	07-IF-PAG-CW_ W12	08-SED-PAG-C W_W9	08-SED-PAG-C W_W10
Client sampling date / time					25-Mar-2021 14:45	01-Apr-2021 12:55	08-Apr-2021 14:45	18-Mar-2021 13:45	25-Mar-2021 14:45	
Analyte	CAS Number	Method	LOR	Unit	SK2100888-026	SK2100888-027	SK2100888-028	SK2100888-029	SK2100888-030	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	----	0.357	----	----	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	----	<0.0300 ^{DLDS}	----	----	
dissolved metals filtration location	----	EP421	-	-	----	----	Field	----	----	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	08-SED-PAG-C W_W11	08-SED-PAG-C W_W12	09-FZONE-NPA G_W9	09-FZONE-NPA G_W10	09-FZONE-NPA G_W11
Client sampling date / time					01-Apr-2021 12:55	08-Apr-2021 14:55	18-Mar-2021 13:45	25-Mar-2021 14:45	01-Apr-2021 12:55	
Analyte	CAS Number	Method	LOR	Unit	SK2100888-031	SK2100888-032	SK2100888-033	SK2100888-034	SK2100888-035	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	12200	----	----	----	
conductivity	----	E100	2.0	µS/cm	----	74100	----	----	----	
pH	----	E108	0.10	pH units	----	7.44	----	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	50.8	----	----	----	
bicarbonate	71-52-3	E290	1.0	mg/L	----	61.9	----	----	----	
carbonate	3812-32-6	E290	1.0	mg/L	----	<1.0	----	----	----	
hydroxide	14280-30-9	E290	1.0	mg/L	----	<1.0	----	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	53600	----	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	3.74	----	----	----	
bromide	24959-67-9	E235.Br	0.10	mg/L	351	295	2.06	1.75	1.40	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	<0.0020	----	----	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	3.98	----	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	31700	----	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	<6.00 ^{DLDS}	----	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	<6.00 ^{DLDS}	----	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	<3.00 ^{DLDS}	----	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	2950	3130	45.8	41.6	31.0	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	<6.71	----	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	960	----	----	----	
cation sum	----	EC101	0.10	meq/L	----	893	----	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	3.62	----	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	93.0	----	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	<0.100 ^{DLDS}	----	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	<0.0100 ^{DLDS}	----	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	<0.0100 ^{DLDS}	----	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	0.196	----	----	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	<0.00200 ^{DLDS}	----	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	<0.00500 ^{DLDS}	----	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	08-SED-PAG-C W_W11	08-SED-PAG-C W_W12	09-FZONE-NPA G_W9	09-FZONE-NPA G_W10	09-FZONE-NPA G_W11
Client sampling date / time					01-Apr-2021 12:55	08-Apr-2021 14:55	18-Mar-2021 13:45	25-Mar-2021 14:45	01-Apr-2021 12:55	
Analyte	CAS Number	Method	LOR	Unit	SK2100888-031	SK2100888-032	SK2100888-033	SK2100888-034	SK2100888-035	
					Result	Result	Result	Result	Result	
Dissolved Metals										
boron, dissolved	7440-42-8	E421	0.010	mg/L	---	<1.00 ^{DLDS}	---	---	---	
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	---	0.00329	---	---	---	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	1630	---	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	0.00722	---	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	<0.0500 ^{DLDS}	---	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	0.0241	---	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	<0.0200 ^{DLDS}	---	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	<3.00 ^{DLDS}	---	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	<0.00500 ^{DLDS}	---	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	0.241	---	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	1970	---	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	<0.500 ^{DLDS}	---	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	0.0224	---	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	0.195	---	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	<5.00 ^{DLDS}	---	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	567	---	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	0.192	---	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	<0.00500 ^{DLDS}	---	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	<5.00 ^{DLDS}	---	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	0.00120	---	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	14600	---	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	36.3	---	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	1120	---	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	<0.0200 ^{DLDS}	---	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	0.00109	---	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	<0.0100 ^{DLDS}	---	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	<0.0100 ^{DLDS}	---	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	<0.0300 ^{DLDS}	---	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	<0.0100 ^{DLDS}	---	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	0.0370	---	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	<0.0500 ^{DLDS}	---	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	08-SED-PAG-C W_W11	08-SED-PAG-C W_W12	09-FZONE-NPA G_W9	09-FZONE-NPA G_W10	09-FZONE-NPA G_W11
Client sampling date / time					01-Apr-2021 12:55	08-Apr-2021 14:55	18-Mar-2021 13:45	25-Mar-2021 14:45	01-Apr-2021 12:55	
Analyte	CAS Number	Method	LOR	Unit	SK2100888-031	SK2100888-032	SK2100888-033	SK2100888-034	SK2100888-035	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	0.245	----	----	----	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	<0.0300 ^{DLDS}	----	----	----	
dissolved metals filtration location	----	EP421	-	-	----	Field	----	----	----	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	09-FZONE-NPA G_W12	10-ROM-SR1_ W9	10-ROM-SR1_ W10	10-ROM-SR1_ W11	10-ROM-SR1_ W12
Client sampling date / time					08-Apr-2021 15:00	18-Mar-2021 13:45	25-Mar-2021 14:45	01-Apr-2021 12:55	08-Apr-2021 15:05	
Analyte	CAS Number	Method	LOR	Unit	SK2100888-036	SK2100888-037	SK2100888-038	SK2100888-039	SK2100888-040	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	56.2	146	121	102	96.1	
conductivity	----	E100	2.0	µS/cm	490	621	483	357	346	
pH	----	E108	0.10	pH units	8.31	7.99	8.02	8.00	7.98	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	148	82.1	79.4	73.7	71.3	
bicarbonate	71-52-3	E290	1.0	mg/L	180	100	96.8	89.9	87.0	
carbonate	3812-32-6	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
hydroxide	14280-30-9	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	261	366	288	212	206	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0132	----	----	----	0.804	
bromide	24959-67-9	E235.Br	0.10	mg/L	1.08	0.17	0.14	<0.10	<0.10	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0736	----	----	----	0.0082	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	<0.200	----	----	----	1.15	
chloride	16887-00-6	E235.Cl	0.50	mg/L	31.7	60.0	41.1	25.1	22.0	
fluoride	16984-48-8	E235.F	0.020	mg/L	0.662	0.149	0.131	0.108	0.130	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.020	6.54	4.50	2.78	2.46	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	0.027	0.024	0.019	0.034	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	28.6	100	80.3	56.0	58.2	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	<0.0500	6.57	4.52	2.80	2.49	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	4.48	5.89	4.75	3.55	3.44	
cation sum	----	EC101	0.10	meq/L	4.64	5.86	4.60	3.49	3.22	
ion balance (cation-anion difference)	----	EC101	0.010	%	1.75	0.255	1.60	0.852	3.30	
ion balance (cations/anions ratio)	----	EC101	0.010	%	104	99.5	96.8	98.3	93.6	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0455	----	----	----	0.0256	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00698	----	----	----	0.00047	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00260	----	----	----	0.0228	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0186	----	----	----	0.0187	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	----	----	----	<0.000020	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	----	----	----	<0.000050	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	09-FZONE-NPA G_W12	10-ROM-SR1_ W9	10-ROM-SR1_ W10	10-ROM-SR1_ W11	10-ROM-SR1_ W12
Client sampling date / time					08-Apr-2021 15:00	18-Mar-2021 13:45	25-Mar-2021 14:45	01-Apr-2021 12:55	08-Apr-2021 15:05	
Analyte	CAS Number	Method	LOR	Unit	SK2100888-036	SK2100888-037	SK2100888-038	SK2100888-039	SK2100888-040	
					Result	Result	Result	Result	Result	
Dissolved Metals										
boron, dissolved	7440-42-8	E421	0.010	mg/L	0.083	----	----	----	0.443	
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	<0.000050	----	----	----	0.000052	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	12.8	37.2	30.8	27.2	25.5	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000010	----	----	----	0.000095	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	----	----	----	<0.00050	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00012	----	----	----	0.00016	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00312	----	----	----	0.00112	
iron, dissolved	7439-89-6	E421	0.030	mg/L	<0.030	<0.030	<0.030	<0.030	<0.030	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	----	----	----	0.000090	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0048	----	----	----	0.0036	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	5.90	13.0	10.8	8.18	7.87	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	0.0151	0.0401	0.0390	0.0365	0.0275	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00810	----	----	----	0.00304	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00178	----	----	----	0.00082	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	----	----	----	<0.050	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	7.19	7.02	5.45	4.02	4.22	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00141	----	----	----	0.00326	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.00133	----	----	----	0.000346	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	3.30	----	----	----	2.55	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	----	----	----	<0.000010	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	76.4	63.2	46.8	31.2	26.1	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0344	----	----	----	0.145	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	10.6	----	----	----	19.1	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	----	----	----	<0.00020	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	----	----	----	<0.000010	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	----	----	----	<0.00010	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	0.0260	----	----	----	0.00520	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	----	----	----	<0.00030	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	0.00032	----	----	----	0.00039	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.00286	----	----	----	0.00123	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	0.00096	----	----	----	<0.00050	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	09-FZONE-NPA G_W12	10-ROM-SR1_ W9	10-ROM-SR1_ W10	10-ROM-SR1_ W11	10-ROM-SR1_ W12
Client sampling date / time					08-Apr-2021 15:00	18-Mar-2021 13:45	25-Mar-2021 14:45	01-Apr-2021 12:55	08-Apr-2021 15:05	
Analyte	CAS Number	Method	LOR	Unit	SK2100888-036	SK2100888-037	SK2100888-038	SK2100888-039	SK2100888-040	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0022	----	----	----	<0.0010	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	----	----	----	<0.00030	
dissolved metals filtration location	----	EP421	-	-	Field	Laboratory ^{SFP}	Laboratory ^{SFP}	Laboratory ^{SFP}	Field	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	11-ROM-SR2_ W9	11-ROM-SR2_ W10	11-ROM-SR2_ W11	11-ROM-SR2_ W12	----
Client sampling date / time					18-Mar-2021 13:45	25-Mar-2021 14:45	01-Apr-2021 12:55	08-Apr-2021 15:15	----	
Analyte	CAS Number	Method	LOR	Unit	SK2100888-041	SK2100888-042	SK2100888-043	SK2100888-044	-----	
					Result	Result	Result	Result	---	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	116	109	104	94.3	----	
conductivity	----	E100	2.0	µS/cm	492	426	401	397	----	
pH	----	E108	0.10	pH units	7.99	7.91	7.92	7.91	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	66.8	58.6	56.6	56.9	----	
bicarbonate	71-52-3	E290	1.0	mg/L	81.5	71.4	69.0	69.4	----	
carbonate	3812-32-6	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	----	
hydroxide	14280-30-9	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	282	243	232	225	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	----	0.0128	----	
bromide	24959-67-9	E235.Br	0.10	mg/L	0.21	0.16	0.15	0.13	----	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	----	----	0.0128	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	----	----	0.277	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	68.8	55.3	52.2	49.0	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	0.080	0.068	0.062	0.076	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	3.12	2.50	2.38	2.13	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	0.040	0.026	0.021	0.025	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	56.1	50.2	54.2	55.5	----	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	3.16	2.53	2.40	2.16	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	4.67	3.96	3.91	3.83	----	
cation sum	----	EC101	0.10	meq/L	4.67	4.21	3.84	3.49	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	<0.010	3.06	0.903	4.64	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	100	106	98.2	91.1	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	----	0.0310	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	----	0.00020	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	----	0.00725	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	----	0.0182	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	----	----	<0.000020	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	----	----	<0.000050	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	11-ROM-SR2_ W9	11-ROM-SR2_ W10	11-ROM-SR2_ W11	11-ROM-SR2_ W12	----
Client sampling date / time					18-Mar-2021 13:45	25-Mar-2021 14:45	01-Apr-2021 12:55	08-Apr-2021 15:15	----	
Analyte	CAS Number	Method	LOR	Unit	SK2100888-041	SK2100888-042	SK2100888-043	SK2100888-044	-----	
					Result	Result	Result	Result	---	
Dissolved Metals										
boron, dissolved	7440-42-8	E421	0.010	mg/L	----	----	----	0.200	----	
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	----	----	----	0.000078	----	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	29.6	28.3	26.9	24.3	----	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	----	----	----	0.000034	----	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	----	----	----	<0.00050	----	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	----	----	----	0.00024	----	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	----	----	----	0.00359	----	
iron, dissolved	7439-89-6	E421	0.030	mg/L	<0.030	<0.030	<0.030	<0.030	----	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	----	----	----	0.000086	----	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	----	----	----	0.0062	----	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	10.2	9.37	8.93	8.17	----	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	0.132	0.113	0.109	0.0718	----	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	----	----	----	0.00142	----	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	----	----	----	0.00115	----	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	----	----	----	<0.050	----	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	3.10	2.78	2.59	2.61	----	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	----	----	----	0.00127	----	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	----	----	----	0.000129	----	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	----	----	----	2.43	----	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	----	----	----	<0.000010	----	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	52.2	44.9	38.9	35.2	----	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	----	----	----	0.108	----	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	----	----	----	17.7	----	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	----	----	----	<0.00020	----	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	----	----	----	<0.000010	----	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	----	----	----	<0.00010	----	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	----	----	----	0.00481	----	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	----	----	----	<0.00030	----	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	----	----	----	0.00045	----	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	----	----	----	0.000761	----	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	----	----	----	<0.00050	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	11-ROM-SR2_ W9	11-ROM-SR2_ W10	11-ROM-SR2_ W11	11-ROM-SR2_ W12	----
Client sampling date / time					18-Mar-2021 13:45	25-Mar-2021 14:45	01-Apr-2021 12:55	08-Apr-2021 15:15	----	
Analyte	CAS Number	Method	LOR	Unit	SK2100888-041	SK2100888-042	SK2100888-043	SK2100888-044	-----	
					Result	Result	Result	Result	---	
Dissolved Metals										
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	----	----	0.0080	----	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	----	----	<0.00030	----	
dissolved metals filtration location	----	EP421	-	-	Laboratory ^{SFP}	Laboratory ^{SFP}	Laboratory ^{SFP}	Field	----	

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: SK2100888	Page	: 1 of 37
Client	: O'Kane Consultants Inc.	Laboratory	: Saskatoon - Environmental
Contact	: Jared Robertson	Account Manager	: Brian Morgan
Address	: 112 - 112 Research Drive Saskatoon SK Canada S7N 3R3	Address	: 819 58 Street East Saskatoon, Saskatchewan Canada S7K 6X5
Telephone	: 250 420 7010	Telephone	: 1 306 221 7147
Project	: 948-021	Date Samples Received	: 08-Apr-2021 15:45
PO	: ----	Issue Date	: 19-Apr-2021 10:13
C-O-C number	: ----		
Sampler	: Client		
Site	: ----		
Quote number	: Q83455		
No. of samples received	: 44		
No. of samples analysed	: 44		

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 Services number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

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

RIGHT SOLUTIONS | RIGHT PARTNER



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 15:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 15:00 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		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 01_TSF_W16	E298	01-Apr-2021	14-Apr-2021	28 days	12 days	✓	14-Apr-2021	15 days	0 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 02_IF_PAG_W12	E298	08-Apr-2021	14-Apr-2021	28 days	5 days	✓	14-Apr-2021	22 days	0 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 03-SED_PAG_W12	E298	08-Apr-2021	14-Apr-2021	28 days	5 days	✓	14-Apr-2021	22 days	0 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 04-GAB-NPAG_W12	E298	08-Apr-2021	14-Apr-2021	28 days	5 days	✓	14-Apr-2021	22 days	0 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 05-SED-NPAG_W12	E298	08-Apr-2021	14-Apr-2021	28 days	5 days	✓	14-Apr-2021	22 days	0 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 06-IF-NPAG_W12	E298	08-Apr-2021	14-Apr-2021	28 days	5 days	✓	14-Apr-2021	22 days	0 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 07-IF-PAG-CW_W12	E298	08-Apr-2021	14-Apr-2021	28 days	5 days	✓	14-Apr-2021	22 days	0 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 08-SED-PAG-CW_W12	E298	08-Apr-2021	14-Apr-2021	28 days	5 days	✔	14-Apr-2021	22 days	0 days	✔	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 09-FZONE-NPAG_W12	E298	08-Apr-2021	14-Apr-2021	28 days	5 days	✔	14-Apr-2021	22 days	0 days	✔	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 10-ROM-SR1_W12	E298	08-Apr-2021	14-Apr-2021	28 days	5 days	✔	14-Apr-2021	22 days	0 days	✔	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 11-ROM-SR2_W12	E298	08-Apr-2021	14-Apr-2021	28 days	5 days	✔	14-Apr-2021	22 days	0 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 01_TSF_W15	E235.Br	25-Mar-2021	----	----	----		11-Apr-2021	28 days	16 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 02_IF_PAG_W10	E235.Br	25-Mar-2021	----	----	----		11-Apr-2021	28 days	16 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 03-SED-PAG_W10	E235.Br	25-Mar-2021	----	----	----		11-Apr-2021	28 days	16 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 04-GAB-NPAG_W10	E235.Br	25-Mar-2021	----	----	----		11-Apr-2021	28 days	16 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 05-SED-NPAG_W10	E235.Br	25-Mar-2021	----	----	----		11-Apr-2021	28 days	16 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Bromide in Water by IC										
HDPE 06-IF-NPAG_W10	E235.Br	25-Mar-2021	----	----	----		11-Apr-2021	28 days	16 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 07-IF-PAG-CW_W10	E235.Br	25-Mar-2021	----	----	----		11-Apr-2021	28 days	16 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 08-SED-PAG-CW_W10	E235.Br	25-Mar-2021	----	----	----		11-Apr-2021	28 days	16 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 09-FZONE-NPAG_W10	E235.Br	25-Mar-2021	----	----	----		11-Apr-2021	28 days	16 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 10-ROM-SR1_W10	E235.Br	25-Mar-2021	----	----	----		10-Apr-2021	28 days	16 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 11-ROM-SR2_W10	E235.Br	25-Mar-2021	----	----	----		10-Apr-2021	28 days	16 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 01_TSF_W17	E235.Br	08-Apr-2021	----	----	----		11-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 02_IF_PAG_W12	E235.Br	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 03-SED_PAG_W12	E235.Br	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Bromide in Water by IC										
HDPE 04-GAB-NPAG_W12	E235.Br	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 05-SED-NPAG_W12	E235.Br	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 06-IF-NPAG_W12	E235.Br	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 07-IF-PAG-CW_W12	E235.Br	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 08-SED-PAG-CW_W12	E235.Br	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 09-FZONE-NPAG_W12	E235.Br	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 10-ROM-SR1_W12	E235.Br	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 11-ROM-SR2_W12	E235.Br	08-Apr-2021	----	----	----		11-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 01_TSF_W14	E235.Br	18-Mar-2021	----	----	----		11-Apr-2021	28 days	23 days	✔



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Bromide in Water by IC										
HDPE 02-IF-PAG_W9	E235.Br	18-Mar-2021	----	----	----		11-Apr-2021	28 days	23 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 03-SED-PAG_W9	E235.Br	18-Mar-2021	----	----	----		11-Apr-2021	28 days	23 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 04-GAB-NPAG_W9	E235.Br	18-Mar-2021	----	----	----		11-Apr-2021	28 days	23 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 05-SED-NPAG_W9	E235.Br	18-Mar-2021	----	----	----		11-Apr-2021	28 days	23 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 06-IF-NPAG_W9	E235.Br	18-Mar-2021	----	----	----		11-Apr-2021	28 days	23 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 07-IF-PAG-CW_W9	E235.Br	18-Mar-2021	----	----	----		11-Apr-2021	28 days	23 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 08-SED-PAG-CW_W9	E235.Br	18-Mar-2021	----	----	----		11-Apr-2021	28 days	23 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 09-FZONE-NPAG_W9	E235.Br	18-Mar-2021	----	----	----		11-Apr-2021	28 days	23 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 10-ROM-SR1_W9	E235.Br	18-Mar-2021	----	----	----		10-Apr-2021	28 days	23 days	✔



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Bromide in Water by IC											
HDPE 11-ROM-SR2_W9	E235.Br	18-Mar-2021	----	----	----		10-Apr-2021	28 days	23 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 03-SED-PAG_W11	E235.Br	01-Mar-2021	----	----	----		10-Apr-2021	28 days	40 days	* EHTR	
Anions and Nutrients : Bromide in Water by IC											
HDPE 01_TSF_W16	E235.Br	01-Apr-2021	----	----	----		10-Apr-2021	28 days	9 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 02_IF_PAG_W11	E235.Br	01-Apr-2021	----	----	----		11-Apr-2021	28 days	9 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 04-GAB-NPAG_W11	E235.Br	01-Apr-2021	----	----	----		11-Apr-2021	28 days	9 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 05-SED-NPAG_W11	E235.Br	01-Apr-2021	----	----	----		11-Apr-2021	28 days	9 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 06-IF-NPAG_W11	E235.Br	01-Apr-2021	----	----	----		11-Apr-2021	28 days	9 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 07-IF-PAG-CW_W11	E235.Br	01-Apr-2021	----	----	----		11-Apr-2021	28 days	9 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 08-SED-PAG-CW_W11	E235.Br	01-Apr-2021	----	----	----		11-Apr-2021	28 days	9 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Bromide in Water by IC										
HDPE 09-FZONE-NPAG_W11	E235.Br	01-Apr-2021	----	----	----		11-Apr-2021	28 days	9 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 10-ROM-SR1_W11	E235.Br	01-Apr-2021	----	----	----		10-Apr-2021	28 days	9 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 11-ROM-SR2_W11	E235.Br	01-Apr-2021	----	----	----		11-Apr-2021	28 days	9 days	✔
Anions and Nutrients : Chloride in Water by IC										
HDPE 10-ROM-SR1_W10	E235.Cl	25-Mar-2021	----	----	----		10-Apr-2021	28 days	16 days	✔
Anions and Nutrients : Chloride in Water by IC										
HDPE 11-ROM-SR2_W10	E235.Cl	25-Mar-2021	----	----	----		10-Apr-2021	28 days	16 days	✔
Anions and Nutrients : Chloride in Water by IC										
HDPE 02_IF_PAG_W12	E235.Cl	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Chloride in Water by IC										
HDPE 03-SED_PAG_W12	E235.Cl	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Chloride in Water by IC										
HDPE 04-GAB-NPAG_W12	E235.Cl	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Chloride in Water by IC										
HDPE 05-SED-NPAG_W12	E235.Cl	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Chloride in Water by IC											
HDPE 06-IF-NPAG_W12	E235.Cl	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 07-IF-PAG-CW_W12	E235.Cl	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 08-SED-PAG-CW_W12	E235.Cl	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 09-FZONE-NPAG_W12	E235.Cl	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 10-ROM-SR1_W12	E235.Cl	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 11-ROM-SR2_W12	E235.Cl	08-Apr-2021	----	----	----		11-Apr-2021	28 days	2 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 10-ROM-SR1_W9	E235.Cl	18-Mar-2021	----	----	----		10-Apr-2021	28 days	23 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 11-ROM-SR2_W9	E235.Cl	18-Mar-2021	----	----	----		10-Apr-2021	28 days	23 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 01_TSF_W16	E235.Cl	01-Apr-2021	----	----	----		10-Apr-2021	28 days	9 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
Rec	Actual	Rec		Actual						
Anions and Nutrients : Chloride in Water by IC										
HDPE 10-ROM-SR1_W11	E235.Cl	01-Apr-2021	----	----	----		10-Apr-2021	28 days	9 days	✔
Anions and Nutrients : Chloride in Water by IC										
HDPE 11-ROM-SR2_W11	E235.Cl	01-Apr-2021	----	----	----		11-Apr-2021	28 days	9 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 10-ROM-SR1_W10	E235.F	25-Mar-2021	----	----	----		10-Apr-2021	28 days	16 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 11-ROM-SR2_W10	E235.F	25-Mar-2021	----	----	----		10-Apr-2021	28 days	16 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 02_IF_PAG_W12	E235.F	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 03-SED_PAG_W12	E235.F	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 04-GAB-NPAG_W12	E235.F	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 05-SED-NPAG_W12	E235.F	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 06-IF-NPAG_W12	E235.F	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Fluoride in Water by IC										
HDPE 07-IF-PAG-CW_W12	E235.F	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 08-SED-PAG-CW_W12	E235.F	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 09-FZONE-NPAG_W12	E235.F	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 10-ROM-SR1_W12	E235.F	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 11-ROM-SR2_W12	E235.F	08-Apr-2021	----	----	----		11-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 10-ROM-SR1_W9	E235.F	18-Mar-2021	----	----	----		10-Apr-2021	28 days	23 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 11-ROM-SR2_W9	E235.F	18-Mar-2021	----	----	----		10-Apr-2021	28 days	23 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 01_TSF_W16	E235.F	01-Apr-2021	----	----	----		10-Apr-2021	28 days	9 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 10-ROM-SR1_W11	E235.F	01-Apr-2021	----	----	----		10-Apr-2021	28 days	9 days	✔



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Fluoride in Water by IC											
HDPE 11-ROM-SR2_W11	E235.F	01-Apr-2021	----	----	----		11-Apr-2021	28 days	9 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 10-ROM-SR1_W10	E235.NO3	25-Mar-2021	----	----	----		10-Apr-2021	3 days	16 days	* EHTR	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 11-ROM-SR2_W10	E235.NO3	25-Mar-2021	----	----	----		10-Apr-2021	3 days	16 days	* EHTR	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 02-IF-PAG_W12	E235.NO3	08-Apr-2021	----	----	----		10-Apr-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 03-SED-PAG_W12	E235.NO3	08-Apr-2021	----	----	----		10-Apr-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 04-GAB-NPAG_W12	E235.NO3	08-Apr-2021	----	----	----		10-Apr-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 05-SED-NPAG_W12	E235.NO3	08-Apr-2021	----	----	----		10-Apr-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 06-IF-NPAG_W12	E235.NO3	08-Apr-2021	----	----	----		10-Apr-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 07-IF-PAG-CW_W12	E235.NO3	08-Apr-2021	----	----	----		10-Apr-2021	3 days	2 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrate in Water by IC											
HDPE 08-SED-PAG-CW_W12	E235.NO3	08-Apr-2021	----	----	----		10-Apr-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 09-FZONE-NPAG_W12	E235.NO3	08-Apr-2021	----	----	----		10-Apr-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 10-ROM-SR1_W12	E235.NO3	08-Apr-2021	----	----	----		10-Apr-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 11-ROM-SR2_W12	E235.NO3	08-Apr-2021	----	----	----		11-Apr-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 10-ROM-SR1_W9	E235.NO3	18-Mar-2021	----	----	----		10-Apr-2021	3 days	23 days	* EHTR	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 11-ROM-SR2_W9	E235.NO3	18-Mar-2021	----	----	----		10-Apr-2021	3 days	23 days	* EHTR	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 01_TSF_W16	E235.NO3	01-Apr-2021	----	----	----		10-Apr-2021	3 days	9 days	* EHTR	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 10-ROM-SR1_W11	E235.NO3	01-Apr-2021	----	----	----		10-Apr-2021	3 days	9 days	* EHTR	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 11-ROM-SR2_W11	E235.NO3	01-Apr-2021	----	----	----		11-Apr-2021	3 days	9 days	* EHTR	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Nitrite in Water by IC										
HDPE 10-ROM-SR1_W10	E235.NO2	25-Mar-2021	----	----	----		10-Apr-2021	3 days	16 days	* EHTR
Anions and Nutrients : Nitrite in Water by IC										
HDPE 11-ROM-SR2_W10	E235.NO2	25-Mar-2021	----	----	----		10-Apr-2021	3 days	16 days	* EHTR
Anions and Nutrients : Nitrite in Water by IC										
HDPE 02_IF_PAG_W12	E235.NO2	08-Apr-2021	----	----	----		10-Apr-2021	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 03-SED_PAG_W12	E235.NO2	08-Apr-2021	----	----	----		10-Apr-2021	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 04-GAB-NPAG_W12	E235.NO2	08-Apr-2021	----	----	----		10-Apr-2021	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 05-SED-NPAG_W12	E235.NO2	08-Apr-2021	----	----	----		10-Apr-2021	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 06-IF-NPAG_W12	E235.NO2	08-Apr-2021	----	----	----		10-Apr-2021	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 07-IF-PAG-CW_W12	E235.NO2	08-Apr-2021	----	----	----		10-Apr-2021	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 08-SED-PAG-CW_W12	E235.NO2	08-Apr-2021	----	----	----		10-Apr-2021	3 days	2 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrite in Water by IC											
HDPE 09-FZONE-NPAG_W12	E235.NO2	08-Apr-2021	----	----	----		10-Apr-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 10-ROM-SR1_W12	E235.NO2	08-Apr-2021	----	----	----		10-Apr-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 11-ROM-SR2_W12	E235.NO2	08-Apr-2021	----	----	----		11-Apr-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 10-ROM-SR1_W9	E235.NO2	18-Mar-2021	----	----	----		10-Apr-2021	3 days	23 days	* EHTR	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 11-ROM-SR2_W9	E235.NO2	18-Mar-2021	----	----	----		10-Apr-2021	3 days	23 days	* EHTR	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 01_TSF_W16	E235.NO2	01-Apr-2021	----	----	----		10-Apr-2021	3 days	9 days	* EHTR	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 10-ROM-SR1_W11	E235.NO2	01-Apr-2021	----	----	----		10-Apr-2021	3 days	9 days	* EHTR	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 11-ROM-SR2_W11	E235.NO2	01-Apr-2021	----	----	----		11-Apr-2021	3 days	9 days	* EHTR	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 01_TSF_W15	E235.SO4	25-Mar-2021	----	----	----		11-Apr-2021	28 days	16 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Sulfate in Water by IC											
HDPE 02-IF-PAG_W10	E235.S04	25-Mar-2021	----	----	----		11-Apr-2021	28 days	16 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 03-SED-PAG_W10	E235.S04	25-Mar-2021	----	----	----		11-Apr-2021	28 days	16 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 04-GAB-NPAG_W10	E235.S04	25-Mar-2021	----	----	----		11-Apr-2021	28 days	16 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 05-SED-NPAG_W10	E235.S04	25-Mar-2021	----	----	----		11-Apr-2021	28 days	16 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 06-IF-NPAG_W10	E235.S04	25-Mar-2021	----	----	----		11-Apr-2021	28 days	16 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 07-IF-PAG-CW_W10	E235.S04	25-Mar-2021	----	----	----		11-Apr-2021	28 days	16 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 08-SED-PAG-CW_W10	E235.S04	25-Mar-2021	----	----	----		11-Apr-2021	28 days	16 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 09-FZONE-NPAG_W10	E235.S04	25-Mar-2021	----	----	----		11-Apr-2021	28 days	16 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 10-ROM-SR1_W10	E235.S04	25-Mar-2021	----	----	----		10-Apr-2021	28 days	16 days	✔	



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Sulfate in Water by IC										
HDPE 11-ROM-SR2_W10	E235.SO4	25-Mar-2021	----	----	----		10-Apr-2021	28 days	16 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W17	E235.SO4	08-Apr-2021	----	----	----		11-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 02_IF_PAG_W12	E235.SO4	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 03-SED_PAG_W12	E235.SO4	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 04-GAB-NPAG_W12	E235.SO4	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 05-SED-NPAG_W12	E235.SO4	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 06-IF-NPAG_W12	E235.SO4	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 07-IF-PAG-CW_W12	E235.SO4	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 08-SED-PAG-CW_W12	E235.SO4	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Sulfate in Water by IC										
HDPE 09-FZONE-NPAG_W12	E235.S04	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 10-ROM-SR1_W12	E235.S04	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 11-ROM-SR2_W12	E235.S04	08-Apr-2021	----	----	----		11-Apr-2021	28 days	2 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W14	E235.S04	18-Mar-2021	----	----	----		11-Apr-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 02_IF_PAG_W9	E235.S04	18-Mar-2021	----	----	----		11-Apr-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 03-SED-PAG_W9	E235.S04	18-Mar-2021	----	----	----		11-Apr-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 04-GAB-NPAG_W9	E235.S04	18-Mar-2021	----	----	----		11-Apr-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 05-SED-NPAG_W9	E235.S04	18-Mar-2021	----	----	----		11-Apr-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 06-IF-NPAG_W9	E235.S04	18-Mar-2021	----	----	----		11-Apr-2021	28 days	23 days	✔



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Sulfate in Water by IC											
HDPE 07-IF-PAG-CW_W9	E235.S04	18-Mar-2021	----	----	----		11-Apr-2021	28 days	23 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 08-SED-PAG-CW_W9	E235.S04	18-Mar-2021	----	----	----		11-Apr-2021	28 days	23 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 09-FZONE-NPAG_W9	E235.S04	18-Mar-2021	----	----	----		11-Apr-2021	28 days	23 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 10-ROM-SR1_W9	E235.S04	18-Mar-2021	----	----	----		10-Apr-2021	28 days	23 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 11-ROM-SR2_W9	E235.S04	18-Mar-2021	----	----	----		10-Apr-2021	28 days	23 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 03-SED-PAG_W11	E235.S04	01-Mar-2021	----	----	----		10-Apr-2021	28 days	40 days	✖ EHTR	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 01_TSF_W16	E235.S04	01-Apr-2021	----	----	----		10-Apr-2021	28 days	9 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 02_IF_PAG_W11	E235.S04	01-Apr-2021	----	----	----		11-Apr-2021	28 days	9 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 04-GAB-NPAG_W11	E235.S04	01-Apr-2021	----	----	----		11-Apr-2021	28 days	9 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Sulfate in Water by IC											
HDPE 05-SED-NPAG_W11	E235.S04	01-Apr-2021	----	----	----		11-Apr-2021	28 days	9 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 06-IF-NPAG_W11	E235.S04	01-Apr-2021	----	----	----		11-Apr-2021	28 days	9 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 07-IF-PAG-CW_W11	E235.S04	01-Apr-2021	----	----	----		11-Apr-2021	28 days	9 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 08-SED-PAG-CW_W11	E235.S04	01-Apr-2021	----	----	----		11-Apr-2021	28 days	9 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 09-FZONE-NPAG_W11	E235.S04	01-Apr-2021	----	----	----		11-Apr-2021	28 days	9 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 10-ROM-SR1_W11	E235.S04	01-Apr-2021	----	----	----		10-Apr-2021	28 days	9 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 11-ROM-SR2_W11	E235.S04	01-Apr-2021	----	----	----		11-Apr-2021	28 days	9 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 01_TSF_W16	E318	01-Apr-2021	13-Apr-2021	28 days	11 days	✔	13-Apr-2021	16 days	0 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 02_IF_PAG_W12	E318	08-Apr-2021	13-Apr-2021	28 days	4 days	✔	13-Apr-2021	23 days	0 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 03-SED_PAG_W12	E318	08-Apr-2021	13-Apr-2021	28 days	4 days	✔	13-Apr-2021	23 days	0 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 04-GAB-NPAG_W12	E318	08-Apr-2021	13-Apr-2021	28 days	4 days	✔	13-Apr-2021	23 days	0 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 05-SED-NPAG_W12	E318	08-Apr-2021	13-Apr-2021	28 days	4 days	✔	13-Apr-2021	23 days	0 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 06-IF-NPAG_W12	E318	08-Apr-2021	13-Apr-2021	28 days	4 days	✔	13-Apr-2021	23 days	0 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 07-IF-PAG-CW_W12	E318	08-Apr-2021	13-Apr-2021	28 days	4 days	✔	13-Apr-2021	23 days	0 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 08-SED-PAG-CW_W12	E318	08-Apr-2021	13-Apr-2021	28 days	4 days	✔	13-Apr-2021	23 days	0 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 09-FZONE-NPAG_W12	E318	08-Apr-2021	13-Apr-2021	28 days	4 days	✔	13-Apr-2021	23 days	0 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 10-ROM-SR1_W12	E318	08-Apr-2021	13-Apr-2021	28 days	4 days	✔	13-Apr-2021	23 days	0 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 11-ROM-SR2_W12	E318	08-Apr-2021	13-Apr-2021	28 days	4 days	✔	13-Apr-2021	23 days	0 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 01_TSF_W16	E372-U	01-Apr-2021	16-Apr-2021	28 days	14 days	✔	16-Apr-2021	13 days	0 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 02_IF_PAG_W12	E372-U	08-Apr-2021	16-Apr-2021	28 days	7 days	✔	16-Apr-2021	20 days	0 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 03-SED_PAG_W12	E372-U	08-Apr-2021	16-Apr-2021	28 days	7 days	✔	16-Apr-2021	20 days	0 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 04-GAB-NPAG_W12	E372-U	08-Apr-2021	16-Apr-2021	28 days	7 days	✔	16-Apr-2021	20 days	0 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 05-SED-NPAG_W12	E372-U	08-Apr-2021	16-Apr-2021	28 days	7 days	✔	16-Apr-2021	20 days	0 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 06-IF-NPAG_W12	E372-U	08-Apr-2021	16-Apr-2021	28 days	7 days	✔	16-Apr-2021	20 days	0 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 07-IF-PAG-CW_W12	E372-U	08-Apr-2021	16-Apr-2021	28 days	7 days	✔	16-Apr-2021	20 days	0 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 08-SED-PAG-CW_W12	E372-U	08-Apr-2021	16-Apr-2021	28 days	7 days	✔	16-Apr-2021	20 days	0 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 09-FZONE-NPAG_W12	E372-U	08-Apr-2021	16-Apr-2021	28 days	7 days	✔	16-Apr-2021	20 days	0 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 10-ROM-SR1_W12	E372-U	08-Apr-2021	16-Apr-2021	28 days	7 days	✔	16-Apr-2021	20 days	0 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 11-ROM-SR2_W12	E372-U	08-Apr-2021	16-Apr-2021	28 days	7 days	✔	16-Apr-2021	20 days	0 days	✔	
Cyanides : Total Cyanide by CFA											
UV inhibited HDPE - total (sodium hydroxide) 01_TSF_W16	E333	01-Apr-2021	----	----	----		15-Apr-2021	14 days	13 days	✔	
Cyanides : WAD Cyanide by CFA											
UV inhibited HDPE - total (sodium hydroxide) 01_TSF_W16	E336	01-Apr-2021	----	----	----		15-Apr-2021	14 days	13 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 01_TSF_W16	E421	01-Apr-2021	12-Apr-2021	180 days	10 days	✔	12-Apr-2021	169 days	0 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE 10-ROM-SR1_W11	E421	01-Apr-2021	12-Apr-2021	180 days	10 days	✔	12-Apr-2021	169 days	0 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE 11-ROM-SR2_W11	E421	01-Apr-2021	12-Apr-2021	180 days	10 days	✔	12-Apr-2021	169 days	0 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE 10-ROM-SR1_W10	E421	25-Mar-2021	12-Apr-2021	180 days	17 days	✔	12-Apr-2021	162 days	0 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE 11-ROM-SR2_W10	E421	25-Mar-2021	12-Apr-2021	180 days	17 days	✔	12-Apr-2021	162 days	0 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE 10-ROM-SR1_W9	E421	18-Mar-2021	12-Apr-2021	180 days	24 days	✔	12-Apr-2021	155 days	0 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE 11-ROM-SR2_W9	E421	18-Mar-2021	12-Apr-2021	180 days	24 days	✔	12-Apr-2021	155 days	0 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 02-IF-PAG_W12	E421	08-Apr-2021	12-Apr-2021	180 days	3 days	✔	12-Apr-2021	176 days	0 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 03-SED-PAG_W12	E421	08-Apr-2021	12-Apr-2021	180 days	3 days	✔	12-Apr-2021	176 days	0 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 04-GAB-NPAG_W12	E421	08-Apr-2021	12-Apr-2021	180 days	3 days	✔	12-Apr-2021	176 days	0 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 05-SED-NPAG_W12	E421	08-Apr-2021	12-Apr-2021	180 days	3 days	✔	12-Apr-2021	176 days	0 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 06-IF-NPAG_W12	E421	08-Apr-2021	12-Apr-2021	180 days	3 days	✔	12-Apr-2021	176 days	0 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 07-IF-PAG-CW_W12	E421	08-Apr-2021	12-Apr-2021	180 days	3 days	✔	12-Apr-2021	176 days	0 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 08-SED-PAG-CW_W12	E421	08-Apr-2021	12-Apr-2021	180 days	3 days	✔	12-Apr-2021	176 days	0 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 09-FZONE-NPAG_W12	E421	08-Apr-2021	12-Apr-2021	180 days	3 days	✔	12-Apr-2021	176 days	0 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 10-ROM-SR1_W12	E421	08-Apr-2021	12-Apr-2021	180 days	3 days	✔	12-Apr-2021	176 days	0 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 11-ROM-SR2_W12	E421	08-Apr-2021	12-Apr-2021	180 days	3 days	✔	12-Apr-2021	176 days	0 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE 04-GAB-NPAG_W12	E290	08-Apr-2021	----	----	----		10-Apr-2021	14 days	1 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE 05-SED-NPAG_W12	E290	08-Apr-2021	----	----	----		10-Apr-2021	14 days	1 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE 06-IF-NPAG_W12	E290	08-Apr-2021	----	----	----		10-Apr-2021	14 days	1 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE 07-IF-PAG-CW_W12	E290	08-Apr-2021	----	----	----		10-Apr-2021	14 days	1 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE 08-SED-PAG-CW_W12	E290	08-Apr-2021	----	----	----		10-Apr-2021	14 days	1 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE 09-FZONE-NPAG_W12	E290	08-Apr-2021	----	----	----		10-Apr-2021	14 days	1 days	✔	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Alkalinity Species by Titration										
HDPE 10-ROM-SR1_W12	E290	08-Apr-2021	----	----	----		10-Apr-2021	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 11-ROM-SR2_W12	E290	08-Apr-2021	----	----	----		10-Apr-2021	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 10-ROM-SR1_W10	E290	25-Mar-2021	----	----	----		10-Apr-2021	14 days	15 days	* EHTR
Physical Tests : Alkalinity Species by Titration										
HDPE 11-ROM-SR2_W10	E290	25-Mar-2021	----	----	----		10-Apr-2021	14 days	15 days	* EHTR
Physical Tests : Alkalinity Species by Titration										
HDPE 02_IF_PAG_W12	E290	08-Apr-2021	----	----	----		10-Apr-2021	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 03-SED_PAG_W12	E290	08-Apr-2021	----	----	----		10-Apr-2021	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 10-ROM-SR1_W9	E290	18-Mar-2021	----	----	----		10-Apr-2021	14 days	23 days	* EHTR
Physical Tests : Alkalinity Species by Titration										
HDPE 11-ROM-SR2_W9	E290	18-Mar-2021	----	----	----		10-Apr-2021	14 days	23 days	* EHTR
Physical Tests : Alkalinity Species by Titration										
HDPE 01_TSF_W16	E290	01-Apr-2021	----	----	----		10-Apr-2021	14 days	9 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Alkalinity Species by Titration										
HDPE 10-ROM-SR1_W11	E290	01-Apr-2021	----	----	----		10-Apr-2021	14 days	9 days	✔
Physical Tests : Alkalinity Species by Titration										
HDPE 11-ROM-SR2_W11	E290	01-Apr-2021	----	----	----		10-Apr-2021	14 days	9 days	✔
Physical Tests : Conductivity in Water										
HDPE 04-GAB-NPAG_W12	E100	08-Apr-2021	----	----	----		10-Apr-2021	28 days	1 days	✔
Physical Tests : Conductivity in Water										
HDPE 05-SED-NPAG_W12	E100	08-Apr-2021	----	----	----		10-Apr-2021	28 days	1 days	✔
Physical Tests : Conductivity in Water										
HDPE 06-IF-NPAG_W12	E100	08-Apr-2021	----	----	----		10-Apr-2021	28 days	1 days	✔
Physical Tests : Conductivity in Water										
HDPE 07-IF-PAG-CW_W12	E100	08-Apr-2021	----	----	----		10-Apr-2021	28 days	1 days	✔
Physical Tests : Conductivity in Water										
HDPE 08-SED-PAG-CW_W12	E100	08-Apr-2021	----	----	----		10-Apr-2021	28 days	1 days	✔
Physical Tests : Conductivity in Water										
HDPE 09-FZONE-NPAG_W12	E100	08-Apr-2021	----	----	----		10-Apr-2021	28 days	1 days	✔
Physical Tests : Conductivity in Water										
HDPE 10-ROM-SR1_W12	E100	08-Apr-2021	----	----	----		10-Apr-2021	28 days	1 days	✔



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Conductivity in Water										
HDPE 11-ROM-SR2_W12	E100	08-Apr-2021	----	----	----		10-Apr-2021	28 days	1 days	✔
Physical Tests : Conductivity in Water										
HDPE 10-ROM-SR1_W10	E100	25-Mar-2021	----	----	----		10-Apr-2021	28 days	15 days	✔
Physical Tests : Conductivity in Water										
HDPE 11-ROM-SR2_W10	E100	25-Mar-2021	----	----	----		10-Apr-2021	28 days	15 days	✔
Physical Tests : Conductivity in Water										
HDPE 02_IF_PAG_W12	E100	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔
Physical Tests : Conductivity in Water										
HDPE 03-SED_PAG_W12	E100	08-Apr-2021	----	----	----		10-Apr-2021	28 days	2 days	✔
Physical Tests : Conductivity in Water										
HDPE 10-ROM-SR1_W9	E100	18-Mar-2021	----	----	----		10-Apr-2021	28 days	23 days	✔
Physical Tests : Conductivity in Water										
HDPE 11-ROM-SR2_W9	E100	18-Mar-2021	----	----	----		10-Apr-2021	28 days	23 days	✔
Physical Tests : Conductivity in Water										
HDPE 01_TSF_W16	E100	01-Apr-2021	----	----	----		10-Apr-2021	28 days	9 days	✔
Physical Tests : Conductivity in Water										
HDPE 10-ROM-SR1_W11	E100	01-Apr-2021	----	----	----		10-Apr-2021	28 days	9 days	✔



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Physical Tests : Conductivity in Water											
HDPE 11-ROM-SR2_W11	E100	01-Apr-2021	----	----	----		10-Apr-2021	28 days	9 days		✓
Physical Tests : pH by Meter											
HDPE 01_TSF_W16	E108	01-Apr-2021	----	----	----		10-Apr-2021	0.25 hrs	217 hrs		* EHTR-FM
Physical Tests : pH by Meter											
HDPE 10-ROM-SR1_W11	E108	01-Apr-2021	----	----	----		10-Apr-2021	0.25 hrs	217 hrs		* EHTR-FM
Physical Tests : pH by Meter											
HDPE 11-ROM-SR2_W11	E108	01-Apr-2021	----	----	----		10-Apr-2021	0.25 hrs	217 hrs		* EHTR-FM
Physical Tests : pH by Meter											
HDPE 10-ROM-SR1_W10	E108	25-Mar-2021	----	----	----		10-Apr-2021	0.25 hrs	383 hrs		* EHTR-FM
Physical Tests : pH by Meter											
HDPE 11-ROM-SR2_W10	E108	25-Mar-2021	----	----	----		10-Apr-2021	0.25 hrs	383 hrs		* EHTR-FM
Physical Tests : pH by Meter											
HDPE 10-ROM-SR1_W12	E108	08-Apr-2021	----	----	----		10-Apr-2021	0.25 hrs	46 hrs		* EHTR-FM
Physical Tests : pH by Meter											
HDPE 11-ROM-SR2_W12	E108	08-Apr-2021	----	----	----		10-Apr-2021	0.25 hrs	46 hrs		* EHTR-FM
Physical Tests : pH by Meter											
HDPE 04-GAB-NPAG_W12	E108	08-Apr-2021	----	----	----		10-Apr-2021	0.25 hrs	47 hrs		* EHTR-FM



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 Actual		Eval	Analysis Date	Holding Times Rec Actual		Eval
Physical Tests : pH by Meter										
HDPE 05-SED-NPAG_W12	E108	08-Apr-2021	----	----	----		10-Apr-2021	0.25 hrs	47 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 06-IF-NPAG_W12	E108	08-Apr-2021	----	----	----		10-Apr-2021	0.25 hrs	47 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 07-IF-PAG-CW_W12	E108	08-Apr-2021	----	----	----		10-Apr-2021	0.25 hrs	47 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 08-SED-PAG-CW_W12	E108	08-Apr-2021	----	----	----		10-Apr-2021	0.25 hrs	47 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 09-FZONE-NPAG_W12	E108	08-Apr-2021	----	----	----		10-Apr-2021	0.25 hrs	47 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 02_IF_PAG_W12	E108	08-Apr-2021	----	----	----		10-Apr-2021	0.25 hrs	48 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 03-SED_PAG_W12	E108	08-Apr-2021	----	----	----		10-Apr-2021	0.25 hrs	48 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 10-ROM-SR1_W9	E108	18-Mar-2021	----	----	----		10-Apr-2021	0.25 hrs	552 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 11-ROM-SR2_W9	E108	18-Mar-2021	----	----	----		10-Apr-2021	0.25 hrs	552 hrs	* EHTR-FM

Legend & Qualifier Definitions

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

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

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Work Order : SK2100888
Client : O'Kane Consultants Inc.
Project : 948-021



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	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	176267	1	17	5.8	5.0	✓
Ammonia by Fluorescence	E298	178481	1	20	5.0	5.0	✓
Bromide in Water by IC	E235.Br	176259	3	48	6.2	5.0	✓
Chloride in Water by IC	E235.Cl	176264	2	22	9.0	5.0	✓
Conductivity in Water	E100	176265	1	18	5.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	177141	2	22	9.0	5.0	✓
Fluoride in Water by IC	E235.F	176260	2	22	9.0	5.0	✓
Nitrate in Water by IC	E235.NO3	176261	2	22	9.0	5.0	✓
Nitrite in Water by IC	E235.NO2	176262	2	22	9.0	5.0	✓
pH by Meter	E108	176266	1	18	5.5	5.0	✓
Sulfate in Water by IC	E235.SO4	176263	3	49	6.1	5.0	✓
Total Cyanide by CFA	E333	178919	1	11	9.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	177828	2	28	7.1	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	178515	1	19	5.2	5.0	✓
WAD Cyanide by CFA	E336	178920	1	1	100.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	176267	1	17	5.8	5.0	✓
Ammonia by Fluorescence	E298	178481	1	20	5.0	5.0	✓
Bromide in Water by IC	E235.Br	176259	3	48	6.2	5.0	✓
Chloride in Water by IC	E235.Cl	176264	2	22	9.0	5.0	✓
Conductivity in Water	E100	176265	1	18	5.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	177141	2	22	9.0	5.0	✓
Fluoride in Water by IC	E235.F	176260	2	22	9.0	5.0	✓
Nitrate in Water by IC	E235.NO3	176261	2	22	9.0	5.0	✓
Nitrite in Water by IC	E235.NO2	176262	2	22	9.0	5.0	✓
pH by Meter	E108	176266	1	18	5.5	5.0	✓
Sulfate in Water by IC	E235.SO4	176263	3	49	6.1	5.0	✓
Total Cyanide by CFA	E333	178919	1	11	9.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	177828	2	28	7.1	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	178515	1	19	5.2	5.0	✓
WAD Cyanide by CFA	E336	178920	1	1	100.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	176267	1	17	5.8	5.0	✓
Ammonia by Fluorescence	E298	178481	1	20	5.0	5.0	✓
Bromide in Water by IC	E235.Br	176259	3	48	6.2	5.0	✓
Chloride in Water by IC	E235.Cl	176264	2	22	9.0	5.0	✓
Conductivity in Water	E100	176265	1	18	5.5	5.0	✓



Matrix: **Water**

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
<i>Analytical Methods</i>							
Method Blanks (MB) - Continued							
Dissolved Metals in Water by CRC ICPMS	E421	177141	2	22	9.0	5.0	✓
Fluoride in Water by IC	E235.F	176260	2	22	9.0	5.0	✓
Nitrate in Water by IC	E235.NO3	176261	2	22	9.0	5.0	✓
Nitrite in Water by IC	E235.NO2	176262	2	22	9.0	5.0	✓
Sulfate in Water by IC	E235.SO4	176263	3	49	6.1	5.0	✓
Total Cyanide by CFA	E333	178919	1	11	9.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	177828	2	28	7.1	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	178515	1	19	5.2	5.0	✓
WAD Cyanide by CFA	E336	178920	1	1	100.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	178481	1	20	5.0	5.0	✓
Bromide in Water by IC	E235.Br	176259	3	48	6.2	5.0	✓
Chloride in Water by IC	E235.Cl	176264	2	22	9.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	177141	2	22	9.0	5.0	✓
Fluoride in Water by IC	E235.F	176260	2	22	9.0	5.0	✓
Nitrate in Water by IC	E235.NO3	176261	2	22	9.0	5.0	✓
Nitrite in Water by IC	E235.NO2	176262	2	22	9.0	5.0	✓
Sulfate in Water by IC	E235.SO4	176263	3	49	6.1	5.0	✓
Total Cyanide by CFA	E333	178919	1	11	9.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	177828	2	28	7.1	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	178515	1	19	5.2	5.0	✓
WAD Cyanide by CFA	E336	178920	0	1	0.0	5.0	*



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Saskatoon - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Saskatoon - 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.
Bromide in Water by IC	E235.Br Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC	E235.Cl Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Saskatoon - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Total Kjeldahl Nitrogen is determined using block digestion followed by flow-injection analysis with fluorescence detection.
Total Cyanide by CFA	E333 Vancouver - Environmental	Water	ISO 14403 (mod)	Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.
WAD Cyanide by CFA	E336 Vancouver - Environmental	Water	APHA 4500-CN I (mod)	Weak Acid Dissociable (WAD) cyanide is determined by in-line sample distillation with final determination by colourimetric analysis.
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Metals in Water by CRC ICPMS	E421 Saskatoon - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Hardness (Calculated)	EC100 Saskatoon - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Ion Balance using Dissolved Metals	EC101 Saskatoon - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
TDS in Water (Calculation)	EC103 Saskatoon - Environmental	Water	APHA 1030E (mod)	Total Dissolved Solids is calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Saskatoon - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested using block digestion with Copper Sulfate Digestion Reagent.



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Saskatoon - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.



QUALITY CONTROL REPORT

Work Order : SK2100888

Page : 1 of 18

Client : O'Kane Consultants Inc.
Contact : Jared Robertson
Address : 112 - 112 Research Drive
Saskatoon SK Canada S7N 3R3
Telephone : 250 420 7010
Project : 948-021
PO : ----
C-O-C number : ----
Sampler : Client
Site : ----
Quote number : Q83455
No. of samples received : 44
No. of samples analysed : 44

Laboratory : Saskatoon - Environmental
Account Manager : Brian Morgan
Address : 819 58 Street East
Saskatoon, Saskatchewan Canada S7K 6X5
Telephone : 1 306 221 7147
Date Samples Received : 08-Apr-2021 15:45
Date Analysis Commenced : 09-Apr-2021
Issue Date : 19-Apr-2021 10:13

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 Percentage Difference (RPD) and Acceptance Limits
● Matrix Spike (MS) Report; Recovery and Acceptance Limits
● Reference Material (RM) Report; Recovery and Acceptance Limits
● Method Blank (MB) Report; Recovery and Acceptance Limits
● Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

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.

Table with 3 columns: Signatories, Position, Laboratory Department. Lists names like Dwayne Bennett, Harpreet Chawla, Hedy Lai, etc., along with their roles and departments.

Page : 2 of 18
Work Order : SK2100888
Client : O'Kane Consultants Inc.
Project : 948-021



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 Services number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

= Indicates a QC result that did not meet the ALS DQO.



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: 176265)											
SK2100888-003	01_TSF_W16	conductivity	----	E100	2.0	µS/cm	43100	42800	0.698%	10%	----
Physical Tests (QC Lot: 176266)											
SK2100888-003	01_TSF_W16	pH	----	E108	0.10	pH units	7.85	7.85	0.0202%	3%	----
Physical Tests (QC Lot: 176267)											
SK2100888-003	01_TSF_W16	alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	376	383	1.79%	20%	----
Anions and Nutrients (QC Lot: 176259)											
SK2100888-008	02_IF_PAG_W12	bromide	24959-67-9	E235.Br	0.50	mg/L	1.63	1.54	0.09	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 176260)											
SK2100888-008	02_IF_PAG_W12	fluoride	16984-48-8	E235.F	0.100	mg/L	0.501	0.615	0.114	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 176261)											
SK2100888-008	02_IF_PAG_W12	nitrate (as N)	14797-55-8	E235.NO3	0.100	mg/L	0.145	0.160	0.014	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 176262)											
SK2100888-008	02_IF_PAG_W12	nitrite (as N)	14797-65-0	E235.NO2	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 176263)											
SK2100888-008	02_IF_PAG_W12	sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	102	97.2	5.13%	20%	----
Anions and Nutrients (QC Lot: 176264)											
SK2100888-008	02_IF_PAG_W12	chloride	16887-00-6	E235.Cl	2.50	mg/L	61.7	60.1	2.54%	20%	----
Anions and Nutrients (QC Lot: 176321)											
SK2100888-043	11-ROM-SR2_W11	bromide	24959-67-9	E235.Br	0.10	mg/L	0.15	0.14	0.01	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 176322)											
SK2100888-043	11-ROM-SR2_W11	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	54.2	51.2	5.85%	20%	----
Anions and Nutrients (QC Lot: 176323)											
SK2100888-043	11-ROM-SR2_W11	nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	2.38	2.28	3.98%	20%	----
Anions and Nutrients (QC Lot: 176324)											
SK2100888-043	11-ROM-SR2_W11	nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	0.021	0.020	0.001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 176325)											
SK2100888-043	11-ROM-SR2_W11	fluoride	16984-48-8	E235.F	0.020	mg/L	0.062	0.062	0.0003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 176326)											
SK2100888-043	11-ROM-SR2_W11	chloride	16887-00-6	E235.Cl	0.50	mg/L	52.2	50.9	2.55%	20%	----
Anions and Nutrients (QC Lot: 176327)											
SK2100888-025	07-IF-PAG-CW_W9	bromide	24959-67-9	E235.Br	30.0	mg/L	347	351	1.26%	20%	----



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
Anions and Nutrients (QC Lot: 176328)											
SK2100888-025	07-IF-PAG-CW_W9	sulfate (as SO4)	14808-79-8	E235.SO4	90.0	mg/L	2710	2810	3.59%	20%	----
Anions and Nutrients (QC Lot: 177828)											
CG2100749-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 177829)											
SK2100888-016	04-GAB-NPAG_W12	Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	0.508	0.544	0.036	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 178481)											
CG2100751-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0432	0.0430	0.0002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 178515)											
CG2100749-011	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0038	0.0034	0.0004	Diff <2x LOR	----
Cyanides (QC Lot: 178919)											
SK2100888-003	01_TSF_W16	cyanide, strong acid dissociable (total)	----	E333	0.0200	mg/L	2.56	2.56	0.142%	20%	----
Cyanides (QC Lot: 178920)											
SK2100888-003	01_TSF_W16	cyanide, weak acid dissociable	----	E336	0.0200	mg/L	0.0881	0.0979	0.0098	Diff <2x LOR	----
Dissolved Metals (QC Lot: 177141)											
SK2100888-041	11-ROM-SR2_W9	aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0206	0.0206	0.0761%	20%	----
		antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00021	0.00021	0.000005	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00584	0.00588	0.633%	20%	----
		barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0236	0.0237	0.297%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.010	mg/L	0.206	0.211	2.20%	20%	----
		cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000099	0.0000130	0.0000030	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.050	mg/L	29.6	31.1	4.76%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000035	0.000035	0.0000005	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00034	0.00034	0.00000001	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00137	0.00135	0.00002	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.030	mg/L	<0.030	<0.030	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000050	mg/L	0.000052	0.000056	0.000004	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0071	0.0070	0.00007	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	10.2	10.2	0.191%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00500	mg/L	0.132	0.132	0.242%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00170	0.00168	0.734%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00078	0.00080	0.00002	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----



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
Dissolved Metals (QC Lot: 177141) - continued											
SK2100888-041	11-ROM-SR2_W9	potassium, dissolved	7440-09-7	E421	0.050	mg/L	3.10	3.11	0.220%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00155	0.00149	0.00006	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000226	0.000237	0.000011	Diff <2x LOR	----
		silicon, dissolved	7440-21-3	E421	0.050	mg/L	2.72	2.66	2.09%	20%	----
		silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, dissolved	17341-25-2	E421	0.050	mg/L	52.2	52.6	0.645%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.126	0.126	0.190%	20%	----
		sulfur, dissolved	7704-34-9	E421	0.50	mg/L	20.0	20.3	1.14%	20%	----
		tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00010	mg/L	0.0110	0.0111	0.639%	20%	----
		titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	0.00046	0.00046	0.000001	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000868	0.000887	2.13%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 177142)											
SK2100888-032	08-SED-PAG-CW_W12	aluminum, dissolved	7429-90-5	E421	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.0100	mg/L	0.196	0.203	3.08%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	1.00	mg/L	<1.00	<1.00	0	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.000500	mg/L	0.00329	0.00296	0.000326	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	5.00	mg/L	1630	1630	0.148%	20%	----
		cesium, dissolved	7440-46-2	E421	0.00100	mg/L	0.00722	0.00741	0.000194	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.0500	mg/L	<0.0500	<0.0500	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.0100	mg/L	0.0241	0.0247	0.00063	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.0200	mg/L	<0.0200	<0.0200	0	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	3.00	mg/L	<3.00	<3.00	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.100	mg/L	0.241	0.245	0.0040	Diff <2x LOR	----



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
Dissolved Metals (QC Lot: 177142) - continued											
SK2100888-032	08-SED-PAG-CW_W12	magnesium, dissolved	7439-95-4	E421	0.500	mg/L	1970	2030	3.07%	20%	----
		manganese, dissolved	7439-96-5	E421	0.500	mg/L	<0.500	<0.500	0	Diff <2x LOR	----
		molybdenum, dissolved	7439-98-7	E421	0.00500	mg/L	0.0224	0.0226	0.000253	Diff <2x LOR	----
		nickel, dissolved	7440-02-0	E421	0.0500	mg/L	0.195	0.190	0.00505	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	5.00	mg/L	<5.00	<5.00	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	5.00	mg/L	567	559	1.42%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.0200	mg/L	0.192	0.195	0.00344	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		silicon, dissolved	7440-21-3	E421	5.00	mg/L	<5.00	<5.00	0	Diff <2x LOR	----
		silver, dissolved	7440-22-4	E421	0.00100	mg/L	0.00120	0.00114	0.000057	Diff <2x LOR	----
		sodium, dissolved	17341-25-2	E421	5.00	mg/L	14600	14700	0.805%	20%	----
		strontium, dissolved	7440-24-6	E421	0.0200	mg/L	36.3	35.8	1.35%	20%	----
		sulfur, dissolved	7704-34-9	E421	50.0	mg/L	1120	1130	1.51%	20%	----
		tellurium, dissolved	13494-80-9	E421	0.0200	mg/L	<0.0200	<0.0200	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.00100	mg/L	0.00109	<0.00100	0.000091	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.0300	mg/L	<0.0300	<0.0300	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.00100	mg/L	0.0370	0.0364	1.45%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.0500	mg/L	<0.0500	<0.0500	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.100	mg/L	0.245	0.238	0.0066	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.0300	mg/L	<0.0300	<0.0300	0	Diff <2x LOR	----



Method Blank (MB) Report

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

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 176265)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 176267)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Anions and Nutrients (QCLot: 176259)						
bromide	24959-67-9	E235.Br	0.1	mg/L	<0.10	----
Anions and Nutrients (QCLot: 176260)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 176261)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 176262)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 176263)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 176264)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 176321)						
bromide	24959-67-9	E235.Br	0.1	mg/L	<0.10	----
Anions and Nutrients (QCLot: 176322)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 176323)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 176324)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 176325)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 176326)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 176327)						
bromide	24959-67-9	E235.Br	0.1	mg/L	<0.10	----
Anions and Nutrients (QCLot: 176328)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 177828)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 177829)						
Kjeldahl nitrogen, total [TKN]	---	E318	0.05	mg/L	<0.050	---
Anions and Nutrients (QCLot: 178481)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	---
Anions and Nutrients (QCLot: 178515)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	---
Cyanides (QCLot: 178919)						
cyanide, strong acid dissociable (total)	---	E333	0.002	mg/L	<0.0020	---
Cyanides (QCLot: 178920)						
cyanide, weak acid dissociable	---	E336	0.002	mg/L	<0.0020	---
Dissolved Metals (QCLot: 177141)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	---
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	---
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	---
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	---
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	---
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	---
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	---
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	---
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	---
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	---
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	---
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	---
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	---
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	---
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	---
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	---
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	---
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	---
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	---
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	---
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	---
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	---
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	---
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	---
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	---
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	---



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 177141) - continued						
sodium, dissolved	17341-25-2	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Dissolved Metals (QCLot: 177142)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 177142) - continued						
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	17341-25-2	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----



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				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 176265)									
conductivity	----	E100	1	µS/cm	1000 µS/cm	97.4	90.0	110	----
Physical Tests (QCLot: 176266)									
pH	----	E108	----	pH units	6.86 pH units	100.0	98.0	102	----
Physical Tests (QCLot: 176267)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	96.3	85.0	115	----
Anions and Nutrients (QCLot: 176259)									
bromide	24959-67-9	E235.Br	0.1	mg/L	0.5 mg/L	94.7	85.0	115	----
Anions and Nutrients (QCLot: 176260)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	96.6	90.0	110	----
Anions and Nutrients (QCLot: 176261)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 176262)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	98.9	90.0	110	----
Anions and Nutrients (QCLot: 176263)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 176264)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	99.1	90.0	110	----
Anions and Nutrients (QCLot: 176321)									
bromide	24959-67-9	E235.Br	0.1	mg/L	0.5 mg/L	101	85.0	115	----
Anions and Nutrients (QCLot: 176322)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 176323)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 176324)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 176325)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 176326)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 176327)									
bromide	24959-67-9	E235.Br	0.1	mg/L	0.5 mg/L	98.2	85.0	115	----
Anions and Nutrients (QCLot: 176328)									



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 176328) - continued									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 177828)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	97.1	75.0	125	----
Anions and Nutrients (QCLot: 177829)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	90.9	75.0	125	----
Anions and Nutrients (QCLot: 178481)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.1 mg/L	108	85.0	115	----
Anions and Nutrients (QCLot: 178515)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.32 mg/L	93.2	80.0	120	----
Cyanides (QCLot: 178919)									
cyanide, strong acid dissociable (total)	----	E333	0.002	mg/L	0.25 mg/L	91.3	80.0	120	----
Cyanides (QCLot: 178920)									
cyanide, weak acid dissociable	----	E336	0.002	mg/L	0.125 mg/L	102	80.0	120	----
Dissolved Metals (QCLot: 177141)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	99.5	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	107	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	99.9	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	99.1	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	98.8	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	101	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	99.4	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	97.5	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	98.9	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	107	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	99.8	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	100	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	96.6	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	108	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	97.1	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	99.6	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	106	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	96.9	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	104	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	97.8	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	98.4	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 177141) - continued									
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	96.2	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	99.7	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	99.5	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	104	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	108	80.0	120	----
sodium, dissolved	17341-25-2	E421	0.05	mg/L	50 mg/L	105	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	103	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	104	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	103	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	96.9	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	95.2	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	96.4	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	94.8	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	98.4	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	98.4	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	99.7	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	96.7	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	104	80.0	120	----
Dissolved Metals (QCLot: 177142)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	102	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	102	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	99.9	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	101	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	105	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	95.0	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	101	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	100	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	102	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	103	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	99.1	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	98.7	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	95.6	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	107	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	93.6	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	105	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	102	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	95.9	80.0	120	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Dissolved Metals (QCLot: 177142) - continued									
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	100	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	97.2	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	99.6	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	96.0	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	101	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	101	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	103	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	104	80.0	120	----
sodium, dissolved	17341-25-2	E421	0.05	mg/L	50 mg/L	101	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	105	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	102	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	98.5	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	90.8	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	89.8	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	100	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	95.2	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	93.1	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	93.3	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	99.2	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	96.1	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	101	80.0	120	----



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 $\geq 1 \times$ 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: 176259)										
SK2100888-039	10-ROM-SR1_W11	bromide	24959-67-9	E235.Br	0.53 mg/L	0.5 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 176260)										
SK2100888-039	10-ROM-SR1_W11	fluoride	16984-48-8	E235.F	0.953 mg/L	1 mg/L	95.3	75.0	125	----
Anions and Nutrients (QCLot: 176261)										
SK2100888-039	10-ROM-SR1_W11	nitrate (as N)	14797-55-8	E235.NO3	ND mg/L	2.5 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 176262)										
SK2100888-039	10-ROM-SR1_W11	nitrite (as N)	14797-65-0	E235.NO2	0.502 mg/L	0.5 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 176263)										
SK2100888-039	10-ROM-SR1_W11	sulfate (as SO4)	14808-79-8	E235.SO4	97.9 mg/L	100 mg/L	97.9	90.0	110	----
Anions and Nutrients (QCLot: 176264)										
SK2100888-039	10-ROM-SR1_W11	chloride	16887-00-6	E235.Cl	100 mg/L	100 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 176321)										
SK2100888-044	11-ROM-SR2_W12	bromide	24959-67-9	E235.Br	0.49 mg/L	0.5 mg/L	97.8	75.0	125	----
Anions and Nutrients (QCLot: 176322)										
SK2100888-044	11-ROM-SR2_W12	sulfate (as SO4)	14808-79-8	E235.SO4	97.2 mg/L	100 mg/L	97.2	90.0	110	----
Anions and Nutrients (QCLot: 176323)										
SK2100888-044	11-ROM-SR2_W12	nitrate (as N)	14797-55-8	E235.NO3	2.50 mg/L	2.5 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 176324)										
SK2100888-044	11-ROM-SR2_W12	nitrite (as N)	14797-65-0	E235.NO2	0.494 mg/L	0.5 mg/L	98.8	75.0	125	----
Anions and Nutrients (QCLot: 176325)										
SK2100888-044	11-ROM-SR2_W12	fluoride	16984-48-8	E235.F	0.996 mg/L	1 mg/L	99.6	75.0	125	----
Anions and Nutrients (QCLot: 176326)										
SK2100888-044	11-ROM-SR2_W12	chloride	16887-00-6	E235.Cl	100 mg/L	100 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 176327)										
SK2100888-026	07-IF-PAG-CW_W10	bromide	24959-67-9	E235.Br	ND mg/L	0.5 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 176328)										
SK2100888-026	07-IF-PAG-CW_W10	sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	90.0	110	----



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: 177828)										
CG2100749-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.66 mg/L	2.5 mg/L	106	70.0	130	----
Anions and Nutrients (QCLot: 177829)										
SK2100888-020	05-SED-NPAG_W12	Kjeldahl nitrogen, total [TKN]	----	E318	2.34 mg/L	2.5 mg/L	93.5	70.0	130	----
Anions and Nutrients (QCLot: 178481)										
CG2100751-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.115 mg/L	0.1 mg/L	115	75.0	125	----
Anions and Nutrients (QCLot: 178515)										
CG2100750-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0565 mg/L	0.0676 mg/L	83.6	70.0	130	----
Cyanides (QCLot: 178919)										
SK2100865-001	Anonymous	cyanide, strong acid dissociable (total)	----	E333	0.217 mg/L	0.25 mg/L	87.0	75.0	125	----
Dissolved Metals (QCLot: 177141)										
SK2100895-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.210 mg/L	0.2 mg/L	105	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0212 mg/L	0.02 mg/L	106	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0201 mg/L	0.02 mg/L	100	70.0	130	----
		barium, dissolved	7440-39-3	E421	0.0201 mg/L	0.02 mg/L	101	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0378 mg/L	0.04 mg/L	94.5	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00858 mg/L	0.01 mg/L	85.8	70.0	130	----
		boron, dissolved	7440-42-8	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00374 mg/L	0.004 mg/L	93.6	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.0105 mg/L	0.01 mg/L	105	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0398 mg/L	0.04 mg/L	99.6	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0190 mg/L	0.02 mg/L	94.8	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0173 mg/L	0.02 mg/L	86.6	70.0	130	----
		iron, dissolved	7439-89-6	E421	1.90 mg/L	2 mg/L	95.0	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0173 mg/L	0.02 mg/L	86.4	70.0	130	----
		lithium, dissolved	7439-93-2	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0220 mg/L	0.02 mg/L	110	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0362 mg/L	0.04 mg/L	90.6	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	11.6 mg/L	10 mg/L	116	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0186 mg/L	0.02 mg/L	93.1	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0448 mg/L	0.04 mg/L	112	70.0	130	----
		silicon, dissolved	7440-21-3	E421	11.0 mg/L	10 mg/L	110	70.0	130	----



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
Dissolved Metals (QCLot: 177141) - continued										
SK2100895-001	Anonymous	silver, dissolved	7440-22-4	E421	0.00336 mg/L	0.004 mg/L	83.9	70.0	130	----
		sodium, dissolved	17341-25-2	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0417 mg/L	0.04 mg/L	104	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00351 mg/L	0.004 mg/L	87.8	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0187 mg/L	0.02 mg/L	93.5	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0191 mg/L	0.02 mg/L	95.7	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0418 mg/L	0.04 mg/L	104	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0194 mg/L	0.02 mg/L	96.9	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.00358 mg/L	0.004 mg/L	89.5	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.104 mg/L	0.1 mg/L	104	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.368 mg/L	0.4 mg/L	92.0	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0432 mg/L	0.04 mg/L	108	70.0	130	----
Dissolved Metals (QCLot: 177142)										
SK2100888-036	09-FZONE-NPAG_W12	aluminum, dissolved	7429-90-5	E421	0.207 mg/L	0.2 mg/L	104	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0206 mg/L	0.02 mg/L	103	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0196 mg/L	0.02 mg/L	97.9	70.0	130	----
		barium, dissolved	7440-39-3	E421	0.0204 mg/L	0.02 mg/L	102	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0418 mg/L	0.04 mg/L	104	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00919 mg/L	0.01 mg/L	91.9	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.098 mg/L	0.1 mg/L	97.8	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00377 mg/L	0.004 mg/L	94.2	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.0102 mg/L	0.01 mg/L	102	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0386 mg/L	0.04 mg/L	96.6	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0195 mg/L	0.02 mg/L	97.5	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0183 mg/L	0.02 mg/L	91.6	70.0	130	----
		iron, dissolved	7439-89-6	E421	1.94 mg/L	2 mg/L	97.0	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0182 mg/L	0.02 mg/L	90.8	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.0992 mg/L	0.1 mg/L	99.2	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	0.0178 mg/L	0.02 mg/L	88.9	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0374 mg/L	0.04 mg/L	93.5	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	10.7 mg/L	10 mg/L	107	70.0	130	----



Sub-Matrix: **Water**

					<i>Matrix Spike (MS) Report</i>					
					<i>Spike</i>		<i>Recovery (%)</i>	<i>Recovery Limits (%)</i>		
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>Concentration</i>	<i>Target</i>	<i>MS</i>	<i>Low</i>	<i>High</i>	<i>Qualifier</i>
Dissolved Metals (QCLot: 177142) - continued										
SK2100888-036	09-FZONE-NPAG_W12	potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0197 mg/L	0.02 mg/L	98.4	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0413 mg/L	0.04 mg/L	103	70.0	130	----
		silicon, dissolved	7440-21-3	E421	8.48 mg/L	10 mg/L	84.8	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00398 mg/L	0.004 mg/L	99.5	70.0	130	----
		sodium, dissolved	17341-25-2	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	20.8 mg/L	20 mg/L	104	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0384 mg/L	0.04 mg/L	96.1	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00363 mg/L	0.004 mg/L	90.7	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0192 mg/L	0.02 mg/L	95.9	70.0	130	----
		tin, dissolved	7440-31-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0413 mg/L	0.04 mg/L	103	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0188 mg/L	0.02 mg/L	94.1	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.00398 mg/L	0.004 mg/L	99.5	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.101 mg/L	0.1 mg/L	101	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.374 mg/L	0.4 mg/L	93.4	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0415 mg/L	0.04 mg/L	104	70.0	130	----



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Copy of Invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			<table border="1"> <tr> <td rowspan="10">NUMBER OF CONTAINERS</td> <td colspan="10"></td> <td rowspan="10">SAMPLES ON HOLD</td> <td rowspan="10">SUSPECTED HAZARD (see Special Instructions)</td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table>										NUMBER OF CONTAINERS											SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)																																																																																										
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Company:		Email 1 or Fax jrobertson@okc-sk.com																																																																																																																			
Contact:		Email 2																																																																																																																			
Project Information		Oil and Gas Required Fields (client use)																																																																																																																			
ALS Account # / Quote #: Q83455		AFE/Cost Center: PO#																																																																																																																			
Job #: 948-021		Major/Minor Code: Routing Code:																																																																																																																			
PO / AFE:		Requisitioner:																																																																																																																			
LSD:		Location:																																																																																																																			
ALS Lab Work Order # (lab use only):		ALS Contact:			Sampler:																																																																																																																
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																																																																																																												
01_TSF_W14					18-Mar-21		13:45		Leachate																																																																																																												
01_TSF_W15					25-Mar-21		14:45		Leachate																																																																																																												
01_TSF_W16					1-Mar-21		12:55		Leachate																																																																																																												
01_TSF_W17					8-Apr-21		13:40		Leachate																																																																																																												
02-IF-PAG_W9					18-Mar-21		13:45		Leachate																																																																																																												
02-IF-PAG_W10					25-Mar-21		14:45		Leachate																																																																																																												
02-IF-PAG_W11					1-Mar-21		12:55		Leachate																																																																																																												
02-IF-PAG_W12					8-Apr-21		13:45		Leachate																																																																																																												
03-SED-PAG_W9					18-Mar-21		13:45		Leachate																																																																																																												
03-SED-PAG_W10					25-Mar-21		14:45		Leachate																																																																																																												
03-SED-PAG_W11					1-Mar-21		12:55		Leachate																																																																																																												
03-SED-PAG_W12					8-Apr-21		14:00		Leachate																																																																																																												
Drinking Water (DW) Samples¹ (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)			SAMPLE CONDITION AS RECEIVED (lab use only)																																																																																																																
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Suspected hazards: elevated metals, potential for low levels of cyanide			Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>																																																																																																																
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					Ice Packs <input type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>																																																																																																																
		Cooling initiated <input type="checkbox"/>																																																																																																																			
		INITIAL COOLER TEMPERATURES °C					FINAL COOLER TEMPERATURES °C																																																																																																														
		15																																																																																																																			
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)																																																																																																																
Released by: Jared Robertson		Date: April 8, 2021		Time:		Received by: <i>[Signature]</i>		Date: 8-4-20		Time: 3:45		Received by: <i>[Signature]</i>		Date: 9/4/2021		Time: 8:40																																																																																																					

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NOV 2019 - FROD

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 : **SK2101287**
Client : **O'Kane Consultants Inc.**
Contact : Jared Robertson
Address : 112 - 112 Research Drive
Saskatoon SK Canada S7N 3R3
Telephone : 250 420 7010
Project : 948-021
PO : ----
C-O-C number : ----
Sampler : Client
Site : ----
Quote number : Q83455
No. of samples received : 38
No. of samples analysed : 36

Page : 1 of 26
Laboratory : Saskatoon - Environmental
Account Manager : Brian Morgan
Address : 819 58 Street East
Saskatoon SK Canada S7K 6X5
Telephone : 1 306 221 7147
Date Samples Received : 06-May-2021 16:45
Date Analysis Commenced : 07-May-2021
Issue Date : 15-May-2021 18:10

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Colby Bingham	Quality Systems Coordinator	Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Quality Systems Coordinator	Metals, Saskatoon, Saskatchewan
Dwayne Bennett	Technical Specialist	Inorganics, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Lian Nesbitt	Laboratory Analyst	Metals, Saskatoon, Saskatchewan
Melissa Houseman	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Nancy Cruse	Laboratory _ Supervisor	Inorganics, Saskatoon, Saskatchewan
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Tracy Harley	Supervisor - Water Quality Instrumentation	Inorganics, Burnaby, British Columbia



General Comments

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

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

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

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

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

<i>Unit</i>	<i>Description</i>
-	No Unit
%	percent
µS/cm	Microsiemens per centimetre
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).



Analytical Results

Sub-Matrix: Water					Client sample ID	01_TSF_W18	01_TSF_W19	01_TSF_W20	01_TSF_W21	02-IF-PAG_W13
(Matrix: Water)										
Client sampling date / time					15-Apr-2021 13:45	22-Apr-2021 14:18	29-Apr-2021 12:55	06-May-2021 13:40	15-Apr-2021 13:45	
Analyte	CAS Number	Method	LOR	Unit	SK2101287-001	SK2101287-002	SK2101287-003	SK2101287-004	SK2101287-005	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	----	1930	----	----	
conductivity	----	E100	2.0	µS/cm	----	----	30800	----	----	
pH	----	E108	0.10	pH units	----	----	8.08	----	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	----	379	----	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	----	<1.0	----	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	----	<1.0	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	311	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	22300	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	37.2	----	----	
bromide	24959-67-9	E235.Br	0.10	mg/L	23.7	<20.0 ^{DLDS}	<20.0 ^{DLDS}	<20.0 ^{DLDS}	1.06	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	5140	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	<4.00 ^{DLDS}	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	375	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	3.82	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	8350	8220	7080	7290	94.4	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	379	----	----	
Cyanides										
cyanide, strong acid dissociable (total)	----	E333	0.0050	mg/L	----	----	1.57	----	----	
cyanide, weak acid dissociable	----	E336	0.0050	mg/L	----	----	0.122	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	----	326	----	----	
cation sum	----	EC101	0.10	meq/L	----	----	355	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	4.26	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	109	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	<0.0500 ^{DLDS}	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	0.00945	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	0.601	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	0.0551	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	01_TSF_W18	01_TSF_W19	01_TSF_W20	01_TSF_W21	02-IF-PAG_W13
Client sampling date / time					15-Apr-2021 13:45	22-Apr-2021 14:18	29-Apr-2021 12:55	06-May-2021 13:40	15-Apr-2021 13:45	
Analyte	CAS Number	Method	LOR	Unit	SK2101287-001	SK2101287-002	SK2101287-003	SK2101287-004	SK2101287-005	
					Result	Result	Result	Result	Result	
Dissolved Metals										
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	---	---	<0.00100 ^{DLDS}	---	---	---
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	---	---	<0.00250 ^{DLDS}	---	---	---
boron, dissolved	7440-42-8	E421	0.010	mg/L	---	---	1.84	---	---	---
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	---	---	0.000423	---	---	---
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	621	---	---	---
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	<0.000500 ^{DLDS}	---	---	---
chromium, dissolved	7440-47-3	E421	0.000050	mg/L	---	---	<0.0250 ^{DLDS}	---	---	---
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	0.931	---	---	---
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	0.0180	---	---	---
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	<1.50 ^{DLDS}	---	---	---
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	<0.00250 ^{DLDS}	---	---	---
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	<0.0500 ^{DLDS}	---	---	---
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	92.5	---	---	---
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	3.82	---	---	---
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	0.698	---	---	---
nickel, dissolved	7440-02-0	E421	0.000050	mg/L	---	---	<0.0250 ^{DLDS}	---	---	---
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	<2.50 ^{DLDS}	---	---	---
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	550	---	---	---
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	0.0594	---	---	---
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	0.0498	---	---	---
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	4.67	---	---	---
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	0.00167	---	---	---
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	6890	---	---	---
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	2.44	---	---	---
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	3710	---	---	---
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	<0.0100 ^{DLDS}	---	---	---
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	<0.000500 ^{DLDS}	---	---	---
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	<0.00500 ^{DLDS}	---	---	---
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	<0.00500 ^{DLDS}	---	---	---
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	---	<0.0150 ^{DLDS}	---	---	---
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	---	<0.00500 ^{DLDS}	---	---	---



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	01_TSF_W18	01_TSF_W19	01_TSF_W20	01_TSF_W21	02-IF-PAG_W13
Client sampling date / time					15-Apr-2021 13:45	22-Apr-2021 14:18	29-Apr-2021 12:55	06-May-2021 13:40	15-Apr-2021 13:45	
Analyte	CAS Number	Method	LOR	Unit	SK2101287-001	SK2101287-002	SK2101287-003	SK2101287-004	SK2101287-005	
					Result	Result	Result	Result	Result	
Dissolved Metals										
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	----	----	0.00906	----	----	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	----	----	<0.0250 ^{DLDS}	----	----	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	----	<0.0500 ^{DLDS}	----	----	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	----	<0.0150 ^{DLDS}	----	----	
dissolved metals filtration location	----	EP421	-	-	----	----	Field	----	----	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	02-IF-PAG_W14	02-IF-PAG_W15	02-IF-PAG_W16	03-SED-PAG_W 13	03-SED-PAG_W 14
Client sampling date / time					22-Apr-2021 14:18	29-Apr-2021 12:55	06-May-2021 13:40	15-Apr-2021 13:45	22-Apr-2021 14:18	
Analyte	CAS Number	Method	LOR	Unit	SK2101287-006	SK2101287-007	SK2101287-008	SK2101287-009	SK2101287-010	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	----	42.8	----	----	
conductivity	----	E100	2.0	µS/cm	----	----	479	----	----	
pH	----	E108	0.10	pH units	----	----	8.32	----	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	----	151	----	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	----	<1.0	----	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	----	<1.0	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	125	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	274	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	0.0335	----	----	
bromide	24959-67-9	E235.Br	0.10	mg/L	0.77	<1.00 ^{DLM}	0.25	<1.00 ^{DLM}	1.45	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	10.8	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	0.392	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	<0.020	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	<0.010	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	97.4	95.1	84.2	190	55.8	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	<0.0500	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	----	4.58	----	----	
cation sum	----	EC101	0.10	meq/L	----	----	4.26	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	3.62	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	93.0	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	0.0238	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	0.0130	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	0.00098	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	0.0176	----	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	----	<0.000020	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	----	<0.000050	----	----	
boron, dissolved	7440-42-8	E421	0.010	mg/L	----	----	0.090	----	----	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	----	----	0.0000092	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	02-IF-PAG_W14	02-IF-PAG_W15	02-IF-PAG_W16	03-SED-PAG_W 13	03-SED-PAG_W 14
Client sampling date / time					22-Apr-2021 14:18	29-Apr-2021 12:55	06-May-2021 13:40	15-Apr-2021 13:45	22-Apr-2021 14:18	
Analyte	CAS Number	Method	LOR	Unit	SK2101287-006	SK2101287-007	SK2101287-008	SK2101287-009	SK2101287-010	
					Result	Result	Result	Result	Result	
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	10.8	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	0.000042	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	---	<0.00050	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	<0.00010	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	0.00169	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	<0.030	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	<0.000050	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	0.0055	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	3.85	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	<0.00500	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	0.00598	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	---	0.00077	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	<0.050	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	6.10	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	0.00437	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	0.000231	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	2.88	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	<0.000010	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	74.5	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	0.0554	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	28.5	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	<0.00020	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	<0.000010	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	<0.00010	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	0.00451	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	---	<0.00030	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	---	0.00418	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	---	0.0101	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	---	<0.00050	---	---	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	---	---	0.0082	---	---	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	---	---	<0.00030	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	02-IF-PAG_W14	02-IF-PAG_W15	02-IF-PAG_W16	03-SED-PAG_W 13	03-SED-PAG_W 14
Client sampling date / time					22-Apr-2021 14:18	29-Apr-2021 12:55	06-May-2021 13:40	15-Apr-2021 13:45	22-Apr-2021 14:18	
Analyte	CAS Number	Method	LOR	Unit	SK2101287-006	SK2101287-007	SK2101287-008	SK2101287-009	SK2101287-010	
					Result	Result	Result	Result	Result	
Dissolved Metals										
dissolved metals filtration location	----	EP421	-	-	----	----	Field	----	----	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	03-SED-PAG_W 15	03-SED-PAG_W 16	04-GAB-NPAG- W13	04-GAB-NPAG- W14	04-GAB-NPAG- W15
Client sampling date / time					29-Apr-2021 12:55	06-May-2021 13:40	15-Apr-2021 13:45	22-Apr-2021 14:18	29-Apr-2021 12:55	
Analyte	CAS Number	Method	LOR	Unit	SK2101287-011	SK2101287-012	SK2101287-013	SK2101287-014	SK2101287-015	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	54.1	----	----	----	
conductivity	----	E100	2.0	µS/cm	----	453	----	----	----	
pH	----	E108	0.10	pH units	----	8.34	----	----	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	168	----	----	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	<1.0	----	----	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	<1.0	----	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	140	----	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	262	----	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	0.0078	----	----	----	
bromide	24959-67-9	E235.Br	0.10	mg/L	3.04	0.64	1.42	1.24	0.96	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	21.0	----	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	0.736	----	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	<0.020	----	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	<0.010	----	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	118	50.0	36.9	37.0	32.1	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	<0.0500	----	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	4.47	----	----	----	
cation sum	----	EC101	0.10	meq/L	----	4.43	----	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	0.449	----	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	99.1	----	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	0.0446	----	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	0.00212	----	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	0.00294	----	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	0.0120	----	----	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	<0.000020	----	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	<0.000050	----	----	----	
boron, dissolved	7440-42-8	E421	0.010	mg/L	----	0.066	----	----	----	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	----	<0.0000100 ^{DLM}	----	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	03-SED-PAG_W 15	03-SED-PAG_W 16	04-GAB-NPAG- W13	04-GAB-NPAG- W14	04-GAB-NPAG- W15
Client sampling date / time					29-Apr-2021 12:55	06-May-2021 13:40	15-Apr-2021 13:45	22-Apr-2021 14:18	29-Apr-2021 12:55	
Analyte	CAS Number	Method	LOR	Unit	SK2101287-011	SK2101287-012	SK2101287-013	SK2101287-014	SK2101287-015	
					Result	Result	Result	Result	Result	
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	12.3	---	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	0.000030	---	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	<0.00050	---	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	<0.00010	---	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	0.00145	---	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	<0.030	---	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	0.000141	---	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	0.0102	---	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	5.67	---	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	<0.00500	---	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	0.0345	---	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	0.00101	---	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	<0.050	---	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	9.28	---	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	0.00251	---	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	0.00100	---	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	2.72	---	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	<0.000010	---	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	71.4	---	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	0.0545	---	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	17.8	---	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	<0.00020	---	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	0.000013	---	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	<0.00010	---	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	0.00398	---	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	<0.00030	---	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	0.00048	---	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	0.00522	---	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	0.00052	---	---	---	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	---	0.0046	---	---	---	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	---	<0.00030	---	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	03-SED-PAG_W 15	03-SED-PAG_W 16	04-GAB-NPAG_ W13	04-GAB-NPAG_ W14	04-GAB-NPAG_ W15
Client sampling date / time					29-Apr-2021 12:55	06-May-2021 13:40	15-Apr-2021 13:45	22-Apr-2021 14:18	29-Apr-2021 12:55	
Analyte	CAS Number	Method	LOR	Unit	SK2101287-011	SK2101287-012	SK2101287-013	SK2101287-014	SK2101287-015	
					Result	Result	Result	Result	Result	
Dissolved Metals										
dissolved metals filtration location	----	EP421	-	-	----	Field	----	----	----	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	05-GAB-NPAG_ W16	05-SED-NPAG_ W13	05-SED-NPAG_ W14	05-SED-NPAG_ W15	05-SED-NPAG_ W16
Client sampling date / time					06-May-2021 13:40	15-Apr-2021 13:45	22-Apr-2021 14:18	29-Apr-2021 12:55	06-May-2021 13:34	
Analyte	CAS Number	Method	LOR	Unit	SK2101287-016	SK2101287-017	SK2101287-018	SK2101287-019	SK2101287-020	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	20.6	----	----	----	42.4	
conductivity	----	E100	2.0	µS/cm	634	----	----	----	419	
pH	----	E108	0.10	pH units	8.58	----	----	----	8.36	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	281	----	----	----	168	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	7.8	----	----	----	1.1	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	<1.0	----	----	----	<1.0	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	243	----	----	----	139	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	368	----	----	----	244	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.205	----	----	----	0.0420	
bromide	24959-67-9	E235.Br	0.10	mg/L	0.73	1.34	1.07	0.90	0.78	
chloride	16887-00-6	E235.Cl	0.50	mg/L	36.0	----	----	----	30.7	
fluoride	16984-48-8	E235.F	0.020	mg/L	0.605	----	----	----	0.821	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.020	----	----	----	0.114	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	----	----	----	<0.050 ^{DLM}	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	31.2	31.8	29.4	28.7	29.5	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	<0.0500	----	----	----	0.114	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	6.55	----	----	----	4.31	
cation sum	----	EC101	0.10	meq/L	6.43	----	----	----	4.10	
ion balance (cation-anion difference)	----	EC101	0.010	%	0.924	----	----	----	2.50	
ion balance (cations/anions ratio)	----	EC101	0.010	%	98.2	----	----	----	95.1	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0600	----	----	----	0.0611	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00266	----	----	----	0.00212	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.0169	----	----	----	0.154	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.00995	----	----	----	0.0122	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	----	----	----	<0.000020	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	----	----	----	<0.000050	
boron, dissolved	7440-42-8	E421	0.010	mg/L	0.103	----	----	----	0.083	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	----	----	----	0.0000060	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	05-GAB-NPAG_ W16	05-SED-NPAG_ W13	05-SED-NPAG_ W14	05-SED-NPAG_ W15	05-SED-NPAG_ W16
Client sampling date / time					06-May-2021 13:40	15-Apr-2021 13:45	22-Apr-2021 14:18	29-Apr-2021 12:55	06-May-2021 13:34	
Analyte	CAS Number	Method	LOR	Unit	SK2101287-016	SK2101287-017	SK2101287-018	SK2101287-019	SK2101287-020	
					Result	Result	Result	Result	Result	
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L	5.08	----	----	----	9.71	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000299	----	----	----	0.000054	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	0.00076	----	----	----	<0.00050	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00020	----	----	----	0.00033	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00232	----	----	----	0.00139	
iron, dissolved	7439-89-6	E421	0.030	mg/L	<0.030	----	----	----	<0.030	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	----	----	----	<0.000050	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0082	----	----	----	0.0077	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	1.92	----	----	----	4.42	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	<0.00500	----	----	----	<0.00500	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00837	----	----	----	0.0140	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00108	----	----	----	0.00173	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	----	----	----	<0.050	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	4.85	----	----	----	8.40	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00409	----	----	----	0.00292	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.00162	----	----	----	0.000734	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	2.81	----	----	----	2.71	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	----	----	----	<0.000010	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	135	----	----	----	69.5	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0149	----	----	----	0.0414	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	11.1	----	----	----	9.52	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	----	----	----	<0.00020	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.000028	----	----	----	0.000011	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	----	----	----	<0.00010	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	0.00433	----	----	----	0.00618	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	----	----	----	<0.00030	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	0.00140	----	----	----	0.00081	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.0241	----	----	----	0.00733	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	0.00798	----	----	----	0.00192	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0146	----	----	----	0.0085	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	----	----	----	<0.00030	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	05-GAB-NPAG_ W16	05-SED-NPAG_ W13	05-SED-NPAG_ W14	05-SED-NPAG_ W15	05-SED-NPAG_ W16
Client sampling date / time					06-May-2021 13:40	15-Apr-2021 13:45	22-Apr-2021 14:18	29-Apr-2021 12:55	06-May-2021 13:34	
Analyte	CAS Number	Method	LOR	Unit	SK2101287-016	SK2101287-017	SK2101287-018	SK2101287-019	SK2101287-020	
Dissolved Metals					Result	Result	Result	Result	Result	
dissolved metals filtration location	----	EP421	-	-	Field	----	----	----	Field	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	06-IF-NPAG_W1 3	06-IF-NPAG_W1 4	06-IF-NPAG_W1 5	06-IF-NPAG_W1 6	07-IF-PAG-CW_ W13
Client sampling date / time					15-Apr-2021 13:45	22-Apr-2021 14:18	29-Apr-2021 12:55	06-May-2021 13:40	15-Apr-2021 13:45	
Analyte	CAS Number	Method	LOR	Unit	SK2101287-021 Result	SK2101287-022 Result	SK2101287-023 Result	SK2101287-024 Result	SK2101287-025 Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	----	----	51.5	----	
conductivity	----	E100	2.0	µS/cm	----	----	----	372	----	
pH	----	E108	0.10	pH units	----	----	----	8.33	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	----	----	164	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	----	----	<1.0	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	----	----	<1.0	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	----	136	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	----	217	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	----	0.0369	----	
bromide	24959-67-9	E235.Br	0.10	mg/L	1.32	0.96	0.67	<0.50 ^{DLM}	280	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	----	14.2	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	----	0.380	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	----	<0.100 ^{DLM}	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	----	<0.050 ^{DLM}	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	35.5	33.0	29.8	28.6	3380	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	----	<0.112	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	----	----	3.73	----	
cation sum	----	EC101	0.10	meq/L	----	----	----	3.65	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	----	1.08	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	----	97.8	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	----	0.0122	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	----	0.0200	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	----	0.00153	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	----	0.0202	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	----	----	<0.000020	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	----	----	<0.000050	----	
boron, dissolved	7440-42-8	E421	0.010	mg/L	----	----	----	0.102	----	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	----	----	----	0.0000071	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	06-IF-NPAG_W1 3	06-IF-NPAG_W1 4	06-IF-NPAG_W1 5	06-IF-NPAG_W1 6	07-IF-PAG-CW_ W13
Client sampling date / time					15-Apr-2021 13:45	22-Apr-2021 14:18	29-Apr-2021 12:55	06-May-2021 13:40	15-Apr-2021 13:45	
Analyte	CAS Number	Method	LOR	Unit	SK2101287-021 Result	SK2101287-022 Result	SK2101287-023 Result	SK2101287-024 Result	SK2101287-025 Result	
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	---	13.6	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	---	0.000042	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	---	---	<0.00050	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	---	<0.00010	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	---	0.00124	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	---	<0.030	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	---	<0.000050	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	---	0.0126	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	---	4.25	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	---	<0.00500	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	---	0.00707	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	---	---	0.00082	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	---	<0.050	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	---	13.4	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	---	0.00983	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	---	0.000310	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	---	3.29	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	---	<0.000010	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	---	52.2	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	---	0.134	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	---	10.7	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	---	<0.00020	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	---	<0.000010	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	---	<0.00010	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	---	0.00500	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	---	---	<0.00030	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	---	---	0.00135	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	---	---	0.00532	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	---	---	<0.00050	---	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	---	---	---	0.0206	---	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	---	---	---	<0.00030	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	06-IF-NPAG_W1 3	06-IF-NPAG_W1 4	06-IF-NPAG_W1 5	06-IF-NPAG_W1 6	07-IF-PAG-CW_ W13
Client sampling date / time					15-Apr-2021 13:45	22-Apr-2021 14:18	29-Apr-2021 12:55	06-May-2021 13:40	15-Apr-2021 13:45	
Analyte	CAS Number	Method	LOR	Unit	SK2101287-021	SK2101287-022	SK2101287-023	SK2101287-024	SK2101287-025	
Dissolved Metals					Result	Result	Result	Result	Result	
dissolved metals filtration location	----	EP421	-	-	----	----	----	Field	----	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	07-IF-PAG-CW_ W14	07-IF-PAG-CW_ W15	07-IF-PAG-CW_ W16	08-SED-PAG-C W_W13	08-SED-PAG-C W_W14
Client sampling date / time					22-Apr-2021 14:18	29-Apr-2021 12:55	06-May-2021 13:40	15-Apr-2021 13:45	22-Apr-2021 14:18	
Analyte	CAS Number	Method	LOR	Unit	SK2101287-026	SK2101287-027	SK2101287-028	SK2101287-029	SK2101287-030	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	----	12600	----	----	
conductivity	----	E100	2.0	µS/cm	----	----	77600	----	----	
pH	----	E108	0.10	pH units	----	----	7.55	----	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	----	69.9	----	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	----	<1.0	----	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	----	<1.0	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	57.3	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	54800	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	3.76	----	----	
bromide	24959-67-9	E235.Br	0.10	mg/L	250	225	201	258	215	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	32400	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	<6.00 ^{DLDS}	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	<6.00 ^{DLDS}	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	<3.00 ^{DLDS}	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	3450	2960	3340	3400	3280	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	<6.71	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	----	985	----	----	
cation sum	----	EC101	0.10	meq/L	----	----	907	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	4.12	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	92.1	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	<0.0500 ^{DLDS}	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	0.0114	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	<0.00500 ^{DLDS}	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	0.189	----	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	----	<0.00100 ^{DLDS}	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	----	<0.00250 ^{DLDS}	----	----	
boron, dissolved	7440-42-8	E421	0.010	mg/L	----	----	0.946	----	----	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	----	----	0.00150	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	07-IF-PAG-CW_ W14	07-IF-PAG-CW_ W15	07-IF-PAG-CW_ W16	08-SED-PAG-C W_W13	08-SED-PAG-C W_W14
Client sampling date / time					22-Apr-2021 14:18	29-Apr-2021 12:55	06-May-2021 13:40	15-Apr-2021 13:45	22-Apr-2021 14:18	
Analyte	CAS Number	Method	LOR	Unit	SK2101287-026	SK2101287-027	SK2101287-028	SK2101287-029	SK2101287-030	
					Result	Result	Result	Result	Result	
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	1760	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	0.0147	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	---	<0.0250 ^{DLDS}	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	<0.00500 ^{DLDS}	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	<0.0100 ^{DLDS}	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	<1.50 ^{DLDS}	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	<0.00250 ^{DLDS}	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	0.298	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	2000	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	0.385	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	0.00746	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	---	0.0663	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	<2.50 ^{DLDS}	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	586	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	0.506	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	<0.00250 ^{DLDS}	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	2.82	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	0.00176	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	14700	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	38.4	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	1220	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	<0.0100 ^{DLDS}	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	<0.000500 ^{DLDS}	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	<0.00500 ^{DLDS}	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	<0.00500 ^{DLDS}	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	---	<0.0150 ^{DLDS}	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	---	<0.00500 ^{DLDS}	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	---	0.0162	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	---	<0.0250 ^{DLDS}	---	---	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	---	---	0.352	---	---	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	---	---	<0.0150 ^{DLDS}	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	07-IF-PAG-CW_ W14	07-IF-PAG-CW_ W15	07-IF-PAG-CW_ W16	08-SED-PAG-C W_W13	08-SED-PAG-C W_W14
Client sampling date / time					22-Apr-2021 14:18	29-Apr-2021 12:55	06-May-2021 13:40	15-Apr-2021 13:45	22-Apr-2021 14:18	
Analyte	CAS Number	Method	LOR	Unit	SK2101287-026	SK2101287-027	SK2101287-028	SK2101287-029	SK2101287-030	
Dissolved Metals					Result	Result	Result	Result	Result	
dissolved metals filtration location	----	EP421	-	-	----	----	Field	----	----	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	08-SED-PAG-C W_W15	08-SED-PAG-C W_W16	09-FZONE-NPA G_W13	09-FZONE-NPA G_W14	09-FZONE-NPA G_W15
Client sampling date / time					29-Apr-2021 12:55	06-May-2021 13:34	15-Apr-2021 13:45	22-Apr-2021 14:18	29-Apr-2021 12:55	
Analyte	CAS Number	Method	LOR	Unit	SK2101287-031	SK2101287-032	SK2101287-033	SK2101287-034	SK2101287-035	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	13300	----	----	----	
conductivity	----	E100	2.0	µS/cm	----	78300	----	----	----	
pH	----	E108	0.10	pH units	----	7.51	----	----	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	58.9	----	----	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	<1.0	----	----	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	<1.0	----	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	48.2	----	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	56600	----	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	4.04	----	----	----	
bromide	24959-67-9	E235.Br	0.10	mg/L	207	176	0.82	0.55	0.40	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	32800	----	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	<6.00 ^{DLDS}	----	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	<6.00 ^{DLDS}	----	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	<3.00 ^{DLDS}	----	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	2910	3340	28.2	27.2	28.8	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	<6.71	----	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	996	----	----	----	
cation sum	----	EC101	0.10	meq/L	----	972	----	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	1.22	----	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	97.6	----	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	0.0655	----	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	<0.00500 ^{DLDS}	----	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	<0.00500 ^{DLDS}	----	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	0.177	----	----	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	<0.00100 ^{DLDS}	----	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	<0.00250 ^{DLDS}	----	----	----	
boron, dissolved	7440-42-8	E421	0.010	mg/L	----	0.936	----	----	----	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	----	0.00333	----	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	08-SED-PAG-C W_W15	08-SED-PAG-C W_W16	09-FZONE-NPA G_W13	09-FZONE-NPA G_W14	09-FZONE-NPA G_W15
Client sampling date / time					29-Apr-2021 12:55	06-May-2021 13:34	15-Apr-2021 13:45	22-Apr-2021 14:18	29-Apr-2021 12:55	
Analyte	CAS Number	Method	LOR	Unit	SK2101287-031	SK2101287-032	SK2101287-033	SK2101287-034	SK2101287-035	
					Result	Result	Result	Result	Result	
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	1770	---	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	0.00810	---	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	<0.0250 ^{DLDS}	---	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	0.0269	---	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	<0.0100 ^{DLDS}	---	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	<1.50 ^{DLDS}	---	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	<0.00250 ^{DLDS}	---	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	0.285	---	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	2160	---	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	0.328	---	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	0.0209	---	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	0.190	---	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	<2.50 ^{DLDS}	---	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	566	---	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	0.231	---	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	<0.00250 ^{DLDS}	---	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	<2.50 ^{DLDS}	---	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	0.00136	---	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	15900	---	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	42.4	---	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	1190	---	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	<0.0100 ^{DLDS}	---	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	0.00110	---	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	<0.00500 ^{DLDS}	---	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	<0.00500 ^{DLDS}	---	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	<0.0150 ^{DLDS}	---	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	<0.00500 ^{DLDS}	---	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	0.0309	---	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	<0.0250 ^{DLDS}	---	---	---	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	---	0.250	---	---	---	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	---	<0.0150 ^{DLDS}	---	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	08-SED-PAG-C W_W15	08-SED-PAG-C W_W16	09-FZONE-NPA G_W13	09-FZONE-NPA G_W14	09-FZONE-NPA G_W15
Client sampling date / time					29-Apr-2021 12:55	06-May-2021 13:34	15-Apr-2021 13:45	22-Apr-2021 14:18	29-Apr-2021 12:55	
Analyte	CAS Number	Method	LOR	Unit	SK2101287-031	SK2101287-032	SK2101287-033	SK2101287-034	SK2101287-035	
Dissolved Metals					Result	Result	Result	Result	Result	
dissolved metals filtration location	----	EP421	-	-	----	Field	----	----	----	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	09-FZONE-NPA G_W16	----	----	----	----
Client sampling date / time					06-May-2021 13:40	----	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	SK2101287-036	-----	-----	-----	-----	
					Result	---	---	---	---	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	65.1	----	----	----	----	
conductivity	----	E100	2.0	µS/cm	382	----	----	----	----	
pH	----	E108	0.10	pH units	8.33	----	----	----	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	158	----	----	----	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	<1.0	----	----	----	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	<1.0	----	----	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	130	----	----	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	199	----	----	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0087	----	----	----	----	
bromide	24959-67-9	E235.Br	0.10	mg/L	0.26	----	----	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	9.09	----	----	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	0.723	----	----	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.020	----	----	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	----	----	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	28.9	----	----	----	----	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	<0.0500	----	----	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	3.49	----	----	----	----	
cation sum	----	EC101	0.10	meq/L	3.37	----	----	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	1.75	----	----	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	96.6	----	----	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0344	----	----	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00713	----	----	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00267	----	----	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0203	----	----	----	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	----	----	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	----	----	----	----	
boron, dissolved	7440-42-8	E421	0.010	mg/L	0.091	----	----	----	----	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	----	----	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	09-FZONE-NPA G_W16	----	----	----	----
Client sampling date / time					06-May-2021 13:40	---	---	---	---	
Analyte	CAS Number	Method	LOR	Unit	SK2101287-036	-----	-----	-----	-----	
					Result	---	---	---	---	
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L	15.8	---	---	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	---	---	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	---	---	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00010	---	---	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00283	---	---	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	<0.030	---	---	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	---	---	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0055	---	---	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	6.23	---	---	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	0.0177	---	---	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00712	---	---	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00129	---	---	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	---	---	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	7.36	---	---	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00122	---	---	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000728	---	---	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	3.52	---	---	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	---	---	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	43.2	---	---	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0387	---	---	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	10.2	---	---	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	---	---	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.000010	---	---	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	---	---	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	0.0255	---	---	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	---	---	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	0.00029	---	---	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.00252	---	---	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	0.00091	---	---	---	---	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0025	---	---	---	---	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	---	---	---	---	



Analytical Results

Sub-Matrix: Water					Client sample ID	09-FZONE-NPA	----	----	----	----
(Matrix: Water)						G_W16				
					Client sampling date / time	06-May-2021 13:40	----	----	----	----
Analyte	CAS Number	Method	LOR	Unit	SK2101287-036	-----	-----	-----	-----	-----
					Result	---	---	---	---	---
Dissolved Metals										
dissolved metals filtration location	----	EP421	-	-	Field	----	----	----	----	----

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: SK2101287	Page	: 1 of 23
Client	: O'Kane Consultants Inc.	Laboratory	: Saskatoon - Environmental
Contact	: Jared Robertson	Account Manager	: Brian Morgan
Address	: 112 - 112 Research Drive Saskatoon SK Canada S7N 3R3	Address	: 819 58 Street East Saskatoon, Saskatchewan Canada S7K 6X5
Telephone	: 250 420 7010	Telephone	: 1 306 221 7147
Project	: 948-021	Date Samples Received	: 06-May-2021 16:45
PO	: ----	Issue Date	: 15-May-2021 18:10
C-O-C number	: ----		
Sampler	: Client		
Site	: ----		
Quote number	: Q83455		
No. of samples received	: 38		
No. of samples analysed	: 36		

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 Services number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

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		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 01-TSF_W20	E298	29-Apr-2021	14-May-2021	----	16 days	✓	14-May-2021	28 days	1 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 02-IF-PAG_W16	E298	06-May-2021	14-May-2021	----	9 days	✓	14-May-2021	28 days	1 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 03-SED-PAG_W16	E298	06-May-2021	14-May-2021	----	9 days	✓	14-May-2021	28 days	1 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 05-GAB-NPAG_W16	E298	06-May-2021	14-May-2021	----	9 days	✓	14-May-2021	28 days	1 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 05-SED-NPAG_W16	E298	06-May-2021	14-May-2021	----	9 days	✓	14-May-2021	28 days	1 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 06-IF-NPAG_W16	E298	06-May-2021	14-May-2021	----	9 days	✓	14-May-2021	28 days	1 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 07-IF-PAG-CW_W16	E298	06-May-2021	14-May-2021	----	9 days	✓	14-May-2021	28 days	1 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 08-SED-PAG-CW_W16	E298	06-May-2021	14-May-2021	----	9 days	✓	14-May-2021	28 days	1 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 09-FZONE-NPAG_W16	E298	06-May-2021	14-May-2021	----	9 days	✓	14-May-2021	28 days	1 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 04-GAB-NPAG-_W15	E235.Br	29-Apr-2021	----	----	----		10-May-2021	28 days	11 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 05-SED-NPAG_W15	E235.Br	29-Apr-2021	----	----	----		10-May-2021	28 days	11 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 06-IF-NPAG_W15	E235.Br	29-Apr-2021	----	----	----		10-May-2021	28 days	11 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 07-IF-PAG-CW_W15	E235.Br	29-Apr-2021	----	----	----		10-May-2021	28 days	11 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 08-SED-PAG-CW_W15	E235.Br	29-Apr-2021	----	----	----		10-May-2021	28 days	11 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 09-FZONE-NPAG_W15	E235.Br	29-Apr-2021	----	----	----		10-May-2021	28 days	11 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 01_TSF_W19	E235.Br	22-Apr-2021	----	----	----		07-May-2021	28 days	16 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Bromide in Water by IC										
HDPE 02-IF-PAG_W14	E235.Br	22-Apr-2021	----	----	----		07-May-2021	28 days	16 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 03-SED-PAG_W14	E235.Br	22-Apr-2021	----	----	----		07-May-2021	28 days	16 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 04-GAB-NPAG-_W14	E235.Br	22-Apr-2021	----	----	----		07-May-2021	28 days	16 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 05-SED-NPAG_W14	E235.Br	22-Apr-2021	----	----	----		07-May-2021	28 days	16 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 06-IF-NPAG_W14	E235.Br	22-Apr-2021	----	----	----		07-May-2021	28 days	16 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 07-IF-PAG-CW_W14	E235.Br	22-Apr-2021	----	----	----		07-May-2021	28 days	16 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 08-SED-PAG-CW_W14	E235.Br	22-Apr-2021	----	----	----		07-May-2021	28 days	16 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 09-FZONE-NPAG_W14	E235.Br	22-Apr-2021	----	----	----		07-May-2021	28 days	16 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 02-IF-PAG_W16	E235.Br	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✔



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Bromide in Water by IC											
HDPE 03-SED-PAG_W16	E235.Br	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 05-GAB-NPAG-_W16	E235.Br	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 05-SED-NPAG_W16	E235.Br	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 06-IF-NPAG_W16	E235.Br	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 07-IF-PAG-CW_W16	E235.Br	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 08-SED-PAG-CW_W16	E235.Br	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 09-FZONE-NPAG_W16	E235.Br	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 01_TSF_W18	E235.Br	15-Apr-2021	----	----	----		07-May-2021	28 days	23 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 02-IF-PAG_W13	E235.Br	15-Apr-2021	----	----	----		07-May-2021	28 days	23 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Bromide in Water by IC										
HDPE 03-SED-PAG_W13	E235.Br	15-Apr-2021	----	----	----		07-May-2021	28 days	23 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 04-GAB-NPAG-_W13	E235.Br	15-Apr-2021	----	----	----		07-May-2021	28 days	23 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 05-SED-NPAG_W13	E235.Br	15-Apr-2021	----	----	----		07-May-2021	28 days	23 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 06-IF-NPAG_W13	E235.Br	15-Apr-2021	----	----	----		07-May-2021	28 days	23 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 07-IF-PAG-CW_W13	E235.Br	15-Apr-2021	----	----	----		07-May-2021	28 days	23 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 08-SED-PAG-CW_W13	E235.Br	15-Apr-2021	----	----	----		07-May-2021	28 days	23 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 09-FZONE-NPAG_W13	E235.Br	15-Apr-2021	----	----	----		07-May-2021	28 days	23 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 01_TSF_W21	E235.Br	06-May-2021	----	----	----		10-May-2021	28 days	4 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 01_TSF_W20	E235.Br	29-Apr-2021	----	----	----		08-May-2021	28 days	9 days	✔



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Bromide in Water by IC										
HDPE 02-IF-PAG_W15	E235.Br	29-Apr-2021	----	----	----		07-May-2021	28 days	9 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 03-SED-PAG_W15	E235.Br	29-Apr-2021	----	----	----		07-May-2021	28 days	9 days	✔
Anions and Nutrients : Chloride in Water by IC										
HDPE 02-IF-PAG_W16	E235.Cl	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✔
Anions and Nutrients : Chloride in Water by IC										
HDPE 03-SED-PAG_W16	E235.Cl	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✔
Anions and Nutrients : Chloride in Water by IC										
HDPE 05-GAB-NPAG-_W16	E235.Cl	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✔
Anions and Nutrients : Chloride in Water by IC										
HDPE 05-SED-NPAG_W16	E235.Cl	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✔
Anions and Nutrients : Chloride in Water by IC										
HDPE 06-IF-NPAG_W16	E235.Cl	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✔
Anions and Nutrients : Chloride in Water by IC										
HDPE 07-IF-PAG-CW_W16	E235.Cl	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✔
Anions and Nutrients : Chloride in Water by IC										
HDPE 08-SED-PAG-CW_W16	E235.Cl	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✔



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation			Analysis				
			Preparation Date	Holding Times Rec Actual		Eval	Analysis Date	Holding Times Rec Actual		Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE 09-FZONE-NPAG_W16	E235.Cl	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 01_TSF_W20	E235.Cl	29-Apr-2021	----	----	----		08-May-2021	28 days	9 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE 02-IF-PAG_W16	E235.F	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE 03-SED-PAG_W16	E235.F	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE 05-GAB-NPAG-_W16	E235.F	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE 05-SED-NPAG_W16	E235.F	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE 06-IF-NPAG_W16	E235.F	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE 07-IF-PAG-CW_W16	E235.F	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE 08-SED-PAG-CW_W16	E235.F	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Fluoride in Water by IC											
HDPE 09-FZONE-NPAG_W16	E235.F	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✓	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 01_TSF_W20	E235.F	29-Apr-2021	----	----	----		08-May-2021	28 days	9 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 02-IF-PAG_W16	E235.NO3	06-May-2021	----	----	----		08-May-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 03-SED-PAG_W16	E235.NO3	06-May-2021	----	----	----		08-May-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 05-GAB-NPAG-_W16	E235.NO3	06-May-2021	----	----	----		08-May-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 05-SED-NPAG_W16	E235.NO3	06-May-2021	----	----	----		08-May-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 06-IF-NPAG_W16	E235.NO3	06-May-2021	----	----	----		08-May-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 07-IF-PAG-CW_W16	E235.NO3	06-May-2021	----	----	----		08-May-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 08-SED-PAG-CW_W16	E235.NO3	06-May-2021	----	----	----		08-May-2021	3 days	2 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrate in Water by IC											
HDPE 09-FZONE-NPAG_W16	E235.NO3	06-May-2021	----	----	----		08-May-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 01_TSF_W20	E235.NO3	29-Apr-2021	----	----	----		08-May-2021	3 days	9 days	* EHTR	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 02-IF-PAG_W16	E235.NO2	06-May-2021	----	----	----		08-May-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 03-SED-PAG_W16	E235.NO2	06-May-2021	----	----	----		08-May-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 05-GAB-NPAG-_W16	E235.NO2	06-May-2021	----	----	----		08-May-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 05-SED-NPAG_W16	E235.NO2	06-May-2021	----	----	----		08-May-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 06-IF-NPAG_W16	E235.NO2	06-May-2021	----	----	----		08-May-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 07-IF-PAG-CW_W16	E235.NO2	06-May-2021	----	----	----		08-May-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 08-SED-PAG-CW_W16	E235.NO2	06-May-2021	----	----	----		08-May-2021	3 days	2 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrite in Water by IC											
HDPE 09-FZONE-NPAG_W16	E235.NO2	06-May-2021	----	----	----		08-May-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 01_TSF_W20	E235.NO2	29-Apr-2021	----	----	----		08-May-2021	3 days	9 days	* EHTR	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 04-GAB-NPAG-_W15	E235.SO4	29-Apr-2021	----	----	----		10-May-2021	28 days	11 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 05-SED-NPAG_W15	E235.SO4	29-Apr-2021	----	----	----		10-May-2021	28 days	11 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 06-IF-NPAG_W15	E235.SO4	29-Apr-2021	----	----	----		10-May-2021	28 days	11 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 07-IF-PAG-CW_W15	E235.SO4	29-Apr-2021	----	----	----		10-May-2021	28 days	11 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 08-SED-PAG-CW_W15	E235.SO4	29-Apr-2021	----	----	----		10-May-2021	28 days	11 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 09-FZONE-NPAG_W15	E235.SO4	29-Apr-2021	----	----	----		10-May-2021	28 days	11 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 01_TSF_W19	E235.SO4	22-Apr-2021	----	----	----		07-May-2021	28 days	16 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Sulfate in Water by IC										
HDPE 02-IF-PAG_W14	E235.S04	22-Apr-2021	----	----	----		07-May-2021	28 days	16 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 03-SED-PAG_W14	E235.S04	22-Apr-2021	----	----	----		07-May-2021	28 days	16 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 04-GAB-NPAG-_W14	E235.S04	22-Apr-2021	----	----	----		07-May-2021	28 days	16 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 05-SED-NPAG_W14	E235.S04	22-Apr-2021	----	----	----		07-May-2021	28 days	16 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 06-IF-NPAG_W14	E235.S04	22-Apr-2021	----	----	----		07-May-2021	28 days	16 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 07-IF-PAG-CW_W14	E235.S04	22-Apr-2021	----	----	----		07-May-2021	28 days	16 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 08-SED-PAG-CW_W14	E235.S04	22-Apr-2021	----	----	----		07-May-2021	28 days	16 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 09-FZONE-NPAG_W14	E235.S04	22-Apr-2021	----	----	----		07-May-2021	28 days	16 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 02-IF-PAG_W16	E235.S04	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✔



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Sulfate in Water by IC										
HDPE 03-SED-PAG_W16	E235.S04	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 05-GAB-NPAG-_W16	E235.S04	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 05-SED-NPAG_W16	E235.S04	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 06-IF-NPAG_W16	E235.S04	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 07-IF-PAG-CW_W16	E235.S04	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 08-SED-PAG-CW_W16	E235.S04	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 09-FZONE-NPAG_W16	E235.S04	06-May-2021	----	----	----		08-May-2021	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W18	E235.S04	15-Apr-2021	----	----	----		07-May-2021	28 days	23 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 02-IF-PAG_W13	E235.S04	15-Apr-2021	----	----	----		07-May-2021	28 days	23 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec Actual		Eval	Analysis Date	Holding Times Rec Actual		Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE 03-SED-PAG_W13	E235.SO4	15-Apr-2021	----	----	----		07-May-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 04-GAB-NPAG-_W13	E235.SO4	15-Apr-2021	----	----	----		07-May-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 05-SED-NPAG_W13	E235.SO4	15-Apr-2021	----	----	----		07-May-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 06-IF-NPAG_W13	E235.SO4	15-Apr-2021	----	----	----		07-May-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 07-IF-PAG-CW_W13	E235.SO4	15-Apr-2021	----	----	----		07-May-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 08-SED-PAG-CW_W13	E235.SO4	15-Apr-2021	----	----	----		07-May-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 09-FZONE-NPAG_W13	E235.SO4	15-Apr-2021	----	----	----		07-May-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W21	E235.SO4	06-May-2021	----	----	----		10-May-2021	28 days	4 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W20	E235.SO4	29-Apr-2021	----	----	----		08-May-2021	28 days	9 days	✔



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Sulfate in Water by IC										
HDPE 02-IF-PAG_W15	E235.SO4	29-Apr-2021	----	----	----		07-May-2021	28 days	9 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 03-SED-PAG_W15	E235.SO4	29-Apr-2021	----	----	----		07-May-2021	28 days	9 days	✔
Cyanides : Total Cyanide by CFA										
UV inhibited HDPE - total (sodium hydroxide) 01_TSF_W20	E333	29-Apr-2021	----	----	----		13-May-2021	14 days	14 days	✔
Cyanides : WAD Cyanide by CFA										
UV inhibited HDPE - total (sodium hydroxide) 01_TSF_W20	E336	29-Apr-2021	----	----	----		13-May-2021	14 days	14 days	✔
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 01_TSF_W20	E421	29-Apr-2021	12-May-2021	----	13 days	✔	12-May-2021	180 days	1 days	✔
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 02-IF-PAG_W16	E421	06-May-2021	12-May-2021	----	6 days	✔	12-May-2021	180 days	1 days	✔
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 03-SED-PAG_W16	E421	06-May-2021	12-May-2021	----	6 days	✔	12-May-2021	180 days	1 days	✔
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 05-GAB-NPAG-_W16	E421	06-May-2021	12-May-2021	----	6 days	✔	12-May-2021	180 days	1 days	✔
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 05-SED-NPAG_W16	E421	06-May-2021	12-May-2021	----	6 days	✔	12-May-2021	180 days	1 days	✔



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 06-IF-NPAG_W16	E421	06-May-2021	12-May-2021	----	6 days	✓	12-May-2021	180 days	1 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 07-IF-PAG-CW_W16	E421	06-May-2021	12-May-2021	----	6 days	✓	12-May-2021	180 days	1 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 08-SED-PAG-CW_W16	E421	06-May-2021	12-May-2021	----	6 days	✓	12-May-2021	180 days	1 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 09-FZONE-NPAG_W16	E421	06-May-2021	12-May-2021	----	6 days	✓	12-May-2021	180 days	1 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 02-IF-PAG_W16	E290	06-May-2021	----	----	----		07-May-2021	14 days	2 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 03-SED-PAG_W16	E290	06-May-2021	----	----	----		07-May-2021	14 days	2 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 05-GAB-NPAG-_W16	E290	06-May-2021	----	----	----		07-May-2021	14 days	2 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 05-SED-NPAG_W16	E290	06-May-2021	----	----	----		07-May-2021	14 days	2 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 06-IF-NPAG_W16	E290	06-May-2021	----	----	----		07-May-2021	14 days	2 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Physical Tests : Alkalinity Species by Titration											
HDPE 07-IF-PAG-CW_W16	E290	06-May-2021	----	----	----		07-May-2021	14 days	2 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 08-SED-PAG-CW_W16	E290	06-May-2021	----	----	----		07-May-2021	14 days	2 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 09-FZONE-NPAG_W16	E290	06-May-2021	----	----	----		07-May-2021	14 days	2 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 01_TSF_W20	E290	29-Apr-2021	----	----	----		07-May-2021	14 days	9 days	✓	
Physical Tests : Conductivity in Water											
HDPE 02-IF-PAG_W16	E100	06-May-2021	----	----	----		07-May-2021	28 days	2 days	✓	
Physical Tests : Conductivity in Water											
HDPE 03-SED-PAG_W16	E100	06-May-2021	----	----	----		07-May-2021	28 days	2 days	✓	
Physical Tests : Conductivity in Water											
HDPE 05-GAB-NPAG-_W16	E100	06-May-2021	----	----	----		07-May-2021	28 days	2 days	✓	
Physical Tests : Conductivity in Water											
HDPE 05-SED-NPAG_W16	E100	06-May-2021	----	----	----		07-May-2021	28 days	2 days	✓	
Physical Tests : Conductivity in Water											
HDPE 06-IF-NPAG_W16	E100	06-May-2021	----	----	----		07-May-2021	28 days	2 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Physical Tests : Conductivity in Water											
HDPE 07-IF-PAG-CW_W16	E100	06-May-2021	----	----	----		07-May-2021	28 days	2 days		✓
Physical Tests : Conductivity in Water											
HDPE 08-SED-PAG-CW_W16	E100	06-May-2021	----	----	----		07-May-2021	28 days	2 days		✓
Physical Tests : Conductivity in Water											
HDPE 09-FZONE-NPAG_W16	E100	06-May-2021	----	----	----		07-May-2021	28 days	2 days		✓
Physical Tests : Conductivity in Water											
HDPE 01_TSF_W20	E100	29-Apr-2021	----	----	----		07-May-2021	28 days	9 days		✓
Physical Tests : pH by Meter											
HDPE 01_TSF_W20	E108	29-Apr-2021	----	----	----		07-May-2021	0.25 hrs	196 hrs		* EHTR-FM
Physical Tests : pH by Meter											
HDPE 02-IF-PAG_W16	E108	06-May-2021	----	----	----		07-May-2021	0.25 hrs	28 hrs		* EHTR-FM
Physical Tests : pH by Meter											
HDPE 03-SED-PAG_W16	E108	06-May-2021	----	----	----		07-May-2021	0.25 hrs	28 hrs		* EHTR-FM
Physical Tests : pH by Meter											
HDPE 05-GAB-NPAG-_W16	E108	06-May-2021	----	----	----		07-May-2021	0.25 hrs	28 hrs		* EHTR-FM
Physical Tests : pH by Meter											
HDPE 05-SED-NPAG_W16	E108	06-May-2021	----	----	----		07-May-2021	0.25 hrs	28 hrs		* EHTR-FM



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : pH by Meter										
HDPE 06-IF-NPAG_W16	E108	06-May-2021	----	----	----		07-May-2021	0.25 hrs	28 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 07-IF-PAG-CW_W16	E108	06-May-2021	----	----	----		07-May-2021	0.25 hrs	28 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 08-SED-PAG-CW_W16	E108	06-May-2021	----	----	----		07-May-2021	0.25 hrs	28 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 09-FZONE-NPAG_W16	E108	06-May-2021	----	----	----		07-May-2021	0.25 hrs	28 hrs	* EHTR-FM

Legend & Qualifier Definitions

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

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	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	193481	1	19	5.2	5.0	✓
Ammonia by Fluorescence	E298	198039	1	20	5.0	5.0	✓
Bromide in Water by IC	E235.Br	193331	3	36	8.3	5.0	✓
Chloride in Water by IC	E235.Cl	193537	1	20	5.0	5.0	✓
Conductivity in Water	E100	193480	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	195827	2	25	8.0	5.0	✓
Fluoride in Water by IC	E235.F	193534	1	19	5.2	5.0	✓
Nitrate in Water by IC	E235.NO3	193538	1	19	5.2	5.0	✓
Nitrite in Water by IC	E235.NO2	193535	1	19	5.2	5.0	✓
pH by Meter	E108	193479	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	193332	3	55	5.4	5.0	✓
Total Cyanide by CFA	E333	196595	1	18	5.5	5.0	✓
WAD Cyanide by CFA	E336	196594	1	13	7.6	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	193481	1	19	5.2	5.0	✓
Ammonia by Fluorescence	E298	198039	1	20	5.0	5.0	✓
Bromide in Water by IC	E235.Br	193331	3	36	8.3	5.0	✓
Chloride in Water by IC	E235.Cl	193537	1	20	5.0	5.0	✓
Conductivity in Water	E100	193480	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	195827	2	25	8.0	5.0	✓
Fluoride in Water by IC	E235.F	193534	1	19	5.2	5.0	✓
Nitrate in Water by IC	E235.NO3	193538	1	19	5.2	5.0	✓
Nitrite in Water by IC	E235.NO2	193535	1	19	5.2	5.0	✓
pH by Meter	E108	193479	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	193332	3	55	5.4	5.0	✓
Total Cyanide by CFA	E333	196595	1	18	5.5	5.0	✓
WAD Cyanide by CFA	E336	196594	1	13	7.6	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	193481	1	19	5.2	5.0	✓
Ammonia by Fluorescence	E298	198039	1	20	5.0	5.0	✓
Bromide in Water by IC	E235.Br	193331	3	36	8.3	5.0	✓
Chloride in Water by IC	E235.Cl	193537	1	20	5.0	5.0	✓
Conductivity in Water	E100	193480	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	195827	2	25	8.0	5.0	✓
Fluoride in Water by IC	E235.F	193534	1	19	5.2	5.0	✓
Nitrate in Water by IC	E235.NO3	193538	1	19	5.2	5.0	✓
Nitrite in Water by IC	E235.NO2	193535	1	19	5.2	5.0	✓



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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<i>Analytical Methods</i>							
Method Blanks (MB) - Continued							
Sulfate in Water by IC	E235.SO4	193332	3	55	5.4	5.0	✓
Total Cyanide by CFA	E333	196595	1	18	5.5	5.0	✓
WAD Cyanide by CFA	E336	196594	1	13	7.6	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	198039	1	20	5.0	5.0	✓
Bromide in Water by IC	E235.Br	193331	3	36	8.3	5.0	✓
Chloride in Water by IC	E235.Cl	193537	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	195827	2	25	8.0	5.0	✓
Fluoride in Water by IC	E235.F	193534	1	19	5.2	5.0	✓
Nitrate in Water by IC	E235.NO3	193538	1	19	5.2	5.0	✓
Nitrite in Water by IC	E235.NO2	193535	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	193332	3	55	5.4	5.0	✓
Total Cyanide by CFA	E333	196595	1	18	5.5	5.0	✓
WAD Cyanide by CFA	E336	196594	1	13	7.6	5.0	✓



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Saskatoon - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Saskatoon - 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.
Bromide in Water by IC	E235.Br Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC	E235.Cl Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Saskatoon - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).



<i>Analytical Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Total Cyanide by CFA	E333 Vancouver - Environmental	Water	ISO 14403 (mod)	Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.
WAD Cyanide by CFA	E336 Vancouver - Environmental	Water	APHA 4500-CN I (mod)	Weak Acid Dissociable (WAD) cyanide is determined by in-line sample distillation with final determination by colourimetric analysis.
Dissolved Metals in Water by CRC ICPMS	E421 Saskatoon - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Hardness (Calculated)	EC100 Saskatoon - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Ion Balance using Dissolved Metals	EC101 Saskatoon - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
TDS in Water (Calculation)	EC103 Saskatoon - Environmental	Water	APHA 1030E (mod)	Total Dissolved Solids is calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Saskatoon - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Dissolved Metals Water Filtration	EP421 Saskatoon - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO ₃ .



QUALITY CONTROL REPORT

Work Order : **SK2101287**

Page : 1 of 18

Client : O'Kane Consultants Inc.
 Contact : Jared Robertson
 Address : 112 - 112 Research Drive
 Saskatoon SK Canada S7N 3R3
 Telephone : 250 420 7010
 Project : 948-021
 PO : ----
 C-O-C number : ----
 Sampler : Client
 Site : ----
 Quote number : Q83455
 No. of samples received : 38
 No. of samples analysed : 36

Laboratory : Saskatoon - Environmental
 Account Manager : Brian Morgan
 Address : 819 58 Street East
 Saskatoon, Saskatchewan Canada S7K 6X5
 Telephone : 1 306 221 7147
 Date Samples Received : 06-May-2021 16:45
 Date Analysis Commenced : 07-May-2021
 Issue Date : 15-May-2021 18:10

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 Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

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
Colby Bingham	Quality Systems Coordinator	Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Quality Systems Coordinator	Metals, Saskatoon, Saskatchewan
Dwayne Bennett	Technical Specialist	Inorganics, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Lian Nesbitt	Laboratory Analyst	Metals, Saskatoon, Saskatchewan
Melissa Houseman	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Nancy Cruse	Laboratory _ Supervisor	Inorganics, Saskatoon, Saskatchewan
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Tracy Harley	Supervisor - Water Quality Instrumentation	Inorganics, Burnaby, British Columbia

Page : 2 of 18
Work Order : SK2101287
Client : O'Kane Consultants Inc.
Project : 948-021



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 Services number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

= Indicates a QC result that did not meet the ALS DQO.



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: 193479)											
SK2101289-001	Anonymous	pH	----	E108	0.10	pH units	8.24	8.24	0.0203%	3%	----
Physical Tests (QC Lot: 193480)											
SK2101289-001	Anonymous	conductivity	----	E100	2.0	µS/cm	2150	2140	0.466%	10%	----
Physical Tests (QC Lot: 193481)											
SK2101289-001	Anonymous	alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	439	449	2.30%	20%	----
Anions and Nutrients (QC Lot: 193331)											
SK2101287-001	01_TSF_W18	bromide	24959-67-9	E235.Br	20.0	mg/L	23.7	22.3	1.39	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 193332)											
SK2101287-001	01_TSF_W18	sulfate (as SO4)	14808-79-8	E235.SO4	60.0	mg/L	8350	8610	3.10%	20%	----
Anions and Nutrients (QC Lot: 193534)											
SK2101287-003	01_TSF_W20	fluoride	16984-48-8	E235.F	4.00	mg/L	<4.00	<4.00	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 193535)											
SK2101287-003	01_TSF_W20	nitrite (as N)	14797-65-0	E235.NO2	2.00	mg/L	3.82	4.00	0.183	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 193536)											
SK2101287-003	01_TSF_W20	sulfate (as SO4)	14808-79-8	E235.SO4	60.0	mg/L	7080	7290	2.96%	20%	----
Anions and Nutrients (QC Lot: 193537)											
SK2101287-003	01_TSF_W20	chloride	16887-00-6	E235.Cl	100	mg/L	5140	5300	3.15%	20%	----
Anions and Nutrients (QC Lot: 193538)											
SK2101287-003	01_TSF_W20	nitrate (as N)	14797-55-8	E235.NO3	4.00	mg/L	375	388	3.29%	20%	----
Anions and Nutrients (QC Lot: 193539)											
SK2101287-003	01_TSF_W20	bromide	24959-67-9	E235.Br	20.0	mg/L	<20.0	<20.0	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 194354)											
SK2101287-004	01_TSF_W21	bromide	24959-67-9	E235.Br	20.0	mg/L	<20.0	<20.0	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 194355)											
SK2101287-004	01_TSF_W21	sulfate (as SO4)	14808-79-8	E235.SO4	60.0	mg/L	7290	7290	0.102%	20%	----
Anions and Nutrients (QC Lot: 198039)											
RG2100127-005	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0250	mg/L	0.973	1.06	8.83%	20%	----
Cyanides (QC Lot: 196594)											
YL2100352-001	Anonymous	cyanide, weak acid dissociable	----	E336	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Cyanides (QC Lot: 196595)											
YL2100352-001	Anonymous	cyanide, strong acid dissociable (total)	----	E333	0.0250	mg/L	0.0794	0.0814	0.0019	Diff <2x LOR	----



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
Dissolved Metals (QC Lot: 195827)											
SK2101287-032	08-SED-PAG-CW_W16	aluminum, dissolved	7429-90-5	E421	0.0500	mg/L	0.0655	<0.0500	0.0155	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.00500	mg/L	0.177	0.175	1.51%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.00250	mg/L	<0.00250	<0.00250	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.500	mg/L	0.936	0.989	0.053	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.000250	mg/L	0.00333	0.00294	12.5%	20%	----
		calcium, dissolved	7440-70-2	E421	2.50	mg/L	1770	1810	2.40%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000500	mg/L	0.00810	0.00790	2.53%	20%	----
		chromium, dissolved	7440-47-3	E421	0.0250	mg/L	<0.0250	<0.0250	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00500	mg/L	0.0269	0.0264	0.00049	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	1.50	mg/L	<1.50	<1.50	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.00250	mg/L	<0.00250	<0.00250	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0500	mg/L	0.285	0.314	0.0296	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.250	mg/L	2160	2150	0.424%	20%	----
		manganese, dissolved	7439-96-5	E421	0.250	mg/L	0.328	0.325	0.00300	Diff <2x LOR	----
		molybdenum, dissolved	7439-98-7	E421	0.00250	mg/L	0.0209	0.0216	0.000722	Diff <2x LOR	----
		nickel, dissolved	7440-02-0	E421	0.0250	mg/L	0.190	0.192	0.00200	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	2.50	mg/L	<2.50	<2.50	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	2.50	mg/L	566	571	0.978%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.0100	mg/L	0.231	0.232	0.677%	20%	----
		selenium, dissolved	7782-49-2	E421	0.00250	mg/L	<0.00250	<0.00250	0	Diff <2x LOR	----
		silicon, dissolved	7440-21-3	E421	2.50	mg/L	<2.50	<2.50	0	Diff <2x LOR	----
		silver, dissolved	7440-22-4	E421	0.000500	mg/L	0.00136	0.00145	0.000095	Diff <2x LOR	----
		sodium, dissolved	17341-25-2	E421	2.50	mg/L	15900	16000	0.529%	20%	----
		strontium, dissolved	7440-24-6	E421	0.0100	mg/L	42.4	40.8	4.06%	20%	----
		sulfur, dissolved	7704-34-9	E421	25.0	mg/L	1190	1220	3.05%	20%	----
		tellurium, dissolved	13494-80-9	E421	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000500	mg/L	0.00110	0.00107	0.000034	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.0150	mg/L	<0.0150	<0.0150	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----



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
Dissolved Metals (QC Lot: 195827) - continued											
SK2101287-032	08-SED-PAG-CW_W16	uranium, dissolved	7440-61-1	E421	0.000500	mg/L	0.0309	0.0299	3.50%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.0250	mg/L	<0.0250	<0.0250	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0500	mg/L	0.250	0.244	0.0057	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.0150	mg/L	<0.0150	<0.0150	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 195828)											
SK2101287-003	01_TSF_W20	aluminum, dissolved	7429-90-5	E421	0.0500	mg/L	<0.0500	<0.0500	0	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00500	mg/L	0.00945	0.00826	0.00119	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00500	mg/L	0.601	0.611	1.68%	20%	----
		barium, dissolved	7440-39-3	E421	0.00500	mg/L	0.0551	0.0551	0.107%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.00250	mg/L	<0.00250	<0.00250	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.500	mg/L	1.84	1.83	0.008	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.000250	mg/L	0.000423	0.000392	0.0000315	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	2.50	mg/L	621	618	0.508%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.0250	mg/L	<0.0250	<0.0250	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00500	mg/L	0.931	0.934	0.314%	20%	----
		copper, dissolved	7440-50-8	E421	0.0100	mg/L	0.0180	0.0195	0.00157	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	1.50	mg/L	<1.50	<1.50	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.00250	mg/L	<0.00250	<0.00250	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0500	mg/L	<0.0500	<0.0500	0	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.250	mg/L	92.5	95.0	2.62%	20%	----
		manganese, dissolved	7439-96-5	E421	0.250	mg/L	3.82	3.88	1.69%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.00250	mg/L	0.698	0.699	0.194%	20%	----
		nickel, dissolved	7440-02-0	E421	0.0250	mg/L	<0.0250	<0.0250	0	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	2.50	mg/L	<2.50	<2.50	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	2.50	mg/L	550	563	2.25%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.0100	mg/L	0.0594	0.0562	0.00318	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.00250	mg/L	0.0498	0.0435	13.7%	20%	----
		silicon, dissolved	7440-21-3	E421	2.50	mg/L	4.67	4.79	0.123	Diff <2x LOR	----
		silver, dissolved	7440-22-4	E421	0.000500	mg/L	0.00167	0.00175	0.000082	Diff <2x LOR	----
		sodium, dissolved	17341-25-2	E421	2.50	mg/L	6890	7070	2.54%	20%	----
		strontium, dissolved	7440-24-6	E421	0.0100	mg/L	2.44	2.42	1.01%	20%	----
		sulfur, dissolved	7704-34-9	E421	25.0	mg/L	3710	3800	2.63%	20%	----
		tellurium, dissolved	13494-80-9	E421	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	<i>Original Result</i>	<i>Duplicate Result</i>	<i>RPD(%) or Difference</i>	<i>Duplicate Limits</i>	<i>Qualifier</i>
Dissolved Metals (QC Lot: 195828) - continued											
SK2101287-003	01_TSF_W20	thallium, dissolved	7440-28-0	E421	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.0150	mg/L	<0.0150	<0.0150	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000500	mg/L	0.00906	0.00902	0.398%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.0250	mg/L	<0.0250	<0.0250	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0500	mg/L	<0.0500	<0.0500	0	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.0150	mg/L	<0.0150	<0.0150	0	Diff <2x LOR	----



Method Blank (MB) Report

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

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 193480)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 193481)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Anions and Nutrients (QCLot: 193331)						
bromide	24959-67-9	E235.Br	0.1	mg/L	<0.10	----
Anions and Nutrients (QCLot: 193332)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 193534)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 193535)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 193536)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 193537)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 193538)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 193539)						
bromide	24959-67-9	E235.Br	0.1	mg/L	<0.10	----
Anions and Nutrients (QCLot: 194354)						
bromide	24959-67-9	E235.Br	0.1	mg/L	<0.10	----
Anions and Nutrients (QCLot: 194355)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 198039)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Cyanides (QCLot: 196594)						
cyanide, weak acid dissociable	----	E336	0.002	mg/L	<0.0020	----
Cyanides (QCLot: 196595)						
cyanide, strong acid dissociable (total)	----	E333	0.002	mg/L	<0.0020	----
Dissolved Metals (QCLot: 195827)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 195827) - continued						
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	17341-25-2	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 195828)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	---
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	---
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	---
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	---
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	---
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	---
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	---
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	---
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	---
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	---
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	---
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	---
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	---
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	---
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	---
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	---
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	---
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	---
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	---
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	---
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	---
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	---
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	---
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	---
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	---
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	---
sodium, dissolved	17341-25-2	E421	0.05	mg/L	<0.050	---
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	---
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	---
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	---
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	---
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	---
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	---
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	---
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	---
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	---

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Sub-Matrix: **Water**

<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	<i>Result</i>	<i>Qualifier</i>
Dissolved Metals (QCLot: 195828) - continued						
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	---
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	---
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	---



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				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 193479)									
pH	----	E108	----	pH units	6.86 pH units	100	98.0	102	----
Physical Tests (QCLot: 193480)									
conductivity	----	E100	1	µS/cm	1000 µS/cm	99.8	90.0	110	----
Physical Tests (QCLot: 193481)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	99.9	85.0	115	----
Anions and Nutrients (QCLot: 193331)									
bromide	24959-67-9	E235.Br	0.1	mg/L	0.5 mg/L	103	85.0	115	----
Anions and Nutrients (QCLot: 193332)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	106	90.0	110	----
Anions and Nutrients (QCLot: 193534)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	94.5	90.0	110	----
Anions and Nutrients (QCLot: 193535)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 193536)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 193537)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 193538)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 193539)									
bromide	24959-67-9	E235.Br	0.1	mg/L	0.5 mg/L	100	85.0	115	----
Anions and Nutrients (QCLot: 194354)									
bromide	24959-67-9	E235.Br	0.1	mg/L	0.5 mg/L	103	85.0	115	----
Anions and Nutrients (QCLot: 194355)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	108	90.0	110	----
Anions and Nutrients (QCLot: 198039)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.1 mg/L	96.2	85.0	115	----
Cyanides (QCLot: 196594)									
cyanide, weak acid dissociable	----	E336	0.002	mg/L	0.125 mg/L	99.9	80.0	120	----
Cyanides (QCLot: 196595)									
cyanide, strong acid dissociable (total)	----	E333	0.002	mg/L	0.25 mg/L	92.4	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 195827)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	99.2	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	98.7	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	97.6	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	101	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	98.2	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	105	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	97.5	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	99.5	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	100	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	93.2	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	97.0	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	99.1	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	96.3	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	109	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	101	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	102	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	101	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	99.0	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	99.3	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	99.3	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	108	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	102	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	99.7	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	96.9	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	103	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	101	80.0	120	----
sodium, dissolved	17341-25-2	E421	0.05	mg/L	50 mg/L	100	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	104	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	106	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	96.4	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	102	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	98.0	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	97.1	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	92.0	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	101	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	96.1	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	98.7	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	103	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 195827) - continued									
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	99.7	80.0	120	----
Dissolved Metals (QCLot: 195828)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	103	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	102	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	97.8	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	103	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	111	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	104	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	98.8	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	103	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	89.5	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	96.3	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	98.9	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	98.4	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	111	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	104	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	112	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	100	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	101	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	99.6	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	100	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	109	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	103	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	100	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	97.6	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	105	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	104	80.0	120	----
sodium, dissolved	17341-25-2	E421	0.05	mg/L	50 mg/L	102	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	101	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	110	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	98.2	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	105	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	103	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	97.3	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	95.5	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	106	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 195828) - continued									
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	103	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	99.5	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	102	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	102	80.0	120	----



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: 193331)										
SK2101287-002	01_TSF_W19	bromide	24959-67-9	E235.Br	ND mg/L	0.5 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 193332)										
SK2101287-002	01_TSF_W19	sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	90.0	110	----
Anions and Nutrients (QCLot: 193534)										
SK2101287-008	02-IF-PAG_W16	fluoride	16984-48-8	E235.F	0.968 mg/L	1 mg/L	96.8	75.0	125	----
Anions and Nutrients (QCLot: 193535)										
SK2101287-008	02-IF-PAG_W16	nitrite (as N)	14797-65-0	E235.NO2	0.481 mg/L	0.5 mg/L	96.2	75.0	125	----
Anions and Nutrients (QCLot: 193536)										
SK2101287-008	02-IF-PAG_W16	sulfate (as SO4)	14808-79-8	E235.SO4	95.9 mg/L	100 mg/L	95.9	90.0	110	----
Anions and Nutrients (QCLot: 193537)										
SK2101287-008	02-IF-PAG_W16	chloride	16887-00-6	E235.Cl	98.9 mg/L	100 mg/L	98.9	75.0	125	----
Anions and Nutrients (QCLot: 193538)										
SK2101287-008	02-IF-PAG_W16	nitrate (as N)	14797-55-8	E235.NO3	2.49 mg/L	2.5 mg/L	99.7	75.0	125	----
Anions and Nutrients (QCLot: 193539)										
SK2101287-008	02-IF-PAG_W16	bromide	24959-67-9	E235.Br	0.50 mg/L	0.5 mg/L	99.5	75.0	125	----
Anions and Nutrients (QCLot: 194354)										
SK2101287-019	05-SED-NPAG_W15	bromide	24959-67-9	E235.Br	ND mg/L	0.5 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 194355)										
SK2101287-019	05-SED-NPAG_W15	sulfate (as SO4)	14808-79-8	E235.SO4	109 mg/L	100 mg/L	109	90.0	110	----
Anions and Nutrients (QCLot: 198039)										
RG2100133-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Cyanides (QCLot: 196594)										
VA21A8632-001	Anonymous	cyanide, weak acid dissociable	----	E336	0.111 mg/L	0.125 mg/L	89.2	75.0	125	----
Cyanides (QCLot: 196595)										
VA21A8632-001	Anonymous	cyanide, strong acid dissociable (total)	----	E333	0.206 mg/L	0.25 mg/L	82.4	75.0	125	----
Dissolved Metals (QCLot: 195827)										
SK2101287-036	09-FZONE-NPAG_W16	aluminum, dissolved	7429-90-5	E421	0.201 mg/L	0.2 mg/L	100	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0206 mg/L	0.02 mg/L	103	70.0	130	----



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
Dissolved Metals (QCLot: 195827) - continued										
SK2101287-036	09-FZONE-NPAG_W16	arsenic, dissolved	7440-38-2	E421	0.0196 mg/L	0.02 mg/L	98.0	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0411 mg/L	0.04 mg/L	103	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.0103 mg/L	0.01 mg/L	103	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.093 mg/L	0.1 mg/L	92.7	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00392 mg/L	0.004 mg/L	98.1	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.00991 mg/L	0.01 mg/L	99.1	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0382 mg/L	0.04 mg/L	95.5	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0193 mg/L	0.02 mg/L	96.3	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0188 mg/L	0.02 mg/L	93.9	70.0	130	----
		iron, dissolved	7439-89-6	E421	1.95 mg/L	2 mg/L	97.7	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0194 mg/L	0.02 mg/L	96.9	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.104 mg/L	0.1 mg/L	104	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	0.0192 mg/L	0.02 mg/L	95.8	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0205 mg/L	0.02 mg/L	102	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0390 mg/L	0.04 mg/L	97.4	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	10.7 mg/L	10 mg/L	107	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0200 mg/L	0.02 mg/L	100	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0401 mg/L	0.04 mg/L	100	70.0	130	----
		silicon, dissolved	7440-21-3	E421	9.63 mg/L	10 mg/L	96.3	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00393 mg/L	0.004 mg/L	98.2	70.0	130	----
		sodium, dissolved	17341-25-2	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	21.5 mg/L	20 mg/L	107	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0401 mg/L	0.04 mg/L	100	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00400 mg/L	0.004 mg/L	100	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0215 mg/L	0.02 mg/L	107	70.0	130	----
		tin, dissolved	7440-31-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0399 mg/L	0.04 mg/L	99.8	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0212 mg/L	0.02 mg/L	106	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.00422 mg/L	0.004 mg/L	106	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.0989 mg/L	0.1 mg/L	98.9	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.401 mg/L	0.4 mg/L	100	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0409 mg/L	0.04 mg/L	102	70.0	130	----



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
Dissolved Metals (QCLot: 195828)										
SK2101287-008	02-IF-PAG_W16	aluminum, dissolved	7429-90-5	E421	0.208 mg/L	0.2 mg/L	104	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0197 mg/L	0.02 mg/L	98.6	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0196 mg/L	0.02 mg/L	98.1	70.0	130	----
		barium, dissolved	7440-39-3	E421	0.0179 mg/L	0.02 mg/L	89.5	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0425 mg/L	0.04 mg/L	106	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00995 mg/L	0.01 mg/L	99.5	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.099 mg/L	0.1 mg/L	99.2	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00386 mg/L	0.004 mg/L	96.6	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.00956 mg/L	0.01 mg/L	95.6	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0392 mg/L	0.04 mg/L	98.0	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0194 mg/L	0.02 mg/L	97.0	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0188 mg/L	0.02 mg/L	94.2	70.0	130	----
		iron, dissolved	7439-89-6	E421	2.01 mg/L	2 mg/L	100	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0196 mg/L	0.02 mg/L	97.9	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.109 mg/L	0.1 mg/L	109	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	0.0190 mg/L	0.02 mg/L	94.8	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0394 mg/L	0.04 mg/L	98.6	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	10.5 mg/L	10 mg/L	105	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0201 mg/L	0.02 mg/L	100	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0391 mg/L	0.04 mg/L	97.7	70.0	130	----
		silicon, dissolved	7440-21-3	E421	9.95 mg/L	10 mg/L	99.5	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00393 mg/L	0.004 mg/L	98.3	70.0	130	----
		sodium, dissolved	17341-25-2	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0393 mg/L	0.04 mg/L	98.2	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00390 mg/L	0.004 mg/L	97.5	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0208 mg/L	0.02 mg/L	104	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0196 mg/L	0.02 mg/L	97.9	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0400 mg/L	0.04 mg/L	100.0	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0215 mg/L	0.02 mg/L	107	70.0	130	----
		uranium, dissolved	7440-61-1	E421	ND mg/L	0.004 mg/L	ND	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.101 mg/L	0.1 mg/L	101	70.0	130	----

Page : 18 of 18
 Work Order : SK2101287
 Client : O'Kane Consultants Inc.
 Project : 948-021



Sub-Matrix: **Water**

					<i>Matrix Spike (MS) Report</i>					
					<i>Spike</i>		<i>Recovery (%)</i>	<i>Recovery Limits (%)</i>		
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>Concentration</i>	<i>Target</i>	<i>MS</i>	<i>Low</i>	<i>High</i>	<i>Qualifier</i>
Dissolved Metals (QCLot: 195828) - continued										
SK2101287-008	02-IF-PAG_W16	zinc, dissolved	7440-66-6	E421	0.392 mg/L	0.4 mg/L	98.0	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0410 mg/L	0.04 mg/L	102	70.0	130	----



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Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC No

Environmental Division
Saskatoon
Work Order Reference
SK2101287



Telephone: +1 306 668 8370

ply)

30%

Report To Contact and company name below will appear on the final report		Report Format / Distribution			Select Service Level Below - Contact your															
Company: Okane Consultants		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL)			Regular [R] <input checked="" type="checkbox"/> Standard TAT if recei															
Contact: Jared Robertson		Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			PRIORITY (Business Days)					EMERGENCY										
Phone: 1 (306) 713-1695		<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked			4 day [P4-20%] <input type="checkbox"/>					1 d										
Company address below will appear on the final report		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			3 day [P3-25%] <input type="checkbox"/>					Sat (La										
Street: 112-112 Research Drive		Email 1 or Fax jrobertson@okc-sk.com			Date and Time Required for all E&P TATs:															
City/Province: Saskatoon, SK		Email 2			For tests that can not be performed according to the servi															
Postal Code: S7N 3R3		Email 3			Analysis Request															
Invoice To		Invoice Distribution			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below															
Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			NUMBER OF CONTAINERS															
Copy of invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Email 1 or Fax jrobertson@okc-sk.com			F/P															
Company:		Email 2			BR-IC-N-CL															
Contact:		Email 2			MET-D-COMS-SK															
Project Information		Oil and Gas Required Fields (client use)			ROU-H-SK															
ALS Account # / Quote #: Q83455		AFE/Cost Center: PO#			ISO-IC-N-CL															
Job #: 948-021		Major/Minor Code: Routing Code:			CN-T-CFA-VA															
PO / AFE:		Requisitioner:			CN-WAD-CFA-VA															
LSD:		Location:			NH3-TKN-PT															
ALS Lab Work Order # (lab use only):		ALS Contact:			Sampler:															
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											
01_TSF_W18					15-Apr-21		13:45		Leachate		1 R									
01_TSF_W19					22-Apr-21		14:18		Leachate		1 R									
01_TSF_W20					29-Apr-21		12:55		Leachate		4 R R R R R R									
01_TSF_W21					6-May-21		13:40		Leachate		1 R R R									
02-IF-PAG_W13					15-Apr-21		13:45		Leachate		1 R R R									
02-IF-PAG_W14					22-Apr-21		14:18		Leachate		1 R R R									
02-IF-PAG_W15					29-Apr-21		12:55		Leachate		1 R R R									
02-IF-PAG_W16					6-May-21		13:40		Leachate		3 R R R R R R									
03-SED-PAG_W13					15-Apr-21		13:45		Leachate		1 R R R									
03-SED-PAG_W14					22-Apr-21		14:18		Leachate		1 R R R									
03-SED-PAG_W15					29-Apr-21		12:55		Leachate		1 R R R									
03-SED-PAG_W16					6-May-21		13:40		Leachate		3 R R R R R R									
Drinking Water (DW) Samples¹ (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)			SAMPLE CONDITION AS RECEIVED (lab use only)															
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Suspected hazards: elevated metals, potential for low levels of cyanide			Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>															
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					Ice Packs <input type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>															
					Cooling Initiated <input type="checkbox"/>															
					INITIAL COOLER TEMPERATURES °C					FINAL COOLER TEMPERATURES °C										
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)															
Released by: Jared Robertson		Date: May 6, 2021		Time:		Received by:		Date:		Time:		Received by:		Date:		Time:				

SAMPLES ON HOLD
SUSPECTED HAZARD (see Special Instructions)

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION
 WHITE - LABORATORY COPY YELLOW - CLIENT COPY
 Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.
 1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.



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Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number

Environmental Division
Saskatoon
Work Order Reference
SK2101287



Telephone: +1 306 668 9370

Report To Company: Okane Consultants Contact: Jared Robertson Phone: 1 (306) 713-1695 Street: 112-112 Research Drive City/Province: Saskatoon, SK Postal Code: S7N 3R3		Report Format / Distribution Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL) Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: jrobertson@okc-sk.com Email 2 Email 3		Select Service Level Below - Contact your Regular [R] <input checked="" type="checkbox"/> Standard TAT if receive 4 day [P4-20%] <input type="checkbox"/> 3 day [P3-25%] <input type="checkbox"/> 2 day [P2-50%] <input type="checkbox"/> EMERGENCY: 1 B, San (La)	
Invoice To Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO Copy of Invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO Company: Contact:		Invoice Distribution Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: jrobertson@okc-sk.com Email 2		Analysis Request Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below	
Project Information ALS Account # / Quote #: Q83455 Job #: 948-021 PO / AFE: LSD:		Oil and Gas Required Fields (client use) AFE/Cost Center: PO# Major/Minor Code: Routing Code: Requisitioner: Location:		NUMBER OF CONTAINERS BR-IC-N-CL MET-D-COMS-SK ROU-F-SK SO4-IC-N-CL CNT-CFA-VA CN-WAD-CFA-VA NH4-TKN-PT	
ALS Lab Work Order # (lab use only):		ALS Contact: Sampler:			
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mm-yy)	Time (hh:mm)	Sample Type	Y
04-GAB-NPAG_W13		15-Apr-21	13:45	Leachate	Y
04-GAB-NPAG_W14		22-Apr-21	14:18	Leachate	Y
04-GAB-NPAG_W15		29-Apr-21	12:55	Leachate	Y
04-GAB-NPAG_W16		6-May-21	13:40	Leachate	Y
05-SED-NPAG_W13		15-Apr-21	13:45	Leachate	Y
05-SED-NPAG_W14		22-Apr-21	14:18	Leachate	Y
05-SED-NPAG_W15		29-Apr-21	12:55	Leachate	Y
05-SED-NPAG_W16		6-May-21	13:40	Leachate	Y
06-IF-NPAG_W13		15-Apr-21	13:45	Leachate	Y
06-IF-NPAG_W14		22-Apr-21	14:18	Leachate	Y
06-IF-NPAG_W15		29-Apr-21	12:55	Leachate	Y
06-IF-NPAG_W16		6-May-21	13:40	Leachate	Y
Drinking Water (DW) Samples (client use) Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only) Suspected hazards: elevated metals, potential for low levels of cyanide		SAMPLE CONDITION AS RECEIVED (lab use only) Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/> Ice Packs <input type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/> Cooling Initiated <input checked="" type="checkbox"/> INITIAL COOLER TEMPERATURES °C: FINAL COOLER TEMPERATURES °C:	
SHIPMENT RELEASE (client use) Released by: Jared Robertson Date: April 8, 2021 Time:		INITIAL SHIPMENT RECEPTION (lab use only) Received by: Date: Time:		FINAL SHIPMENT RECEPTION (lab use only) Received by: Date: Time:	

SAMPLES ON HOLD
SUSPECTED HAZARD (see Special Instructions)



CERTIFICATE OF ANALYSIS

Work Order : **SK2101741**
Client : **O'Kane Consultants Inc.**
Contact : Jared Robertson
Address : 112 - 112 Research Drive
Saskatoon SK Canada S7N 3R3
Telephone : 250 420 7010
Project : 948-021
PO : ----
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : Q83455
No. of samples received : 35
No. of samples analysed : 35

Page : 1 of 23
Laboratory : Saskatoon - Environmental
Account Manager : Brian Morgan
Address : 819 58 Street East
Saskatoon SK Canada S7K 6X5
Telephone : 1 306 221 7147
Date Samples Received : 03-Jun-2021 16:51
Date Analysis Commenced : 04-Jun-2021
Issue Date : 28-Jun-2021 15:53

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Colby Bingham	Quality Systems Coordinator	Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Quality Systems Coordinator	Metals, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Inorganics, Burnaby, British Columbia
Lian Nesbitt	Laboratory Analyst	Metals, Saskatoon, Saskatchewan
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Melissa Houseman	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Melissa Houseman	Team Leader - Inorganics	Metals, Saskatoon, Saskatchewan
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Naeun Kim	Analyst	Inorganics, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta



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).

<i>Unit</i>	<i>Description</i>
-	No Unit
%	percent
µS/cm	Microsiemens per centimetre
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
RRV	Reported result verified by repeat analysis.



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					01_TSF_W22	01_TSF_W23	01_TSF_W24	01_TSF_W25	02-IF-PAG_W17
Client sampling date / time					13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45
Analyte	CAS Number	Method	LOR	Unit	SK2101741-001	SK2101741-002	SK2101741-003	SK2101741-004	SK2101741-005
					Result	Result	Result	Result	Result
Physical Tests									
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	----	1530	----	----
conductivity	----	E100	2.0	µS/cm	----	----	18300	----	----
pH	----	E108	0.10	pH units	----	----	8.04	----	----
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	----	365	----	----
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	----	<1.0	----	----
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	----	<1.0	----	----
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	299	----	----
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	13200	----	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	39.1	----	----
bromide	24959-67-9	E235.Br	0.10	mg/L	<20.0 ^{DLDS}	20.3	<10.0 ^{DLDS}	13.4	0.14
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	----	<0.0020	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	6280	11200	5230	9320	79.0
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	----	305	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	2380	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	<2.00 ^{DLDS}	----	----
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	178	----	----
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	5.16	----	----
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	183	----	----
Cyanides									
cyanide, strong acid dissociable (total)	----	E333	0.0050	mg/L	----	----	0.744	----	----
cyanide, weak acid dissociable	----	E336	0.0050	mg/L	----	----	<0.100 ^{DLHC}	----	----
Ion Balance									
anion sum	----	EC101	0.10	meq/L	----	----	195	----	----
cation sum	----	EC101	0.10	meq/L	----	----	199	----	----
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	1.02	----	----
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	102	----	----
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	<0.0200 ^{DLDS}	----	----
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	0.00785	----	----



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					01_TSF_W22	01_TSF_W23	01_TSF_W24	01_TSF_W25	02-IF-PAG_W17
Client sampling date / time					13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45
Analyte	CAS Number	Method	LOR	Unit	SK2101741-001	SK2101741-002	SK2101741-003	SK2101741-004	SK2101741-005
					Result	Result	Result	Result	Result
Dissolved Metals									
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	---	---	0.646	---	---
barium, dissolved	7440-39-3	E421	0.00010	mg/L	---	---	0.0459	---	---
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	---	---	<0.000400 ^{DLDS}	---	---
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	---	---	<0.00100 ^{DLDS}	---	---
boron, dissolved	7440-42-8	E421	0.010	mg/L	---	---	1.55	---	---
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	---	---	0.000254	---	---
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	498	---	---
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	<0.000200 ^{DLDS}	---	---
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	---	<0.0100 ^{DLDS}	---	---
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	0.412	---	---
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	0.00988	---	---
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	<0.600 ^{DLDS}	---	---
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	<0.00100 ^{DLDS}	---	---
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	<0.0200 ^{DLDS}	---	---
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	70.5	---	---
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	2.41	---	---
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	0.496	---	---
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	---	<0.0100 ^{DLDS}	---	---
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	<1.00 ^{DLDS}	---	---
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	339	---	---
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	0.0456	---	---
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	0.0212	---	---
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	5.63	---	---
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	0.000804	---	---
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	3600	---	---
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	2.03	---	---
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	2240	---	---
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	<0.00400 ^{DLDS}	---	---
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	0.000323	---	---
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	<0.00200 ^{DLDS}	---	---
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	0.00287	---	---



Analytical Results

Sub-Matrix: Leachate

(Matrix: Water)

					Client sample ID	01_TSF_W22	01_TSF_W23	01_TSF_W24	01_TSF_W25	02-IF-PAG_W17
					Client sampling date / time	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45
Analyte	CAS Number	Method	LOR	Unit	SK2101741-001	SK2101741-002	SK2101741-003	SK2101741-004	SK2101741-005	
					Result	Result	Result	Result	Result	
Dissolved Metals										
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	----	----	<0.00600 ^{DLDS}	----	----	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	----	----	<0.00200 ^{DLDS}	----	----	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	----	----	0.00752	----	----	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	----	----	<0.0100 ^{DLDS}	----	----	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	----	0.0247	----	----	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	----	<0.00600 ^{DLDS}	----	----	
dissolved metals filtration location	----	EP421	-	-	----	----	Field	----	----	

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



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					02-IF-PAG_W18	02-IF-PAG_W19	02-IF-PAG_W20	03-SED-PAG_W 17	03-SED-PAG_W 18
Client sampling date / time					13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45
Analyte	CAS Number	Method	LOR	Unit	SK2101741-006	SK2101741-007	SK2101741-008	SK2101741-009	SK2101741-010
					Result	Result	Result	Result	Result
Physical Tests									
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	----	59.3	----	----
conductivity	----	E100	2.0	µS/cm	----	----	450	----	----
pH	----	E108	0.10	pH units	----	----	8.16	----	----
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	----	132	----	----
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	----	<1.0	----	----
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	----	<1.0	----	----
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	108	----	----
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	268	----	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	0.174	----	----
bromide	24959-67-9	E235.Br	0.10	mg/L	0.12	<0.10	<0.10	0.44	<1.00 ^{DLM}
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	----	<0.0020	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	84.8	91.4	101	50.6	45.4
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	----	<0.200	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	5.20	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	0.413	----	----
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	<0.020	----	----
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	<0.010	----	----
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	<0.0500	----	----
Ion Balance									
anion sum	----	EC101	0.10	meq/L	----	----	4.43	----	----
cation sum	----	EC101	0.10	meq/L	----	----	4.03	----	----
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	4.73	----	----
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	91.0	----	----
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	0.0283	----	----
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	0.0105	----	----
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	0.00084	----	----
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	0.0243	----	----
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	----	<0.000020	----	----
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	----	<0.000050	----	----



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					02-IF-PAG_W18	02-IF-PAG_W19	02-IF-PAG_W20	03-SED-PAG_W 17	03-SED-PAG_W 18
Client sampling date / time					13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45
Analyte	CAS Number	Method	LOR	Unit	SK2101741-006	SK2101741-007	SK2101741-008	SK2101741-009	SK2101741-010
					Result	Result	Result	Result	Result
Dissolved Metals									
boron, dissolved	7440-42-8	E421	0.010	mg/L	---	---	0.082	---	---
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	---	---	<0.000050	---	---
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	15.1	---	---
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	0.000061	---	---
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	---	<0.00050	---	---
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	<0.00010	---	---
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	0.00147	---	---
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	<0.030	---	---
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	<0.000050	---	---
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	0.0075	---	---
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	5.25	---	---
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	<0.00500	---	---
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	0.00484	---	---
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	---	0.00062	---	---
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	<0.050	---	---
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	6.24	---	---
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	0.00523	---	---
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	0.000148	---	---
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	2.98	---	---
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	<0.000010	---	---
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	61.3	---	---
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	0.0854	---	---
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	32.3	---	---
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	<0.00020	---	---
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	<0.000010	---	---
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	<0.00010	---	---
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	0.00561	---	---
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	---	<0.00030	---	---
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	---	0.00238	---	---
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	---	0.00772	---	---
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	---	<0.00050	---	---



Analytical Results

Sub-Matrix: Leachate

(Matrix: Water)

					Client sample ID	02-IF-PAG_W18	02-IF-PAG_W19	02-IF-PAG_W20	03-SED-PAG_W 17	03-SED-PAG_W 18
					Client sampling date / time	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45
Analyte	CAS Number	Method	LOR	Unit	SK2101741-006	SK2101741-007	SK2101741-008	SK2101741-009	SK2101741-010	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	----	0.0100	----	----	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	----	<0.00030	----	----	
dissolved metals filtration location	----	EP421	-	-	----	----	Field	----	----	

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



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					03-SED-PAG_W 19	03-SED-PAG_W 20	04-GAB-NPAG_ W17	04-GAB-NPAG_ W18	04-GAB-NPAG_ W19
Client sampling date / time					13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45
Analyte	CAS Number	Method	LOR	Unit	SK2101741-011	SK2101741-012	SK2101741-013	SK2101741-014	SK2101741-015
					Result	Result	Result	Result	Result
Physical Tests									
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	63.1	----	----	----
conductivity	----	E100	2.0	µS/cm	----	354	----	----	----
pH	----	E108	0.10	pH units	----	8.22	----	----	----
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	140	----	----	----
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	<1.0	----	----	----
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	<1.0	----	----	----
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	115	----	----	----
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	206	----	----	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	0.0100	----	----	----
bromide	24959-67-9	E235.Br	0.10	mg/L	<1.00 ^{DLM}	0.14	<1.00 ^{DLM}	0.42	0.32
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	<0.0020	----	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	46.2	50.7	26.5	26.2	26.1
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	<0.200	----	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	6.55	----	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L	----	0.663	----	----	----
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	<0.020	----	----	----
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	<0.010	----	----	----
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	<0.0500	----	----	----
Ion Balance									
anion sum	----	EC101	0.10	meq/L	----	3.57	----	----	----
cation sum	----	EC101	0.10	meq/L	----	3.30	----	----	----
ion balance (cation-anion difference)	----	EC101	0.010	%	----	3.93	----	----	----
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	92.4	----	----	----
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	0.0557	----	----	----
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	0.00226	----	----	----
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	0.00330	----	----	----
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	0.0139	----	----	----
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	<0.000020	----	----	----
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	<0.000050	----	----	----



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					03-SED-PAG_W 19	03-SED-PAG_W 20	04-GAB-NPAG_ W17	04-GAB-NPAG_ W18	04-GAB-NPAG_ W19
Client sampling date / time					13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45
Analyte	CAS Number	Method	LOR	Unit	SK2101741-011	SK2101741-012	SK2101741-013	SK2101741-014	SK2101741-015
					Result	Result	Result	Result	Result
Dissolved Metals									
boron, dissolved	7440-42-8	E421	0.010	mg/L	---	0.065	---	---	---
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	---	0.000083	---	---	---
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	14.2	---	---	---
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	0.000035	---	---	---
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	<0.00050	---	---	---
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	<0.00010	---	---	---
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	0.00092	---	---	---
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	<0.030	---	---	---
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	<0.000050	---	---	---
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	0.0122	---	---	---
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	6.71	---	---	---
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	<0.00500	---	---	---
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	0.0215	---	---	---
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	0.00054	---	---	---
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	<0.050	---	---	---
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	8.89	---	---	---
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	0.00292	---	---	---
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	0.000647	---	---	---
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	2.90	---	---	---
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	<0.000010	---	---	---
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	41.6	---	---	---
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	0.0740	---	---	---
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	16.3	---	---	---
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	<0.00020	---	---	---
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	0.000013	---	---	---
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	<0.00010	---	---	---
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	0.00454	---	---	---
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	<0.00030	---	---	---
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	0.00039	---	---	---
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	0.00488	---	---	---
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	0.00058	---	---	---



Analytical Results

Sub-Matrix: Leachate

(Matrix: Water)

					Client sample ID	03-SED-PAG_W 19	03-SED-PAG_W 20	04-GAB-NPAG_ W17	04-GAB-NPAG_ W18	04-GAB-NPAG_ W19
					Client sampling date / time	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45
Analyte	CAS Number	Method	LOR	Unit	SK2101741-011	SK2101741-012	SK2101741-013	SK2101741-014	SK2101741-015	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	0.0037	----	----	----	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	<0.00030	----	----	----	
dissolved metals filtration location	----	EP421	-	-	----	Field	----	----	----	

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



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					04-GAB-NPAG_ W20	05-SED-NPAG_ W17	05-SED-NPAG_ W18	05-SED-NPAG_ W19	05-SED-NPAG_ W20
Client sampling date / time					13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45
Analyte	CAS Number	Method	LOR	Unit	SK2101741-016	SK2101741-017	SK2101741-018	SK2101741-019	SK2101741-020
					Result	Result	Result	Result	Result
Physical Tests									
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	19.3	----	----	----	43.3
conductivity	----	E100	2.0	µS/cm	499	----	----	----	295
pH	----	E108	0.10	pH units	8.45	----	----	----	8.21
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	246	----	----	----	140
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	4.6	----	----	----	<1.0
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	<1.0	----	----	----	<1.0
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	210	----	----	----	115
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	291	----	----	----	167
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.242	----	----	----	0.0472
bromide	24959-67-9	E235.Br	0.10	mg/L	0.26	0.49	0.35	0.23	0.16
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	----	----	----	<0.0020
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	28.2	25.0	23.6	20.8	19.4
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	0.216	----	----	----	<0.200
chloride	16887-00-6	E235.Cl	0.50	mg/L	14.8	----	----	----	9.19
fluoride	16984-48-8	E235.F	0.020	mg/L	0.578	----	----	----	0.682
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.020	----	----	----	<0.020
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	----	----	----	<0.010
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	<0.0500	----	----	----	<0.0500
Ion Balance									
anion sum	----	EC101	0.10	meq/L	5.23	----	----	----	3.00
cation sum	----	EC101	0.10	meq/L	4.96	----	----	----	2.79
ion balance (cation-anion difference)	----	EC101	0.010	%	2.65	----	----	----	3.63
ion balance (cations/anions ratio)	----	EC101	0.010	%	94.8	----	----	----	93.0
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0879	----	----	----	0.0772
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00268	----	----	----	0.00193
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.0188	----	----	----	0.148
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.00958	----	----	----	0.0116
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	----	----	----	<0.000020
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	----	----	----	<0.000050



Analytical Results

Sub-Matrix: Leachate

(Matrix: Water)

Client sample ID

					04-GAB-NPAG_ W20	05-SED-NPAG_ W17	05-SED-NPAG_ W18	05-SED-NPAG_ W19	05-SED-NPAG_ W20
Client sampling date / time					13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45
Analyte	CAS Number	Method	LOR	Unit	SK2101741-016	SK2101741-017	SK2101741-018	SK2101741-019	SK2101741-020
					Result	Result	Result	Result	Result
Dissolved Metals									
boron, dissolved	7440-42-8	E421	0.010	mg/L	0.089	----	----	----	0.071
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	<0.000050	----	----	----	0.000054
calcium, dissolved	7440-70-2	E421	0.050	mg/L	5.05	----	----	----	10.3
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000314	----	----	----	0.000055
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	----	----	----	<0.00050
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00015	----	----	----	0.00023
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00194	----	----	----	0.00110
iron, dissolved	7439-89-6	E421	0.030	mg/L	<0.030	----	----	----	<0.030
lead, dissolved	7439-92-1	E421	0.000050	mg/L	0.000052	----	----	----	<0.000050
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0078	----	----	----	0.0071
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	1.63	----	----	----	4.27
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	<0.00500	----	----	----	<0.00500
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00607	----	----	----	0.00887
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00077	----	----	----	0.00111
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	----	----	----	<0.050
potassium, dissolved	7440-09-7	E421	0.050	mg/L	4.36	----	----	----	7.11
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00325	----	----	----	0.00259
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.00115	----	----	----	0.000392
silicon, dissolved	7440-21-3	E421	0.050	mg/L	2.87	----	----	----	2.63
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	----	----	----	<0.000010
sodium, dissolved	17341-25-2	E421	0.050	mg/L	102	----	----	----	39.8
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0146	----	----	----	0.0487
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	9.49	----	----	----	6.48
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	----	----	----	<0.00020
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.000026	----	----	----	0.000010
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	----	----	----	<0.00010
tin, dissolved	7440-31-5	E421	0.00010	mg/L	0.00531	----	----	----	0.00717
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	----	----	----	<0.00030
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	0.00111	----	----	----	0.00054
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.0232	----	----	----	0.00638
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	0.00763	----	----	----	0.00182



Analytical Results

Sub-Matrix: Leachate
 (Matrix: Water)

					Client sample ID	04-GAB-NPAG_ W20	05-SED-NPAG_ W17	05-SED-NPAG_ W18	05-SED-NPAG_ W19	05-SED-NPAG_ W20
					Client sampling date / time	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45
Analyte	CAS Number	Method	LOR	Unit	SK2101741-016	SK2101741-017	SK2101741-018	SK2101741-019	SK2101741-020	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0183	----	----	----	----	0.0048
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	----	----	----	----	<0.00030
dissolved metals filtration location	----	EP421	-	-	Field	----	----	----	----	Field

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



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					06-IF-NPAG_W1 7	06-IF-NPAG_W1 8	06-IF-NPAG_W1 9	06-IF-NPAG_W2 0	07-IF-PAG-CW_ W18
Client sampling date / time					13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45
Analyte	CAS Number	Method	LOR	Unit	SK2101741-021	SK2101741-022	SK2101741-023	SK2101741-024	SK2101741-025
					Result	Result	Result	Result	Result
Physical Tests									
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	----	----	52.1	----
conductivity	----	E100	2.0	µS/cm	----	----	----	382	----
pH	----	E108	0.10	pH units	----	----	----	8.24	----
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	----	----	156	----
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	----	----	<1.0	----
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	----	----	<1.0	----
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	----	128	----
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	----	192	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	----	0.0184	----
bromide	24959-67-9	E235.Br	0.10	mg/L	0.38	0.28	<1.00 ^{DLM}	<1.00 ^{DLM}	163
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	----	----	<0.0020	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	30.6	31.9	28.7	28.5	3070
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	----	----	<0.200	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	----	6.41	----
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	----	0.380	----
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	----	<0.200 ^{DLM}	----
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	----	<0.100 ^{DLM}	----
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	----	<0.224	----
Ion Balance									
anion sum	----	EC101	0.10	meq/L	----	----	----	3.35	----
cation sum	----	EC101	0.10	meq/L	----	----	----	3.11	----
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	----	3.72	----
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	----	92.8	----
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	----	0.0152	----
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	----	0.0197	----
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	----	0.00156	----
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	----	0.0230	----
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	----	----	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	----	----	<0.000050	----



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					06-IF-NPAG_W1 7	06-IF-NPAG_W1 8	06-IF-NPAG_W1 9	06-IF-NPAG_W2 0	07-IF-PAG-CW_ W18
Client sampling date / time					13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45
Analyte	CAS Number	Method	LOR	Unit	SK2101741-021	SK2101741-022	SK2101741-023	SK2101741-024	SK2101741-025
					Result	Result	Result	Result	Result
Dissolved Metals									
boron, dissolved	7440-42-8	E421	0.010	mg/L	---	---	---	0.092	---
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	---	---	---	<0.000050	---
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	---	13.6	---
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	---	0.000035	---
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	---	---	<0.00050	---
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	---	<0.00010	---
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	---	0.00120	---
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	---	<0.030	---
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	---	<0.000050	---
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	---	0.0138	---
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	---	4.41	---
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	---	<0.00500	---
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	---	0.00633	---
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	---	---	0.00074	---
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	---	<0.050	---
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	---	13.8	---
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	---	0.0110	---
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	---	0.000177	---
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	---	3.41	---
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	---	<0.000010	---
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	---	39.3	---
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	---	0.163	---
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	---	10.2	---
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	---	<0.00020	---
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	---	0.000011	---
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	---	<0.00010	---
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	---	0.00556	---
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	---	---	<0.00030	---
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	---	---	0.00116	---
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	---	---	0.00556	---
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	---	---	<0.00050	---



Analytical Results

Sub-Matrix: Leachate

(Matrix: Water)

					Client sample ID	06-IF-NPAG_W1 7	06-IF-NPAG_W1 8	06-IF-NPAG_W1 9	06-IF-NPAG_W2 0	07-IF-PAG-CW_ W18
					Client sampling date / time	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45
Analyte	CAS Number	Method	LOR	Unit	SK2101741-021	SK2101741-022	SK2101741-023	SK2101741-024	SK2101741-025	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	----	----	0.0088	----	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	----	----	<0.00030	----	
dissolved metals filtration location	----	EP421	-	-	----	----	----	Field	----	

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



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					07-IF-PAG-CW_ W19	07-IF-PAG-CW_ W20	08-SED-PAG-C W_W17	08-SED-PAG-C W_W18	08-SED-PAG-C W_W19
Client sampling date / time					13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45
Analyte	CAS Number	Method	LOR	Unit	SK2101741-026	SK2101741-027	SK2101741-028	SK2101741-029	SK2101741-030
					Result	Result	Result	Result	Result
Physical Tests									
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	12400	----	----	----
conductivity	----	E100	2.0	µS/cm	----	77900	----	----	----
pH	----	E108	0.10	pH units	----	7.60	----	----	----
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	71.6	----	----	----
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	<1.0	----	----	----
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	<1.0	----	----	----
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	58.7	----	----	----
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	55000	----	----	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	4.67 ^{RRV}	----	----	----
bromide	24959-67-9	E235.Br	0.10	mg/L	157	148	153	150	138
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	<0.0020	----	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	3150	3260	3060	3250	3170
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	1.75	----	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	31700	----	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L	----	<8.00 ^{DLDS}	----	----	----
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	<8.00 ^{DLDS}	----	----	----
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	<4.00 ^{DLDS}	----	----	----
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	<8.94	----	----	----
Ion Balance									
anion sum	----	EC101	0.10	meq/L	----	963	----	----	----
cation sum	----	EC101	0.10	meq/L	----	948	----	----	----
ion balance (cation-anion difference)	----	EC101	0.010	%	----	0.785	----	----	----
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	98.4	----	----	----
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	<0.100 ^{DLDS}	----	----	----
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	0.0127	----	----	----
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	<0.0100 ^{DLDS}	----	----	----
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	0.186	----	----	----
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	<0.00200 ^{DLDS}	----	----	----
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	<0.00500 ^{DLDS}	----	----	----



Analytical Results

Sub-Matrix: Leachate
 (Matrix: Water)

Client sample ID

					07-IF-PAG-CW_ W19	07-IF-PAG-CW_ W20	08-SED-PAG-C W_W17	08-SED-PAG-C W_W18	08-SED-PAG-C W_W19
Client sampling date / time					13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45
Analyte	CAS Number	Method	LOR	Unit	SK2101741-026	SK2101741-027	SK2101741-028	SK2101741-029	SK2101741-030
					Result	Result	Result	Result	Result
Dissolved Metals									
boron, dissolved	7440-42-8	E421	0.010	mg/L	---	1.06	---	---	---
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	---	0.00168	---	---	---
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	1700	---	---	---
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	0.0167	---	---	---
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	<0.0500 ^{DLDS}	---	---	---
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	<0.0100 ^{DLDS}	---	---	---
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	<0.0200 ^{DLDS}	---	---	---
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	<3.00 ^{DLDS}	---	---	---
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	<0.00500 ^{DLDS}	---	---	---
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	0.306	---	---	---
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	1970	---	---	---
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	<0.500 ^{DLDS}	---	---	---
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	0.00772	---	---	---
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	0.0777	---	---	---
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	<5.00 ^{DLDS}	---	---	---
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	550	---	---	---
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	0.509	---	---	---
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	<0.00500 ^{DLDS}	---	---	---
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	<5.00 ^{DLDS}	---	---	---
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	0.00192	---	---	---
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	15800	---	---	---
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	40.6	---	---	---
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	1180	---	---	---
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	<0.0200 ^{DLDS}	---	---	---
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	<0.00100 ^{DLDS}	---	---	---
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	<0.0100 ^{DLDS}	---	---	---
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	<0.0100 ^{DLDS}	---	---	---
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	<0.0300 ^{DLDS}	---	---	---
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	<0.0100 ^{DLDS}	---	---	---
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	0.0152	---	---	---
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	<0.0500 ^{DLDS}	---	---	---



Analytical Results

Sub-Matrix: Leachate

(Matrix: Water)

					Client sample ID	07-IF-PAG-CW_ W19	07-IF-PAG-CW_ W20	08-SED-PAG-C W_W17	08-SED-PAG-C W_W18	08-SED-PAG-C W_W19
					Client sampling date / time	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45
Analyte	CAS Number	Method	LOR	Unit	SK2101741-026	SK2101741-027	SK2101741-028	SK2101741-029	SK2101741-030	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	0.213	----	----	----	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	<0.0300 ^{DLDS}	----	----	----	
dissolved metals filtration location	----	EP421	-	-	----	Field	----	----	----	

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



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					08-SED-PAG-C W_W20	09-FZONE-NPA G_W17	09-FZONE-NPA G_W18	09-FZONE-NPA G_W19	09-FZONE-NPA G_W20
Client sampling date / time					13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45
Analyte	CAS Number	Method	LOR	Unit	SK2101741-031	SK2101741-032	SK2101741-033	SK2101741-034	SK2101741-035
					Result	Result	Result	Result	Result
Physical Tests									
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	12400	----	----	----	75.1
conductivity	----	E100	2.0	µS/cm	77700	----	----	----	333
pH	----	E108	0.10	pH units	7.58	----	----	----	8.29
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	57.7	----	----	----	143
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	<1.0	----	----	----	<1.0
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	<1.0	----	----	----	<1.0
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	47.3	----	----	----	118
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	54600	----	----	----	171
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	5.24 ^{RRV}	----	----	----	0.0842
bromide	24959-67-9	E235.Br	0.10	mg/L	132	<0.20 ^{DLDS}	0.14	<0.10	<0.10
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	----	----	----	<0.0020
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	3130	29.9	30.7	28.6	28.8
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	2.98	----	----	----	<0.200
chloride	16887-00-6	E235.Cl	0.50	mg/L	31400	----	----	----	3.35
fluoride	16984-48-8	E235.F	0.020	mg/L	<8.00 ^{DLDS}	----	----	----	0.613
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<8.00 ^{DLDS}	----	----	----	<0.020
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<4.00 ^{DLDS}	----	----	----	<0.010
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	<8.94	----	----	----	<0.0500
Ion Balance									
anion sum	----	EC101	0.10	meq/L	952	----	----	----	3.08
cation sum	----	EC101	0.10	meq/L	950	----	----	----	2.85
ion balance (cation-anion difference)	----	EC101	0.010	%	0.105	----	----	----	3.88
ion balance (cations/anions ratio)	----	EC101	0.010	%	99.8	----	----	----	92.5
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.147	----	----	----	0.0306
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.0100 ^{DLDS}	----	----	----	0.00593
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	<0.0100 ^{DLDS}	----	----	----	0.00196
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.179	----	----	----	0.0208
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.00200 ^{DLDS}	----	----	----	<0.000020
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.00500 ^{DLDS}	----	----	----	<0.000050



Analytical Results

Sub-Matrix: Leachate

Client sample ID

(Matrix: Water)

					08-SED-PAG-C W_W20	09-FZONE-NPA G_W17	09-FZONE-NPA G_W18	09-FZONE-NPA G_W19	09-FZONE-NPA G_W20
Client sampling date / time					13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45
Analyte	CAS Number	Method	LOR	Unit	SK2101741-031	SK2101741-032	SK2101741-033	SK2101741-034	SK2101741-035
					Result	Result	Result	Result	Result
Dissolved Metals									
boron, dissolved	7440-42-8	E421	0.010	mg/L	1.08	----	----	----	0.070
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	0.00341	----	----	----	<0.000050
calcium, dissolved	7440-70-2	E421	0.050	mg/L	1720	----	----	----	16.9
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.00780	----	----	----	<0.000010
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.0500 ^{DLDS}	----	----	----	<0.00050
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.0258	----	----	----	<0.00010
copper, dissolved	7440-50-8	E421	0.00020	mg/L	<0.0200 ^{DLDS}	----	----	----	0.00207
iron, dissolved	7439-89-6	E421	0.030	mg/L	<3.00 ^{DLDS}	----	----	----	<0.030
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.00500 ^{DLDS}	----	----	----	<0.000050
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.308	----	----	----	0.0052
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	1980	----	----	----	7.99
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	<0.500 ^{DLDS}	----	----	----	0.0113
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.0199	----	----	----	0.00416
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.182	----	----	----	0.00101
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<5.00 ^{DLDS}	----	----	----	<0.050
potassium, dissolved	7440-09-7	E421	0.050	mg/L	520	----	----	----	6.68
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.231	----	----	----	0.00116
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	<0.00500 ^{DLDS}	----	----	----	0.000333
silicon, dissolved	7440-21-3	E421	0.050	mg/L	<5.00 ^{DLDS}	----	----	----	3.29
silver, dissolved	7440-22-4	E421	0.000010	mg/L	0.00178	----	----	----	<0.000010
sodium, dissolved	17341-25-2	E421	0.050	mg/L	15800	----	----	----	26.8
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	39.9	----	----	----	0.0464
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	1180	----	----	----	9.20
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.0200 ^{DLDS}	----	----	----	<0.00020
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.00100 ^{DLDS}	----	----	----	<0.000010
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.0100 ^{DLDS}	----	----	----	<0.00010
tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.0100 ^{DLDS}	----	----	----	0.0223
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.0300 ^{DLDS}	----	----	----	<0.00030
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.0100 ^{DLDS}	----	----	----	0.00019
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.0292	----	----	----	0.00226
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.0500 ^{DLDS}	----	----	----	0.00069



Analytical Results

Sub-Matrix: Leachate

(Matrix: Water)

					Client sample ID	08-SED-PAG-C W_W20	09-FZONE-NPA G_W17	09-FZONE-NPA G_W18	09-FZONE-NPA G_W19	09-FZONE-NPA G_W20
					Client sampling date / time	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45	13-May-2021 11:45
Analyte	CAS Number	Method	LOR	Unit	SK2101741-031	SK2101741-032	SK2101741-033	SK2101741-034	SK2101741-035	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.122	----	----	----	----	0.0024
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.0300 ^{DLDS}	----	----	----	----	<0.00030
dissolved metals filtration location	----	EP421	-	-	Field	----	----	----	----	Field

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: SK2101741	Page	: 1 of 26
Client	: O'Kane Consultants Inc.	Laboratory	: Saskatoon - Environmental
Contact	: Jared Robertson	Account Manager	: Brian Morgan
Address	: 112 - 112 Research Drive Saskatoon SK Canada S7N 3R3	Address	: 819 58 Street East Saskatoon, Saskatchewan Canada S7K 6X5
Telephone	: 250 420 7010	Telephone	: 1 306 221 7147
Project	: 948-021	Date Samples Received	: 03-Jun-2021 16:51
PO	: ----	Issue Date	: 28-Jun-2021 15:53
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: Q83455		
No. of samples received	: 35		
No. of samples analysed	: 35		

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 Services number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

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		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 01-TSF_W24	E298	13-May-2021	26-Jun-2021	----	45 days	* EHT	26-Jun-2021	28 days	1 days	* EHT	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 02-IF-PAG_W20	E298	13-May-2021	26-Jun-2021	----	45 days	* EHT	26-Jun-2021	28 days	1 days	* EHT	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 03-SED-PAG_W20	E298	13-May-2021	26-Jun-2021	----	45 days	* EHT	26-Jun-2021	28 days	1 days	* EHT	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 04-GAB-NPAG_W20	E298	13-May-2021	26-Jun-2021	----	45 days	* EHT	26-Jun-2021	28 days	1 days	* EHT	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 05-SED-NPAG_W20	E298	13-May-2021	26-Jun-2021	----	45 days	* EHT	26-Jun-2021	28 days	1 days	* EHT	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 06-IF-NPAG_W20	E298	13-May-2021	26-Jun-2021	----	45 days	* EHT	26-Jun-2021	28 days	1 days	* EHT	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 07-IF-PAG-CW_W20	E298	13-May-2021	26-Jun-2021	----	45 days	* EHT	26-Jun-2021	28 days	1 days	* EHT	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 08-SED-PAG-CW_W20	E298	13-May-2021	26-Jun-2021	----	45 days	* EHT	26-Jun-2021	28 days	1 days	* EHT	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 09-FZONE-NPAG_W20	E298	13-May-2021	26-Jun-2021	----	45 days	* EHT	26-Jun-2021	28 days	1 days	* EHT	
Anions and Nutrients : Bromide in Water by IC											
HDPE 01_TSF_W22	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 01_TSF_W23	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 01_TSF_W24	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 01_TSF_W25	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 02-IF-PAG_W17	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 02-IF-PAG_W18	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 02-IF-PAG_W19	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Bromide in Water by IC										
HDPE 02-IF-PAG_W20	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 03-SED-PAG_W17	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 03-SED-PAG_W18	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 03-SED-PAG_W19	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 03-SED-PAG_W20	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 04-GAB-NPAG_W17	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 04-GAB-NPAG_W18	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 04-GAB-NPAG_W19	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 04-GAB-NPAG_W20	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔



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			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Bromide in Water by IC											
HDPE 05-SED-NPAG_W17	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 05-SED-NPAG_W18	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 05-SED-NPAG_W19	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 05-SED-NPAG_W20	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 06-IF-NPAG_W17	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 06-IF-NPAG_W18	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 06-IF-NPAG_W19	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 06-IF-NPAG_W20	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 07-IF-PAG-CW_W18	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	



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			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Bromide in Water by IC											
HDPE 07-IF-PAG-CW_W19	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 07-IF-PAG-CW_W20	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 08-SED-PAG-CW_W20	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 09-FZONE-NPAG_W20	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 08-SED-PAG-CW_W17	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	24 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 08-SED-PAG-CW_W18	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	24 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 08-SED-PAG-CW_W19	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	24 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 09-FZONE-NPAG_W17	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	24 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 09-FZONE-NPAG_W18	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	24 days	✔	



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			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Bromide in Water by IC											
HDPE 09-FZONE-NPAG_W19	E235.Br	13-May-2021	----	----	----		05-Jun-2021	28 days	24 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 01_TSF_W24	E235.Cl	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 02-IF-PAG_W20	E235.Cl	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 03-SED-PAG_W20	E235.Cl	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 04-GAB-NPAG_W20	E235.Cl	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 05-SED-NPAG_W20	E235.Cl	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 06-IF-NPAG_W20	E235.Cl	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 07-IF-PAG-CW_W20	E235.Cl	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 08-SED-PAG-CW_W20	E235.Cl	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Chloride in Water by IC											
HDPE 09-FZONE-NPAG_W20	E235.Cl	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 01_TSF_W24	E235.F	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 02-IF-PAG_W20	E235.F	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 03-SED-PAG_W20	E235.F	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 04-GAB-NPAG_W20	E235.F	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 05-SED-NPAG_W20	E235.F	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 06-IF-NPAG_W20	E235.F	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 07-IF-PAG-CW_W20	E235.F	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 08-SED-PAG-CW_W20	E235.F	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	



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			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Fluoride in Water by IC											
HDPE 09-FZONE-NPAG_W20	E235.F	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 01_TSF_W24	E235.NO3	13-May-2021	----	----	----		05-Jun-2021	3 days	23 days	* EHTR	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 02-IF-PAG_W20	E235.NO3	13-May-2021	----	----	----		05-Jun-2021	3 days	23 days	* EHTR	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 03-SED-PAG_W20	E235.NO3	13-May-2021	----	----	----		05-Jun-2021	3 days	23 days	* EHTR	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 04-GAB-NPAG_W20	E235.NO3	13-May-2021	----	----	----		05-Jun-2021	3 days	23 days	* EHTR	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 05-SED-NPAG_W20	E235.NO3	13-May-2021	----	----	----		05-Jun-2021	3 days	23 days	* EHTR	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 06-IF-NPAG_W20	E235.NO3	13-May-2021	----	----	----		05-Jun-2021	3 days	23 days	* EHTR	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 07-IF-PAG-CW_W20	E235.NO3	13-May-2021	----	----	----		05-Jun-2021	3 days	23 days	* EHTR	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 08-SED-PAG-CW_W20	E235.NO3	13-May-2021	----	----	----		05-Jun-2021	3 days	23 days	* EHTR	



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec Actual		Eval	Analysis Date	Holding Times Rec Actual		Eval
Anions and Nutrients : Nitrate in Water by IC										
HDPE 09-FZONE-NPAG_W20	E235.NO3	13-May-2021	----	----	----		05-Jun-2021	3 days	23 days	* EHTR
Anions and Nutrients : Nitrite in Water by IC										
HDPE 01_TSF_W24	E235.NO2	13-May-2021	----	----	----		05-Jun-2021	3 days	23 days	* EHTR
Anions and Nutrients : Nitrite in Water by IC										
HDPE 02-IF-PAG_W20	E235.NO2	13-May-2021	----	----	----		05-Jun-2021	3 days	23 days	* EHTR
Anions and Nutrients : Nitrite in Water by IC										
HDPE 03-SED-PAG_W20	E235.NO2	13-May-2021	----	----	----		05-Jun-2021	3 days	23 days	* EHTR
Anions and Nutrients : Nitrite in Water by IC										
HDPE 04-GAB-NPAG_W20	E235.NO2	13-May-2021	----	----	----		05-Jun-2021	3 days	23 days	* EHTR
Anions and Nutrients : Nitrite in Water by IC										
HDPE 05-SED-NPAG_W20	E235.NO2	13-May-2021	----	----	----		05-Jun-2021	3 days	23 days	* EHTR
Anions and Nutrients : Nitrite in Water by IC										
HDPE 06-IF-NPAG_W20	E235.NO2	13-May-2021	----	----	----		05-Jun-2021	3 days	23 days	* EHTR
Anions and Nutrients : Nitrite in Water by IC										
HDPE 07-IF-PAG-CW_W20	E235.NO2	13-May-2021	----	----	----		05-Jun-2021	3 days	23 days	* EHTR
Anions and Nutrients : Nitrite in Water by IC										
HDPE 08-SED-PAG-CW_W20	E235.NO2	13-May-2021	----	----	----		05-Jun-2021	3 days	23 days	* EHTR



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			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Nitrite in Water by IC										
HDPE 09-FZONE-NPAG_W20	E235.NO2	13-May-2021	----	----	----		05-Jun-2021	3 days	23 days	* EHTR
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W22	E235.SO4	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W23	E235.SO4	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W24	E235.SO4	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W25	E235.SO4	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 02-IF-PAG_W17	E235.SO4	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 02-IF-PAG_W18	E235.SO4	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 02-IF-PAG_W19	E235.SO4	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 02-IF-PAG_W20	E235.SO4	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✓



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			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Sulfate in Water by IC										
HDPE 03-SED-PAG_W17	E235.S04	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 03-SED-PAG_W18	E235.S04	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 03-SED-PAG_W19	E235.S04	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 03-SED-PAG_W20	E235.S04	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 04-GAB-NPAG_W17	E235.S04	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 04-GAB-NPAG_W18	E235.S04	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 04-GAB-NPAG_W19	E235.S04	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 04-GAB-NPAG_W20	E235.S04	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 05-SED-NPAG_W17	E235.S04	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Sulfate in Water by IC										
HDPE 05-SED-NPAG_W18	E235.S04	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 05-SED-NPAG_W19	E235.S04	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 05-SED-NPAG_W20	E235.S04	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 06-IF-NPAG_W17	E235.S04	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 06-IF-NPAG_W18	E235.S04	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 06-IF-NPAG_W19	E235.S04	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 06-IF-NPAG_W20	E235.S04	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 07-IF-PAG-CW_W18	E235.S04	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 07-IF-PAG-CW_W19	E235.S04	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Sulfate in Water by IC											
HDPE 07-IF-PAG-CW_W20	E235.S04	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 08-SED-PAG-CW_W20	E235.S04	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 09-FZONE-NPAG_W20	E235.S04	13-May-2021	----	----	----		05-Jun-2021	28 days	23 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 08-SED-PAG-CW_W17	E235.S04	13-May-2021	----	----	----		05-Jun-2021	28 days	24 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 08-SED-PAG-CW_W18	E235.S04	13-May-2021	----	----	----		05-Jun-2021	28 days	24 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 08-SED-PAG-CW_W19	E235.S04	13-May-2021	----	----	----		05-Jun-2021	28 days	24 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 09-FZONE-NPAG_W17	E235.S04	13-May-2021	----	----	----		05-Jun-2021	28 days	24 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 09-FZONE-NPAG_W18	E235.S04	13-May-2021	----	----	----		05-Jun-2021	28 days	24 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 09-FZONE-NPAG_W19	E235.S04	13-May-2021	----	----	----		05-Jun-2021	28 days	24 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 01_TSF_W24	E318	13-May-2021	08-Jun-2021	----	27 days	✔	08-Jun-2021	28 days	1 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 02-IF-PAG_W20	E318	13-May-2021	08-Jun-2021	----	27 days	✔	08-Jun-2021	28 days	1 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 03-SED-PAG_W20	E318	13-May-2021	08-Jun-2021	----	27 days	✔	08-Jun-2021	28 days	1 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 04-GAB-NPAG_W20	E318	13-May-2021	08-Jun-2021	----	27 days	✔	08-Jun-2021	28 days	1 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 05-SED-NPAG_W20	E318	13-May-2021	08-Jun-2021	----	27 days	✔	08-Jun-2021	28 days	1 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 06-IF-NPAG_W20	E318	13-May-2021	08-Jun-2021	----	27 days	✔	08-Jun-2021	28 days	1 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 07-IF-PAG-CW_W20	E318	13-May-2021	08-Jun-2021	----	27 days	✔	08-Jun-2021	28 days	1 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 08-SED-PAG-CW_W20	E318	13-May-2021	08-Jun-2021	----	27 days	✔	08-Jun-2021	28 days	1 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 09-FZONE-NPAG_W20	E318	13-May-2021	08-Jun-2021	----	27 days	✔	08-Jun-2021	28 days	1 days	✔	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 01_TSF_W24	E372-U	13-May-2021	09-Jun-2021	----	27 days	✓	09-Jun-2021	28 days	1 days	✓	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 02-IF-PAG_W20	E372-U	13-May-2021	09-Jun-2021	----	27 days	✓	09-Jun-2021	28 days	1 days	✓	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 03-SED-PAG_W20	E372-U	13-May-2021	09-Jun-2021	----	27 days	✓	09-Jun-2021	28 days	1 days	✓	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 04-GAB-NPAG_W20	E372-U	13-May-2021	09-Jun-2021	----	27 days	✓	09-Jun-2021	28 days	1 days	✓	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 05-SED-NPAG_W20	E372-U	13-May-2021	09-Jun-2021	----	27 days	✓	09-Jun-2021	28 days	1 days	✓	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 06-IF-NPAG_W20	E372-U	13-May-2021	09-Jun-2021	----	27 days	✓	09-Jun-2021	28 days	1 days	✓	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 07-IF-PAG-CW_W20	E372-U	13-May-2021	11-Jun-2021	----	29 days	* EHT	11-Jun-2021	28 days	1 days	* EHT	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 08-SED-PAG-CW_W20	E372-U	13-May-2021	11-Jun-2021	----	29 days	* EHT	11-Jun-2021	28 days	1 days	* EHT	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 09-FZONE-NPAG_W20	E372-U	13-May-2021	11-Jun-2021	----	29 days	* EHT	11-Jun-2021	28 days	1 days	* EHT	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Cyanides : Total Cyanide by CFA										
UV inhibited HDPE - total (sodium hydroxide) 01_TSF_W24	E333	13-May-2021	----	----	----		07-Jun-2021	14 days	25 days	* EHTR
Cyanides : WAD Cyanide by CFA										
UV inhibited HDPE - total (sodium hydroxide) 01_TSF_W24	E336	13-May-2021	----	----	----		07-Jun-2021	14 days	25 days	* EHTR
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 01_TSF_W24	E421	13-May-2021	07-Jun-2021	----	26 days	✓	08-Jun-2021	180 days	1 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 02-IF-PAG_W20	E421	13-May-2021	07-Jun-2021	----	26 days	✓	08-Jun-2021	180 days	1 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 03-SED-PAG_W20	E421	13-May-2021	07-Jun-2021	----	26 days	✓	08-Jun-2021	180 days	1 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 04-GAB-NPAG_W20	E421	13-May-2021	07-Jun-2021	----	26 days	✓	08-Jun-2021	180 days	1 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 05-SED-NPAG_W20	E421	13-May-2021	07-Jun-2021	----	26 days	✓	08-Jun-2021	180 days	1 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 06-IF-NPAG_W20	E421	13-May-2021	07-Jun-2021	----	26 days	✓	08-Jun-2021	180 days	1 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 07-IF-PAG-CW_W20	E421	13-May-2021	07-Jun-2021	----	26 days	✓	08-Jun-2021	180 days	1 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 08-SED-PAG-CW_W20	E421	13-May-2021	07-Jun-2021	----	26 days	✓	08-Jun-2021	180 days	1 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 09-FZONE-NPAG_W20	E421	13-May-2021	07-Jun-2021	----	26 days	✓	08-Jun-2021	180 days	1 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 01_TSF_W24	E290	13-May-2021	----	----	----		04-Jun-2021	14 days	23 days	* EHTR	
Physical Tests : Alkalinity Species by Titration											
HDPE 02-IF-PAG_W20	E290	13-May-2021	----	----	----		04-Jun-2021	14 days	23 days	* EHTR	
Physical Tests : Alkalinity Species by Titration											
HDPE 03-SED-PAG_W20	E290	13-May-2021	----	----	----		04-Jun-2021	14 days	23 days	* EHTR	
Physical Tests : Alkalinity Species by Titration											
HDPE 04-GAB-NPAG_W20	E290	13-May-2021	----	----	----		04-Jun-2021	14 days	23 days	* EHTR	
Physical Tests : Alkalinity Species by Titration											
HDPE 05-SED-NPAG_W20	E290	13-May-2021	----	----	----		04-Jun-2021	14 days	23 days	* EHTR	
Physical Tests : Alkalinity Species by Titration											
HDPE 06-IF-NPAG_W20	E290	13-May-2021	----	----	----		04-Jun-2021	14 days	23 days	* EHTR	
Physical Tests : Alkalinity Species by Titration											
HDPE 07-IF-PAG-CW_W20	E290	13-May-2021	----	----	----		04-Jun-2021	14 days	23 days	* EHTR	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Physical Tests : Alkalinity Species by Titration											
HDPE 08-SED-PAG-CW_W20	E290	13-May-2021	----	----	----		04-Jun-2021	14 days	23 days	*	EHTR
Physical Tests : Alkalinity Species by Titration											
HDPE 09-FZONE-NPAG_W20	E290	13-May-2021	----	----	----		04-Jun-2021	14 days	23 days	*	EHTR
Physical Tests : Conductivity in Water											
HDPE 01_TSF_W24	E100	13-May-2021	----	----	----		04-Jun-2021	28 days	23 days	✓	
Physical Tests : Conductivity in Water											
HDPE 02-IF-PAG_W20	E100	13-May-2021	----	----	----		04-Jun-2021	28 days	23 days	✓	
Physical Tests : Conductivity in Water											
HDPE 03-SED-PAG_W20	E100	13-May-2021	----	----	----		04-Jun-2021	28 days	23 days	✓	
Physical Tests : Conductivity in Water											
HDPE 04-GAB-NPAG_W20	E100	13-May-2021	----	----	----		04-Jun-2021	28 days	23 days	✓	
Physical Tests : Conductivity in Water											
HDPE 05-SED-NPAG_W20	E100	13-May-2021	----	----	----		04-Jun-2021	28 days	23 days	✓	
Physical Tests : Conductivity in Water											
HDPE 06-IF-NPAG_W20	E100	13-May-2021	----	----	----		04-Jun-2021	28 days	23 days	✓	
Physical Tests : Conductivity in Water											
HDPE 07-IF-PAG-CW_W20	E100	13-May-2021	----	----	----		04-Jun-2021	28 days	23 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Conductivity in Water										
HDPE 08-SED-PAG-CW_W20	E100	13-May-2021	----	----	----		04-Jun-2021	28 days	23 days	✓
Physical Tests : Conductivity in Water										
HDPE 09-FZONE-NPAG_W20	E100	13-May-2021	----	----	----		04-Jun-2021	28 days	23 days	✓
Physical Tests : pH by Meter										
HDPE 01_TSF_W24	E108	13-May-2021	----	----	----		04-Jun-2021	0.25 hrs	532 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 02-IF-PAG_W20	E108	13-May-2021	----	----	----		04-Jun-2021	0.25 hrs	532 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 03-SED-PAG_W20	E108	13-May-2021	----	----	----		04-Jun-2021	0.25 hrs	532 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 04-GAB-NPAG_W20	E108	13-May-2021	----	----	----		04-Jun-2021	0.25 hrs	532 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 05-SED-NPAG_W20	E108	13-May-2021	----	----	----		04-Jun-2021	0.25 hrs	532 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 06-IF-NPAG_W20	E108	13-May-2021	----	----	----		04-Jun-2021	0.25 hrs	532 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 07-IF-PAG-CW_W20	E108	13-May-2021	----	----	----		04-Jun-2021	0.25 hrs	532 hrs	* EHTR-FM



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : pH by Meter										
HDPE 08-SED-PAG-CW_W20	E108	13-May-2021	----	----	----		04-Jun-2021	0.25 hrs	532 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 09-FZONE-NPAG_W20	E108	13-May-2021	----	----	----		04-Jun-2021	0.25 hrs	532 hrs	* EHTR-FM

Legend & Qualifier Definitions

- EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
- EHTR: Exceeded ALS recommended hold time prior to sample receipt.
- EHT: Exceeded ALS recommended hold time prior to analysis.
- Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

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

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	213503	1	16	6.2	5.0	✓
Ammonia by Fluorescence	E298	230971	1	20	5.0	5.0	✓
Bromide in Water by IC	E235.Br	213570	3	38	7.8	5.0	✓
Chloride in Water by IC	E235.Cl	213581	1	17	5.8	5.0	✓
Conductivity in Water	E100	213502	1	18	5.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	214782	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	213580	1	17	5.8	5.0	✓
Nitrate in Water by IC	E235.NO3	213577	1	17	5.8	5.0	✓
Nitrite in Water by IC	E235.NO2	213578	1	17	5.8	5.0	✓
pH by Meter	E108	213504	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	213571	3	57	5.2	5.0	✓
Total Cyanide by CFA	E333	214783	1	16	6.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	215206	1	19	5.2	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	216068	2	33	6.0	5.0	✓
WAD Cyanide by CFA	E336	214784	1	7	14.2	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	213503	1	16	6.2	5.0	✓
Ammonia by Fluorescence	E298	230971	1	20	5.0	5.0	✓
Bromide in Water by IC	E235.Br	213570	3	38	7.8	5.0	✓
Chloride in Water by IC	E235.Cl	213581	1	17	5.8	5.0	✓
Conductivity in Water	E100	213502	1	18	5.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	214782	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	213580	1	17	5.8	5.0	✓
Nitrate in Water by IC	E235.NO3	213577	1	17	5.8	5.0	✓
Nitrite in Water by IC	E235.NO2	213578	1	17	5.8	5.0	✓
pH by Meter	E108	213504	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	213571	3	57	5.2	5.0	✓
Total Cyanide by CFA	E333	214783	1	16	6.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	215206	1	19	5.2	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	216068	2	33	6.0	5.0	✓
WAD Cyanide by CFA	E336	214784	1	7	14.2	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	213503	1	16	6.2	5.0	✓
Ammonia by Fluorescence	E298	230971	1	20	5.0	5.0	✓
Bromide in Water by IC	E235.Br	213570	3	38	7.8	5.0	✓
Chloride in Water by IC	E235.Cl	213581	1	17	5.8	5.0	✓
Conductivity in Water	E100	213502	1	18	5.5	5.0	✓



Matrix: **Water**

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
<i>Analytical Methods</i>							
Method Blanks (MB) - Continued							
Dissolved Metals in Water by CRC ICPMS	E421	214782	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	213580	1	17	5.8	5.0	✓
Nitrate in Water by IC	E235.NO3	213577	1	17	5.8	5.0	✓
Nitrite in Water by IC	E235.NO2	213578	1	17	5.8	5.0	✓
Sulfate in Water by IC	E235.SO4	213571	3	57	5.2	5.0	✓
Total Cyanide by CFA	E333	214783	1	16	6.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	215206	1	19	5.2	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	216068	2	33	6.0	5.0	✓
WAD Cyanide by CFA	E336	214784	1	7	14.2	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	230971	1	20	5.0	5.0	✓
Bromide in Water by IC	E235.Br	213570	3	38	7.8	5.0	✓
Chloride in Water by IC	E235.Cl	213581	1	17	5.8	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	214782	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	213580	1	17	5.8	5.0	✓
Nitrate in Water by IC	E235.NO3	213577	1	17	5.8	5.0	✓
Nitrite in Water by IC	E235.NO2	213578	1	17	5.8	5.0	✓
Sulfate in Water by IC	E235.SO4	213571	3	57	5.2	5.0	✓
Total Cyanide by CFA	E333	214783	1	16	6.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	215206	1	19	5.2	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	216068	2	33	6.0	5.0	✓
WAD Cyanide by CFA	E336	214784	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
Conductivity in Water	E100 Saskatoon - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Saskatoon - 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.
Bromide in Water by IC	E235.Br Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC	E235.Cl Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Saskatoon - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Total Kjeldahl Nitrogen is determined using block digestion followed by flow-injection analysis with fluorescence detection.
Total Cyanide by CFA	E333 Vancouver - Environmental	Water	ISO 14403 (mod)	Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.
WAD Cyanide by CFA	E336 Vancouver - Environmental	Water	APHA 4500-CN I (mod)	Weak Acid Dissociable (WAD) cyanide is determined by in-line sample distillation with final determination by colourimetric analysis.
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Metals in Water by CRC ICPMS	E421 Saskatoon - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Hardness (Calculated)	EC100 Saskatoon - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Ion Balance using Dissolved Metals	EC101 Saskatoon - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
TDS in Water (Calculation)	EC103 Saskatoon - Environmental	Water	APHA 1030E (mod)	Total Dissolved Solids is calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Saskatoon - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested using block digestion with Copper Sulfate Digestion Reagent.



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Saskatoon - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

QUALITY CONTROL REPORT

Work Order : **SK2101741**

Page : 1 of 14

Client : O'Kane Consultants Inc.
Contact : Jared Robertson
Address : 112 - 112 Research Drive
 Saskatoon SK Canada S7N 3R3
Telephone : 250 420 7010
Project : 948-021
PO : ----
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : Q83455
No. of samples received : 35
No. of samples analysed : 35

Laboratory : Saskatoon - Environmental
Account Manager : Brian Morgan
Address : 819 58 Street East
 Saskatoon, Saskatchewan Canada S7K 6X5
Telephone : 1 306 221 7147
Date Samples Received : 03-Jun-2021 16:51
Date Analysis Commenced : 04-Jun-2021
Issue Date : 28-Jun-2021 15:53

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 Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Colby Bingham	Quality Systems Coordinator	Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Quality Systems Coordinator	Metals, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Inorganics, Burnaby, British Columbia
Lian Nesbitt	Laboratory Analyst	Metals, Saskatoon, Saskatchewan
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Melissa Houseman	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Melissa Houseman	Team Leader - Inorganics	Metals, Saskatoon, Saskatchewan
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Naeun Kim	Analyst	Inorganics, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta

Page : 2 of 14
Work Order : SK2101741
Client : O'Kane Consultants Inc.
Project : 948-021



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 Services number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

= Indicates a QC result that did not meet the ALS DQO.



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: 213502)											
SK2101708-001	Anonymous	conductivity	----	E100	2.0	µS/cm	3940	3930	0.254%	10%	----
Physical Tests (QC Lot: 213503)											
SK2101708-001	Anonymous	alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	70.1	69.2	1.22%	20%	----
Physical Tests (QC Lot: 213504)											
SK2101708-001	Anonymous	pH	----	E108	0.10	pH units	8.18	8.16	0.170%	3%	----
Anions and Nutrients (QC Lot: 213570)											
SK2101754-002	Anonymous	bromide	24959-67-9	E235.Br	0.10	mg/L	<0.10	<0.10	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 213571)											
SK2101754-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	2.36	2.47	0.10	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 213576)											
SK2101741-003	01_TSF_W24	bromide	24959-67-9	E235.Br	10.0	mg/L	<10.0	<10.0	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 213577)											
SK2101741-003	01_TSF_W24	nitrate (as N)	14797-55-8	E235.NO3	2.00	mg/L	178	182	1.82%	20%	----
Anions and Nutrients (QC Lot: 213578)											
SK2101741-003	01_TSF_W24	nitrite (as N)	14797-65-0	E235.NO2	1.00	mg/L	5.16	6.09	0.933	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 213579)											
SK2101741-003	01_TSF_W24	sulfate (as SO4)	14808-79-8	E235.SO4	30.0	mg/L	5230	5350	2.22%	20%	----
Anions and Nutrients (QC Lot: 213580)											
SK2101741-003	01_TSF_W24	fluoride	16984-48-8	E235.F	2.00	mg/L	<2.00	<2.00	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 213581)											
SK2101741-003	01_TSF_W24	chloride	16887-00-6	E235.Cl	50.0	mg/L	2380	2450	2.71%	20%	----
Anions and Nutrients (QC Lot: 215008)											
SK2101761-001	Anonymous	bromide	24959-67-9	E235.Br	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 215009)											
SK2101761-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	375	376	0.266%	20%	----
Anions and Nutrients (QC Lot: 215206)											
SK2101736-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	1.40	1.45	3.46%	20%	----
Anions and Nutrients (QC Lot: 216068)											
SK2101736-003	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0168	0.0181	0.0013	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 216809)											
CG2101827-004	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----



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
Anions and Nutrients (QC Lot: 230971)											
SK2101740-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0452	0.0486	0.0034	Diff <2x LOR	----
Cyanides (QC Lot: 214783)											
SK2101741-003	01_TSF_W24	cyanide, strong acid dissociable (total)	----	E333	0.100	mg/L	0.744	0.836	0.0917	Diff <2x LOR	----
Cyanides (QC Lot: 214784)											
SK2101741-003	01_TSF_W24	cyanide, weak acid dissociable	----	E336	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 214782)											
SK2101741-003	01_TSF_W24	aluminum, dissolved	7429-90-5	E421	0.0200	mg/L	<0.0200	<0.0200	0	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00200	mg/L	0.00785	0.00781	0.00003	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00200	mg/L	0.646	0.658	1.89%	20%	----
		barium, dissolved	7440-39-3	E421	0.00200	mg/L	0.0459	0.0466	1.52%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000400	mg/L	<0.000400	<0.000400	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.200	mg/L	1.55	1.61	0.062	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.000100	mg/L	0.000254	0.000220	0.0000336	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	1.00	mg/L	498	503	1.05%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000200	mg/L	<0.000200	<0.000200	0	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00200	mg/L	0.412	0.422	2.35%	20%	----
		copper, dissolved	7440-50-8	E421	0.00400	mg/L	0.00988	0.0104	0.00055	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.600	mg/L	<0.600	<0.600	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0200	mg/L	<0.0200	<0.0200	0	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.100	mg/L	70.5	71.2	0.985%	20%	----
		manganese, dissolved	7439-96-5	E421	0.100	mg/L	2.41	2.43	1.10%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.00100	mg/L	0.496	0.498	0.430%	20%	----
		nickel, dissolved	7440-02-0	E421	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	1.00	mg/L	<1.00	<1.00	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	1.00	mg/L	339	336	1.04%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00400	mg/L	0.0456	0.0447	1.98%	20%	----
		selenium, dissolved	7782-49-2	E421	0.00100	mg/L	0.0212	0.0221	4.38%	20%	----
		silicon, dissolved	7440-21-3	E421	1.00	mg/L	5.63	5.63	0.005	Diff <2x LOR	----
		silver, dissolved	7440-22-4	E421	0.000200	mg/L	0.000804	0.000819	0.000015	Diff <2x LOR	----
		sodium, dissolved	17341-25-2	E421	1.00	mg/L	3600	3550	1.42%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00400	mg/L	2.03	2.05	1.08%	20%	----
		sulfur, dissolved	7704-34-9	E421	10.0	mg/L	2240	2300	2.27%	20%	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	<i>Original Result</i>	<i>Duplicate Result</i>	<i>RPD(%) or Difference</i>	<i>Duplicate Limits</i>	<i>Qualifier</i>
Dissolved Metals (QC Lot: 214782) - continued											
SK2101741-003	01_TSF_W24	tellurium, dissolved	13494-80-9	E421	0.00400	mg/L	<0.00400	<0.00400	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000200	mg/L	0.000323	0.000292	0.000031	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00200	mg/L	0.00287	0.00284	0.00002	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00600	mg/L	<0.00600	<0.00600	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000200	mg/L	0.00752	0.00769	2.33%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0200	mg/L	0.0247	0.0285	0.0038	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00600	mg/L	<0.00600	<0.00600	0	Diff <2x LOR	----



Method Blank (MB) Report

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

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 213502)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 213503)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Anions and Nutrients (QCLot: 213570)						
bromide	24959-67-9	E235.Br	0.1	mg/L	<0.10	----
Anions and Nutrients (QCLot: 213571)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 213576)						
bromide	24959-67-9	E235.Br	0.1	mg/L	<0.10	----
Anions and Nutrients (QCLot: 213577)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 213578)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 213579)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 213580)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 213581)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 215008)						
bromide	24959-67-9	E235.Br	0.1	mg/L	<0.10	----
Anions and Nutrients (QCLot: 215009)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 215206)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 216068)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 216809)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 230971)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Cyanides (QCLot: 214783)						
cyanide, strong acid dissociable (total)	----	E333	0.002	mg/L	<0.0020	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Cyanides (QCLot: 214784)						
cyanide, weak acid dissociable	---	E336	0.002	mg/L	<0.0020	---
Dissolved Metals (QCLot: 214782)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	---
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	---
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	---
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	---
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	---
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	---
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	---
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	---
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	---
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	---
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	---
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	---
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	---
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	---
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	---
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	---
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	---
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	---
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	---
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	---
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	---
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	---
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	---
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	---
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	---
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	---
sodium, dissolved	17341-25-2	E421	0.05	mg/L	<0.050	---
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	---
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	---
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	---
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	---
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	---
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	---
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	---



Sub-Matrix: **Water**

<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	<i>Result</i>	<i>Qualifier</i>
Dissolved Metals (QCLot: 214782) - continued						
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----



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				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 213502)									
conductivity	----	E100	1	µS/cm	1000 µS/cm	102	90.0	110	----
Physical Tests (QCLot: 213503)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	96.7	85.0	115	----
Physical Tests (QCLot: 213504)									
pH	----	E108	----	pH units	6.86 pH units	99.9	98.0	102	----
Anions and Nutrients (QCLot: 213570)									
bromide	24959-67-9	E235.Br	0.1	mg/L	0.5 mg/L	99.3	85.0	115	----
Anions and Nutrients (QCLot: 213571)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 213576)									
bromide	24959-67-9	E235.Br	0.1	mg/L	0.5 mg/L	95.4	85.0	115	----
Anions and Nutrients (QCLot: 213577)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 213578)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 213579)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	107	90.0	110	----
Anions and Nutrients (QCLot: 213580)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	95.2	90.0	110	----
Anions and Nutrients (QCLot: 213581)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 215008)									
bromide	24959-67-9	E235.Br	0.1	mg/L	0.5 mg/L	97.5	85.0	115	----
Anions and Nutrients (QCLot: 215009)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	110	90.0	110	----
Anions and Nutrients (QCLot: 215206)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	91.7	75.0	125	----
Anions and Nutrients (QCLot: 216068)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.32 mg/L	94.0	80.0	120	----
Anions and Nutrients (QCLot: 216809)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.32 mg/L	105	80.0	120	----
Anions and Nutrients (QCLot: 230971)									



Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 230971) - continued									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	102	85.0	115	----
Cyanides (QCLot: 214783)									
cyanide, strong acid dissociable (total)	----	E333	0.002	mg/L	0.25 mg/L	90.5	80.0	120	----
Cyanides (QCLot: 214784)									
cyanide, weak acid dissociable	----	E336	0.002	mg/L	0.125 mg/L	99.4	80.0	120	----
Dissolved Metals (QCLot: 214782)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	103	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	102	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	104	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	105	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	102	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	100	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	99.0	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	98.4	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	103	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	99.2	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	98.3	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	97.9	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	94.0	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	113	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	102	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	102	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	103	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	100	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	104	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	97.3	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	104	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	99.2	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	101	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	100	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	105	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	102	80.0	120	----
sodium, dissolved	17341-25-2	E421	0.05	mg/L	50 mg/L	100	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	104	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	102	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	101	80.0	120	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report					
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier	
					Concentration	LCS	Low	High		
Dissolved Metals (QCLot: 214782) - continued										
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	101	80.0	120	----	
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	107	80.0	120	----	
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	96.6	80.0	120	----	
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	99.0	80.0	120	----	
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	108	80.0	120	----	
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	101	80.0	120	----	
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	98.2	80.0	120	----	
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	96.0	80.0	120	----	
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	101	80.0	120	----	



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 $\geq 1 \times$ 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: 213570)										
SK2101754-001	Anonymous	bromide	24959-67-9	E235.Br	0.45 mg/L	0.5 mg/L	90.5	75.0	125	----
Anions and Nutrients (QCLot: 213571)										
SK2101754-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	107 mg/L	100 mg/L	107	90.0	110	----
Anions and Nutrients (QCLot: 213576)										
SK2101741-008	02-IF-PAG_W20	bromide	24959-67-9	E235.Br	0.44 mg/L	0.5 mg/L	88.9	75.0	125	----
Anions and Nutrients (QCLot: 213577)										
SK2101741-008	02-IF-PAG_W20	nitrate (as N)	14797-55-8	E235.NO3	2.44 mg/L	2.5 mg/L	97.6	75.0	125	----
Anions and Nutrients (QCLot: 213578)										
SK2101741-008	02-IF-PAG_W20	nitrite (as N)	14797-65-0	E235.NO2	0.479 mg/L	0.5 mg/L	95.8	75.0	125	----
Anions and Nutrients (QCLot: 213579)										
SK2101741-008	02-IF-PAG_W20	sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	90.0	110	----
Anions and Nutrients (QCLot: 213580)										
SK2101741-008	02-IF-PAG_W20	fluoride	16984-48-8	E235.F	0.948 mg/L	1 mg/L	94.8	75.0	125	----
Anions and Nutrients (QCLot: 213581)										
SK2101741-008	02-IF-PAG_W20	chloride	16887-00-6	E235.Cl	94.9 mg/L	100 mg/L	94.9	75.0	125	----
Anions and Nutrients (QCLot: 215008)										
SK2101741-029	08-SED-PAG-CW_W18	bromide	24959-67-9	E235.Br	ND mg/L	0.5 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 215009)										
SK2101741-029	08-SED-PAG-CW_W18	sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	90.0	110	----
Anions and Nutrients (QCLot: 215206)										
SK2101736-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.70 mg/L	2.5 mg/L	108	70.0	130	----
Anions and Nutrients (QCLot: 216068)										
SK2101736-004	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0656 mg/L	0.0676 mg/L	97.0	70.0	130	----
Anions and Nutrients (QCLot: 216809)										
CG2101827-005	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0582 mg/L	0.0676 mg/L	86.1	70.0	130	----
Anions and Nutrients (QCLot: 230971)										
SK2101740-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.112 mg/L	0.1 mg/L	112	75.0	125	----



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
Cyanides (QCLot: 214783)										
WR2100556-001	Anonymous	cyanide, strong acid dissociable (total)	----	E333	1.28 mg/L	1.25 mg/L	103	75.0	125	----
Cyanides (QCLot: 214784)										
WR2100556-001	Anonymous	cyanide, weak acid dissociable	----	E336	0.706 mg/L	0.625 mg/L	113	75.0	125	----
Dissolved Metals (QCLot: 214782)										
SK2101741-008	02-IF-PAG_W20	aluminum, dissolved	7429-90-5	E421	0.207 mg/L	0.2 mg/L	103	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0203 mg/L	0.02 mg/L	101	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0199 mg/L	0.02 mg/L	99.5	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0375 mg/L	0.04 mg/L	93.8	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00998 mg/L	0.01 mg/L	99.8	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.089 mg/L	0.1 mg/L	89.3	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00371 mg/L	0.004 mg/L	92.8	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.00928 mg/L	0.01 mg/L	92.8	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0393 mg/L	0.04 mg/L	98.3	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0191 mg/L	0.02 mg/L	95.3	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0183 mg/L	0.02 mg/L	91.7	70.0	130	----
		iron, dissolved	7439-89-6	E421	1.94 mg/L	2 mg/L	97.0	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0201 mg/L	0.02 mg/L	101	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.102 mg/L	0.1 mg/L	102	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	0.0199 mg/L	0.02 mg/L	99.3	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0206 mg/L	0.02 mg/L	103	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0379 mg/L	0.04 mg/L	94.8	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	10.2 mg/L	10 mg/L	102	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0200 mg/L	0.02 mg/L	99.8	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0378 mg/L	0.04 mg/L	94.4	70.0	130	----
		silicon, dissolved	7440-21-3	E421	9.19 mg/L	10 mg/L	91.9	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00388 mg/L	0.004 mg/L	97.0	70.0	130	----
		sodium, dissolved	17341-25-2	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0376 mg/L	0.04 mg/L	94.0	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00404 mg/L	0.004 mg/L	101	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0217 mg/L	0.02 mg/L	108	70.0	130	----



Sub-Matrix: **Water**

					<i>Matrix Spike (MS) Report</i>					
					<i>Spike</i>		<i>Recovery (%)</i>	<i>Recovery Limits (%)</i>		
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>Concentration</i>	<i>Target</i>	<i>MS</i>	<i>Low</i>	<i>High</i>	<i>Qualifier</i>
Dissolved Metals (QCLot: 214782) - continued										
SK2101741-008	02-IF-PAG_W20	tin, dissolved	7440-31-5	E421	0.0186 mg/L	0.02 mg/L	93.1	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0398 mg/L	0.04 mg/L	99.5	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0214 mg/L	0.02 mg/L	107	70.0	130	----
		uranium, dissolved	7440-61-1	E421	ND mg/L	0.004 mg/L	ND	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.0986 mg/L	0.1 mg/L	98.6	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.368 mg/L	0.4 mg/L	91.9	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0390 mg/L	0.04 mg/L	97.4	70.0	130	----



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Invoice To		Invoice Distribution			Analysis Request																																							
Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below																																							
Copy of Invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Email 1 or Fax jrobertson@okc-sk.com			<table border="1"> <tr> <th rowspan="2">NUMBER OF CONTAINERS</th> <th colspan="12">F/P</th> <th rowspan="2">SAMPLES ON HOLD</th> <th rowspan="2">SUSPECTED HAZARD (see Special Instructions)</th> </tr> <tr> <th>BR-IC-N-CL</th> <th>MET-D-COIMS-SK</th> <th>ROU-F-SK</th> <th>SO4-IC-N-CL</th> <th>CN-T-CFA-VA</th> <th>CN-WAD-CFA-VA</th> <th>NH3</th> <th>TKN</th> <th>PT</th> <th></th> <th></th> <th></th> <th></th> </tr> </table>												NUMBER OF CONTAINERS	F/P												SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)	BR-IC-N-CL	MET-D-COIMS-SK	ROU-F-SK	SO4-IC-N-CL	CN-T-CFA-VA	CN-WAD-CFA-VA	NH3	TKN	PT				
NUMBER OF CONTAINERS	F/P												SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)																														
	BR-IC-N-CL	MET-D-COIMS-SK	ROU-F-SK	SO4-IC-N-CL	CN-T-CFA-VA	CN-WAD-CFA-VA	NH3	TKN	PT																																			
Company:		Email 2																																										
Contact:																																												
Project Information		Oil and Gas Required Fields (client use)																																										
ALS Account # / Quote #: Q83455		AFE/Cost Center: PO#																																										
Job #: 948-021		Major/Minor Code: Routing Code:																																										
PO / AFE:		Requisitioner:																																										
.SD:		Location:																																										
ALS Lab Work Order # (lab use only):		ALS Contact:			Sampler:																																							
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																																			
01_TSF_W22					13-May-21		11:45		Leachate																																			
01_TSF_W23					20-May-21		9:55		Leachate																																			
01_TSF_W24					27-May-21		10:33		Leachate																																			
01_TSF_W25					3-Jun-21		13:40		Leachate																																			
02-IF-PAG_W17					13-May-21		11:45		Leachate																																			
02-IF-PAG_W18					20-May-21		9:55		Leachate																																			
02-IF-PAG_W19					27-May-21		10:33		Leachate																																			
02-IF-PAG_W20					3-Jun-21		13:40		Leachate																																			
03-SED-PAG_W17					13-May-21		11:45		Leachate																																			
03-SED-PAG_W18					20-May-21		9:55		Leachate																																			
03-SED-PAG_W19					27-May-21		10:33		Leachate																																			
03-SED-PAG_W20					3-Jun-21		13:40		Leachate																																			
Drinking Water (DW) Samples¹ (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)			SAMPLE CONDITION AS RECEIVED (lab use only)																																							
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Suspected hazards: elevated metals, potential for low levels of cyanide			Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>																																							
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					Ice Packs <input type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>																																							
					Cooling Initiated <input type="checkbox"/>																																							
					INITIAL COOLER TEMPERATURES °C						FINAL COOLER TEMPERATURES °C																																	
					12.8																																							
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)																																							
Released by: Jared Robertson		Received by: MEB			Received by:																																							
Date: June 3, 2021		Date: 3/6/21			Date:																																							
Time:		Time: 4:51			Time:																																							



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Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17 -

Page 1 of

Report To Contact and company name below will appear on the final report		Report Format / Distribution			Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)																		
Company:	Okane Consultants	Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL)			Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply																		
Contact:	Jared Robertson	Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			PRIORITY (Business Days)	4 day [P4-20%] <input type="checkbox"/>					EMERGENCY	1 Business day [E - 100%] <input type="checkbox"/>											
Phone:	1 (306) 713-1695	<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked				3 day [P3-25%] <input type="checkbox"/>						Same Day, Weekend or Statutory holiday [E2 -200%] <input type="checkbox"/>											
Company address below will appear on the final report		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX				2 day [P2-50%] <input type="checkbox"/>						[Laboratory opening fees may apply]											
Street:	112-112 Research Drive	Email 1 or Fax jrobertson@okc-sk.com			Date and Time Required for all E&P TATs:					dd-mmm-yy hh:mm													
City/Province:	Saskatoon, SK	Email 2			For tests that can not be performed according to the service level selected, you will be contacted.																		
Postal Code:	S7N 3R3	Email 3			Analysis Request																		
Invoice To		Invoice Distribution			NUMBER OF CONTAINERS	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below										SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)						
Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX				F/P																	
Copy of Invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Email 1 or Fax jrobertson@okc-sk.com																					
Company:		Email 2																					
Contact:																							
Project Information		Oil and Gas Required Fields (client use)				BR-IC-N-CL																	
ALS Account # / Quote #:	Q83455	AFE/Cost Center:		PO#		MET-D-COMS-SK																	
Job #:	948-021	Major/Minor Code:		Routing Code:		ROU-H-SK																	
PO / AFE:		Requisitioner:				ISO4-IC-N-CL																	
.SD:		Location:				CN-T-CFA-VA																	
ALS Lab Work Order # (lab use only):		ALS Contact:		Sampler:	CN-WAD-CFA-VA																		
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																	
	04-GAB-NPAG_W17			13-May-21	11:45	Leachate	1	R				R								Y			
	04-GAB-NPAG_W18			20-May-21	9:55	Leachate	1	R				R								Y			
	04-GAB-NPAG_W19			27-May-21	10:33	Leachate	1	R				R								Y			
	04-GAB-NPAG_W20			3-Jun-21	13:40	Leachate	3	R	R	R				R	R	R				Y			
	05-SED-NPAG_W17			13-May-21	11:45	Leachate	1	R				R								Y			
	05-SED-NPAG_W18			20-May-21	9:55	Leachate	1	R				R								Y			
	05-SED-NPAG_W19			27-May-21	10:33	Leachate	1	R				R								Y			
	05-SED-NPAG_W20			3-Jun-21	13:40	Leachate	3	R	R	R				R	R	R				Y			
	06-IF-NPAG_W17			13-May-21	11:45	Leachate	1	R				R								Y			
	06-IF-NPAG_W18			20-May-21	9:55	Leachate	1	R				R								Y			
	06-IF-NPAG_W19			27-May-21	10:33	Leachate	1	R				R								Y			
	06-IF-NPAG_W20			3-Jun-21	13:40	Leachate	3	R	R	R				R	R	R				Y			
Drinking Water (DW) Samples¹ (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)			SAMPLE CONDITION AS RECEIVED (lab use only)																		
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Suspected hazards: elevated metals, potential for low levels of cyanide			Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>																		
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					Ice Packs <input type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>																		
		Cooling Initiated <input type="checkbox"/>																					
		INITIAL COOLER TEMPERATURES °C					FINAL COOLER TEMPERATURES °C																
		12.8																					
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)																		
Released by: Jared Robertson	Date: June 3, 2021	Time:	Received by: <i>[Signature]</i>	Date: 3/6/21	Time: 4:51	Received by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:									



CERTIFICATE OF ANALYSIS

Work Order : **SK2102164**
Client : **O'Kane Consultants Inc.**
Contact : Jared Robertson
Address : 112 - 112 Research Drive
Saskatoon SK Canada S7N 3R3
Telephone : 250 420 7010
Project : 948-021
PO : ----
C-O-C number : ----
Sampler : Client
Site : ----
Quote number : Q83455
No. of samples received : 36
No. of samples analysed : 36

Page : 1 of 26
Laboratory : Saskatoon - Environmental
Account Manager : Brian Morgan
Address : 819 58 Street East
Saskatoon SK Canada S7K 6X5
Telephone : 1 306 221 7147
Date Samples Received : 30-Jun-2021 16:30
Date Analysis Commenced : 02-Jul-2021
Issue Date : 11-Jul-2021 18:51

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Colby Bingham	Quality Systems Coordinator	Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Quality Systems Coordinator	Metals, Saskatoon, Saskatchewan
Dwayne Bennett	Technical Specialist	Inorganics, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Jorden Fanson	Analyst	Inorganics, Calgary, Alberta
Lian Nesbitt	Laboratory Analyst	Metals, Saskatoon, Saskatchewan
Naeun Kim	Analyst	Inorganics, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Tracy Harley	Supervisor - Water Quality Instrumentation	Inorganics, Burnaby, British Columbia



General Comments

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

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

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

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

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

<i>Unit</i>	<i>Description</i>
-	No Unit
%	percent
µS/cm	Microsiemens per centimetre
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
IB:INT	Ion Balance Reviewed: Imbalance is due to interference or non-measured component.



Analytical Results

Sub-Matrix: Water					Client sample ID	01_TSF_W26	01_TSF_W27	01_TSF_W28	01_TSF_W29	02-IF-PAG_W21
(Matrix: Water)					Client sampling date / time	10-Jun-2021 15:15	17-Jun-2021 14:10	24-Jun-2021 13:15	30-Jun-2021 13:30	10-Jun-2021 15:25
Analyte	CAS Number	Method	LOR	Unit	SK2102164-001	SK2102164-002	SK2102164-003	SK2102164-004	SK2102164-005	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	----	1410	----	----	
conductivity	----	E100	2.0	µS/cm	----	----	9590	----	----	
pH	----	E108	0.10	pH units	----	----	7.99	----	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	----	235	----	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	----	<1.0	----	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	----	<1.0	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	193	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	7430	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	34.0	----	----	
bromide	24959-67-9	E235.Br	0.10	mg/L	5.35	4.38	<5.00 ^{DLDS}	2.68	<0.10	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	----	<0.0020	----	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	----	137	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	900	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	<1.00 ^{DLDS}	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	55.4	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	7.94	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	4440	4030	3820	3580	104	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	63.3	----	----	
Cyanides										
cyanide, strong acid dissociable (total)	----	E333	0.0050	mg/L	----	----	0.222	----	----	
cyanide, weak acid dissociable	----	E336	0.0050	mg/L	----	----	0.0103	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	----	113	----	----	
cation sum	----	EC101	0.10	meq/L	----	----	102	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	5.12	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	90.3	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	<0.0100 ^{DLDS}	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	0.00788	----	----	



Analytical Results

Sub-Matrix: Water					Client sample ID	01_TSF_W26	01_TSF_W27	01_TSF_W28	01_TSF_W29	02-IF-PAG_W21
(Matrix: Water)					Client sampling date / time	10-Jun-2021 15:15	17-Jun-2021 14:10	24-Jun-2021 13:15	30-Jun-2021 13:30	10-Jun-2021 15:25
Analyte	CAS Number	Method	LOR	Unit	SK2102164-001	SK2102164-002	SK2102164-003	SK2102164-004	SK2102164-005	
					Result	Result	Result	Result	Result	
Dissolved Metals										
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	---	---	0.570	---	---	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	---	---	0.0382	---	---	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	---	---	<0.000200 ^{DLDS}	---	---	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	---	---	<0.000500 ^{DLDS}	---	---	
boron, dissolved	7440-42-8	E421	0.010	mg/L	---	---	1.44	---	---	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	---	---	<0.000250 ^{DLM}	---	---	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	473	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	<0.000100 ^{DLDS}	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	---	<0.00500 ^{DLDS}	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	0.160	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	0.00271	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	<0.300 ^{DLDS}	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	<0.000500 ^{DLDS}	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	<0.0100 ^{DLDS}	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	56.1	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	1.36	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	0.342	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	---	<0.00500 ^{DLDS}	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	<0.500 ^{DLDS}	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	211	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	0.0373	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	0.0113	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	6.39	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	0.000261	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	1520	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	1.72	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	1470	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	<0.00200 ^{DLDS}	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	0.000220	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	<0.00100 ^{DLDS}	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	0.00299	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	01_TSF_W26	01_TSF_W27	01_TSF_W28	01_TSF_W29	02-IF-PAG_W21
Client sampling date / time					10-Jun-2021 15:15	17-Jun-2021 14:10	24-Jun-2021 13:15	30-Jun-2021 13:30	10-Jun-2021 15:25	
Analyte	CAS Number	Method	LOR	Unit	SK2102164-001	SK2102164-002	SK2102164-003	SK2102164-004	SK2102164-005	
					Result	Result	Result	Result	Result	
Dissolved Metals										
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	----	----	<0.00300 ^{DLDS}	----	----	----
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	----	----	<0.00100 ^{DLDS}	----	----	----
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	----	----	0.00589	----	----	----
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	----	----	<0.00500 ^{DLDS}	----	----	----
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	----	<0.0100 ^{DLDS}	----	----	----
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	----	<0.00300 ^{DLDS}	----	----	----
dissolved metals filtration location	----	EP421	-	-	----	----	Field	----	----	----

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	02-IF-PAG_W22	02-IF-PAG_W23	02-IF-PAG_W24	03-SED-PAG_W 21	03-SED-PAG_W 22
Client sampling date / time					07-Jun-2021 14:15	24-Jun-2021 15:25	30-Jun-2021 13:30	10-Jun-2021 15:45	17-Jun-2021 14:30	
Analyte	CAS Number	Method	LOR	Unit	SK2102164-006	SK2102164-007	SK2102164-008	SK2102164-009	SK2102164-010	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	----	85.4	----	----	
conductivity	----	E100	2.0	µS/cm	----	----	457	----	----	
pH	----	E108	0.10	pH units	----	----	8.22	----	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	----	106	----	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	----	<1.0	----	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	----	<1.0	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	86.8	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	286	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	<0.0050	----	----	
bromide	24959-67-9	E235.Br	0.10	mg/L	<0.10	<0.10	<0.50 ^{DLM}	<0.10	<0.10	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	----	<0.0020	----	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	----	1.42	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	4.60	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	0.355	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	<0.100 ^{DLM}	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	<0.050 ^{DLM}	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	110	122	131	54.2	50.6	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	<0.112	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	----	4.61	----	----	
cation sum	----	EC101	0.10	meq/L	----	----	4.16	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	5.13	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	90.2	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	0.0314	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	0.00881	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	0.00074	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	0.0297	----	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	----	<0.000020	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	----	<0.000050	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	02-IF-PAG_W22	02-IF-PAG_W23	02-IF-PAG_W24	03-SED-PAG_W 21	03-SED-PAG_W 22
Client sampling date / time					07-Jun-2021 14:15	24-Jun-2021 15:25	30-Jun-2021 13:30	10-Jun-2021 15:45	17-Jun-2021 14:30	
Analyte	CAS Number	Method	LOR	Unit	SK2102164-006	SK2102164-007	SK2102164-008	SK2102164-009	SK2102164-010	
					Result	Result	Result	Result	Result	
Dissolved Metals										
boron, dissolved	7440-42-8	E421	0.010	mg/L	---	---	0.086	---	---	
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	---	---	0.000051	---	---	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	21.6	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	0.000052	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	---	<0.00050	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	<0.00010	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	0.00129	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	<0.030	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	<0.000050	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	0.0090	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	7.65	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	<0.00500	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	0.00443	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	---	<0.00050	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	<0.050	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	7.90	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	0.00644	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	0.000143	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	3.30	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	<0.000010	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	51.8	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	0.135	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	44.7	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	<0.00020	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	<0.000010	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	<0.00010	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	0.00666	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	---	<0.00030	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	---	0.00220	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	---	0.00623	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	---	<0.00050	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	02-IF-PAG_W22	02-IF-PAG_W23	02-IF-PAG_W24	03-SED-PAG_W 21	03-SED-PAG_W 22
Client sampling date / time					07-Jun-2021 14:15	24-Jun-2021 15:25	30-Jun-2021 13:30	10-Jun-2021 15:45	17-Jun-2021 14:30	
Analyte	CAS Number	Method	LOR	Unit	SK2102164-006	SK2102164-007	SK2102164-008	SK2102164-009	SK2102164-010	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	----	0.0082	----	----	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	----	<0.00030	----	----	
dissolved metals filtration location	----	EP421	-	-	----	----	Field	----	----	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	03-SED-PAG_W 23	03-SED-PAG_W 24	04-GAB-NPAG_ W21	04-GAB-NPAG_ W22	04-GAB-NPAG_ W23
Client sampling date / time					24-Jun-2021 15:50	30-Jun-2021 13:35	10-Jun-2021 15:50	17-Jun-2021 14:35	24-Jun-2021 15:55	
Analyte	CAS Number	Method	LOR	Unit	SK2102164-011	SK2102164-012	SK2102164-013	SK2102164-014	SK2102164-015	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	82.9	----	----	----	
conductivity	----	E100	2.0	µS/cm	----	323	----	----	----	
pH	----	E108	0.10	pH units	----	8.26	----	----	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	118	----	----	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	<1.0	----	----	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	<1.0	----	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	97.2	----	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	193	----	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	<0.0050	----	----	----	
bromide	24959-67-9	E235.Br	0.10	mg/L	<0.10	<0.10	0.18	0.15	0.13	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	<0.0020	----	----	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	<0.200	----	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	4.34	----	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	0.631	----	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	<0.020	----	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	<0.010	----	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	55.3	59.4	27.6	28.0	33.9	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	<0.0500	----	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	3.33	----	----	----	
cation sum	----	EC101	0.10	meq/L	----	2.97	----	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	5.71	----	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	89.2	----	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	0.0572	----	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	0.00248	----	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	0.00311	----	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	0.0179	----	----	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	<0.000020	----	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	<0.000050	----	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	03-SED-PAG_W 23	03-SED-PAG_W 24	04-GAB-NPAG_ W21	04-GAB-NPAG_ W22	04-GAB-NPAG_ W23
Client sampling date / time					24-Jun-2021 15:50	30-Jun-2021 13:35	10-Jun-2021 15:50	17-Jun-2021 14:35	24-Jun-2021 15:55	
Analyte	CAS Number	Method	LOR	Unit	SK2102164-011	SK2102164-012	SK2102164-013	SK2102164-014	SK2102164-015	
					Result	Result	Result	Result	Result	
Dissolved Metals										
boron, dissolved	7440-42-8	E421	0.010	mg/L	---	0.064	---	---	---	
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	---	0.000088	---	---	---	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	19.1	---	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	0.000042	---	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	<0.00050	---	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	<0.00010	---	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	0.00091	---	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	<0.030	---	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	<0.000050	---	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	0.0126	---	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	8.56	---	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	<0.00500	---	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	0.0188	---	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	<0.00050	---	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	<0.050	---	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	9.95	---	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	0.00328	---	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	0.000674	---	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	3.28	---	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	<0.000010	---	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	24.2	---	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	0.0988	---	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	19.7	---	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	<0.00020	---	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	0.000015	---	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	<0.00010	---	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	0.00519	---	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	<0.00030	---	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	0.00029	---	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	0.00446	---	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	0.00063	---	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	03-SED-PAG_W 23	03-SED-PAG_W 24	04-GAB-NPAG_ W21	04-GAB-NPAG_ W22	04-GAB-NPAG_ W23
Client sampling date / time					24-Jun-2021 15:50	30-Jun-2021 13:35	10-Jun-2021 15:50	17-Jun-2021 14:35	24-Jun-2021 15:55	
Analyte	CAS Number	Method	LOR	Unit	SK2102164-011	SK2102164-012	SK2102164-013	SK2102164-014	SK2102164-015	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	0.0037	----	----	----	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	<0.00030	----	----	----	
dissolved metals filtration location	----	EP421	-	-	----	Field	----	----	----	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	04-GAB-NPAG_ W24	05-SED-NPAG_ W21	05-SED-NPAG_ W22	05-SED-NPAG_ W23	05-SED-NPAG_ W24
Client sampling date / time					30-Jun-2021 14:05	10-Jun-2021 16:10	17-Jun-2021 14:55	24-Jun-2021 16:15	30-Jun-2021 14:30	
Analyte	CAS Number	Method	LOR	Unit	SK2102164-016	SK2102164-017	SK2102164-018	SK2102164-019	SK2102164-020	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	19.9	----	----	----	52.2	
conductivity	----	E100	2.0	µS/cm	447	----	----	----	277	
pH	----	E108	0.10	pH units	8.58	----	----	----	8.36	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	206	----	----	----	133	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	6.5	----	----	----	1.0	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	<1.0	----	----	----	<1.0	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	179	----	----	----	111	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	261	----	----	----	165	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0948	----	----	----	0.0340	
bromide	24959-67-9	E235.Br	0.10	mg/L	0.12	0.12	<0.10	<0.10	<0.10	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	----	----	----	<0.0020	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	0.226	----	----	----	<0.200	
chloride	16887-00-6	E235.Cl	0.50	mg/L	9.48	----	----	----	6.51	
fluoride	16984-48-8	E235.F	0.020	mg/L	0.553	----	----	----	0.830	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.020	----	----	----	<0.020	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	----	----	----	<0.010	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	39.1	20.2	20.1	21.5	23.4	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	<0.0500	----	----	----	<0.0500	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	4.69	----	----	----	2.93	
cation sum	----	EC101	0.10	meq/L	4.23	----	----	----	2.70	
ion balance (cation-anion difference)	----	EC101	0.010	%	5.16	----	----	----	4.08	
ion balance (cations/anions ratio)	----	EC101	0.010	%	90.2	----	----	----	92.2	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.104	----	----	----	0.0981	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00353	----	----	----	0.00227	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.0213	----	----	----	0.146	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.00912	----	----	----	0.0133	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	----	----	----	<0.000020	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	----	----	----	<0.000050	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	04-GAB-NPAG_ W24	05-SED-NPAG_ W21	05-SED-NPAG_ W22	05-SED-NPAG_ W23	05-SED-NPAG_ W24
Client sampling date / time					30-Jun-2021 14:05	10-Jun-2021 16:10	17-Jun-2021 14:55	24-Jun-2021 16:15	30-Jun-2021 14:30	
Analyte	CAS Number	Method	LOR	Unit	SK2102164-016	SK2102164-017	SK2102164-018	SK2102164-019	SK2102164-020	
					Result	Result	Result	Result	Result	
Dissolved Metals										
boron, dissolved	7440-42-8	E421	0.010	mg/L	0.090	----	----	----	0.077	
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	<0.000050	----	----	----	0.000058	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	5.22	----	----	----	12.4	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000291	----	----	----	0.000063	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	----	----	----	<0.00050	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00012	----	----	----	0.00019	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00184	----	----	----	0.00119	
iron, dissolved	7439-89-6	E421	0.030	mg/L	<0.030	----	----	----	<0.030	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	----	----	----	<0.000050	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0088	----	----	----	0.0083	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	1.66	----	----	----	5.15	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	<0.00500	----	----	----	<0.00500	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00598	----	----	----	0.00910	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00054	----	----	----	0.00087	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	----	----	----	<0.050	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	4.29	----	----	----	8.01	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00300	----	----	----	0.00288	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.00112	----	----	----	0.000437	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	3.06	----	----	----	3.15	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	----	----	----	<0.000010	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	85.1	----	----	----	33.1	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0149	----	----	----	0.0556	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	13.2	----	----	----	7.85	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	----	----	----	<0.00020	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.000022	----	----	----	<0.000010	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	----	----	----	<0.00010	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	0.00592	----	----	----	0.00791	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	----	----	----	<0.00030	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	0.00094	----	----	----	0.00047	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.0232	----	----	----	0.00697	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	0.00761	----	----	----	0.00230	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	04-GAB-NPAG_ W24	05-SED-NPAG_ W21	05-SED-NPAG_ W22	05-SED-NPAG_ W23	05-SED-NPAG_ W24
Client sampling date / time					30-Jun-2021 14:05	10-Jun-2021 16:10	17-Jun-2021 14:55	24-Jun-2021 16:15	30-Jun-2021 14:30	
Analyte	CAS Number	Method	LOR	Unit	SK2102164-016	SK2102164-017	SK2102164-018	SK2102164-019	SK2102164-020	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0078	----	----	----	0.0418	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	----	----	----	<0.00030	
dissolved metals filtration location	----	EP421	-	-	Field	----	----	----	Field	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	06-IF-NPAG_W2 1	06-IF-NPAG_W2 2	06-IF-NPAG_W2 3	06-IF-NPAG_W2 4	07-IF-PAG-CW_ W21
Client sampling date / time					10-Jun-2021 16:15	17-Jun-2021 15:00	24-Jun-2021 16:20	30-Jun-2021 14:45	10-Jun-2021 16:35	
Analyte	CAS Number	Method	LOR	Unit	SK2102164-021	SK2102164-022	SK2102164-023	SK2102164-024	SK2102164-025	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	----	----	57.6	----	
conductivity	----	E100	2.0	µS/cm	----	----	----	304	----	
pH	----	E108	0.10	pH units	----	----	----	8.33	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	----	----	137	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	----	----	<1.0	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	----	----	<1.0	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	----	113	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	----	186	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	----	0.0179	----	
bromide	24959-67-9	E235.Br	0.10	mg/L	<0.10	<0.10	<0.10	<0.10	128	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	----	----	<0.0020	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	----	----	<0.200	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	----	4.49	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	----	0.485	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	----	<0.020	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	----	<0.010	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	31.9	33.9	35.8	39.3	3190	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	----	<0.0500	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	----	----	3.23	----	
cation sum	----	EC101	0.10	meq/L	----	----	----	2.78	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	----	7.49 ^{IB:INT}	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	----	86.1 ^{IB:INT}	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	----	0.0205	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	----	0.0203	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	----	0.00180	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	----	0.0258	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	----	----	<0.000020	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	----	----	<0.000050	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	06-IF-NPAG_W2 1	06-IF-NPAG_W2 2	06-IF-NPAG_W2 3	06-IF-NPAG_W2 4	07-IF-PAG-CW_ W21
Client sampling date / time					10-Jun-2021 16:15	17-Jun-2021 15:00	24-Jun-2021 16:20	30-Jun-2021 14:45	10-Jun-2021 16:35	
Analyte	CAS Number	Method	LOR	Unit	SK2102164-021 Result	SK2102164-022 Result	SK2102164-023 Result	SK2102164-024 Result	SK2102164-025 Result	
Dissolved Metals										
boron, dissolved	7440-42-8	E421	0.010	mg/L	---	---	---	0.089	---	
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	---	---	---	<0.000050	---	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	---	15.4	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	---	0.000032	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	---	---	<0.00050	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	---	<0.00010	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	---	0.00108	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	---	<0.030	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	---	<0.000050	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	---	0.0163	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	---	4.65	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	---	<0.00500	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	---	0.00605	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	---	---	<0.00050	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	---	<0.050	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	---	17.0	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	---	0.0145	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	---	0.000201	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	---	3.41	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	---	<0.000010	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	---	27.5	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	---	0.189	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	---	13.1	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	---	<0.00020	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	---	0.000012	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	---	<0.00010	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	---	0.00649	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	---	---	<0.00030	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	---	---	0.00113	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	---	---	0.00499	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	---	---	<0.00050	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	06-IF-NPAG_W2 1	06-IF-NPAG_W2 2	06-IF-NPAG_W2 3	06-IF-NPAG_W2 4	07-IF-PAG-CW_ W21
Client sampling date / time					10-Jun-2021 16:15	17-Jun-2021 15:00	24-Jun-2021 16:20	30-Jun-2021 14:45	10-Jun-2021 16:35	
Analyte	CAS Number	Method	LOR	Unit	SK2102164-021	SK2102164-022	SK2102164-023	SK2102164-024	SK2102164-025	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	----	----	0.0056	----	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	----	----	<0.00030	----	
dissolved metals filtration location	----	EP421	-	-	----	----	----	Field	----	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	07-IF-PAG-CW_ W22	07-IF-PAG-CW_ W23	07-IF-PAG-CW_ W24	08-SED-PAG-C W_W21	08-SED-PAG-C W_W22
Client sampling date / time					17-Jun-2021 15:05	24-Jun-2021 16:25	30-Jun-2021 14:50	10-Jun-2021 16:40	17-Jun-2021 15:10	
Analyte	CAS Number	Method	LOR	Unit	SK2102164-026	SK2102164-027	SK2102164-028	SK2102164-029	SK2102164-030	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	----	13100	----	----	
conductivity	----	E100	2.0	µS/cm	----	----	76900	----	----	
pH	----	E108	0.10	pH units	----	----	7.59	----	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	----	59.6	----	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	----	<1.0	----	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	----	<1.0	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	48.9	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	55500	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	4.24	----	----	
bromide	24959-67-9	E235.Br	0.10	mg/L	120	128	118	119	117	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	----	<0.0020	----	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	----	10.9	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	31600	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	<4.00 ^{DLDS}	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	<4.00 ^{DLDS}	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	<2.00 ^{DLDS}	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	3190	3210	3330	3200	3100	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	<4.47	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	----	962	----	----	
cation sum	----	EC101	0.10	meq/L	----	----	976	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	0.722	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	101	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	<0.0500 ^{DLDS}	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	0.0119	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	<0.00500 ^{DLDS}	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	0.175	----	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	----	<0.00100 ^{DLDS}	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	----	<0.00250 ^{DLDS}	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	07-IF-PAG-CW_ W22	07-IF-PAG-CW_ W23	07-IF-PAG-CW_ W24	08-SED-PAG-C W_W21	08-SED-PAG-C W_W22
Client sampling date / time					17-Jun-2021 15:05	24-Jun-2021 16:25	30-Jun-2021 14:50	10-Jun-2021 16:40	17-Jun-2021 15:10	
Analyte	CAS Number	Method	LOR	Unit	SK2102164-026	SK2102164-027	SK2102164-028	SK2102164-029	SK2102164-030	
					Result	Result	Result	Result	Result	
Dissolved Metals										
boron, dissolved	7440-42-8	E421	0.010	mg/L	---	---	1.14	---	---	
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	---	---	0.00158	---	---	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	1790	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	0.0201	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	---	<0.0250 ^{DLDS}	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	<0.00500 ^{DLDS}	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	<0.0100 ^{DLDS}	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	<1.50 ^{DLDS}	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	<0.00250 ^{DLDS}	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	0.315	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	2090	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	0.448	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	0.00755	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	---	0.0707	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	<2.50 ^{DLDS}	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	546	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	0.485	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	<0.00250 ^{DLDS}	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	2.80	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	0.00151	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	16100	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	42.2	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	1250	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	<0.0100 ^{DLDS}	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	0.000502	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	<0.00500 ^{DLDS}	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	<0.00500 ^{DLDS}	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	---	<0.0150 ^{DLDS}	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	---	<0.00500 ^{DLDS}	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	---	0.0102	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	---	<0.0250 ^{DLDS}	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	07-IF-PAG-CW_ W22	07-IF-PAG-CW_ W23	07-IF-PAG-CW_ W24	08-SED-PAG-C W_W21	08-SED-PAG-C W_W22
Client sampling date / time					17-Jun-2021 15:05	24-Jun-2021 16:25	30-Jun-2021 14:50	10-Jun-2021 16:40	17-Jun-2021 15:10	
Analyte	CAS Number	Method	LOR	Unit	SK2102164-026	SK2102164-027	SK2102164-028	SK2102164-029	SK2102164-030	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	----	0.177	----	----	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	----	<0.0150 ^{DLDS}	----	----	
dissolved metals filtration location	----	EP421	-	-	----	----	Field	----	----	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	08-SED-PAG-C W_W23	08-SED-PAG-C W_W24	09-FZONE-NPA G_W21	09-FZONE-NPA G_W22	09-FZONE-NPA G_W23
Client sampling date / time					24-Jun-2021 16:25	30-Jun-2021 15:00	10-Jun-2021 17:15	17-Jun-2021 15:15	24-Jun-2021 16:45	
Analyte	CAS Number	Method	LOR	Unit	SK2102164-031	SK2102164-032	SK2102164-033	SK2102164-034	SK2102164-035	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	12800	----	----	----	
conductivity	----	E100	2.0	µS/cm	----	76100	----	----	----	
pH	----	E108	0.10	pH units	----	7.58	----	----	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	57.9	----	----	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	<1.0	----	----	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	<1.0	----	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	47.4	----	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	54500	----	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	4.64	----	----	----	
bromide	24959-67-9	E235.Br	0.10	mg/L	116	111	<0.10	<0.10	<0.10	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	<0.0020	----	----	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	4.59	----	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	30800	----	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	<10.0 ^{DLDS}	----	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	<10.0 ^{DLDS}	----	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	<5.00 ^{DLDS}	----	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	3200	3140	27.3	26.0	28.4	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	<11.2	----	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	935	----	----	----	
cation sum	----	EC101	0.10	meq/L	----	975	----	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	2.09	----	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	104	----	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	0.0700	----	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	0.00694	----	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	0.00527	----	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	0.177	----	----	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	<0.00100 ^{DLDS}	----	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	<0.00250 ^{DLDS}	----	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	08-SED-PAG-C W_W23	08-SED-PAG-C W_W24	09-FZONE-NPA G_W21	09-FZONE-NPA G_W22	09-FZONE-NPA G_W23
Client sampling date / time					24-Jun-2021 16:25	30-Jun-2021 15:00	10-Jun-2021 17:15	17-Jun-2021 15:15	24-Jun-2021 16:45	
Analyte	CAS Number	Method	LOR	Unit	SK2102164-031	SK2102164-032	SK2102164-033	SK2102164-034	SK2102164-035	
					Result	Result	Result	Result	Result	
Dissolved Metals										
boron, dissolved	7440-42-8	E421	0.010	mg/L	---	1.16	---	---	---	
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	---	0.00411	---	---	---	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	1700	---	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	0.0116	---	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	<0.0250 ^{DLDS}	---	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	0.0318	---	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	<0.0100 ^{DLDS}	---	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	<1.50 ^{DLDS}	---	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	<0.00250 ^{DLDS}	---	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	0.297	---	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	2090	---	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	0.382	---	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	0.0210	---	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	0.162	---	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	<2.50 ^{DLDS}	---	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	523	---	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	0.228	---	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	<0.00250 ^{DLDS}	---	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	2.66	---	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	0.00192	---	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	16200	---	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	41.5	---	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	1200	---	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	<0.0100 ^{DLDS}	---	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	0.000969	---	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	<0.00500 ^{DLDS}	---	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	0.00611	---	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	<0.0150 ^{DLDS}	---	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	<0.00500 ^{DLDS}	---	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	0.0226	---	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	<0.0250 ^{DLDS}	---	---	---	



Analytical Results

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

					Client sample ID	08-SED-PAG-C W_W23	08-SED-PAG-C W_W24	09-FZONE-NPA G_W21	09-FZONE-NPA G_W22	09-FZONE-NPA G_W23
					Client sampling date / time	24-Jun-2021 16:25	30-Jun-2021 15:00	10-Jun-2021 17:15	17-Jun-2021 15:15	24-Jun-2021 16:45
Analyte	CAS Number	Method	LOR	Unit	SK2102164-031	SK2102164-032	SK2102164-033	SK2102164-034	SK2102164-035	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	0.121	----	----	----	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	<0.0150 ^{DLDS}	----	----	----	
dissolved metals filtration location	----	EP421	-	-	----	Field	----	----	----	

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



Analytical Results

Sub-Matrix: Water					Client sample ID	09-FZONE-NPA	----	----	----	----
(Matrix: Water)					G_W24					
Client sampling date / time					30-Jun-2021 15:10	----	----	----	----	----
Analyte	CAS Number	Method	LOR	Unit	SK2102164-036	-----	-----	-----	-----	-----
					Result	---	---	---	---	---
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	89.0	----	----	----	----	----
conductivity	----	E100	2.0	µS/cm	297	----	----	----	----	----
pH	----	E108	0.10	pH units	8.32	----	----	----	----	----
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	127	----	----	----	----	----
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	<1.0	----	----	----	----	----
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	<1.0	----	----	----	----	----
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	104	----	----	----	----	----
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	157	----	----	----	----	----
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0062	----	----	----	----	----
bromide	24959-67-9	E235.Br	0.10	mg/L	<0.10	----	----	----	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	----	----	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	<0.200	----	----	----	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	3.16	----	----	----	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L	0.592	----	----	----	----	----
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.020	----	----	----	----	----
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	----	----	----	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	26.9	----	----	----	----	----
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	<0.0500	----	----	----	----	----
Ion Balance										
anion sum	----	EC101	0.10	meq/L	2.76	----	----	----	----	----
cation sum	----	EC101	0.10	meq/L	2.72	----	----	----	----	----
ion balance (cation-anion difference)	----	EC101	0.010	%	0.730	----	----	----	----	----
ion balance (cations/anions ratio)	----	EC101	0.010	%	98.6	----	----	----	----	----
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0494	----	----	----	----	----
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00578	----	----	----	----	----
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00489	----	----	----	----	----
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0248	----	----	----	----	----
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	----	----	----	----	----
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	----	----	----	----	----



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	09-FZONE-NPA G_W24	----	----	----	----
Client sampling date / time					30-Jun-2021 15:10	---	---	---	---	
Analyte	CAS Number	Method	LOR	Unit	SK2102164-036	-----	-----	-----	-----	
					Result	---	---	---	---	
Dissolved Metals										
boron, dissolved	7440-42-8	E421	0.010	mg/L	0.069	---	---	---	---	
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	0.0000156	---	---	---	---	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	21.5	---	---	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000021	---	---	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	---	---	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00014	---	---	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.0756	---	---	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	0.050	---	---	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	0.00335	---	---	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0059	---	---	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	8.57	---	---	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	0.00884	---	---	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00388	---	---	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00243	---	---	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	---	---	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	6.79	---	---	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00126	---	---	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000228	---	---	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	3.31	---	---	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	---	---	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	17.5	---	---	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0566	---	---	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	9.75	---	---	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	---	---	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	---	---	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	---	---	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	0.0196	---	---	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	---	---	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	0.00016	---	---	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.00216	---	---	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	0.00081	---	---	---	---	



Analytical Results

Sub-Matrix: Water					Client sample ID	09-FZONE-NPA G_W24	----	----	----	----
(Matrix: Water)					Client sampling date / time	30-Jun-2021 15:10	----	----	----	----
<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	SK2102164-036	-----	-----	-----	-----	-----
					Result	---	---	---	---	---
Dissolved Metals										
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0552	----	----	----	----	----
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	----	----	----	----	----
dissolved metals filtration location	----	EP421	-	-	Field	----	----	----	----	----

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: SK2102164	Page	: 1 of 27
Client	: O'Kane Consultants Inc.	Laboratory	: Saskatoon - Environmental
Contact	: Jared Robertson	Account Manager	: Brian Morgan
Address	: 112 - 112 Research Drive Saskatoon SK Canada S7N 3R3	Address	: 819 58 Street East Saskatoon, Saskatchewan Canada S7K 6X5
Telephone	: 250 420 7010	Telephone	: 1 306 221 7147
Project	: 948-021	Date Samples Received	: 30-Jun-2021 16:30
PO	: ----	Issue Date	: 11-Jul-2021 18:51
C-O-C number	: ----		
Sampler	: Client		
Site	: ----		
Quote number	: Q83455		
No. of samples received	: 36		
No. of samples analysed	: 36		

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 Services number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- Matrix Spike outliers occur - please see following pages for full details.
- 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.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Matrix Spike (MS) Recoveries								
Anions and Nutrients	SK2102164-028	07-IF-PAG-CW_W24	fluoride	16984-48-8	E235.F	62.6 % ^K	75.0-125%	Recovery less than lower data quality objective
Anions and Nutrients	SK2102164-028	07-IF-PAG-CW_W24	nitrite (as N)	14797-65-0	E235.NO2	70.4 % ^K	75.0-125%	Recovery less than lower data quality objective

Result Qualifiers

Qualifier	Description
K	Matrix Spike recovery outside ALS DQO due to sample matrix effects.



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		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 01-TSF_W28	E298	24-Jun-2021	05-Jul-2021	----	----		05-Jul-2021	28 days	11 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 02-IF-PAG_W24	E298	30-Jun-2021	05-Jul-2021	----	----		05-Jul-2021	28 days	5 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 03-SED-PAG_W24	E298	30-Jun-2021	05-Jul-2021	----	----		05-Jul-2021	28 days	5 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 04-GAB-NPAG_W24	E298	30-Jun-2021	05-Jul-2021	----	----		05-Jul-2021	28 days	5 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 05-SED-NPAG_W24	E298	30-Jun-2021	05-Jul-2021	----	----		05-Jul-2021	28 days	5 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 06-IF-NPAG_W24	E298	30-Jun-2021	05-Jul-2021	----	----		05-Jul-2021	28 days	5 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 07-IF-PAG-CW_W24	E298	30-Jun-2021	05-Jul-2021	----	----		05-Jul-2021	28 days	5 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 08-SED-PAG-CW_W24	E298	30-Jun-2021	05-Jul-2021	----	----		05-Jul-2021	28 days	5 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 09-FZONE-NPAG_W24	E298	30-Jun-2021	05-Jul-2021	----	----		05-Jul-2021	28 days	5 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 01_TSF_W27	E235.Br	17-Jun-2021	----	----	----		02-Jul-2021	28 days	15 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 03-SED-PAG_W22	E235.Br	17-Jun-2021	----	----	----		02-Jul-2021	28 days	15 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 04-GAB-NPAG_W22	E235.Br	17-Jun-2021	----	----	----		02-Jul-2021	28 days	15 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 05-SED-NPAG_W22	E235.Br	17-Jun-2021	----	----	----		02-Jul-2021	28 days	15 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 06-IF-NPAG_W22	E235.Br	17-Jun-2021	----	----	----		03-Jul-2021	28 days	15 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 07-IF-PAG-CW_W22	E235.Br	17-Jun-2021	----	----	----		03-Jul-2021	28 days	15 days	✓	
Anions and Nutrients : Bromide in Water by IC											
HDPE 08-SED-PAG-CW_W22	E235.Br	17-Jun-2021	----	----	----		03-Jul-2021	28 days	15 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Bromide in Water by IC										
HDPE 09-FZONE-NPAG_W22	E235.Br	17-Jun-2021	----	----	----		03-Jul-2021	28 days	15 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 01_TSF_W29	E235.Br	30-Jun-2021	----	----	----		02-Jul-2021	28 days	2 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 02-IF-PAG_W24	E235.Br	30-Jun-2021	----	----	----		02-Jul-2021	28 days	2 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 03-SED-PAG_W24	E235.Br	30-Jun-2021	----	----	----		02-Jul-2021	28 days	2 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 04-GAB-NPAG_W24	E235.Br	30-Jun-2021	----	----	----		02-Jul-2021	28 days	2 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 05-SED-NPAG_W24	E235.Br	30-Jun-2021	----	----	----		02-Jul-2021	28 days	2 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 06-IF-NPAG_W24	E235.Br	30-Jun-2021	----	----	----		03-Jul-2021	28 days	2 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 07-IF-PAG-CW_W24	E235.Br	30-Jun-2021	----	----	----		03-Jul-2021	28 days	2 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 08-SED-PAG-CW_W24	E235.Br	30-Jun-2021	----	----	----		03-Jul-2021	28 days	2 days	✔



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Bromide in Water by IC										
HDPE 09-FZONE-NPAG_W24	E235.Br	30-Jun-2021	----	----	----		03-Jul-2021	28 days	2 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 01_TSF_W26	E235.Br	10-Jun-2021	----	----	----		02-Jul-2021	28 days	22 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 02-IF-PAG_W21	E235.Br	10-Jun-2021	----	----	----		02-Jul-2021	28 days	22 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 03-SED-PAG_W21	E235.Br	10-Jun-2021	----	----	----		02-Jul-2021	28 days	22 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 04-GAB-NPAG_W21	E235.Br	10-Jun-2021	----	----	----		02-Jul-2021	28 days	22 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 05-SED-NPAG_W21	E235.Br	10-Jun-2021	----	----	----		02-Jul-2021	28 days	22 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 06-IF-NPAG_W21	E235.Br	10-Jun-2021	----	----	----		03-Jul-2021	28 days	22 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 07-IF-PAG-CW_W21	E235.Br	10-Jun-2021	----	----	----		03-Jul-2021	28 days	22 days	✔
Anions and Nutrients : Bromide in Water by IC										
HDPE 08-SED-PAG-CW_W21	E235.Br	10-Jun-2021	----	----	----		03-Jul-2021	28 days	22 days	✔



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Bromide in Water by IC										
HDPE 09-FZONE-NPAG_W21	E235.Br	10-Jun-2021	----	----	----		03-Jul-2021	28 days	22 days	✓
Anions and Nutrients : Bromide in Water by IC										
HDPE 02-IF-PAG_W22	E235.Br	07-Jun-2021	----	----	----		02-Jul-2021	28 days	25 days	✓
Anions and Nutrients : Bromide in Water by IC										
HDPE 01_TSF_W28	E235.Br	24-Jun-2021	----	----	----		02-Jul-2021	28 days	8 days	✓
Anions and Nutrients : Bromide in Water by IC										
HDPE 02-IF-PAG_W23	E235.Br	24-Jun-2021	----	----	----		02-Jul-2021	28 days	8 days	✓
Anions and Nutrients : Bromide in Water by IC										
HDPE 03-SED-PAG_W23	E235.Br	24-Jun-2021	----	----	----		02-Jul-2021	28 days	8 days	✓
Anions and Nutrients : Bromide in Water by IC										
HDPE 04-GAB-NPAG_W23	E235.Br	24-Jun-2021	----	----	----		02-Jul-2021	28 days	8 days	✓
Anions and Nutrients : Bromide in Water by IC										
HDPE 05-SED-NPAG_W23	E235.Br	24-Jun-2021	----	----	----		02-Jul-2021	28 days	8 days	✓
Anions and Nutrients : Bromide in Water by IC										
HDPE 06-IF-NPAG_W23	E235.Br	24-Jun-2021	----	----	----		03-Jul-2021	28 days	8 days	✓
Anions and Nutrients : Bromide in Water by IC										
HDPE 07-IF-PAG-CW_W23	E235.Br	24-Jun-2021	----	----	----		03-Jul-2021	28 days	8 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Bromide in Water by IC											
HDPE 08-SED-PAG-CW_W23	E235.Br	24-Jun-2021	----	----	----		03-Jul-2021	28 days	8 days	✔	
Anions and Nutrients : Bromide in Water by IC											
HDPE 09-FZONE-NPAG_W23	E235.Br	24-Jun-2021	----	----	----		03-Jul-2021	28 days	8 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 02-IF-PAG_W24	E235.Cl	30-Jun-2021	----	----	----		02-Jul-2021	28 days	2 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 03-SED-PAG_W24	E235.Cl	30-Jun-2021	----	----	----		02-Jul-2021	28 days	2 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 04-GAB-NPAG_W24	E235.Cl	30-Jun-2021	----	----	----		02-Jul-2021	28 days	2 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 05-SED-NPAG_W24	E235.Cl	30-Jun-2021	----	----	----		02-Jul-2021	28 days	2 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 06-IF-NPAG_W24	E235.Cl	30-Jun-2021	----	----	----		03-Jul-2021	28 days	2 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 07-IF-PAG-CW_W24	E235.Cl	30-Jun-2021	----	----	----		03-Jul-2021	28 days	2 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 08-SED-PAG-CW_W24	E235.Cl	30-Jun-2021	----	----	----		03-Jul-2021	28 days	2 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Chloride in Water by IC										
HDPE 09-FZONE-NPAG_W24	E235.Cl	30-Jun-2021	----	----	----		03-Jul-2021	28 days	2 days	✔
Anions and Nutrients : Chloride in Water by IC										
HDPE 01_TSF_W28	E235.Cl	24-Jun-2021	----	----	----		02-Jul-2021	28 days	8 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 02-IF-PAG_W24	E235.F	30-Jun-2021	----	----	----		02-Jul-2021	28 days	2 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 03-SED-PAG_W24	E235.F	30-Jun-2021	----	----	----		02-Jul-2021	28 days	2 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 04-GAB-NPAG_W24	E235.F	30-Jun-2021	----	----	----		02-Jul-2021	28 days	2 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 05-SED-NPAG_W24	E235.F	30-Jun-2021	----	----	----		02-Jul-2021	28 days	2 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 06-IF-NPAG_W24	E235.F	30-Jun-2021	----	----	----		03-Jul-2021	28 days	2 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 07-IF-PAG-CW_W24	E235.F	30-Jun-2021	----	----	----		03-Jul-2021	28 days	2 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 08-SED-PAG-CW_W24	E235.F	30-Jun-2021	----	----	----		03-Jul-2021	28 days	2 days	✔



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Fluoride in Water by IC										
HDPE 09-FZONE-NPAG_W24	E235.F	30-Jun-2021	----	----	----		03-Jul-2021	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE 01_TSF_W28	E235.F	24-Jun-2021	----	----	----		02-Jul-2021	28 days	8 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE 02-IF-PAG_W24	E235.NO3	30-Jun-2021	----	----	----		02-Jul-2021	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE 03-SED-PAG_W24	E235.NO3	30-Jun-2021	----	----	----		02-Jul-2021	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE 04-GAB-NPAG_W24	E235.NO3	30-Jun-2021	----	----	----		02-Jul-2021	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE 05-SED-NPAG_W24	E235.NO3	30-Jun-2021	----	----	----		02-Jul-2021	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE 06-IF-NPAG_W24	E235.NO3	30-Jun-2021	----	----	----		03-Jul-2021	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE 07-IF-PAG-CW_W24	E235.NO3	30-Jun-2021	----	----	----		03-Jul-2021	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE 08-SED-PAG-CW_W24	E235.NO3	30-Jun-2021	----	----	----		03-Jul-2021	3 days	2 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrate in Water by IC											
HDPE 09-FZONE-NPAG_W24	E235.NO3	30-Jun-2021	----	----	----		03-Jul-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 01_TSF_W28	E235.NO3	24-Jun-2021	----	----	----		02-Jul-2021	3 days	8 days	* EHTR	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 02-IF-PAG_W24	E235.NO2	30-Jun-2021	----	----	----		02-Jul-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 03-SED-PAG_W24	E235.NO2	30-Jun-2021	----	----	----		02-Jul-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 04-GAB-NPAG_W24	E235.NO2	30-Jun-2021	----	----	----		02-Jul-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 05-SED-NPAG_W24	E235.NO2	30-Jun-2021	----	----	----		02-Jul-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 06-IF-NPAG_W24	E235.NO2	30-Jun-2021	----	----	----		03-Jul-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 07-IF-PAG-CW_W24	E235.NO2	30-Jun-2021	----	----	----		03-Jul-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 08-SED-PAG-CW_W24	E235.NO2	30-Jun-2021	----	----	----		03-Jul-2021	3 days	2 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrite in Water by IC											
HDPE 09-FZONE-NPAG_W24	E235.NO2	30-Jun-2021	----	----	----		03-Jul-2021	3 days	2 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 01_TSF_W28	E235.NO2	24-Jun-2021	----	----	----		02-Jul-2021	3 days	8 days	* EHTR	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 01_TSF_W27	E235.SO4	17-Jun-2021	----	----	----		02-Jul-2021	28 days	15 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 03-SED-PAG_W22	E235.SO4	17-Jun-2021	----	----	----		02-Jul-2021	28 days	15 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 04-GAB-NPAG_W22	E235.SO4	17-Jun-2021	----	----	----		02-Jul-2021	28 days	15 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 05-SED-NPAG_W22	E235.SO4	17-Jun-2021	----	----	----		02-Jul-2021	28 days	15 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 06-IF-NPAG_W22	E235.SO4	17-Jun-2021	----	----	----		03-Jul-2021	28 days	15 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 07-IF-PAG-CW_W22	E235.SO4	17-Jun-2021	----	----	----		03-Jul-2021	28 days	15 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 08-SED-PAG-CW_W22	E235.SO4	17-Jun-2021	----	----	----		03-Jul-2021	28 days	15 days	✓	



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Sulfate in Water by IC										
HDPE 09-FZONE-NPAG_W22	E235.S04	17-Jun-2021	----	----	----		03-Jul-2021	28 days	15 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W29	E235.S04	30-Jun-2021	----	----	----		02-Jul-2021	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 02-IF-PAG_W24	E235.S04	30-Jun-2021	----	----	----		02-Jul-2021	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 03-SED-PAG_W24	E235.S04	30-Jun-2021	----	----	----		02-Jul-2021	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 04-GAB-NPAG_W24	E235.S04	30-Jun-2021	----	----	----		02-Jul-2021	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 05-SED-NPAG_W24	E235.S04	30-Jun-2021	----	----	----		02-Jul-2021	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 06-IF-NPAG_W24	E235.S04	30-Jun-2021	----	----	----		03-Jul-2021	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 07-IF-PAG-CW_W24	E235.S04	30-Jun-2021	----	----	----		03-Jul-2021	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 08-SED-PAG-CW_W24	E235.S04	30-Jun-2021	----	----	----		03-Jul-2021	28 days	2 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Sulfate in Water by IC											
HDPE 09-FZONE-NPAG_W24	E235.SO4	30-Jun-2021	----	----	----		03-Jul-2021	28 days	2 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 01_TSF_W26	E235.SO4	10-Jun-2021	----	----	----		02-Jul-2021	28 days	22 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 02-IF-PAG_W21	E235.SO4	10-Jun-2021	----	----	----		02-Jul-2021	28 days	22 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 03-SED-PAG_W21	E235.SO4	10-Jun-2021	----	----	----		02-Jul-2021	28 days	22 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 04-GAB-NPAG_W21	E235.SO4	10-Jun-2021	----	----	----		02-Jul-2021	28 days	22 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 05-SED-NPAG_W21	E235.SO4	10-Jun-2021	----	----	----		02-Jul-2021	28 days	22 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 06-IF-NPAG_W21	E235.SO4	10-Jun-2021	----	----	----		03-Jul-2021	28 days	22 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 07-IF-PAG-CW_W21	E235.SO4	10-Jun-2021	----	----	----		03-Jul-2021	28 days	22 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 08-SED-PAG-CW_W21	E235.SO4	10-Jun-2021	----	----	----		03-Jul-2021	28 days	22 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Sulfate in Water by IC										
HDPE 09-FZONE-NPAG_W21	E235.S04	10-Jun-2021	----	----	----		03-Jul-2021	28 days	22 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 02-IF-PAG_W22	E235.S04	07-Jun-2021	----	----	----		02-Jul-2021	28 days	25 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W28	E235.S04	24-Jun-2021	----	----	----		02-Jul-2021	28 days	8 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 02-IF-PAG_W23	E235.S04	24-Jun-2021	----	----	----		02-Jul-2021	28 days	8 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 03-SED-PAG_W23	E235.S04	24-Jun-2021	----	----	----		02-Jul-2021	28 days	8 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 04-GAB-NPAG_W23	E235.S04	24-Jun-2021	----	----	----		02-Jul-2021	28 days	8 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 05-SED-NPAG_W23	E235.S04	24-Jun-2021	----	----	----		02-Jul-2021	28 days	8 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 06-IF-NPAG_W23	E235.S04	24-Jun-2021	----	----	----		03-Jul-2021	28 days	8 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 07-IF-PAG-CW_W23	E235.S04	24-Jun-2021	----	----	----		03-Jul-2021	28 days	8 days	✔



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Sulfate in Water by IC											
HDPE 08-SED-PAG-CW_W23	E235.SO4	24-Jun-2021	----	----	----		03-Jul-2021	28 days	8 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 09-FZONE-NPAG_W23	E235.SO4	24-Jun-2021	----	----	----		03-Jul-2021	28 days	8 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 01_TSF_W28	E318	24-Jun-2021	05-Jul-2021	----	----		05-Jul-2021	28 days	11 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 02-IF-PAG_W24	E318	30-Jun-2021	05-Jul-2021	----	----		05-Jul-2021	28 days	5 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 03-SED-PAG_W24	E318	30-Jun-2021	05-Jul-2021	----	----		05-Jul-2021	28 days	5 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 04-GAB-NPAG_W24	E318	30-Jun-2021	05-Jul-2021	----	----		05-Jul-2021	28 days	5 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 05-SED-NPAG_W24	E318	30-Jun-2021	05-Jul-2021	----	----		05-Jul-2021	28 days	5 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 06-IF-NPAG_W24	E318	30-Jun-2021	05-Jul-2021	----	----		05-Jul-2021	28 days	5 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 07-IF-PAG-CW_W24	E318	30-Jun-2021	05-Jul-2021	----	----		05-Jul-2021	28 days	5 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 08-SED-PAG-CW_W24	E318	30-Jun-2021	05-Jul-2021	----	----		05-Jul-2021	28 days	5 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 09-FZONE-NPAG_W24	E318	30-Jun-2021	05-Jul-2021	----	----		05-Jul-2021	28 days	5 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 01_TSF_W28	E372-U	24-Jun-2021	07-Jul-2021	----	----		07-Jul-2021	28 days	13 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 02-IF-PAG_W24	E372-U	30-Jun-2021	07-Jul-2021	----	----		07-Jul-2021	28 days	7 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 03-SED-PAG_W24	E372-U	30-Jun-2021	07-Jul-2021	----	----		07-Jul-2021	28 days	7 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 04-GAB-NPAG_W24	E372-U	30-Jun-2021	07-Jul-2021	----	----		07-Jul-2021	28 days	7 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 05-SED-NPAG_W24	E372-U	30-Jun-2021	07-Jul-2021	----	----		07-Jul-2021	28 days	7 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 06-IF-NPAG_W24	E372-U	30-Jun-2021	07-Jul-2021	----	----		07-Jul-2021	28 days	7 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 07-IF-PAG-CW_W24	E372-U	30-Jun-2021	07-Jul-2021	----	----		07-Jul-2021	28 days	7 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 08-SED-PAG-CW_W24	E372-U	30-Jun-2021	07-Jul-2021	----	----		07-Jul-2021	28 days	7 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 09-FZONE-NPAG_W24	E372-U	30-Jun-2021	07-Jul-2021	----	----		07-Jul-2021	28 days	7 days	✔	
Cyanides : Total Cyanide by CFA											
UV inhibited HDPE - total (sodium hydroxide) 01_TSF_W28	E333	24-Jun-2021	----	----	----		06-Jul-2021	14 days	12 days	✔	
Cyanides : WAD Cyanide by CFA											
UV inhibited HDPE - total (sodium hydroxide) 01_TSF_W28	E336	24-Jun-2021	----	----	----		06-Jul-2021	14 days	12 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 01_TSF_W28	E421	24-Jun-2021	05-Jul-2021	----	----		06-Jul-2021	180 days	12 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 02-IF-PAG_W24	E421	30-Jun-2021	05-Jul-2021	----	----		06-Jul-2021	180 days	6 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 03-SED-PAG_W24	E421	30-Jun-2021	05-Jul-2021	----	----		06-Jul-2021	180 days	6 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 04-GAB-NPAG_W24	E421	30-Jun-2021	05-Jul-2021	----	----		06-Jul-2021	180 days	6 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 05-SED-NPAG_W24	E421	30-Jun-2021	05-Jul-2021	----	----		06-Jul-2021	180 days	6 days	✔	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 06-IF-NPAG_W24	E421	30-Jun-2021	05-Jul-2021	----	----		06-Jul-2021	180 days	6 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 07-IF-PAG-CW_W24	E421	30-Jun-2021	05-Jul-2021	----	----		06-Jul-2021	180 days	6 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 08-SED-PAG-CW_W24	E421	30-Jun-2021	05-Jul-2021	----	----		06-Jul-2021	180 days	6 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 09-FZONE-NPAG_W24	E421	30-Jun-2021	05-Jul-2021	----	----		06-Jul-2021	180 days	6 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 02-IF-PAG_W24	E290	30-Jun-2021	----	----	----		02-Jul-2021	14 days	2 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 03-SED-PAG_W24	E290	30-Jun-2021	----	----	----		02-Jul-2021	14 days	2 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 04-GAB-NPAG_W24	E290	30-Jun-2021	----	----	----		02-Jul-2021	14 days	2 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 05-SED-NPAG_W24	E290	30-Jun-2021	----	----	----		02-Jul-2021	14 days	2 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 06-IF-NPAG_W24	E290	30-Jun-2021	----	----	----		02-Jul-2021	14 days	2 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec Actual		Eval	Analysis Date	Holding Times Rec Actual		Eval
Physical Tests : Alkalinity Species by Titration										
HDPE 07-IF-PAG-CW_W24	E290	30-Jun-2021	----	----	----		02-Jul-2021	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 08-SED-PAG-CW_W24	E290	30-Jun-2021	----	----	----		02-Jul-2021	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 09-FZONE-NPAG_W24	E290	30-Jun-2021	----	----	----		02-Jul-2021	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 01_TSF_W28	E290	24-Jun-2021	----	----	----		02-Jul-2021	14 days	8 days	✓
Physical Tests : Conductivity in Water										
HDPE 02-IF-PAG_W24	E100	30-Jun-2021	----	----	----		02-Jul-2021	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE 03-SED-PAG_W24	E100	30-Jun-2021	----	----	----		02-Jul-2021	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE 04-GAB-NPAG_W24	E100	30-Jun-2021	----	----	----		02-Jul-2021	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE 05-SED-NPAG_W24	E100	30-Jun-2021	----	----	----		02-Jul-2021	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE 06-IF-NPAG_W24	E100	30-Jun-2021	----	----	----		02-Jul-2021	28 days	2 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Physical Tests : Conductivity in Water											
HDPE 07-IF-PAG-CW_W24	E100	30-Jun-2021	----	----	----		02-Jul-2021	28 days	2 days		✓
Physical Tests : Conductivity in Water											
HDPE 08-SED-PAG-CW_W24	E100	30-Jun-2021	----	----	----		02-Jul-2021	28 days	2 days		✓
Physical Tests : Conductivity in Water											
HDPE 09-FZONE-NPAG_W24	E100	30-Jun-2021	----	----	----		02-Jul-2021	28 days	2 days		✓
Physical Tests : Conductivity in Water											
HDPE 01_TSF_W28	E100	24-Jun-2021	----	----	----		02-Jul-2021	28 days	8 days		✓
Physical Tests : pH by Meter											
HDPE 01_TSF_W28	E108	24-Jun-2021	----	----	----		02-Jul-2021	0.25 hrs	196 hrs		* EHTR-FM
Physical Tests : pH by Meter											
HDPE 08-SED-PAG-CW_W24	E108	30-Jun-2021	----	----	----		02-Jul-2021	0.25 hrs	50 hrs		* EHTR-FM
Physical Tests : pH by Meter											
HDPE 09-FZONE-NPAG_W24	E108	30-Jun-2021	----	----	----		02-Jul-2021	0.25 hrs	50 hrs		* EHTR-FM
Physical Tests : pH by Meter											
HDPE 04-GAB-NPAG_W24	E108	30-Jun-2021	----	----	----		02-Jul-2021	0.25 hrs	51 hrs		* EHTR-FM
Physical Tests : pH by Meter											
HDPE 05-SED-NPAG_W24	E108	30-Jun-2021	----	----	----		02-Jul-2021	0.25 hrs	51 hrs		* EHTR-FM



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : pH by Meter										
HDPE 06-IF-NPAG_W24	E108	30-Jun-2021	----	----	----		02-Jul-2021	0.25 hrs	51 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 07-IF-PAG-CW_W24	E108	30-Jun-2021	----	----	----		02-Jul-2021	0.25 hrs	51 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 02-IF-PAG_W24	E108	30-Jun-2021	----	----	----		02-Jul-2021	0.25 hrs	52 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 03-SED-PAG_W24	E108	30-Jun-2021	----	----	----		02-Jul-2021	0.25 hrs	52 hrs	* EHTR-FM

Legend & Qualifier Definitions

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

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	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	235154	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	236511	1	11	9.0	5.0	✓
Bromide in Water by IC	E235.Br	234931	2	36	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	234936	2	12	16.6	5.0	✓
Conductivity in Water	E100	235153	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	236053	1	11	9.0	5.0	✓
Fluoride in Water by IC	E235.F	234935	2	9	22.2	5.0	✓
Nitrate in Water by IC	E235.NO3	234933	2	10	20.0	5.0	✓
Nitrite in Water by IC	E235.NO2	234934	2	10	20.0	5.0	✓
pH by Meter	E108	235152	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	234932	2	37	5.4	5.0	✓
Total Cyanide by CFA	E333	237378	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	235876	1	9	11.1	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	236376	1	20	5.0	5.0	✓
WAD Cyanide by CFA	E336	237377	1	2	50.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	235154	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	236511	1	11	9.0	5.0	✓
Bromide in Water by IC	E235.Br	234931	2	36	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	234936	2	12	16.6	5.0	✓
Conductivity in Water	E100	235153	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	236053	1	11	9.0	5.0	✓
Fluoride in Water by IC	E235.F	234935	2	9	22.2	5.0	✓
Nitrate in Water by IC	E235.NO3	234933	2	10	20.0	5.0	✓
Nitrite in Water by IC	E235.NO2	234934	2	10	20.0	5.0	✓
pH by Meter	E108	235152	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	234932	2	37	5.4	5.0	✓
Total Cyanide by CFA	E333	237378	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	235876	1	9	11.1	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	236376	1	20	5.0	5.0	✓
WAD Cyanide by CFA	E336	237377	1	2	50.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	235154	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	236511	1	11	9.0	5.0	✓
Bromide in Water by IC	E235.Br	234931	2	36	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	234936	2	12	16.6	5.0	✓
Conductivity in Water	E100	235153	1	20	5.0	5.0	✓



Matrix: **Water**

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
<i>Analytical Methods</i>							
Method Blanks (MB) - Continued							
Dissolved Metals in Water by CRC ICPMS	E421	236053	1	11	9.0	5.0	✓
Fluoride in Water by IC	E235.F	234935	2	9	22.2	5.0	✓
Nitrate in Water by IC	E235.NO3	234933	2	10	20.0	5.0	✓
Nitrite in Water by IC	E235.NO2	234934	2	10	20.0	5.0	✓
Sulfate in Water by IC	E235.SO4	234932	2	37	5.4	5.0	✓
Total Cyanide by CFA	E333	237378	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	235876	1	9	11.1	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	236376	1	20	5.0	5.0	✓
WAD Cyanide by CFA	E336	237377	1	2	50.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	236511	1	11	9.0	5.0	✓
Bromide in Water by IC	E235.Br	234931	2	36	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	234936	2	12	16.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	236053	1	11	9.0	5.0	✓
Fluoride in Water by IC	E235.F	234935	2	9	22.2	5.0	✓
Nitrate in Water by IC	E235.NO3	234933	2	10	20.0	5.0	✓
Nitrite in Water by IC	E235.NO2	234934	2	10	20.0	5.0	✓
Sulfate in Water by IC	E235.SO4	234932	2	37	5.4	5.0	✓
Total Cyanide by CFA	E333	237378	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	235876	1	9	11.1	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	236376	1	20	5.0	5.0	✓
WAD Cyanide by CFA	E336	237377	1	2	50.0	5.0	✓



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Saskatoon - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Saskatoon - 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.
Bromide in Water by IC	E235.Br Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC	E235.Cl Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Saskatoon - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Total Kjeldahl Nitrogen is determined using block digestion followed by flow-injection analysis with fluorescence detection.
Total Cyanide by CFA	E333 Vancouver - Environmental	Water	ISO 14403 (mod)	Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.
WAD Cyanide by CFA	E336 Vancouver - Environmental	Water	APHA 4500-CN I (mod)	Weak Acid Dissociable (WAD) cyanide is determined by in-line sample distillation with final determination by colourimetric analysis.
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Metals in Water by CRC ICPMS	E421 Saskatoon - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Hardness (Calculated)	EC100 Saskatoon - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Ion Balance using Dissolved Metals	EC101 Saskatoon - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
TDS in Water (Calculation)	EC103 Saskatoon - Environmental	Water	APHA 1030E (mod)	Total Dissolved Solids is calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Saskatoon - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested using block digestion with Copper Sulfate Digestion Reagent.

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<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Saskatoon - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.



QUALITY CONTROL REPORT

Work Order : **SK2102164**

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Client : O'Kane Consultants Inc.
 Contact : Jared Robertson
 Address : 112 - 112 Research Drive
 Saskatoon SK Canada S7N 3R3
 Telephone : 250 420 7010
 Project : 948-021
 PO : ----
 C-O-C number : ----
 Sampler : Client
 Site : ----
 Quote number : Q83455
 No. of samples received : 36
 No. of samples analysed : 36

Laboratory : Saskatoon - Environmental
 Account Manager : Brian Morgan
 Address : 819 58 Street East
 Saskatoon, Saskatchewan Canada S7K 6X5
 Telephone : 1 306 221 7147
 Date Samples Received : 30-Jun-2021 16:30
 Date Analysis Commenced : 02-Jul-2021
 Issue Date : 11-Jul-2021 18:51

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 Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Colby Bingham	Quality Systems Coordinator	Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Quality Systems Coordinator	Metals, Saskatoon, Saskatchewan
Dwayne Bennett	Technical Specialist	Inorganics, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Jorden Fanson	Analyst	Inorganics, Calgary, Alberta
Lian Nesbitt	Laboratory Analyst	Metals, Saskatoon, Saskatchewan
Naeun Kim	Analyst	Inorganics, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Tracy Harley	Supervisor - Water Quality Instrumentation	Inorganics, Burnaby, British Columbia

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Project : 948-021



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 Services number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

= Indicates a QC result that did not meet the ALS DQO.



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: 235152)											
SK2102164-016	04-GAB-NPAG_W24	pH	----	E108	0.10	pH units	8.58	8.55	0.461%	3%	----
Physical Tests (QC Lot: 235153)											
SK2102164-016	04-GAB-NPAG_W24	conductivity	----	E100	2.0	µS/cm	447	445	0.448%	10%	----
Physical Tests (QC Lot: 235154)											
SK2102164-016	04-GAB-NPAG_W24	alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	179	181	1.05%	20%	----
Anions and Nutrients (QC Lot: 234931)											
SK2102164-003	01_TSF_W28	bromide	24959-67-9	E235.Br	5.00	mg/L	<5.00	<5.00	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 234932)											
SK2102164-003	01_TSF_W28	sulfate (as SO4)	14808-79-8	E235.SO4	15.0	mg/L	3820	3800	0.472%	20%	----
Anions and Nutrients (QC Lot: 234933)											
SK2102164-003	01_TSF_W28	nitrate (as N)	14797-55-8	E235.NO3	1.00	mg/L	55.4	55.0	0.687%	20%	----
Anions and Nutrients (QC Lot: 234934)											
SK2102164-003	01_TSF_W28	nitrite (as N)	14797-65-0	E235.NO2	0.500	mg/L	7.94	7.92	0.183%	20%	----
Anions and Nutrients (QC Lot: 234935)											
SK2102164-003	01_TSF_W28	fluoride	16984-48-8	E235.F	1.00	mg/L	<1.00	<1.00	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 234936)											
SK2102164-003	01_TSF_W28	chloride	16887-00-6	E235.Cl	25.0	mg/L	900	917	1.91%	20%	----
Anions and Nutrients (QC Lot: 234944)											
SK2102164-024	06-IF-NPAG_W24	chloride	16887-00-6	E235.Cl	0.50	mg/L	4.49	4.37	0.12	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 234945)											
SK2102164-024	06-IF-NPAG_W24	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	39.3	38.5	2.22%	20%	----
Anions and Nutrients (QC Lot: 234946)											
SK2102164-024	06-IF-NPAG_W24	bromide	24959-67-9	E235.Br	0.10	mg/L	<0.10	<0.10	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 234947)											
SK2102164-024	06-IF-NPAG_W24	nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 234948)											
SK2102164-024	06-IF-NPAG_W24	nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 234949)											
SK2102164-024	06-IF-NPAG_W24	fluoride	16984-48-8	E235.F	0.020	mg/L	0.485	0.487	0.298%	20%	----
Anions and Nutrients (QC Lot: 235876)											
SK2102164-003	01_TSF_W28	Kjeldahl nitrogen, total [TKN]	----	E318	2.50	mg/L	137	126	8.76%	20%	----



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
Anions and Nutrients (QC Lot: 236376)											
CG2102302-011	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0030	0.0029	0.00005	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 236511)											
SK2102125-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0279	0.0258	0.0021	Diff <2x LOR	----
Cyanides (QC Lot: 237377)											
SK2102164-003	01_TSF_W28	cyanide, weak acid dissociable	----	E336	0.0050	mg/L	0.0103	0.0116	0.0012	Diff <2x LOR	----
Cyanides (QC Lot: 237378)											
SK2102164-003	01_TSF_W28	cyanide, strong acid dissociable (total)	----	E333	0.0100	mg/L	0.222	0.245	9.55%	20%	----
Dissolved Metals (QC Lot: 236053)											
SK2102164-003	01_TSF_W28	aluminum, dissolved	7429-90-5	E421	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00100	mg/L	0.00788	0.00707	0.00081	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00100	mg/L	0.570	0.569	0.0567%	20%	----
		barium, dissolved	7440-39-3	E421	0.00100	mg/L	0.0382	0.0391	2.30%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000200	mg/L	<0.000200	<0.000200	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.100	mg/L	1.44	1.53	6.53%	20%	----
		cadmium, dissolved	7440-43-9	E421	0.000250	mg/L	<0.000250	<0.000250	0	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.500	mg/L	473	490	3.41%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00100	mg/L	0.160	0.158	1.39%	20%	----
		copper, dissolved	7440-50-8	E421	0.00200	mg/L	0.00271	0.00262	0.00010	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.300	mg/L	<0.300	<0.300	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.0500	mg/L	56.1	55.1	1.74%	20%	----
		manganese, dissolved	7439-96-5	E421	0.0500	mg/L	1.36	1.37	0.440%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000500	mg/L	0.342	0.338	1.00%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	0.500	mg/L	<0.500	<0.500	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.500	mg/L	211	212	0.409%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00200	mg/L	0.0373	0.0374	0.333%	20%	----
		selenium, dissolved	7782-49-2	E421	0.000500	mg/L	0.0113	0.0101	11.8%	20%	----
		silicon, dissolved	7440-21-3	E421	0.500	mg/L	6.39	6.68	4.42%	20%	----
		silver, dissolved	7440-22-4	E421	0.000100	mg/L	0.000261	0.000259	0.000002	Diff <2x LOR	----
		sodium, dissolved	17341-25-2	E421	0.500	mg/L	1520	1550	2.37%	20%	----



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
Dissolved Metals (QC Lot: 236053) - continued											
SK2102164-003	01_TSF_W28	strontium, dissolved	7440-24-6	E421	0.00200	mg/L	1.72	1.66	3.30%	20%	----
		sulfur, dissolved	7704-34-9	E421	5.00	mg/L	1470	1470	0.0272%	20%	----
		tellurium, dissolved	13494-80-9	E421	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000100	mg/L	0.000220	0.000189	0.000030	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00100	mg/L	0.00299	0.00303	0.00004	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00300	mg/L	<0.00300	<0.00300	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000100	mg/L	0.00589	0.00614	4.16%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00300	mg/L	<0.00300	<0.00300	0	Diff <2x LOR	----



Method Blank (MB) Report

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

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 235153)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 235154)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Anions and Nutrients (QCLot: 234931)						
bromide	24959-67-9	E235.Br	0.1	mg/L	<0.10	----
Anions and Nutrients (QCLot: 234932)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 234933)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 234934)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 234935)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 234936)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 234944)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 234945)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 234946)						
bromide	24959-67-9	E235.Br	0.1	mg/L	<0.10	----
Anions and Nutrients (QCLot: 234947)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 234948)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 234949)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 235876)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 236376)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 236511)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Cyanides (QCLot: 237377)						
cyanide, weak acid dissociable	---	E336	0.002	mg/L	<0.0020	---
Cyanides (QCLot: 237378)						
cyanide, strong acid dissociable (total)	---	E333	0.002	mg/L	<0.0020	---
Dissolved Metals (QCLot: 236053)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	---
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	---
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	---
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	---
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	---
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	---
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	---
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	---
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	---
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	---
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	---
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	---
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	---
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	---
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	---
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	---
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	---
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	---
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	---
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	---
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	---
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	---
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	---
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	---
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	---
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	---
sodium, dissolved	17341-25-2	E421	0.05	mg/L	<0.050	---
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	---
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	---
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	---
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	---
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	---



Sub-Matrix: **Water**

<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	<i>Result</i>	<i>Qualifier</i>
Dissolved Metals (QCLot: 236053) - continued						
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----



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 Concentration	Recovery (%) LCS	Recovery Limits (%)		Qualifier
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	
Physical Tests (QCLot: 235152)									
pH	----	E108	----	pH units	6.86 pH units	99.6	98.0	102	----
Physical Tests (QCLot: 235153)									
conductivity	----	E100	1	µS/cm	1000 µS/cm	98.9	90.0	110	----
Physical Tests (QCLot: 235154)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	98.6	85.0	115	----
Anions and Nutrients (QCLot: 234931)									
bromide	24959-67-9	E235.Br	0.1	mg/L	0.5 mg/L	103	85.0	115	----
Anions and Nutrients (QCLot: 234932)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	108	90.0	110	----
Anions and Nutrients (QCLot: 234933)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 234934)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 234935)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	98.6	90.0	110	----
Anions and Nutrients (QCLot: 234936)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 234944)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 234945)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 234946)									
bromide	24959-67-9	E235.Br	0.1	mg/L	0.5 mg/L	101	85.0	115	----
Anions and Nutrients (QCLot: 234947)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 234948)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	98.5	90.0	110	----
Anions and Nutrients (QCLot: 234949)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	98.0	90.0	110	----
Anions and Nutrients (QCLot: 235876)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	93.5	75.0	125	----
Anions and Nutrients (QCLot: 236376)									



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 236376) - continued									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.32 mg/L	98.2	80.0	120	----
Anions and Nutrients (QCLot: 236511)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	99.6	85.0	115	----
Cyanides (QCLot: 237377)									
cyanide, weak acid dissociable	----	E336	0.002	mg/L	0.125 mg/L	102	80.0	120	----
Cyanides (QCLot: 237378)									
cyanide, strong acid dissociable (total)	----	E333	0.002	mg/L	0.25 mg/L	88.8	80.0	120	----
Dissolved Metals (QCLot: 236053)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	100	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	102	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	97.9	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	99.4	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	104	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	99.7	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	96.3	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	96.4	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	97.4	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	102	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	96.8	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	96.7	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	95.0	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	106	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	100	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	105	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	95.3	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	96.5	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	107	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	95.7	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	98.9	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	95.0	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	97.4	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	100.0	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	102	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	101	80.0	120	----
sodium, dissolved	17341-25-2	E421	0.05	mg/L	50 mg/L	95.9	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 236053) - continued									
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	104	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	101	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	101	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	96.8	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	96.6	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	95.2	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	92.2	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	99.3	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	101	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	97.2	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	96.6	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	102	80.0	120	----



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 $\geq 1 \times$ 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: 234931)										
SK2102164-008	02-IF-PAG_W24	bromide	24959-67-9	E235.Br	0.47 mg/L	0.5 mg/L	94.1	75.0	125	----
Anions and Nutrients (QCLot: 234932)										
SK2102164-008	02-IF-PAG_W24	sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	90.0	110	----
Anions and Nutrients (QCLot: 234933)										
SK2102164-008	02-IF-PAG_W24	nitrate (as N)	14797-55-8	E235.NO3	2.48 mg/L	2.5 mg/L	99.2	75.0	125	----
Anions and Nutrients (QCLot: 234934)										
SK2102164-008	02-IF-PAG_W24	nitrite (as N)	14797-65-0	E235.NO2	0.453 mg/L	0.5 mg/L	90.6	75.0	125	----
Anions and Nutrients (QCLot: 234935)										
SK2102164-008	02-IF-PAG_W24	fluoride	16984-48-8	E235.F	0.970 mg/L	1 mg/L	97.0	75.0	125	----
Anions and Nutrients (QCLot: 234936)										
SK2102164-008	02-IF-PAG_W24	chloride	16887-00-6	E235.Cl	99.3 mg/L	100 mg/L	99.3	75.0	125	----
Anions and Nutrients (QCLot: 234944)										
SK2102164-028	07-IF-PAG-CW_W24	chloride	16887-00-6	E235.Cl	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 234945)										
SK2102164-028	07-IF-PAG-CW_W24	sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	90.0	110	----
Anions and Nutrients (QCLot: 234946)										
SK2102164-028	07-IF-PAG-CW_W24	bromide	24959-67-9	E235.Br	ND mg/L	0.5 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 234947)										
SK2102164-028	07-IF-PAG-CW_W24	nitrate (as N)	14797-55-8	E235.NO3	2.27 mg/L	2.5 mg/L	90.9	75.0	125	----
Anions and Nutrients (QCLot: 234948)										
SK2102164-028	07-IF-PAG-CW_W24	nitrite (as N)	14797-65-0	E235.NO2	0.352 mg/L	0.5 mg/L	70.4	75.0	125	K
Anions and Nutrients (QCLot: 234949)										
SK2102164-028	07-IF-PAG-CW_W24	fluoride	16984-48-8	E235.F	0.626 mg/L	1 mg/L	62.6	75.0	125	K
Anions and Nutrients (QCLot: 235876)										
SK2102164-008	02-IF-PAG_W24	Kjeldahl nitrogen, total [TKN]	----	E318	1.88 mg/L	2.5 mg/L	75.2	70.0	130	----
Anions and Nutrients (QCLot: 236376)										
CG2102302-012	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0631 mg/L	0.0676 mg/L	93.3	70.0	130	----



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: 236511)										
SK2102126-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.112 mg/L	0.1 mg/L	112	75.0	125	----
Cyanides (QCLot: 237377)										
YL2100671-001	Anonymous	cyanide, weak acid dissociable	----	E336	0.606 mg/L	0.625 mg/L	96.9	75.0	125	----
Cyanides (QCLot: 237378)										
YL2100664-001	Anonymous	cyanide, strong acid dissociable (total)	----	E333	23.9 mg/L	25 mg/L	95.8	75.0	125	----
Dissolved Metals (QCLot: 236053)										
SK2102164-008	02-IF-PAG_W24	aluminum, dissolved	7429-90-5	E421	0.196 mg/L	0.2 mg/L	98.0	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0206 mg/L	0.02 mg/L	103	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0193 mg/L	0.02 mg/L	96.6	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0393 mg/L	0.04 mg/L	98.3	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00929 mg/L	0.01 mg/L	92.9	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.100 mg/L	0.1 mg/L	100.0	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00388 mg/L	0.004 mg/L	97.1	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.0100 mg/L	0.01 mg/L	100	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0373 mg/L	0.04 mg/L	93.3	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0186 mg/L	0.02 mg/L	93.1	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0180 mg/L	0.02 mg/L	90.3	70.0	130	----
		iron, dissolved	7439-89-6	E421	1.95 mg/L	2 mg/L	97.4	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0186 mg/L	0.02 mg/L	93.1	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.102 mg/L	0.1 mg/L	102	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	0.0188 mg/L	0.02 mg/L	94.2	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0207 mg/L	0.02 mg/L	104	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0373 mg/L	0.04 mg/L	93.2	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	10.3 mg/L	10 mg/L	103	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0196 mg/L	0.02 mg/L	98.0	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0397 mg/L	0.04 mg/L	99.4	70.0	130	----
		silicon, dissolved	7440-21-3	E421	9.62 mg/L	10 mg/L	96.2	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00387 mg/L	0.004 mg/L	96.7	70.0	130	----
		sodium, dissolved	17341-25-2	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0388 mg/L	0.04 mg/L	96.9	70.0	130	----



Sub-Matrix: **Water**

					<i>Matrix Spike (MS) Report</i>					
					<i>Spike</i>		<i>Recovery (%)</i>	<i>Recovery Limits (%)</i>		
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>Concentration</i>	<i>Target</i>	<i>MS</i>	<i>Low</i>	<i>High</i>	<i>Qualifier</i>
Dissolved Metals (QCLot: 236053) - continued										
SK2102164-008	02-IF-PAG_W24	thallium, dissolved	7440-28-0	E421	0.00365 mg/L	0.004 mg/L	91.2	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0205 mg/L	0.02 mg/L	102	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0194 mg/L	0.02 mg/L	96.8	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0386 mg/L	0.04 mg/L	96.6	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0192 mg/L	0.02 mg/L	96.2	70.0	130	----
		uranium, dissolved	7440-61-1	E421	ND mg/L	0.004 mg/L	ND	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.0972 mg/L	0.1 mg/L	97.2	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.379 mg/L	0.4 mg/L	94.9	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0417 mg/L	0.04 mg/L	104	70.0	130	----

Qualifiers

<i>Qualifier</i>	<i>Description</i>
K	Matrix Spike recovery outside ALS DQO due to sample matrix effects.



CERTIFICATE OF ANALYSIS

Work Order : **SK2102643**
Client : **O'Kane Consultants Inc.**
Contact : Jared Robertson
Address : 112 - 112 Research Drive
Saskatoon SK Canada S7N 3R3
Telephone : 250 420 7010
Project : 948-021
PO : ----
C-O-C number : ----
Sampler : Client
Site : ----
Quote number : Q83455
No. of samples received : 36
No. of samples analysed : 36

Page : 1 of 27
Laboratory : Saskatoon - Environmental
Account Manager : Brian Morgan
Address : 819 58 Street East
Saskatoon SK Canada S7K 6X5
Telephone : 1 306 221 7147
Date Samples Received : 29-Jul-2021 13:30
Date Analysis Commenced : 30-Jul-2021
Issue Date : 09-Aug-2021 17:34

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Colby Bingham	Quality Systems Coordinator	Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Quality Systems Coordinator	Metals, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Melissa Houseman	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Melissa Houseman	Team Leader - Inorganics	Metals, Saskatoon, Saskatchewan
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta



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
-	No Unit
%	percent
µS/cm	Microsiemens per centimetre
meq/L	milliequivalents per litre
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.

Sample Comments

Sample	Client Id	Comment
SK2102643-003	01_TSF_W32	sample 01_TSF_W33 is coded for multiple analysis but only received 1 125ml bottle for it. Sample 01_TSF_w32 is only coded for SO4 but received multiple containers matching those needed for 01_TSF_W33. Will assume client mislabelled and will process those bottles for sample 01_TSF_W33.
SK2102643-004	01_TSF_W33	sample 01_TSF_W33 is coded for multiple analysis but only received 1 125ml bottle for it. Sample 01_TSF_w32 is only coded for SO4 but received multiple containers matching those needed for 01_TSF_W33. Will assume client mislabelled and will process those bottles for sample 01_TSF_W33.

Qualifiers

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).



IB:INT

Ion Balance Reviewed: Imbalance is due to interference or non-measured component.



Analytical Results

Sub-Matrix: Water					Client sample ID				
(Matrix: Water)					01_TSF_W30	01_TSF_W31	01_TSF_W32	01_TSF_W33	02-IF-PAG_W25
Client sampling date / time					07-Jul-2021 07:00	15-Jul-2021 13:25	22-Jul-2021 16:00	29-Jul-2021 13:30	07-Jul-2021 07:00
Analyte	CAS Number	Method	LOR	Unit	SK2102643-001	SK2102643-002	SK2102643-003	SK2102643-004	SK2102643-005
					Result	Result	Result	Result	Result
Physical Tests									
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	----	1440	----	----
conductivity	----	E100	2.0	µS/cm	----	----	5960	----	----
pH	----	E108	0.10	pH units	----	----	7.69	----	----
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	----	196	----	----
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	----	<1.0	----	----
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	----	<1.0	----	----
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	161	----	----
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	4930	----	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	25.7	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	----	0.0140	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	----	44.7	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	300	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	<1.00 ^{DLDS}	----	----
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	16.9	----	----
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	2.40	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	3330	3170	2940	2840	138
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	19.3	----	----
Cyanides									
cyanide, strong acid dissociable (total)	----	E333	0.0050	mg/L	----	----	0.326	----	----
cyanide, weak acid dissociable	----	E336	0.0050	mg/L	----	----	0.0142	----	----
Ion Balance									
anion sum	----	EC101	0.10	meq/L	----	----	74.3	----	----
cation sum	----	EC101	0.10	meq/L	----	----	67.6	----	----
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	4.72	----	----
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	91.0	----	----
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	0.0055	----	----
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	0.00589	----	----
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	0.477	----	----
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	0.0390	----	----



Analytical Results

Sub-Matrix: Water					Client sample ID				
(Matrix: Water)					01_TSF_W30	01_TSF_W31	01_TSF_W32	01_TSF_W33	02-IF-PAG_W25
Client sampling date / time					07-Jul-2021 07:00	15-Jul-2021 13:25	22-Jul-2021 16:00	29-Jul-2021 13:30	07-Jul-2021 07:00
Analyte	CAS Number	Method	LOR	Unit	SK2102643-001	SK2102643-002	SK2102643-003	SK2102643-004	SK2102643-005
					Result	Result	Result	Result	Result
Dissolved Metals									
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	---	---	<0.000100 ^{DLDS}	---	---
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	---	---	<0.000250 ^{DLDS}	---	---
boron, dissolved	7440-42-8	E421	0.010	mg/L	---	---	1.37	---	---
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	---	---	<0.0000900 ^{DLM}	---	---
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	487	---	---
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	<0.000050 ^{DLDS}	---	---
chromium, dissolved	7440-47-3	E421	0.000050	mg/L	---	---	<0.00250 ^{DLDS}	---	---
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	0.0615	---	---
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	0.00140	---	---
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	0.258	---	---
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	<0.000250 ^{DLDS}	---	---
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	0.0080	---	---
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	53.7	---	---
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	0.692	---	---
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	0.238	---	---
nickel, dissolved	7440-02-0	E421	0.000050	mg/L	---	---	<0.00250 ^{DLDS}	---	---
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	<0.250 ^{DLDS}	---	---
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	168	---	---
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	0.0304	---	---
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	0.00829	---	---
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	7.61	---	---
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	0.000100	---	---
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	751	---	---
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	1.60	---	---
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	1060	---	---
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	<0.00100 ^{DLDS}	---	---
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	0.000155	---	---
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	<0.00050 ^{DLDS}	---	---
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	0.00359	---	---
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	---	<0.00150 ^{DLDS}	---	---
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	---	<0.00050 ^{DLDS}	---	---
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	---	0.00496	---	---



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	01_TSF_W30	01_TSF_W31	01_TSF_W32	01_TSF_W33	02-IF-PAG_W25
Client sampling date / time					07-Jul-2021 07:00	15-Jul-2021 13:25	22-Jul-2021 16:00	29-Jul-2021 13:30	07-Jul-2021 07:00	
Analyte	CAS Number	Method	LOR	Unit	SK2102643-001	SK2102643-002	SK2102643-003	SK2102643-004	SK2102643-005	
					Result	Result	Result	Result	Result	
Dissolved Metals										
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	---	<0.00250 ^{DLDS}	---	---	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	---	---	<0.0050 ^{DLDS}	---	---	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	---	---	<0.00150 ^{DLDS}	---	---	
dissolved metals filtration location	----	EP421	-	-	---	---	Field	---	---	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	02-IF-PAG_W26	02-IF-PAG_W27	02-IF-PAG_W28	03-SED-PAG_W 25	03-SED-PAG_W 26
Client sampling date / time					15-Jul-2021 13:25	22-Jul-2021 16:00	29-Jul-2021 13:30	07-Jul-2021 07:00	15-Jul-2021 13:25	
Analyte	CAS Number	Method	LOR	Unit	SK2102643-006	SK2102643-007	SK2102643-008	SK2102643-009	SK2102643-010	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	----	120	----	----	
conductivity	----	E100	2.0	µS/cm	----	----	511	----	----	
pH	----	E108	0.10	pH units	----	----	7.85	----	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	----	86.8	----	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	----	<1.0	----	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	----	<1.0	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	71.2	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	318	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	<0.0050	----	----	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	----	0.0071	----	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	----	1.08	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	6.08	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	0.338	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	<0.020	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	<0.010	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	153	165	167	58.4	66.9	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	<0.0500	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	----	5.09	----	----	
cation sum	----	EC101	0.10	meq/L	----	----	4.48	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	6.37 ^{IB:INT}	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	88.0 ^{IB:INT}	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	0.0222	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	0.00600	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	0.00057	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	0.0375	----	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	----	<0.000020	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	----	<0.000050	----	----	
boron, dissolved	7440-42-8	E421	0.010	mg/L	----	----	0.088	----	----	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	----	----	0.000062	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	02-IF-PAG_W26	02-IF-PAG_W27	02-IF-PAG_W28	03-SED-PAG_W 25	03-SED-PAG_W 26
Client sampling date / time					15-Jul-2021 13:25	22-Jul-2021 16:00	29-Jul-2021 13:30	07-Jul-2021 07:00	15-Jul-2021 13:25	
Analyte	CAS Number	Method	LOR	Unit	SK2102643-006	SK2102643-007	SK2102643-008	SK2102643-009	SK2102643-010	
					Result	Result	Result	Result	Result	
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	31.4	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	0.000044	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	---	<0.00050	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	<0.00010	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	0.00117	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	<0.030	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	<0.000050	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	0.0134	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	10.1	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	<0.00500	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	0.00345	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	---	<0.00050	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	<0.050	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	9.36	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	0.00775	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	0.000176	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	3.32	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	<0.000010	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	42.4	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	0.205	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	55.8	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	<0.00020	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	0.000012	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	<0.00010	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	0.00720	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	---	<0.00030	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	---	0.00179	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	---	0.00435	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	---	<0.00050	---	---	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	---	---	0.0074	---	---	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	---	---	<0.00030	---	---	
dissolved metals filtration location	---	EP421	-	-	---	---	Field	---	---	



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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID				
					03-SED-PAG_W 27	03-SED-PAG_W 28	04-GAB-NPAG_ W25	04-GAB-NPAG_ W26	04-GAB-NPAG_ W27
Client sampling date / time					22-Jul-2021 16:00	29-Jul-2021 13:30	07-Jul-2021 07:00	15-Jul-2021 13:25	22-Jul-2021 16:00
Analyte	CAS Number	Method	LOR	Unit	SK2102643-011	SK2102643-012	SK2102643-013	SK2102643-014	SK2102643-015
					Result	Result	Result	Result	Result
Physical Tests									
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	105	----	----	----
conductivity	----	E100	2.0	µS/cm	----	341	----	----	----
pH	----	E108	0.10	pH units	----	7.92	----	----	----
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	102	----	----	----
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	<1.0	----	----	----
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	<1.0	----	----	----
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	83.2	----	----	----
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	206	----	----	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	0.0052	----	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	0.0076	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	<0.200	----	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	4.92	----	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L	----	0.549	----	----	----
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	<0.020	----	----	----
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	<0.010	----	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	75.9	80.5	42.8	46.6	48.5
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	<0.0500	----	----	----
Ion Balance									
anion sum	----	EC101	0.10	meq/L	----	3.51	----	----	----
cation sum	----	EC101	0.10	meq/L	----	3.07	----	----	----
ion balance (cation-anion difference)	----	EC101	0.010	%	----	6.69 ^{IB:INT}	----	----	----
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	87.5 ^{IB:INT}	----	----	----
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	0.0498	----	----	----
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	0.00278	----	----	----
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	0.00428	----	----	----
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	0.0217	----	----	----
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	<0.000020	----	----	----
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	<0.000050	----	----	----
boron, dissolved	7440-42-8	E421	0.010	mg/L	----	0.067	----	----	----
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	----	0.0000111	----	----	----



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	03-SED-PAG_W 27	03-SED-PAG_W 28	04-GAB-NPAG_ W25	04-GAB-NPAG_ W26	04-GAB-NPAG_ W27
Client sampling date / time					22-Jul-2021 16:00	29-Jul-2021 13:30	07-Jul-2021 07:00	15-Jul-2021 13:25	22-Jul-2021 16:00	
Analyte	CAS Number	Method	LOR	Unit	SK2102643-011	SK2102643-012	SK2102643-013	SK2102643-014	SK2102643-015	
					Result	Result	Result	Result	Result	
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	25.4	---	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	0.000032	---	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	<0.00050	---	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	0.00012	---	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	0.00302	---	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	<0.030	---	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	<0.000050	---	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	0.0150	---	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	10.1	---	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	0.00515	---	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	0.0144	---	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	0.00058	---	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	<0.050	---	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	10.3	---	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	0.00376	---	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	0.000787	---	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	3.16	---	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	<0.000010	---	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	16.2	---	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	0.134	---	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	26.8	---	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	<0.00020	---	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	0.000014	---	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	<0.00010	---	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	0.00530	---	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	0.00064	---	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	0.00031	---	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	0.00546	---	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	0.00059	---	---	---	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	---	0.0160	---	---	---	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	---	<0.00030	---	---	---	
dissolved metals filtration location	---	EP421	-	-	---	Field	---	---	---	



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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	04-GAB-NPAG_ W28	05-SED-NPAG_ W25	05-SED-NPAG_ W26	05-SED-NPAG_ W27	05-SED-NPAG_ W28
Client sampling date / time					29-Jul-2021 13:30	07-Jul-2021 07:00	15-Jul-2021 13:25	22-Jul-2021 16:00	29-Jul-2021 13:30	
Analyte	CAS Number	Method	LOR	Unit	SK2102643-016	SK2102643-017	SK2102643-018	SK2102643-019	SK2102643-020	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	25.7	----	----	----	62.2	
conductivity	----	E100	2.0	µS/cm	394	----	----	----	270	
pH	----	E108	0.10	pH units	8.24	----	----	----	8.00	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	178	----	----	----	117	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	<1.0	----	----	----	<1.0	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	<1.0	----	----	----	<1.0	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	146	----	----	----	96.2	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	232	----	----	----	158	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.185	----	----	----	0.110	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0092	----	----	----	0.0146	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	<0.200	----	----	----	1.93	
chloride	16887-00-6	E235.Cl	0.50	mg/L	7.16	----	----	----	6.62	
fluoride	16984-48-8	E235.F	0.020	mg/L	0.441	----	----	----	0.678	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.020	----	----	----	<0.020	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	----	----	----	0.030	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	46.1	24.7	26.5	28.8	31.5	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	<0.0500	----	----	----	<0.0500	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	4.10	----	----	----	2.80	
cation sum	----	EC101	0.10	meq/L	3.64	----	----	----	2.49	
ion balance (cation-anion difference)	----	EC101	0.010	%	5.94 ^{IB:INT}	----	----	----	5.86 ^{IB:INT}	
ion balance (cations/anions ratio)	----	EC101	0.010	%	88.8 ^{IB:INT}	----	----	----	88.9 ^{IB:INT}	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0787	----	----	----	0.0685	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00330	----	----	----	0.00256	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.0219	----	----	----	0.163	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0109	----	----	----	0.0151	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	----	----	----	<0.000020	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	----	----	----	<0.000050	
boron, dissolved	7440-42-8	E421	0.010	mg/L	0.084	----	----	----	0.078	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	----	----	----	<0.0000050	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	04-GAB-NPAG_ W28	05-SED-NPAG_ W25	05-SED-NPAG_ W26	05-SED-NPAG_ W27	05-SED-NPAG_ W28
Client sampling date / time					29-Jul-2021 13:30	07-Jul-2021 07:00	15-Jul-2021 13:25	22-Jul-2021 16:00	29-Jul-2021 13:30	
Analyte	CAS Number	Method	LOR	Unit	SK2102643-016	SK2102643-017	SK2102643-018	SK2102643-019	SK2102643-020	
					Result	Result	Result	Result	Result	
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L	6.95	---	---	---	15.8	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000243	---	---	---	0.000064	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	---	---	---	<0.00050	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00014	---	---	---	0.00016	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00183	---	---	---	0.00121	
iron, dissolved	7439-89-6	E421	0.030	mg/L	<0.030	---	---	---	<0.030	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	---	---	---	<0.000050	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0106	---	---	---	0.0102	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	2.02	---	---	---	5.52	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	0.00594	---	---	---	<0.00500	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00426	---	---	---	0.00659	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	---	---	---	0.00065	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	---	---	---	<0.050	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	4.57	---	---	---	7.63	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00297	---	---	---	0.00289	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000938	---	---	---	0.000373	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	2.96	---	---	---	3.12	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	---	---	---	<0.000010	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	68.8	---	---	---	23.9	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0192	---	---	---	0.0666	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	15.7	---	---	---	10.3	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	---	---	---	<0.00020	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.000021	---	---	---	0.000011	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	---	---	---	<0.00010	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	0.00653	---	---	---	0.00788	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	---	---	---	<0.00030	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	0.00087	---	---	---	0.00050	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.0192	---	---	---	0.00784	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	0.00650	---	---	---	0.00214	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0210	---	---	---	0.0070	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	---	---	---	<0.00030	
dissolved metals filtration location	---	EP421	-	-	Field	---	---	---	Field	



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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	06-IF-NPAG_W2 5	06-IF-NPAG_W2 6	06-IF-NPAG_W2 7	06-IF-NPAG_W2 8	07-IF-PAG-CW_ W25
Client sampling date / time					07-Jul-2021 07:00	15-Jul-2021 13:25	22-Jul-2021 16:00	29-Jul-2021 13:30	29-Jul-2021 07:00	
Analyte	CAS Number	Method	LOR	Unit	SK2102643-021	SK2102643-022	SK2102643-023	SK2102643-024	SK2102643-025	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	----	----	70.8	----	
conductivity	----	E100	2.0	µS/cm	----	----	----	338	----	
pH	----	E108	0.10	pH units	----	----	----	8.09	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	----	----	128	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	----	----	<1.0	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	----	----	<1.0	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	----	105	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	----	202	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	----	0.0225	----	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	----	----	0.0072	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	----	----	9.16	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	----	5.31	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	----	0.499	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	----	<0.020	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	----	<0.010	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	41.0	45.5	49.7	53.9	3540	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	----	<0.0500	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	----	----	3.40	----	
cation sum	----	EC101	0.10	meq/L	----	----	----	3.05	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	----	5.43 ^{IB.INT}	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	----	89.7 ^{IB.INT}	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	----	0.0163	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	----	0.0162	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	----	0.00157	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	----	0.0286	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	----	----	<0.000020	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	----	----	<0.000050	----	
boron, dissolved	7440-42-8	E421	0.010	mg/L	----	----	----	0.097	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	06-IF-NPAG_W2 5	06-IF-NPAG_W2 6	06-IF-NPAG_W2 7	06-IF-NPAG_W2 8	07-IF-PAG-CW_ W25
Client sampling date / time					07-Jul-2021 07:00	15-Jul-2021 13:25	22-Jul-2021 16:00	29-Jul-2021 13:30	29-Jul-2021 07:00	
Analyte	CAS Number	Method	LOR	Unit	SK2102643-021	SK2102643-022	SK2102643-023	SK2102643-024	SK2102643-025	
					Result	Result	Result	Result	Result	
Dissolved Metals										
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	---	---	---	<0.000050	---	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	---	19.2	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	---	0.000019	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	---	---	<0.00050	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	---	<0.00010	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	---	0.00130	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	---	<0.030	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	---	<0.000050	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	---	0.0187	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	---	5.55	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	---	<0.00500	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	---	0.00558	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	---	---	0.00406	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	---	<0.050	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	---	17.7	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	---	0.0135	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	---	0.000238	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	---	3.62	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	---	<0.000010	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	---	27.1	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	---	0.207	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	---	18.2	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	---	<0.00020	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	---	0.000011	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	---	<0.00010	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	---	0.00734	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	---	---	<0.00030	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	---	---	0.00090	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	---	---	0.00426	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	---	---	<0.00050	---	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	---	---	---	0.0104	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	06-IF-NPAG_W2 5	06-IF-NPAG_W2 6	06-IF-NPAG_W2 7	06-IF-NPAG_W2 8	07-IF-PAG-CW_ W25
Client sampling date / time					07-Jul-2021 07:00	15-Jul-2021 13:25	22-Jul-2021 16:00	29-Jul-2021 13:30	29-Jul-2021 07:00	
Analyte	CAS Number	Method	LOR	Unit	SK2102643-021	SK2102643-022	SK2102643-023	SK2102643-024	SK2102643-025	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	----	----	<0.00030	----	
dissolved metals filtration location	----	EP421	-	-	----	----	----	Field	----	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	07-IF-PAG-CW_ W26	07-IF-PAG-CW_ W27	07-IF-PAG-CW_ W28	08-SED-PAG-C W_W25	08-SED-PAG-C W_W26
Client sampling date / time					15-Jul-2021 13:25	22-Jul-2021 16:00	29-Jul-2021 13:30	07-Jul-2021 07:00	15-Jul-2021 13:25	
Analyte	CAS Number	Method	LOR	Unit	SK2102643-026	SK2102643-027	SK2102643-028	SK2102643-029	SK2102643-030	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	----	12600	----	----	
conductivity	----	E100	2.0	µS/cm	----	----	78200	----	----	
pH	----	E108	0.10	pH units	----	----	7.37	----	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	----	93.0	----	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	----	<1.0	----	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	----	<1.0	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	76.2	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	55300	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	3.69	----	----	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	----	0.0120	----	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	----	5.15	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	32900	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	<10.0 ^{DLDS}	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	<10.0 ^{DLDS}	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	<5.00 ^{DLDS}	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	3630	3510	3480	3160	3380	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	<11.2	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	----	1000	----	----	
cation sum	----	EC101	0.10	meq/L	----	----	901	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	5.21 ^{IB:INT}	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	90.1 ^{IB:INT}	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	<0.100 ^{DLDS}	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	<0.0100 ^{DLDS}	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	<0.0100 ^{DLDS}	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	0.175	----	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	----	<0.00200 ^{DLDS}	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	----	<0.00500 ^{DLDS}	----	----	
boron, dissolved	7440-42-8	E421	0.010	mg/L	----	----	1.19	----	----	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	----	----	0.00179	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	07-IF-PAG-CW_ W26	07-IF-PAG-CW_ W27	07-IF-PAG-CW_ W28	08-SED-PAG-C W_W25	08-SED-PAG-C W_W26
Client sampling date / time					15-Jul-2021 13:25	22-Jul-2021 16:00	29-Jul-2021 13:30	07-Jul-2021 07:00	15-Jul-2021 13:25	
Analyte	CAS Number	Method	LOR	Unit	SK2102643-026	SK2102643-027	SK2102643-028	SK2102643-029	SK2102643-030	
					Result	Result	Result	Result	Result	
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	1690	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	0.0186	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	---	<0.0500 ^{DLDS}	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	<0.0100 ^{DLDS}	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	<0.0200 ^{DLDS}	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	<3.00 ^{DLDS}	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	<0.00500 ^{DLDS}	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	0.364	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	2040	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	0.610	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	0.0854	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	---	0.0932	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	<5.00 ^{DLDS}	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	517	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	0.436	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	<0.00500 ^{DLDS}	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	<5.00 ^{DLDS}	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	0.00167	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	14600	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	39.2	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	1280	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	<0.0200 ^{DLDS}	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	<0.00100 ^{DLDS}	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	<0.0100 ^{DLDS}	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	<0.0100 ^{DLDS}	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	---	<0.0300 ^{DLDS}	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	---	<0.0100 ^{DLDS}	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	---	0.0115	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	---	<0.0500 ^{DLDS}	---	---	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	---	---	1.08	---	---	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	---	---	<0.0300 ^{DLDS}	---	---	
dissolved metals filtration location	---	EP421	-	-	---	---	Field	---	---	



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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	08-SED-PAG-C W_W27	08-SED-PAG-C W_W28	09-FZONE-NPA G_W25	09-FZONE-NPA G_W26	09-FZONE-NPA G_W27
Client sampling date / time					22-Jul-2021 16:00	29-Jul-2021 13:30	07-Jul-2021 07:00	15-Jul-2021 13:25	22-Jul-2021 16:00	
Analyte	CAS Number	Method	LOR	Unit	SK2102643-031	SK2102643-032	SK2102643-033	SK2102643-034	SK2102643-035	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	12700	----	----	----	
conductivity	----	E100	2.0	µS/cm	----	77500	----	----	----	
pH	----	E108	0.10	pH units	----	7.35	----	----	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	58.0	----	----	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	<1.0	----	----	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	<1.0	----	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	47.5	----	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	53600	----	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	3.97	----	----	----	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	0.0055	----	----	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	4.74	----	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	31600	----	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	<10.0 ^{DLDS}	----	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	<10.0 ^{DLDS}	----	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	<5.00 ^{DLDS}	----	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	3510	3150	28.9	29.4	66.4	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	<11.2	----	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	958	----	----	----	
cation sum	----	EC101	0.10	meq/L	----	898	----	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	3.23	----	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	93.7	----	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	<0.100 ^{DLDS}	----	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	<0.0100 ^{DLDS}	----	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	<0.0100 ^{DLDS}	----	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	0.169	----	----	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	<0.00200 ^{DLDS}	----	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	<0.00500 ^{DLDS}	----	----	----	
boron, dissolved	7440-42-8	E421	0.010	mg/L	----	1.17	----	----	----	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	----	0.00373	----	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	08-SED-PAG-C W_W27	08-SED-PAG-C W_W28	09-FZONE-NPA G_W25	09-FZONE-NPA G_W26	09-FZONE-NPA G_W27
Client sampling date / time					22-Jul-2021 16:00	29-Jul-2021 13:30	07-Jul-2021 07:00	15-Jul-2021 13:25	22-Jul-2021 16:00	
Analyte	CAS Number	Method	LOR	Unit	SK2102643-031	SK2102643-032	SK2102643-033	SK2102643-034	SK2102643-035	
					Result	Result	Result	Result	Result	
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	1720	---	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	0.00998	---	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	<0.0500 DLDS	---	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	0.0335	---	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	<0.0200 DLDS	---	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	<3.00 DLDS	---	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	<0.00500 DLDS	---	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	0.312	---	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	2040	---	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	<0.500 DLDS	---	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	0.0181	---	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	0.135	---	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	<5.00 DLDS	---	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	514	---	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	0.204	---	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	<0.00500 DLDS	---	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	<5.00 DLDS	---	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	0.00261	---	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	14500	---	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	39.3	---	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	1260	---	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	<0.0200 DLDS	---	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	<0.00100 DLDS	---	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	<0.0100 DLDS	---	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	<0.0100 DLDS	---	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	<0.0300 DLDS	---	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	<0.0100 DLDS	---	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	0.0188	---	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	<0.0500 DLDS	---	---	---	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	---	<0.100 DLDS	---	---	---	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	---	<0.0300 DLDS	---	---	---	
dissolved metals filtration location	---	EP421	-	-	---	Field	---	---	---	



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



Analytical Results

Sub-Matrix: Water					Client sample ID	09-FZONE-NPA	----	----	----	----
(Matrix: Water)						G_W28				
					Client sampling date / time	29-Jul-2021 13:30	---	---	---	---
Analyte	CAS Number	Method	LOR	Unit	SK2102643-036	-----	-----	-----	-----	
					Result	---	---	---	---	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	83.2	---	---	---	---	
conductivity	----	E100	2.0	µS/cm	300	---	---	---	---	
pH	----	E108	0.10	pH units	8.03	---	---	---	---	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	116	---	---	---	---	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	<1.0	---	---	---	---	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	<1.0	---	---	---	---	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	95.4	---	---	---	---	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	149	---	---	---	---	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	---	---	---	---	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0158	---	---	---	---	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	1.15	---	---	---	---	
chloride	16887-00-6	E235.Cl	0.50	mg/L	4.42	---	---	---	---	
fluoride	16984-48-8	E235.F	0.020	mg/L	0.594	---	---	---	---	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.020	---	---	---	---	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	---	---	---	---	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	30.2	---	---	---	---	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	<0.0500	---	---	---	---	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	2.69	---	---	---	---	
cation sum	----	EC101	0.10	meq/L	2.38	---	---	---	---	
ion balance (cation-anion difference)	----	EC101	0.010	%	6.11 ^{IB:INT}	---	---	---	---	
ion balance (cations/anions ratio)	----	EC101	0.010	%	88.5 ^{IB:INT}	---	---	---	---	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0326	---	---	---	---	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00558	---	---	---	---	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00241	---	---	---	---	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0209	---	---	---	---	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	---	---	---	---	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	---	---	---	---	
boron, dissolved	7440-42-8	E421	0.010	mg/L	0.064	---	---	---	---	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	---	---	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	09-FZONE-NPA G_W28	----	----	----	----
Client sampling date / time					29-Jul-2021 13:30	----	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	SK2102643-036	-----	-----	-----	-----	
					Result	---	---	---	---	
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L	20.3	---	---	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	---	---	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	---	---	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.00010	---	---	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00154	---	---	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	<0.030	---	---	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	---	---	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0060	---	---	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	7.89	---	---	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	<0.00500	---	---	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00332	---	---	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00059	---	---	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	---	---	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	6.76	---	---	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00112	---	---	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000387	---	---	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	3.34	---	---	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	---	---	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	12.4	---	---	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0478	---	---	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	10.2	---	---	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	---	---	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	---	---	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	---	---	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	0.0193	---	---	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	---	---	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	0.00020	---	---	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.00161	---	---	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	0.00069	---	---	---	---	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0010	---	---	---	---	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	---	---	---	---	
dissolved metals filtration location	----	EP421	-	-	Field	---	---	---	---	



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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: SK2102643	Page	: 1 of 23
Client	: O'Kane Consultants Inc.	Laboratory	: Saskatoon - Environmental
Contact	: Jared Robertson	Account Manager	: Brian Morgan
Address	: 112 - 112 Research Drive Saskatoon SK Canada S7N 3R3	Address	: 819 58 Street East Saskatoon, Saskatchewan Canada S7K 6X5
Telephone	: 250 420 7010	Telephone	: 1 306 221 7147
Project	: 948-021	Date Samples Received	: 29-Jul-2021 13:30
PO	: ----	Issue Date	: 09-Aug-2021 17:34
C-O-C number	: ----		
Sampler	: Client		
Site	: ----		
Quote number	: Q83455		
No. of samples received	: 36		
No. of samples analysed	: 36		

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 Services number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- Matrix Spike outliers occur - please see following pages for full details.
- 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.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Matrix Spike (MS) Recoveries								
Anions and Nutrients	SK2102643-003	01_TSF_W32	fluoride	16984-48-8	E235.F	66.5 % ^K	75.0-125%	Recovery less than lower data quality objective

Result Qualifiers

Qualifier	Description
K	Matrix Spike recovery outside ALS DQO due to sample matrix effects.



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		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 01-TSF_W32	E298	22-Jul-2021	03-Aug-2021	----	----		03-Aug-2021	28 days	12 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 02-IF-PAG_W28	E298	29-Jul-2021	03-Aug-2021	----	----		03-Aug-2021	28 days	5 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 03-SED-PAG_W28	E298	29-Jul-2021	03-Aug-2021	----	----		03-Aug-2021	28 days	5 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 04-GAB-NPAG_W28	E298	29-Jul-2021	03-Aug-2021	----	----		03-Aug-2021	28 days	5 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 05-SED-NPAG_W28	E298	29-Jul-2021	03-Aug-2021	----	----		03-Aug-2021	28 days	5 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 06-IF-NPAG_W28	E298	29-Jul-2021	03-Aug-2021	----	----		03-Aug-2021	28 days	5 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 07-IF-PAG-CW_W28	E298	29-Jul-2021	03-Aug-2021	----	----		03-Aug-2021	28 days	5 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 08-SED-PAG-CW_W28	E298	29-Jul-2021	03-Aug-2021	----	----		03-Aug-2021	28 days	5 days	✔	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 09-FZONE-NPAG_W28	E298	29-Jul-2021	03-Aug-2021	----	----		03-Aug-2021	28 days	5 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 02-IF-PAG_W28	E235.Cl	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 03-SED-PAG_W28	E235.Cl	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 04-GAB-NPAG_W28	E235.Cl	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 05-SED-NPAG_W28	E235.Cl	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 06-IF-NPAG_W28	E235.Cl	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 07-IF-PAG-CW_W28	E235.Cl	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 08-SED-PAG-CW_W28	E235.Cl	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Chloride in Water by IC											
HDPE 09-FZONE-NPAG_W28	E235.Cl	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 01_TSF_W32	E235.Cl	22-Jul-2021	----	----	----		30-Jul-2021	28 days	8 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 02-IF-PAG_W28	E235.F	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 03-SED-PAG_W28	E235.F	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 04-GAB-NPAG_W28	E235.F	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 05-SED-NPAG_W28	E235.F	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 06-IF-NPAG_W28	E235.F	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 07-IF-PAG-CW_W28	E235.F	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 08-SED-PAG-CW_W28	E235.F	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days	✔	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Fluoride in Water by IC											
HDPE 09-FZONE-NPAG_W28	E235.F	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days	✓	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 01_TSF_W32	E235.F	22-Jul-2021	----	----	----		30-Jul-2021	28 days	8 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 02-IF-PAG_W28	E235.NO3	29-Jul-2021	----	----	----		30-Jul-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 03-SED-PAG_W28	E235.NO3	29-Jul-2021	----	----	----		30-Jul-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 04-GAB-NPAG_W28	E235.NO3	29-Jul-2021	----	----	----		30-Jul-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 05-SED-NPAG_W28	E235.NO3	29-Jul-2021	----	----	----		30-Jul-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 06-IF-NPAG_W28	E235.NO3	29-Jul-2021	----	----	----		30-Jul-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 07-IF-PAG-CW_W28	E235.NO3	29-Jul-2021	----	----	----		30-Jul-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 08-SED-PAG-CW_W28	E235.NO3	29-Jul-2021	----	----	----		30-Jul-2021	3 days	1 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrate in Water by IC											
HDPE 09-FZONE-NPAG_W28	E235.NO3	29-Jul-2021	----	----	----		30-Jul-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 01_TSF_W32	E235.NO3	22-Jul-2021	----	----	----		30-Jul-2021	3 days	8 days	* EHTR	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 02-IF-PAG_W28	E235.NO2	29-Jul-2021	----	----	----		30-Jul-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 03-SED-PAG_W28	E235.NO2	29-Jul-2021	----	----	----		30-Jul-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 04-GAB-NPAG_W28	E235.NO2	29-Jul-2021	----	----	----		30-Jul-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 05-SED-NPAG_W28	E235.NO2	29-Jul-2021	----	----	----		30-Jul-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 06-IF-NPAG_W28	E235.NO2	29-Jul-2021	----	----	----		30-Jul-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 07-IF-PAG-CW_W28	E235.NO2	29-Jul-2021	----	----	----		30-Jul-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 08-SED-PAG-CW_W28	E235.NO2	29-Jul-2021	----	----	----		30-Jul-2021	3 days	1 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrite in Water by IC											
HDPE 09-FZONE-NPAG_W28	E235.NO2	29-Jul-2021	----	----	----		30-Jul-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 01_TSF_W32	E235.NO2	22-Jul-2021	----	----	----		30-Jul-2021	3 days	8 days	* EHTR	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 02-IF-PAG_W28	E235.SO4	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 03-SED-PAG_W28	E235.SO4	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 04-GAB-NPAG_W28	E235.SO4	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 05-SED-NPAG_W28	E235.SO4	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 06-IF-NPAG_W28	E235.SO4	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 07-IF-PAG-CW_W28	E235.SO4	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 08-SED-PAG-CW_W28	E235.SO4	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Sulfate in Water by IC											
HDPE 09-FZONE-NPAG_W28	E235.S04	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 01_TSF_W31	E235.S04	15-Jul-2021	----	----	----		31-Jul-2021	28 days	16 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 02-IF-PAG_W26	E235.S04	15-Jul-2021	----	----	----		31-Jul-2021	28 days	16 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 03-SED-PAG_W26	E235.S04	15-Jul-2021	----	----	----		31-Jul-2021	28 days	16 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 04-GAB-NPAG_W26	E235.S04	15-Jul-2021	----	----	----		31-Jul-2021	28 days	16 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 05-SED-NPAG_W26	E235.S04	15-Jul-2021	----	----	----		31-Jul-2021	28 days	16 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 06-IF-NPAG_W26	E235.S04	15-Jul-2021	----	----	----		31-Jul-2021	28 days	16 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 07-IF-PAG-CW_W26	E235.S04	15-Jul-2021	----	----	----		31-Jul-2021	28 days	16 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 08-SED-PAG-CW_W26	E235.S04	15-Jul-2021	----	----	----		31-Jul-2021	28 days	16 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Sulfate in Water by IC										
HDPE 09-FZONE-NPAG_W26	E235.S04	15-Jul-2021	----	----	----		31-Jul-2021	28 days	16 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 07-IF-PAG-CW_W25	E235.S04	29-Jul-2021	----	----	----		31-Jul-2021	28 days	2 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W33	E235.S04	29-Jul-2021	----	----	----		31-Jul-2021	28 days	2 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W30	E235.S04	07-Jul-2021	----	----	----		30-Jul-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 02-IF-PAG_W25	E235.S04	07-Jul-2021	----	----	----		30-Jul-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 03-SED-PAG_W25	E235.S04	07-Jul-2021	----	----	----		30-Jul-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 04-GAB-NPAG_W25	E235.S04	07-Jul-2021	----	----	----		30-Jul-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 05-SED-NPAG_W25	E235.S04	07-Jul-2021	----	----	----		30-Jul-2021	28 days	23 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 06-IF-NPAG_W25	E235.S04	07-Jul-2021	----	----	----		30-Jul-2021	28 days	23 days	✔



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Sulfate in Water by IC											
HDPE 08-SED-PAG-CW_W25	E235.S04	07-Jul-2021	----	----	----		30-Jul-2021	28 days	23 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 09-FZONE-NPAG_W25	E235.S04	07-Jul-2021	----	----	----		30-Jul-2021	28 days	23 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 01_TSF_W32	E235.S04	22-Jul-2021	----	----	----		30-Jul-2021	28 days	8 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 02-IF-PAG_W27	E235.S04	22-Jul-2021	----	----	----		31-Jul-2021	28 days	9 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 03-SED-PAG_W27	E235.S04	22-Jul-2021	----	----	----		31-Jul-2021	28 days	9 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 04-GAB-NPAG_W27	E235.S04	22-Jul-2021	----	----	----		31-Jul-2021	28 days	9 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 05-SED-NPAG_W27	E235.S04	22-Jul-2021	----	----	----		31-Jul-2021	28 days	9 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 06-IF-NPAG_W27	E235.S04	22-Jul-2021	----	----	----		31-Jul-2021	28 days	9 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 07-IF-PAG-CW_W27	E235.S04	22-Jul-2021	----	----	----		31-Jul-2021	28 days	9 days	✔	



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Sulfate in Water by IC											
HDPE 08-SED-PAG-CW_W27	E235.SO4	22-Jul-2021	----	----	----		31-Jul-2021	28 days	9 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 09-FZONE-NPAG_W27	E235.SO4	22-Jul-2021	----	----	----		31-Jul-2021	28 days	9 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 01_TSF_W32	E318	22-Jul-2021	04-Aug-2021	----	----		04-Aug-2021	28 days	13 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 02-IF-PAG_W28	E318	29-Jul-2021	03-Aug-2021	----	----		03-Aug-2021	28 days	5 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 03-SED-PAG_W28	E318	29-Jul-2021	03-Aug-2021	----	----		03-Aug-2021	28 days	5 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 04-GAB-NPAG_W28	E318	29-Jul-2021	03-Aug-2021	----	----		03-Aug-2021	28 days	5 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 05-SED-NPAG_W28	E318	29-Jul-2021	03-Aug-2021	----	----		03-Aug-2021	28 days	5 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 06-IF-NPAG_W28	E318	29-Jul-2021	03-Aug-2021	----	----		03-Aug-2021	28 days	5 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 07-IF-PAG-CW_W28	E318	29-Jul-2021	03-Aug-2021	----	----		03-Aug-2021	28 days	5 days	✓	



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 08-SED-PAG-CW_W28	E318	29-Jul-2021	03-Aug-2021	----	----		03-Aug-2021	28 days	5 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 09-FZONE-NPAG_W28	E318	29-Jul-2021	03-Aug-2021	----	----		03-Aug-2021	28 days	5 days	✓	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 01_TSF_W32	E372-U	22-Jul-2021	05-Aug-2021	----	----		05-Aug-2021	28 days	14 days	✓	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 02-IF-PAG_W28	E372-U	29-Jul-2021	05-Aug-2021	----	----		05-Aug-2021	28 days	7 days	✓	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 03-SED-PAG_W28	E372-U	29-Jul-2021	05-Aug-2021	----	----		05-Aug-2021	28 days	7 days	✓	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 04-GAB-NPAG_W28	E372-U	29-Jul-2021	05-Aug-2021	----	----		05-Aug-2021	28 days	7 days	✓	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 05-SED-NPAG_W28	E372-U	29-Jul-2021	05-Aug-2021	----	----		05-Aug-2021	28 days	7 days	✓	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 06-IF-NPAG_W28	E372-U	29-Jul-2021	05-Aug-2021	----	----		05-Aug-2021	28 days	7 days	✓	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 07-IF-PAG-CW_W28	E372-U	29-Jul-2021	05-Aug-2021	----	----		05-Aug-2021	28 days	7 days	✓	



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 08-SED-PAG-CW_W28	E372-U	29-Jul-2021	05-Aug-2021	----	----		05-Aug-2021	28 days	7 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 09-FZONE-NPAG_W28	E372-U	29-Jul-2021	05-Aug-2021	----	----		05-Aug-2021	28 days	7 days	✔	
Cyanides : Total Cyanide by CFA											
UV inhibited HDPE - total (sodium hydroxide) 01_TSF_W32	E333	22-Jul-2021	----	----	----		04-Aug-2021	14 days	13 days	✔	
Cyanides : WAD Cyanide by CFA											
UV inhibited HDPE - total (sodium hydroxide) 01_TSF_W32	E336	22-Jul-2021	----	----	----		04-Aug-2021	14 days	13 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 02-IF-PAG_W28	E421	29-Jul-2021	30-Jul-2021	----	----		30-Jul-2021	180 days	1 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 03-SED-PAG_W28	E421	29-Jul-2021	30-Jul-2021	----	----		30-Jul-2021	180 days	1 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 04-GAB-NPAG_W28	E421	29-Jul-2021	30-Jul-2021	----	----		30-Jul-2021	180 days	1 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 05-SED-NPAG_W28	E421	29-Jul-2021	30-Jul-2021	----	----		30-Jul-2021	180 days	1 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 06-IF-NPAG_W28	E421	29-Jul-2021	30-Jul-2021	----	----		30-Jul-2021	180 days	1 days	✔	



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 07-IF-PAG-CW_W28	E421	29-Jul-2021	30-Jul-2021	----	----		30-Jul-2021	180 days	1 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 08-SED-PAG-CW_W28	E421	29-Jul-2021	30-Jul-2021	----	----		30-Jul-2021	180 days	1 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 09-FZONE-NPAG_W28	E421	29-Jul-2021	30-Jul-2021	----	----		30-Jul-2021	180 days	1 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 01_TSF_W32	E421	22-Jul-2021	30-Jul-2021	----	----		30-Jul-2021	180 days	8 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 02-IF-PAG_W28	E290	29-Jul-2021	----	----	----		30-Jul-2021	14 days	1 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 03-SED-PAG_W28	E290	29-Jul-2021	----	----	----		30-Jul-2021	14 days	1 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 04-GAB-NPAG_W28	E290	29-Jul-2021	----	----	----		30-Jul-2021	14 days	1 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 05-SED-NPAG_W28	E290	29-Jul-2021	----	----	----		30-Jul-2021	14 days	1 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 06-IF-NPAG_W28	E290	29-Jul-2021	----	----	----		30-Jul-2021	14 days	1 days	✓	



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Physical Tests : Alkalinity Species by Titration											
HDPE 07-IF-PAG-CW_W28	E290	29-Jul-2021	----	----	----		30-Jul-2021	14 days	1 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 08-SED-PAG-CW_W28	E290	29-Jul-2021	----	----	----		30-Jul-2021	14 days	1 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 09-FZONE-NPAG_W28	E290	29-Jul-2021	----	----	----		30-Jul-2021	14 days	1 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 01_TSF_W32	E290	22-Jul-2021	----	----	----		30-Jul-2021	14 days	8 days	✓	
Physical Tests : Conductivity in Water											
HDPE 02-IF-PAG_W28	E100	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days	✓	
Physical Tests : Conductivity in Water											
HDPE 03-SED-PAG_W28	E100	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days	✓	
Physical Tests : Conductivity in Water											
HDPE 04-GAB-NPAG_W28	E100	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days	✓	
Physical Tests : Conductivity in Water											
HDPE 05-SED-NPAG_W28	E100	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days	✓	
Physical Tests : Conductivity in Water											
HDPE 06-IF-NPAG_W28	E100	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days	✓	



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Physical Tests : Conductivity in Water											
HDPE 07-IF-PAG-CW_W28	E100	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days		✓
Physical Tests : Conductivity in Water											
HDPE 08-SED-PAG-CW_W28	E100	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days		✓
Physical Tests : Conductivity in Water											
HDPE 09-FZONE-NPAG_W28	E100	29-Jul-2021	----	----	----		30-Jul-2021	28 days	1 days		✓
Physical Tests : Conductivity in Water											
HDPE 01_TSF_W32	E100	22-Jul-2021	----	----	----		30-Jul-2021	28 days	8 days		✓
Physical Tests : pH by Meter											
HDPE 01_TSF_W32	E108	22-Jul-2021	----	----	----		30-Jul-2021	0.25 hrs	187 hrs		* EHTR-FM
Physical Tests : pH by Meter											
HDPE 02-IF-PAG_W28	E108	29-Jul-2021	----	----	----		30-Jul-2021	0.25 hrs	22 hrs		* EHTL
Physical Tests : pH by Meter											
HDPE 03-SED-PAG_W28	E108	29-Jul-2021	----	----	----		30-Jul-2021	0.25 hrs	22 hrs		* EHTL
Physical Tests : pH by Meter											
HDPE 04-GAB-NPAG_W28	E108	29-Jul-2021	----	----	----		30-Jul-2021	0.25 hrs	22 hrs		* EHTL
Physical Tests : pH by Meter											
HDPE 05-SED-NPAG_W28	E108	29-Jul-2021	----	----	----		30-Jul-2021	0.25 hrs	22 hrs		* EHTL



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : pH by Meter										
HDPE 06-IF-NPAG_W28	E108	29-Jul-2021	----	----	----		30-Jul-2021	0.25 hrs	22 hrs	* EHTL
Physical Tests : pH by Meter										
HDPE 07-IF-PAG-CW_W28	E108	29-Jul-2021	----	----	----		30-Jul-2021	0.25 hrs	22 hrs	* EHTL
Physical Tests : pH by Meter										
HDPE 08-SED-PAG-CW_W28	E108	29-Jul-2021	----	----	----		30-Jul-2021	0.25 hrs	22 hrs	* EHTL
Physical Tests : pH by Meter										
HDPE 09-FZONE-NPAG_W28	E108	29-Jul-2021	----	----	----		30-Jul-2021	0.25 hrs	22 hrs	* EHTL

Legend & Qualifier Definitions

- EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
- EHTR: Exceeded ALS recommended hold time prior to sample receipt.
- EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
- 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	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	255518	1	12	8.3	5.0	✓
Ammonia by Fluorescence	E298	257308	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	255510	1	13	7.6	5.0	✓
Conductivity in Water	E100	255517	1	12	8.3	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	255513	1	17	5.8	5.0	✓
Fluoride in Water by IC	E235.F	255512	1	10	10.0	5.0	✓
Nitrate in Water by IC	E235.NO3	255508	1	16	6.2	5.0	✓
Nitrite in Water by IC	E235.NO2	255511	1	16	6.2	5.0	✓
pH by Meter	E108	255519	1	12	8.3	5.0	✓
Sulfate in Water by IC	E235.SO4	255509	4	68	5.8	5.0	✓
Total Cyanide by CFA	E333	258554	1	9	11.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	256655	3	31	9.6	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	258018	2	29	6.9	5.0	✓
WAD Cyanide by CFA	E336	258553	1	10	10.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	255518	1	12	8.3	5.0	✓
Ammonia by Fluorescence	E298	257308	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	255510	1	13	7.6	5.0	✓
Conductivity in Water	E100	255517	1	12	8.3	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	255513	1	17	5.8	5.0	✓
Fluoride in Water by IC	E235.F	255512	1	10	10.0	5.0	✓
Nitrate in Water by IC	E235.NO3	255508	1	16	6.2	5.0	✓
Nitrite in Water by IC	E235.NO2	255511	1	16	6.2	5.0	✓
pH by Meter	E108	255519	1	12	8.3	5.0	✓
Sulfate in Water by IC	E235.SO4	255509	4	68	5.8	5.0	✓
Total Cyanide by CFA	E333	258554	1	9	11.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	256655	3	31	9.6	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	258018	2	29	6.9	5.0	✓
WAD Cyanide by CFA	E336	258553	1	10	10.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	255518	1	12	8.3	5.0	✓
Ammonia by Fluorescence	E298	257308	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	255510	1	13	7.6	5.0	✓
Conductivity in Water	E100	255517	1	12	8.3	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	255513	1	17	5.8	5.0	✓
Fluoride in Water by IC	E235.F	255512	1	10	10.0	5.0	✓
Nitrate in Water by IC	E235.NO3	255508	1	16	6.2	5.0	✓



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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
<i>Analytical Methods</i>							
Method Blanks (MB) - Continued							
Nitrite in Water by IC	E235.NO2	255511	1	16	6.2	5.0	✓
Sulfate in Water by IC	E235.SO4	255509	4	68	5.8	5.0	✓
Total Cyanide by CFA	E333	258554	1	9	11.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	256655	3	31	9.6	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	258018	2	29	6.9	5.0	✓
WAD Cyanide by CFA	E336	258553	1	10	10.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	257308	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	255510	1	13	7.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	255513	1	17	5.8	5.0	✓
Fluoride in Water by IC	E235.F	255512	1	10	10.0	5.0	✓
Nitrate in Water by IC	E235.NO3	255508	1	16	6.2	5.0	✓
Nitrite in Water by IC	E235.NO2	255511	1	16	6.2	5.0	✓
Sulfate in Water by IC	E235.SO4	255509	4	68	5.8	5.0	✓
Total Cyanide by CFA	E333	258554	1	9	11.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	256655	3	31	9.6	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	258018	2	29	6.9	5.0	✓
WAD Cyanide by CFA	E336	258553	1	10	10.0	5.0	✓



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Saskatoon - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Saskatoon - 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.
Chloride in Water by IC	E235.Cl Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Saskatoon - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Total Kjeldahl Nitrogen is determined using block digestion followed by flow-injection analysis with fluorescence detection.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Cyanide by CFA	E333 Vancouver - Environmental	Water	ISO 14403 (mod)	Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.
WAD Cyanide by CFA	E336 Vancouver - Environmental	Water	APHA 4500-CN I (mod)	Weak Acid Dissociable (WAD) cyanide is determined by in-line sample distillation with final determination by colourimetric analysis.
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Metals in Water by CRC ICPMS	E421 Saskatoon - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Hardness (Calculated)	EC100 Saskatoon - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Ion Balance using Dissolved Metals	EC101 Saskatoon - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
TDS in Water (Calculation)	EC103 Saskatoon - Environmental	Water	APHA 1030E (mod)	Total Dissolved Solids is calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Saskatoon - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested using block digestion with Copper Sulfate Digestion Reagent.
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

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Client : O'Kane Consultants Inc.
Project : 948-021



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Dissolved Metals Water Filtration	EP421 Saskatoon - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

QUALITY CONTROL REPORT

Work Order : **SK2102643**

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Client : O'Kane Consultants Inc.
 Contact : Jared Robertson
 Address : 112 - 112 Research Drive
 Saskatoon SK Canada S7N 3R3
 Telephone : 250 420 7010
 Project : 948-021
 PO : ----
 C-O-C number : ----
 Sampler : Client
 Site : ----
 Quote number : Q83455
 No. of samples received : 36
 No. of samples analysed : 36

Laboratory : Saskatoon - Environmental
 Account Manager : Brian Morgan
 Address : 819 58 Street East
 Saskatoon, Saskatchewan Canada S7K 6X5
 Telephone : 1 306 221 7147
 Date Samples Received : 29-Jul-2021 13:30
 Date Analysis Commenced : 30-Jul-2021
 Issue Date : 09-Aug-2021 17:34

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 Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Colby Bingham	Quality Systems Coordinator	Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Quality Systems Coordinator	Metals, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Melissa Houseman	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Melissa Houseman	Team Leader - Inorganics	Metals, Saskatoon, Saskatchewan
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta

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Work Order : SK2102643
Client : O'Kane Consultants Inc.
Project : 948-021



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 Services number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

= Indicates a QC result that did not meet the ALS DQO.



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: 255517)											
SK2102633-001	Anonymous	conductivity	----	E100	2.0	µS/cm	457	456	0.219%	10%	----
Physical Tests (QC Lot: 255518)											
SK2102633-001	Anonymous	alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	159	159	0.0646%	20%	----
Physical Tests (QC Lot: 255519)											
SK2102633-001	Anonymous	pH	----	E108	0.10	pH units	8.41	8.37	0.491%	3%	----
Anions and Nutrients (QC Lot: 255508)											
RG2100312-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 255509)											
RG2100312-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	150	151	1.09%	20%	----
Anions and Nutrients (QC Lot: 255510)											
RG2100312-001	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	10.3	9.96	3.36%	20%	----
Anions and Nutrients (QC Lot: 255511)											
RG2100312-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 255512)											
RG2100312-001	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.076	0.082	0.005	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 255531)											
SK2102630-005	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	15.0	mg/L	848	833	1.72%	20%	----
Anions and Nutrients (QC Lot: 255737)											
SK2102561-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	<0.30	<0.30	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 255882)											
SK2102664-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	387	386	0.333%	20%	----
Anions and Nutrients (QC Lot: 256655)											
CG2102911-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.107	0.140	0.033	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 256656)											
SK2102643-028	07-IF-PAG-CW_W28	Kjeldahl nitrogen, total [TKN]	----	E318	0.500	mg/L	5.15	4.34	0.810	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 257221)											
RG2100311-003	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	1.66	1.59	0.067	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 257308)											
CG2102942-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.500	mg/L	11.9	12.2	2.84%	20%	----
Anions and Nutrients (QC Lot: 258018)											
CG2102978-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0200	mg/L	0.532	0.523	1.79%	20%	----



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
Anions and Nutrients (QC Lot: 258019)											
SK2102646-001	Anonymous	phosphorus, total	7723-14-0	E372-U	2.00	mg/L	96.4	97.5	1.14%	20%	----
Cyanides (QC Lot: 258553)											
SK2102643-003	01_TSF_W32	cyanide, weak acid dissociable	----	E336	0.0100	mg/L	0.0142	0.0161	0.0019	Diff <2x LOR	----
Cyanides (QC Lot: 258554)											
SK2102643-003	01_TSF_W32	cyanide, strong acid dissociable (total)	----	E333	0.0100	mg/L	0.326	0.382	15.9%	20%	----
Dissolved Metals (QC Lot: 255513)											
SK2102635-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0100	mg/L	0.0193	0.0204	0.0012	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00100	mg/L	0.00713	0.00726	0.00013	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.00100	mg/L	0.0188	0.0179	4.92%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000200	mg/L	<0.000200	<0.000200	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.100	mg/L	0.246	0.255	0.008	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.0000500	mg/L	<0.0000500	<0.0000500	0	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.500	mg/L	518	527	1.67%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00100	mg/L	0.00731	0.00753	0.00022	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.100	mg/L	20.3	20.8	2.33%	20%	----
		lead, dissolved	7439-92-1	E421	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0100	mg/L	0.797	0.783	1.80%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.0500	mg/L	746	786	5.16%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00100	mg/L	3.20	3.21	0.481%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000500	mg/L	0.00301	0.00286	0.000149	Diff <2x LOR	----
		nickel, dissolved	7440-02-0	E421	0.00500	mg/L	0.0163	0.0164	0.00004	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	0.500	mg/L	<0.500	<0.500	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.500	mg/L	12.5	12.9	3.06%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		silicon, dissolved	7440-21-3	E421	0.500	mg/L	14.9	14.8	0.373%	20%	----
		silver, dissolved	7440-22-4	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		sodium, dissolved	17341-25-2	E421	0.500	mg/L	991	1010	2.20%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00200	mg/L	4.00	3.85	3.69%	20%	----
		sulfur, dissolved	7704-34-9	E421	5.00	mg/L	1540	1530	1.21%	20%	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	<i>Original Result</i>	<i>Duplicate Result</i>	<i>RPD(%) or Difference</i>	<i>Duplicate Limits</i>	<i>Qualifier</i>
Dissolved Metals (QC Lot: 255513) - continued											
SK2102635-001	Anonymous	tellurium, dissolved	13494-80-9	E421	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00300	mg/L	<0.00300	<0.00300	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000100	mg/L	0.0235	0.0244	3.96%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00300	mg/L	0.00636	0.00606	0.00029	Diff <2x LOR	----



Method Blank (MB) Report

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

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 255517)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 255518)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Anions and Nutrients (QCLot: 255508)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 255509)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 255510)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 255511)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 255512)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 255531)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 255737)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 255882)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 256655)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 256656)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 257221)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 257308)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 258018)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 258019)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Cyanides (QCLot: 258553)						
cyanide, weak acid dissociable	----	E336	0.002	mg/L	<0.0020	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Cyanides (QCLot: 258554)						
cyanide, strong acid dissociable (total)	---	E333	0.002	mg/L	<0.0020	---
Dissolved Metals (QCLot: 255513)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	---
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	---
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	---
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	---
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	---
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	---
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	---
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	---
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	---
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	---
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	---
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	---
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	---
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	---
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	---
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	---
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	---
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	---
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	---
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	---
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	---
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	---
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	---
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	---
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	---
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	---
sodium, dissolved	17341-25-2	E421	0.05	mg/L	<0.050	---
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	---
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	---
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	---
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	---
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	---
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	---
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	---



Sub-Matrix: **Water**

<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	<i>Result</i>	<i>Qualifier</i>
Dissolved Metals (QCLot: 255513) - continued						
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----



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 Concentration	Recovery (%) LCS	Recovery Limits (%)		Qualifier
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 255517)									
conductivity	----	E100	1	µS/cm	1000 µS/cm	99.6	90.0	110	----
Physical Tests (QCLot: 255518)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	101	85.0	115	----
Physical Tests (QCLot: 255519)									
pH	----	E108	----	pH units	6.86 pH units	99.5	98.0	102	----
Anions and Nutrients (QCLot: 255508)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 255509)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 255510)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 255511)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	99.9	90.0	110	----
Anions and Nutrients (QCLot: 255512)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	97.4	90.0	110	----
Anions and Nutrients (QCLot: 255531)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	106	90.0	110	----
Anions and Nutrients (QCLot: 255737)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 255882)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	106	90.0	110	----
Anions and Nutrients (QCLot: 256655)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 256656)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	108	75.0	125	----
Anions and Nutrients (QCLot: 257221)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 257308)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	111	85.0	115	----
Anions and Nutrients (QCLot: 258018)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.32 mg/L	98.5	80.0	120	----
Anions and Nutrients (QCLot: 258019)									



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 258019) - continued									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.32 mg/L	94.8	80.0	120	----
Cyanides (QCLot: 258553)									
cyanide, weak acid dissociable	----	E336	0.002	mg/L	0.125 mg/L	104	80.0	120	----
Cyanides (QCLot: 258554)									
cyanide, strong acid dissociable (total)	----	E333	0.002	mg/L	0.25 mg/L	90.6	80.0	120	----
Dissolved Metals (QCLot: 255513)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	99.9	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	97.7	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	98.0	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	101	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	101	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	96.1	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	97.0	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	99.3	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	91.0	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	98.8	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	97.8	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	98.6	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	110	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	101	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	115	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	102	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	101	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	100	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	96.4	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	108	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	97.7	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	102	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	93.2	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	98.7	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	96.4	80.0	120	----
sodium, dissolved	17341-25-2	E421	0.05	mg/L	50 mg/L	95.5	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	105	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	101	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	93.9	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 255513) - continued									
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	101	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	94.4	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	96.1	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	98.9	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	97.7	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	94.5	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	99.5	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	95.6	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	105	80.0	120	----



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: 255508)										
SK2102643-003	01_TSF_W32	nitrate (as N)	14797-55-8	E235.NO3	ND mg/L	2.5 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 255509)										
SK2102643-003	01_TSF_W32	sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	90.0	110	----
Anions and Nutrients (QCLot: 255510)										
SK2102643-003	01_TSF_W32	chloride	16887-00-6	E235.Cl	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 255511)										
SK2102643-003	01_TSF_W32	nitrite (as N)	14797-65-0	E235.NO2	ND mg/L	0.5 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 255512)										
SK2102643-003	01_TSF_W32	fluoride	16984-48-8	E235.F	0.665 mg/L	1 mg/L	66.5	75.0	125	K
Anions and Nutrients (QCLot: 255531)										
SK2102631-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	90.0	110	----
Anions and Nutrients (QCLot: 255737)										
SK2102561-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	100 mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 255882)										
SK2102664-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	101 mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 256655)										
CG2102911-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.55 mg/L	2.5 mg/L	102	70.0	130	----
Anions and Nutrients (QCLot: 256656)										
SK2102643-032	08-SED-PAG-CW_W28	Kjeldahl nitrogen, total [TKN]	----	E318	ND mg/L	2.5 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 257221)										
RG2100311-004	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	ND mg/L	2.5 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 257308)										
CG2102962-006	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0996 mg/L	0.1 mg/L	99.6	75.0	125	----
Anions and Nutrients (QCLot: 258018)										
CG2102979-001	Anonymous	phosphorus, total	7723-14-0	E372-U	ND mg/L	0.0676 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 258019)										
SK2102643-012	03-SED-PAG_W28	phosphorus, total	7723-14-0	E372-U	0.0659 mg/L	0.0676 mg/L	97.5	70.0	130	----



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
Cyanides (QCLot: 258553)										
WR2100949-001	Anonymous	cyanide, weak acid dissociable	----	E336	0.128 mg/L	0.125 mg/L	103	75.0	125	----
Cyanides (QCLot: 258554)										
WR2100949-001	Anonymous	cyanide, strong acid dissociable (total)	----	E333	0.224 mg/L	0.25 mg/L	89.5	75.0	125	----
Dissolved Metals (QCLot: 255513)										
SK2102635-002	Anonymous	aluminum, dissolved	7429-90-5	E421	0.200 mg/L	0.2 mg/L	100	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0187 mg/L	0.02 mg/L	93.6	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0190 mg/L	0.02 mg/L	94.9	70.0	130	----
		barium, dissolved	7440-39-3	E421	0.0192 mg/L	0.02 mg/L	96.3	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0371 mg/L	0.04 mg/L	92.7	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00838 mg/L	0.01 mg/L	83.8	70.0	130	----
		boron, dissolved	7440-42-8	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00387 mg/L	0.004 mg/L	96.7	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.00884 mg/L	0.01 mg/L	88.4	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0383 mg/L	0.04 mg/L	95.6	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0188 mg/L	0.02 mg/L	94.0	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0180 mg/L	0.02 mg/L	89.9	70.0	130	----
		iron, dissolved	7439-89-6	E421	1.98 mg/L	2 mg/L	99.0	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0172 mg/L	0.02 mg/L	86.0	70.0	130	----
		lithium, dissolved	7439-93-2	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0195 mg/L	0.02 mg/L	97.4	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0361 mg/L	0.04 mg/L	90.3	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	11.2 mg/L	10 mg/L	112	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0200 mg/L	0.02 mg/L	99.9	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0396 mg/L	0.04 mg/L	99.0	70.0	130	----
		silicon, dissolved	7440-21-3	E421	ND mg/L	10 mg/L	ND	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00300 mg/L	0.004 mg/L	74.9	70.0	130	----
		sodium, dissolved	17341-25-2	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0361 mg/L	0.04 mg/L	90.2	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00342 mg/L	0.004 mg/L	85.6	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0174 mg/L	0.02 mg/L	86.8	70.0	130	----



Sub-Matrix: **Water**

					<i>Matrix Spike (MS) Report</i>					
					<i>Spike</i>		<i>Recovery (%)</i>	<i>Recovery Limits (%)</i>		
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>Concentration</i>	<i>Target</i>	<i>MS</i>	<i>Low</i>	<i>High</i>	<i>Qualifier</i>
Dissolved Metals (QCLot: 255513) - continued										
SK2102635-002	Anonymous	tin, dissolved	7440-31-5	E421	0.0182 mg/L	0.02 mg/L	91.1	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0414 mg/L	0.04 mg/L	103	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0186 mg/L	0.02 mg/L	92.9	70.0	130	----
		uranium, dissolved	7440-61-1	E421	ND mg/L	0.004 mg/L	ND	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.100 mg/L	0.1 mg/L	100	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.354 mg/L	0.4 mg/L	88.5	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0393 mg/L	0.04 mg/L	98.2	70.0	130	----

Qualifiers

<i>Qualifier</i>	<i>Description</i>
K	Matrix Spike recovery outside ALS DQO due to sample matrix effects.



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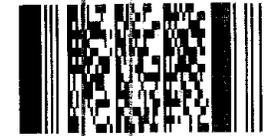
Chain of Custody (COC) / Analytical Request Form

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COC Number: 1
Page

Environmental Division
Saskatoon
Work Order Reference
SK2102643



Telephone: 1 306 688 8370

Report To Company: Okane Consultants Contact: Jared Robertson Phone: 1 (306) 713-1695 Company address below will appear on the final report		Report Format / Distribution Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL) Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX		Select Service Level Below - Contact your AM to confirm Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm Priority (Business Day) 4 day [P4-20%] <input type="checkbox"/> 3 day [P3-25%] <input type="checkbox"/> 2 day [P2-50%] <input type="checkbox"/> EMERGENCY 1 Business Day Same Day, W (Laboratory)			
Street: 112-112 Research Drive City/Province: Saskatoon, SK Postal Code: S7N 3R3		Email 1 or Fax: jrobertson@okc-sk.com Email 2 Email 3		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.			
Invoice To Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO Copy of Invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Invoice Distribution Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: jrobertson@okc-sk.com Email 2		Analysis Request Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below			
Project Information ALS Account # / Quote #: Q83455 Job #: 948-021 PO / AFE: LSD:		Oil and Gas Required Fields (client use) AFE/Cost Center: PO# Major/Minor Code: Routing Code: Requisitioner: Location:		NUMBER OF CONTAINERS MET-D-COMS-SK ROU-F-SK SO4-IC-N-CL CN-T-CFA-VA CN-WAD-CFA-VA NH3 TKN PT SAMPLES ON HOLD SUSPECTED HAZARD (see Special Instructions)			
ALS Lab Work Order # (lab use only):		ALS Contact: Sampler:					
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	
01_TSF_W30						7-Jul-21 7:00 Leachate 1	
01_TSF_W31						15-Jul-21 13:25 Leachate 1	
01_TSF_W32						22-Jul-21 16:00 Leachate 1	
01_TSF_W33						29-Jul-21 13:30 Leachate 4	
02-IF-PAG_W25						7-Jul-21 7:00 Leachate 1	
02-IF-PAG_W26				15-Jul-21 13:25 Leachate 1			
02-IF-PAG_W27				22-Jul-21 16:00 Leachate 1			
02-IF-PAG_W28				29-Jul-21 13:30 Leachate 3			
03-SED-PAG_W25				7-Jul-21 7:00 Leachate 1			
03-SED-PAG_W26				15-Jul-21 13:25 Leachate 1			
03-SED-PAG_W27				22-Jul-21 16:00 Leachate 1			
03-SED-PAG_W28				29-Jul-21 13:30 Leachate 3			
Drinking Water (DW) Samples¹ (client use) Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only) Suspected hazards: elevated metals, potential for low levels of cyanide		SAMPLE CONDITION AS RECEIVED (lab use only) Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/> Ice Packs <input type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/> Cooling Initiated <input type="checkbox"/> INITIAL COOLER TEMPERATURES °C: 13.4 FINAL COOLER TEMPERATURES °C:			
SHIPMENT RELEASE (client use) Released by: Jared Robertson Date: July 29, 2021 Time:		INITIAL SHIPMENT RECEPTION (lab use only) Received by: <i>ML</i> Date: 29-7-21 Time: 1:30		FINAL SHIPMENT RECEPTION (lab use only) Received by: <i>ME3</i> Date: 29/7/21 Time: 1:50			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION
WHITE - LABORATORY COPY YELLOW - CLIENT COPY
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.
1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.



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Affix ALS barcode label here
(lab use only)

COC Number: 17 -

Page 1 of 3

Report To Contact and company name below will appear on the final report		Report Format / Distribution			Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)												
Company: Okane Consultants		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL)			Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply												
Contact: Jared Robertson		Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			PRIORITY (Business days)	4 day [P4-20%] <input type="checkbox"/>		EMERGENCY	1 Business day [E - 100%] <input type="checkbox"/>								
Phone: 1 (306) 713-1695		<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked				3 day [P3-25%] <input type="checkbox"/>			Same Day, Weekend or Statutory holiday [E2 -200%] <input type="checkbox"/>								
Company address below will appear on the final report		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX				2 day [P2-50%] <input type="checkbox"/>			(Laboratory opening fees may apply)								
Street: 112-112 Research Drive		Email 1 or Fax jrobertson@okc-sk.com			Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm												
City/Province: Saskatoon, SK		Email 2			For tests that can not be performed according to the service level selected, you will be contacted.												
Postal Code: S7N 3R3		Email 3			Analysis Request												
Invoice To		Invoice Distribution			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below												
Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			NUMBER OF CONTAINERS								SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)			
Copy of Invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Email 1 or Fax jrobertson@okc-sk.com				BR-IC-N-CL	F/P										
Company:		Email 2				MET-D-COMIS-SK											
Contact:						ROUHF-SK											
Project Information		Oil and Gas Required Fields (client use)				SO4-IC-N-CL											
ALS Account # / Quote #: Q83455		AFE/Cost Center: PO#				CN-T-CFAVA											
Job #: 948-021		Major/Minor Code: Routing Code:				CN-WAD-CFAVA											
PO / AFE:		Requisitioner:				NH3											
LSD:		Location:				TKN											
ALS Lab Work Order # (lab use only):		ALS Contact:				PT											
Sampler:																	
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													
	07-IF-PAG-CW_W25	7-Jul-21	7:00	Leachate	1												
	07-IF-PAG-CW_W26	15-Jul-21	13:25	Leachate	1												
	07-IF-PAG-CW_W27	22-Jul-21	16:00	Leachate	1												
	07-IF-PAG-CW_W28	29-Jul-21	13:30	Leachate	3		R	R			R	R	R				
	08-SED-PAG-CW_W25	7-Jul-21	7:00	Leachate	1												
	08-SED-PAG-CW_W26	15-Jul-21	13:25	Leachate	1												
	08-SED-PAG-CW_W27	22-Jul-21	16:00	Leachate	1												
	08-SED-PAG-CW_W28	29-Jul-21	13:30	Leachate	3		R	R			R	R	R				
	09-FZONE-NPAG_W25	7-Jul-21	7:00	Leachate	1												
	09-FZONE-NPAG_W26	15-Jul-21	13:25	Leachate	1												
	09-FZONE-NPAG_W27	22-Jul-21	16:00	Leachate	1												
	09-FZONE-NPAG_W28	29-Jul-21	13:30	Leachate	3		R	R			R	R	R				
Drinking Water (DW) Samples¹ (client use)		Special Instructions / Specify Criteria to add on report by checking on the drop-down list below (electronic COC only)			SAMPLE CONDITION AS RECEIVED (lab use only)												
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Suspected hazards: elevated metals, potential for low levels of cyanide			Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>												
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					Ice Packs <input type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>												
					Cooling Initiated <input type="checkbox"/>												
					INITIAL COOLER TEMPERATURES °C												
					FINAL COOLER TEMPERATURES °C												
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)												
Released by: Jared Robertson		Date: June 30, 2021		Time:		Received by:		Date:		Time:		Received by:		Date:		Time:	



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(lab use only)

COC Number: 17 -

Page 1 of 3

Report To Contact and company name below will appear on the final report		Report Format / Distribution			Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)									
Company: Okane Consultants		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL)			Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply									
Contact: Jared Robertson		Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			PRIORITY (Business Days)		EMERGENCY							
Phone: 1 (306) 713-1695		<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked			4 day [P4-20%] <input type="checkbox"/>		1 Business day [E - 100%] <input type="checkbox"/>							
Company address below will appear on the final report		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			3 day [P3-25%] <input type="checkbox"/>		Same Day, Weekend or Statutory holiday [E2 -200%] <input type="checkbox"/> (Laboratory opening fees may apply)							
Street: 112-112 Research Drive		Email 1 or Fax jrobertson@okc-sk.com			Date and Time Required for all E&P TATs:					dd-mmm-yy hh:mm				
City/Province: Saskatoon, SK		Email 2			For tests that can not be performed according to the service level selected, you will be contacted.									
Postal Code: S7N 3R3		Email 3			Analysis Request									
Invoice To		Invoice Distribution			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below									
Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			NUMBER OF CONTAINERS									
Copy of Invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Email 1 or Fax jrobertson@okc-sk.com												
Company:		Email 2			SAMPLES ON HOLD									
Contact:		Email 3												
Project Information		Oil and Gas Required Fields (client use)			SUSPECTED HAZARD (see Special Instructions)									
ALS Account # / Quote #: Q83455		AFE/Cost Center: PO#												
Job #: 948-021		Major/Minor Code: Routing Code:			BR-IC-N-CL MET-D-CCMS-SK ROU-H-SK SO4-IC-N-CL CN-T-CFA-VA CN-WAD-CFA-VA NHS TKN PT									
PO / AFE:		Requisitioner:												
LSD:		Location:			Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y									
ALS Lab Work Order # (lab use only):		ALS Contact:												
ALS Lab Work Order # (lab use only):		Sampler:			Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y									
ALS Sample # (lab use only)		Sample Identification and/or Coordinates (This description will appear on the report)												
Date (dd-mmm-yy)		Time (hh:mm)			Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y									
Sample Type		Date												
04-GAB-NPAG_W25		7-Jul-21 7:00 Leachate			Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y									
04-GAB-NPAG_W26		15-Jul-21 13:25 Leachate												
04-GAB-NPAG_W27		22-Jul-21 16:00 Leachate			Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y									
04-GAB-NPAG_W28		29-Jul-21 13:30 Leachate												
05-SED-NPAG_W25		7-Jul-21 7:00 Leachate			Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y									
05-SED-NPAG_W26		15-Jul-21 13:25 Leachate												
05-SED-NPAG_W27		22-Jul-21 16:00 Leachate			Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y									
05-SED-NPAG_W28		29-Jul-21 13:30 Leachate												
06-IF-NPAG_W25		7-Jul-21 7:00 Leachate			Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y									
06-IF-NPAG_W26		15-Jul-21 13:25 Leachate												
06-IF-NPAG_W27		22-Jul-21 16:00 Leachate			Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y									
06-IF-NPAG_W28		29-Jul-21 13:30 Leachate												
Drinking Water (DW) Samples¹ (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)			SAMPLE CONDITION AS RECEIVED (lab use only)									
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Suspected hazards: elevated metals, potential for low levels of cyanide			Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>									
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					Ice Packs <input type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>									
		Cooling Initiated <input type="checkbox"/>												
		INITIAL COOLER TEMPERATURES °C					FINAL COOLER TEMPERATURES °C							
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)									
Released by: Jared Robertson 18 Time:		Received by: Date: Time:			Received by: Date: Time:									



CERTIFICATE OF ANALYSIS

Work Order : **SK2103098**
Client : **O'Kane Consultants Inc.**
Contact : Jared Robertson
Address : 112 - 112 Research Drive
Saskatoon SK Canada S7N 3R3
Telephone : 250 420 7010
Project : 948-021
PO : ----
C-O-C number : ----
Sampler : Client
Site : ----
Quote number : Q83455
No. of samples received : 36
No. of samples analysed : 36

Page : 1 of 26
Laboratory : Saskatoon - Environmental
Account Manager : Brian Morgan
Address : 819 58 Street East
Saskatoon SK Canada S7K 6X5
Telephone : 1 306 221 7147
Date Samples Received : 26-Aug-2021 16:51
Date Analysis Commenced : 27-Aug-2021
Issue Date : 08-Sep-2021 16:17

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Cindy Tang	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Colby Bingham	Quality Systems Coordinator	Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Quality Systems Coordinator	Metals, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Lian Nesbitt	Laboratory Analyst	Metals, Saskatoon, Saskatchewan
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Melissa Houseman	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Nancy Cruse	Laboratory _ Supervisor	Inorganics, Saskatoon, Saskatchewan



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).

<i>Unit</i>	<i>Description</i>
-	No Unit
%	percent
µS/cm	Microsiemens per centimetre
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
IB:INT	Ion Balance Reviewed: Imbalance is due to interference or non-measured component.
TKNI	TKN result may be biased low due to Nitrate interference. Nitrate-N is > 10x TKN.



Analytical Results

Sub-Matrix: Water					Client sample ID				
(Matrix: Water)					01_TSF_W34	01_TSF_W35	01_TSF_W36	01_TSF_W37	02-IF-PAG_W29
Client sampling date / time					05-Aug-2021 15:10	12-Aug-2021 09:15	20-Aug-2021 10:55	26-Aug-2021 13:30	05-Aug-2021 15:10
Analyte	CAS Number	Method	LOR	Unit	SK2103098-001	SK2103098-002	SK2103098-003	SK2103098-004	SK2103098-005
					Result	Result	Result	Result	Result
Physical Tests									
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	----	1360	----	----
conductivity	----	E100	2.0	µS/cm	----	----	4250	----	----
pH	----	E108	0.10	pH units	----	----	7.99	----	----
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	----	241	----	----
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	----	<1.0	----	----
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	----	<1.0	----	----
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	197	----	----
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	3540	----	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	<0.0050	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	----	<0.0020	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	2590	2460	2310	2210	172
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	----	<0.050 ^{TKN}	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	92.5	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	<0.400 ^{DLDS}	----	----
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	4.83	----	----
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	0.481	----	----
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	5.31	----	----
Cyanides									
cyanide, strong acid dissociable (total)	----	E333	0.0050	mg/L	----	----	0.0613	----	----
cyanide, weak acid dissociable	----	E336	0.0050	mg/L	----	----	0.0117	----	----
Ion Balance									
anion sum	----	EC101	0.10	meq/L	----	----	55.0	----	----
cation sum	----	EC101	0.10	meq/L	----	----	45.5	----	----
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	9.45 ^{IB:INT}	----	----
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	82.7 ^{IB:INT}	----	----
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	<0.0050 ^{DLDS}	----	----
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	0.00475	----	----
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	0.303	----	----



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	01_TSF_W34	01_TSF_W35	01_TSF_W36	01_TSF_W37	02-IF-PAG_W29
Client sampling date / time					05-Aug-2021 15:10	12-Aug-2021 09:15	20-Aug-2021 10:55	26-Aug-2021 13:30	05-Aug-2021 15:10	
Analyte	CAS Number	Method	LOR	Unit	SK2103098-001	SK2103098-002	SK2103098-003	SK2103098-004	SK2103098-005	
					Result	Result	Result	Result	Result	
Dissolved Metals										
barium, dissolved	7440-39-3	E421	0.00010	mg/L	---	---	0.0312	---	---	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	---	---	<0.000100 ^{DLDS}	---	---	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	---	---	<0.000250 ^{DLDS}	---	---	
boron, dissolved	7440-42-8	E421	0.010	mg/L	---	---	0.932	---	---	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	---	---	<0.0000700 ^{DLM}	---	---	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	458	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	<0.000050 ^{DLDS}	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	---	<0.00250 ^{DLDS}	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	0.0247	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	0.00115	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	<0.150 ^{DLDS}	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	<0.000250 ^{DLDS}	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	<0.0050 ^{DLDS}	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	52.0	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	0.855	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	0.184	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	---	<0.00250 ^{DLDS}	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	<0.250 ^{DLDS}	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	121	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	0.0192	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	0.00840	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	6.90	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	<0.000050 ^{DLDS}	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	350	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	1.40	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	738	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	<0.00100 ^{DLDS}	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	0.000082	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	<0.00050 ^{DLDS}	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	0.00285	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	---	<0.00150 ^{DLDS}	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	01_TSF_W34	01_TSF_W35	01_TSF_W36	01_TSF_W37	02-IF-PAG_W29
Client sampling date / time					05-Aug-2021 15:10	12-Aug-2021 09:15	20-Aug-2021 10:55	26-Aug-2021 13:30	05-Aug-2021 15:10	
Analyte	CAS Number	Method	LOR	Unit	SK2103098-001	SK2103098-002	SK2103098-003	SK2103098-004	SK2103098-005	
					Result	Result	Result	Result	Result	
Dissolved Metals										
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	----	----	<0.00050 ^{DLDS}	----	----	----
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	----	----	0.00384	----	----	----
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	----	----	<0.00250 ^{DLDS}	----	----	----
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	----	<0.0050 ^{DLDS}	----	----	----
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	----	<0.00150 ^{DLDS}	----	----	----
dissolved metals filtration location	----	EP421	-	-	----	----	Field	----	----	----

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	02-IF-PAG_W30	02-IF-PAG_W31	02-IF-PAG_W32	03-SED-PAG_W 29	03-SED-PAG_W 30
Client sampling date / time					12-Aug-2021 09:15	20-Aug-2021 10:55	26-Aug-2021 13:30	05-Aug-2021 15:10	12-Aug-2021 09:15	
Analyte	CAS Number	Method	LOR	Unit	SK2103098-006	SK2103098-007	SK2103098-008	SK2103098-009	SK2103098-010	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	----	143	----	----	
conductivity	----	E100	2.0	µS/cm	----	----	486	----	----	
pH	----	E108	0.10	pH units	----	----	7.93	----	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	----	79.3	----	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	----	<1.0	----	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	----	<1.0	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	65.0	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	330	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	19.4	----	----	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	----	<0.0020	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	167	167	159	87.6	86.6	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	----	22.1	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	6.79	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	0.298	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	<0.020 ^{DLDS}	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	<0.010 ^{DLDS}	----	----	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	<0.0500	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	----	4.82	----	----	
cation sum	----	EC101	0.10	meq/L	----	----	5.89	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	9.99 ^{IB:INT}	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	122 ^{IB:INT}	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	0.0172	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	0.00438	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	0.00050	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	0.0398	----	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	----	<0.000020	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	----	<0.000050	----	----	
boron, dissolved	7440-42-8	E421	0.010	mg/L	----	----	0.078	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	02-IF-PAG_W30	02-IF-PAG_W31	02-IF-PAG_W32	03-SED-PAG_W 29	03-SED-PAG_W 30
Client sampling date / time					12-Aug-2021 09:15	20-Aug-2021 10:55	26-Aug-2021 13:30	05-Aug-2021 15:10	12-Aug-2021 09:15	
Analyte	CAS Number	Method	LOR	Unit	SK2103098-006	SK2103098-007	SK2103098-008	SK2103098-009	SK2103098-010	
					Result	Result	Result	Result	Result	
Dissolved Metals										
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	---	---	0.000077	---	---	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	36.3	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	0.000033	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	---	<0.00050	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	<0.00010	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	0.00106	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	<0.030	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	<0.000050	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	0.0109	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	12.7	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	<0.00500	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	0.00246	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	---	<0.00050	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	<0.050	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	9.64	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	0.00739	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	0.000186	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	3.25	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	<0.000010	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	32.3	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	0.212	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	55.0	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	<0.00020	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	0.000016	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	<0.00010	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	0.00606	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	---	<0.00030	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	---	0.00142	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	---	0.00388	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	---	<0.00050	---	---	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	---	---	0.0118	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	02-IF-PAG_W30	02-IF-PAG_W31	02-IF-PAG_W32	03-SED-PAG_W 29	03-SED-PAG_W 30
Client sampling date / time					12-Aug-2021 09:15	20-Aug-2021 10:55	26-Aug-2021 13:30	05-Aug-2021 15:10	12-Aug-2021 09:15	
Analyte	CAS Number	Method	LOR	Unit	SK2103098-006	SK2103098-007	SK2103098-008	SK2103098-009	SK2103098-010	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	----	<0.00030	----	----	
dissolved metals filtration location	----	EP421	-	-	----	----	Field	----	----	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	03-SED-PAG_W 31	03-SED-PAG_W 32	04-GAB-NPAG_ W29	04-GAB-NPAG_ W30	04-GAB-NPAG_ W31
Client sampling date / time					20-Aug-2021 10:55	26-Aug-2021 13:30	05-Aug-2021 15:10	12-Aug-2021 09:15	20-Aug-2021 10:55	
Analyte	CAS Number	Method	LOR	Unit	SK2103098-011	SK2103098-012	SK2103098-013	SK2103098-014	SK2103098-015	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	127	----	----	----	
conductivity	----	E100	2.0	µS/cm	----	354	----	----	----	
pH	----	E108	0.10	pH units	----	8.00	----	----	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	96.9	----	----	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	<1.0	----	----	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	<1.0	----	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	79.4	----	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	217	----	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	<0.0050	----	----	----	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	<0.0020	----	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	85.4	88.1	52.4	56.2	57.8	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	<0.050	----	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	5.42	----	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	0.490	----	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	<0.020 ^{DLDS}	----	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	<0.010 ^{DLDS}	----	----	----	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	<0.0500	----	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	3.60	----	----	----	
cation sum	----	EC101	0.10	meq/L	----	3.40	----	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	2.86	----	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	94.4	----	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	0.0276	----	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	0.00265	----	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	0.00450	----	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	0.0248	----	----	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	<0.000020	----	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	<0.000050	----	----	----	
boron, dissolved	7440-42-8	E421	0.010	mg/L	----	0.056	----	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	03-SED-PAG_W 31	03-SED-PAG_W 32	04-GAB-NPAG_ W29	04-GAB-NPAG_ W30	04-GAB-NPAG_ W31
Client sampling date / time					20-Aug-2021 10:55	26-Aug-2021 13:30	05-Aug-2021 15:10	12-Aug-2021 09:15	20-Aug-2021 10:55	
Analyte	CAS Number	Method	LOR	Unit	SK2103098-011	SK2103098-012	SK2103098-013	SK2103098-014	SK2103098-015	
					Result	Result	Result	Result	Result	
Dissolved Metals										
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	---	0.0000104	---	---	---	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	29.4	---	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	0.000024	---	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	<0.00050	---	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	0.00011	---	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	0.00089	---	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	<0.030	---	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	<0.000050	---	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	0.0140	---	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	13.0	---	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	<0.00500	---	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	0.0116	---	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	<0.00050	---	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	<0.050	---	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	10.0	---	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	0.00334	---	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	0.000754	---	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	3.21	---	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	<0.000010	---	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	13.9	---	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	0.147	---	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	29.6	---	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	<0.00020	---	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	0.000013	---	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	<0.00010	---	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	0.00426	---	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	<0.00030	---	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	0.00023	---	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	0.00601	---	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	0.00052	---	---	---	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	---	0.0081	---	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	03-SED-PAG_W 31	03-SED-PAG_W 32	04-GAB-NPAG_ W29	04-GAB-NPAG_ W30	04-GAB-NPAG_ W31
Client sampling date / time					20-Aug-2021 10:55	26-Aug-2021 13:30	05-Aug-2021 15:10	12-Aug-2021 09:15	20-Aug-2021 10:55	
Analyte	CAS Number	Method	LOR	Unit	SK2103098-011	SK2103098-012	SK2103098-013	SK2103098-014	SK2103098-015	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	<0.00030	----	----	----	
dissolved metals filtration location	----	EP421	-	-	----	Field	----	----	----	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	04-GAB-NPAG_ W32	05-SED-NPAG_ W29	05-SED-NPAG_ W30	05-SED-NPAG_ W31	05-SED-NPAG_ W32
Client sampling date / time					26-Aug-2021 13:30	05-Aug-2021 15:10	12-Aug-2021 09:15	20-Aug-2021 10:55	26-Aug-2021 13:30	
Analyte	CAS Number	Method	LOR	Unit	SK2103098-016	SK2103098-017	SK2103098-018	SK2103098-019	SK2103098-020	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	37.2	----	----	----	74.8	
conductivity	----	E100	2.0	µS/cm	395	----	----	----	268	
pH	----	E108	0.10	pH units	8.22	----	----	----	8.02	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	159	----	----	----	98.3	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	<1.0	----	----	----	<1.0	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	<1.0	----	----	----	<1.0	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	130	----	----	----	80.6	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	238	----	----	----	157	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	----	----	----	0.0821	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0026	----	----	----	0.0050	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	56.9	34.5	38.1	39.2	41.9	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	0.057	----	----	----	0.167	
chloride	16887-00-6	E235.Cl	0.50	mg/L	6.72	----	----	----	5.84	
fluoride	16984-48-8	E235.F	0.020	mg/L	0.416	----	----	----	0.586	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.020 ^{DLDS}	----	----	----	<0.020 ^{DLDS}	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010 ^{DLDS}	----	----	----	0.034	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	<0.0500	----	----	----	<0.0500	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	3.99	----	----	----	2.68	
cation sum	----	EC101	0.10	meq/L	3.89	----	----	----	2.52	
ion balance (cation-anion difference)	----	EC101	0.010	%	1.27	----	----	----	3.08	
ion balance (cations/anions ratio)	----	EC101	0.010	%	97.5	----	----	----	94.0	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0510	----	----	----	0.0502	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00342	----	----	----	0.00366	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.0202	----	----	----	0.184	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0141	----	----	----	0.0171	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	----	----	----	<0.000020	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	----	----	----	<0.000050	
boron, dissolved	7440-42-8	E421	0.010	mg/L	0.072	----	----	----	0.066	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	04-GAB-NPAG_ W32	05-SED-NPAG_ W29	05-SED-NPAG_ W30	05-SED-NPAG_ W31	05-SED-NPAG_ W32
Client sampling date / time					26-Aug-2021 13:30	05-Aug-2021 15:10	12-Aug-2021 09:15	20-Aug-2021 10:55	26-Aug-2021 13:30	
Analyte	CAS Number	Method	LOR	Unit	SK2103098-016	SK2103098-017	SK2103098-018	SK2103098-019	SK2103098-020	
					Result	Result	Result	Result	Result	
Dissolved Metals										
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	<0.000050	----	----	----	0.000085	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	9.89	----	----	----	18.7	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000146	----	----	----	0.000051	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	----	----	----	<0.00050	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00016	----	----	----	0.00013	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00147	----	----	----	0.00102	
iron, dissolved	7439-89-6	E421	0.030	mg/L	<0.030	----	----	----	<0.030	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	----	----	----	<0.000050	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0107	----	----	----	0.0092	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	3.05	----	----	----	6.83	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	0.00965	----	----	----	<0.00500	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00365	----	----	----	0.00444	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00051	----	----	----	0.00063	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	----	----	----	<0.050	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	5.62	----	----	----	7.69	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00252	----	----	----	0.00256	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000783	----	----	----	0.000292	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	3.13	----	----	----	3.00	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	----	----	----	<0.000010	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	68.9	----	----	----	18.7	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0293	----	----	----	0.0853	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	18.8	----	----	----	13.9	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	----	----	----	<0.00020	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.000015	----	----	----	<0.000010	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	----	----	----	<0.00010	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	0.00629	----	----	----	0.00633	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	----	----	----	<0.00030	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	0.00073	----	----	----	0.00042	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.0201	----	----	----	0.00991	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	0.00490	----	----	----	0.00200	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0109	----	----	----	0.0122	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	04-GAB-NPAG_ W32	05-SED-NPAG_ W29	05-SED-NPAG_ W30	05-SED-NPAG_ W31	05-SED-NPAG_ W32
Client sampling date / time					26-Aug-2021 13:30	05-Aug-2021 15:10	12-Aug-2021 09:15	20-Aug-2021 10:55	26-Aug-2021 13:30	
Analyte	CAS Number	Method	LOR	Unit	SK2103098-016	SK2103098-017	SK2103098-018	SK2103098-019	SK2103098-020	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	----	----	----	----	<0.00030
dissolved metals filtration location	----	EP421	-	-	Field	----	----	----	----	Field

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	06-IF-NPAG_W2 9	06-IF-NPAG_W3 0	06-IF-NPAG_W3 1	06-IF-NPAG_W3 2	07-IF-PAG-CW_ W29
Client sampling date / time					05-Aug-2021 15:10	12-Aug-2021 09:15	20-Aug-2021 10:55	26-Aug-2021 13:30	05-Aug-2021 15:10	
Analyte	CAS Number	Method	LOR	Unit	SK2103098-021	SK2103098-022	SK2103098-023	SK2103098-024	SK2103098-025	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	----	----	80.4	----	
conductivity	----	E100	2.0	µS/cm	----	----	----	330	----	
pH	----	E108	0.10	pH units	----	----	----	8.09	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	----	----	115	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	----	----	<1.0	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	----	----	<1.0	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	----	94.4	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	----	200	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	----	0.0072	----	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	----	----	0.0025	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	57.9	59.1	57.7	58.2	3560	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	----	----	<0.050	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	----	5.92	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	----	0.446	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	----	<0.020 ^{DLDS}	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	----	<0.010 ^{DLDS}	----	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	----	<0.0500	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	----	----	3.29	----	
cation sum	----	EC101	0.10	meq/L	----	----	----	3.06	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	----	3.62	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	----	93.0	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	----	0.0128	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	----	0.0134	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	----	0.00123	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	----	0.0318	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	----	----	<0.000020	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	----	----	<0.000050	----	
boron, dissolved	7440-42-8	E421	0.010	mg/L	----	----	----	0.078	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	06-IF-NPAG_W2 9	06-IF-NPAG_W3 0	06-IF-NPAG_W3 1	06-IF-NPAG_W3 2	07-IF-PAG-CW_ W29
Client sampling date / time					05-Aug-2021 15:10	12-Aug-2021 09:15	20-Aug-2021 10:55	26-Aug-2021 13:30	05-Aug-2021 15:10	
Analyte	CAS Number	Method	LOR	Unit	SK2103098-021 Result	SK2103098-022 Result	SK2103098-023 Result	SK2103098-024 Result	SK2103098-025 Result	
Dissolved Metals										
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	---	---	---	<0.000050	---	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	---	21.0	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	---	0.000018	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	---	---	<0.00050	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	---	<0.00010	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	---	0.00088	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	---	<0.030	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	---	<0.000050	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	---	0.0158	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	---	6.80	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	---	<0.00500	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	---	0.00432	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	---	---	<0.00050	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	---	<0.050	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	---	19.7	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	---	0.0153	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	---	0.000147	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	---	3.48	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	---	<0.000010	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	---	21.8	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	---	0.227	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	---	19.0	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	---	<0.00020	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	---	0.000010	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	---	<0.00010	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	---	0.00677	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	---	---	<0.00030	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	---	---	0.00072	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	---	---	0.00396	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	---	---	<0.00050	---	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	---	---	---	0.0119	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	06-IF-NPAG_W2 9	06-IF-NPAG_W3 0	06-IF-NPAG_W3 1	06-IF-NPAG_W3 2	07-IF-PAG-CW_ W29
Client sampling date / time					05-Aug-2021 15:10	12-Aug-2021 09:15	20-Aug-2021 10:55	26-Aug-2021 13:30	05-Aug-2021 15:10	
Analyte	CAS Number	Method	LOR	Unit	SK2103098-021	SK2103098-022	SK2103098-023	SK2103098-024	SK2103098-025	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	----	----	<0.00030	----	
dissolved metals filtration location	----	EP421	-	-	----	----	----	Field	----	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	07-IF-PAG-CW_ W30	07-IF-PAG-CW_ W31	07-IF-PAG-CW_ W32	08-SED-PAG-C W_W29	08-SED-PAG-C W_W30
Client sampling date / time					12-Aug-2021 09:15	20-Aug-2021 10:55	26-Aug-2021 13:30	05-Aug-2021 15:10	12-Aug-2021 09:15	
Analyte	CAS Number	Method	LOR	Unit	SK2103098-026	SK2103098-027	SK2103098-028	SK2103098-029	SK2103098-030	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	----	13400	----	----	
conductivity	----	E100	2.0	µS/cm	----	----	78600	----	----	
pH	----	E108	0.10	pH units	----	----	7.51	----	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	----	86.3	----	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	----	<1.0	----	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	----	<1.0	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	70.8	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	57800	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	3.73	----	----	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	----	<0.0020	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	3500	3550	3620	3450	3460	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	----	5.18	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	33700	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	<10.0 ^{DLDS}	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	<10.0 ^{DLDS}	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	<5.00	----	----	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	<11.2	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	----	1030	----	----	
cation sum	----	EC101	0.10	meq/L	----	----	978	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	2.59	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	95.0	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	<0.100 ^{DLDS}	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	<0.0100 ^{DLDS}	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	<0.0100 ^{DLDS}	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	0.174	----	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	----	<0.00200 ^{DLDS}	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	----	<0.00500 ^{DLDS}	----	----	
boron, dissolved	7440-42-8	E421	0.010	mg/L	----	----	1.12	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	07-IF-PAG-CW_ W30	07-IF-PAG-CW_ W31	07-IF-PAG-CW_ W32	08-SED-PAG-C W_W29	08-SED-PAG-C W_W30
Client sampling date / time					12-Aug-2021 09:15	20-Aug-2021 10:55	26-Aug-2021 13:30	05-Aug-2021 15:10	12-Aug-2021 09:15	
Analyte	CAS Number	Method	LOR	Unit	SK2103098-026	SK2103098-027	SK2103098-028	SK2103098-029	SK2103098-030	
					Result	Result	Result	Result	Result	
Dissolved Metals										
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	---	---	0.00143	---	---	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	1680	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	0.0198	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	---	<0.0500 ^{DLDS}	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	<0.0100 ^{DLDS}	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	<0.0200 ^{DLDS}	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	<3.00 ^{DLDS}	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	<0.00500 ^{DLDS}	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	0.266	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	2240	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	0.676	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	0.00589	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	---	0.0956	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	<5.00 ^{DLDS}	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	527	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	0.438	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	<0.00500 ^{DLDS}	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	<5.00 ^{DLDS}	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	0.00130	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	16000	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	40.3	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	1240	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	<0.0200 ^{DLDS}	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	<0.00100 ^{DLDS}	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	<0.0100 ^{DLDS}	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	<0.0100 ^{DLDS}	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	---	<0.0300 ^{DLDS}	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	---	<0.0100 ^{DLDS}	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	---	0.0139	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	---	<0.0500 ^{DLDS}	---	---	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	---	---	0.350	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	07-IF-PAG-CW_ W30	07-IF-PAG-CW_ W31	07-IF-PAG-CW_ W32	08-SED-PAG-C W_W29	08-SED-PAG-C W_W30
Client sampling date / time					12-Aug-2021 09:15	20-Aug-2021 10:55	26-Aug-2021 13:30	05-Aug-2021 15:10	12-Aug-2021 09:15	
Analyte	CAS Number	Method	LOR	Unit	SK2103098-026	SK2103098-027	SK2103098-028	SK2103098-029	SK2103098-030	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	----	<0.0300 ^{DLDS}	----	----	
dissolved metals filtration location	----	EP421	-	-	----	----	Field	----	----	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	08-SED-PAG-C W_W31	08-SED-PAG-C W_W32	09-FZONE-NPA G_W29	09-FZONE-NPA G_W30	09-FZONE-NPA G_W31
Client sampling date / time					20-Aug-2021 10:55	26-Aug-2021 13:30	05-Aug-2021 15:10	12-Aug-2021 09:15	20-Aug-2021 10:55	
Analyte	CAS Number	Method	LOR	Unit	SK2103098-031	SK2103098-032	SK2103098-033	SK2103098-034	SK2103098-035	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	12500	----	----	----	
conductivity	----	E100	2.0	µS/cm	----	77900	----	----	----	
pH	----	E108	0.10	pH units	----	7.47	----	----	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	54.2	----	----	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	<1.0	----	----	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	<1.0	----	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	44.4	----	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	56000	----	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	3.59	----	----	----	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	<0.0020	----	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	3250	3430	29.8	32.6	30.1	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	4.57	----	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	33100	----	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	<10.0 ^{DLDS}	----	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	<10.0 ^{DLDS}	----	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	<5.00 ^{DLDS}	----	----	----	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	<11.2	----	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	1010	----	----	----	
cation sum	----	EC101	0.10	meq/L	----	927	----	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	4.28	----	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	91.8	----	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	<0.100 ^{DLDS}	----	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	<0.0100 ^{DLDS}	----	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	<0.0100 ^{DLDS}	----	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	0.156	----	----	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	<0.00200 ^{DLDS}	----	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	<0.00500 ^{DLDS}	----	----	----	
boron, dissolved	7440-42-8	E421	0.010	mg/L	----	1.09	----	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	08-SED-PAG-C W_W31	08-SED-PAG-C W_W32	09-FZONE-NPA G_W29	09-FZONE-NPA G_W30	09-FZONE-NPA G_W31
Client sampling date / time					20-Aug-2021 10:55	26-Aug-2021 13:30	05-Aug-2021 15:10	12-Aug-2021 09:15	20-Aug-2021 10:55	
Analyte	CAS Number	Method	LOR	Unit	SK2103098-031	SK2103098-032	SK2103098-033	SK2103098-034	SK2103098-035	
					Result	Result	Result	Result	Result	
Dissolved Metals										
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	---	0.00382	---	---	---	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	1610	---	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	0.00936	---	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	<0.0500 ^{DLDS}	---	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	0.0326	---	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	<0.0200 ^{DLDS}	---	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	<3.00 ^{DLDS}	---	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	<0.00500 ^{DLDS}	---	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	0.263	---	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	2050	---	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	<0.500 ^{DLDS}	---	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	0.0170	---	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	0.131	---	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	<5.00 ^{DLDS}	---	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	491	---	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	0.199	---	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	<0.00500 ^{DLDS}	---	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	<5.00 ^{DLDS}	---	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	0.00220	---	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	15300	---	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	38.6	---	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	1220	---	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	<0.0200 ^{DLDS}	---	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	<0.00100 ^{DLDS}	---	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	<0.0100 ^{DLDS}	---	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	<0.0100 ^{DLDS}	---	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	<0.0300 ^{DLDS}	---	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	<0.0100 ^{DLDS}	---	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	0.0193	---	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	<0.0500 ^{DLDS}	---	---	---	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	---	<0.100 ^{DLDS}	---	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	08-SED-PAG-C W_W31	08-SED-PAG-C W_W32	09-FZONE-NPA G_W29	09-FZONE-NPA G_W30	09-FZONE-NPA G_W31
Client sampling date / time					20-Aug-2021 10:55	26-Aug-2021 13:30	05-Aug-2021 15:10	12-Aug-2021 09:15	20-Aug-2021 10:55	
Analyte	CAS Number	Method	LOR	Unit	SK2103098-031	SK2103098-032	SK2103098-033	SK2103098-034	SK2103098-035	
					Result	Result	Result	Result	Result	
Dissolved Metals										
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	<0.0300 ^{DLDS}	----	----	----	
dissolved metals filtration location	----	EP421	-	-	----	Field	----	----	----	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	09-FZONE-NPA G_W32	----	----	----	----
Client sampling date / time					26-Aug-2021 13:30	---	---	---	---	
Analyte	CAS Number	Method	LOR	Unit	SK2103098-036	-----	-----	-----	-----	
					Result	---	---	---	---	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	87.2	----	----	----	----	
conductivity	----	E100	2.0	µS/cm	284	----	----	----	----	
pH	----	E108	0.10	pH units	8.10	----	----	----	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	106	----	----	----	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	<1.0	----	----	----	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	<1.0	----	----	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	87.0	----	----	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	138	----	----	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	----	----	----	----	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0099	----	----	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	26.0	----	----	----	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	<0.050	----	----	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	4.97	----	----	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	0.432	----	----	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.020 ^{DLDS}	----	----	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010 ^{DLDS}	----	----	----	----	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	<0.0500	----	----	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	2.44	----	----	----	----	
cation sum	----	EC101	0.10	meq/L	2.37	----	----	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	1.46	----	----	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	97.1	----	----	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0292	----	----	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00486	----	----	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00287	----	----	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0183	----	----	----	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	----	----	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	----	----	----	----	
boron, dissolved	7440-42-8	E421	0.010	mg/L	0.066	----	----	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	09-FZONE-NPA G_W32	----	----	----	----
Client sampling date / time					26-Aug-2021 13:30	---	---	---	---	
Analyte	CAS Number	Method	LOR	Unit	SK2103098-036	-----	-----	-----	-----	
					Result	---	---	---	---	
Dissolved Metals										
cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	<0.000050	---	---	---	---	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	21.9	---	---	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	---	---	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	---	---	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.00010	---	---	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00127	---	---	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	<0.030	---	---	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	---	---	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0046	---	---	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	7.89	---	---	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	0.0110	---	---	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00203	---	---	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	---	---	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	---	---	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	6.52	---	---	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00115	---	---	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000388	---	---	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	2.78	---	---	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	---	---	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	10.5	---	---	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0479	---	---	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	8.90	---	---	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	---	---	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	---	---	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	---	---	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	0.0128	---	---	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	---	---	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	0.00021	---	---	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.00129	---	---	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	0.00064	---	---	---	---	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0013	---	---	---	---	



Analytical Results

Sub-Matrix: Water					Client sample ID	09-FZONE-NPA G_W32	----	----	----	----
(Matrix: Water)					Client sampling date / time	26-Aug-2021 13:30	----	----	----	----
Analyte	CAS Number	Method	LOR	Unit	SK2103098-036	-----	-----	-----	-----	-----
					Result	---	---	---	---	---
Dissolved Metals										
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	----	----	----	----	----
dissolved metals filtration location	----	EP421	-	-	Field	----	----	----	----	----

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: SK2103098	Page	: 1 of 22
Client	: O'Kane Consultants Inc.	Laboratory	: Saskatoon - Environmental
Contact	: Jared Robertson	Account Manager	: Brian Morgan
Address	: 112 - 112 Research Drive Saskatoon SK Canada S7N 3R3	Address	: 819 58 Street East Saskatoon, Saskatchewan Canada S7K 6X5
Telephone	: 250 420 7010	Telephone	: 1 306 221 7147
Project	: 948-021	Date Samples Received	: 26-Aug-2021 16:51
PO	: ----	Issue Date	: 08-Sep-2021 16:17
C-O-C number	: ----		
Sampler	: Client		
Site	: ----		
Quote number	: Q83455		
No. of samples received	: 36		
No. of samples analysed	: 36		

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 Services number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

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		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) 01-TSF_W36	E298	20-Aug-2021	01-Sep-2021	----	----		01-Sep-2021	28 days	12 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) 02-IF-PAG_W32	E298	26-Aug-2021	01-Sep-2021	----	----		01-Sep-2021	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) 03-SED-PAG_W32	E298	26-Aug-2021	01-Sep-2021	----	----		01-Sep-2021	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) 04-GAB-NPAG_W32	E298	26-Aug-2021	01-Sep-2021	----	----		01-Sep-2021	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) 05-SED-NPAG_W32	E298	26-Aug-2021	01-Sep-2021	----	----		01-Sep-2021	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) 06-IF-NPAG_W32	E298	26-Aug-2021	01-Sep-2021	----	----		01-Sep-2021	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) 07-IF-PAG-CW_W32	E298	26-Aug-2021	01-Sep-2021	----	----		01-Sep-2021	28 days	6 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 08-SED-PAG-CW_W32	E298	26-Aug-2021	01-Sep-2021	----	----		01-Sep-2021	28 days	6 days	✔	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 09-FZONE-NPAG_W32	E298	26-Aug-2021	01-Sep-2021	----	----		01-Sep-2021	28 days	6 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 02-IF-PAG_W32	E235.Cl	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 03-SED-PAG_W32	E235.Cl	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 04-GAB-NPAG_W32	E235.Cl	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 05-SED-NPAG_W32	E235.Cl	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 06-IF-NPAG_W32	E235.Cl	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 07-IF-PAG-CW_W32	E235.Cl	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 08-SED-PAG-CW_W32	E235.Cl	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Chloride in Water by IC										
HDPE 09-FZONE-NPAG_W32	E235.Cl	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✔
Anions and Nutrients : Chloride in Water by IC										
HDPE 01_TSF_W36	E235.Cl	20-Aug-2021	----	----	----		27-Aug-2021	28 days	7 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 02-IF-PAG_W32	E235.F	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 03-SED-PAG_W32	E235.F	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 04-GAB-NPAG_W32	E235.F	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 05-SED-NPAG_W32	E235.F	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 06-IF-NPAG_W32	E235.F	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 07-IF-PAG-CW_W32	E235.F	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE 08-SED-PAG-CW_W32	E235.F	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✔



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Fluoride in Water by IC											
HDPE 09-FZONE-NPAG_W32	E235.F	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 01_TSF_W36	E235.F	20-Aug-2021	----	----	----		27-Aug-2021	28 days	7 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 02-IF-PAG_W32	E235.NO3	26-Aug-2021	----	----	----		27-Aug-2021	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 03-SED-PAG_W32	E235.NO3	26-Aug-2021	----	----	----		27-Aug-2021	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 04-GAB-NPAG_W32	E235.NO3	26-Aug-2021	----	----	----		27-Aug-2021	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 05-SED-NPAG_W32	E235.NO3	26-Aug-2021	----	----	----		27-Aug-2021	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 06-IF-NPAG_W32	E235.NO3	26-Aug-2021	----	----	----		27-Aug-2021	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 07-IF-PAG-CW_W32	E235.NO3	26-Aug-2021	----	----	----		27-Aug-2021	3 days	1 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 08-SED-PAG-CW_W32	E235.NO3	26-Aug-2021	----	----	----		27-Aug-2021	3 days	1 days	✔	



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrate in Water by IC											
HDPE 09-FZONE-NPAG_W32	E235.NO3	26-Aug-2021	----	----	----		27-Aug-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 01_TSF_W36	E235.NO3	20-Aug-2021	----	----	----		27-Aug-2021	3 days	7 days	* EHTR	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 02-IF-PAG_W32	E235.NO2	26-Aug-2021	----	----	----		27-Aug-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 03-SED-PAG_W32	E235.NO2	26-Aug-2021	----	----	----		27-Aug-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 04-GAB-NPAG_W32	E235.NO2	26-Aug-2021	----	----	----		27-Aug-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 05-SED-NPAG_W32	E235.NO2	26-Aug-2021	----	----	----		27-Aug-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 06-IF-NPAG_W32	E235.NO2	26-Aug-2021	----	----	----		27-Aug-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 07-IF-PAG-CW_W32	E235.NO2	26-Aug-2021	----	----	----		27-Aug-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 08-SED-PAG-CW_W32	E235.NO2	26-Aug-2021	----	----	----		27-Aug-2021	3 days	1 days	✓	



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrite in Water by IC											
HDPE 09-FZONE-NPAG_W32	E235.NO2	26-Aug-2021	----	----	----		27-Aug-2021	3 days	1 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 01_TSF_W36	E235.NO2	20-Aug-2021	----	----	----		27-Aug-2021	3 days	7 days	* EHTR	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 01_TSF_W37	E235.SO4	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 02-IF-PAG_W32	E235.SO4	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 03-SED-PAG_W32	E235.SO4	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 04-GAB-NPAG_W32	E235.SO4	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 05-SED-NPAG_W32	E235.SO4	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 06-IF-NPAG_W32	E235.SO4	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 07-IF-PAG-CW_W32	E235.SO4	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✓	



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Sulfate in Water by IC										
HDPE 08-SED-PAG-CW_W32	E235.S04	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 09-FZONE-NPAG_W32	E235.S04	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W35	E235.S04	12-Aug-2021	----	----	----		27-Aug-2021	28 days	15 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 02-IF-PAG_W30	E235.S04	12-Aug-2021	----	----	----		27-Aug-2021	28 days	15 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 03-SED-PAG_W30	E235.S04	12-Aug-2021	----	----	----		27-Aug-2021	28 days	15 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 04-GAB-NPAG_W30	E235.S04	12-Aug-2021	----	----	----		27-Aug-2021	28 days	15 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 05-SED-NPAG_W30	E235.S04	12-Aug-2021	----	----	----		27-Aug-2021	28 days	15 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 06-IF-NPAG_W30	E235.S04	12-Aug-2021	----	----	----		27-Aug-2021	28 days	15 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 07-IF-PAG-CW_W30	E235.S04	12-Aug-2021	----	----	----		27-Aug-2021	28 days	15 days	✔



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Sulfate in Water by IC										
HDPE 08-SED-PAG-CW_W30	E235.SO4	12-Aug-2021	----	----	----		27-Aug-2021	28 days	15 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 09-FZONE-NPAG_W30	E235.SO4	12-Aug-2021	----	----	----		27-Aug-2021	28 days	15 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W34	E235.SO4	05-Aug-2021	----	----	----		27-Aug-2021	28 days	22 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 02-IF-PAG_W29	E235.SO4	05-Aug-2021	----	----	----		27-Aug-2021	28 days	22 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 03-SED-PAG_W29	E235.SO4	05-Aug-2021	----	----	----		27-Aug-2021	28 days	22 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 04-GAB-NPAG_W29	E235.SO4	05-Aug-2021	----	----	----		27-Aug-2021	28 days	22 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 05-SED-NPAG_W29	E235.SO4	05-Aug-2021	----	----	----		27-Aug-2021	28 days	22 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 06-IF-NPAG_W29	E235.SO4	05-Aug-2021	----	----	----		27-Aug-2021	28 days	22 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 07-IF-PAG-CW_W29	E235.SO4	05-Aug-2021	----	----	----		27-Aug-2021	28 days	22 days	✔



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			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Sulfate in Water by IC										
HDPE 08-SED-PAG-CW_W29	E235.SO4	05-Aug-2021	----	----	----		27-Aug-2021	28 days	22 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 09-FZONE-NPAG_W29	E235.SO4	05-Aug-2021	----	----	----		27-Aug-2021	28 days	22 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W36	E235.SO4	20-Aug-2021	----	----	----		27-Aug-2021	28 days	7 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 02-IF-PAG_W31	E235.SO4	20-Aug-2021	----	----	----		27-Aug-2021	28 days	7 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 03-SED-PAG_W31	E235.SO4	20-Aug-2021	----	----	----		27-Aug-2021	28 days	7 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 04-GAB-NPAG_W31	E235.SO4	20-Aug-2021	----	----	----		27-Aug-2021	28 days	7 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 05-SED-NPAG_W31	E235.SO4	20-Aug-2021	----	----	----		27-Aug-2021	28 days	7 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 06-IF-NPAG_W31	E235.SO4	20-Aug-2021	----	----	----		27-Aug-2021	28 days	7 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 07-IF-PAG-CW_W31	E235.SO4	20-Aug-2021	----	----	----		27-Aug-2021	28 days	7 days	✔



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			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Sulfate in Water by IC											
HDPE 08-SED-PAG-CW_W31	E235.SO4	20-Aug-2021	----	----	----		27-Aug-2021	28 days	7 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 09-FZONE-NPAG_W31	E235.SO4	20-Aug-2021	----	----	----		27-Aug-2021	28 days	7 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 01_TSF_W36	E318	20-Aug-2021	01-Sep-2021	----	----		04-Sep-2021	28 days	15 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 02-IF-PAG_W32	E318	26-Aug-2021	01-Sep-2021	----	----		04-Sep-2021	28 days	9 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 03-SED-PAG_W32	E318	26-Aug-2021	01-Sep-2021	----	----		04-Sep-2021	28 days	9 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 04-GAB-NPAG_W32	E318	26-Aug-2021	01-Sep-2021	----	----		04-Sep-2021	28 days	9 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 05-SED-NPAG_W32	E318	26-Aug-2021	01-Sep-2021	----	----		04-Sep-2021	28 days	9 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 06-IF-NPAG_W32	E318	26-Aug-2021	01-Sep-2021	----	----		04-Sep-2021	28 days	9 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 07-IF-PAG-CW_W32	E318	26-Aug-2021	01-Sep-2021	----	----		04-Sep-2021	28 days	9 days	✔	



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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 08-SED-PAG-CW_W32	E318	26-Aug-2021	01-Sep-2021	----	----		04-Sep-2021	28 days	9 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 09-FZONE-NPAG_W32	E318	26-Aug-2021	01-Sep-2021	----	----		04-Sep-2021	28 days	9 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 01_TSF_W36	E372-U	20-Aug-2021	01-Sep-2021	----	----		02-Sep-2021	28 days	13 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 02-IF-PAG_W32	E372-U	26-Aug-2021	01-Sep-2021	----	----		02-Sep-2021	28 days	7 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 03-SED-PAG_W32	E372-U	26-Aug-2021	01-Sep-2021	----	----		02-Sep-2021	28 days	7 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 04-GAB-NPAG_W32	E372-U	26-Aug-2021	01-Sep-2021	----	----		02-Sep-2021	28 days	7 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 05-SED-NPAG_W32	E372-U	26-Aug-2021	01-Sep-2021	----	----		02-Sep-2021	28 days	7 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 06-IF-NPAG_W32	E372-U	26-Aug-2021	01-Sep-2021	----	----		02-Sep-2021	28 days	7 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 07-IF-PAG-CW_W32	E372-U	26-Aug-2021	01-Sep-2021	----	----		02-Sep-2021	28 days	7 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 08-SED-PAG-CW_W32	E372-U	26-Aug-2021	01-Sep-2021	----	----		02-Sep-2021	28 days	7 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 09-FZONE-NPAG_W32	E372-U	26-Aug-2021	01-Sep-2021	----	----		02-Sep-2021	28 days	7 days	✔	
Cyanides : Total Cyanide by CFA											
UV inhibited HDPE - total (sodium hydroxide) 01_TSF_W36	E333	20-Aug-2021	----	----	----		02-Sep-2021	14 days	13 days	✔	
Cyanides : WAD Cyanide by CFA											
UV inhibited HDPE - total (sodium hydroxide) 01_TSF_W36	E336	20-Aug-2021	----	----	----		02-Sep-2021	14 days	13 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 01_TSF_W36	E421	20-Aug-2021	31-Aug-2021	----	----		31-Aug-2021	180 days	11 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 02-IF-PAG_W32	E421	26-Aug-2021	31-Aug-2021	----	----		31-Aug-2021	180 days	5 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 03-SED-PAG_W32	E421	26-Aug-2021	31-Aug-2021	----	----		31-Aug-2021	180 days	5 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 04-GAB-NPAG_W32	E421	26-Aug-2021	31-Aug-2021	----	----		31-Aug-2021	180 days	5 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 05-SED-NPAG_W32	E421	26-Aug-2021	31-Aug-2021	----	----		31-Aug-2021	180 days	5 days	✔	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 06-IF-NPAG_W32	E421	26-Aug-2021	31-Aug-2021	----	----		31-Aug-2021	180 days	5 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 07-IF-PAG-CW_W32	E421	26-Aug-2021	31-Aug-2021	----	----		31-Aug-2021	180 days	5 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 08-SED-PAG-CW_W32	E421	26-Aug-2021	31-Aug-2021	----	----		31-Aug-2021	180 days	5 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 09-FZONE-NPAG_W32	E421	26-Aug-2021	31-Aug-2021	----	----		31-Aug-2021	180 days	5 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 02-IF-PAG_W32	E290	26-Aug-2021	----	----	----		27-Aug-2021	14 days	1 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 03-SED-PAG_W32	E290	26-Aug-2021	----	----	----		27-Aug-2021	14 days	1 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 04-GAB-NPAG_W32	E290	26-Aug-2021	----	----	----		27-Aug-2021	14 days	1 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 05-SED-NPAG_W32	E290	26-Aug-2021	----	----	----		27-Aug-2021	14 days	1 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 06-IF-NPAG_W32	E290	26-Aug-2021	----	----	----		27-Aug-2021	14 days	1 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Physical Tests : Alkalinity Species by Titration											
HDPE 07-IF-PAG-CW_W32	E290	26-Aug-2021	----	----	----		27-Aug-2021	14 days	1 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE 08-SED-PAG-CW_W32	E290	26-Aug-2021	----	----	----		27-Aug-2021	14 days	1 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE 09-FZONE-NPAG_W32	E290	26-Aug-2021	----	----	----		27-Aug-2021	14 days	1 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE 01_TSF_W36	E290	20-Aug-2021	----	----	----		27-Aug-2021	14 days	7 days	✔	
Physical Tests : Conductivity in Water											
HDPE 02-IF-PAG_W32	E100	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✔	
Physical Tests : Conductivity in Water											
HDPE 03-SED-PAG_W32	E100	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✔	
Physical Tests : Conductivity in Water											
HDPE 04-GAB-NPAG_W32	E100	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✔	
Physical Tests : Conductivity in Water											
HDPE 05-SED-NPAG_W32	E100	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✔	
Physical Tests : Conductivity in Water											
HDPE 06-IF-NPAG_W32	E100	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✔	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Conductivity in Water										
HDPE 07-IF-PAG-CW_W32	E100	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 08-SED-PAG-CW_W32	E100	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 09-FZONE-NPAG_W32	E100	26-Aug-2021	----	----	----		27-Aug-2021	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 01_TSF_W36	E100	20-Aug-2021	----	----	----		27-Aug-2021	28 days	7 days	✓
Physical Tests : pH by Meter										
HDPE 01_TSF_W36	E108	20-Aug-2021	----	----	----		27-Aug-2021	0.25 hrs	171 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 02-IF-PAG_W32	E108	26-Aug-2021	----	----	----		27-Aug-2021	0.25 hrs	24 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 03-SED-PAG_W32	E108	26-Aug-2021	----	----	----		27-Aug-2021	0.25 hrs	24 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 04-GAB-NPAG_W32	E108	26-Aug-2021	----	----	----		27-Aug-2021	0.25 hrs	24 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 05-SED-NPAG_W32	E108	26-Aug-2021	----	----	----		27-Aug-2021	0.25 hrs	24 hrs	* EHTR-FM



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : pH by Meter										
HDPE 06-IF-NPAG_W32	E108	26-Aug-2021	----	----	----		27-Aug-2021	0.25 hrs	24 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 07-IF-PAG-CW_W32	E108	26-Aug-2021	----	----	----		27-Aug-2021	0.25 hrs	24 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 08-SED-PAG-CW_W32	E108	26-Aug-2021	----	----	----		27-Aug-2021	0.25 hrs	24 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 09-FZONE-NPAG_W32	E108	26-Aug-2021	----	----	----		27-Aug-2021	0.25 hrs	24 hrs	* EHTR-FM

Legend & Qualifier Definitions

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

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	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	278023	1	20	5.0	5.0	✔
Ammonia by Fluorescence	E298	281828	1	15	6.6	5.0	✔
Chloride in Water by IC	E235.Cl	277992	2	26	7.6	5.0	✔
Conductivity in Water	E100	278022	1	20	5.0	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	277928	1	13	7.6	5.0	✔
Fluoride in Water by IC	E235.F	277990	2	26	7.6	5.0	✔
Nitrate in Water by IC	E235.NO3	277988	2	29	6.9	5.0	✔
Nitrite in Water by IC	E235.NO2	277989	2	29	6.9	5.0	✔
pH by Meter	E108	278024	1	20	5.0	5.0	✔
Sulfate in Water by IC	E235.SO4	277991	3	53	5.6	5.0	✔
Total Cyanide by CFA	E333	283303	1	20	5.0	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	281826	1	13	7.6	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	281827	1	9	11.1	5.0	✔
WAD Cyanide by CFA	E336	283304	1	5	20.0	5.0	✔
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	278023	1	20	5.0	5.0	✔
Ammonia by Fluorescence	E298	281828	1	15	6.6	5.0	✔
Chloride in Water by IC	E235.Cl	277992	2	26	7.6	5.0	✔
Conductivity in Water	E100	278022	1	20	5.0	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	277928	1	13	7.6	5.0	✔
Fluoride in Water by IC	E235.F	277990	2	26	7.6	5.0	✔
Nitrate in Water by IC	E235.NO3	277988	2	29	6.9	5.0	✔
Nitrite in Water by IC	E235.NO2	277989	2	29	6.9	5.0	✔
pH by Meter	E108	278024	1	20	5.0	5.0	✔
Sulfate in Water by IC	E235.SO4	277991	3	53	5.6	5.0	✔
Total Cyanide by CFA	E333	283303	1	20	5.0	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	281826	1	13	7.6	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	281827	1	9	11.1	5.0	✔
WAD Cyanide by CFA	E336	283304	1	5	20.0	5.0	✔
Method Blanks (MB)							
Alkalinity Species by Titration	E290	278023	1	20	5.0	5.0	✔
Ammonia by Fluorescence	E298	281828	1	15	6.6	5.0	✔
Chloride in Water by IC	E235.Cl	277992	2	26	7.6	5.0	✔
Conductivity in Water	E100	278022	1	20	5.0	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	277928	1	13	7.6	5.0	✔
Fluoride in Water by IC	E235.F	277990	2	26	7.6	5.0	✔
Nitrate in Water by IC	E235.NO3	277988	2	29	6.9	5.0	✔



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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<i>Analytical Methods</i>							
Method Blanks (MB) - Continued							
Nitrite in Water by IC	E235.NO2	277989	2	29	6.9	5.0	✓
Sulfate in Water by IC	E235.SO4	277991	3	53	5.6	5.0	✓
Total Cyanide by CFA	E333	283303	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	281826	1	13	7.6	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	281827	1	9	11.1	5.0	✓
WAD Cyanide by CFA	E336	283304	1	5	20.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	281828	1	15	6.6	5.0	✓
Chloride in Water by IC	E235.Cl	277992	2	26	7.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	277928	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	277990	2	26	7.6	5.0	✓
Nitrate in Water by IC	E235.NO3	277988	2	29	6.9	5.0	✓
Nitrite in Water by IC	E235.NO2	277989	2	29	6.9	5.0	✓
Sulfate in Water by IC	E235.SO4	277991	3	53	5.6	5.0	✓
Total Cyanide by CFA	E333	283303	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	281826	1	13	7.6	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	281827	1	9	11.1	5.0	✓
WAD Cyanide by CFA	E336	283304	1	5	20.0	5.0	✓



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Saskatoon - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Saskatoon - 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.
Chloride in Water by IC	E235.Cl Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Saskatoon - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Total Kjeldahl Nitrogen is determined using block digestion followed by flow-injection analysis with fluorescence detection.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Cyanide by CFA	E333 Vancouver - Environmental	Water	ISO 14403 (mod)	Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.
WAD Cyanide by CFA	E336 Vancouver - Environmental	Water	APHA 4500-CN I (mod)	Weak Acid Dissociable (WAD) cyanide is determined by in-line sample distillation with final determination by colourimetric analysis.
Total Phosphorus by Colourimetry (Ultra Trace)	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.
Dissolved Metals in Water by CRC ICPMS	E421 Saskatoon - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Hardness (Calculated)	EC100 Saskatoon - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Ion Balance using Dissolved Metals	EC101 Saskatoon - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
TDS in Water (Calculation)	EC103 Saskatoon - Environmental	Water	APHA 1030E (mod)	Total Dissolved Solids is calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Saskatoon - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested using block digestion with Copper Sulfate Digestion Reagent.



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Digestion for Total Phosphorus in water	EP372 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Saskatoon - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

QUALITY CONTROL REPORT

Work Order : **SK2103098**

Page : 1 of 14

Client : O'Kane Consultants Inc.
 Contact : Jared Robertson
 Address : 112 - 112 Research Drive
 Saskatoon SK Canada S7N 3R3
 Telephone : 250 420 7010
 Project : 948-021
 PO : ----
 C-O-C number : ----
 Sampler : Client
 Site : ----
 Quote number : Q83455
 No. of samples received : 36
 No. of samples analysed : 36

Laboratory : Saskatoon - Environmental
 Account Manager : Brian Morgan
 Address : 819 58 Street East
 Saskatoon, Saskatchewan Canada S7K 6X5
 Telephone : 1 306 221 7147
 Date Samples Received : 26-Aug-2021 16:51
 Date Analysis Commenced : 27-Aug-2021
 Issue Date : 08-Sep-2021 16:17

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 Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Cindy Tang	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Colby Bingham	Quality Systems Coordinator	Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Quality Systems Coordinator	Metals, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Lian Nesbitt	Laboratory Analyst	Metals, Saskatoon, Saskatchewan
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Melissa Houseman	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Nancy Cruse	Laboratory _ Supervisor	Inorganics, Saskatoon, Saskatchewan

Page : 2 of 14
Work Order : SK2103098
Client : O'Kane Consultants Inc.
Project : 948-021



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 Services number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

= Indicates a QC result that did not meet the ALS DQO.



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: 278022)											
RG2100399-001	Anonymous	conductivity	----	E100	2.0	µS/cm	3630	3620	0.276%	10%	----
Physical Tests (QC Lot: 278023)											
RG2100399-001	Anonymous	alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	469	471	0.378%	20%	----
Physical Tests (QC Lot: 278024)											
RG2100399-001	Anonymous	pH	----	E108	0.10	pH units	8.18	8.18	0.00%	3%	----
Anions and Nutrients (QC Lot: 277988)											
RG2100404-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	0.533	0.517	2.93%	20%	----
Anions and Nutrients (QC Lot: 277989)											
RG2100404-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 277990)											
RG2100404-001	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.078	0.075	0.003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 277991)											
RG2100404-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	16.1	15.7	2.26%	20%	----
Anions and Nutrients (QC Lot: 277992)											
RG2100404-001	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	2.76	2.77	0.009	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 278170)											
SK2103098-008	02-IF-PAG_W32	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	159	155	2.44%	20%	----
Anions and Nutrients (QC Lot: 278171)											
SK2103098-008	02-IF-PAG_W32	fluoride	16984-48-8	E235.F	0.020	mg/L	0.298	0.295	1.02%	20%	----
Anions and Nutrients (QC Lot: 278172)											
SK2103098-008	02-IF-PAG_W32	nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 278173)											
SK2103098-008	02-IF-PAG_W32	chloride	16887-00-6	E235.Cl	0.50	mg/L	6.79	6.65	2.19%	20%	----
Anions and Nutrients (QC Lot: 278174)											
SK2103098-008	02-IF-PAG_W32	nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 278230)											
SK2103098-004	01_TSF_W37	sulfate (as SO4)	14808-79-8	E235.SO4	6.00	mg/L	2210	2240	1.32%	20%	----
Anions and Nutrients (QC Lot: 281826)											
CG2103614-003	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.357	0.340	0.018	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 281827)											
SK2103098-003	01_TSF_W36	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----



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
Anions and Nutrients (QC Lot: 281828)											
KS2102729-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Cyanides (QC Lot: 283303)											
SK2103098-003	01_TSF_W36	cyanide, strong acid dissociable (total)	----	E333	0.0050	mg/L	0.0613	0.0597	2.71%	20%	----
Cyanides (QC Lot: 283304)											
SK2103098-003	01_TSF_W36	cyanide, weak acid dissociable	----	E336	0.0100	mg/L	0.0117	<0.0100	0.0017	Diff <2x LOR	----
Dissolved Metals (QC Lot: 277928)											
SK2103096-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0058	0.0055	0.0003	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00045	0.00044	0.000009	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00340	0.00341	0.437%	20%	----
		barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0332	0.0336	1.23%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.010	mg/L	0.679	0.697	2.64%	20%	----
		cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000065	<0.0000050	0.0000015	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.050	mg/L	38.7	39.4	1.77%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000235	0.000234	0.252%	20%	----
		chromium, dissolved	7440-47-3	E421	0.000050	mg/L	0.0102	0.0102	0.158%	20%	----
		cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00013	0.00013	0.000002	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00205	0.00202	1.40%	20%	----
		iron, dissolved	7439-89-6	E421	0.030	mg/L	<0.030	<0.030	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0502	0.0497	0.869%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	44.7	42.7	4.38%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00500	mg/L	0.0103	0.0104	0.00009	Diff <2x LOR	----
		molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.0169	0.0167	0.904%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00189	0.00191	0.00001	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	0.072	0.081	0.009	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.050	mg/L	78.5	77.4	1.32%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.0928	0.0938	1.15%	20%	----
		selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.00111	0.00112	1.51%	20%	----
		silicon, dissolved	7440-21-3	E421	0.050	mg/L	7.79	7.71	0.995%	20%	----
		silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, dissolved	17341-25-2	E421	0.050	mg/L	232	226	2.64%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.214	0.212	1.13%	20%	----
		sulfur, dissolved	7704-34-9	E421	0.50	mg/L	116	112	3.49%	20%	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	<i>Original Result</i>	<i>Duplicate Result</i>	<i>RPD(%) or Difference</i>	<i>Duplicate Limits</i>	<i>Qualifier</i>
Dissolved Metals (QC Lot: 277928) - continued											
SK2103096-001	Anonymous	tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.000015	0.000014	0.0000006	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	0.00069	0.00070	0.000003	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.0101	0.0100	1.01%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	0.0218	0.0218	0.338%	20%	----
		zinc, dissolved	7440-66-6	E421	0.0050	mg/L	0.801	0.803	0.249%	20%	----
		zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----



Method Blank (MB) Report

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

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 278022)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 278023)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Anions and Nutrients (QCLot: 277988)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 277989)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 277990)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 277991)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 277992)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 278170)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 278171)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 278172)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 278173)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 278174)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 278230)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 281826)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 281827)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 281828)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Cyanides (QCLot: 283303)						
cyanide, strong acid dissociable (total)	----	E333	0.002	mg/L	<0.0020	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Cyanides (QCLot: 283304)						
cyanide, weak acid dissociable	---	E336	0.002	mg/L	<0.0020	---
Dissolved Metals (QCLot: 277928)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	---
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	---
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	---
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	---
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	---
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	---
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	---
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	---
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	---
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	---
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	---
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	---
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	---
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	---
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	---
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	---
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	---
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	---
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	---
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	---
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	---
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	---
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	---
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	---
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	---
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	---
sodium, dissolved	17341-25-2	E421	0.05	mg/L	<0.050	---
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	---
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	---
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	---
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	---
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	---
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	---
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	---



Sub-Matrix: **Water**

<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	<i>Result</i>	<i>Qualifier</i>
Dissolved Metals (QCLot: 277928) - continued						
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----



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				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 278022)									
conductivity	----	E100	1	µS/cm	1000 µS/cm	99.5	90.0	110	----
Physical Tests (QCLot: 278023)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	97.6	85.0	115	----
Physical Tests (QCLot: 278024)									
pH	----	E108	----	pH units	6.86 pH units	99.6	98.0	102	----
Anions and Nutrients (QCLot: 277988)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	98.7	90.0	110	----
Anions and Nutrients (QCLot: 277989)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	93.3	90.0	110	----
Anions and Nutrients (QCLot: 277990)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 277991)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 277992)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	99.2	90.0	110	----
Anions and Nutrients (QCLot: 278170)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 278171)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 278172)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	99.8	90.0	110	----
Anions and Nutrients (QCLot: 278173)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 278174)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 278230)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 281826)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	91.6	75.0	125	----
Anions and Nutrients (QCLot: 281827)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	94.5	80.0	120	----
Anions and Nutrients (QCLot: 281828)									



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 281828) - continued									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	97.3	85.0	115	----
Cyanides (QCLot: 283303)									
cyanide, strong acid dissociable (total)	----	E333	0.002	mg/L	0.25 mg/L	92.7	80.0	120	----
Cyanides (QCLot: 283304)									
cyanide, weak acid dissociable	----	E336	0.002	mg/L	0.125 mg/L	96.4	80.0	120	----
Dissolved Metals (QCLot: 277928)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	106	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	102	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	102	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	97.9	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	100	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	87.0	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	106	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	100	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	102	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	101	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	105	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	102	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	111	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	96.3	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	95.0	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	105	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	104	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	101	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	108	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	105	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	111	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	95.7	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	101	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	105	80.0	120	----
sodium, dissolved	17341-25-2	E421	0.05	mg/L	50 mg/L	106	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	102	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	106	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	97.6	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 277928) - continued									
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	94.2	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	93.3	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	95.4	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	102	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	93.8	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	91.2	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	104	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	98.5	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	106	80.0	120	----



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 $\geq 1 \times$ 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: 277988)										
RG2100404-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	2.50 mg/L	2.5 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 277989)										
RG2100404-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.495 mg/L	0.5 mg/L	99.0	75.0	125	----
Anions and Nutrients (QCLot: 277990)										
RG2100404-002	Anonymous	fluoride	16984-48-8	E235.F	0.970 mg/L	1 mg/L	97.0	75.0	125	----
Anions and Nutrients (QCLot: 277991)										
RG2100404-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	101 mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 277992)										
RG2100404-002	Anonymous	chloride	16887-00-6	E235.Cl	99.7 mg/L	100 mg/L	99.7	75.0	125	----
Anions and Nutrients (QCLot: 278170)										
SK2103098-008	02-IF-PAG_W32	sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	90.0	110	----
Anions and Nutrients (QCLot: 278171)										
SK2103098-008	02-IF-PAG_W32	fluoride	16984-48-8	E235.F	0.958 mg/L	1 mg/L	95.8	75.0	125	----
Anions and Nutrients (QCLot: 278172)										
SK2103098-008	02-IF-PAG_W32	nitrite (as N)	14797-65-0	E235.NO2	0.502 mg/L	0.5 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 278173)										
SK2103098-008	02-IF-PAG_W32	chloride	16887-00-6	E235.Cl	102 mg/L	100 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 278174)										
SK2103098-008	02-IF-PAG_W32	nitrate (as N)	14797-55-8	E235.NO3	2.53 mg/L	2.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 278230)										
SK2103098-004	01_TSF_W37	sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	90.0	110	----
Anions and Nutrients (QCLot: 281826)										
KS2102729-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.37 mg/L	2.5 mg/L	94.7	70.0	130	----
Anions and Nutrients (QCLot: 281827)										
SK2103098-008	02-IF-PAG_W32	phosphorus, total	7723-14-0	E372-U	0.0491 mg/L	0.05 mg/L	98.3	70.0	130	----
Anions and Nutrients (QCLot: 281828)										
KS2102729-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.101 mg/L	0.1 mg/L	101	75.0	125	----



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
Cyanides (QCLot: 283303)										
VA21B8212-001	Anonymous	cyanide, strong acid dissociable (total)	----	E333	0.188 mg/L	0.25 mg/L	75.4	75.0	125	----
Cyanides (QCLot: 283304)										
VA21B8212-001	Anonymous	cyanide, weak acid dissociable	----	E336	0.595 mg/L	0.625 mg/L	95.2	75.0	125	----
Dissolved Metals (QCLot: 277928)										
SK2103096-002	Anonymous	aluminum, dissolved	7429-90-5	E421	0.213 mg/L	0.2 mg/L	107	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0203 mg/L	0.02 mg/L	101	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0207 mg/L	0.02 mg/L	104	70.0	130	----
		barium, dissolved	7440-39-3	E421	0.0208 mg/L	0.02 mg/L	104	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0395 mg/L	0.04 mg/L	98.8	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00890 mg/L	0.01 mg/L	89.0	70.0	130	----
		boron, dissolved	7440-42-8	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00402 mg/L	0.004 mg/L	100	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.0105 mg/L	0.01 mg/L	105	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0390 mg/L	0.04 mg/L	97.4	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0195 mg/L	0.02 mg/L	97.5	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0183 mg/L	0.02 mg/L	91.6	70.0	130	----
		iron, dissolved	7439-89-6	E421	1.96 mg/L	2 mg/L	98.3	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0182 mg/L	0.02 mg/L	91.2	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.0885 mg/L	0.1 mg/L	88.5	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	0.0198 mg/L	0.02 mg/L	98.8	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0373 mg/L	0.04 mg/L	93.2	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	11.8 mg/L	10 mg/L	118	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0404 mg/L	0.04 mg/L	101	70.0	130	----
		silicon, dissolved	7440-21-3	E421	ND mg/L	10 mg/L	ND	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00393 mg/L	0.004 mg/L	98.3	70.0	130	----
		sodium, dissolved	17341-25-2	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	23.2 mg/L	20 mg/L	116	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0383 mg/L	0.04 mg/L	95.8	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00349 mg/L	0.004 mg/L	87.2	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0193 mg/L	0.02 mg/L	96.7	70.0	130	----



Sub-Matrix: **Water**

					<i>Matrix Spike (MS) Report</i>					
					<i>Spike</i>		<i>Recovery (%)</i>	<i>Recovery Limits (%)</i>		
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>Concentration</i>	<i>Target</i>	<i>MS</i>	<i>Low</i>	<i>High</i>	<i>Qualifier</i>
Dissolved Metals (QCLot: 277928) - continued										
SK2103096-002	Anonymous	tin, dissolved	7440-31-5	E421	0.0194 mg/L	0.02 mg/L	97.2	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0423 mg/L	0.04 mg/L	106	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0192 mg/L	0.02 mg/L	95.9	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.00352 mg/L	0.004 mg/L	88.1	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.109 mg/L	0.1 mg/L	109	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.378 mg/L	0.4 mg/L	94.5	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0451 mg/L	0.04 mg/L	113	70.0	130	----



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Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17 -

Page 1 of

Report To Contact and company name below will appear on the final report Company: Okane Consultants Contact: Jared Robertson Phone: 1 (306) 713-1695 Company address below will appear on the final report Street: 112-112 Research Drive City/Province: Saskatoon, SK Postal Code: S7N 3R3		Report Format / Distribution Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL) Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: jrobertson@okc-sk.com Email 2 Email 3		Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply) Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply Priority (Business Days): 4 day [P4-20%] <input type="checkbox"/> 3 day [P3-25%] <input type="checkbox"/> 2 day [P2-50%] <input type="checkbox"/> Emergency: 1 Business day [E - 100%] <input type="checkbox"/> Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] <input type="checkbox"/> Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm For tests that can not be performed according to the service level selected, you will be contacted.																																																																																																																																																																																																																																										
Invoice To Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO Copy of Invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO Company: Contact:		Invoice Distribution Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: jrobertson@okc-sk.com Email 2		Analysis Request Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below <table border="1"> <thead> <tr> <th rowspan="2">NUMBER OF CONTAINERS</th> <th colspan="2">F/P</th> <th colspan="10"></th> <th rowspan="2">SUSPECTED HAZARD (see Special Instructions)</th> </tr> <tr> <th>BR-IC-N-CL</th> <th>MET-D-CCHS-SK</th> <th>ROU4F-SK</th> <th>SO4-IC-N-CL</th> <th>CN-T-CFA-VA</th> <th>CN-WAD-CFA-VA</th> <th>NH3</th> <th>TKN</th> <th>PT</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> </tr> </thead> <tbody> <tr><td>1</td><td></td><td></td><td></td><td>R</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Y</td></tr> <tr><td>1</td><td></td><td></td><td></td><td>R</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Y</td></tr> <tr><td>1</td><td></td><td></td><td></td><td>R</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Y</td></tr> <tr><td>3</td><td></td><td>R</td><td>R</td><td></td><td></td><td></td><td></td><td>R</td><td>R</td><td>R</td><td></td><td></td><td></td><td></td><td></td><td>Y</td></tr> <tr><td>1</td><td></td><td></td><td></td><td>R</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Y</td></tr> <tr><td>1</td><td></td><td></td><td></td><td>R</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Y</td></tr> <tr><td>1</td><td></td><td></td><td></td><td>R</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Y</td></tr> <tr><td>3</td><td></td><td>R</td><td>R</td><td></td><td></td><td></td><td></td><td>R</td><td>R</td><td>R</td><td></td><td></td><td></td><td></td><td></td><td>Y</td></tr> <tr><td>1</td><td></td><td></td><td></td><td>R</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Y</td></tr> <tr><td>1</td><td></td><td></td><td></td><td>R</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Y</td></tr> <tr><td>1</td><td></td><td></td><td></td><td>R</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Y</td></tr> <tr><td>3</td><td></td><td>R</td><td>R</td><td></td><td></td><td></td><td></td><td>R</td><td>R</td><td>R</td><td></td><td></td><td></td><td></td><td></td><td>Y</td></tr> </tbody> </table>		NUMBER OF CONTAINERS	F/P												SUSPECTED HAZARD (see Special Instructions)	BR-IC-N-CL	MET-D-CCHS-SK	ROU4F-SK	SO4-IC-N-CL	CN-T-CFA-VA	CN-WAD-CFA-VA	NH3	TKN	PT							1				R												Y	1				R												Y	1				R												Y	3		R	R					R	R	R						Y	1				R												Y	1				R												Y	1				R												Y	3		R	R					R	R	R						Y	1				R												Y	1				R												Y	1				R												Y	3		R	R					R	R	R						Y
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Project Information ALS Account # / Quote #: Q83455 Job #: 948-021 PO / AFE: .SD:		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:																																																																																																																																																																																																																																										
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		SHIPPING RELEASE (client use) Released by: Jared Robertson Date: 26-Aug-21 Time:		INITIAL SHIPMENT RECEPTION (lab use only) Received by: Date: Time:																																																																																																																																																																																																																																										
Drinking Water (DW) Samples¹ (client use) Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only) Suspected hazards: elevated metals, potential for low levels of cyanide		SAMPLE CONDITION AS RECEIVED (lab use only) Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/> Ice Packs <input type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/> Cooling Initiated <input type="checkbox"/> INITIAL COOLER TEMPERATURES °C: FINAL COOLER TEMPERATURES °C:																																																																																																																																																																																																																																										
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SAMPLES ON HOLD

SUSPECTED HAZARD (see Special Instructions)

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION 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.



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Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 17 -

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Report To Contact and company name below will appear on the final report		Report Format / Distribution			Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)																	
Company:	Okane Consultants	Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL)			Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply																	
Contact:	Jared Robertson	Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			PRIORITY (Business Days)	4 day [P4-20%] <input type="checkbox"/>		EMERGENCY	1 Business day [E - 100%] <input type="checkbox"/>													
Phone:	1 (306) 713-1695	<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked				3 day [P3-25%] <input type="checkbox"/>			Same Day, Weekend or Statutory holiday [E2 -200%] <input type="checkbox"/>													
Company address below will appear on the final report		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX				2 day [P2-50%] <input type="checkbox"/>			(Laboratory opening fees may apply)]													
Street:	112-112 Research Drive	Email 1 or Fax jrobertson@okc-sk.com			Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm																	
City/Province:	Saskatoon, SK	Email 2			For tests that can not be performed according to the service level selected, you will be contacted.																	
Postal Code:	S7N 3R3	Email 3			Analysis Request																	
Invoice To	Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Invoice Distribution			NUMBER OF CONTAINERS	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below							SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)								
Contact:	Copy of Invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX				F/P																
Company:		Email 1 or Fax jrobertson@okc-sk.com				BR-IC-N-CL																
Contact:		Email 2				MET-D-CCMS-SK																
Project Information		Oil and Gas Required Fields (client use)				ROU-F-SK																
ALS Account # / Quote #:	Q83455	AFE/Cost Center:		PO#		SO4-IC-N-CL																
Job #:	948-021	Major/Minor Code:		Routing Code:		CN-T-CFA-VA																
PO / AFE:		Requisitioner:				CN-WAD-CFA-VA																
SD:		Location:				NH3																
ALS Lab Work Order # (lab use only):		ALS Contact:		Sampler:		TKN																
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																
	07-IF-PAG-CW_W29			5-Aug-21	15:10	Leachate	1															
	07-IF-PAG-CW_W30			12-Aug-21	9:15	Leachate	1															
	07-IF-PAG-CW_W31			20-Aug-21	10:55	Leachate	1															
	07-IF-PAG-CW_W32			28-Aug-21	13:30	Leachate	3		R	R				R	R	R						
	08-SED-PAG-CW_W29			5-Aug-21	15:10	Leachate	1															
	08-SED-PAG-CW_W30			12-Aug-21	9:15	Leachate	1															
	08-SED-PAG-CW_W31			20-Aug-21	10:55	Leachate	1															
	08-SED-PAG-CW_W32			26-Aug-21	13:30	Leachate	3		R	R				R	R	R						
	09-FZONE-NPAG_W29			5-Aug-21	15:10	Leachate	1															
	09-FZONE-NPAG_W30			12-Aug-21	9:15	Leachate	1															
	09-FZONE-NPAG_W31			20-Aug-21	10:55	Leachate	1															
	09-FZONE-NPAG_W32			26-Aug-21	13:30	Leachate	3		R	R				R	R	R						
Drinking Water (DW) Samples¹ (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)			SAMPLE CONDITION AS RECEIVED (lab use only)																	
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Suspected hazards: elevated metals, potential for low levels of cyanide			Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>																	
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					Ice Packs <input type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>																	
		Cooling Initiated <input type="checkbox"/>																				
		INITIAL COOLER TEMPERATURES °C																				
		FINAL COOLER TEMPERATURES °C																				
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)																	
Released by: Jared Robertson	Date: August 26, 2021	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:														

CERTIFICATE OF ANALYSIS

Work Order : **SK2104022**
Client : **O'Kane Consultants Inc.**
Contact : Jared Robertson
Address : 112 - 112 Research Drive
 Saskatoon SK Canada S7N 3R3
Telephone : 250 420 7010
Project : 948-021
PO : ----
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : Q83455
No. of samples received : 36
No. of samples analysed : 36

Page : 1 of 26
Laboratory : Saskatoon - Environmental
Account Manager : Brian Morgan
Address : 819 58 Street East
 Saskatoon SK Canada S7K 6X5
Telephone : 1 306 221 7147
Date Samples Received : 23-Sep-2021 15:45
Date Analysis Commenced : 24-Sep-2021
Issue Date : 15-Oct-2021 14:58

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Anthony Calero	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Colby Bingham	Quality Systems Coordinator	Inorganics, Saskatoon, Saskatchewan
Dwayne Bennett	Technical Specialist	Metals, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Jon Fisher	Department Manager - Inorganics	Inorganics, Waterloo, Ontario
Lian Nesbitt	Laboratory Analyst	Metals, Saskatoon, Saskatchewan
Melissa Houseman	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Melissa Houseman	Team Leader - Inorganics	Metals, Saskatoon, Saskatchewan
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta



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).

<i>Unit</i>	<i>Description</i>
-	No Unit
%	percent
µS/cm	Microsiemens per centimetre
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
IB:INT	Ion Balance Reviewed: Imbalance is due to interference or non-measured component.
RRV	Reported result verified by repeat analysis.



Analytical Results

Sub-Matrix: Water					Client sample ID	01_TSF_W38	01_TSF_W39	01_TSF_W40	01_TSF_W41	02-IF-PAG_W33
(Matrix: Water)					Client sampling date / time	02-Sep-2021 14:50	09-Sep-2021 15:35	17-Sep-2021 11:50	23-Sep-2021 12:00	02-Sep-2021 14:50
Analyte	CAS Number	Method	LOR	Unit	SK2104022-001	SK2104022-002	SK2104022-003	SK2104022-004	SK2104022-005	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	----	1480	----	----	
conductivity	----	E100	2.0	µS/cm	----	----	3460	----	----	
pH	----	E108	0.10	pH units	----	----	8.17	----	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	----	234	----	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	----	<1.0	----	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	----	<1.0	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	192	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	3110	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	15.9	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	2110	2040	2050	1970	156	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	----	14.0	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	33.8	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	<0.400 ^{DLDS}	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	1.40	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	<0.200 ^{DLDS}	----	----	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	1.40	----	----	
Cyanides										
cyanide, strong acid dissociable (total)	----	E333	0.0050	mg/L	----	----	0.167	----	----	
cyanide, weak acid dissociable	----	E336	0.0050	mg/L	----	----	0.0051	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	----	47.6	----	----	
cation sum	----	EC101	0.10	meq/L	----	----	42.5	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	5.66 ^{IB:INT}	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	89.3 ^{IB:INT}	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	0.0092	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	0.00429	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	0.234	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	0.0329	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	01_TSF_W38	01_TSF_W39	01_TSF_W40	01_TSF_W41	02-IF-PAG_W33
Client sampling date / time					02-Sep-2021 14:50	09-Sep-2021 15:35	17-Sep-2021 11:50	23-Sep-2021 12:00	02-Sep-2021 14:50	
Analyte	CAS Number	Method	LOR	Unit	SK2104022-001	SK2104022-002	SK2104022-003	SK2104022-004	SK2104022-005	
					Result	Result	Result	Result	Result	
Dissolved Metals										
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	---	---	<0.000100 ^{DLDS}	---	---	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	---	---	<0.000250 ^{DLDS}	---	---	
boron, dissolved	7440-42-8	E421	0.010	mg/L	---	---	0.909	---	---	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	---	---	0.0000662	---	---	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	494	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	<0.000050 ^{DLDS}	---	---	
chromium, dissolved	7440-47-3	E421	0.000050	mg/L	---	---	<0.00250 ^{DLDS}	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	0.0154	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	0.00105	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	<0.150 ^{DLDS}	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	<0.000250 ^{DLDS}	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	0.0057	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	61.0	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	1.02	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	0.177	---	---	
nickel, dissolved	7440-02-0	E421	0.000050	mg/L	---	---	0.00252	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	<0.250 ^{DLDS}	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	110	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	0.0147	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	0.0100	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	6.69	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	<0.000050 ^{DLDS}	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	203	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	1.58	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	666	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	<0.00100 ^{DLDS}	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	0.000072	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	<0.00050 ^{DLDS}	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	0.00256	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	---	<0.00150 ^{DLDS}	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	---	<0.00050 ^{DLDS}	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	01_TSF_W38	01_TSF_W39	01_TSF_W40	01_TSF_W41	02-IF-PAG_W33
Client sampling date / time					02-Sep-2021 14:50	09-Sep-2021 15:35	17-Sep-2021 11:50	23-Sep-2021 12:00	02-Sep-2021 14:50	
Analyte	CAS Number	Method	LOR	Unit	SK2104022-001	SK2104022-002	SK2104022-003	SK2104022-004	SK2104022-005	
					Result	Result	Result	Result	Result	
Dissolved Metals										
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	----	----	0.00368	----	----	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	----	----	<0.00250 ^{DLDS}	----	----	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	----	<0.0050 ^{DLDS}	----	----	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	----	<0.00150 ^{DLDS}	----	----	
dissolved metals filtration location	----	EP421	-	-	----	----	Field	----	----	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	02-IF-PAG_W34	02-IF-PAG_W35	02-IF-PAG_W36	03-SED-PAG_W 33	03-SED-PAG_W 34
Client sampling date / time					09-Sep-2021 15:35	17-Sep-2021 11:50	23-Sep-2021 12:00	02-Sep-2021 14:50	09-Sep-2021 15:35	
Analyte	CAS Number	Method	LOR	Unit	SK2104022-006	SK2104022-007	SK2104022-008	SK2104022-009	SK2104022-010	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	----	124	----	----	
conductivity	----	E100	2.0	µS/cm	----	----	402	----	----	
pH	----	E108	0.10	pH units	----	----	7.85	----	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	----	83.0	----	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	----	<1.0	----	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	----	<1.0	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	68.0	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	248	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	0.0336	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	143	123	118	86.5	81.9	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	----	<0.200	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	6.44	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	0.251	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	<0.020	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	<0.010	----	----	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	<0.0500	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	----	4.01	----	----	
cation sum	----	EC101	0.10	meq/L	----	----	3.72	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	3.75	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	92.8	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	0.0188	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	0.00397	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	0.00047	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	0.0354	----	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	----	<0.000020	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	----	<0.000050	----	----	
boron, dissolved	7440-42-8	E421	0.010	mg/L	----	----	0.083	----	----	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	----	----	0.0000056	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	02-IF-PAG_W34	02-IF-PAG_W35	02-IF-PAG_W36	03-SED-PAG_W 33	03-SED-PAG_W 34
Client sampling date / time					09-Sep-2021 15:35	17-Sep-2021 11:50	23-Sep-2021 12:00	02-Sep-2021 14:50	09-Sep-2021 15:35	
Analyte	CAS Number	Method	LOR	Unit	SK2104022-006	SK2104022-007	SK2104022-008	SK2104022-009	SK2104022-010	
					Result	Result	Result	Result	Result	
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	30.9	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	0.000028	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	---	<0.00050	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	<0.00010	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	0.00079	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	<0.030	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	<0.000050	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	0.0112	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	11.5	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	<0.00500	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	0.00206	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	---	<0.00050	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	<0.050	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	9.22	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	0.00670	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	0.000148	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	3.12	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	<0.000010	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	22.9	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	0.198	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	40.8	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	<0.00020	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	0.000010	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	<0.00010	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	0.00540	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	---	<0.00030	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	---	0.00162	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	---	0.00419	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	---	<0.00050	---	---	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	---	---	0.0101	---	---	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	---	---	<0.00030	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	02-IF-PAG_W34	02-IF-PAG_W35	02-IF-PAG_W36	03-SED-PAG_W 33	03-SED-PAG_W 34
Client sampling date / time					09-Sep-2021 15:35	17-Sep-2021 11:50	23-Sep-2021 12:00	02-Sep-2021 14:50	09-Sep-2021 15:35	
Analyte	CAS Number	Method	LOR	Unit	SK2104022-006	SK2104022-007	SK2104022-008	SK2104022-009	SK2104022-010	
Dissolved Metals					Result	Result	Result	Result	Result	Result
dissolved metals filtration location	----	EP421	-	-	----	----	Field	----	----	----

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	03-SED-PAG_W 35	03-SED-PAG_W 36	04-GAB-NPAG_ W33	04-GAB-NPAG_ W34	04-GAB-NPAG_ W35
Client sampling date / time					17-Sep-2021 11:50	23-Sep-2021 12:00	02-Sep-2021 14:50	09-Sep-2021 15:35	17-Sep-2021 11:50	
Analyte	CAS Number	Method	LOR	Unit	SK2104022-011	SK2104022-012	SK2104022-013	SK2104022-014	SK2104022-015	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	120	----	----	----	
conductivity	----	E100	2.0	µS/cm	----	481	----	----	----	
pH	----	E108	0.10	pH units	----	7.94	----	----	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	101	----	----	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	<1.0	----	----	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	<1.0	----	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	82.6	----	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	198	----	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	<0.0050	----	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	78.0	73.9	57.0	51.1	50.9	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	<0.200	----	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	5.27	----	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	0.447	----	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	<0.020	----	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	<0.010	----	----	----	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	<0.0500	----	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	3.36	----	----	----	
cation sum	----	EC101	0.10	meq/L	----	3.10	----	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	4.02	----	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	92.3	----	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	0.0286	----	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	0.00246	----	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	0.00426	----	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	0.0237	----	----	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	<0.000020	----	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	<0.000050	----	----	----	
boron, dissolved	7440-42-8	E421	0.010	mg/L	----	0.066	----	----	----	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	----	0.0000071	----	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	03-SED-PAG_W 35	03-SED-PAG_W 36	04-GAB-NPAG_ W33	04-GAB-NPAG_ W34	04-GAB-NPAG_ W35
Client sampling date / time					17-Sep-2021 11:50	23-Sep-2021 12:00	02-Sep-2021 14:50	09-Sep-2021 15:35	17-Sep-2021 11:50	
Analyte	CAS Number	Method	LOR	Unit	SK2104022-011	SK2104022-012	SK2104022-013	SK2104022-014	SK2104022-015	
					Result	Result	Result	Result	Result	
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	28.4	---	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	0.000019	---	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	<0.00050	---	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	<0.00010	---	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	0.00073	---	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	<0.030	---	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	<0.000050	---	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	0.0141	---	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	12.0	---	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	<0.00500	---	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	0.00895	---	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	<0.00050	---	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	<0.050	---	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	9.09	---	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	0.00281	---	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	0.000624	---	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	3.08	---	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	<0.000010	---	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	10.6	---	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	0.144	---	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	24.6	---	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	<0.00020	---	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	0.000013	---	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	<0.00010	---	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	0.00357	---	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	<0.00030	---	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	0.00020	---	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	0.00623	---	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	<0.00050	---	---	---	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	---	0.0080	---	---	---	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	---	<0.00030	---	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	03-SED-PAG_W 35	03-SED-PAG_W 36	04-GAB-NPAG_ W33	04-GAB-NPAG_ W34	04-GAB-NPAG_ W35
Client sampling date / time					17-Sep-2021 11:50	23-Sep-2021 12:00	02-Sep-2021 14:50	09-Sep-2021 15:35	17-Sep-2021 11:50	
Analyte	CAS Number	Method	LOR	Unit	SK2104022-011	SK2104022-012	SK2104022-013	SK2104022-014	SK2104022-015	
Dissolved Metals					Result	Result	Result	Result	Result	
dissolved metals filtration location	----	EP421	-	-	----	Field	----	----	----	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	04-GAB-NPAG_ W36	05-SED-NPAG_ W33	05-SED-NPAG_ W34	05-SED-NPAG_ W35	05-SED-NPAG_ W36
Client sampling date / time					23-Sep-2021 12:00	02-Sep-2021 14:50	09-Sep-2021 15:35	17-Sep-2021 11:50	23-Sep-2021 12:00	
Analyte	CAS Number	Method	LOR	Unit	SK2104022-016	SK2104022-017	SK2104022-018	SK2104022-019	SK2104022-020	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	46.6	----	----	----	80.9	
conductivity	----	E100	2.0	µS/cm	337	----	----	----	255	
pH	----	E108	0.10	pH units	8.13	----	----	----	7.94	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	141	----	----	----	93.9	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	<1.0	----	----	----	<1.0	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	<1.0	----	----	----	<1.0	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	116	----	----	----	77.0	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	201	----	----	----	149	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	----	----	----	0.0180	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	45.4	45.0	43.2	42.3	39.9	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	<0.200	----	----	----	<0.200	
chloride	16887-00-6	E235.Cl	0.50	mg/L	6.16	----	----	----	5.53	
fluoride	16984-48-8	E235.F	0.020	mg/L	0.319	----	----	----	0.540	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.020	----	----	----	<0.020	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	----	----	----	0.017	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	<0.0500	----	----	----	<0.0500	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	3.45	----	----	----	2.56	
cation sum	----	EC101	0.10	meq/L	3.26	----	----	----	2.44	
ion balance (cation-anion difference)	----	EC101	0.010	%	2.83	----	----	----	2.40	
ion balance (cations/anions ratio)	----	EC101	0.010	%	94.5	----	----	----	95.3	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0441	----	----	----	0.0513	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00303	----	----	----	0.00352	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.0188	----	----	----	0.172	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0164	----	----	----	0.0177	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	----	----	----	<0.000020	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	----	----	----	<0.000050	
boron, dissolved	7440-42-8	E421	0.010	mg/L	0.084	----	----	----	0.077	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	----	----	----	0.0000076	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	04-GAB-NPAG_ W36	05-SED-NPAG_ W33	05-SED-NPAG_ W34	05-SED-NPAG_ W35	05-SED-NPAG_ W36
Client sampling date / time					23-Sep-2021 12:00	02-Sep-2021 14:50	09-Sep-2021 15:35	17-Sep-2021 11:50	23-Sep-2021 12:00	
Analyte	CAS Number	Method	LOR	Unit	SK2104022-016 Result	SK2104022-017 Result	SK2104022-018 Result	SK2104022-019 Result	SK2104022-020 Result	
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L	12.1	----	----	----	19.7	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000144	----	----	----	0.000033	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	----	----	----	<0.00050	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00017	----	----	----	0.00010	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00114	----	----	----	0.00085	
iron, dissolved	7439-89-6	E421	0.030	mg/L	<0.030	----	----	----	<0.030	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	----	----	----	<0.000050	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0132	----	----	----	0.0099	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	3.98	----	----	----	7.70	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	0.0133	----	----	----	<0.00500	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00234	----	----	----	0.00338	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	----	----	----	0.00058	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	----	----	----	<0.050	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	5.53	----	----	----	7.36	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00296	----	----	----	0.00230	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000454	----	----	----	0.000198	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	2.98	----	----	----	2.92	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	----	----	----	<0.000010	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	50.2	----	----	----	14.4	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0422	----	----	----	0.0908	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	15.7	----	----	----	13.7	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	----	----	----	<0.00020	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.000018	----	----	----	<0.000010	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	----	----	----	<0.00010	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	0.00603	----	----	----	0.00576	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	----	----	----	<0.00030	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	0.00058	----	----	----	0.00037	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.0189	----	----	----	0.0102	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	0.00398	----	----	----	0.00176	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0088	----	----	----	0.0055	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	----	----	----	<0.00030	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	04-GAB-NPAG_ W36	05-SED-NPAG_ W33	05-SED-NPAG_ W34	05-SED-NPAG_ W35	05-SED-NPAG_ W36
Client sampling date / time					23-Sep-2021 12:00	02-Sep-2021 14:50	09-Sep-2021 15:35	17-Sep-2021 11:50	23-Sep-2021 12:00	
Analyte	CAS Number	Method	LOR	Unit	SK2104022-016	SK2104022-017	SK2104022-018	SK2104022-019	SK2104022-020	
Dissolved Metals					Result	Result	Result	Result	Result	
dissolved metals filtration location	----	EP421	-	-	Field	----	----	----	Field	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	06-IF-NPAG_W3 3	06-IF-NPAG_W3 4	06-IF-NPAG_W3 5	06-IF-NPAG_W3 6	07-IF-PAG-CW_ W33
Client sampling date / time					02-Sep-2021 14:50	09-Sep-2021 15:35	17-Sep-2021 11:50	23-Sep-2021 12:00	02-Sep-2021 14:50	
Analyte	CAS Number	Method	LOR	Unit	SK2104022-021	SK2104022-022	SK2104022-023	SK2104022-024	SK2104022-025	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	----	----	79.7	----	
conductivity	----	E100	2.0	µS/cm	----	----	----	298	----	
pH	----	E108	0.10	pH units	----	----	----	8.00	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	----	----	106	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	----	----	<1.0	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	----	----	<1.0	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	----	87.3	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	----	176	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	----	<0.0050	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	52.9	50.2	49.6	45.7	2910	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	----	----	<0.200	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	----	5.81	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	----	0.324	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	----	<0.020	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	----	<0.010	----	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	----	<0.0500	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	----	----	2.88	----	
cation sum	----	EC101	0.10	meq/L	----	----	----	2.77	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	----	1.95	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	----	96.2	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	----	0.0142	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	----	0.0126	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	----	0.00108	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	----	0.0309	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	----	----	<0.000020	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	----	----	<0.000050	----	
boron, dissolved	7440-42-8	E421	0.010	mg/L	----	----	----	0.088	----	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	----	----	----	<0.0000050	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	06-IF-NPAG_W3 3	06-IF-NPAG_W3 4	06-IF-NPAG_W3 5	06-IF-NPAG_W3 6	07-IF-PAG-CW_ W33
Client sampling date / time					02-Sep-2021 14:50	09-Sep-2021 15:35	17-Sep-2021 11:50	23-Sep-2021 12:00	02-Sep-2021 14:50	
Analyte	CAS Number	Method	LOR	Unit	SK2104022-021 Result	SK2104022-022 Result	SK2104022-023 Result	SK2104022-024 Result	SK2104022-025 Result	
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	---	21.1	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	---	0.000024	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	---	---	<0.00050	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	---	<0.00010	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	---	0.00061	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	---	<0.030	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	---	<0.000050	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	---	0.0190	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	---	6.56	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	---	<0.00500	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	---	0.00330	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	---	---	<0.00050	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	---	<0.050	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	---	20.0	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	---	0.0172	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	---	0.000134	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	---	3.22	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	---	<0.000010	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	---	15.3	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	---	0.256	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	---	15.7	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	---	<0.00020	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	---	<0.000010	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	---	<0.00010	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	---	0.00562	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	---	---	<0.00030	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	---	---	0.00069	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	---	---	0.00392	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	---	---	<0.00050	---	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	---	---	---	0.0049	---	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	---	---	---	<0.00030	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	06-IF-NPAG_W3 3	06-IF-NPAG_W3 4	06-IF-NPAG_W3 5	06-IF-NPAG_W3 6	07-IF-PAG-CW_ W33
Client sampling date / time					02-Sep-2021 14:50	09-Sep-2021 15:35	17-Sep-2021 11:50	23-Sep-2021 12:00	02-Sep-2021 14:50	
Analyte	CAS Number	Method	LOR	Unit	SK2104022-021	SK2104022-022	SK2104022-023	SK2104022-024	SK2104022-025	
Dissolved Metals					Result	Result	Result	Result	Result	
dissolved metals filtration location	----	EP421	-	-	----	----	----	Field	----	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	07-IF-PAG-CW_ W34	07-IF-PAG-CW_ W35	07-IF-PAG-CW_ W36	08-SED-PAG-C W_W33	08-SED-PAG-C W_W34
Client sampling date / time					09-Sep-2021 15:35	17-Sep-2021 11:50	23-Sep-2021 12:00	02-Sep-2021 14:50	09-Sep-2021 15:35	
Analyte	CAS Number	Method	LOR	Unit	SK2104022-026	SK2104022-027	SK2104022-028	SK2104022-029	SK2104022-030	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	----	13300	----	----	
conductivity	----	E100	2.0	µS/cm	----	----	78200	----	----	
pH	----	E108	0.10	pH units	----	----	7.47	----	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	----	80.5	----	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	----	<1.0	----	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	----	<1.0	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	66.0	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	56200	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	4.23 ^{RRV}	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	2850	3560	2900	2590	2730	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	----	2.29	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	32700	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	<10.0 ^{DLDS}	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	<10.0 ^{DLDS}	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	<5.00 ^{DLDS}	----	----	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	<11.2	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	----	984	----	----	
cation sum	----	EC101	0.10	meq/L	----	----	984	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	<0.010	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	100	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	<0.100 ^{DLDS}	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	<0.0100 ^{DLDS}	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	<0.0100 ^{DLDS}	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	0.171	----	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	----	<0.00200 ^{DLDS}	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	----	<0.00500 ^{DLDS}	----	----	
boron, dissolved	7440-42-8	E421	0.010	mg/L	----	----	1.21	----	----	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	----	----	0.00104	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	07-IF-PAG-CW_ W34	07-IF-PAG-CW_ W35	07-IF-PAG-CW_ W36	08-SED-PAG-C W_W33	08-SED-PAG-C W_W34
Client sampling date / time					09-Sep-2021 15:35	17-Sep-2021 11:50	23-Sep-2021 12:00	02-Sep-2021 14:50	09-Sep-2021 15:35	
Analyte	CAS Number	Method	LOR	Unit	SK2104022-026 Result	SK2104022-027 Result	SK2104022-028 Result	SK2104022-029 Result	SK2104022-030 Result	
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	1650	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	0.0176	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	---	<0.0500 ^{DLDS}	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	<0.0100 ^{DLDS}	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	<0.0200 ^{DLDS}	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	<3.00 ^{DLDS}	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	<0.00500 ^{DLDS}	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	0.310	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	2230	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	0.636	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	<0.00500 ^{DLDS}	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	---	0.0957	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	<5.00 ^{DLDS}	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	522	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	0.396	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	<0.00500 ^{DLDS}	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	<5.00 ^{DLDS}	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	0.00130	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	---	16200	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	40.8	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	1240	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	<0.0200 ^{DLDS}	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	<0.00100 ^{DLDS}	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	<0.0100 ^{DLDS}	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	<0.0100 ^{DLDS}	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	---	<0.0300 ^{DLDS}	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	---	<0.0100 ^{DLDS}	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	---	0.0128	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	---	<0.0500 ^{DLDS}	---	---	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	---	---	0.160	---	---	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	---	---	<0.0300 ^{DLDS}	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	07-IF-PAG-CW_ W34	07-IF-PAG-CW_ W35	07-IF-PAG-CW_ W36	08-SED-PAG-C W_W33	08-SED-PAG-C W_W34
Client sampling date / time					09-Sep-2021 15:35	17-Sep-2021 11:50	23-Sep-2021 12:00	02-Sep-2021 14:50	09-Sep-2021 15:35	
Analyte	CAS Number	Method	LOR	Unit	SK2104022-026	SK2104022-027	SK2104022-028	SK2104022-029	SK2104022-030	
Dissolved Metals					Result	Result	Result	Result	Result	
dissolved metals filtration location	----	EP421	-	-	----	----	Field	----	----	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	08-SED-PAG-C W_W35	08-SED-PAG-C W_W36	09-FZONE-NPA G_W33	09-FZONE-NPA G_W34	09-FZONE-NPA G_W35
Client sampling date / time					17-Sep-2021 11:50	23-Sep-2021 12:00	02-Sep-2021 14:50	09-Sep-2021 15:35	17-Sep-2021 11:50	
Analyte	CAS Number	Method	LOR	Unit	SK2104022-031	SK2104022-032	SK2104022-033	SK2104022-034	SK2104022-035	
					Result	Result	Result	Result	Result	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	13100	----	----	----	
conductivity	----	E100	2.0	µS/cm	----	78300	----	----	----	
pH	----	E108	0.10	pH units	----	7.36	----	----	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	52.2	----	----	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	<1.0	----	----	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	<1.0	----	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	42.8	----	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	55500	----	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	4.43 ^{RRV}	----	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	2760	3210	31.2	28.1	30.8	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	1.10	----	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	31700	----	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	<10.0 ^{DLDS}	----	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	<10.0 ^{DLDS}	----	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	<5.00 ^{DLDS}	----	----	----	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	<11.2	----	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	962	----	----	----	
cation sum	----	EC101	0.10	meq/L	----	980	----	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	0.927	----	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	102	----	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	0.105	----	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	<0.0100 ^{DLDS}	----	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	<0.0100 ^{DLDS}	----	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	0.158	----	----	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	<0.00200 ^{DLDS}	----	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	<0.00500 ^{DLDS}	----	----	----	
boron, dissolved	7440-42-8	E421	0.010	mg/L	----	1.17	----	----	----	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	----	0.00412	----	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	08-SED-PAG-C W_W35	08-SED-PAG-C W_W36	09-FZONE-NPA G_W33	09-FZONE-NPA G_W34	09-FZONE-NPA G_W35
Client sampling date / time					17-Sep-2021 11:50	23-Sep-2021 12:00	02-Sep-2021 14:50	09-Sep-2021 15:35	17-Sep-2021 11:50	
Analyte	CAS Number	Method	LOR	Unit	SK2104022-031	SK2104022-032	SK2104022-033	SK2104022-034	SK2104022-035	
					Result	Result	Result	Result	Result	
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	1630	---	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	0.0109	---	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	<0.0500 DLDS	---	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	0.0373	---	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	<0.0200 DLDS	---	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	<3.00 DLDS	---	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	<0.00500 DLDS	---	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	0.269	---	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	2200	---	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	<0.500 DLDS	---	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	0.0148	---	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	0.131	---	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	<5.00 DLDS	---	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	499	---	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	0.204	---	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	<0.00500 DLDS	---	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	<5.00 DLDS	---	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	0.00152	---	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	---	16200	---	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	41.9	---	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	1210	---	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	<0.0200 DLDS	---	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	<0.00100 DLDS	---	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	<0.0100 DLDS	---	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	<0.0100 DLDS	---	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	<0.0300 DLDS	---	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	<0.0100 DLDS	---	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	0.0192	---	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	<0.0500 DLDS	---	---	---	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	---	<0.100 DLDS	---	---	---	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	---	<0.0300 DLDS	---	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	08-SED-PAG-C W_W35	08-SED-PAG-C W_W36	09-FZONE-NPA G_W33	09-FZONE-NPA G_W34	09-FZONE-NPA G_W35
Client sampling date / time					17-Sep-2021 11:50	23-Sep-2021 12:00	02-Sep-2021 14:50	09-Sep-2021 15:35	17-Sep-2021 11:50	
Analyte	CAS Number	Method	LOR	Unit	SK2104022-031	SK2104022-032	SK2104022-033	SK2104022-034	SK2104022-035	
					Result	Result	Result	Result	Result	
Dissolved Metals										
dissolved metals filtration location	----	EP421	-	-	----	Field	----	----	----	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	09-FZONE-NPA G_W36	----	----	----	----
Client sampling date / time					23-Sep-2021 12:00	----	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	SK2104022-036	-----	-----	-----	-----	
					Result	---	---	---	---	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	95.0	----	----	----	----	
conductivity	----	E100	2.0	µS/cm	311	----	----	----	----	
pH	----	E108	0.10	pH units	8.07	----	----	----	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	116	----	----	----	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	<1.0	----	----	----	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	<1.0	----	----	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	94.8	----	----	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	151	----	----	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0399	----	----	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	29.6	----	----	----	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	<0.200	----	----	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	5.41	----	----	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	0.507	----	----	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.020	----	----	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	----	----	----	----	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	<0.0500	----	----	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	2.69	----	----	----	----	
cation sum	----	EC101	0.10	meq/L	2.59	----	----	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	1.89	----	----	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	96.3	----	----	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0248	----	----	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00477	----	----	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00221	----	----	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0215	----	----	----	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	----	----	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	----	----	----	----	
boron, dissolved	7440-42-8	E421	0.010	mg/L	0.070	----	----	----	----	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	----	----	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	09-FZONE-NPA G_W36	----	----	----	----
Client sampling date / time					23-Sep-2021 12:00	---	---	---	---	
Analyte	CAS Number	Method	LOR	Unit	SK2104022-036	-----	-----	-----	-----	
					Result	---	---	---	---	
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L	22.2	---	---	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	---	---	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	---	---	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.00010	---	---	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00121	---	---	---	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	<0.030	---	---	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	---	---	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0051	---	---	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	9.62	---	---	---	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	<0.00500	---	---	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00210	---	---	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	---	---	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	---	---	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	7.18	---	---	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00104	---	---	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000333	---	---	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	3.14	---	---	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	---	---	---	---	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	11.5	---	---	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0570	---	---	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	10.6	---	---	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	---	---	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	---	---	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	---	---	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	0.0126	---	---	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	---	---	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	0.00015	---	---	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.00179	---	---	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	0.00052	---	---	---	---	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0016	---	---	---	---	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	---	---	---	---	



Analytical Results

Sub-Matrix: Water					<i>Client sample ID</i>	09-FZONE-NPA G_W36	----	----	----	----
(Matrix: Water)					<i>Client sampling date / time</i>	23-Sep-2021 12:00	----	----	----	----
<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	SK2104022-036	-----	-----	-----	-----	-----
					Result	---	---	---	---	---
Dissolved Metals										
dissolved metals filtration location	----	EP421	-	-	Field	----	----	----	----	----

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: SK2104022	Page	: 1 of 20
Client	: O'Kane Consultants Inc.	Laboratory	: Saskatoon - Environmental
Contact	: Jared Robertson	Account Manager	: Brian Morgan
Address	: 112 - 112 Research Drive Saskatoon SK Canada S7N 3R3	Address	: 819 58 Street East Saskatoon, Saskatchewan Canada S7K 6X5
Telephone	: 250 420 7010	Telephone	: 1 306 221 7147
Project	: 948-021	Date Samples Received	: 23-Sep-2021 15:45
PO	: ----	Issue Date	: 15-Oct-2021 14:58
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: Q83455		
No. of samples received	: 36		
No. of samples analysed	: 36		

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 Services number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

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		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 02-IF-PAG_W36	E298	23-Sep-2021	13-Oct-2021	----	----		13-Oct-2021	28 days	20 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 03-SED-PAG_W36	E298	23-Sep-2021	13-Oct-2021	----	----		13-Oct-2021	28 days	20 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 04-GAB-NPAG_W36	E298	23-Sep-2021	13-Oct-2021	----	----		13-Oct-2021	28 days	20 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 05-SED-NPAG_W36	E298	23-Sep-2021	13-Oct-2021	----	----		13-Oct-2021	28 days	20 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 06-IF-NPAG_W36	E298	23-Sep-2021	13-Oct-2021	----	----		13-Oct-2021	28 days	20 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 07-IF-PAG-CW_W36	E298	23-Sep-2021	13-Oct-2021	----	----		13-Oct-2021	28 days	20 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 08-SED-PAG-CW_W36	E298	23-Sep-2021	13-Oct-2021	----	----		13-Oct-2021	28 days	20 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 09-FZONE-NPAG_W36	E298	23-Sep-2021	13-Oct-2021	----	----		13-Oct-2021	28 days	20 days	✔	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) 01_TSF_W40	E298	17-Sep-2021	13-Oct-2021	----	----		13-Oct-2021	28 days	26 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 02-IF-PAG_W36	E235.Cl	23-Sep-2021	----	----	----		26-Sep-2021	28 days	3 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 03-SED-PAG_W36	E235.Cl	23-Sep-2021	----	----	----		26-Sep-2021	28 days	3 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 04-GAB-NPAG_W36	E235.Cl	23-Sep-2021	----	----	----		26-Sep-2021	28 days	3 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 05-SED-NPAG_W36	E235.Cl	23-Sep-2021	----	----	----		26-Sep-2021	28 days	3 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 06-IF-NPAG_W36	E235.Cl	23-Sep-2021	----	----	----		26-Sep-2021	28 days	3 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 07-IF-PAG-CW_W36	E235.Cl	23-Sep-2021	----	----	----		26-Sep-2021	28 days	3 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 08-SED-PAG-CW_W36	E235.Cl	23-Sep-2021	----	----	----		26-Sep-2021	28 days	3 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Chloride in Water by IC											
HDPE 09-FZONE-NPAG_W36	E235.Cl	23-Sep-2021	----	----	----		26-Sep-2021	28 days	3 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE 01_TSF_W40	E235.Cl	17-Sep-2021	----	----	----		24-Sep-2021	28 days	7 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 02-IF-PAG_W36	E235.F	23-Sep-2021	----	----	----		26-Sep-2021	28 days	3 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 03-SED-PAG_W36	E235.F	23-Sep-2021	----	----	----		26-Sep-2021	28 days	3 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 04-GAB-NPAG_W36	E235.F	23-Sep-2021	----	----	----		26-Sep-2021	28 days	3 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 05-SED-NPAG_W36	E235.F	23-Sep-2021	----	----	----		26-Sep-2021	28 days	3 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 06-IF-NPAG_W36	E235.F	23-Sep-2021	----	----	----		26-Sep-2021	28 days	3 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 07-IF-PAG-CW_W36	E235.F	23-Sep-2021	----	----	----		26-Sep-2021	28 days	3 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 08-SED-PAG-CW_W36	E235.F	23-Sep-2021	----	----	----		26-Sep-2021	28 days	3 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Fluoride in Water by IC											
HDPE 09-FZONE-NPAG_W36	E235.F	23-Sep-2021	----	----	----		26-Sep-2021	28 days	3 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE 01_TSF_W40	E235.F	17-Sep-2021	----	----	----		24-Sep-2021	28 days	7 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 02-IF-PAG_W36	E235.NO3	23-Sep-2021	----	----	----		26-Sep-2021	3 days	3 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 03-SED-PAG_W36	E235.NO3	23-Sep-2021	----	----	----		26-Sep-2021	3 days	3 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 04-GAB-NPAG_W36	E235.NO3	23-Sep-2021	----	----	----		26-Sep-2021	3 days	3 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 05-SED-NPAG_W36	E235.NO3	23-Sep-2021	----	----	----		26-Sep-2021	3 days	3 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 06-IF-NPAG_W36	E235.NO3	23-Sep-2021	----	----	----		26-Sep-2021	3 days	3 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 07-IF-PAG-CW_W36	E235.NO3	23-Sep-2021	----	----	----		26-Sep-2021	3 days	3 days	✔	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 08-SED-PAG-CW_W36	E235.NO3	23-Sep-2021	----	----	----		26-Sep-2021	3 days	3 days	✔	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrate in Water by IC											
HDPE 09-FZONE-NPAG_W36	E235.NO3	23-Sep-2021	----	----	----		26-Sep-2021	3 days	3 days	✓	
Anions and Nutrients : Nitrate in Water by IC											
HDPE 01_TSF_W40	E235.NO3	17-Sep-2021	----	----	----		24-Sep-2021	3 days	7 days	* EHTR	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 02-IF-PAG_W36	E235.NO2	23-Sep-2021	----	----	----		26-Sep-2021	3 days	3 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 03-SED-PAG_W36	E235.NO2	23-Sep-2021	----	----	----		26-Sep-2021	3 days	3 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 04-GAB-NPAG_W36	E235.NO2	23-Sep-2021	----	----	----		26-Sep-2021	3 days	3 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 05-SED-NPAG_W36	E235.NO2	23-Sep-2021	----	----	----		26-Sep-2021	3 days	3 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 06-IF-NPAG_W36	E235.NO2	23-Sep-2021	----	----	----		26-Sep-2021	3 days	3 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 07-IF-PAG-CW_W36	E235.NO2	23-Sep-2021	----	----	----		26-Sep-2021	3 days	3 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 08-SED-PAG-CW_W36	E235.NO2	23-Sep-2021	----	----	----		26-Sep-2021	3 days	3 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrite in Water by IC											
HDPE 09-FZONE-NPAG_W36	E235.NO2	23-Sep-2021	----	----	----		26-Sep-2021	3 days	3 days	✓	
Anions and Nutrients : Nitrite in Water by IC											
HDPE 01_TSF_W40	E235.NO2	17-Sep-2021	----	----	----		24-Sep-2021	3 days	7 days	* EHTR	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 06-IF-NPAG_W35	E235.SO4	17-Sep-2021	----	----	----		29-Sep-2021	28 days	12 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 07-IF-PAG-CW_W35	E235.SO4	17-Sep-2021	----	----	----		29-Sep-2021	28 days	12 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 08-SED-PAG-CW_W35	E235.SO4	17-Sep-2021	----	----	----		29-Sep-2021	28 days	12 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 09-FZONE-NPAG_W35	E235.SO4	17-Sep-2021	----	----	----		29-Sep-2021	28 days	12 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 01_TSF_W39	E235.SO4	09-Sep-2021	----	----	----		24-Sep-2021	28 days	15 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 02-IF-PAG_W34	E235.SO4	09-Sep-2021	----	----	----		24-Sep-2021	28 days	15 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 03-SED-PAG_W34	E235.SO4	09-Sep-2021	----	----	----		24-Sep-2021	28 days	15 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Sulfate in Water by IC										
HDPE 04-GAB-NPAG_W34	E235.S04	09-Sep-2021	----	----	----		24-Sep-2021	28 days	15 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 05-SED-NPAG_W34	E235.S04	09-Sep-2021	----	----	----		24-Sep-2021	28 days	15 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 06-IF-NPAG_W34	E235.S04	09-Sep-2021	----	----	----		24-Sep-2021	28 days	15 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 07-IF-PAG-CW_W34	E235.S04	09-Sep-2021	----	----	----		24-Sep-2021	28 days	15 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 08-SED-PAG-CW_W34	E235.S04	09-Sep-2021	----	----	----		24-Sep-2021	28 days	15 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 09-FZONE-NPAG_W34	E235.S04	09-Sep-2021	----	----	----		24-Sep-2021	28 days	15 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W38	E235.S04	02-Sep-2021	----	----	----		24-Sep-2021	28 days	22 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 02-IF-PAG_W33	E235.S04	02-Sep-2021	----	----	----		24-Sep-2021	28 days	22 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 03-SED-PAG_W33	E235.S04	02-Sep-2021	----	----	----		24-Sep-2021	28 days	22 days	✔



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Sulfate in Water by IC										
HDPE 04-GAB-NPAG_W33	E235.S04	02-Sep-2021	----	----	----		24-Sep-2021	28 days	22 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 05-SED-NPAG_W33	E235.S04	02-Sep-2021	----	----	----		24-Sep-2021	28 days	22 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 06-IF-NPAG_W33	E235.S04	02-Sep-2021	----	----	----		24-Sep-2021	28 days	22 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 07-IF-PAG-CW_W33	E235.S04	02-Sep-2021	----	----	----		24-Sep-2021	28 days	22 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 08-SED-PAG-CW_W33	E235.S04	02-Sep-2021	----	----	----		24-Sep-2021	28 days	22 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 09-FZONE-NPAG_W33	E235.S04	02-Sep-2021	----	----	----		24-Sep-2021	28 days	22 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 02-IF-PAG_W36	E235.S04	23-Sep-2021	----	----	----		26-Sep-2021	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 03-SED-PAG_W36	E235.S04	23-Sep-2021	----	----	----		26-Sep-2021	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 04-GAB-NPAG_W36	E235.S04	23-Sep-2021	----	----	----		26-Sep-2021	28 days	3 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Sulfate in Water by IC											
HDPE 05-SED-NPAG_W36	E235.S04	23-Sep-2021	----	----	----		26-Sep-2021	28 days	3 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 06-IF-NPAG_W36	E235.S04	23-Sep-2021	----	----	----		26-Sep-2021	28 days	3 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 07-IF-PAG-CW_W36	E235.S04	23-Sep-2021	----	----	----		26-Sep-2021	28 days	3 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 08-SED-PAG-CW_W36	E235.S04	23-Sep-2021	----	----	----		26-Sep-2021	28 days	3 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 09-FZONE-NPAG_W36	E235.S04	23-Sep-2021	----	----	----		26-Sep-2021	28 days	3 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 01_TSF_W41	E235.S04	23-Sep-2021	----	----	----		29-Sep-2021	28 days	6 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 01_TSF_W40	E235.S04	17-Sep-2021	----	----	----		24-Sep-2021	28 days	7 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 02-IF-PAG_W35	E235.S04	17-Sep-2021	----	----	----		24-Sep-2021	28 days	7 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 03-SED-PAG_W35	E235.S04	17-Sep-2021	----	----	----		24-Sep-2021	28 days	7 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Sulfate in Water by IC											
HDPE 04-GAB-NPAG_W35	E235.SO4	17-Sep-2021	----	----	----		24-Sep-2021	28 days	7 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE 05-SED-NPAG_W35	E235.SO4	17-Sep-2021	----	----	----		24-Sep-2021	28 days	7 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 02-IF-PAG_W36	E318	23-Sep-2021	07-Oct-2021	----	----		07-Oct-2021	28 days	14 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 03-SED-PAG_W36	E318	23-Sep-2021	07-Oct-2021	----	----		07-Oct-2021	28 days	14 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 04-GAB-NPAG_W36	E318	23-Sep-2021	07-Oct-2021	----	----		07-Oct-2021	28 days	14 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 05-SED-NPAG_W36	E318	23-Sep-2021	07-Oct-2021	----	----		07-Oct-2021	28 days	14 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 06-IF-NPAG_W36	E318	23-Sep-2021	07-Oct-2021	----	----		07-Oct-2021	28 days	14 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 07-IF-PAG-CW_W36	E318	23-Sep-2021	07-Oct-2021	----	----		07-Oct-2021	28 days	14 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 08-SED-PAG-CW_W36	E318	23-Sep-2021	07-Oct-2021	----	----		07-Oct-2021	28 days	14 days	✔	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 09-FZONE-NPAG_W36	E318	23-Sep-2021	07-Oct-2021	----	----		07-Oct-2021	28 days	14 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) 01_TSF_W40	E318	17-Sep-2021	07-Oct-2021	----	----		07-Oct-2021	28 days	20 days	✓	
Cyanides : Total Cyanide by CFA											
UV inhibited HDPE - total (sodium hydroxide) 01_TSF_W40	E333	17-Sep-2021	----	----	----		27-Sep-2021	14 days	10 days	✓	
Cyanides : WAD Cyanide by CFA											
UV inhibited HDPE - total (sodium hydroxide) 01_TSF_W40	E336	17-Sep-2021	----	----	----		27-Sep-2021	14 days	10 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 01_TSF_W40	E421	17-Sep-2021	28-Sep-2021	----	----		28-Sep-2021	180 days	11 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 02-IF-PAG_W36	E421	23-Sep-2021	28-Sep-2021	----	----		28-Sep-2021	180 days	5 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 03-SED-PAG_W36	E421	23-Sep-2021	28-Sep-2021	----	----		28-Sep-2021	180 days	5 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 04-GAB-NPAG_W36	E421	23-Sep-2021	28-Sep-2021	----	----		28-Sep-2021	180 days	5 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 05-SED-NPAG_W36	E421	23-Sep-2021	28-Sep-2021	----	----		28-Sep-2021	180 days	5 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 06-IF-NPAG_W36	E421	23-Sep-2021	28-Sep-2021	----	----		28-Sep-2021	180 days	5 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 07-IF-PAG-CW_W36	E421	23-Sep-2021	28-Sep-2021	----	----		28-Sep-2021	180 days	5 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 08-SED-PAG-CW_W36	E421	23-Sep-2021	28-Sep-2021	----	----		28-Sep-2021	180 days	5 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 09-FZONE-NPAG_W36	E421	23-Sep-2021	28-Sep-2021	----	----		28-Sep-2021	180 days	5 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 02-IF-PAG_W36	E290	23-Sep-2021	----	----	----		24-Sep-2021	14 days	1 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 03-SED-PAG_W36	E290	23-Sep-2021	----	----	----		24-Sep-2021	14 days	1 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 04-GAB-NPAG_W36	E290	23-Sep-2021	----	----	----		24-Sep-2021	14 days	1 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 05-SED-NPAG_W36	E290	23-Sep-2021	----	----	----		24-Sep-2021	14 days	1 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 06-IF-NPAG_W36	E290	23-Sep-2021	----	----	----		24-Sep-2021	14 days	1 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Physical Tests : Alkalinity Species by Titration											
HDPE 07-IF-PAG-CW_W36	E290	23-Sep-2021	----	----	----		24-Sep-2021	14 days	1 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE 08-SED-PAG-CW_W36	E290	23-Sep-2021	----	----	----		24-Sep-2021	14 days	1 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE 09-FZONE-NPAG_W36	E290	23-Sep-2021	----	----	----		24-Sep-2021	14 days	1 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE 01_TSF_W40	E290	17-Sep-2021	----	----	----		24-Sep-2021	14 days	7 days	✔	
Physical Tests : Conductivity in Water											
HDPE 02-IF-PAG_W36	E100	23-Sep-2021	----	----	----		24-Sep-2021	28 days	1 days	✔	
Physical Tests : Conductivity in Water											
HDPE 03-SED-PAG_W36	E100	23-Sep-2021	----	----	----		24-Sep-2021	28 days	1 days	✔	
Physical Tests : Conductivity in Water											
HDPE 04-GAB-NPAG_W36	E100	23-Sep-2021	----	----	----		24-Sep-2021	28 days	1 days	✔	
Physical Tests : Conductivity in Water											
HDPE 05-SED-NPAG_W36	E100	23-Sep-2021	----	----	----		24-Sep-2021	28 days	1 days	✔	
Physical Tests : Conductivity in Water											
HDPE 06-IF-NPAG_W36	E100	23-Sep-2021	----	----	----		24-Sep-2021	28 days	1 days	✔	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Conductivity in Water										
HDPE 07-IF-PAG-CW_W36	E100	23-Sep-2021	----	----	----		24-Sep-2021	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 08-SED-PAG-CW_W36	E100	23-Sep-2021	----	----	----		24-Sep-2021	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 09-FZONE-NPAG_W36	E100	23-Sep-2021	----	----	----		24-Sep-2021	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 01_TSF_W40	E100	17-Sep-2021	----	----	----		24-Sep-2021	28 days	7 days	✓
Physical Tests : pH by Meter										
HDPE 01_TSF_W40	E108	17-Sep-2021	----	----	----		24-Sep-2021	0.25 hrs	166 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 02-IF-PAG_W36	E108	23-Sep-2021	----	----	----		24-Sep-2021	0.25 hrs	22 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 03-SED-PAG_W36	E108	23-Sep-2021	----	----	----		24-Sep-2021	0.25 hrs	22 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 04-GAB-NPAG_W36	E108	23-Sep-2021	----	----	----		24-Sep-2021	0.25 hrs	22 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 05-SED-NPAG_W36	E108	23-Sep-2021	----	----	----		24-Sep-2021	0.25 hrs	22 hrs	* EHTR-FM



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : pH by Meter										
HDPE 06-IF-NPAG_W36	E108	23-Sep-2021	----	----	----		24-Sep-2021	0.25 hrs	22 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 07-IF-PAG-CW_W36	E108	23-Sep-2021	----	----	----		24-Sep-2021	0.25 hrs	22 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 08-SED-PAG-CW_W36	E108	23-Sep-2021	----	----	----		24-Sep-2021	0.25 hrs	22 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE 09-FZONE-NPAG_W36	E108	23-Sep-2021	----	----	----		24-Sep-2021	0.25 hrs	22 hrs	* EHTR-FM

Legend & Qualifier Definitions

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

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	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	300985	1	19	5.2	5.0	✓
Ammonia by Fluorescence	E298	318005	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	301832	2	34	5.8	5.0	✓
Conductivity in Water	E100	300984	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	301992	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	301830	2	31	6.4	5.0	✓
Nitrate in Water by IC	E235.NO3	301829	2	36	5.5	5.0	✓
Nitrite in Water by IC	E235.NO2	301828	2	36	5.5	5.0	✓
pH by Meter	E108	300983	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	301831	4	77	5.1	5.0	✓
Total Cyanide by CFA	E333	303738	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	312103	1	10	10.0	5.0	✓
WAD Cyanide by CFA	E336	303739	1	7	14.2	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	300985	1	19	5.2	5.0	✓
Ammonia by Fluorescence	E298	318005	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	301832	2	34	5.8	5.0	✓
Conductivity in Water	E100	300984	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	301992	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	301830	2	31	6.4	5.0	✓
Nitrate in Water by IC	E235.NO3	301829	2	36	5.5	5.0	✓
Nitrite in Water by IC	E235.NO2	301828	2	36	5.5	5.0	✓
pH by Meter	E108	300983	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	301831	4	77	5.1	5.0	✓
Total Cyanide by CFA	E333	303738	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	312103	1	10	10.0	5.0	✓
WAD Cyanide by CFA	E336	303739	1	7	14.2	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	300985	1	19	5.2	5.0	✓
Ammonia by Fluorescence	E298	318005	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	301832	2	34	5.8	5.0	✓
Conductivity in Water	E100	300984	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	301992	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	301830	2	31	6.4	5.0	✓
Nitrate in Water by IC	E235.NO3	301829	2	36	5.5	5.0	✓
Nitrite in Water by IC	E235.NO2	301828	2	36	5.5	5.0	✓
Sulfate in Water by IC	E235.SO4	301831	4	77	5.1	5.0	✓



Matrix: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<i>Analytical Methods</i>							
Method Blanks (MB) - Continued							
Total Cyanide by CFA	E333	303738	1	20	5.0	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	312103	1	10	10.0	5.0	✔
WAD Cyanide by CFA	E336	303739	1	7	14.2	5.0	✔
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	318005	1	19	5.2	5.0	✔
Chloride in Water by IC	E235.Cl	301832	2	34	5.8	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	301992	1	20	5.0	5.0	✔
Fluoride in Water by IC	E235.F	301830	2	31	6.4	5.0	✔
Nitrate in Water by IC	E235.NO3	301829	2	36	5.5	5.0	✔
Nitrite in Water by IC	E235.NO2	301828	2	36	5.5	5.0	✔
Sulfate in Water by IC	E235.SO4	301831	4	77	5.1	5.0	✔
Total Cyanide by CFA	E333	303738	1	20	5.0	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	312103	1	10	10.0	5.0	✔
WAD Cyanide by CFA	E336	303739	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
Conductivity in Water	E100 Saskatoon - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Saskatoon - 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.
Chloride in Water by IC	E235.Cl Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Saskatoon - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Total Kjeldahl Nitrogen is determined using block digestion followed by flow-injection analysis with fluorescence detection.



<i>Analytical Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Total Cyanide by CFA	E333 Waterloo - Environmental	Water	ISO 14403 (mod)	Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.
WAD Cyanide by CFA	E336 Waterloo - Environmental	Water	APHA 4500-CN I (mod)	Weak Acid Dissociable (WAD) cyanide is determined by in-line sample distillation with final determination by colourimetric analysis.
Dissolved Metals in Water by CRC ICPMS	E421 Saskatoon - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Hardness (Calculated)	EC100 Saskatoon - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Ion Balance using Dissolved Metals	EC101 Saskatoon - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
TDS in Water (Calculation)	EC103 Saskatoon - Environmental	Water	APHA 1030E (mod)	Total Dissolved Solids is calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Saskatoon - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested using block digestion with Copper Sulfate Digestion Reagent.
Dissolved Metals Water Filtration	EP421 Saskatoon - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO ₃ .



QUALITY CONTROL REPORT

Work Order : **SK2104022**

Page : 1 of 14

Client : O'Kane Consultants Inc.
 Contact : Jared Robertson
 Address : 112 - 112 Research Drive
 Saskatoon SK Canada S7N 3R3
 Telephone : 250 420 7010
 Project : 948-021
 PO : ----
 C-O-C number : ----
 Sampler : ----
 Site : ----
 Quote number : Q83455
 No. of samples received : 36
 No. of samples analysed : 36

Laboratory : Saskatoon - Environmental
 Account Manager : Brian Morgan
 Address : 819 58 Street East
 Saskatoon, Saskatchewan Canada S7K 6X5
 Telephone : 1 306 221 7147
 Date Samples Received : 23-Sep-2021 15:45
 Date Analysis Commenced : 24-Sep-2021
 Issue Date : 15-Oct-2021 14:59

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 Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Anthony Calero	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Colby Bingham	Quality Systems Coordinator	Inorganics, Saskatoon, Saskatchewan
Dwayne Bennett	Technical Specialist	Metals, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Jon Fisher	Department Manager - Inorganics	Inorganics, Waterloo, Ontario
Lian Nesbitt	Laboratory Analyst	Metals, Saskatoon, Saskatchewan
Melissa Houseman	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Melissa Houseman	Team Leader - Inorganics	Metals, Saskatoon, Saskatchewan
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta

Page : 2 of 14
Work Order : SK2104022
Client : O'Kane Consultants Inc.
Project : 948-021



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 Services number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

= Indicates a QC result that did not meet the ALS DQO.



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: 300983)											
SK2104004-012	Anonymous	pH	----	E108	0.10	pH units	8.63	8.64	0.0506%	3%	----
Physical Tests (QC Lot: 300984)											
SK2104004-012	Anonymous	conductivity	----	E100	2.0	µS/cm	2940	2950	0.340%	10%	----
Physical Tests (QC Lot: 300985)											
SK2104004-012	Anonymous	alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	506	507	0.303%	20%	----
Anions and Nutrients (QC Lot: 301828)											
SK2103940-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 301829)											
SK2103940-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	0.794	0.790	0.519%	20%	----
Anions and Nutrients (QC Lot: 301830)											
SK2103940-001	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.047	0.048	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 301831)											
SK2103940-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	38.0	38.0	0.126%	20%	----
Anions and Nutrients (QC Lot: 301832)											
SK2103940-001	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	15.4	15.1	1.76%	20%	----
Anions and Nutrients (QC Lot: 301840)											
SK2103648-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	95.1	94.9	0.160%	20%	----
Anions and Nutrients (QC Lot: 301960)											
RG2100558-001	Anonymous	fluoride	16984-48-8	E235.F	0.400	mg/L	<0.400	<0.400	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 301961)											
RG2100558-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.200	mg/L	<0.200	<0.200	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 301962)											
RG2100558-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	6.00	mg/L	3240	3230	0.275%	20%	----
Anions and Nutrients (QC Lot: 301963)											
RG2100558-001	Anonymous	chloride	16887-00-6	E235.Cl	10.0	mg/L	123	126	1.93%	20%	----
Anions and Nutrients (QC Lot: 301964)											
RG2100558-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	0.400	mg/L	1.51	1.45	0.054	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 304009)											
SK2104134-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	5.26	5.31	0.912%	20%	----
Anions and Nutrients (QC Lot: 312103)											
SK2104022-008	02-IF-PAG_W36	Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	<0.200	<0.200	0	Diff <2x LOR	----



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
Anions and Nutrients (QC Lot: 318005)											
SK2104004-004	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.297	0.269	9.86%	20%	----
Cyanides (QC Lot: 303738)											
VA21C0956-001	Anonymous	cyanide, strong acid dissociable (total)	----	E333	0.0250	mg/L	<0.0250	<0.0250	0	Diff <2x LOR	----
Cyanides (QC Lot: 303739)											
VA21C0956-001	Anonymous	cyanide, weak acid dissociable	----	E336	0.0250	mg/L	<0.0250	<0.0250	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 301992)											
RG2100556-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0200	mg/L	0.104	0.0931	0.0114	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.00200	mg/L	0.0806	0.0790	2.02%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000400	mg/L	<0.000400	<0.000400	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.200	mg/L	0.806	0.816	0.010	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.000100	mg/L	0.00370	0.00365	1.34%	20%	----
		calcium, dissolved	7440-70-2	E421	1.00	mg/L	548	566	3.21%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000200	mg/L	0.000394	0.000369	0.000025	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00200	mg/L	0.151	0.148	2.07%	20%	----
		copper, dissolved	7440-50-8	E421	0.00400	mg/L	<0.00400	<0.00400	0	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.600	mg/L	<0.600	<0.600	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0200	mg/L	6.45	6.11	5.38%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.100	mg/L	1690	1640	3.43%	20%	----
		manganese, dissolved	7439-96-5	E421	0.100	mg/L	51.3	48.9	4.89%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.00100	mg/L	0.00349	0.00293	0.000557	Diff <2x LOR	----
		nickel, dissolved	7440-02-0	E421	0.0100	mg/L	0.425	0.410	3.65%	20%	----
		phosphorus, dissolved	7723-14-0	E421	1.00	mg/L	<1.00	<1.00	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	1.00	mg/L	48.1	46.8	2.80%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00400	mg/L	0.0616	0.0632	2.53%	20%	----
		selenium, dissolved	7782-49-2	E421	0.00100	mg/L	0.352	0.349	0.842%	20%	----
		silicon, dissolved	7440-21-3	E421	1.00	mg/L	9.44	9.25	0.192	Diff <2x LOR	----
		silver, dissolved	7440-22-4	E421	0.000200	mg/L	<0.000200	<0.000200	0	Diff <2x LOR	----
		sodium, dissolved	17341-25-2	E421	1.00	mg/L	2480	2310	6.96%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00400	mg/L	5.29	5.20	1.76%	20%	----
		sulfur, dissolved	7704-34-9	E421	10.0	mg/L	3450	3380	2.10%	20%	----



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
Dissolved Metals (QC Lot: 301992) - continued											
RG2100556-001	Anonymous	tellurium, dissolved	13494-80-9	E421	0.00400	mg/L	<0.00400	<0.00400	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000200	mg/L	0.000819	0.000748	0.000071	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00600	mg/L	<0.00600	<0.00600	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000200	mg/L	0.0177	0.0177	0.186%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0200	mg/L	0.111	0.108	0.0031	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00600	mg/L	<0.00600	<0.00600	0	Diff <2x LOR	----



Method Blank (MB) Report

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

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 300984)						
conductivity	----	E100	1	µS/cm	1.3	----
Physical Tests (QCLot: 300985)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Anions and Nutrients (QCLot: 301828)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 301829)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 301830)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 301831)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 301832)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 301840)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 301960)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 301961)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 301962)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 301963)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 301964)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 304009)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 312103)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 318005)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Cyanides (QCLot: 303738)						
cyanide, strong acid dissociable (total)	----	E333	0.002	mg/L	<0.0020	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Cyanides (QCLot: 303739)						
cyanide, weak acid dissociable	---	E336	0.002	mg/L	<0.0020	---
Dissolved Metals (QCLot: 301992)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	---
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	---
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	---
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	---
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	---
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	---
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	---
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	---
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	---
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	---
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	---
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	---
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	---
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	---
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	---
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	---
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	---
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	---
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	---
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	---
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	---
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	---
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	---
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	---
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	---
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	---
sodium, dissolved	17341-25-2	E421	0.05	mg/L	<0.050	---
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	---
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	---
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	---
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	---
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	---
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	---
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	---



Sub-Matrix: **Water**

<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	<i>Result</i>	<i>Qualifier</i>
Dissolved Metals (QCLot: 301992) - continued						
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----



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				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 300983)									
pH	----	E108	----	pH units	6.86 pH units	99.6	98.0	102	----
Physical Tests (QCLot: 300984)									
conductivity	----	E100	1	µS/cm	1000 µS/cm	101	90.0	110	----
Physical Tests (QCLot: 300985)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	100	85.0	115	----
Anions and Nutrients (QCLot: 301828)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	99.1	90.0	110	----
Anions and Nutrients (QCLot: 301829)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 301830)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	99.7	90.0	110	----
Anions and Nutrients (QCLot: 301831)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 301832)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 301840)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 301960)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	98.3	90.0	110	----
Anions and Nutrients (QCLot: 301961)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	92.4	90.0	110	----
Anions and Nutrients (QCLot: 301962)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 301963)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	96.1	90.0	110	----
Anions and Nutrients (QCLot: 301964)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	99.4	90.0	110	----
Anions and Nutrients (QCLot: 304009)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 312103)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 318005)									



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 318005) - continued									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	104	85.0	115	----
Cyanides (QCLot: 303738)									
cyanide, strong acid dissociable (total)	----	E333	0.002	mg/L	0.25 mg/L	98.0	80.0	120	----
Cyanides (QCLot: 303739)									
cyanide, weak acid dissociable	----	E336	0.002	mg/L	0.125 mg/L	96.5	80.0	120	----
Dissolved Metals (QCLot: 301992)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	111	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	106	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	107	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	110	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	98.4	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	103	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	99.7	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	104	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	96.1	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	103	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	108	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	107	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	108	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	109	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	105	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	106	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	106	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	110	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	106	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	107	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	95.7	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	109	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	108	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	99.3	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	102	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	102	80.0	120	----
sodium, dissolved	17341-25-2	E421	0.05	mg/L	50 mg/L	111	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	103	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	114	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	95.8	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 301992) - continued									
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	104	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	104	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	105	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	106	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	105	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	104	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	109	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	107	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	101	80.0	120	----



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: 301828)										
SK2103940-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.493 mg/L	0.5 mg/L	98.6	75.0	125	----
Anions and Nutrients (QCLot: 301829)										
SK2103940-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	2.48 mg/L	2.5 mg/L	99.3	75.0	125	----
Anions and Nutrients (QCLot: 301830)										
SK2103940-002	Anonymous	fluoride	16984-48-8	E235.F	0.993 mg/L	1 mg/L	99.3	75.0	125	----
Anions and Nutrients (QCLot: 301831)										
SK2103940-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	102 mg/L	100 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 301832)										
SK2103940-002	Anonymous	chloride	16887-00-6	E235.Cl	100 mg/L	100 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 301840)										
SK2103657-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	82.0 mg/L	100 mg/L	82.0	75.0	125	----
Anions and Nutrients (QCLot: 301960)										
RG2100558-002	Anonymous	fluoride	16984-48-8	E235.F	0.837 mg/L	1 mg/L	83.7	75.0	125	----
Anions and Nutrients (QCLot: 301961)										
RG2100558-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.413 mg/L	0.5 mg/L	82.6	75.0	125	----
Anions and Nutrients (QCLot: 301962)										
RG2100558-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 301963)										
RG2100558-002	Anonymous	chloride	16887-00-6	E235.Cl	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 301964)										
RG2100558-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	2.23 mg/L	2.5 mg/L	89.1	75.0	125	----
Anions and Nutrients (QCLot: 304009)										
SK2104134-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	101 mg/L	100 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 312103)										
SK2104022-003	01_TSF_W40	Kjeldahl nitrogen, total [TKN]	----	E318	ND mg/L	2.5 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 318005)										
SK2104004-005	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----



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
Cyanides (QCLot: 303738)										
VA21C0956-001	Anonymous	cyanide, strong acid dissociable (total)	----	E333	0.210 mg/L	0.25 mg/L	83.8	70.0	130	----
Cyanides (QCLot: 303739)										
VA21C0956-001	Anonymous	cyanide, weak acid dissociable	----	E336	0.115 mg/L	0.125 mg/L	92.0	70.0	130	----
Dissolved Metals (QCLot: 301992)										
RG2100556-007	Anonymous	aluminum, dissolved	7429-90-5	E421	0.200 mg/L	0.2 mg/L	99.8	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0205 mg/L	0.02 mg/L	102	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0218 mg/L	0.02 mg/L	109	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0400 mg/L	0.04 mg/L	100	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00910 mg/L	0.01 mg/L	91.0	70.0	130	----
		boron, dissolved	7440-42-8	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00398 mg/L	0.004 mg/L	99.5	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.0104 mg/L	0.01 mg/L	104	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0429 mg/L	0.04 mg/L	107	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0199 mg/L	0.02 mg/L	99.6	70.0	130	----
		iron, dissolved	7439-89-6	E421	2.13 mg/L	2 mg/L	107	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0189 mg/L	0.02 mg/L	94.5	70.0	130	----
		lithium, dissolved	7439-93-2	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0222 mg/L	0.02 mg/L	111	70.0	130	----
		nickel, dissolved	7440-02-0	E421	ND mg/L	0.04 mg/L	ND	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	9.92 mg/L	10 mg/L	99.2	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		selenium, dissolved	7782-49-2	E421	ND mg/L	0.04 mg/L	ND	70.0	130	----
		silicon, dissolved	7440-21-3	E421	ND mg/L	10 mg/L	ND	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00387 mg/L	0.004 mg/L	96.8	70.0	130	----
		sodium, dissolved	17341-25-2	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0391 mg/L	0.04 mg/L	97.8	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00369 mg/L	0.004 mg/L	92.3	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0188 mg/L	0.02 mg/L	94.3	70.0	130	----



Sub-Matrix: **Water**

					<i>Matrix Spike (MS) Report</i>					
					<i>Spike</i>		<i>Recovery (%)</i>	<i>Recovery Limits (%)</i>		
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>Concentration</i>	<i>Target</i>	<i>MS</i>	<i>Low</i>	<i>High</i>	<i>Qualifier</i>
Dissolved Metals (QCLot: 301992) - continued										
RG2100556-007	Anonymous	tin, dissolved	7440-31-5	E421	0.0210 mg/L	0.02 mg/L	105	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0448 mg/L	0.04 mg/L	112	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0212 mg/L	0.02 mg/L	106	70.0	130	----
		uranium, dissolved	7440-61-1	E421	ND mg/L	0.004 mg/L	ND	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.111 mg/L	0.1 mg/L	111	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.402 mg/L	0.4 mg/L	100	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0412 mg/L	0.04 mg/L	103	70.0	130	----



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Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 17 -

Page 1 of

Report To Contact and company name below will appear on the final report		Report Format / Distribution			Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)															
Company: Okane Consultants		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL)			Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply															
Contact: Jared Robertson		Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			PRIORITY (Business Days)		4 day [P4-20%] <input type="checkbox"/>		EMERGENCY		1 Business day [E - 100%] <input type="checkbox"/>									
Phone: 1 (306) 713-1695		<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked			3 day [P3-25%] <input type="checkbox"/>		2 day [P2-50%] <input type="checkbox"/>		Same Day, Weekend or Statutory holiday [E2 - 200% (Laboratory opening fees may apply)] <input type="checkbox"/>											
Company address below will appear on the final report		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm															
Street: 112-112 Research Drive		Email 1 or Fax jrobertson@okc-sk.com			For tests that can not be performed according to the service level selected, you will be contacted.															
City/Province: Saskatoon, SK		Email 2			Analysis Request															
Postal Code: S7N 3R3		Email 3			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below															
Invoice To		Invoice Distribution			NUMBER OF CONTAINERS															
Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			F/P															
Copy of Invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Email 1 or Fax jrobertson@okc-sk.com			BR-IC-N-CL															
Company:		Email 2			MET-D-COM-SK															
Contact:					ROU-F-SK															
Project Information		Oil and Gas Required Fields (client use)			SO4-IC-N-CL															
ALS Account # / Quote #: Q83455		AFE/Cost Center: PO#			CN-T-CFA-VA															
Job #: 948-021		Major/Minor Code: Routing Code:			CN-WAD-CFA-VA															
PO / AFE:		Requisitioner:			NH3															
_SD:		Location:			TKN															
ALS Lab Work Order # (lab use only):		ALS Contact:			PT															
		Sampler:																		
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											
04-GAB-NPAG_W33					2-Sep-21		14:50		Leachate		1									
04-GAB-NPAG_W34					9-Sep-21		15:35		Leachate		1									
04-GAB-NPAG_W35					17-Sep-21		11:50		Leachate		1									
04-GAB-NPAG_W36					23-Sep-21		12:00		Leachate		3									
05-SED-NPAG_W33					2-Sep-21		14:50		Leachate		1									
05-SED-NPAG_W34					9-Sep-21		15:35		Leachate		1									
05-SED-NPAG_W35					17-Sep-21		11:50		Leachate		1									
05-SED-NPAG_W36					23-Sep-21		12:00		Leachate		3									
06-IF-NPAG_W33					2-Sep-21		14:50		Leachate		1									
06-IF-NPAG_W34					9-Sep-21		15:35		Leachate		1									
06-IF-NPAG_W35					17-Sep-21		11:50		Leachate		1									
06-IF-NPAG_W36					23-Sep-21		12:00		Leachate		3									
Drinking Water (DW) Samples¹ (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)			SAMPLE CONDITION AS RECEIVED (lab use only)															
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Suspected hazards: elevated metals, potential for low levels of cyanide			Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>															
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					Ice Packs <input type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>															
					Cooling Initiated <input type="checkbox"/>															
					INITIAL COOLER TEMPERATURES °C					FINAL COOLER TEMPERATURES °C										
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)															
Released by: Jared Robertson		Date: September 23, 2021		Time:		Received by:		Date:		Time:		Received by:		Date:		Time:				



CERTIFICATE OF ANALYSIS

Work Order : **SK2105043**
Client : **O'Kane Consultants Inc.**
Contact : Jared Robertson
Address : 112 - 112 Research Drive
Saskatoon SK Canada S7N 3R3
Telephone : 250 420 7010
Project : 948-021
PO : ----
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : Q83455
No. of samples received : 19
No. of samples analysed : 19

Page : 1 of 7
Laboratory : Saskatoon - Environmental
Account Manager : Brian Morgan
Address : 819 58 Street East
Saskatoon SK Canada S7K 6X5
Telephone : 1 306 221 7147
Date Samples Received : 14-Oct-2021 11:25
Date Analysis Commenced : 14-Oct-2021
Issue Date : 05-Nov-2021 12:55

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Anthony Calero	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Colby Bingham	Quality Systems Coordinator	Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Quality Systems Coordinator	Metals, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Jon Fisher	Department Manager - Inorganics	Inorganics, Waterloo, Ontario
Lian Nesbitt	Laboratory Analyst	Metals, Saskatoon, Saskatchewan
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta



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).

<i>Unit</i>	<i>Description</i>
-	No Unit
%	percent
µS/cm	Microsiemens per centimetre
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).



Analytical Results

Sub-Matrix: Leachate (Matrix: Water)					Client sample ID	01_TSF_W42	01_TSF_W43	02-IF-PAG_W37	02-IF-PAG_W38	03-SED-PAG_W37
Client sampling date / time					29-Sep-2021 13:50	07-Oct-2021 09:20	29-Sep-2021 13:50	07-Oct-2021 09:20	29-Sep-2021 13:50	
Analyte	CAS Number	Method	LOR	Unit	SK2105043-001	SK2105043-002	SK2105043-004	SK2105043-005	SK2105043-006	
Anions and Nutrients					Result	Result	Result	Result	Result	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	1990	1900	118	104	72.6	

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

Analytical Results

Sub-Matrix: Leachate (Matrix: Water)					Client sample ID	03-SED-PAG_W38	04-GAB-NPAG_W37	04-GAB-NPAG_W38	05-SED-NPAG_W37	05-SED-NPAG_W38
Client sampling date / time					10-Jul-2021 09:20	29-Sep-2021 13:50	10-Jul-2021 09:20	29-Sep-2021 13:50	10-Jul-2021 09:20	
Analyte	CAS Number	Method	LOR	Unit	SK2105043-007	SK2105043-008	SK2105043-009	SK2105043-010	SK2105043-011	
Anions and Nutrients					Result	Result	Result	Result	Result	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	66.3	43.6	39.7	40.4	40.0	

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

Analytical Results

Sub-Matrix: Leachate (Matrix: Water)					Client sample ID	06-IF-NPAG_W37	06-IF-NPAG_W38	07-IF-PAG-CW_W37	07-IF-PAG-CW_W38	08-SED-PAG-CW_W37
Client sampling date / time					29-Sep-2021 13:50	10-Jul-2021 09:20	29-Sep-2021 13:50	10-Jul-2021 09:20	29-Sep-2021 13:50	
Analyte	CAS Number	Method	LOR	Unit	SK2105043-012	SK2105043-013	SK2105043-014	SK2105043-015	SK2105043-016	
Anions and Nutrients					Result	Result	Result	Result	Result	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	45.5	41.9	3550	3540	3390	

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



Analytical Results

Sub-Matrix: Leachate

(Matrix: Water)

					Client sample ID	08-SED-PAG-C W_W38	09-FZONE-NPA G_W37	09-FZONE-NPA G_W38	----	----
					Client sampling date / time	10-Jul-2021 09:20	29-Sep-2021 13:50	10-Jul-2021 09:20	----	----
Analyte	CAS Number	Method	LOR	Unit	SK2105043-017	SK2105043-018	SK2105043-019	-----	-----	
					Result	Result	Result	----	----	
Anions and Nutrients										
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	3490	31.1	31.0	----	----	

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



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	01_TSF_W44	----	----	----	----
					Client sampling date / time	14-Oct-2021 12:00	---	---	---	---
Analyte	CAS Number	Method	LOR	Unit	SK2105043-003	-----	-----	-----	-----	
					Result	---	---	---	---	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	1620	----	----	----	----	
conductivity	----	E100	2.0	µS/cm	3000	----	----	----	----	
pH	----	E108	0.10	pH units	7.93	----	----	----	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	219	----	----	----	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	<1.0	----	----	----	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	<1.0	----	----	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	179	----	----	----	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	2860	----	----	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	9.57	----	----	----	----	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	----	----	----	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	11.0	----	----	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	14.1	----	----	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	<0.400 ^{DLDS}	----	----	----	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	0.418	----	----	----	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.200 ^{DLDS}	----	----	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	1900	----	----	----	----	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	<0.447	----	----	----	----	
Cyanides										
cyanide, strong acid dissociable (total)	----	E333	0.0050	mg/L	0.163	----	----	----	----	
cyanide, weak acid dissociable	----	E336	0.0050	mg/L	<0.0050	----	----	----	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	43.6	----	----	----	----	
cation sum	----	EC101	0.10	meq/L	40.3	----	----	----	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	3.93	----	----	----	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	92.4	----	----	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0052	----	----	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00354	----	----	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.184	----	----	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0284	----	----	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	01_TSF_W44	----	----	----	----
Client sampling date / time					14-Oct-2021 12:00	----	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	SK2105043-003	-----	-----	-----	-----	
					Result	---	---	---	---	
Dissolved Metals										
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000040 ^{DLDS}	----	----	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000100 ^{DLDS}	----	----	----	----	
boron, dissolved	7440-42-8	E421	0.010	mg/L	0.720	----	----	----	----	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000500 ^{DLM}	----	----	----	----	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	550	----	----	----	----	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000020 ^{DLDS}	----	----	----	----	
chromium, dissolved	7440-47-3	E421	0.000050	mg/L	<0.00100 ^{DLDS}	----	----	----	----	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.0104	----	----	----	----	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00168	----	----	----	----	
iron, dissolved	7439-89-6	E421	0.030	mg/L	1.32	----	----	----	----	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000100 ^{DLDS}	----	----	----	----	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0042	----	----	----	----	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	61.3	----	----	----	----	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	0.902	----	----	----	----	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.148	----	----	----	----	
nickel, dissolved	7440-02-0	E421	0.000050	mg/L	0.00307	----	----	----	----	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.100 ^{DLDS}	----	----	----	----	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	85.8	----	----	----	----	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.0102	----	----	----	----	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.00964	----	----	----	----	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	6.61	----	----	----	----	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000020 ^{DLDS}	----	----	----	----	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	112	----	----	----	----	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	1.53	----	----	----	----	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	640	----	----	----	----	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00040 ^{DLDS}	----	----	----	----	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.000035	----	----	----	----	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00020 ^{DLDS}	----	----	----	----	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	0.00199	----	----	----	----	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00060 ^{DLDS}	----	----	----	----	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	0.00026	----	----	----	----	



Analytical Results

Sub-Matrix: Water					<i>Client sample ID</i>	01_TSF_W44	----	----	----	----
(Matrix: Water)					<i>Client sampling date / time</i>	14-Oct-2021 12:00	----	----	----	----
<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	SK2105043-003	-----	-----	-----	-----	-----
					Result	---	---	---	---	---
Dissolved Metals										
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.00274	----	----	----	----	----
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00100 ^{DLDS}	----	----	----	----	----
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.122	----	----	----	----	----
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00060 ^{DLDS}	----	----	----	----	----
dissolved metals filtration location	----	EP421	-	-	Field	----	----	----	----	----

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: SK2105043	Page	: 1 of 11
Client	: O'Kane Consultants Inc.	Laboratory	: Saskatoon - Environmental
Contact	: Jared Robertson	Account Manager	: Brian Morgan
Address	: 112 - 112 Research Drive Saskatoon SK Canada S7N 3R3	Address	: 819 58 Street East Saskatoon, Saskatchewan Canada S7K 6X5
Telephone	: 250 420 7010	Telephone	: 1 306 221 7147
Project	: 948-021	Date Samples Received	: 14-Oct-2021 11:25
PO	: ----	Issue Date	: 05-Nov-2021 12:55
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: Q83455		
No. of samples received	: 19		
No. of samples analysed	: 19		

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 Services number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- Matrix Spike outliers occur - please see following pages for full details.
- 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.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Matrix Spike (MS) Recoveries								
Anions and Nutrients	Anonymous	Anonymous	fluoride	16984-48-8	E235.F	58.8 % ^K	75.0-125%	Recovery less than lower data quality objective

Result Qualifiers

Qualifier	Description
K	Matrix Spike recovery outside ALS DQO due to sample matrix effects.



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		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) 01_TSF_W44	E298	14-Oct-2021	03-Nov-2021	----	----		03-Nov-2021	28 days	20 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 01_TSF_W44	E235.Cl	14-Oct-2021	----	----	----		15-Oct-2021	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE 01_TSF_W44	E235.F	14-Oct-2021	----	----	----		15-Oct-2021	28 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE 01_TSF_W44	E235.NO3	14-Oct-2021	----	----	----		15-Oct-2021	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 01_TSF_W44	E235.NO2	14-Oct-2021	----	----	----		15-Oct-2021	3 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W44	E235.SO4	14-Oct-2021	----	----	----		15-Oct-2021	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W42	E235.SO4	29-Sep-2021	----	----	----		16-Oct-2021	28 days	17 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Sulfate in Water by IC										
HDPE 02-IF-PAG_W37	E235.S04	29-Sep-2021	----	----	----		16-Oct-2021	28 days	17 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 03-SED-PAG_W37	E235.S04	29-Sep-2021	----	----	----		16-Oct-2021	28 days	17 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 04-GAB-NPAG_W37	E235.S04	29-Sep-2021	----	----	----		16-Oct-2021	28 days	17 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 05-SED-NPAG_W37	E235.S04	29-Sep-2021	----	----	----		16-Oct-2021	28 days	17 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 06-IF-NPAG_W37	E235.S04	29-Sep-2021	----	----	----		16-Oct-2021	28 days	17 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 07-IF-PAG-CW_W37	E235.S04	29-Sep-2021	----	----	----		16-Oct-2021	28 days	17 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 08-SED-PAG-CW_W37	E235.S04	29-Sep-2021	----	----	----		16-Oct-2021	28 days	17 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 09-FZONE-NPAG_W37	E235.S04	29-Sep-2021	----	----	----		16-Oct-2021	28 days	17 days	✔
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W43	E235.S04	07-Oct-2021	----	----	----		16-Oct-2021	28 days	9 days	✔



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Sulfate in Water by IC										
HDPE 02-IF-PAG_W38	E235.S04	07-Oct-2021	----	----	----		16-Oct-2021	28 days	9 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 03-SED-PAG_W38	E235.S04	10-Jul-2021	----	----	----		16-Oct-2021	28 days	98 days	* EHTR
Anions and Nutrients : Sulfate in Water by IC										
HDPE 04-GAB-NPAG_W38	E235.S04	10-Jul-2021	----	----	----		16-Oct-2021	28 days	98 days	* EHTR
Anions and Nutrients : Sulfate in Water by IC										
HDPE 05-SED-NPAG_W38	E235.S04	10-Jul-2021	----	----	----		16-Oct-2021	28 days	98 days	* EHTR
Anions and Nutrients : Sulfate in Water by IC										
HDPE 06-IF-NPAG_W38	E235.S04	10-Jul-2021	----	----	----		16-Oct-2021	28 days	98 days	* EHTR
Anions and Nutrients : Sulfate in Water by IC										
HDPE 07-IF-PAG-CW_W38	E235.S04	10-Jul-2021	----	----	----		16-Oct-2021	28 days	98 days	* EHTR
Anions and Nutrients : Sulfate in Water by IC										
HDPE 08-SED-PAG-CW_W38	E235.S04	10-Jul-2021	----	----	----		16-Oct-2021	28 days	98 days	* EHTR
Anions and Nutrients : Sulfate in Water by IC										
HDPE 09-FZONE-NPAG_W38	E235.S04	10-Jul-2021	----	----	----		16-Oct-2021	28 days	98 days	* EHTR
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) 01_TSF_W44	E318	14-Oct-2021	26-Oct-2021	----	----		26-Oct-2021	28 days	12 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
Rec	Actual	Rec		Actual							
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)											
Amber glass total (sulfuric acid) 01_TSF_W44	E372-U	14-Oct-2021	21-Oct-2021	----	----		21-Oct-2021	28 days	7 days	✓	
Cyanides : Total Cyanide by CFA											
UV inhibited HDPE - total (sodium hydroxide) 01_TSF_W44	E333	14-Oct-2021	----	----	----		20-Oct-2021	14 days	6 days	✓	
Cyanides : WAD Cyanide by CFA											
UV inhibited HDPE - total (sodium hydroxide) 01_TSF_W44	E336	14-Oct-2021	----	----	----		20-Oct-2021	14 days	6 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) 01_TSF_W44	E421	14-Oct-2021	18-Oct-2021	----	----		18-Oct-2021	180 days	4 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE 01_TSF_W44	E290	14-Oct-2021	----	----	----		15-Oct-2021	14 days	1 days	✓	
Physical Tests : Conductivity in Water											
HDPE 01_TSF_W44	E100	14-Oct-2021	----	----	----		15-Oct-2021	28 days	1 days	✓	
Physical Tests : pH by Meter											
HDPE 01_TSF_W44	E108	14-Oct-2021	----	----	----		15-Oct-2021	0.25 hrs	24 hrs	* EHTL	

Legend & Qualifier Definitions

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

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

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	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	319678	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	336634	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	320390	1	8	12.5	5.0	✓
Conductivity in Water	E100	319677	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	321137	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	320388	1	8	12.5	5.0	✓
Nitrate in Water by IC	E235.NO3	320386	1	10	10.0	5.0	✓
Nitrite in Water by IC	E235.NO2	320387	1	10	10.0	5.0	✓
pH by Meter	E108	319676	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	320389	2	26	7.6	5.0	✓
Total Cyanide by CFA	E333	324629	1	8	12.5	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	327092	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	325038	1	20	5.0	5.0	✓
WAD Cyanide by CFA	E336	324630	1	2	50.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	319678	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	336634	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	320390	1	8	12.5	5.0	✓
Conductivity in Water	E100	319677	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	321137	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	320388	1	8	12.5	5.0	✓
Nitrate in Water by IC	E235.NO3	320386	1	10	10.0	5.0	✓
Nitrite in Water by IC	E235.NO2	320387	1	10	10.0	5.0	✓
pH by Meter	E108	319676	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	320389	2	26	7.6	5.0	✓
Total Cyanide by CFA	E333	324629	1	8	12.5	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	327092	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	325038	1	20	5.0	5.0	✓
WAD Cyanide by CFA	E336	324630	1	2	50.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	319678	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	336634	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	320390	1	8	12.5	5.0	✓
Conductivity in Water	E100	319677	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	321137	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	320388	1	8	12.5	5.0	✓
Nitrate in Water by IC	E235.NO3	320386	1	10	10.0	5.0	✓



Matrix: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<i>Analytical Methods</i>							
Method Blanks (MB) - Continued							
Nitrite in Water by IC	E235.NO2	320387	1	10	10.0	5.0	✔
Sulfate in Water by IC	E235.SO4	320389	2	26	7.6	5.0	✔
Total Cyanide by CFA	E333	324629	1	8	12.5	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	327092	1	20	5.0	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	325038	1	20	5.0	5.0	✔
WAD Cyanide by CFA	E336	324630	1	2	50.0	5.0	✔
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	336634	1	20	5.0	5.0	✔
Chloride in Water by IC	E235.Cl	320390	1	8	12.5	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	321137	1	20	5.0	5.0	✔
Fluoride in Water by IC	E235.F	320388	1	8	12.5	5.0	✔
Nitrate in Water by IC	E235.NO3	320386	1	10	10.0	5.0	✔
Nitrite in Water by IC	E235.NO2	320387	1	10	10.0	5.0	✔
Sulfate in Water by IC	E235.SO4	320389	2	26	7.6	5.0	✔
Total Cyanide by CFA	E333	324629	1	8	12.5	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	327092	1	20	5.0	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	325038	1	20	5.0	5.0	✔
WAD Cyanide by CFA	E336	324630	1	2	50.0	5.0	✔



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Saskatoon - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Saskatoon - 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.
Chloride in Water by IC	E235.Cl Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Saskatoon - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Total Kjeldahl Nitrogen is determined using block digestion followed by flow-injection analysis with fluorescence detection.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Cyanide by CFA	E333 Waterloo - Environmental	Water	ISO 14403 (mod)	Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.
WAD Cyanide by CFA	E336 Waterloo - Environmental	Water	APHA 4500-CN I (mod)	Weak Acid Dissociable (WAD) cyanide is determined by in-line sample distillation with final determination by colourimetric analysis.
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Metals in Water by CRC ICPMS	E421 Saskatoon - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Hardness (Calculated)	EC100 Saskatoon - Environmental	Water	APHA 2340B	"Hardness (as CaCO3), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Ion Balance using Dissolved Metals	EC101 Saskatoon - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
TDS in Water (Calculation)	EC103 Saskatoon - Environmental	Water	APHA 1030E (mod)	Total Dissolved Solids is calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Saskatoon - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested using block digestion with Copper Sulfate Digestion Reagent.
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

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<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Dissolved Metals Water Filtration	EP421 Saskatoon - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

QUALITY CONTROL REPORT

Work Order : **SK2105043**

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Client : O'Kane Consultants Inc.
Contact : Jared Robertson
Address : 112 - 112 Research Drive
 Saskatoon SK Canada S7N 3R3
Telephone : 250 420 7010
Project : 948-021
PO : ----
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : Q83455
No. of samples received : 19
No. of samples analysed : 19

Laboratory : Saskatoon - Environmental
Account Manager : Brian Morgan
Address : 819 58 Street East
 Saskatoon, Saskatchewan Canada S7K 6X5
Telephone : 1 306 221 7147
Date Samples Received : 14-Oct-2021 11:25
Date Analysis Commenced : 14-Oct-2021
Issue Date : 05-Nov-2021 12:55

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 Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Anthony Calero	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Colby Bingham	Quality Systems Coordinator	Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Quality Systems Coordinator	Metals, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Jon Fisher	Department Manager - Inorganics	Inorganics, Waterloo, Ontario
Lian Nesbitt	Laboratory Analyst	Metals, Saskatoon, Saskatchewan
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta

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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 Services number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

= Indicates a QC result that did not meet the ALS DQO.



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: 319676)											
SK2105044-002	Anonymous	pH	----	E108	0.10	pH units	7.78	7.79	0.0482%	3%	----
Physical Tests (QC Lot: 319677)											
SK2105044-002	Anonymous	conductivity	----	E100	2.0	µS/cm	9490	9520	0.316%	10%	----
Physical Tests (QC Lot: 319678)											
SK2105044-002	Anonymous	alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	521	522	0.234%	20%	----
Anions and Nutrients (QC Lot: 320386)											
SK2105043-003	01_TSF_W44	nitrate (as N)	14797-55-8	E235.NO3	0.400	mg/L	0.418	0.413	0.005	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 320387)											
SK2105043-003	01_TSF_W44	nitrite (as N)	14797-65-0	E235.NO2	0.200	mg/L	<0.200	<0.200	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 320388)											
SK2105043-003	01_TSF_W44	fluoride	16984-48-8	E235.F	0.400	mg/L	<0.400	<0.400	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 320389)											
SK2105043-003	01_TSF_W44	sulfate (as SO4)	14808-79-8	E235.SO4	6.00	mg/L	1900	1840	3.03%	20%	----
Anions and Nutrients (QC Lot: 320390)											
SK2105043-003	01_TSF_W44	chloride	16887-00-6	E235.Cl	10.0	mg/L	14.1	13.3	0.82	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 321424)											
SK2105043-001	01_TSF_W42	sulfate (as SO4)	14808-79-8	E235.SO4	6.00	mg/L	1990	1970	1.19%	20%	----
Anions and Nutrients (QC Lot: 325038)											
CG2105040-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0213	0.0193	9.71%	20%	----
Anions and Nutrients (QC Lot: 327092)											
EO2103278-010	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	0.478	0.656	0.178	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 336634)											
EO2103230-021	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0250	mg/L	0.140	0.138	0.0021	Diff <2x LOR	----
Cyanides (QC Lot: 324629)											
WT2100204-037	Anonymous	cyanide, strong acid dissociable (total)	----	E333	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Cyanides (QC Lot: 324630)											
WT2100204-037	Anonymous	cyanide, weak acid dissociable	----	E336	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 321137)											
RG2100699-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0020	mg/L	0.0036	0.0034	0.0002	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----



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
Dissolved Metals (QC Lot: 321137) - continued											
RG2100699-001	Anonymous	barium, dissolved	7440-39-3	E421	0.00020	mg/L	0.0201	0.0201	0.385%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000040	mg/L	<0.000040	<0.000040	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.020	mg/L	0.281	0.281	0.0219%	20%	----
		cadmium, dissolved	7440-43-9	E421	0.0000100	mg/L	<0.0000100	<0.0000100	0	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.100	mg/L	188	185	1.20%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00020	mg/L	0.00032	0.00032	0.000003	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00040	mg/L	0.00094	0.00104	0.00010	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.060	mg/L	<0.060	<0.060	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0020	mg/L	0.103	0.102	0.211%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.0100	mg/L	89.5	87.8	1.93%	20%	----
		manganese, dissolved	7439-96-5	E421	0.0100	mg/L	2.92	2.86	2.12%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000100	mg/L	0.00230	0.00227	1.29%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00100	mg/L	0.00621	0.00614	0.00007	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.100	mg/L	12.7	13.0	2.07%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00040	mg/L	0.00178	0.00167	0.00011	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.000100	mg/L	0.000114	<0.000100	0.000014	Diff <2x LOR	----
		silicon, dissolved	7440-21-3	E421	0.100	mg/L	12.7	13.0	2.34%	20%	----
		silver, dissolved	7440-22-4	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		sodium, dissolved	17341-25-2	E421	0.100	mg/L	239	241	0.987%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00040	mg/L	1.32	1.34	1.18%	20%	----
		sulfur, dissolved	7704-34-9	E421	1.00	mg/L	273	274	0.392%	20%	----
		tellurium, dissolved	13494-80-9	E421	0.00040	mg/L	<0.00040	<0.00040	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00060	mg/L	<0.00060	<0.00060	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000020	mg/L	0.00120	0.00120	0.472%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----

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 Client : O'Kane Consultants Inc.
 Project : 948-021



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	<i>Original Result</i>	<i>Duplicate Result</i>	<i>RPD(%) or Difference</i>	<i>Duplicate Limits</i>	<i>Qualifier</i>
Dissolved Metals (QC Lot: 321137) - continued											
RG2100699-001	Anonymous	zirconium, dissolved	7440-67-7	E421	0.00060	mg/L	<0.00060	<0.00060	0	Diff <2x LOR	----



Method Blank (MB) Report

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

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 319677)						
conductivity	----	E100	1	µS/cm	1.6	----
Physical Tests (QCLot: 319678)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Anions and Nutrients (QCLot: 320386)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 320387)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 320388)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 320389)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 320390)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 321424)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 325038)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 327092)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 336634)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Cyanides (QCLot: 324629)						
cyanide, strong acid dissociable (total)	----	E333	0.002	mg/L	<0.0020	----
Cyanides (QCLot: 324630)						
cyanide, weak acid dissociable	----	E336	0.002	mg/L	<0.0020	----
Dissolved Metals (QCLot: 321137)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 321137) - continued						
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	---
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	---
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	---
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	---
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	---
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	---
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	---
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	---
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	---
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	---
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	---
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	---
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	---
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	---
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	---
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	---
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	---
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	---
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	---
sodium, dissolved	17341-25-2	E421	0.05	mg/L	<0.050	---
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	---
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	---
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	---
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	---
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	---
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	---
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	---
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	---
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	---
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	---
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	---
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	---



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				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 319676)									
pH	----	E108	----	pH units	6.86 pH units	99.7	98.0	102	----
Physical Tests (QCLot: 319677)									
conductivity	----	E100	1	µS/cm	1000 µS/cm	101	90.0	110	----
Physical Tests (QCLot: 319678)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	97.2	85.0	115	----
Anions and Nutrients (QCLot: 320386)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 320387)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 320388)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	99.0	90.0	110	----
Anions and Nutrients (QCLot: 320389)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	107	90.0	110	----
Anions and Nutrients (QCLot: 320390)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 321424)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	107	90.0	110	----
Anions and Nutrients (QCLot: 325038)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.02 mg/L	110	80.0	120	----
Anions and Nutrients (QCLot: 327092)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	92.6	75.0	125	----
Anions and Nutrients (QCLot: 336634)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	97.6	85.0	115	----
Cyanides (QCLot: 324629)									
cyanide, strong acid dissociable (total)	----	E333	0.002	mg/L	0.25 mg/L	87.6	80.0	120	----
Cyanides (QCLot: 324630)									
cyanide, weak acid dissociable	----	E336	0.002	mg/L	0.125 mg/L	101	80.0	120	----
Dissolved Metals (QCLot: 321137)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	105	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	99.9	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	101	80.0	120	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Dissolved Metals (QCLot: 321137) - continued									
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	100	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	102	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	104	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	102	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	101	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	106	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	97.1	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	102	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	99.1	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	106	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	103	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	109	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	101	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	101	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	99.3	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	100	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	111	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	102	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	104	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	99.8	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	98.3	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	94.8	80.0	120	----
sodium, dissolved	17341-25-2	E421	0.05	mg/L	50 mg/L	107	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	98.0	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	104	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	92.6	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	103	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	98.5	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	96.8	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	97.1	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	99.7	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	98.0	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	100	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	101	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	100	80.0	120	----



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: 320386)										
SK2105045-007	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	2.49 mg/L	2.5 mg/L	99.8	75.0	125	----
Anions and Nutrients (QCLot: 320387)										
SK2105045-007	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	ND mg/L	0.5 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 320388)										
SK2105045-007	Anonymous	fluoride	16984-48-8	E235.F	0.588 mg/L	1 mg/L	58.8	75.0	125	K
Anions and Nutrients (QCLot: 320389)										
SK2105045-007	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 320390)										
SK2105045-007	Anonymous	chloride	16887-00-6	E235.Cl	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 321424)										
SK2105043-002	01_TSF_W43	sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 325038)										
CG2105040-002	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0625 mg/L	0.0676 mg/L	92.5	70.0	130	----
Anions and Nutrients (QCLot: 327092)										
EO2103278-011	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	ND mg/L	2.5 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 336634)										
EO2103230-022	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.122 mg/L	0.1 mg/L	122	75.0	125	----
Cyanides (QCLot: 324629)										
WT2100204-037	Anonymous	cyanide, strong acid dissociable (total)	----	E333	0.208 mg/L	0.25 mg/L	83.3	70.0	130	----
Cyanides (QCLot: 324630)										
WT2100204-037	Anonymous	cyanide, weak acid dissociable	----	E336	0.125 mg/L	0.125 mg/L	99.8	70.0	130	----
Dissolved Metals (QCLot: 321137)										
RG2100699-002	Anonymous	aluminum, dissolved	7429-90-5	E421	0.202 mg/L	0.2 mg/L	101	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0197 mg/L	0.02 mg/L	98.3	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0209 mg/L	0.02 mg/L	105	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0406 mg/L	0.04 mg/L	101	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00904 mg/L	0.01 mg/L	90.4	70.0	130	----



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
Dissolved Metals (QCLot: 321137) - continued										
RG2100699-002	Anonymous	boron, dissolved	7440-42-8	E421	0.095 mg/L	0.1 mg/L	94.7	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00396 mg/L	0.004 mg/L	99.1	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.00990 mg/L	0.01 mg/L	99.0	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0406 mg/L	0.04 mg/L	101	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0194 mg/L	0.02 mg/L	97.0	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0184 mg/L	0.02 mg/L	91.8	70.0	130	----
		iron, dissolved	7439-89-6	E421	1.96 mg/L	2 mg/L	97.8	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0185 mg/L	0.02 mg/L	92.6	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.106 mg/L	0.1 mg/L	106	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	0.0196 mg/L	0.02 mg/L	97.8	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0198 mg/L	0.02 mg/L	99.2	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0384 mg/L	0.04 mg/L	95.9	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	10.9 mg/L	10 mg/L	109	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0210 mg/L	0.02 mg/L	105	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0435 mg/L	0.04 mg/L	109	70.0	130	----
		silicon, dissolved	7440-21-3	E421	8.91 mg/L	10 mg/L	89.1	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00366 mg/L	0.004 mg/L	91.6	70.0	130	----
		sodium, dissolved	17341-25-2	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0405 mg/L	0.04 mg/L	101	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00371 mg/L	0.004 mg/L	92.8	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0198 mg/L	0.02 mg/L	99.3	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0196 mg/L	0.02 mg/L	98.2	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0410 mg/L	0.04 mg/L	102	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0199 mg/L	0.02 mg/L	99.6	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.00363 mg/L	0.004 mg/L	90.9	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.103 mg/L	0.1 mg/L	103	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.376 mg/L	0.4 mg/L	94.1	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0428 mg/L	0.04 mg/L	107	70.0	130	----

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Work Order : SK2105043
Client : O'Kane Consultants Inc.
Project : 948-021



Qualifiers

<i>Qualifier</i>	<i>Description</i>
K	<i>Matrix Spike recovery outside ALS DQO due to sample matrix effects.</i>



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Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17

Page

Environmental Division
Saskatoon
Work Order Reference
SK2105043



Telephone: +1 306 668 8370

Report To, Report Format / Distribution, Select Service Level, Invoice Distribution, Project Information, ALS Lab Work Order #, Sample Identification and/or Coordinates, Drinking Water (DW) Samples, SHIPMENT RELEASE, INITIAL SHIPMENT RECEPTION, FINAL SHIPMENT RECEPTION

NUMBER OF CONTAINERS

SAMPLES ON HOLD

SUSPECTED HAZARD (see Special Instructions)

Table with columns for sample types (MET-D, CCMS-SK, etc.) and rows for individual samples with F/P status.



CERTIFICATE OF ANALYSIS

Work Order : **SK2105810**
Client : **O'Kane Consultants Inc.**
Contact : Jared Robertson
Address : 112 - 112 Research Drive
Saskatoon SK Canada S7N 3R3
Telephone : 250 420 7010
Project : 948-021
PO : ----
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : Q83455
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 5
Laboratory : Saskatoon - Environmental
Account Manager : Brian Morgan
Address : 819 58 Street East
Saskatoon SK Canada S7K 6X5
Telephone : 1 306 221 7147
Date Samples Received : 10-Nov-2021 16:08
Date Analysis Commenced : 10-Nov-2021
Issue Date : 18-Nov-2021 13:35

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Colby Bingham	Quality Systems Coordinator	Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Quality Systems Coordinator	Metals, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Jon Fisher	Department Manager - Inorganics	Inorganics, Waterloo, Ontario
Lian Nesbitt	Laboratory Analyst	Metals, Saskatoon, Saskatchewan



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).

<i>Unit</i>	<i>Description</i>
-	No Unit
%	percent
µS/cm	Microsiemens per centimetre
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).



Analytical Results

Sub-Matrix: Water					Client sample ID	01_TSF_W45	01_TSF_W46	01_TSF_W47	01_TSF_W48	----
(Matrix: Water)					Client sampling date / time	21-Oct-2021 14:00	28-Oct-2021 12:00	04-Nov-2021 13:00	10-Nov-2021 13:17	----
Analyte	CAS Number	Method	LOR	Unit	SK2105810-001	SK2105810-002	SK2105810-003	SK2105810-004	-----	
					Result	Result	Result	Result	----	
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	----	----	1520	----	
conductivity	----	E100	2.0	µS/cm	----	----	----	2690	----	
pH	----	E108	0.10	pH units	----	----	----	7.74	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	----	----	218	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	----	----	<1.0	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	----	----	<1.0	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	----	178	----	
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	----	2500	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	----	6.93 ^{DLHC}	----	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	----	----	<0.0020	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	1690	1670	1930	1660	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	----	----	7.30 ^{DLHC}	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	----	<10.0 ^{DLDS}	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	----	<0.400 ^{DLDS}	----	
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	----	<0.400 ^{DLDS}	----	
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	----	<0.200 ^{DLDS}	----	
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	----	<0.447	----	
Cyanides										
cyanide, strong acid dissociable (total)	----	E333	0.0050	mg/L	----	----	----	0.139	----	
cyanide, weak acid dissociable	----	E336	0.0050	mg/L	----	----	----	<0.0050	----	
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	----	----	38.1	----	
cation sum	----	EC101	0.10	meq/L	----	----	----	35.6	----	
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	----	3.39	----	
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	----	93.4	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	----	0.0036	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	----	0.00292	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	----	0.134	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	01_TSF_W45	01_TSF_W46	01_TSF_W47	01_TSF_W48	----
Client sampling date / time					21-Oct-2021 14:00	28-Oct-2021 12:00	04-Nov-2021 13:00	10-Nov-2021 13:17	----	----
Analyte	CAS Number	Method	LOR	Unit	SK2105810-001	SK2105810-002	SK2105810-003	SK2105810-004	-----	----
					Result	Result	Result	Result	----	----
Dissolved Metals										
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	----	0.0258	----	----
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	----	----	<0.000040 ^{DLDS}	----	----
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	----	----	<0.000100 ^{DLDS}	----	----
boron, dissolved	7440-42-8	E421	0.010	mg/L	----	----	----	0.552	----	----
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	----	----	----	<0.0000500 ^{DLM}	----	----
calcium, dissolved	7440-70-2	E421	0.050	mg/L	----	----	----	526	----	----
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	----	----	----	<0.000020 ^{DLDS}	----	----
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	----	----	----	<0.00100 ^{DLDS}	----	----
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	----	----	----	0.00749	----	----
copper, dissolved	7440-50-8	E421	0.00020	mg/L	----	----	----	0.00118	----	----
iron, dissolved	7439-89-6	E421	0.030	mg/L	----	----	----	0.066	----	----
lead, dissolved	7439-92-1	E421	0.000050	mg/L	----	----	----	<0.000100 ^{DLDS}	----	----
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	----	----	----	0.0035	----	----
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	----	----	----	51.3	----	----
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	----	----	----	0.742	----	----
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	----	----	----	0.125	----	----
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	----	----	----	0.00295	----	----
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	----	----	----	<0.100 ^{DLDS}	----	----
potassium, dissolved	7440-09-7	E421	0.050	mg/L	----	----	----	70.3	----	----
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	----	----	----	0.00695	----	----
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	----	----	----	0.00741	----	----
silicon, dissolved	7440-21-3	E421	0.050	mg/L	----	----	----	6.15	----	----
silver, dissolved	7440-22-4	E421	0.000010	mg/L	----	----	----	<0.000020 ^{DLDS}	----	----
sodium, dissolved	17341-25-2	E421	0.050	mg/L	----	----	----	64.2	----	----
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	----	----	----	1.49	----	----
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	----	----	----	559	----	----
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	----	----	----	<0.00040 ^{DLDS}	----	----
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	----	----	----	0.000029	----	----
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	----	----	----	<0.00020 ^{DLDS}	----	----
tin, dissolved	7440-31-5	E421	0.00010	mg/L	----	----	----	0.00178	----	----
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	----	----	----	<0.00060 ^{DLDS}	----	----



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	01_TSF_W45	01_TSF_W46	01_TSF_W47	01_TSF_W48	----
Client sampling date / time					21-Oct-2021 14:00	28-Oct-2021 12:00	04-Nov-2021 13:00	10-Nov-2021 13:17	----	----
Analyte	CAS Number	Method	LOR	Unit	SK2105810-001	SK2105810-002	SK2105810-003	SK2105810-004	-----	-----
					Result	Result	Result	Result	----	----
Dissolved Metals										
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	----	----	----	0.00021	----	----
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	----	----	----	0.00231	----	----
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	----	----	----	<0.00100 ^{DLDS}	----	----
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	----	----	0.0044	----	----
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	----	----	<0.00060 ^{DLDS}	----	----
dissolved metals filtration location	----	EP421	-	-	----	----	----	Field	----	----

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: SK2105810	Page	: 1 of 9
Client	: O'Kane Consultants Inc.	Laboratory	: Saskatoon - Environmental
Contact	: Jared Robertson	Account Manager	: Brian Morgan
Address	: 112 - 112 Research Drive Saskatoon SK Canada S7N 3R3	Address	: 819 58 Street East Saskatoon, Saskatchewan Canada S7K 6X5
Telephone	: 250 420 7010	Telephone	: 1 306 221 7147
Project	: 948-021	Date Samples Received	: 10-Nov-2021 16:08
PO	: ----	Issue Date	: 18-Nov-2021 13:35
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: Q83455		
No. of samples received	: 4		
No. of samples analysed	: 4		

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 Services number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

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		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) 01_TSF_W48	E298	10-Nov-2021	15-Nov-2021	----	----		15-Nov-2021	28 days	5 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 01_TSF_W48	E235.Cl	10-Nov-2021	----	----	----		12-Nov-2021	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE 01_TSF_W48	E235.F	10-Nov-2021	----	----	----		12-Nov-2021	28 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE 01_TSF_W48	E235.NO3	10-Nov-2021	----	----	----		12-Nov-2021	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 01_TSF_W48	E235.NO2	10-Nov-2021	----	----	----		12-Nov-2021	3 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W46	E235.SO4	28-Oct-2021	----	----	----		12-Nov-2021	28 days	15 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W48	E235.SO4	10-Nov-2021	----	----	----		12-Nov-2021	28 days	2 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W45	E235.SO4	21-Oct-2021	----	----	----		12-Nov-2021	28 days	22 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W47	E235.SO4	04-Nov-2021	----	----	----		12-Nov-2021	28 days	8 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) 01_TSF_W48	E318	10-Nov-2021	15-Nov-2021	----	----		15-Nov-2021	28 days	5 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)										
Amber glass total (sulfuric acid) 01_TSF_W48	E372-U	10-Nov-2021	16-Nov-2021	----	----		17-Nov-2021	28 days	7 days	✓
Cyanides : Total Cyanide										
UV inhibited HDPE - total (sodium hydroxide) 01_TSF_W48	E333	10-Nov-2021	----	----	----		15-Nov-2021	14 days	5 days	✓
Cyanides : WAD Cyanide										
UV inhibited HDPE - total (sodium hydroxide) 01_TSF_W48	E336	10-Nov-2021	----	----	----		15-Nov-2021	14 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 01_TSF_W48	E421	10-Nov-2021	15-Nov-2021	----	----		15-Nov-2021	180 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 01_TSF_W48	E290	10-Nov-2021	----	----	----		12-Nov-2021	14 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE 01_TSF_W48	E100	10-Nov-2021	----	----	----		12-Nov-2021	28 days	2 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : pH by Meter										
HDPE 01_TSF_W48	E108	10-Nov-2021	----	----	----		12-Nov-2021	0.25 hrs	44 hrs	* EHTR-FM

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	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	342550	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	344770	1	13	7.6	5.0	✓
Chloride in Water by IC	E235.Cl	343650	1	20	5.0	5.0	✓
Conductivity in Water	E100	342549	1	15	6.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	344106	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	343647	1	16	6.2	5.0	✓
Nitrate in Water by IC	E235.NO3	343651	1	20	5.0	5.0	✓
Nitrite in Water by IC	E235.NO2	343648	1	20	5.0	5.0	✓
pH by Meter	E108	342548	1	15	6.6	5.0	✓
Sulfate in Water by IC	E235.SO4	343649	2	36	5.5	5.0	✓
Total Cyanide	E333	344994	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	344757	1	14	7.1	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	344771	1	9	11.1	5.0	✓
WAD Cyanide	E336	344995	1	1	100.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	342550	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	344770	1	13	7.6	5.0	✓
Chloride in Water by IC	E235.Cl	343650	1	20	5.0	5.0	✓
Conductivity in Water	E100	342549	1	15	6.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	344106	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	343647	1	16	6.2	5.0	✓
Nitrate in Water by IC	E235.NO3	343651	1	20	5.0	5.0	✓
Nitrite in Water by IC	E235.NO2	343648	1	20	5.0	5.0	✓
pH by Meter	E108	342548	1	15	6.6	5.0	✓
Sulfate in Water by IC	E235.SO4	343649	2	36	5.5	5.0	✓
Total Cyanide	E333	344994	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	344757	1	14	7.1	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	344771	1	9	11.1	5.0	✓
WAD Cyanide	E336	344995	1	1	100.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	342550	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	344770	1	13	7.6	5.0	✓
Chloride in Water by IC	E235.Cl	343650	1	20	5.0	5.0	✓
Conductivity in Water	E100	342549	1	15	6.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	344106	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	343647	1	16	6.2	5.0	✓
Nitrate in Water by IC	E235.NO3	343651	1	20	5.0	5.0	✓



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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<i>Analytical Methods</i>							
Method Blanks (MB) - Continued							
Nitrite in Water by IC	E235.NO2	343648	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	343649	2	36	5.5	5.0	✓
Total Cyanide	E333	344994	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	344757	1	14	7.1	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	344771	1	9	11.1	5.0	✓
WAD Cyanide	E336	344995	1	1	100.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	344770	1	13	7.6	5.0	✓
Chloride in Water by IC	E235.Cl	343650	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	344106	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	343647	1	16	6.2	5.0	✓
Nitrate in Water by IC	E235.NO3	343651	1	20	5.0	5.0	✓
Nitrite in Water by IC	E235.NO2	343648	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	343649	2	36	5.5	5.0	✓
Total Cyanide	E333	344994	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	344757	1	14	7.1	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	344771	1	9	11.1	5.0	✓
WAD Cyanide	E336	344995	1	1	100.0	5.0	✓



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Saskatoon - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Saskatoon - 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.
Chloride in Water by IC	E235.Cl Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Saskatoon - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Waterloo - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Waterloo - Environmental	Water	APHA 4500-Norg D (mod)	Total Kjeldahl Nitrogen is determined using block digestion followed by flow-injection analysis with fluorescence detection.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Cyanide	E333 Waterloo - Environmental	Water	ISO 14403 (mod)	Total or Strong Acid Dissociable (SAD) Cyanide is determined by Continuous Flow Analyzer (CFA) with in-line UV digestion followed by colourmetric analysis. Method Limitation: High levels of thiocyanate (SCN) may cause positive interference (up to 0.5% of SCN concentration).
WAD Cyanide	E336 Waterloo - Environmental	Water	APHA 4500-CN I (mod)	Weak Acid Dissociable (WAD) cyanide is determined by Continuous Flow Analyzer (CFA) with in-line distillation followed by colourmetric analysis.
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U Waterloo - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Metals in Water by CRC ICPMS	E421 Saskatoon - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Hardness (Calculated)	EC100 Saskatoon - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Ion Balance using Dissolved Metals	EC101 Saskatoon - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
TDS in Water (Calculation)	EC103 Saskatoon - Environmental	Water	APHA 1030E (mod)	Total Dissolved Solids is calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Saskatoon - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Waterloo - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Waterloo - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested using block digestion with Copper Sulfate Digestion Reagent.



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Digestion for Total Phosphorus in water	EP372 Waterloo - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Saskatoon - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.



QUALITY CONTROL REPORT

Work Order : **SK2105810**

Page : 1 of 12

Client : O'Kane Consultants Inc.
 Contact : Jared Robertson
 Address : 112 - 112 Research Drive
 Saskatoon SK Canada S7N 3R3
 Telephone : 250 420 7010
 Project : 948-021
 PO : ----
 C-O-C number : ----
 Sampler : ----
 Site : ----
 Quote number : Q83455
 No. of samples received : 4
 No. of samples analysed : 4

Laboratory : Saskatoon - Environmental
 Account Manager : Brian Morgan
 Address : 819 58 Street East
 Saskatoon, Saskatchewan Canada S7K 6X5
 Telephone : 1 306 221 7147
 Date Samples Received : 10-Nov-2021 16:08
 Date Analysis Commenced : 10-Nov-2021
 Issue Date : 18-Nov-2021 13:35

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 Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

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
Colby Bingham	Quality Systems Coordinator	Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Quality Systems Coordinator	Metals, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Jon Fisher	Department Manager - Inorganics	Inorganics, Waterloo, Ontario
Lian Nesbitt	Laboratory Analyst	Metals, Saskatoon, Saskatchewan



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 Services number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

= Indicates a QC result that did not meet the ALS DQO.



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: 342548)											
RG2100874-001	Anonymous	pH	----	E108	0.10	pH units	7.74	7.74	0.0786%	3%	----
Physical Tests (QC Lot: 342549)											
RG2100874-001	Anonymous	conductivity	----	E100	2.0	µS/cm	1740	1730	0.404%	10%	----
Physical Tests (QC Lot: 342550)											
RG2100874-001	Anonymous	alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	324	324	0.229%	20%	----
Anions and Nutrients (QC Lot: 343647)											
RG2100884-001	Anonymous	fluoride	16984-48-8	E235.F	0.100	mg/L	0.138	0.136	0.003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 343648)											
RG2100884-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 343649)											
RG2100884-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	276	278	0.832%	20%	----
Anions and Nutrients (QC Lot: 343650)											
RG2100884-001	Anonymous	chloride	16887-00-6	E235.Cl	2.50	mg/L	29.3	29.5	0.636%	20%	----
Anions and Nutrients (QC Lot: 343651)											
RG2100884-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	0.100	mg/L	0.201	0.160	0.042	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 343771)											
RG2100881-005	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	6.00	mg/L	2870	2890	0.575%	20%	----
Anions and Nutrients (QC Lot: 344757)											
RG2100881-009	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	2.82	2.73	3.24%	20%	----
Anions and Nutrients (QC Lot: 344770)											
RG2100881-019	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0500	mg/L	2.74	2.72	0.750%	20%	----
Anions and Nutrients (QC Lot: 344771)											
RG2100889-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0581	0.0577	0.690%	20%	----
Cyanides (QC Lot: 344994)											
CG2105599-001	Anonymous	cyanide, strong acid dissociable (total)	----	E333	0.0200	mg/L	<0.0200	<0.0200	0	Diff <2x LOR	----
Cyanides (QC Lot: 344995)											
SK2105810-004	01_TSF_W48	cyanide, weak acid dissociable	----	E336	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 344106)											
RG2100881-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0020	mg/L	0.136	0.154	12.5%	20%	----
		antimony, dissolved	7440-36-0	E421	0.00020	mg/L	0.00028	0.00026	0.00002	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00020	mg/L	0.00087	0.00094	0.00007	Diff <2x LOR	----



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
Dissolved Metals (QC Lot: 344106) - continued											
RG2100881-001	Anonymous	barium, dissolved	7440-39-3	E421	0.00020	mg/L	0.0468	0.0482	2.95%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000040	mg/L	<0.000040	<0.000040	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.020	mg/L	1.06	1.05	0.599%	20%	----
		cadmium, dissolved	7440-43-9	E421	0.0000100	mg/L	0.000141	0.000167	17.0%	20%	----
		calcium, dissolved	7440-70-2	E421	0.100	mg/L	297	290	2.13%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000020	mg/L	<0.000020	0.000023	0.000003	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00020	mg/L	0.00165	0.00168	0.00003	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00040	mg/L	0.00406	0.00354	0.00053	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.060	mg/L	0.301	0.332	0.031	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000100	mg/L	0.000273	0.000286	0.000012	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0020	mg/L	0.117	0.121	3.04%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.0100	mg/L	234	242	3.03%	20%	----
		manganese, dissolved	7439-96-5	E421	0.0100	mg/L	0.748	0.761	1.72%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000100	mg/L	0.00399	0.00440	9.69%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00100	mg/L	0.0140	0.0142	1.46%	20%	----
		phosphorus, dissolved	7723-14-0	E421	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.100	mg/L	8.48	8.50	0.263%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00040	mg/L	0.00209	0.00180	0.00029	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.000100	mg/L	0.000412	0.000339	0.000072	Diff <2x LOR	----
		silicon, dissolved	7440-21-3	E421	0.100	mg/L	11.1	11.2	0.796%	20%	----
		silver, dissolved	7440-22-4	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		sodium, dissolved	17341-25-2	E421	0.100	mg/L	133	131	1.05%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00040	mg/L	0.903	0.931	3.04%	20%	----
		sulfur, dissolved	7704-34-9	E421	1.00	mg/L	398	404	1.49%	20%	----
		tellurium, dissolved	13494-80-9	E421	0.00040	mg/L	<0.00040	<0.00040	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000020	mg/L	0.000044	0.000041	0.000003	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00060	mg/L	0.00704	0.00777	9.85%	20%	----
		tungsten, dissolved	7440-33-7	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000020	mg/L	0.0764	0.0751	1.68%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0020	mg/L	0.0064	0.0080	0.0016	Diff <2x LOR	----

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 Work Order : SK2105810
 Client : O'Kane Consultants Inc.
 Project : 948-021



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	<i>Original Result</i>	<i>Duplicate Result</i>	<i>RPD(%) or Difference</i>	<i>Duplicate Limits</i>	<i>Qualifier</i>
Dissolved Metals (QC Lot: 344106) - continued											
RG2100881-001	Anonymous	zirconium, dissolved	7440-67-7	E421	0.00060	mg/L	0.00079	0.00083	0.00004	Diff <2x LOR	----



Method Blank (MB) Report

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

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 342549)						
conductivity	----	E100	1	µS/cm	1.2	----
Physical Tests (QCLot: 342550)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Anions and Nutrients (QCLot: 343647)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 343648)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 343649)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 343650)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 343651)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 343771)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 344757)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 344770)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 344771)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Cyanides (QCLot: 344994)						
cyanide, strong acid dissociable (total)	----	E333	0.002	mg/L	<0.0020	----
Cyanides (QCLot: 344995)						
cyanide, weak acid dissociable	----	E336	0.002	mg/L	<0.0020	----
Dissolved Metals (QCLot: 344106)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 344106) - continued						
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	---
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	---
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	---
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	---
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	---
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	---
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	---
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	---
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	---
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	---
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	---
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	---
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	---
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	---
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	---
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	---
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	---
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	---
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	---
sodium, dissolved	17341-25-2	E421	0.05	mg/L	<0.050	---
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	---
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	---
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	---
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	---
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	---
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	---
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	---
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	---
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	---
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	---
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	---
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	---



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				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 342548)									
pH	----	E108	----	pH units	6.86 pH units	100.0	98.0	102	----
Physical Tests (QCLot: 342549)									
conductivity	----	E100	1	µS/cm	1000 µS/cm	98.7	90.0	110	----
Physical Tests (QCLot: 342550)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	98.5	85.0	115	----
Anions and Nutrients (QCLot: 343647)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	107	90.0	110	----
Anions and Nutrients (QCLot: 343648)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 343649)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 343650)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 343651)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 343771)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 344757)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	108	75.0	125	----
Anions and Nutrients (QCLot: 344770)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	110	85.0	115	----
Anions and Nutrients (QCLot: 344771)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.283 mg/L	93.4	80.0	120	----
Cyanides (QCLot: 344994)									
cyanide, strong acid dissociable (total)	----	E333	0.002	mg/L	0.25 mg/L	105	80.0	120	----
Cyanides (QCLot: 344995)									
cyanide, weak acid dissociable	----	E336	0.002	mg/L	0.125 mg/L	106	80.0	120	----
Dissolved Metals (QCLot: 344106)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	105	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	96.2	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	99.4	80.0	120	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Dissolved Metals (QCLot: 344106) - continued									
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	101	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	99.4	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	102	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	92.1	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	98.7	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	99.2	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	101	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	103	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	99.4	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	102	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	104	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	115	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	100	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	101	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	102	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	98.4	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	111	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	104	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	104	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	95.3	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	101	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	96.5	80.0	120	----
sodium, dissolved	17341-25-2	E421	0.05	mg/L	50 mg/L	103	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	101	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	96.1	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	91.4	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	98.5	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	95.8	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	100	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	104	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	98.0	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	108	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	101	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	94.8	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	103	80.0	120	----



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: 343647)										
RG2100885-001	Anonymous	fluoride	16984-48-8	E235.F	1.01 mg/L	1 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 343648)										
RG2100885-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.479 mg/L	0.5 mg/L	95.8	75.0	125	----
Anions and Nutrients (QCLot: 343649)										
RG2100885-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	99.9 mg/L	100 mg/L	99.9	75.0	125	----
Anions and Nutrients (QCLot: 343650)										
RG2100885-001	Anonymous	chloride	16887-00-6	E235.Cl	98.2 mg/L	100 mg/L	98.2	75.0	125	----
Anions and Nutrients (QCLot: 343651)										
RG2100885-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	2.46 mg/L	2.5 mg/L	98.5	75.0	125	----
Anions and Nutrients (QCLot: 343771)										
RG2100881-006	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 344757)										
RG2100881-009	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	ND mg/L	2.5 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 344770)										
RG2100881-019	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 344771)										
RG2100889-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0932 mg/L	0.1 mg/L	93.2	70.0	130	----
Cyanides (QCLot: 344994)										
CG2105599-001	Anonymous	cyanide, strong acid dissociable (total)	----	E333	0.176 mg/L	0.25 mg/L	70.6	70.0	130	----
Cyanides (QCLot: 344995)										
SK2105810-004	01_TSF_W48	cyanide, weak acid dissociable	----	E336	0.135 mg/L	0.125 mg/L	108	70.0	130	----
Dissolved Metals (QCLot: 344106)										
RG2100881-002	Anonymous	aluminum, dissolved	7429-90-5	E421	0.201 mg/L	0.2 mg/L	100	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0199 mg/L	0.02 mg/L	99.5	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0412 mg/L	0.04 mg/L	103	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00944 mg/L	0.01 mg/L	94.4	70.0	130	----



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
Dissolved Metals (QCLot: 344106) - continued										
RG2100881-002	Anonymous	boron, dissolved	7440-42-8	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00402 mg/L	0.004 mg/L	100	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.0100 mg/L	0.01 mg/L	100	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0400 mg/L	0.04 mg/L	100	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0190 mg/L	0.02 mg/L	95.1	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0182 mg/L	0.02 mg/L	91.1	70.0	130	----
		iron, dissolved	7439-89-6	E421	1.78 mg/L	2 mg/L	89.1	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0195 mg/L	0.02 mg/L	97.3	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.0884 mg/L	0.1 mg/L	88.4	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0358 mg/L	0.04 mg/L	89.5	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	11.5 mg/L	10 mg/L	115	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0196 mg/L	0.02 mg/L	97.9	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0450 mg/L	0.04 mg/L	112	70.0	130	----
		silicon, dissolved	7440-21-3	E421	ND mg/L	10 mg/L	ND	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00313 mg/L	0.004 mg/L	78.3	70.0	130	----
		sodium, dissolved	17341-25-2	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0386 mg/L	0.04 mg/L	96.6	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00378 mg/L	0.004 mg/L	94.6	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0200 mg/L	0.02 mg/L	100	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0204 mg/L	0.02 mg/L	102	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0411 mg/L	0.04 mg/L	103	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0198 mg/L	0.02 mg/L	98.9	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.00416 mg/L	0.004 mg/L	104	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.0997 mg/L	0.1 mg/L	99.7	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.363 mg/L	0.4 mg/L	90.9	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0411 mg/L	0.04 mg/L	103	70.0	130	----

Page : 12 of 12
Work Order : SK2105810
Client : O'Kane Consultants Inc.
Project : 948-021



Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

Affix ALS barcode label here
(lab use only)

Report To Company: Okane Consultants Contact: Jared Robertson Phone: 1 (306) 713-1695 Company address below will appear on the final report 112-112 Research Drive Saskatoon, SK S7N 3R3	Report Format / Distribution Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL) Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: jrobertson@okc-sk.com Email 2 Email 3	Invoice Distribution Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: jrobertson@okc-sk.com Email 2 Email 3	Oil and Gas Required Fields (client use) AFE/Cost Center: Q83455 Major/Minor Code: Requisitioner: Location:
ALS Account # / Quote #: Q83455 Job #: 948-021 PO / AFE: LSD:	Project Information Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO Copy of invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		
ALS Lab Work Order # (lab use only): Sample Identification and/or Coordinates (This description will appear on the report) 01_TSF_W45 01_TSF_W46 01_TSF_W47 01_TSF_W48	ALS Contact: Date (dd-mmm-yy) 21-Oct-21 28-Oct-21 4-Nov-21 10-Nov-21 Time (hh:mm) 14:00 12:00 13:00 13:17 Sample Type Leachate Leachate Leachate Leachate	Sampler: MET-D-CMS-SK ROU-F-SK SO4-IC-N-CL CN-T-CFA-VA CN-WAD-CFA-VA	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below F/P Y Y Y Y
Drinking Water (DW) Samples¹ (client use) Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only) Suspected hazards: elevated metals, potential for low levels of cyanide		
Released by: Jared Robertson Date: November 10, 2021 Time:	Received by: <u>ME3</u> Date: <u>10/11/21</u> Time: <u>4:08</u>	INITIAL SHIPMENT RECEPTION (lab use only) Received by: <u>ME3</u> Date: <u>10/11/21</u> Time: <u>4:08</u>	
Suspected HAZARD (see Special Instructions)			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION
 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 : **SK2106353**
Client : **O'Kane Consultants Inc.**
Contact : Jared Robertson
Address : 112 - 112 Research Drive
Saskatoon SK Canada S7N 3R3
Telephone : 250 420 7010
Project : 948-021
PO : ----
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : Q83455
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 5
Laboratory : Saskatoon - Environmental
Account Manager : Brian Morgan
Address : 819 58 Street East
Saskatoon SK Canada S7K 6X5
Telephone : 1 306 221 7147
Date Samples Received : 10-Dec-2021 14:56
Date Analysis Commenced : 10-Dec-2021
Issue Date : 20-Dec-2021 18:02

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Colby Bingham	Quality Systems Coordinator	Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Quality Systems Coordinator	Metals, Saskatoon, Saskatchewan
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Jon Fisher	Department Manager - Inorganics	Inorganics, Waterloo, Ontario
Lian Nesbitt	Laboratory Analyst	Metals, Saskatoon, Saskatchewan
Melissa Houseman	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta



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).

<i>Unit</i>	<i>Description</i>
-	No Unit
%	percent
µS/cm	Microsiemens per centimetre
meq/L	milliequivalents per litre
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.

Sample Comments

<i>Sample</i>	<i>Client Id</i>	<i>Comment</i>
SK2106353-002	01_TSF_W50	Received 2 samples marked 01_TSF_W51, missing W50. 1 container lists a time of 16:25, will assume this is the missing W50
SK2106353-003	01_TSF_W51	Received 2 samples marked 01_TSF_W51, missing W50. 1 container lists a time of 16:25, will assume this is the missing W50

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).



Analytical Results

Sub-Matrix: Water					Client sample ID	01_TSF_W49	01_TSF_W50	01_TSF_W51	01_TSF_W52	----
(Matrix: Water)					Client sampling date / time	18-Nov-2021 14:50	29-Nov-2021 16:25	02-Dec-2021 10:15	09-Dec-2021 12:00	----
Analyte	CAS Number	Method	LOR	Unit	SK2106353-001	SK2106353-002	SK2106353-003	SK2106353-004	-----	----
					Result	Result	Result	Result	----	----
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	----	----	----	1550	----	----
conductivity	----	E100	2.0	µS/cm	----	----	----	2590	----	----
pH	----	E108	0.10	pH units	----	----	----	7.89	----	----
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	----	----	----	234	----	----
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	----	----	----	<1.0	----	----
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	----	----	----	<1.0	----	----
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	----	192	----	----
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	----	----	----	2420	----	----
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	----	5.56	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	----	----	<0.0020	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	1490	1490	1430	1590	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	----	----	----	5.70	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	----	<10.0 ^{DLDS}	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	----	<0.400 ^{DLDS}	----	----
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	----	----	----	<0.400 ^{DLDS}	----	----
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	----	----	----	<0.200 ^{DLDS}	----	----
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L	----	----	----	<0.447	----	----
Cyanides										
cyanide, strong acid dissociable (total)	----	E333	0.0050	mg/L	----	----	----	0.149	----	----
cyanide, weak acid dissociable	----	E336	0.0050	mg/L	----	----	----	<0.0050	----	----
Ion Balance										
anion sum	----	EC101	0.10	meq/L	----	----	----	36.9	----	----
cation sum	----	EC101	0.10	meq/L	----	----	----	34.9	----	----
ion balance (cation-anion difference)	----	EC101	0.010	%	----	----	----	2.78	----	----
ion balance (cations/anions ratio)	----	EC101	0.010	%	----	----	----	94.6	----	----
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	----	0.0203	----	----
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	----	0.00232	----	----
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	----	0.103	----	----



Analytical Results

Sub-Matrix: Water					Client sample ID	01_TSF_W49	01_TSF_W50	01_TSF_W51	01_TSF_W52	----
(Matrix: Water)					Client sampling date / time	18-Nov-2021 14:50	29-Nov-2021 16:25	02-Dec-2021 10:15	09-Dec-2021 12:00	----
Analyte	CAS Number	Method	LOR	Unit	SK2106353-001	SK2106353-002	SK2106353-003	SK2106353-004	-----	
					Result	Result	Result	Result	---	
Dissolved Metals										
barium, dissolved	7440-39-3	E421	0.00010	mg/L	---	---	---	0.0243	---	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	---	---	---	<0.000040 ^{DLDS}	---	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	---	---	---	<0.000100 ^{DLDS}	---	
boron, dissolved	7440-42-8	E421	0.010	mg/L	---	---	---	0.485	---	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	---	---	---	<0.0000500 ^{DLM}	---	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	---	---	541	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	---	---	<0.000020 ^{DLDS}	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	---	---	<0.00100 ^{DLDS}	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	---	---	0.00636	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	---	---	0.00165	---	
iron, dissolved	7439-89-6	E421	0.030	mg/L	---	---	---	0.062	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	---	---	<0.000100 ^{DLDS}	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	---	---	0.0027	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	---	---	48.4	---	
manganese, dissolved	7439-96-5	E421	0.00500	mg/L	---	---	---	0.690	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	---	---	0.105	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	---	---	0.00342	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	---	---	<0.100 ^{DLDS}	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	---	---	61.1	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	---	---	0.00624	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	---	---	0.00561	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	---	---	6.01	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	---	---	<0.000020 ^{DLDS}	---	
sodium, dissolved	7440-23-5	E421	0.050	mg/L	---	---	---	43.7	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	---	---	1.34	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	---	---	546	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	---	---	<0.00040 ^{DLDS}	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	---	---	0.000022	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	---	---	<0.00020 ^{DLDS}	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	---	---	0.00137	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	---	---	<0.00060 ^{DLDS}	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	01_TSF_W49	01_TSF_W50	01_TSF_W51	01_TSF_W52	----
Client sampling date / time					18-Nov-2021 14:50	29-Nov-2021 16:25	02-Dec-2021 10:15	09-Dec-2021 12:00	----	----
Analyte	CAS Number	Method	LOR	Unit	SK2106353-001	SK2106353-002	SK2106353-003	SK2106353-004	-----	-----
					Result	Result	Result	Result	----	----
Dissolved Metals										
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	----	----	----	<0.00020 ^{DLDS}	----	----
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	----	----	----	0.00223	----	----
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	----	----	----	<0.00100 ^{DLDS}	----	----
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	----	----	0.0059	----	----
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	----	----	<0.00060 ^{DLDS}	----	----
dissolved metals filtration location	----	EP421	-	-	----	----	----	Field	----	----

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: SK2106353	Page	: 1 of 9
Client	: O'Kane Consultants Inc.	Laboratory	: Saskatoon - Environmental
Contact	: Jared Robertson	Account Manager	: Brian Morgan
Address	: 112 - 112 Research Drive Saskatoon SK Canada S7N 3R3	Address	: 819 58 Street East Saskatoon, Saskatchewan Canada S7K 6X5
Telephone	: 250 420 7010	Telephone	: 1 306 221 7147
Project	: 948-021	Date Samples Received	: 10-Dec-2021 14:56
PO	: ----	Issue Date	: 20-Dec-2021 18:02
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: Q83455		
No. of samples received	: 4		
No. of samples analysed	: 4		

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 Services number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

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



Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) 01_TSF_W52	E298	09-Dec-2021	16-Dec-2021	----	----		16-Dec-2021	28 days	7 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 01_TSF_W52	E235.Cl	09-Dec-2021	----	----	----		10-Dec-2021	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE 01_TSF_W52	E235.F	09-Dec-2021	----	----	----		10-Dec-2021	28 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE 01_TSF_W52	E235.NO3	09-Dec-2021	----	----	----		10-Dec-2021	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 01_TSF_W52	E235.NO2	09-Dec-2021	----	----	----		10-Dec-2021	3 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W52	E235.SO4	09-Dec-2021	----	----	----		10-Dec-2021	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W50	E235.SO4	29-Nov-2021	----	----	----		10-Dec-2021	28 days	11 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W49	E235.SO4	18-Nov-2021	----	----	----		10-Dec-2021	28 days	22 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01_TSF_W51	E235.SO4	02-Dec-2021	----	----	----		10-Dec-2021	28 days	8 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) 01_TSF_W52	E318	09-Dec-2021	18-Dec-2021	----	----		18-Dec-2021	28 days	9 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)										
Amber glass total (sulfuric acid) 01_TSF_W52	E372-U	09-Dec-2021	17-Dec-2021	----	----		17-Dec-2021	28 days	8 days	✓
Cyanides : Total Cyanide										
UV inhibited HDPE - total (sodium hydroxide) 01_TSF_W52	E333	09-Dec-2021	----	----	----		16-Dec-2021	14 days	7 days	✓
Cyanides : WAD Cyanide										
UV inhibited HDPE - total (sodium hydroxide) 01_TSF_W52	E336	09-Dec-2021	----	----	----		16-Dec-2021	14 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 01_TSF_W52	E421	09-Dec-2021	13-Dec-2021	----	----		13-Dec-2021	180 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 01_TSF_W52	E290	09-Dec-2021	----	----	----		10-Dec-2021	14 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 01_TSF_W52	E100	09-Dec-2021	----	----	----		10-Dec-2021	28 days	1 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : pH by Meter										
HDPE 01_TSF_W52	E108	09-Dec-2021	----	----	----		10-Dec-2021	0.25 hrs	29 hrs	* EHTR-FM

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	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	364888	1	11	9.0	5.0	✓
Ammonia by Fluorescence	E298	370121	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	364902	1	15	6.6	5.0	✓
Conductivity in Water	E100	364887	1	11	9.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	365994	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	364899	1	15	6.6	5.0	✓
Nitrate in Water by IC	E235.NO3	364903	1	16	6.2	5.0	✓
Nitrite in Water by IC	E235.NO2	364900	1	16	6.2	5.0	✓
pH by Meter	E108	364886	1	11	9.0	5.0	✓
Sulfate in Water by IC	E235.SO4	364901	1	18	5.5	5.0	✓
Total Cyanide	E333	369550	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	370441	1	2	50.0	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	370113	1	1	100.0	5.0	✓
WAD Cyanide	E336	369551	1	1	100.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	364888	1	11	9.0	5.0	✓
Ammonia by Fluorescence	E298	370121	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	364902	1	15	6.6	5.0	✓
Conductivity in Water	E100	364887	1	11	9.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	365994	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	364899	1	15	6.6	5.0	✓
Nitrate in Water by IC	E235.NO3	364903	1	16	6.2	5.0	✓
Nitrite in Water by IC	E235.NO2	364900	1	16	6.2	5.0	✓
pH by Meter	E108	364886	1	11	9.0	5.0	✓
Sulfate in Water by IC	E235.SO4	364901	1	18	5.5	5.0	✓
Total Cyanide	E333	369550	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	370441	1	2	50.0	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	370113	1	1	100.0	5.0	✓
WAD Cyanide	E336	369551	1	1	100.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	364888	1	11	9.0	5.0	✓
Ammonia by Fluorescence	E298	370121	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	364902	1	15	6.6	5.0	✓
Conductivity in Water	E100	364887	1	11	9.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	365994	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	364899	1	15	6.6	5.0	✓
Nitrate in Water by IC	E235.NO3	364903	1	16	6.2	5.0	✓



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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<i>Analytical Methods</i>							
Method Blanks (MB) - Continued							
Nitrite in Water by IC	E235.NO2	364900	1	16	6.2	5.0	✓
Sulfate in Water by IC	E235.SO4	364901	1	18	5.5	5.0	✓
Total Cyanide	E333	369550	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	370441	1	2	50.0	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	370113	1	1	100.0	5.0	✓
WAD Cyanide	E336	369551	1	1	100.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	370121	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	364902	1	15	6.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	365994	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	364899	1	15	6.6	5.0	✓
Nitrate in Water by IC	E235.NO3	364903	1	16	6.2	5.0	✓
Nitrite in Water by IC	E235.NO2	364900	1	16	6.2	5.0	✓
Sulfate in Water by IC	E235.SO4	364901	1	18	5.5	5.0	✓
Total Cyanide	E333	369550	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	370441	1	2	50.0	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	370113	0	1	0.0	5.0	✗
WAD Cyanide	E336	369551	1	1	100.0	5.0	✓



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Saskatoon - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Saskatoon - 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.
Chloride in Water by IC	E235.Cl Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Saskatoon - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Saskatoon - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Total Kjeldahl Nitrogen is determined using block digestion followed by flow-injection analysis with fluorescence detection.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Cyanide	E333 Waterloo - Environmental	Water	ISO 14403 (mod)	Total or Strong Acid Dissociable (SAD) Cyanide is determined by Continuous Flow Analyzer (CFA) with in-line UV digestion followed by colourmetric analysis. Method Limitation: High levels of thiocyanate (SCN) may cause positive interference (up to 0.5% of SCN concentration).
WAD Cyanide	E336 Waterloo - Environmental	Water	APHA 4500-CN I (mod)	Weak Acid Dissociable (WAD) cyanide is determined by Continuous Flow Analyzer (CFA) with in-line distillation followed by colourmetric analysis.
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Metals in Water by CRC ICPMS	E421 Saskatoon - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Hardness (Calculated)	EC100 Saskatoon - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Ion Balance using Dissolved Metals	EC101 Saskatoon - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
TDS in Water (Calculation)	EC103 Saskatoon - Environmental	Water	APHA 1030E (mod)	Total Dissolved Solids is calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Saskatoon - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested using block digestion with Copper Sulfate Digestion Reagent.
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Dissolved Metals Water Filtration	EP421 Saskatoon - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.



QUALITY CONTROL REPORT

Work Order : **SK2106353**

Page : 1 of 10

Client : O'Kane Consultants Inc.
 Contact : Jared Robertson
 Address : 112 - 112 Research Drive
 Saskatoon SK Canada S7N 3R3
 Telephone : 250 420 7010
 Project : 948-021
 PO : ----
 C-O-C number : ----
 Sampler : ----
 Site : ----
 Quote number : Q83455
 No. of samples received : 4
 No. of samples analysed : 4

Laboratory : Saskatoon - Environmental
 Account Manager : Brian Morgan
 Address : 819 58 Street East
 Saskatoon, Saskatchewan Canada S7K 6X5
 Telephone : 1 306 221 7147
 Date Samples Received : 10-Dec-2021 14:56
 Date Analysis Commenced : 10-Dec-2021
 Issue Date : 20-Dec-2021 18:02

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 Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Colby Bingham	Quality Systems Coordinator	Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Quality Systems Coordinator	Metals, Saskatoon, Saskatchewan
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Jon Fisher	Department Manager - Inorganics	Inorganics, Waterloo, Ontario
Lian Nesbitt	Laboratory Analyst	Metals, Saskatoon, Saskatchewan
Melissa Houseman	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta

Page : 2 of 10
Work Order : SK2106353
Client : O'Kane Consultants Inc.
Project : 948-021



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 Services number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

= Indicates a QC result that did not meet the ALS DQO.



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: 364886)											
SK2106352-001	Anonymous	pH	----	E108	0.10	pH units	7.93	7.96	0.395%	3%	----
Physical Tests (QC Lot: 364887)											
SK2106352-001	Anonymous	conductivity	----	E100	2.0	µS/cm	478	469	1.90%	10%	----
Physical Tests (QC Lot: 364888)											
SK2106352-001	Anonymous	alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	220	213	3.12%	20%	----
Anions and Nutrients (QC Lot: 364899)											
SK2106337-001	Anonymous	fluoride	16984-48-8	E235.F	0.040	mg/L	0.138	0.127	0.011	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 364900)											
SK2106337-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 364901)											
SK2106337-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.60	mg/L	4.76	4.86	0.10	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 364902)											
SK2106337-001	Anonymous	chloride	16887-00-6	E235.Cl	1.00	mg/L	<1.00	<1.00	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 364903)											
SK2106337-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	0.040	mg/L	<0.040	<0.040	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 370113)											
SK2106353-004	01_TSF_W52	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 370121)											
CG2106805-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.250	mg/L	6.88	6.88	0.0480%	20%	----
Anions and Nutrients (QC Lot: 370441)											
EO2104401-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.100	mg/L	0.389	0.339	0.050	Diff <2x LOR	----
Cyanides (QC Lot: 369550)											
EO2104361-005	Anonymous	cyanide, strong acid dissociable (total)	----	E333	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Cyanides (QC Lot: 369551)											
SK2106353-004	01_TSF_W52	cyanide, weak acid dissociable	----	E336	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 365994)											
SK2106328-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0626	0.0621	0.744%	20%	----
		antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00014	0.00014	0.0000003	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.382	0.383	0.345%	20%	----
		barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0430	0.0442	2.60%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----



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
Dissolved Metals (QC Lot: 365994) - continued											
SK2106328-001	Anonymous	bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.010	mg/L	0.024	0.025	0.001	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000062	0.0000064	0.0000002	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.050	mg/L	41.2	42.0	1.91%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.344	0.332	3.46%	20%	----
		iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0110	0.0113	2.47%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	19.2	19.8	2.95%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.133	0.132	0.798%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00148	0.00147	0.800%	20%	----
		nickel, dissolved	7440-02-0	E421	0.000050	mg/L	0.0255	0.0255	0.0725%	20%	----
		phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	0.215	0.202	0.012	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.050	mg/L	3.42	3.45	0.813%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00121	0.00118	0.00003	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000348	0.000346	0.000003	Diff <2x LOR	----
		silicon, dissolved	7440-21-3	E421	0.050	mg/L	0.554	0.551	0.494%	20%	----
		silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	0.050	mg/L	24.6	24.1	2.21%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.227	0.227	0.146%	20%	----
		sulfur, dissolved	7704-34-9	E421	0.50	mg/L	32.5	32.1	1.34%	20%	----
		tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.00115	0.00112	2.84%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0237	0.0244	2.99%	20%	----
		zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----



Method Blank (MB) Report

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

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 364887)						
conductivity	---	E100	1	µS/cm	1.2	---
Physical Tests (QCLot: 364888)						
alkalinity, total (as CaCO3)	---	E290	1	mg/L	<1.0	---
Anions and Nutrients (QCLot: 364899)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	---
Anions and Nutrients (QCLot: 364900)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	---
Anions and Nutrients (QCLot: 364901)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	---
Anions and Nutrients (QCLot: 364902)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	---
Anions and Nutrients (QCLot: 364903)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	---
Anions and Nutrients (QCLot: 370113)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	---
Anions and Nutrients (QCLot: 370121)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	---
Anions and Nutrients (QCLot: 370441)						
Kjeldahl nitrogen, total [TKN]	---	E318	0.05	mg/L	<0.050	---
Cyanides (QCLot: 369550)						
cyanide, strong acid dissociable (total)	---	E333	0.002	mg/L	<0.0020	---
Cyanides (QCLot: 369551)						
cyanide, weak acid dissociable	---	E336	0.002	mg/L	<0.0020	---
Dissolved Metals (QCLot: 365994)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	---
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	---
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	---
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	---
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	---
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	---
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	---
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	---
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	---



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 365994) - continued						
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----



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 Concentration	Recovery (%) LCS	Recovery Limits (%)		Qualifier
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 364886)									
pH	----	E108	----	pH units	6.86 pH units	100	98.0	102	----
Physical Tests (QCLot: 364887)									
conductivity	----	E100	1	µS/cm	1000 µS/cm	99.0	90.0	110	----
Physical Tests (QCLot: 364888)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	98.6	85.0	115	----
Anions and Nutrients (QCLot: 364899)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	98.6	90.0	110	----
Anions and Nutrients (QCLot: 364900)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	99.8	90.0	110	----
Anions and Nutrients (QCLot: 364901)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 364902)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 364903)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 370113)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.02 mg/L	94.5	80.0	120	----
Anions and Nutrients (QCLot: 370121)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	106	85.0	115	----
Anions and Nutrients (QCLot: 370441)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	97.5	75.0	125	----
Cyanides (QCLot: 369550)									
cyanide, strong acid dissociable (total)	----	E333	0.002	mg/L	0.25 mg/L	99.1	80.0	120	----
Cyanides (QCLot: 369551)									
cyanide, weak acid dissociable	----	E336	0.002	mg/L	0.125 mg/L	102	80.0	120	----
Dissolved Metals (QCLot: 365994)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	99.4	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	100	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	98.8	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	94.6	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	99.5	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 365994) - continued									
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	102	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	102	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	99.0	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	97.1	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	102	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	99.2	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	98.1	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	96.8	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	105	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	98.4	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	100	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	98.5	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	97.5	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	103	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	97.0	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	104	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	98.4	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	104	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	95.4	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	99.9	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	98.9	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	104	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	96.5	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	104	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	96.8	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	96.5	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	97.6	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	95.6	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	92.1	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	96.8	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	101	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	96.3	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	93.9	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	101	80.0	120	----



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: 364899)										
SK2106337-002	Anonymous	fluoride	16984-48-8	E235.F	0.996 mg/L	1 mg/L	99.6	75.0	125	----
Anions and Nutrients (QCLot: 364900)										
SK2106337-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.490 mg/L	0.5 mg/L	98.0	75.0	125	----
Anions and Nutrients (QCLot: 364901)										
SK2106337-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	102 mg/L	100 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 364902)										
SK2106337-002	Anonymous	chloride	16887-00-6	E235.Cl	102 mg/L	100 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 364903)										
SK2106337-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	2.55 mg/L	2.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 370121)										
CG2106805-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 370441)										
SK2106353-004	01_TSF_W52	Kjeldahl nitrogen, total [TKN]	----	E318	ND mg/L	2.5 mg/L	ND	70.0	130	----
Cyanides (QCLot: 369550)										
EO2104361-005	Anonymous	cyanide, strong acid dissociable (total)	----	E333	0.240 mg/L	0.25 mg/L	96.0	70.0	130	----
Cyanides (QCLot: 369551)										
SK2106353-004	01_TSF_W52	cyanide, weak acid dissociable	----	E336	0.128 mg/L	0.125 mg/L	102	70.0	130	----
Dissolved Metals (QCLot: 365994)										
SK2106328-002	Anonymous	aluminum, dissolved	7429-90-5	E421	0.211 mg/L	0.2 mg/L	106	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0207 mg/L	0.02 mg/L	104	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0399 mg/L	0.04 mg/L	99.8	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00929 mg/L	0.01 mg/L	92.9	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.098 mg/L	0.1 mg/L	97.7	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00397 mg/L	0.004 mg/L	99.3	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.0102 mg/L	0.01 mg/L	102	70.0	130	----



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
Dissolved Metals (QCLot: 365994) - continued										
SK2106328-002	Anonymous	chromium, dissolved	7440-47-3	E421	0.0414 mg/L	0.04 mg/L	104	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0200 mg/L	0.02 mg/L	99.8	70.0	130	----
		copper, dissolved	7440-50-8	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		iron, dissolved	7439-89-6	E421	1.97 mg/L	2 mg/L	98.4	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0199 mg/L	0.02 mg/L	99.6	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.0972 mg/L	0.1 mg/L	97.2	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0208 mg/L	0.02 mg/L	104	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0388 mg/L	0.04 mg/L	97.1	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	11.1 mg/L	10 mg/L	111	70.0	130	----
		potassium, dissolved	7440-09-7	E421	4.72 mg/L	4 mg/L	118	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0216 mg/L	0.02 mg/L	108	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0445 mg/L	0.04 mg/L	111	70.0	130	----
		silicon, dissolved	7440-21-3	E421	9.94 mg/L	10 mg/L	99.4	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00386 mg/L	0.004 mg/L	96.4	70.0	130	----
		sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0397 mg/L	0.04 mg/L	99.2	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00405 mg/L	0.004 mg/L	101	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0221 mg/L	0.02 mg/L	110	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0200 mg/L	0.02 mg/L	99.8	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0392 mg/L	0.04 mg/L	98.1	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0213 mg/L	0.02 mg/L	107	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.00418 mg/L	0.004 mg/L	104	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.104 mg/L	0.1 mg/L	104	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.401 mg/L	0.4 mg/L	100	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0418 mg/L	0.04 mg/L	104	70.0	130	----



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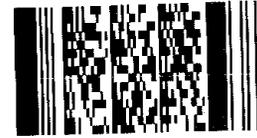
Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number

Environmental Division
Saskatoon
Work Order Reference
SK2106353



Telephone: +1 306 668 8370

Report To Contact and company name below will appear on the final report		Report Format / Distribution Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL) Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax jrobertson@okc-sk.com Email 2 Email 3			Select Service Level Below - Contact your A Regular [R] <input checked="" type="checkbox"/> Standard TAT if received b PRIORITY (Business Days) 4 day [P4-20%] <input type="checkbox"/> 3 day [P3-25%] <input type="checkbox"/> 2 day [P2-50%] <input type="checkbox"/> EMERGENCY 1 Busi Same I (Labor)																																															
Company: Okane Consultants Contact: Jared Robertson Phone: 1 (306) 713-1695 Company address below will appear on the final report Address: 112-112 Research Drive Province: Saskatoon, SK Postal Code: S7N 3R3		Invoice Distribution Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax jrobertson@okc-sk.com Email 2 Email 3			Analysis Request Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below <table border="1"> <tr> <th>F/P</th> <th>MET-D-COMS-SK</th> <th>ROU-F-SK</th> <th>SO4-IC-N-CL</th> <th>CN-T-CFA-VA</th> <th>CN-WAD-CFA-VA</th> <th>NH3</th> <th>TKN</th> <th>PT</th> </tr> <tr> <td></td> <td></td> <td></td> <td>R</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td>R</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td>R</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>R</td> <td>R</td> <td></td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> </tr> </table>			F/P	MET-D-COMS-SK	ROU-F-SK	SO4-IC-N-CL	CN-T-CFA-VA	CN-WAD-CFA-VA	NH3	TKN	PT				R									R									R							R	R		R	R	R	R	R
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Project Information Account # / Quote #: Q83455 #: 948-021 AFE: S Lab Work Order # (lab use only):		Oil and Gas Required Fields (client use) AFE/Cost Center: PO# Major/Minor Code: Routing Code: Requisitioner: Location:			NUMBER OF CONTAINERS MET-D-COMS-SK ROU-F-SK SO4-IC-N-CL CN-T-CFA-VA CN-WAD-CFA-VA NH3 TKN PT																																															
ALS Lab Work Order # (lab use only):		ALS Contact:		Sampler:		SAMPLES ON HOLD SUSPECTED HAZARD (see Special Instructions)																																														
Sample Identification and/or Coordinates (This description will appear on the report)		Date (dd-mm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS			SAMPLES ON HOLD																																												
01_TSF_W49		18-Nov-21	14:50	Leachate	1																																															
01_TSF_W50		29-Nov-21	16:25	Leachate	1																																															
01_TSF_W51		2-Dec-21	10:15	Leachate	1																																															
01_TSF_W52		9-Dec-21	12:00	Leachate	4			R R R R R R R																																												
Drinking Water (DW) Samples¹ (client use) 1 samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO 2 samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only) Suspected hazards: elevated metals, potential for low levels of cyanide			SAMPLE CONDITION AS RECEIVED (lab use only) Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/> Ice Packs <input type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/> Cooling Initiated <input type="checkbox"/> INITIAL COOLER TEMPERATURES °C: 7.6°C FINAL COOLER TEMPERATURES °C:																																															
SHIPMENT RELEASE (client use) Released by: Jared Robertson Date: December 09, 2021 Time:		INITIAL SHIPMENT RECEPTION (lab use only) Received by: <i>WU</i> Date: 12/10/21 Time: 2:50			FINAL SHIPMENT RECEPTION (lab use only) Received by: <i>FW</i> Date: 10-12 Time: 4																																															

Appendix D

Mineral Liberation Analysis

Mineral Liberation Analysis

Results for Sample 05-SED-NPAG-ACLC-05

Queen's University

Prepared by: Agatha Dobosz

Sept 17, 2022

CONTENTS

<i>.xlsx</i>	Title	Details
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Sheet 3	EIDist_XMOD	Elemental Distribution by Point Counting
Sheet 4	CalcAssay_XMOD	Calculated Assay by Point Counting
Sheet 5	Sparse Phase Mineralogy - SPL	Sparse Phase Results - Distribution of As, Mineral Association for As-bearing phases, Detailed Sparse Phase Mineralogy
Sheet 6	MinRef	Mineral Reference Library
Sheet 7	MinLib - Arsenopyrite	Mineral Liberation by Free Surface, Arsenopyrite
Sheet 8	MinLib - As-bearing Pyrite	Mineral Liberation by Free Surface, As-bearing Pyrite
Sheet 9	MinLib - Gersdorffite	Mineral Liberation by Free Surface, Gersdorffite
Sheet 10	MinLib - Fe Oxides w As	Mineral Liberation by Free Surface, Fe Oxides w As
Sheet 11	MinLib - Fe-As-Ca oxide	Mineral Liberation by Free Surface, Fe-As-Ca oxide
<i>.docx</i>	Methodology, Settings, and Images of As-bearing Phases	
<i>.bmp</i>	Exported Image Data of full scans for SPL and XMOD	
<i>.pdf</i>	Overlaid Image Scan Data for SPL and XMOD	

MLA - EXTENSIVE METHODOLOGY

Samples were examined under high vacuum mode on a FEI Quanta 650 FEG Environmental SEM at Queen's University. All images are collected by a back-scatter electron (BSE) detector in 8-bit greyscale, with a colour value of 0 representing black and a value of 255 representing white. This detector is used because in BSE imaging, colour value is directly related to average atomic number. Atoms with a higher atomic number (and as such, a higher atomic weight), with an inherently larger cross-sectional area, have a higher likelihood of interacting with the electron beam generated by the SEM. This higher likelihood of interactions means more elastic collisions between the electrons and atoms in the material, with proportionally more electrons being scattered back towards the pole piece where the BSE detector is mounted. Simply, heavier materials appear brighter, and this imaging property is key to MLA analysis.

Energy dispersive spectrometry (EDS) is the core of the x-ray analysis used by MLA to identify mineral phases. X-ray spectra are collected by twin Bruker XFlash silicon drift detectors. As the electron beam interacts with a material, the energetic electrons from the beam will cause electrons within electron shells of the sample atoms to be ejected. An ejected electron represents an unstable energy level, so an electron from a higher energy level will jump to the newly created 'hole' and eject a photon representing the difference in the energy levels, specifically in the x-ray range of the light spectrum. The specific energy levels of an atom are characteristic of an element, and in combination these can be used to identify the elements a material is composed of. The EDS detector collects all x-rays generated on the sample simultaneously, and differentiates them based on the photon's energy. An x-ray spectrum is the collection of these collected x-rays represented by energy on the x-axis, and how many x-rays are detected (counts) on the y-axis. "Minerals" - that is, phases of consistent chemical composition, are thus able to be identified by their EDS spectrum.

The MLA software itself automates the operation of the SEM and facilitates the collection of these data quickly and efficiently, collecting significantly more data than would be possible by manual operation of the SEM. To begin the measurement, the operator must choose parameters appropriate to the sample to be measured. The combination of standardized brightness, resolution, beam intensity, and magnification - as well as the appropriate measurement method, of which MLA has several - all have a direct impact in the data collected. More detailed scans will take more time, so care must be taken to determine the optimal amount of time used to collect the data required to fulfill the purpose of the MLA analysis.

After the correct parameters are set, the MLA software will collect a BSE image. An image analysis algorithm will determine epoxy as background to be ignored, and then determine 'grains' based on differences in BSE colour. Depending on the MLA method, it will then direct the beam to specific areas on the grains to collect x-ray spectra associated with that x-y coordinate as determined by the software. Once completed for one frame, the MLA software will move the sample stage one frame width and repeat the process, eventually stitching all the frames together into a single large database of images and x-ray spectra with known locations.

The data collected can be quite large depending on the parameters set and commonly several gigabytes per sample are collected. MLA analysis was conducted in two modes to better characterize the sample, named SPL_Lt and XMOD_STD. The measurement type is appended on all data to clarify how the data was collected. The modes change how the x-ray beam is directed. For SPL_Lt measurements, the MLA image algorithm will find the center of each separate phase of a specified colour (as determined by the software - in this case to not analyse extraneous silicates unlikely to be As-bearing hosts for the purposes of reducing agglomeration error and measurement time), then collect an x-ray that defines that grain.

This is important to note as the Modal Mineralogy exported by the software will be biased to brighter phases, and thus not a true modal mineralogy but a measure of relative proportions of very small amounts of potential As-bearing hosts. For XMOD_STD measurements, a grid of points is collected anywhere the software has determined is not epoxy. This method does not take sample texture into account, but is less likely to have problems due image processing errors. XMOD_STD measurements are very good for determining modal mineralogy, but do not provide possibly relevant shape, mineral association, or grain size data.

It is important to bear in mind that an automated system will collect data only on the parameters set, and the data must be processed by an experienced analyst. Data processing is predominantly conducted in two pieces of software that are part of the MLA suite – Image Processing and Mineral Reference Editor. Processing MLA data begins with comparing a basic mineral reference library of characteristic mineral spectra with the collected spectra in the samples. This involves the software comparing every single spectrum (60,000 – 500,000 spectra per sample) collected on the sample with the library. The best match, to a certain percentage match, is used to give that spectrum a name. Any collected minerals that do not match in the library are labelled as Unknown.

At this point, the analyst must do several things. They must ensure that each mineral phase in the library is correctly identifying the mineral in question. For example, plagioclase can have varying ratios of sodium and calcium. If the wrong type of plagioclase is in the library, the software will not correctly identify the mineral. If a mineral is not present in the library, it must be added. The Unknown component must be critically evaluated to ensure that important minerals are not retained in this ‘phase’, and to make sure poor spectra are retained in this Unknown phase. Due to the automated nature of collection, a certain amount of ‘mistakes’ resulting in poor spectra are expected. Usually this occurs when an x-ray is collected in between two different minerals resulting in a mixed spectrum, or if a poorly polished grain is measured, which results in a poor spectrum. It is up to the analyst to determine when to believe the data is as clean as it can be, which is usually based on a combination of sample texture, grain size, mineral types, and polishing quality. For this material, a specialized library was constructed to account for as many types of As-bearing hosts as possible, based on over a decade of collected As-host spectra over a variety of projects. About 17 As-bearing phases were included in the initial library for testing, 10 of which remained in the final library. Of these 10, 5 have been confirmed to be positively identified by MLA. These were confirmed using spectrum filtering to ensure that those with minor amounts of As would still accurately identify the peak at 10.5kV, then manually checked by the analyst.

SETTINGS

High Voltage	25 kV
Beam Current	9-10nA
Spot Size	6 (to achieve a beam current of 10nA)
Working Distance	12.7mm
Imaging Standard (grey level = 255)	Native Au

Table 1: SEM Settings

	SPL_Lt	XMOD_STD
Number of Frames	481	481
Frame Resolution (pixels)	700	700
Scan Speed	16	16

Magnification	278	278
Image Acquisition Minimum Size (pixels)	5	5
Background Removal	0-20	0-20
X-Ray Acquisition Time (ms)	13	13
X-Ray Minimum Size	5	N/A
XMOD Spacing (pixels)	N/A	32 x 32
# of X-Rays Collected	474219	61937
Average Time to Completion (hour)	4	2.5

Table 2: MLA Settings

IMAGES OF SELECTED AS-BEARING PHASES

Note: Ranked from largest on the left to smallest, including some that may not contain that material. Observe the noted colour in processed for confirmation of respective phase.

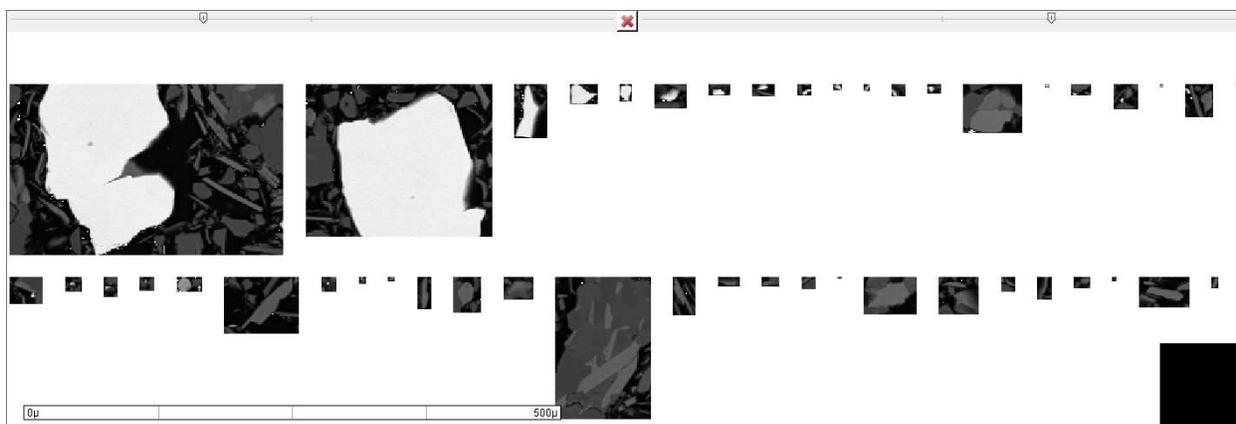


FIGURE 1: ARSENOPYRITE –BSE

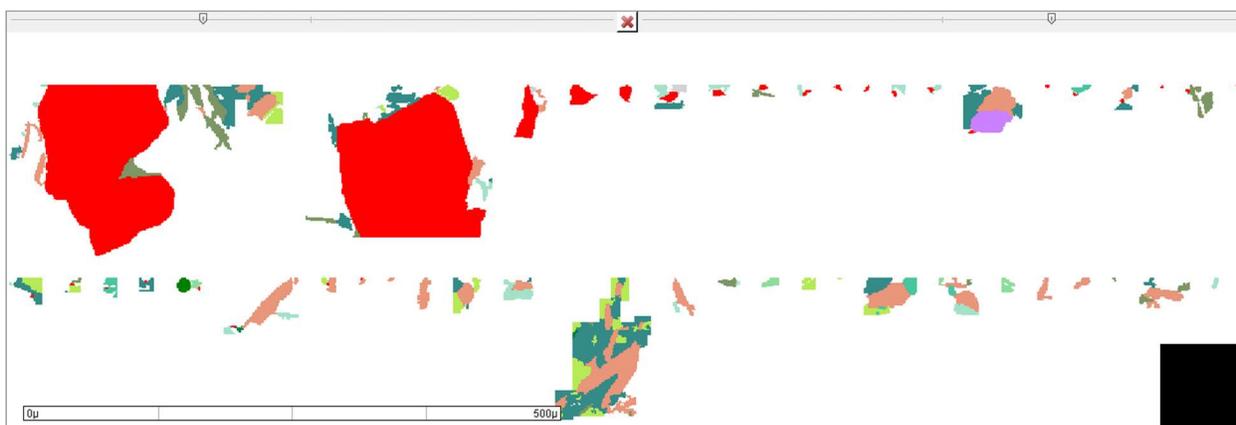


FIGURE 2: ARSENOPYRITE - PROCESSED (RED)

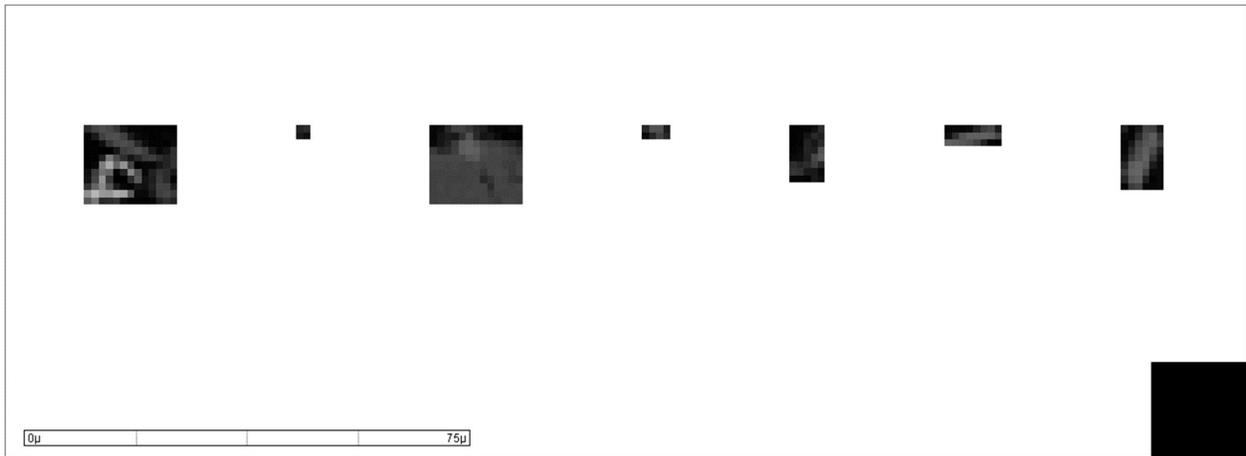


FIGURE 3: AS-BEARING PYRITE – BSE

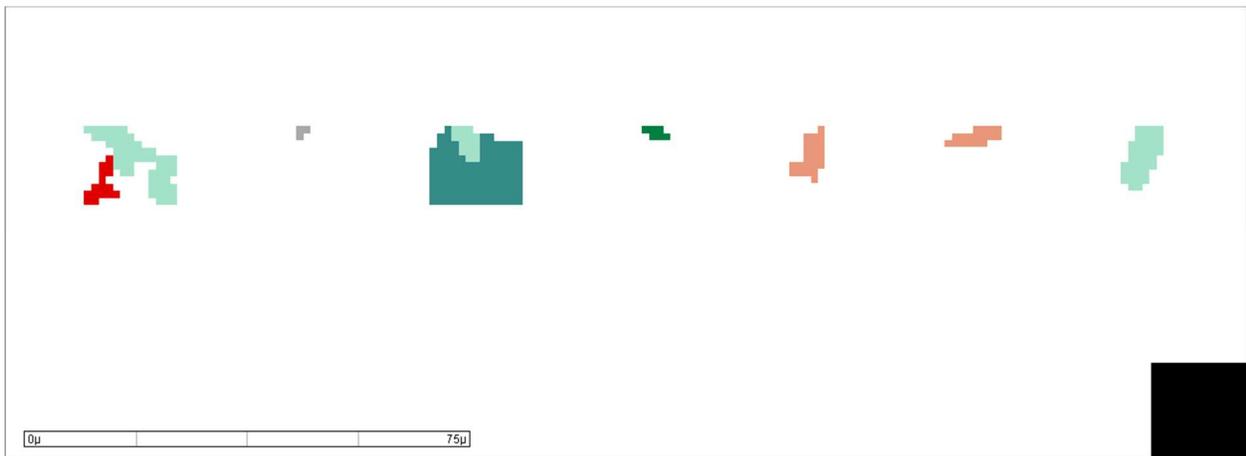


FIGURE 4: AS-BEARING PYRITE – PROCESSED (DARK RED)

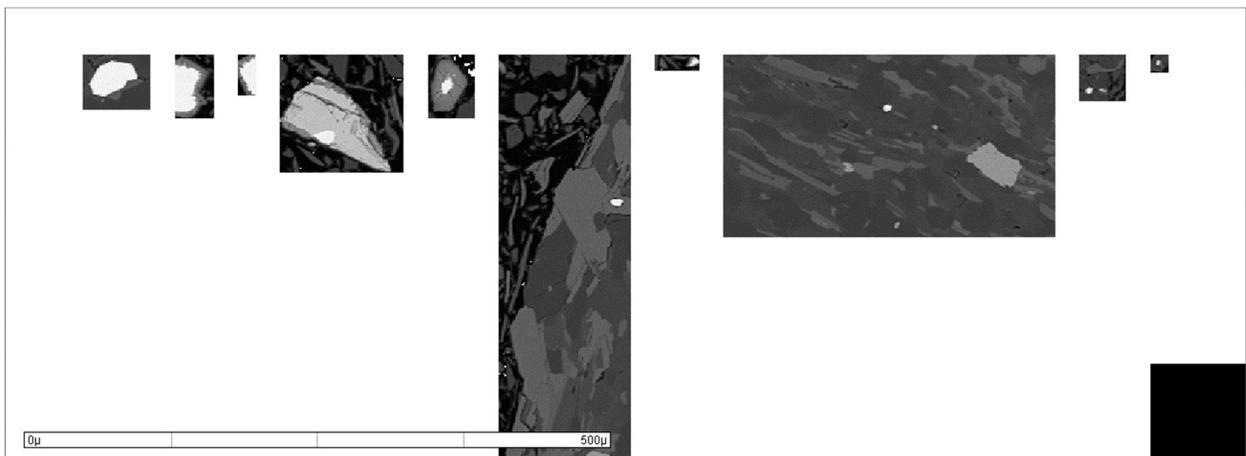


FIGURE 5: GERSDORFFITE – BSE

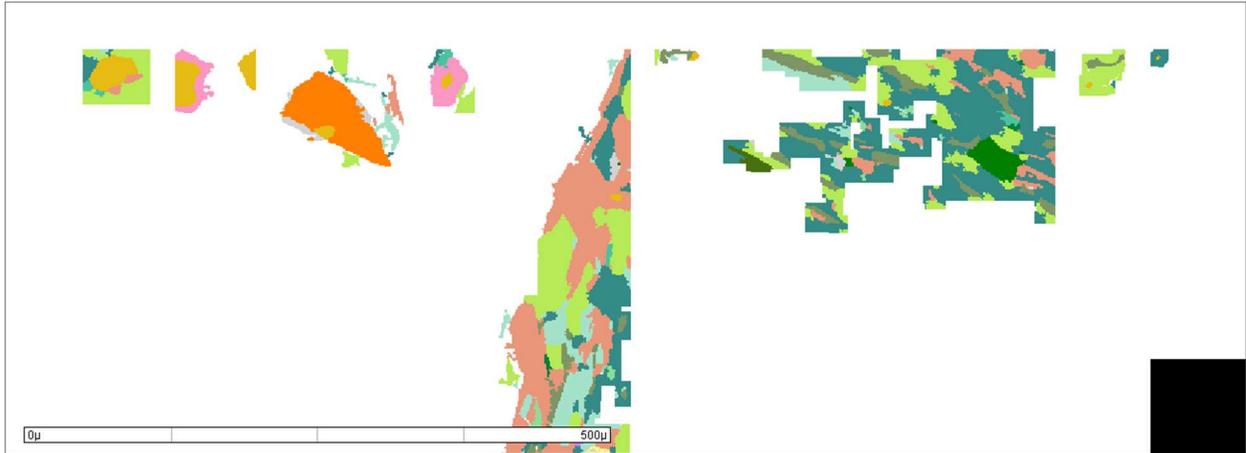


FIGURE 6: GERSDORFFITE- PROCESSED (GOLDEN YELLOW)

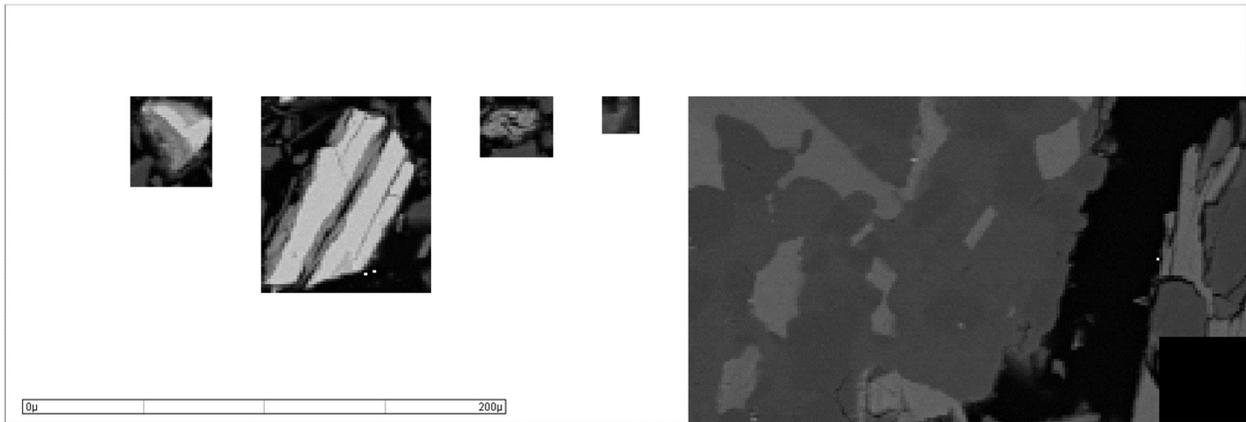


FIGURE 7: FE OXIDES WITH AS – BSE

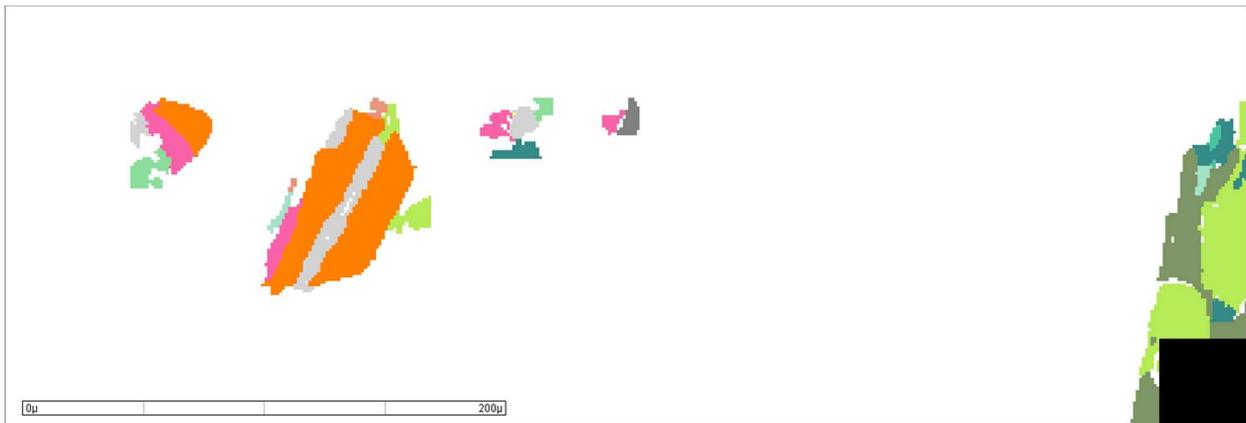


FIGURE 8: FE OXIDES WITH AS - PROCESSED (PINK)

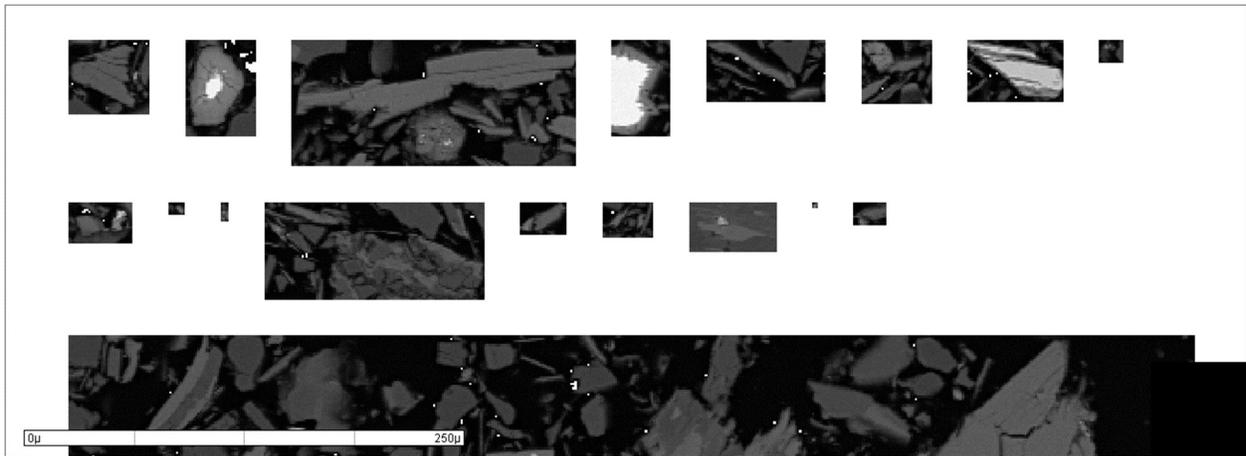


FIGURE 9: FE-AS-CA OXIDE – BSE

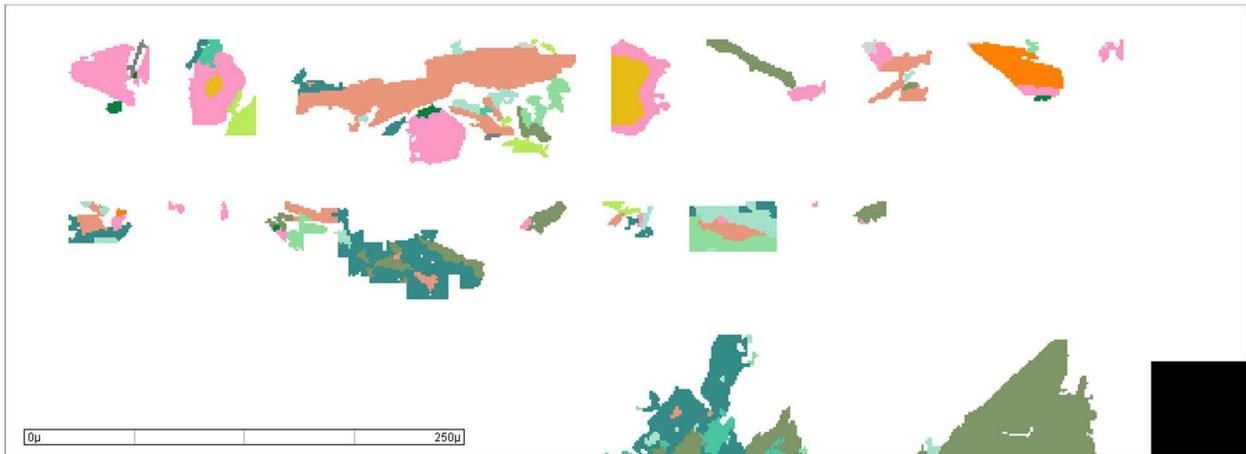


FIGURE 10: FE-AS-CA OXIDE – PROCESSED

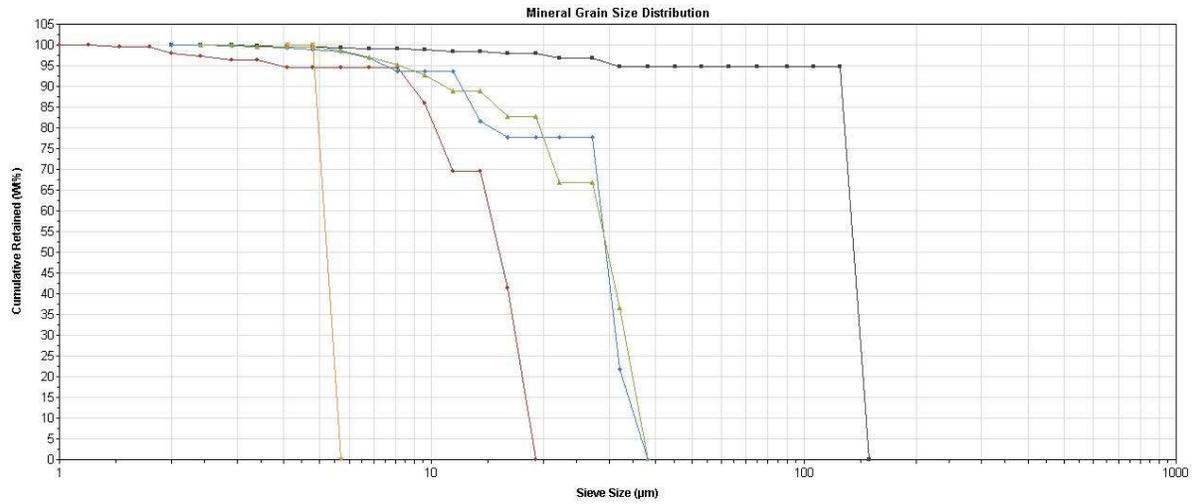


FIGURE 11: AS-BEARING MINERAL GRAIN SIZE DISTRIBUTION

ModMin_XMOD

Data Source: 05-SED-NPAG-ACLC-05_XMOD_STD

Mineral Groupings: Ungrouped

Filter: Unfiltered

Mineral	Wt%	Area%	Area (micron)	Particle Count	Grain Count
Chlorite	9.34	8.72	8021.22	5398	5398
Albite	8.27	8.68	7992.98	5379	5379
Orthoclase	2.32	2.49	2294.32	1544	1544
Tetrahedrite	0.00	0.00	0.00	0	0
Quartz	24.16	25.33	23308.78	15686	15686
Scheelite	0.00	0.00	0.00	0	0
Epidote	0.11	0.08	77.27	52	52
Plagioclase	27.67	28.35	26096.45	17562	17562
Barite	0.00	0.00	0.00	0	0
Muscovite/Mixed Clays	12.29	11.97	11013.94	7412	7412
Hornblende	0.76	0.72	662.74	446	446
Jamesonite	0.00	0.00	0.00	0	0
Pyrrhotite	0.13	0.08	72.81	49	49
Pyrite	0.01	0.00	4.46	3	3
Galena	0.00	0.00	0.00	0	0
Biotite	13.42	11.91	10964.91	7379	7379
Stibnite	0.00	0.00	0.00	0	0
Bronzite	0.00	0.00	1.49	1	1
Titanite	0.07	0.06	52.01	35	35
Rutile	0.00	0.00	2.97	2	2
Fe Oxides - No As	0.07	0.04	38.63	26	26
Apatite	0.25	0.21	197.63	133	133
Calcite	0.55	0.56	514.14	346	346
Ankerite	0.01	0.00	4.46	3	3
Arsenolite	0.00	0.00	0.00	0	0
Zircon	0.00	0.00	1.49	1	1
Monazite	0.00	0.00	0.00	0	0
Spessartine	0.01	0.01	10.40	7	7
Arsenopyrite	0.03	0.01	11.89	8	8
Fe Oxides - with As	0.01	0.00	2.97	2	2
Realgar	0.00	0.00	0.00	0	0
Ilmenite	0.48	0.28	257.07	173	173
Unknown	0.00	0.17	160.48	108	108
Low_Counts	0.00	0.26	239.24	161	161
Tremolite	0.03	0.02	20.80	14	14
No_XRay	0.00	0.00	0.00	0	0
Sphalerite	0.00	0.00	0.00	0	0
Dolomite	0.00	0.00	1.49	1	1
Bornite	0.00	0.00	0.00	0	0
Fe-As-Ca oxide	0.00	0.00	1.49	1	1
Chalcopyrite	0.00	0.00	1.49	1	1
Cobaltite/Gersdorffite	0.00	0.00	1.49	1	1
Cuprite	0.00	0.00	0.00	0	0
Sb2O3	0.00	0.00	0.00	0	0
Pentlandite	0.00	0.00	1.49	1	1
Al-Mn-Fe-As oxide	0.00	0.00	0.00	0	0
Al-Mn-Fe oxide	0.00	0.00	1.49	1	1
As-Bearing Pyrite	0.00	0.00	0.00	0	0
Fe-Mn-oxyhydroxide	0.00	0.00	1.49	1	1
Mn-(oxyhydr)oxide	0.00	0.00	0.00	0	0
Ca Arsenate (Rauenthalite?)	0.00	0.00	0.00	0	0
Ca-Fe Arsenate (Yukonite/Scorodite?)	0.00	0.00	0.00	0	0
Bright Unknowns	0.00	0.00	0.00	0	0
Bastnasite?	0.00	0.00	0.00	0	0
Total	100.00	100.00	92035.97	61937	61937

EIDist_XMOD

Data Source: 05-SED-NPAG-ACLC-05_XMOD_STD

Mineral Groupings: Ungrouped

Filter: Unfiltered

Mineral	Al (%)	As (%)	Ba (%)	C (%)	Ca (%)	Cl (%)	Co (%)	Cu (%)	F (%)	Fe (%)	H (%)	K (%)	Mg (%)	Mn (%)	Na (%)	Ni (%)	O (%)	P (%)	Pb (%)	RE (%)	S (%)	Sb (%)	Si (%)	Ti (%)	W (%)	Zn (%)
Chlorite	9.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	65.25	51.12	0.00	35.42	0.00	0.00	0.00	8.70	0.00	0.00	0.00	0.00	0.00	2.76	0.00	0.00	0.00
Albite	10.95	0.00	0.00	0.00	2.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.91	0.00	8.42	0.00	0.00	0.00	0.00	0.00	8.87	0.00	0.00	0.00
Orthoclase	2.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.89	0.00	0.00	0.00	0.00	2.23	0.00	0.00	0.00	0.00	0.00	2.39	0.00	0.00	0.00
Tetrahedrite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Quartz	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.91	0.00	0.00	0.00	0.00	0.00	38.46	0.00	0.00	0.00
Scheelite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Epidote	0.19	0.00	0.00	0.00	0.71	0.00	0.00	0.00	0.00	0.17	0.10	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00
Plagioclase	33.89	0.00	0.00	0.00	80.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	63.09	0.00	27.36	0.00	0.00	0.00	0.00	0.00	29.32	0.00	0.00	0.00
Barite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Muscovite/Mixed Clays	30.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	43.74	0.00	24.26	43.96	0.00	0.00	0.00	0.00	12.17	0.00	0.00	0.00	0.00	0.00	8.84	0.00	0.00	0.00
Hornblende	1.65	0.00	0.00	0.00	2.77	0.00	0.00	0.00	0.00	2.20	0.78	0.00	1.19	0.00	0.00	0.00	0.70	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00
Jamesonite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pyrrhotite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	79.75	0.00	0.00	0.00	0.00	0.00
Pyrite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.52	0.00	0.00	0.00	0.00	0.00
Galena	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Biotite	10.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	54.84	23.31	23.56	44.16	63.23	0.00	0.00	0.00	12.18	0.00	0.00	0.00	0.00	0.00	8.88	0.00	0.00	0.00
Stibnite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bronzite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Titanite	0.02	0.00	0.00	0.00	0.54	0.00	0.00	0.00	0.26	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	100.00	0.00	0.00	0.03	7.76	0.00	0.00
Rutile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.79	0.00	0.00
Fe Oxides - No As	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.41	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Apatite	0.00	0.00	0.00	0.00	3.86	100.00	0.00	0.00	1.16	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.20	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Calcite	0.00	0.00	0.00	98.74	8.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ankerite	0.00	0.00	0.00	0.93	0.04	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.01	3.20	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arsenolite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zircon	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Monazite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spessartine	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.06	0.00	0.00	66.08	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Arsenopyrite	0.00	89.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.95	0.00	0.00	0.00	0.00	0.00
Fe Oxides - with As	0.00	1.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Realgar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ilmenite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.75	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	90.45	0.00	0.00
Unknown	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low_Counts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tremolite	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.13	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
No_XRay	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sphalerite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dolomite	0.00	0.00	0.00	0.33	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bornite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe-As-Ca oxide	0.00	0.55	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	11.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chalcopyrite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.37	0.00	0.00	0.00	0.00	0.00
Cobaltite/Gersdorffite	0.00	9.02	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	35.02	0.00	0.00	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00
Cuprite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sb2O3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pentlandite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	64.98	0.00	0.00	0.00	0.00	1.49	0.00	0.00	0.00	0.00	0.00
Al-Mn-Fe-As oxide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al-Mn-Fe oxide	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	10.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
As-Bearing Pyrite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe-Mn-oxyhydroxide	0.00	0.00																								

CalcAssay_XMOD

Data Source: 05-SED-NPAG-ACLC-05_XMOD_STD

Filter: Unfiltered

Element	Wt%
Al	8.13
As	0.01
Ba	0.00
C	0.07
Ca	2.54
Ce	0.00
Cl	0.01
Co	0.00
Cu	0.00
F	0.27
Fe	3.71
H	0.23
K	2.74
La	0.00
Mg	2.98
Mn	0.00
Na	1.86
Nd	0.00
Ni	0.00
O	47.81
P	0.05
Pb	0.00
RE	0.00
S	0.06
Sb	0.00
Si	29.36
Th	0.00
Ti	0.17
Unknown	0.00
W	0.00
Zn	0.00
Zr	0.00
Total	100.00

Mineral	Density	Formula	Al (%)	As (%)	Ba (%)	C (%)	Ca (%)	Ce (%)	Cl (%)	Co (%)	Cu (%)	F (%)	Fe (%)	H (%)	K (%)	La (%)	Mg (%)	Mn (%)	Na (%)	Nd (%)	Ni (%)	O (%)	P (%)	Pb (%)	RE (%)	S (%)	Sb (%)	Si (%)	Th (%)	Ti (%)	Unknown (%)	W (%)	Zn (%)	Zr (%)		
Chlorite	2.95	(Mg,Fe)3(Si,Al)4(OH)2 (Mg,Fe)3(OH)6	8.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.81	1.25	0.00	0.00	11.28	0.00	0.00	0.00	0.00	44.53	0.00	0.00	0.00	0.00	0.00	0.00	8.69	0.00	0.00	0.00	0.00	0.00	0.00	
Albite	2.62	NaAlSi3O8	10.77	0.00	0.00	0.00	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	48.66	0.00	0.00	0.00	0.00	0.00	31.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Orthoclase	2.56	KAlSi3O8	9.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.04	0.00	0.00	0.00	0.00	0.00	0.00	45.99	0.00	0.00	0.00	0.00	0.00	30.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tetrahedrite	4.90	[Cu,Fe]12Sb4S13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	42.14	0.00	3.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.13	29.36	0.00	0.00	0.00	0.00	0.00	0.00		
Quartz	2.65	SiO2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	53.26	0.00	0.00	0.00	0.00	0.00	46.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Scheelite	6.01	CaWO4	0.00	0.00	0.00	0.00	13.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	63.86	0.00	0.00	0.00	
Epidote	3.45	Ca2Al2(Fe3+ Al)SiO4(Si2O7)O(OH)	14.39	0.00	0.00	0.00	17.10	0.00	0.00	0.00	0.00	0.00	5.96	2.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.37	0.00	0.00	0.00	0.00	0.00	17.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Plagioclase	2.69	Na0.5Ca0.5Si3AlO8	9.96	0.00	0.00	0.00	7.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.24	0.00	0.00	0.00	0.00	0.00	0.00	31.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Barite	4.48	Ba(SO4)	0.00	0.00	58.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	27.42	0.00	0.00	0.00	13.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Muscovite/Mixed Clays	2.83	KAl3Si3O10(OH)1.9F0.1	20.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.95	0.00	4.5	9.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	47.36	0.00	0.00	0.00	0.00	0.00	21.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hornblende	2.90	Ca2(Mg,Fe,Al)5(Si,Al)8O22(OH)2	17.68	0.00	0.00	0.00	9.27	0.00	0.00	0.00	0.00	0.00	10.76	0.23	0.00	0.00	4.68	0.00	0.00	0.00	0.00	0.00	44.39	0.00	0.00	0.00	0.00	12.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jamesonite	7.00	Pb4FeSb6S14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.15	0.00	0.00	21.75	35.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pyrrhotite	4.62	Fe2+0.95S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	62.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	37.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pyrite	5.01	Fe+S2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	53.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Galena	7.40	PbS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Biotite	3.10	KMg2.5Fe2+0.5AlSi3O10(OH)1.75F0.25	6.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.09	6.44	0.40	9.01	0.00	0.00	0.00	0.00	0.00	0.00	43.38	0.00	0.00	0.00	0.00	0.00	19.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stibnite	4.63	Sb2S3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.31	71.69	0.00	0.00	0.00	0.00	0.00	0.00		
Bronzite	3.20		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.21	0.00	0.00	0.00	0.00	0.00	47.81	0.00	0.00	0.00	0.00	27.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Titanite	3.48	CaTiSiO5	2.72	0.00	0.00	0.00	19.26	0.00	0.00	0.00	0.00	0.96	1.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	39.65	0.00	0.00	3.64	0.00	14.20	0.00	18.16	0.00	0.00	0.00	0.00	0.00	
Rutile	4.25	TiO2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.05	0.00	0.00	0.00	0.00	0.00	59.95	0.00	0.00	0.00	0.00	0.00	0.00	
Fe Oxides - No As	4.90	Fe3+2O3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	69.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Apatite	3.19	Ca5(PO4)3(F,Cl,OH)	0.00	0.00	0.00	0.00	39.37	0.00	2.32	0.00	0.00	1.24	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.76	18.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Calcite	2.71	Ca(CO3)	0.00	0.00	0.00	12.00	40.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	47.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Ankerite	3.05	Ca(Fe,Mg,Mn)(CO3)2	0.00	0.00	0.00	11.63	19.42	0.00	0.00	0.00	0.00	0.00	16.23	0.00	0.00	0.00	3.53	2.66	0.00	0.00	0.00	0.00	46.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arsenolite	1.00	As2O3	0.00	75.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zircon	4.65	ZrSiO4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.91	0.00	0.00	0.00	0.00	0.00	15.32	0.00	0.00	0.00	0.00	0.00	0.00	49.76
Monazite	5.15	Ca0.5La0.25Nd0.2Th0.05(PO4)	0.00	0.00	0.00	0.00	29.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.45	0.00	0.00	0.00	0.00	12.00	0.00	26.65	12.89	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	
Spessartine	3.10	Mn3Al(Si3Al)O10(OH)8Fe2	7.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.71	1.13	0.00	0.00	23.19	0.00	0.00	0.00	0.00	0.00	40.52	0.00	0.00	0.00	0.00	11.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Arsenopyrite	6.07	Fe3+AsS	0.00	46.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Fe Oxides - with As	4.90	Fe3+2O3(As0.07)	0.00	3.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	67.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Realgar	3.56	As4S4	0.00	70.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Ilmenite	4.72	Fe2+TiO3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	31.64	0.00	0.00	0.00	0.00	0.00	31.56	0.00	0.00	0.00	0.00	0.00	0.00	
Unknown	0.00																																			

