

## REPORT

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### R. Radloff & Associates

### District of Wells Lead Assessment



JUNE 2021

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# 1 INTRODUCTION

## 1.1 Background and Scope

Lead can be present in drinking water as result of leaching from distribution and plumbing system components, particularly in corrosive waters. The DOW is undertaking sampling of the District-owned and public buildings to determine the risk of corrosion. Although corrosion will affect the leaching of several contaminants, the primary focus is sampling for lead.

The *Guidelines on Evaluating and Mitigating Lead in Drinking Water Supplies, Schools, Daycares and Other Buildings* (British Columbia Health Protection Branch, April 2019) (referred to in the following document as the *Guidelines*) recommends using the two-tiered approach for assessing corrosion risks. The scope of this project is as follows:

- Review the distribution system drawings for lead services lines in the community.
- Perform lead sampling as an indicator of corrosion, following the protocol for Tier 1 and Tier 2 sampling, including investigating plumbing and fixtures for potential sources of lead.

DOW's primary consultant, R. Radloff & Associates Inc. (Radloff), retained Associated Engineering (AE) to prepare a sampling plan, and analyze the data. This document provides an analysis of the results of the Corrosion Sampling Plan.

## 1.2 Sampling Plan

The Sampling Plan was developed using the *Guidelines* and the project Terms of Reference provided by the DOW. The *Guidelines* note that, for the evaluation of corrosion risk, the two-tier protocol, outlined in Health Canada's *Guidance on Controlling Corrosion in Drinking Water Distribution Systems* (Health Canada, June 2009) should be used.

Sampling was performed as outlined briefly in the following sections. More detail is provided regarding the sampling plan in two sampling plan documents (Sampling Plan for Tier 1, AE, March 2021 and Tier 2 Sampling Plan, AE, April 2021). These sampling plans are included in [Appendix A](#).

The primary indicator of corrosion is lead as its presence is most likely to result in adverse health effects (Health Canada, 2009).

### 1.2.1 Residential Sites

Tier 1 sampling for residential sites was as follows:

- Stagnate water for 6 hours.
- Collect 1 L sample.
- If more than 10% of the samples have lead levels greater than 15 µg/L, proceed to Tier 2.

Tier 2 sampling for residential sites was as follows:

- Stagnate water for 6 hours.
- Collect 4 consecutive 1 L samples.
- Collect a 1 L fully-flushed sample (defined as running the water until there is a noticeable temperature drop).

### 1.2.2 Non-Residential Sites

Tier 1 sampling for non-residential sites was as follows:

- Stagnate water for 8 hours.
- Collect a 250 mL first draw sample.
- Note that the *Guidelines* state that after the first sample, and additional sample should be taken, but the volume is not defined. It is recommended to take a 1 L sample.
- If lead concentration exceeds 5 µg/L at any of the locations, further investigation and remedial action is required.

Tier 2 sampling for non-residential sites was as follows:

- Stagnate water for 8 hours.
- Flush tap for 30 seconds.
- Collect 250 mL sample.
- Collect a 250 mL fully-flushed sample (defined as running the water until there is a noticeable temperature drop).

### 1.2.3 Multi-Family Locations (Apartments)

The *Guidelines* do not specify a method for sampling multi-family residences (i.e., locations where there are multiple services from one connection to the network). Therefore, it was proposed to follow the non-residential sampling program protocol.

Sampling involved stagnating the water for 8 hours, taking a 250 mL sample, then running the tap for 30 s, then taking another 250 mL sample. An additional 250 mL fully-flushed sample (defined as running the water until there is a noticeable temperature drop) was also taken.

### 1.2.4 Water Treatment Plant Sampling

To understand any background lead in the water, the water treatment plant (WTP) was sampled at three locations: the raw water sample tap, the filtered water sample tap immediately after the filters, and the treated water sample tap.

Sampling involved shutting down the plant for 8 hours, then taking a sample at each of the locations. In addition, consecutive 1 L samples were taken until the volume equivalent to the WTP piping (approximately 11 L) was sampled. A fully flushed sample was also taken at the WTP treated water sample tap.

### 1.2.5 Additional Sampling

One hydrant was selected at a dead end in the system to represent high water age. Sampling involved fully flushing the hydrant (clear hydrant lead and hydrant body, 5 minutes at full hydrant flow), then taking a sample.

The reservoir was also sampled for further insight into the lead content in the distribution system.

### 1.3 Sampling Locations

The following locations were sampled for lead as an indicator of corrosion:

#### Residential Sites

- Lebeck House
- Hayley's House
- Mayor's House
- RCMP House (Southside)
- RCMP House (Northside)

#### Non-Residential Sites

- School (Staff Washroom Sink, Student Washroom Sink, Basement Bathroom Sink, Daycare Bathroom Sink)
- School Portable Service Line
- Highways Building (Kitchen Sink)
- Fire Hall (Bathroom Sink)
- Municipal Hall (Kitchen Sink)
- Community Hall (Kitchen Sink)
- BC Ambulance Station (BCAS) (Hose Bib)
- RCMP Detachment

#### Multi-Family Locations

- Community Relations Office, Residential Apartment
- Hubs Motel
- BGM Camp
- BGM Apartments

#### Other

- Water Treatment Plant (the raw water sample tap, the filtered water sample tap immediately after the filters, and the treated water sample tap)
- Reservoir
- Hydrant

The sampling locations are shown in the **Figure 1-1**.



Figure 1-1  
Sampling Locations

## 2 EXTERNAL INFORMATION REVIEW

### 2.1 Review of the Distribution Network

As part of the scope of work, the available water distribution system drawings were assessed for possible sources of lead from piping materials. This review was performed by Radloff.

Radloff's review of the available water system drawings indicate that the water system is comprised of both polyvinyl chloride (PVC) and ductile iron (DI) piping. The drawings also indicate that valving and fixtures are comprised of DI and epoxy coated DI fittings. Water services appear to be comprised of copper and brass piping with similar fittings.

### 2.2 External Sampling Results<sup>1</sup>

In addition to the sampling that was performed as part of this project, two sampling events were performed in January and February 2021, by DOW personnel. The results are shown in the following tables. The samples were not collected in accordance with the Tier 1 sampling *Guidelines*. The Certificates of Analysis for all samples are shown in [Appendix D](#).

It is unknown how the samples from January 6, 2021 were taken. However, all samples with the exception of the raw water well exceeded the MAC. (Refer to [Table 2-1](#).)

<sup>1</sup> Not collected as per *Guidelines*.

**Table 2-1**  
**Additional Lead Sampling Data Results (January 6, 2021)**

Location	Lead Concentration (µg/L)
Wells School #1	10.9
Wells School #2	250
DOW Office	13.0
Fire Hall	11.7
DOW Hall	8.40
Raw Water Supply Well	0.371

**Table 2-2** shows data from February 2021. The reported stagnation time was 24 hours, and the reported flushing time was 3 minutes. While this sampling did not follow the Tier 1 assessment, the results provide additional insight into the lead levels present. In particular, the flushed samples provide data, regarding the lead levels in the water within the distribution system. The numbers in red exceed the MAC.

**Table 2-2**  
**Additional Lead Sampling Data Results 2021**

Location (Sample Date)	Lead Concentration (µg/L) (after 24 hr stagnation)	Lead Concentration (µg/L) (after 3 min flushing)
RCMP Station (12-02-2021)	10.6	1.14
District Office (16-02-2021)	18.8	0.395
EMCON (Road Maintenance Building) (12-02-2021)	3.45	0.062
Fire Hall (12-02-2021)	n/a	6.38
Hall Bar (Municipal Hall Kitchen Tap) (12-02-2021)	0.418	1.36
Portables (Waterline to the former modular school office) (12-02-2021)	36.1	4.29
School Staff Kitchen (16-02-2021)	2.68	0.052
WTP Post Filter (location not specified) (12-02-2021)	21.5	4.26

In addition to the above samples, one resident within the DOW took samples and provided their results. The sample was stagnated overnight, then the pre-flush sample was taken. The tap was flushed for 15 minutes, then another sample was taken. The data is shown in **Table 2-3** and is above the MAC of 5 µg/L prior to flushing, but below the MAC after flushing. Note that this residence was also sampled as part of the Tier 1 and Tier 2 sampling protocol (summarized in section 3.1).

The results are similar such that the initial sample exceeded the MAC and flushing improved the results. The higher initial lead concentration shown in **Table 2-3** may be due to a longer stagnation time.

**Table 2-3**  
**Residential Sampling Results (performed by Residents)**

Location (Sample Date)	Lead Concentration (µg/L) Pre-flushing	Lead Concentration (µg/L) After 15-min Flushing	Comments
Lebeck Residence (21-02-2021)	18.4	0.118	House on newly constructed waterline

### 3 SAMPLING RESULTS

Tier 1 sampling was performed on March 4, 2021 and Tier 2 sampling was performed on April 27, 2021. The following sections outline the results and combine both Tier 1 and Tier 2 results. Photos from all Tier 1 sampling locations are shown in [Appendix B](#). While the sample collector did not note any obvious sources of lead appurtenances at the sampling locations, not all of the building plumbing was visible.

The Certificates of Analysis for all samples are shown in [Appendix C](#).

#### 3.1 Residential Sampling Results

The results from the residential sampling (both Tier 1 and Tier 2) are shown in [Table 3-1](#). Data that exceeds the Guidelines for Canadian Drinking Water Quality (GCDWQ) Maximum Acceptable Concentration (MAC) of 5 µg/L (0.005 mg/L) are shown in red.

**Table 3-1**  
**Residential Sampling Results (After 6 hours of Stagnation, results shown in µg/L)**

Building	Sample Location	1 L	2 L	3 L	4 L	Fully Flushed
Lebeck House	Hose Bib	7.33	0.696	0.586	0.326	0.086
Hayley's House	Kitchen Sink	0.487	0.07	0.058	0.075	0.19
Mayor's House	Hose Bib	2.35	0.483	0.263	1.08	0.519
RCMP (Southside) April 2021 (Refer to Note)	Laundry Room Sink	59.7	14.9	2.43	2.9	1.04
RCMP (Northside)	Kitchen Sink	0.126	0.257	0.076	<0.050	0.084

Based on the results from [Table 3-1](#), two locations showed lead concentrations above the MAC of 5 µg/L: the Lebeck House and the RCMP (Southside) house. At the Lebeck House, the 1<sup>st</sup> litre that was sampled from the tap had a high concentration of lead, yet subsequent samples did not. At the RCMP (Southside), the 1<sup>st</sup> and 2<sup>nd</sup> litres that were sampled had high concentrations of lead, yet subsequent samples did not. This indicates that the lead concern originates from the plumbing around the tap in these residences.

The fully flushed samples in all cases were below the MAC, indicating that the distribution system infrastructure is not the source of lead.



**Note:** In March 2021, two samples were taken from the RCMP (Southside) home. Two 250 mL samples were taken after 6 hours of stagnation. The concentration of the initial sample and the following sample were 9.86 and 731 µg/L, respectively. The 250 mL samples are not consistent with the *Guidelines*. Therefore, re-sampling was performed in April 2021 following the protocol outlined in the *Guidelines*. The results from both sampling events show the same conclusion: lead is present around the tap at the RCMP (Southside) laundry room sink.

### 3.2 Non-Residential Sampling Results

The results from the non-residential sampling are shown in **Table 3-2**. For locations where the Tier 1 sample lead result was above the MAC, Tier 2 sampling was performed. If Tier 1 sampling lead results were below the MAC, Tier 2 sampling was not performed. Data that exceeds the GCDWQ MAC are shown in red.

**Table 3-2**  
**Non-residential Sampling Results (After 8 hours of Stagnation)**

Building	Sample Location	Tier 1 (250 mL)	Tier 2 (250 mL)	Fully Flushed (250 mL)
School	Staff Washroom Sink	5.83	1.02	0.859
School	Student Washroom Sink	8.2	1.3	1.28
School	Basement Bathroom Sink	1.32		
School	Daycare Bathroom Sink	0.903		
School	Portable Service Line	200	Unable to sample, CC inaccessible	
Highways	Kitchen Sink	2.01		
Fire Hall	Bathroom Sink	65.9	0.988	1.97
Municipal Hall	Kitchen Sink	7.73	0.241	0.197
Community Hall	Kitchen Sink	3.66		
BC Ambulance Station	Hose Bib	24.7	1.66	0.664
RCMP Detachment	Kitchen Sink	0.672		

Six locations were revisited for Tier 2 sampling, although only five were able to be sampled (see School Portable Service Line comment). Some Tier 1 samples were above the MAC, however, following a 30 second flush (Tier 2 requirement), the lead concentration was below the MAC for the same samples, indicating that flushing a service can reduce lead exposure. This also indicates that the lead concern originates from the plumbing within the building.

**Note:** If the School Portable Service Line is to be used, Tier 2 sampling should be performed to gather a thorough understanding of the lead concern at that location.

### 3.3 Multi-Family Sampling Results

Multi-Family locations were measured similarly to the non-residential locations. Of the four locations sampled, only one location had Tier 1 lead results above the MAC: The Hubs Motel. Following a 30 second flush, the water at the Hubs Motel was below the MAC, as was the fully flushed sample, indicating that the lead concern originates from the plumbing within the building for the Hubs Motel. (Refer to **Table 3-3**.)



**Note:** The Tier 2 results are shown for the other three locations as both Tier 1 and Tier 2 sampling was performed at the same time for the Multi-Family locations.

**Table 3-3**  
**Multi-Family Sampling Results**

Building	Sample Location	Tier 1 (250 mL)	Tier 2 (250 mL)	Fully Flushed (250 mL)
Community Relations Office	Bathroom Sink	0.695	0.062	0.062
Hubs Motel	Office Hose Bib	5.93	1.08	2.27
BGM Camp	First Washroom	0.31	<0.050	<0.050
BGM Apartment	#204 Kitchen Sink	0.789	0.15	0.054

### 3.4 Water Treatment Plant Sampling Results

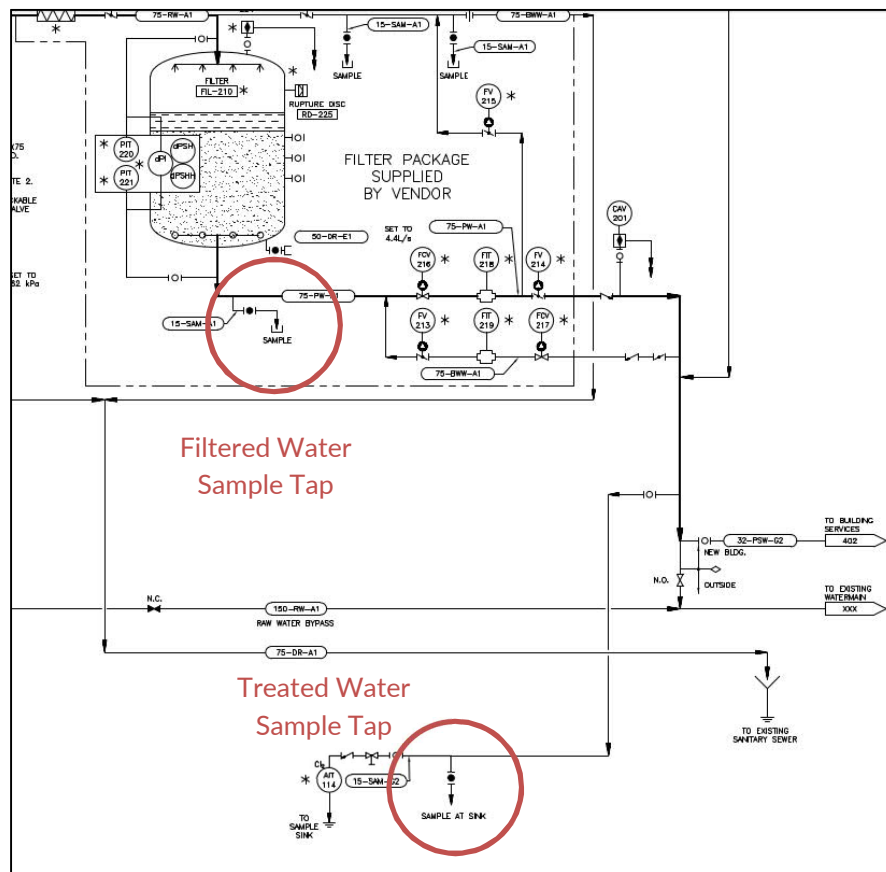
To determine if the source of lead is from the WTP, more extensive sampling was performed at the WTP. This included sampling at the raw water sample tap and the treated water sample tap for lead, total metals, alkalinity, pH, hardness, and Dissolved Inorganic Carbonates (DIC), also referred to as Dissolved Organic Carbon. DIC is an estimate of the total amount of inorganic carbon in water in the form of  $\text{CO}_2$ ,  $\text{H}_2\text{CO}_3^*$ ,  $\text{CO}_3^{2-}$ , and  $\text{HCO}_3^-$ . DIC is considered as the parameter more closely related to corrosion than alkalinity because it directly measures the available carbonate species in the water that can react with lead and copper to form passivating scales (EPA, 2016). DIC and pH can be used to determine which potential corrosion control measures are best suited for lead management. Based on the DIC levels and the pH of the water leaving the WTP, the water is considered corrosive, and could cause lead to release into the water system if it is present (i.e., if lead pipes or lead-containing fixtures are present).

The results of the testing at the WTP are shown in **Table 3-4**.

**Table 3-4**  
**Water Treatment Plant Sampling Results**

Sample Location	Lead ( $\mu\text{g/L}$ ) (Initial 250 mL sample)	Lead ( $\mu\text{g/L}$ ) (Subsequent 250 mL sample)	pH	Alkalinity (mg/L $\text{CaCO}_3$ )	DIC (mg/L of C)
Raw Water Sample Tap	0.086	1.55	7.97	147	32.4
Treated Water Sample Tap	17	11.5	8.00	155	37.9

Additional sampling was performed to understand why the treated water sample tap showed high levels of lead. There are two sampling ports after the filter: one treated water sampling port, which is sampled at the sink at the WTP, and another, which is immediately after the filter. These two sampling taps are shown in **Figure 3-1**. Previously, only the treated water sampling port was sampled.



**Figure 3-1**  
**Process and Instrumentation Diagram Showing Filtered Water Sample Tap and Treated Water Sample Tap**

Additional sampling involved shutting down the plant for 8 hours, then sampling a volume equivalent to the WTP piping (approximately 12 L) in 1-L increments. This method is called profile sampling and provides a snapshot of the piping. A fully flushed sample was also taken at the WTP treated water sample tap.

The results are shown in the **Figure 3-2**, for the treated water sample tap.

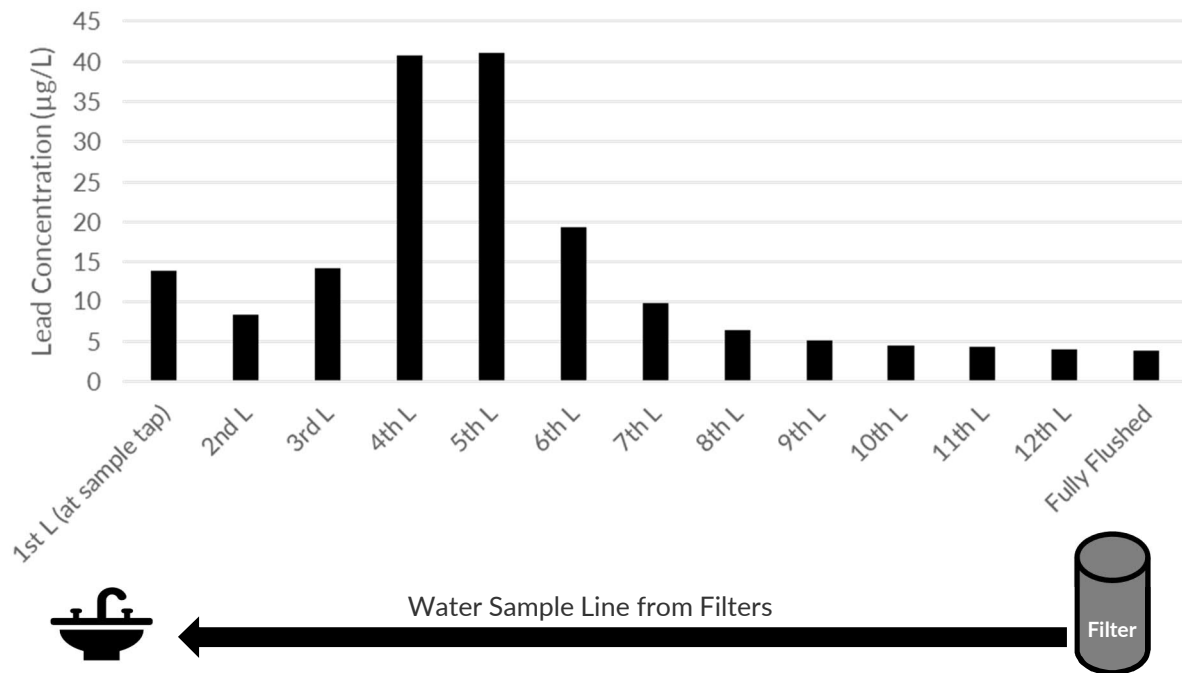


Figure 3-2  
Treated Water Sample Tap Profile Sampling Results

In addition, the filter sample tap was also sampled and had a concentration of 18.9 µg/L, after 8 hours of stagnation.

Based on the WTP results, it appears that the piping around the sampling taps may be the source of lead and not the treatment process itself. As the samples represented water near the filter, their lead concentration dropped.

### 3.5 Additional Sampling Results

Two locations within the distribution system were tested for lead: the reservoir and one hydrant at a dead end to represent high water age in the distribution system. A grab sample was taken at the reservoir. The hydrant was fully flushed for 5 minutes at full hydrant flow, then a sample was collected. The results are shown in [Table 3-5](#). Both the reservoir and the hydrant were below the MAC, indicating that neither the distribution system, nor the WTP, are a source of lead.

Table 3-5  
Additional Sampling Results

Location	Lead Concentration
Reservoir	0.138 µg/L
Hydrant	3.47 µg/L

### 3.6 Sampling Results Findings

Based on the findings of the sampling, the following conclusions were made:

- If lead is present at a sampling location, it is likely due to building plumbing;
- Flushing for 30 seconds was sufficient to lower the lead concentration to below the MAC for residential and non-residential locations; and
- The water is corrosive, so if lead piping or lead-containing plumbing/fixtures/appurtenances are present, leaching may occur.

## 4 CONCLUSIONS AND RECOMMENDATIONS

The goal of this project was to develop a sampling program, and based on the results, determine if corrosion is a concern for the DOW. Lead was used as an indicator of corrosion as its presence is most likely to result in adverse health effects.

Based on the Tier 1 and Tier 2 data, lead concentrations were above the MAC in 2 of the 5 residential locations that were sampled. One of the two locations had a first 1 L sample that was above the MAC, while the other samples were below the MAC. The second location had first and second 1 L samples that were above the MAC, while the other samples were below the MAC. This indicates that the lead concerns originate from the plumbing around the tap in these residences.

Of the 11 non-residential locations that were tested, lead concentrations of 6 locations were above the MAC upon initial sampling. After flushing, all were under the MAC with the exception of the School Portable Services Line (unable to be sampled as the CC was inaccessible). This indicates that flushing can reduce lead exposure and that the lead concerns originate from the plumbing in these locations and not the distribution system.

Four multi-family locations were measured similarly to the non-residential locations. Of the four locations, only one location (Hubs Motel) had a lead concentration above the MAC. However, upon flushing, the lead concentration of the sample was under the MAC, indicating that the lead concerns originate from the plumbing in the building.

To determine if the source of lead is from the water treatment plant, additional sampling was performed at the water treatment plant. Initial results showed elevated lead levels from the treated water tap. Further investigations and additional sampling found that the piping around the sampling taps may be the source of lead and not the treatment process itself. Additional testing indicated that, based on the DIC levels and the pH of the water leaving the water treatment plant, the water is considered corrosive, which can cause lead to release into the water system, if it is present. It is recommended that the piping near the sample taps be replaced with lead-free piping and lead-free solder.

There are two main concerns that are raised based on the sampling data:

1. The lead data within the system is due to the internal building plumbing in certain locations (not the WTP or the distribution system infrastructure).
2. The water chemistry is such that lead may leach into the water if there are lead-containing pipes/appurtenances present.

Based on the study findings, it is recommended that the DOW consider lead mitigation. This may involve:

- Replacing the plumbing fixtures in locations where lead is above the MAC with lead-free appurtenances
- Working with Northern Health Authority to educate residents about purchasing lead-free appurtenances and about flushing if lead is a concern.

In addition, it is recommended that the DOW investigate the feasibility of centralized chemical corrosion control at the water treatment plant (e.g., orthophosphate or soda ash) to be investigated through bench-scale testing.

## CLOSURE

This report was prepared for R. Radloff & Associates to review the sampling results of the Lead Assessment Program.

The services provided by Associated Engineering (B.C.) Ltd. in the preparation of this report were conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions. No other warranty expressed or implied is made.

Respectfully submitted,  
Associated Engineering (B.C.) Ltd.

Authored by:

Reviewed by:

Sarah Larlee, M.A.Sc., P.Eng.  
Process Engineer

Sutha Suthaker, Ph.D., P.Eng.  
National Practice Lead – Water

Stamped by:

Robyn Casement, P.Eng.  
Water Engineer

## APPENDIX A – LEAD SAMPLING PLAN (TIER 1 AND TIER 2)



Date:	March 1, 2021	File:	2021-2137
To:	R. Radloff & Associates Inc.	Page:	Page 1 of 5
From:	Sarah Larlee, M.A.Sc., P.Eng. and Grant Dixon		
Project:	District of Wells Lead Assessment		
Subject:	Sampling Plan V2		

## 1 INTRODUCTION AND BACKGROUND

The District of Wells (Wells) is undertaking sampling of the District-owned and public buildings to determine the risk of corrosion. This document outlines the proposed sampling plan.

This sampling plan was developed using the *Guidelines on Evaluating and Mitigating Lead in Drinking Water Supplies, Schools, Daycares and Other Buildings* (British Columbia Health Protection Branch, April 2019) (referred to in the following document as the *Guidelines*) and the project Terms of Reference provided by Wells.

The *Guideline* notes that, for the evaluation of corrosion risk, the 2-tier protocol outlined in Health Canada's *Guidance on Controlling Corrosion in Drinking Water Distribution Systems* (Health Canada, June 2009) should be used.

The 2-tiers are as follows for **residential** sites:

- First Tier: establish if corrosion is a concern
  - Collect 1 L sample after 6 hours of stagnation.
  - If more than 10% of the samples have lead greater than 15 ug/L, proceed to Second Tier.
- Second Tier: collect information on how lead enters the drinking water to assist in mitigation measures
  - Conduct samples at 10% of the sites sampled in Tier 1, specifically those with the highest lead concentrations. Note: For systems servicing fewer than 500 people, a minimum of two sites should be sampled.
  - Collect 4 x 1 L samples after 6 hours of stagnation. Analyze samples separately to create a profile of where the lead originates.

The 2-tiers are as follows for **non-residential** sites:

- First Tier: establish if corrosion is a concern
  - Identify all locations where drinking water may be consumed
  - Collect a 250 mL first draw sample after 8 hours of stagnation.
  - Note that the *Guidelines* state that after the first sample, an additional sample should be taken, but the volume is not defined. It is recommended to take a 1 L sample.
  - If lead concentration exceeds 5 ug/L at any of the locations, further investigation and remedial action is required.
- Second Tier: collect information on how lead enters the drinking water to assist in mitigation measures
  - Monitor locations exceeding 5 ug/L by taking a 250 mL sample after 8 hours of stagnation plus 30 seconds of flushing.
  - If the lead concentration of any samples exceeds 20 ug/L, corrective measures should be undertaken immediately.



Memo To: R. Radloff & Associates Inc.

March 01, 2021

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Previous lead sampling has been performed at Wells, but it was not completed in accordance with the 2-tier sampling outlined in the *Guidelines*. The following sampling plan outlines the sampling required for First Tier sampling.

## 2 SAMPLING PLAN

The following tables outlines buildings that were determined by Wells to be sampling locations. Note that while the *Guideline* and the Health Canada *Guidance on Controlling Corrosion in Drinking Water Distribution Systems* refers to residential sites, Wells has decided to only measure lead at public and District-owned buildings with the exception of the RCMP house. The table outlines how many samples will be taken at each location, and for what each sample will be analyzed. Note that sampling at the water treatment plant is recommended to provide baseline water quality results.

Although corrosion will affect the leaching of several contaminants, the primary focus is sampling for lead as its presence is most likely to result in adverse health effects (Health Canada, 2009).

**Table 1: Sampling Locations, Number of Samples, Sample Analyte –Residential Sites**

Building	Sampling Location	Number of Samples	Sample Bottle Type	Sample Analysis
RCMP House	Kitchen Tap (Cold)	1	1 L	Lead

**Table 2: Sampling Locations, Number of Samples, Sample Analyte – Non-Residential Sites**

Building	Sampling Location	Number of Samples	Sample Bottle Type	Sample Analysis
Fire Hall	Kitchen Tap (Cold)	2	1 x 250 mL and 1 x 1L	Lead
Community Hall	Kitchen Tap (Cold)	2	1 x 250 mL and 1 x 1L	Lead
Municipal Hall	Kitchen Tap (Cold)	2	1 x 250 mL and 1 x 1L	Lead
School	Water Fountain 1	2	1 x 250 mL and 1 x 1L	Lead
School	Water Fountain 2	2	1 x 250 mL and 1 x 1L	Lead
School	Bathroom 1 (Cold)	2	1 x 250 mL and 1 x 1L	Lead
School	Bathroom 2 (Cold)	2	1 x 250 mL and 1 x 1L	Lead
School Portables	Water Fountain	2	1 x 250 mL and 1 x 1L	Lead
RCMP Detachment	Kitchen Tap (Cold)	2	1 x 250 mL and 1 x 1L	Lead
Highway Maintenance Yard (EMCON)	Drinking Water Tap (Cold)	2	1 x 250 mL and 1 x 1L	Lead
Curling Rink	Concession Tap (Cold)	2	1 x 250 mL and 1 x 1L	Lead
Water Treatment Plant	Raw Water	2	1 x 250 mL and 1 x 1L	Lead



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Building	Sampling Location	Number of Samples	Sample Bottle Type	Sample Analysis
Water Treatment Plant	Raw Water	1	250 mL (General Bottle)	Dissolved Inorganic Carbon, Alkalinity, pH
Water Treatment Plant	Raw Water	1	120 mL (Total Metals)	Hardness and Metals
Water Treatment Plant	Utility Sink, Post-Treatment	2	1 x 250 mL and 1 x 1L	Lead
Water Treatment Plant	Utility Sink, Post-Treatment	1	250 mL (General Bottle)	Dissolved Inorganic Carbon, Alkalinity, pH
Water Treatment Plant	Utility Sink, Post-Treatment	1	120 mL (Total Metals)	Hardness and Metals

Note that 1 L sample bottles will need to be ordered in advance as the ALS lab will need to coordinate their delivery.

The following table summarizes how many sample bottles are required. Note that the sampling bottles are based on the recommendations from ALS Laboratory in Kelowna.

**Table 2: Sampling Bottle Requirements**

Bottle Volume	Number of Bottles Required
1 L	14
250 mL (General Bottle)	16 (already procured)
120 mL (Total Metals)	2 (already procured)

### 3 ADDITIONAL DATA

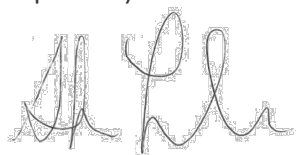
Barkerville Gold Mine has monitoring wells throughout Wells and there is a monitoring well at the old school building. Historical results would be beneficial to the analysis of the lead results that will be collected as part of this sampling plan.

### 4 CLOSURE

It is recommended that Northern Health be engaged prior to sampling to review this sampling plan.

If you have any questions regarding the above sampling plan, please contact the undersigned.

Prepared by:



Sarah Larlee, M.A.Sc., P.Eng.  
Process Engineer  
larlees@ae.ca



Grant Dixon  
Sampling Manager  
dixong@ae.ca



Date:	April 8, 2021	File:	2021-2137
To:	R. Radloff & Associates Inc.	Page:	Page 1 of 7
From:	Grant Dixon and Sarah Larlee, M.A.Sc., P.Eng.		
Project:	District of Wells Lead Assessment		
Subject:	Tier 2 Sampling Plan		

## 1 INTRODUCTION AND BACKGROUND

This memorandum was prepared to outline the proposed District of Wells (DOW) Tier 2 sampling program.

Based on the results of the Tier 1 sampling that was performed in March 2021, 6 non-residential locations had lead results higher than the maximum acceptable concentration (MAC) of 5 µg/L and will therefore proceed to Tier 2 sampling. The locations are as follows:

- School (Staff Washroom Sink, Student Washroom Sink)
- School Portable Service Line
- Fire Hall (Bathroom Sink)
- Municipal Hall (Kitchen Sink)
- BC Ambulance Station (BCAS) (Hose Bib)

In addition, the following location will also be included in Tier 2 sampling:

- RCMP House (south side)

While the *Guidelines on Evaluating and Mitigating Lead in Drinking Water Supplies, Schools, Daycares and Other Buildings* (British Columbia Health Protection Branch, April 2019) (referred to in the following document as the *Guidelines*) note that Tier 2 sampling is required if more than 10% of the residential locations are above 15 µg/L, only one location was sampled, and the second sample exceeded the MAC by 150 times. Therefore, the RCMP House on the south side of town will be sampled according to Tier 2.

Through the Tier 1 sampling, samples were also collected at the water treatment plant (WTP) to determine baseline conditions. Results at the WTP were above the MAC, so additional sampling will be performed at the WTP as part of this sampling plan.

In addition to sampling for Tier 2, DOW, in consultation with Northern Health, has selected other locations to sample for both Tier 1 and Tier 2 at the same time. They include the following locations (also shown in Figure 1):

- Yellow House
- Hayley's House
- RCMP House (north side)



Memo To: R. Radloff & Associates Inc.

April 08, 2021

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- Lebeck House
- Mayor's House
- Community Relations Office, Residential Apartment
- Hubs Motel
- BGM Camp
- BGM Apartments

One hydrant and the reservoir will also be sampled.

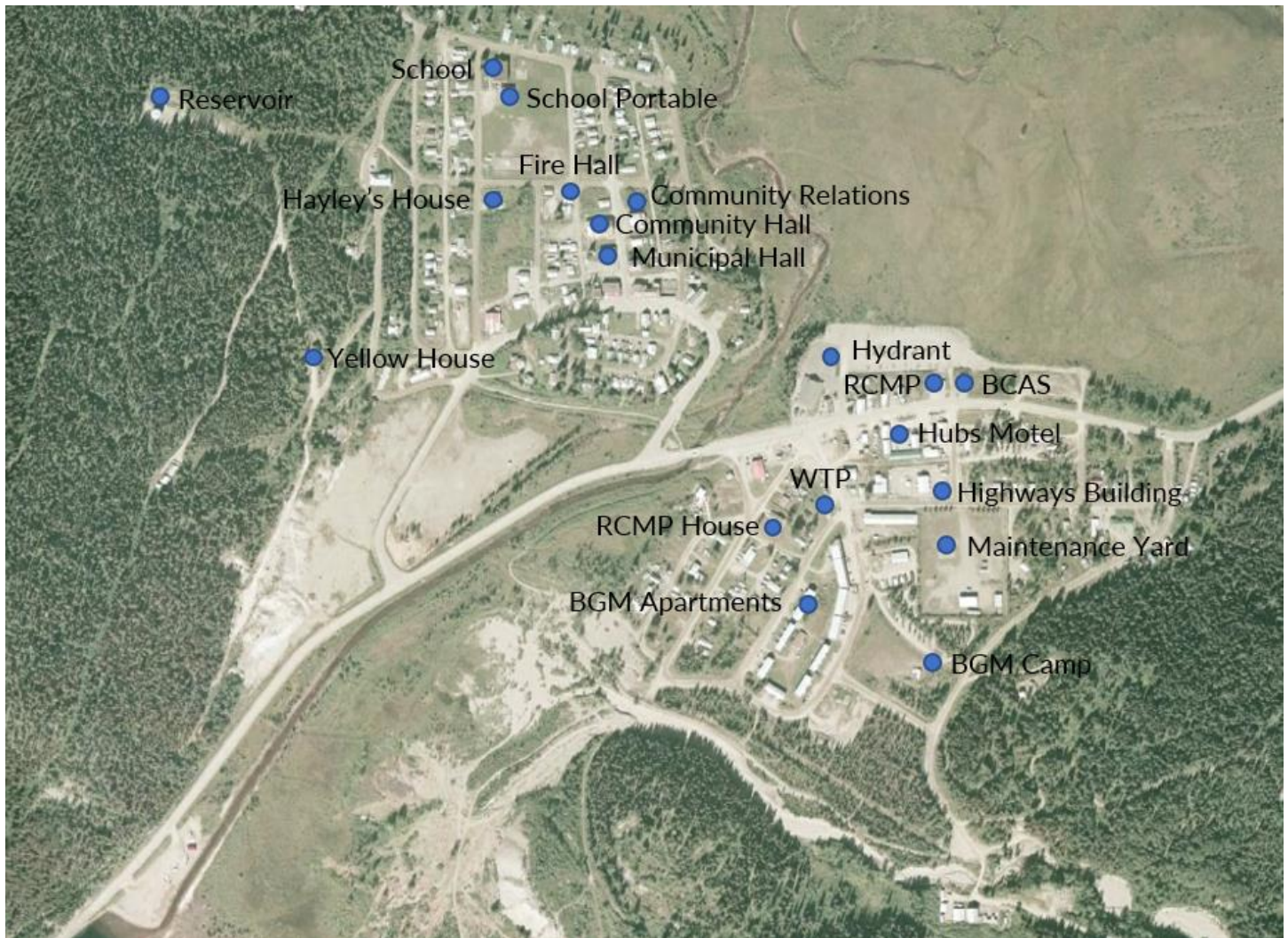


Figure 1: Sampling Locations



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April 08, 2021

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The following sampling plan outlines the sampling required for Tier 2 sampling at locations that were previously sampled, as well as Tier 1 and Tier 2 sampling for locations that were not previously sampled. Additional distribution samples will be outlined as well. This sampling plan was developed using the *Guidelines*.

## 2 SAMPLING PLAN

Depending on the location and whether Tier 2 only or Tier 1 and Tier 2 will be performed will determine the type of sampling required. The following sections outline the type of samples that should be taken at each location. It should be noted that in many of the sections, additional fully flushed samples are recommended that are not required according to Tier 2. These samples will provide additional insight into the source of lead (i.e. in the building plumbing or the distribution system).

### 2.1 Tier 2 Sampling for Non-Residential Locations

The locations identified in the table below were sampled in March 2021 through Tier 1 sampling and had lead concentrations above the MAC of 5 µg/L.

Tier 2 sampling will involve stagnating the water for 8 hours, then running the tap for 30 seconds, then taking a 250 mL sample. An additional 250 mL fully-flushed sample (defined as running the water until there is a noticeable temperature drop) will also be taken.

**Table 1: Tier 2 Sampling for Non-Residential Locations**

Building	Sampling Location	Number of Samples	Sample Bottle Type
School	Staff Washroom Sink	2	250 mL
School	Student Washroom Sink	2	250 mL
School	Portable Service Line	2	250 mL
Fire Hall	Bathroom Sink	2	250 mL
Municipal Hall	Kitchen Sink	2	250 mL
BCAS	Hose Bib	2	250 mL

### 2.2 Tier 2 Sampling for Residential Locations

Tier 2 residential sampling will be performed at the RCMP house on the south side of town. Tier 2 Sampling will involve stagnating the water for 6 hours, then taking 4 consecutive 1 L samples. Samples are to be analyzed separately. An additional 1 L fully-flushed sample (defined as running the water until there is a noticeable temperature drop) will also be taken.

Memo To: R. Radloff & Associates Inc.

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**Table 2: Tier 2 Sampling for Residential Locations**

Building	Sampling Location	Number of Samples	Sample Bottle Type
RCMP House (South Side)	Kitchen Sink	5	1 L

### 2.3 Tier 1+2 Sampling for Residential Locations (Houses)

Additional residential houses will be sampled for both Tier 1 and Tier 2 at the same time. They are identified in the following table.

Sampling will involve stagnating the water for 6 hours, then taking 4 consecutive 1 L samples. Samples are to be analyzed separately. An additional 1 L fully-flushed sample (defined as running the water until there is a noticeable temperature drop) will also be taken.

**Table 3: Tier 1 and Tier 2 Sampling for Residential Locations**

Building	Sampling Location	Number of Samples	Sample Bottle Type
Yellow House	Kitchen Sink	5	1 L
Hayley's House	Kitchen Sink	5	1 L
RCMP House (North Side)	Kitchen Sink	5	1 L
Lebeck House	Kitchen Sink	5	1 L
Mayor's House	Kitchen Sink	5	1 L

### 2.4 Tier 1+2 Sampling for Multi-Family Locations (Apartments)

The *Guideline* does not specify a method for sampling multi-family residences (i.e. locations where there are multiple services off of one connection to the network). Therefore, it is proposed to follow the non-residential sampling program protocol at the locations noted in the following table.

Sampling will involve stagnating the water for 8 hours, taking at 250 mL sample, then running the tap for 30 s, then taking a 250 mL sample. An additional 250 mL fully-flushed sample (defined as running the water until there is a noticeable temperature drop) will also be taken.



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April 08, 2021

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**Table 4: Tier 1 and Tier 2 Sampling for Multi-Family Locations**

Building	Sampling Location	Number of Samples	Sample Bottle Type
Community Relations Office, Residential Apartment	Kitchen Sink	3	250 mL
Hubs Motel	Main House Kitchen Tap	3	250 mL
BGM Camp	First Washroom at Main Entrance	3	250 mL
BGM Apartments	Kitchen Sink at apartment 304 or 201	3	250 mL

## 2.5 Additional WTP Sampling

Additional sampling will be performed at the WTP to determine the source of lead in the samples that were previously taken. The locations are noted in the following table.

Sampling will involve shutting down the plant for 8 hours, then taking a sample at the filter sample tap, a sample at the treated water tap, then consecutive 1 L samples will be taken until the volume equivalent to the WTP piping (approximately 11 L) has been sampled. A fully flushed sample will also be taken at the WTP.

**Table 5: Additional WTP Sampling**

Building	Sampling Location	Number of Samples	Sample Bottle Type
WTP	Treated Water Sample Tap	13	1 L
WTP	Filter Sample Tap	1	1 L

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April 08, 2021

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## 2.6 Hydrant Sampling

One hydrant will be selected at a dead end in the system to represent high water age. Sampling will involve fully flushing the hydrant (clear hydrant lead and hydrant body, 5 minutes at full hydrant flow), then taking a sample.

**Table 6: Hydrant Sampling**

Sampling Location	Number of Samples	Sample Bottle Type
Hydrant	1	250 mL

## 2.7 Reservoir Sampling

Sampling will involve taking a grab sample at the reservoir. If sampling from a tap, make sure that sufficient turnover takes place prior to sampling.

**Table 7: Reservoir Sampling**

Sampling Location	Number of Samples	Sample Bottle Type
Reservoir	1	250 mL

## 2.8 Sampling Summary

The following table summarizes how many sample bottles are required to complete the sampling outlined above.

**Table 8: Sampling Bottle Requirements**

Bottle Volume	Number of Bottles Required
1 L	44
250 mL	26

Note that 1 L sample bottles will need to be ordered in advance as the ALS lab will need to coordinate their delivery.

**3 CLOSURE**

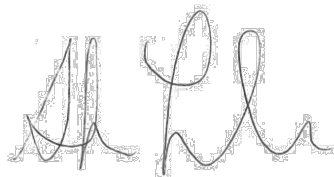
It is recommended that Northern Health be engaged prior to sampling to review this sampling plan.

If you have any questions regarding the above sampling plan, please contact the undersigned.

Prepared by:



Grant Dixon  
Sampling Manager  
dixong@ae.ca



Sarah Larlee, M.A.Sc., P.Eng.  
Process Engineer  
larlees@ae.ca

## APPENDIX B – INSPECTION PHOTOS



School Water Service #1



School Water Service #2



School Staff Washroom Sink



School Student Washroom Sink





School Basement Bathroom Sink



School Daycare Bathroom Sink



Highways Kitchen Sink



Firehall Water Service





Firehall Bathroom Sink



Municipal Hall Water Service



Municipal Hall Kitchen Sink



RCMP Detachment Water Service





RCMP Detachment Kitchen Sink



School New Kitchen Line Water Service



RCMP House Water Service



WTP Raw Water Supply Line





WTP Raw Water Sample Point



WTP Treat Water Sample Tap

## **APPENDIX C – LEAD RESULTS: MARCH 5, 2021 SAMPLING AND APRIL 27, 2021**



**Environmental**

## CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

**Work Order** : **VA21A4279**

**Client** : **District of Wells**

**Contact** : Richard Radloff

**Address** : Box 219 4243 Saunders Avenue  
Wells BC Canada V0K 2R0

**Telephone** : ----

**Project** : ----

**PO** : ----

**C-O-C number** : 20-885694

**Sampler** : ----

**Site** : ----

**Quote number** : KS21-DOWL100-001

**No. of samples received** : 7

**No. of samples analysed** : 7

**Page** : 1 of 4

**Laboratory** : Vancouver - Environmental

**Account Manager** : Amanda Lampreau

**Address** : 8081 Lougheed Highway  
Burnaby, British Columbia Canada V5A 1W9

**Telephone** : 1 250 372 3588

**Date Samples Received** : 09-Mar-2021 08:25

**Date Analysis Commenced** : 10-Mar-2021

**Issue Date** : 12-Mar-2021 09:22

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
- Guideline Comparison

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

### Signatories

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

*Signatories*

*Position*

*Laboratory Department*

Kim Jensen

Department Manager - Metals

Metals, 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.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key : LOR: Limit of Reporting (detection limit).

Unit	Description
mg/L	milligrams per litre

>: greater than.

<: less than.

Red shading is applied where the result is equal to or greater than the Guideline Upper Limit or the result is lower than the Guideline Lower Limit.



## Analytical Results Evaluation

Matrix: Water

				Client sample ID	# 1L	# 2L	# 3L	# 4L	# 5L
				Sampling date/time	04-Mar-2021 07:41	04-Mar-2021 07:44	04-Mar-2021 07:50	04-Mar-2021 07:55	04-Mar-2021 08:05
				Sub-Matrix	Water	Water	Water	Water	Water
Analyte	Method	LOR	Unit		VA21A4279-001	VA21A4279-002	VA21A4279-003	VA21A4279-004	VA21A4279-005
Total Metals									
lead, total	E420	0.000050	mg/L		0.00264	0.000922	0.000578	0.00311	0.000693

## Analytical Results Evaluation

Matrix: Water

				Client sample ID	# 6L	# 7L	----	----	----
				Sampling date/time	04-Mar-2021 08:12	04-Mar-2021 08:19	----	----	----
				Sub-Matrix	Water	Water	----	----	----
Analyte	Method	LOR	Unit		VA21A4279-006	VA21A4279-007	-----	-----	-----
Total Metals									
lead, total	E420	0.000050	mg/L		0.0167	0.000904	----	----	----

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

## Summary of Guideline Breaches by Sample

Client sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
# 6L	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.0167 mg/L	0.005 mg/L



Summary of Guideline Limits

Guideline	Category	Analyte	Limit
BCDWQG	MAC	lead, total	0.01 mg/L

**Keys:**

BCDWQG

British Columbia Drinking Water Quality Guidelines (JAN, 2021)

MAC

Maximum Acceptable Concentrations

## QUALITY CONTROL INTERPRETIVE REPORT

Work Order : **VA21A4279**

Client : **District of Wells**

Contact : Richard Radloff

Address : Box 219 4243 Saunders Avenue  
Wells BC Canada V0K 2R0

Telephone : ----

Project : ----

PO : ----

C-O-C number : 20-885694

Sampler : ----

Site : ----

Quote number : KS21-DOWL100-001

No. of samples received : 7

No. of samples analysed : 7

Page : 1 of 6

Laboratory : Vancouver - Environmental

Account Manager : Amanda Lampreau

Address : 8081 Lougheed Highway  
Burnaby, British Columbia Canada V5A 1W9

Telephone : 1 250 372 3588

Date Samples Received : 09-Mar-2021 08:25

Issue Date : 12-Mar-2021 09:22

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)**

- No Analysis Holding Time Outliers exist.

### **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	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) # 1L	E420	04-Mar-2021	----	----	----		10-Mar-2021	180 days	6 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) # 2L	E420	04-Mar-2021	----	----	----		10-Mar-2021	180 days	6 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) # 3L	E420	04-Mar-2021	----	----	----		10-Mar-2021	180 days	6 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) # 4L	E420	04-Mar-2021	----	----	----		10-Mar-2021	180 days	6 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) # 5L	E420	04-Mar-2021	----	----	----		10-Mar-2021	180 days	6 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) # 6L	E420	04-Mar-2021	----	----	----		10-Mar-2021	180 days	6 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) # 7L	E420	04-Mar-2021	----	----	----		10-Mar-2021	180 days	6 days	✓

[Legend & Qualifier Definitions](#)



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: <b>Water</b>			Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.				
Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
Analytical Methods			QC	Regular	Actual	Expected	Evaluation
Laboratory Duplicates (DUP)							
Total Metals in Water by CRC ICPMS	E420	161438	1	14	7.1	5.0	✔
Laboratory Control Samples (LCS)							
Total Metals in Water by CRC ICPMS	E420	161438	1	14	7.1	5.0	✔
Method Blanks (MB)							
Total Metals in Water by CRC ICPMS	E420	161438	1	14	7.1	5.0	✔
Matrix Spikes (MS)							
Total Metals in Water by CRC ICPMS	E420	161438	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
Total Metals in Water by CRC ICPMS	E420  Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.



Environmental

## QUALITY CONTROL REPORT

Work Order : **VA21A4279**

Page : 1 of 3

Client : District of Wells  
Contact : Richard Radloff  
Address : Box 219 4243 Saunders Avenue  
Wells BC Canada V0K 2R0  
Telephone : ----  
Project : ----  
PO : ----  
C-O-C number : 20-885694  
Sampler : ----  
Site : ----  
Quote number : KS21-DOWL100-001  
No. of samples received : 7  
No. of samples analysed : 7

Laboratory : Vancouver - Environmental  
Account Manager : Amanda Lampreau  
Address : 8081 Lougheed Highway  
Burnaby, British Columbia Canada V5A 1W9  
Telephone : 1 250 372 3588  
Date Samples Received : 09-Mar-2021 08:25  
Date Analysis Commenced : 10-Mar-2021  
Issue Date : 12-Mar-2021 09:22

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
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia



General Comments

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

- Key :
- Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
  - CAS Number = Chemical Abstracts 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
Total Metals (QC Lot: 161438)											
VA21A4279-001	# 1L	lead, total	7439-92-1	E420	0.000050	mg/L	0.00264	0.00262	0.913%	20%	----

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
Total Metals (QCLot: 161438)						
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----



Laboratory Control Sample (LCS) Report

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

Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 161438)									
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 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
Total Metals (QCLot: 161438)									
VA21A4279-001	# 1L	lead, total	7439-92-1	E420	0.0208 mg/L	0.02 mg/L	104	70.0	130

[illegible]

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**.

WHITE - LABORATORY COPY      YELLOW - CLIENT COPY

AUG 2020 FRONT





**Environmental**

## CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

**Work Order** : **VA21A4281**

**Client** : **District of Wells**

**Contact** : Richard Radloff

**Address** : Box 219 4243 Saunders Avenue  
Wells BC Canada V0K 2R0

**Telephone** : ----

**Project** : ----

**PO** : ----

**C-O-C number** : 20-885693

**Sampler** : ----

**Site** : ----

**Quote number** : KS21-DOWL100-001

**No. of samples received** : 7

**No. of samples analysed** : 7

**Page** : 1 of 4

**Laboratory** : Vancouver - Environmental

**Account Manager** : Amanda Lampreau

**Address** : 8081 Lougheed Highway  
Burnaby, British Columbia Canada V5A 1W9

**Telephone** : 1 250 372 3588

**Date Samples Received** : 09-Mar-2021 08:25

**Date Analysis Commenced** : 10-Mar-2021

**Issue Date** : 12-Mar-2021 09:34

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
- Guideline Comparison

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

### Signatories

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

*Signatories*

*Position*

*Laboratory Department*

Kim Jensen

Department Manager - Metals

Metals, 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.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key : LOR: Limit of Reporting (detection limit).

Unit	Description
mg/L	milligrams per litre

>: greater than.

<: less than.

Red shading is applied where the result is equal to or greater than the Guideline Upper Limit or the result is lower than the Guideline Lower Limit.



### Analytical Results Evaluation

Matrix: Water

				Client sample ID	# 8L	# 9L	# 10L	# 11L	# 12L
				Sampling date/time	04-Mar-2021 08:33	04-Mar-2021 09:00	04-Mar-2021 09:04	04-Mar-2021 11:40	04-Mar-2021 15:02
				Sub-Matrix	Water	Water	Water	Water	Water
Analyte	Method	LOR	Unit		VA21A4281-001	VA21A4281-002	VA21A4281-003	VA21A4281-004	VA21A4281-005
Total Metals									
lead, total	E420	0.000050	mg/L		0.000500	0.0129	0.000754	0.103	0.731

### Analytical Results Evaluation

Matrix: Water

				Client sample ID	# 13AL	# 14AL	----	----	----
				Sampling date/time	04-Mar-2021 15:11	04-Mar-2021 15:19	----	----	----
				Sub-Matrix	Water	Water	----	----	----
Analyte	Method	LOR	Unit		VA21A4281-006	VA21A4281-007	-----	-----	-----
Total Metals									
lead, total	E420	0.000050	mg/L		0.00155	0.0115	----	----	----

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



### Summary of Guideline Breaches by Sample

Client sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
# 9L	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.0129 mg/L	0.005 mg/L
# 11L	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.103 mg/L	0.005 mg/L
# 12L	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.731 mg/L	0.005 mg/L
# 14AL	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.0115 mg/L	0.005 mg/L

### Summary of Guideline Limits

Guideline	Category	Analyte	Limit
BCDWQG	MAC	lead, total	0.01 mg/L

**Keys:**

BCDWQG

British Columbia Drinking Water Quality Guidelines (JAN, 2021)

MAC

Maximum Acceptable Concentrations

## QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: <b>VA21A4281</b>	Page	: 1 of 6
Client	: <b>District of Wells</b>	Laboratory	: Vancouver - Environmental
Contact	: Richard Radloff	Account Manager	: Amanda Lampreau
Address	: Box 219 4243 Saunders Avenue Wells BC Canada V0K 2R0	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: 1 250 372 3588
Project	: ----	Date Samples Received	: 09-Mar-2021 08:25
PO	: ----	Issue Date	: 12-Mar-2021 09:34
C-O-C number	: 20-885693		
Sampler	: ----		
Site	: ----		
Quote number	: KS21-DOWL100-001		
No. of samples received	: 7		
No. of samples analysed	: 7		

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)

- No Analysis Holding Time Outliers exist.

### 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	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) # 10L	E420	04-Mar-2021	----	----	----		10-Mar-2021	180 days	6 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) # 11L	E420	04-Mar-2021	----	----	----		10-Mar-2021	180 days	6 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) # 12L	E420	04-Mar-2021	----	----	----		10-Mar-2021	180 days	6 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) # 13AL	E420	04-Mar-2021	----	----	----		10-Mar-2021	180 days	6 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) # 14AL	E420	04-Mar-2021	----	----	----		10-Mar-2021	180 days	6 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) # 8L	E420	04-Mar-2021	----	----	----		10-Mar-2021	180 days	6 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) # 9L	E420	04-Mar-2021	----	----	----		10-Mar-2021	180 days	6 days	✓

[Legend & Qualifier Definitions](#)



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





## Quality Control Parameter Frequency Compliance

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

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	Method	QC Lot #	QC	Regular	Actual	Expected	Evaluation
Laboratory Duplicates (DUP)							
Total Metals in Water by CRC ICPMS	E420	161438	1	14	7.1	5.0	✓
Laboratory Control Samples (LCS)							
Total Metals in Water by CRC ICPMS	E420	161438	1	14	7.1	5.0	✓
Method Blanks (MB)							
Total Metals in Water by CRC ICPMS	E420	161438	1	14	7.1	5.0	✓
Matrix Spikes (MS)							
Total Metals in Water by CRC ICPMS	E420	161438	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
Total Metals in Water by CRC ICPMS	E420  Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.



Environmental

## QUALITY CONTROL REPORT

Work Order : **VA21A4281**

Page : 1 of 3

Client : District of Wells  
Contact : Richard Radloff  
Address : Box 219 4243 Saunders Avenue  
Wells BC Canada V0K 2R0  
Telephone : ----  
Project : ----  
PO : ----  
C-O-C number : 20-885693  
Sampler : ----  
Site : ----  
Quote number : KS21-DOWL100-001  
No. of samples received : 7  
No. of samples analysed : 7

Laboratory : Vancouver - Environmental  
Account Manager : Amanda Lampreau  
Address : 8081 Lougheed Highway  
Burnaby, British Columbia Canada V5A 1W9  
Telephone : 1 250 372 3588  
Date Samples Received : 09-Mar-2021 08:25  
Date Analysis Commenced : 10-Mar-2021  
Issue Date : 12-Mar-2021 09:34

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.

Signatories	Position	Laboratory Department
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia



General Comments

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

- Key :
- Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
  - CAS Number = Chemical Abstracts 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).

					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
Total Metals (QC Lot: 161438)											
VA21A4279-001	Anonymous	lead, total	7439-92-1	E420	0.000050	mg/L	0.00264	0.00262	0.913%	20%	----

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: <b>Water</b>						
<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	<i>Result</i>	<i>Qualifier</i>
Total Metals (QCLot: 161438)						
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----



Laboratory Control Sample (LCS) Report

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

Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 161438)									
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 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
Total Metals (QCLot: 161438)									
VA21A4279-001	Anonymous	lead, total	7439-92-1	E420	0.0208 mg/L	0.02 mg/L	104	70.0	130



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## Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

COC Number: 20 - 885693

Page 1 of 1

<b>Report To</b> Contact and company name below will appear on the final report		<b>Reports / Recipients</b>		<b>Turnaround Time (TAT) Requested</b>		<b>AFFIX ALS BARCODE LABEL HERE</b> (ALS use only)			
Company: <u>R. Radloff and Associates</u>		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL)		<input checked="" type="checkbox"/> Routine [R] if received by 3pm M-F - no surcharges apply <input type="checkbox"/> 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum <input type="checkbox"/> 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum <input type="checkbox"/> 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum <input type="checkbox"/> 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum <input type="checkbox"/> Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests					
Contact: <u>Richard Radloff</u>		Merge QC/QCI Reports with COA <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A							
Phone: <u>250-562-6861</u>		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX							
Company address below will appear on the final report		Email 1 or Fax: <u>richard.radloff@radloffeng.com</u>		Date and Time Required for all E&P TATs: _____					
Street: <u>1820 3rd Ave</u>		Email 2		For all tests with rush TATs requested, please contact your AM to confirm availability.					
City/Province: <u>Prince George BC</u>		Email 3							
Postal Code: <u>V2M 1G4</u>									
<b>Invoice To</b>		<b>Invoice Recipients</b>		<b>Analysis Request</b>		<b>SAMPLES ON HOLD</b> <b>EXTENDED STORAGE REQUIRED</b> <b>SUSPECTED HAZARD (see notes)</b>			
Same as Report To <input 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 type="checkbox"/> YES <input type="checkbox"/> NO		Email 1 or Fax: <u>admin1@wells.ca</u>							
Company:		Email 2							
Contact:									
<b>Project Information</b>		<b>Oil and Gas Required Fields (client use)</b>							
ALS Account # / Quote # <u>DOWL 100</u>		AFE/Cost Center: _____ PO# _____							
Job #:		Major/Minor Code: _____ Routing Code: _____							
PO / AFE:		Requisitioner: _____							
LSD:		Location: _____							
ALS Lab Work Order # (ALS use only): <u>4281</u>		ALS Contact:		Sampler:					
ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS				
1	#8L	04-03-21	8:33	Water	Lead	X			
2	#9L		9:00			X			
3	#10L		9:04			X			
4	#11L		11:40			X			
5	#12L		3:02			X			
6	#13AL		3:11			X			
7	#14AL		3:19			X			
<b>Drinking Water (DW) Samples<sup>1</sup> (client use)</b>		<b>Notes / Specify Limits for result evaluation by selecting from drop-down below</b> (Excel COC only)		<b>SAMPLE RECEIPT DETAILS (ALS use only)</b>					
Are samples taken from a Regulated DW System? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO				Cooling Method: <input type="checkbox"/> NONE <input type="checkbox"/> ICE <input checked="" type="checkbox"/> ICE PACKS <input type="checkbox"/> FROZEN <input type="checkbox"/> COOLING INITIATED					
Are samples for human consumption/ use? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO				Submission Comments identified on Sample Receipt Notification: <input type="checkbox"/> YES <input type="checkbox"/> NO					
				Cooler Custody Seals Intact: <input type="checkbox"/> YES <input type="checkbox"/> N/A Sample Custody Seals Intact: <input type="checkbox"/> YES <input type="checkbox"/> N/A					
				INITIAL COOLER TEMPERATURES °C _____ FINAL COOLER TEMPERATURES °C _____					
<b>SHIPMENT RELEASE (client use)</b>		<b>INITIAL SHIPMENT RECEPTION (ALS use only)</b>		<b>FINAL SHIPMENT RECEPTION (ALS use only)</b>					
Released by: <u>Richard Radloff</u>	Date: <u>2021/03/08</u>	Time: <u>10:30</u>	Received by: _____	Date: _____	Time: _____	Received by: <u>MB</u>	Date: <u>Mar 9</u>		
						Time: <u>8:25AM</u>			

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.

N/A 220 FRONT



**Environmental**

## CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

**Work Order** : **VA21A4293**

**Client** : **District of Wells**

**Contact** : Richard Radloff

**Address** : Box 219 4243 Saunders Avenue  
Wells BC Canada V0K 2R0

**Telephone** : ----

**Project** : ----

**PO** : ----

**C-O-C number** : 20-885691/92

**Sampler** : ----

**Site** : ----

**Quote number** : KS21-DOWL100-001

**No. of samples received** : 18

**No. of samples analysed** : 18

**Page** : 1 of 9

**Laboratory** : Vancouver - Environmental

**Account Manager** : Amanda Lampreau

**Address** : 8081 Lougheed Highway  
Burnaby, British Columbia Canada V5A 1W9

**Telephone** : 1 250 372 3588

**Date Samples Received** : 09-Mar-2021 13:38

**Date Analysis Commenced** : 10-Mar-2021

**Issue Date** : 16-Mar-2021 10:49

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
- Guideline Comparison

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

### Signatories

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

#### Signatories

#### Position

#### Laboratory Department

Angela Ren

Team Leader - Metals

Metals, Burnaby, British Columbia

Lindsay Gung

Supervisor - Water Chemistry

Inorganics, Burnaby, British Columbia

Robin Weeks

Team Leader - Metals

Metals, 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.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key : LOR: Limit of Reporting (detection limit).

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

>: greater than.

<: less than.

Red shading is applied where the result is equal to or greater than the Guideline Upper Limit or the result is lower than the Guideline Lower Limit.



### Analytical Results Evaluation

Matrix: Water

				Client sample ID	#1	#2	#3	#4	#5
				Sampling date/time	04-Mar-2021 07:41	04-Mar-2021 07:44	04-Mar-2021 07:50	04-Mar-2021 07:55	04-Mar-2021 08:05
				Sub-Matrix	Water	Water	Water	Water	Water
Analyte	Method	LOR	Unit		VA21A4293-001	VA21A4293-002	VA21A4293-003	VA21A4293-004	VA21A4293-005
Total Metals									
lead, total	E420	0.000050	mg/L		0.00583	0.00820	0.00132	0.000903	0.00201

### Analytical Results Evaluation

Matrix: Water

				Client sample ID	#6	#7	#8	#9	#10
				Sampling date/time	04-Mar-2021 08:12	04-Mar-2021 08:19	04-Mar-2021 08:33	04-Mar-2021 09:00	04-Mar-2021 09:04
				Sub-Matrix	Water	Water	Water	Water	Water
Analyte	Method	LOR	Unit		VA21A4293-006	VA21A4293-007	VA21A4293-008	VA21A4293-009	VA21A4293-010
Total Metals									
lead, total	E420	0.000050	mg/L		0.0659	0.00773	0.00366	0.0247	0.000672



## Analytical Results Evaluation

Matrix: Water

				Client sample ID	#11	#12	#13A1	#13B1	#13B
				Sampling date/time	04-Mar-2021 11:40	04-Mar-2021 15:02	04-Mar-2021 15:11	04-Mar-2021 15:11	04-Mar-2021 15:11
				Sub-Matrix	Water	Water	Water	Water	Water
Analyte	Method	LOR	Unit		VA21A4293-011	VA21A4293-012	VA21A4293-013	VA21A4293-014	VA21A4293-015
<b>Physical Tests</b>									
alkalinity, total (as CaCO <sub>3</sub> )	E290	1.0	mg/L		----	----	----	147	----
hardness (as CaCO <sub>3</sub> ), from total Ca/Mg	EC100A	0.60	mg/L		----	----	----	----	249
pH	E108	0.10	pH units		----	----	----	7.97	----
<b>Organic / Inorganic Carbon</b>									
carbon, dissolved inorganic [DIC]	E353-L	0.50	mg/L		----	----	----	32.4	----
<b>Total Metals</b>									
aluminum, total	E420	0.0030	mg/L		----	----	----	----	<0.0030
antimony, total	E420	0.00010	mg/L		----	----	----	----	<0.00010
arsenic, total	E420	0.00010	mg/L		----	----	----	----	0.00733
barium, total	E420	0.00010	mg/L		----	----	----	----	0.0407
beryllium, total	E420	0.000020	mg/L		----	----	----	----	<0.000020
bismuth, total	E420	0.000050	mg/L		----	----	----	----	<0.000050
boron, total	E420	0.010	mg/L		----	----	----	----	<0.010
cadmium, total	E420	0.0000050	mg/L		----	----	----	----	<0.0000050
calcium, total	E420	0.050	mg/L		----	----	----	----	67.6
cesium, total	E420	0.000010	mg/L		----	----	----	----	0.000014
chromium, total	E420	0.00050	mg/L		----	----	----	----	<0.00050
cobalt, total	E420	0.00010	mg/L		----	----	----	----	<0.00010
copper, total	E420	0.00050	mg/L		----	----	----	----	0.00433
iron, total	E420	0.010	mg/L		----	----	----	----	2.57
lead, total	E420	0.000050	mg/L		0.200	0.00986	0.000086	----	0.00263
lithium, total	E420	0.0010	mg/L		----	----	----	----	0.0015
magnesium, total	E420	0.0050	mg/L		----	----	----	----	19.4
manganese, total	E420	0.00010	mg/L		----	----	----	----	0.442
molybdenum, total	E420	0.000050	mg/L		----	----	----	----	0.000896
nickel, total	E420	0.00050	mg/L		----	----	----	----	<0.00050
phosphorus, total	E420	0.050	mg/L		----	----	----	----	<0.050
potassium, total	E420	0.050	mg/L		----	----	----	----	0.376
rubidium, total	E420	0.00020	mg/L		----	----	----	----	0.00033



## Analytical Results Evaluation

Matrix: Water

				Client sample ID	#11	#12	#13A1	#13B1	#13B
				Sampling date/time	04-Mar-2021 11:40	04-Mar-2021 15:02	04-Mar-2021 15:11	04-Mar-2021 15:11	04-Mar-2021 15:11
				Sub-Matrix	Water	Water	Water	Water	Water
Analyte	Method	LOR	Unit		VA21A4293-011	VA21A4293-012	VA21A4293-013	VA21A4293-014	VA21A4293-015
<b>Total Metals</b>									
selenium, total	E420	0.000050	mg/L		----	----	----	----	<0.000050
silicon, total	E420	0.10	mg/L		----	----	----	----	3.68
silver, total	E420	0.000010	mg/L		----	----	----	----	<0.000010
sodium, total	E420	0.050	mg/L		----	----	----	----	1.59
strontium, total	E420	0.00020	mg/L		----	----	----	----	0.322
sulfur, total	E420	0.50	mg/L		----	----	----	----	30.9
tellurium, total	E420	0.00020	mg/L		----	----	----	----	<0.00020
thallium, total	E420	0.000010	mg/L		----	----	----	----	<0.000010
thorium, total	E420	0.00010	mg/L		----	----	----	----	<0.00010
tin, total	E420	0.00010	mg/L		----	----	----	----	<0.00010
titanium, total	E420	0.00030	mg/L		----	----	----	----	<0.00030
tungsten, total	E420	0.00010	mg/L		----	----	----	----	0.00010
uranium, total	E420	0.000010	mg/L		----	----	----	----	0.000801
vanadium, total	E420	0.00050	mg/L		----	----	----	----	<0.00050
zinc, total	E420	0.0030	mg/L		----	----	----	----	0.0133
zirconium, total	E420	0.00020	mg/L		----	----	----	----	<0.00020



## Analytical Results Evaluation

Matrix: Water

				Client sample ID	#14A1	#14B1	#14B	----	----
				Sampling date/time	04-Mar-2021 15:19	04-Mar-2021 15:19	04-Mar-2021 15:19	----	----
				Sub-Matrix	Water	Water	Water	----	----
Analyte	Method	LOR	Unit	VA21A4293-016	VA21A4293-017	VA21A4293-018	-----	-----	
<b>Physical Tests</b>									
alkalinity, total (as CaCO <sub>3</sub> )	E290	1.0	mg/L	----	155	----	----	----	----
hardness (as CaCO <sub>3</sub> ), from total Ca/Mg	EC100A	0.60	mg/L	----	----	246	----	----	----
pH	E108	0.10	pH units	----	8.00	----	----	----	----
<b>Organic / Inorganic Carbon</b>									
carbon, dissolved inorganic [DIC]	E353-L	0.50	mg/L	----	37.9	----	----	----	----
<b>Total Metals</b>									
aluminum, total	E420	0.0030	mg/L	----	----	<0.0030	----	----	----
antimony, total	E420	0.00010	mg/L	----	----	<0.00010	----	----	----
arsenic, total	E420	0.00010	mg/L	----	----	0.00087	----	----	----
barium, total	E420	0.00010	mg/L	----	----	0.0360	----	----	----
beryllium, total	E420	0.000020	mg/L	----	----	<0.000020	----	----	----
bismuth, total	E420	0.000050	mg/L	----	----	<0.000050	----	----	----
boron, total	E420	0.010	mg/L	----	----	<0.010	----	----	----
cadmium, total	E420	0.0000050	mg/L	----	----	<0.0000050	----	----	----
calcium, total	E420	0.050	mg/L	----	----	66.8	----	----	----
cesium, total	E420	0.000010	mg/L	----	----	<0.000010	----	----	----
chromium, total	E420	0.00050	mg/L	----	----	<0.00050	----	----	----
cobalt, total	E420	0.00010	mg/L	----	----	<0.00010	----	----	----
copper, total	E420	0.00050	mg/L	----	----	0.0406	----	----	----
iron, total	E420	0.010	mg/L	----	----	0.024	----	----	----
lead, total	E420	0.000050	mg/L	0.0170	----	0.0108	----	----	----
lithium, total	E420	0.0010	mg/L	----	----	0.0012	----	----	----
magnesium, total	E420	0.0050	mg/L	----	----	19.2	----	----	----
manganese, total	E420	0.00010	mg/L	----	----	0.00288	----	----	----
molybdenum, total	E420	0.000050	mg/L	----	----	0.000741	----	----	----
nickel, total	E420	0.00050	mg/L	----	----	0.00397	----	----	----
phosphorus, total	E420	0.050	mg/L	----	----	<0.050	----	----	----
potassium, total	E420	0.050	mg/L	----	----	0.337	----	----	----
rubidium, total	E420	0.00020	mg/L	----	----	0.00023	----	----	----



## Analytical Results Evaluation

Matrix: Water

				Client sample ID	#14A1	#14B1	#14B	----	----
				Sampling date/time	04-Mar-2021 15:19	04-Mar-2021 15:19	04-Mar-2021 15:19	----	----
				Sub-Matrix	Water	Water	Water	----	----
Analyte	Method	LOR	Unit		VA21A4293-016	VA21A4293-017	VA21A4293-018	-----	-----
<b>Total Metals</b>									
selenium, total	E420	0.000050	mg/L		----	----	<0.000050	----	----
silicon, total	E420	0.10	mg/L		----	----	3.49	----	----
silver, total	E420	0.000010	mg/L		----	----	<0.000010	----	----
sodium, total	E420	0.050	mg/L		----	----	2.76	----	----
strontium, total	E420	0.00020	mg/L		----	----	0.320	----	----
sulfur, total	E420	0.50	mg/L		----	----	30.8	----	----
tellurium, total	E420	0.00020	mg/L		----	----	<0.00020	----	----
thallium, total	E420	0.000010	mg/L		----	----	<0.000010	----	----
thorium, total	E420	0.00010	mg/L		----	----	<0.00010	----	----
tin, total	E420	0.00010	mg/L		----	----	0.00038	----	----
titanium, total	E420	0.00030	mg/L		----	----	<0.00030	----	----
tungsten, total	E420	0.00010	mg/L		----	----	<0.00010	----	----
uranium, total	E420	0.000010	mg/L		----	----	0.000952	----	----
vanadium, total	E420	0.00050	mg/L		----	----	<0.00050	----	----
zinc, total	E420	0.0030	mg/L		----	----	0.0577	----	----
zirconium, total	E420	0.00020	mg/L		----	----	<0.00020	----	----

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



### Summary of Guideline Breaches by Sample

Client sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
#1	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.00583 mg/L	0.005 mg/L
#2	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.00820 mg/L	0.005 mg/L
#6	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.0659 mg/L	0.005 mg/L
#7	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.00773 mg/L	0.005 mg/L
#9	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.0247 mg/L	0.005 mg/L
#11	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.200 mg/L	0.005 mg/L
#12	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.00986 mg/L	0.005 mg/L
#13B	Water	iron, total	No summary description available for this compound in this guideline.	BCDWQG	AO	2.57 mg/L	0.3 mg/L
	Water	manganese, total	No summary description available for this compound in this guideline.	BCDWQG	AO	0.442 mg/L	0.05 mg/L
#14A1	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.0170 mg/L	0.005 mg/L
#14B	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.0108 mg/L	0.005 mg/L

### Summary of Guideline Limits

Guideline	Category	Analyte	Limit
BCDWQG	AO	iron, total	0.30 mg/L
	AO	manganese, total	0.05 mg/L
	MAC	lead, total	0.01 mg/L

**Keys:**

BCDWQG

British Columbia Drinking Water Quality Guidelines (JAN, 2021)

AO

Aesthetic Objective/Other Value

MAC

Maximum Acceptable Concentrations



Page : 9 of 9  
Work Order : VA21A4293  
Client : District of Wells  
Project : ----

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## Environmental

Work Order	: VA21A4293
Client	: District of Wells
Contact	: Richard Radloff
Address	: Box 219 4243 Saunders Avenue Wells BC Canada V0K 2R0
Telephone	: ----
Project	: ----
PO	: ----
C-O-C number	: 20-885691/92
Sampler	: ----
Site	: ----
Quote number	: KS21-DOWL100-001
No. of samples received	: 18
No. of samples analysed	: 18

Page : 1 of 7

Laboratory : Vancouver - Environmental

Account Manager : Amanda Lampreau

Address : 8081 Lougheed Highway  
Burnaby BC Canada V5A 1W9

Telephone : 1 250 372 3588

Date Samples Received : 09-Mar-2021 13:38

Date Analysis Commenced : 10-Mar-2021

Issue Date : 16-Mar-2021 10:49

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>
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, 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>
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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



## Analytical Results

Sub-Matrix: Water					Client sample ID	#1	#2	#3	#4	#5
(Matrix: Water)										
Client sampling date / time						04-Mar-2021 07:41	04-Mar-2021 07:44	04-Mar-2021 07:50	04-Mar-2021 07:55	04-Mar-2021 08:05
Analyte	CAS Number	Method	LOR	Unit		VA21A4293-001	VA21A4293-002	VA21A4293-003	VA21A4293-004	VA21A4293-005
						Result	Result	Result	Result	Result
Total Metals										
lead, total	7439-92-1	E420	0.000050	mg/L		0.00583	0.00820	0.00132	0.000903	0.00201

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

## Analytical Results

Sub-Matrix: Water					Client sample ID	#6	#7	#8	#9	#10
(Matrix: Water)										
Client sampling date / time						04-Mar-2021 08:12	04-Mar-2021 08:19	04-Mar-2021 08:33	04-Mar-2021 09:00	04-Mar-2021 09:04
Analyte	CAS Number	Method	LOR	Unit		VA21A4293-006	VA21A4293-007	VA21A4293-008	VA21A4293-009	VA21A4293-010
						Result	Result	Result	Result	Result
Total Metals										
lead, total	7439-92-1	E420	0.000050	mg/L		0.0659	0.00773	0.00366	0.0247	0.000672

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



## Analytical Results

Sub-Matrix: Water					Client sample ID	#11	#12	#13A1	#13B1	#13B
(Matrix: Water)										
Client sampling date / time										
Analyte	CAS Number	Method	LOR	Unit	04-Mar-2021 11:40	04-Mar-2021 15:02	04-Mar-2021 15:11	04-Mar-2021 15:11	04-Mar-2021 15:11	04-Mar-2021 15:11
					VA21A4293-011	VA21A4293-012	VA21A4293-013	VA21A4293-014	VA21A4293-014	VA21A4293-015
					Result	Result	Result	Result	Result	Result
<b>Physical Tests</b>										
alkalinity, total (as CaCO <sub>3</sub> )	----	E290	1.0	mg/L	----	----	----	----	147	----
hardness (as CaCO <sub>3</sub> ), from total Ca/Mg	----	EC100A	0.60	mg/L	----	----	----	----	----	249
pH	----	E108	0.10	pH units	----	----	----	----	7.97	----
<b>Organic / Inorganic Carbon</b>										
carbon, dissolved inorganic [DIC]	----	E353-L	0.50	mg/L	----	----	----	----	32.4	----
<b>Total Metals</b>										
aluminum, total	7429-90-5	E420	0.0030	mg/L	----	----	----	----	----	<0.0030
antimony, total	7440-36-0	E420	0.00010	mg/L	----	----	----	----	----	<0.00010
arsenic, total	7440-38-2	E420	0.00010	mg/L	----	----	----	----	----	0.00733
barium, total	7440-39-3	E420	0.00010	mg/L	----	----	----	----	----	0.0407
beryllium, total	7440-41-7	E420	0.000020	mg/L	----	----	----	----	----	<0.000020
bismuth, total	7440-69-9	E420	0.000050	mg/L	----	----	----	----	----	<0.000050
boron, total	7440-42-8	E420	0.010	mg/L	----	----	----	----	----	<0.010
cadmium, total	7440-43-9	E420	0.0000050	mg/L	----	----	----	----	----	<0.0000050
calcium, total	7440-70-2	E420	0.050	mg/L	----	----	----	----	----	67.6
cesium, total	7440-46-2	E420	0.000010	mg/L	----	----	----	----	----	0.000014
chromium, total	7440-47-3	E420	0.00050	mg/L	----	----	----	----	----	<0.00050
cobalt, total	7440-48-4	E420	0.00010	mg/L	----	----	----	----	----	<0.00010
copper, total	7440-50-8	E420	0.00050	mg/L	----	----	----	----	----	0.00433
iron, total	7439-89-6	E420	0.010	mg/L	----	----	----	----	----	2.57
lead, total	7439-92-1	E420	0.000050	mg/L	0.200	0.00986	0.000086	----	----	0.00263
lithium, total	7439-93-2	E420	0.0010	mg/L	----	----	----	----	----	0.0015
magnesium, total	7439-95-4	E420	0.0050	mg/L	----	----	----	----	----	19.4
manganese, total	7439-96-5	E420	0.00010	mg/L	----	----	----	----	----	0.442
molybdenum, total	7439-98-7	E420	0.000050	mg/L	----	----	----	----	----	0.000896
nickel, total	7440-02-0	E420	0.00050	mg/L	----	----	----	----	----	<0.00050
phosphorus, total	7723-14-0	E420	0.050	mg/L	----	----	----	----	----	<0.050
potassium, total	7440-09-7	E420	0.050	mg/L	----	----	----	----	----	0.376
rubidium, total	7440-17-7	E420	0.00020	mg/L	----	----	----	----	----	0.00033
selenium, total	7782-49-2	E420	0.000050	mg/L	----	----	----	----	----	<0.000050
silicon, total	7440-21-3	E420	0.10	mg/L	----	----	----	----	----	3.68



## Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	#11	#12	#13A1	#13B1	#13B
Client sampling date / time						04-Mar-2021 11:40	04-Mar-2021 15:02	04-Mar-2021 15:11	04-Mar-2021 15:11	04-Mar-2021 15:11
Analyte	CAS Number	Method	LOR	Unit	VA21A4293-011	VA21A4293-012	VA21A4293-013	VA21A4293-014	VA21A4293-015	
					Result	Result	Result	Result	Result	
<b>Total Metals</b>										
silver, total	7440-22-4	E420	0.000010	mg/L	----	----	----	----	----	<0.000010
sodium, total	17341-25-2	E420	0.050	mg/L	----	----	----	----	----	1.59
strontium, total	7440-24-6	E420	0.00020	mg/L	----	----	----	----	----	0.322
sulfur, total	7704-34-9	E420	0.50	mg/L	----	----	----	----	----	30.9
tellurium, total	13494-80-9	E420	0.00020	mg/L	----	----	----	----	----	<0.00020
thallium, total	7440-28-0	E420	0.000010	mg/L	----	----	----	----	----	<0.000010
thorium, total	7440-29-1	E420	0.00010	mg/L	----	----	----	----	----	<0.00010
tin, total	7440-31-5	E420	0.00010	mg/L	----	----	----	----	----	<0.00010
titanium, total	7440-32-6	E420	0.00030	mg/L	----	----	----	----	----	<0.00030
tungsten, total	7440-33-7	E420	0.00010	mg/L	----	----	----	----	----	0.00010
uranium, total	7440-61-1	E420	0.000010	mg/L	----	----	----	----	----	0.000801
vanadium, total	7440-62-2	E420	0.00050	mg/L	----	----	----	----	----	<0.00050
zinc, total	7440-66-6	E420	0.0030	mg/L	----	----	----	----	----	0.0133
zirconium, total	7440-67-7	E420	0.00020	mg/L	----	----	----	----	----	<0.00020

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



## Analytical Results

Sub-Matrix: Water					Client sample ID	#14A1	#14B1	#14B	----	----
(Matrix: Water)										
Client sampling date / time					04-Mar-2021 15:19	04-Mar-2021 15:19	04-Mar-2021 15:19	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA21A4293-016	VA21A4293-017	VA21A4293-018	-----	-----	-----
					Result	Result	Result	----	----	----
<b>Physical Tests</b>										
alkalinity, total (as CaCO <sub>3</sub> )	----	E290	1.0	mg/L	----	155	----	----	----	----
hardness (as CaCO <sub>3</sub> ), from total Ca/Mg	----	EC100A	0.60	mg/L	----	----	246	----	----	----
pH	----	E108	0.10	pH units	----	8.00	----	----	----	----
<b>Organic / Inorganic Carbon</b>										
carbon, dissolved inorganic [DIC]	----	E353-L	0.50	mg/L	----	37.9	----	----	----	----
<b>Total Metals</b>										
aluminum, total	7429-90-5	E420	0.0030	mg/L	----	----	<0.0030	----	----	----
antimony, total	7440-36-0	E420	0.00010	mg/L	----	----	<0.00010	----	----	----
arsenic, total	7440-38-2	E420	0.00010	mg/L	----	----	0.00087	----	----	----
barium, total	7440-39-3	E420	0.00010	mg/L	----	----	0.0360	----	----	----
beryllium, total	7440-41-7	E420	0.000020	mg/L	----	----	<0.000020	----	----	----
bismuth, total	7440-69-9	E420	0.000050	mg/L	----	----	<0.000050	----	----	----
boron, total	7440-42-8	E420	0.010	mg/L	----	----	<0.010	----	----	----
cadmium, total	7440-43-9	E420	0.0000050	mg/L	----	----	<0.0000050	----	----	----
calcium, total	7440-70-2	E420	0.050	mg/L	----	----	66.8	----	----	----
cesium, total	7440-46-2	E420	0.000010	mg/L	----	----	<0.000010	----	----	----
chromium, total	7440-47-3	E420	0.00050	mg/L	----	----	<0.00050	----	----	----
cobalt, total	7440-48-4	E420	0.00010	mg/L	----	----	<0.00010	----	----	----
copper, total	7440-50-8	E420	0.00050	mg/L	----	----	0.0406	----	----	----
iron, total	7439-89-6	E420	0.010	mg/L	----	----	0.024	----	----	----
lead, total	7439-92-1	E420	0.000050	mg/L	0.0170	----	0.0108	----	----	----
lithium, total	7439-93-2	E420	0.0010	mg/L	----	----	0.0012	----	----	----
magnesium, total	7439-95-4	E420	0.0050	mg/L	----	----	19.2	----	----	----
manganese, total	7439-96-5	E420	0.00010	mg/L	----	----	0.00288	----	----	----
molybdenum, total	7439-98-7	E420	0.000050	mg/L	----	----	0.000741	----	----	----
nickel, total	7440-02-0	E420	0.00050	mg/L	----	----	0.00397	----	----	----
phosphorus, total	7723-14-0	E420	0.050	mg/L	----	----	<0.050	----	----	----
potassium, total	7440-09-7	E420	0.050	mg/L	----	----	0.337	----	----	----
rubidium, total	7440-17-7	E420	0.00020	mg/L	----	----	0.00023	----	----	----
selenium, total	7782-49-2	E420	0.000050	mg/L	----	----	<0.000050	----	----	----
silicon, total	7440-21-3	E420	0.10	mg/L	----	----	3.49	----	----	----





## Analytical Results

Sub-Matrix: Water					Client sample ID	#14A1	#14B1	#14B	----	----
(Matrix: Water)										
					Client sampling date / time	04-Mar-2021 15:19	04-Mar-2021 15:19	04-Mar-2021 15:19	----	----
Analyte	CAS Number	Method	LOR	Unit	VA21A4293-016	VA21A4293-017	VA21A4293-018	-----	-----	
					Result	Result	Result	----	----	
<b>Total Metals</b>										
silver, total	7440-22-4	E420	0.000010	mg/L	----	----	<0.000010	----	----	----
sodium, total	17341-25-2	E420	0.050	mg/L	----	----	2.76	----	----	----
strontium, total	7440-24-6	E420	0.00020	mg/L	----	----	0.320	----	----	----
sulfur, total	7704-34-9	E420	0.50	mg/L	----	----	30.8	----	----	----
tellurium, total	13494-80-9	E420	0.00020	mg/L	----	----	<0.00020	----	----	----
thallium, total	7440-28-0	E420	0.000010	mg/L	----	----	<0.000010	----	----	----
thorium, total	7440-29-1	E420	0.00010	mg/L	----	----	<0.00010	----	----	----
tin, total	7440-31-5	E420	0.00010	mg/L	----	----	0.00038	----	----	----
titanium, total	7440-32-6	E420	0.00030	mg/L	----	----	<0.00030	----	----	----
tungsten, total	7440-33-7	E420	0.00010	mg/L	----	----	<0.00010	----	----	----
uranium, total	7440-61-1	E420	0.000010	mg/L	----	----	0.000952	----	----	----
vanadium, total	7440-62-2	E420	0.00050	mg/L	----	----	<0.00050	----	----	----
zinc, total	7440-66-6	E420	0.0030	mg/L	----	----	0.0577	----	----	----
zirconium, total	7440-67-7	E420	0.00020	mg/L	----	----	<0.00020	----	----	----

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

## QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: <b>VA21A4293</b>	Page	: 1 of 8
Client	: <b>District of Wells</b>	Laboratory	: Vancouver - Environmental
Contact	: Richard Radloff	Account Manager	: Amanda Lampreau
Address	: Box 219 4243 Saunders Avenue Wells BC Canada V0K 2R0	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: 1 250 372 3588
Project	: ----	Date Samples Received	: 09-Mar-2021 13:38
PO	: ----	Issue Date	: 16-Mar-2021 10:49
C-O-C number	: 20-885691/92		
Sampler	: ----		
Site	: ----		
Quote number	: KS21-DOWL100-001		
No. of samples received	: 18		
No. of samples analysed	: 18		

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 Matrix Spike outliers occur.
- Laboratory Control Sample (LCS) 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.



Page : 3 of 8  
Work Order : VA21A4293  
Client : District of Wells  
Project : ----



### 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
<b>Laboratory Control Sample (LCS) Recoveries</b>								
Total Metals	QC-MRG3-1611350 02	----	sulfur, total	7704-34-9	E420	122 % <sup>MES</sup>	80.0-120%	Recovery greater than upper control limit

### Result Qualifiers

*Qualifier*                      *Description*

**MES**                      *Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a  
Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).*



## 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	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Organic / Inorganic Carbon : Dissolved Inorganic Carbon by Combustion										
HDPE #13B1	E353-L	04-Mar-2021	----	----	----		12-Mar-2021	13 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Inorganic Carbon by Combustion										
HDPE #14B1	E353-L	04-Mar-2021	----	----	----		12-Mar-2021	13 days	7 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE #13B1	E290	04-Mar-2021	----	----	----		15-Mar-2021	13 days	10 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE #14B1	E290	04-Mar-2021	----	----	----		15-Mar-2021	13 days	10 days	✓
Physical Tests : pH by Meter										
HDPE #13B1	E108	04-Mar-2021	----	----	----		15-Mar-2021	-11.90 hrs	261 hrs	✖ EHTR-FM
Physical Tests : pH by Meter										
HDPE #14B1	E108	04-Mar-2021	----	----	----		15-Mar-2021	-12.03 hrs	261 hrs	✖ EHTR-FM
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) #12	E420	04-Mar-2021	----	----	----		10-Mar-2021	179 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	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) #13A1	E420	04-Mar-2021	----	----	----		10-Mar-2021	179 days	5 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) #14A1	E420	04-Mar-2021	----	----	----		10-Mar-2021	179 days	5 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) #1	E420	04-Mar-2021	----	----	----		10-Mar-2021	180 days	6 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) #10	E420	04-Mar-2021	----	----	----		10-Mar-2021	180 days	6 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) #11	E420	04-Mar-2021	----	----	----		10-Mar-2021	180 days	6 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) #2	E420	04-Mar-2021	----	----	----		10-Mar-2021	180 days	6 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) #3	E420	04-Mar-2021	----	----	----		10-Mar-2021	180 days	6 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) #4	E420	04-Mar-2021	----	----	----		10-Mar-2021	180 days	6 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) #5	E420	04-Mar-2021	----	----	----		10-Mar-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	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) #6	E420	04-Mar-2021	----	----	----		10-Mar-2021	180 days	6 days	✔
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) #7	E420	04-Mar-2021	----	----	----		10-Mar-2021	180 days	6 days	✔
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) #8	E420	04-Mar-2021	----	----	----		10-Mar-2021	180 days	6 days	✔
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) #9	E420	04-Mar-2021	----	----	----		10-Mar-2021	180 days	6 days	✔
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) #13B	E420	04-Mar-2021	----	----	----		11-Mar-2021	184 days	6 days	✔
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) #14B	E420	04-Mar-2021	----	----	----		11-Mar-2021	184 days	6 days	✔

**Legend & Qualifier Definitions**

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





## Quality Control Parameter Frequency Compliance

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

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	Method	QC Lot #	QC	Regular	Actual	Expected	Evaluation
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	163530	1	4	25.0	5.0	✓
Dissolved Inorganic Carbon by Combustion	E353-L	162233	1	2	50.0	5.0	✓
pH by Meter	E108	163531	1	4	25.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	161111	3	59	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	163530	1	4	25.0	5.0	✓
Dissolved Inorganic Carbon by Combustion	E353-L	162233	1	2	50.0	5.0	✓
pH by Meter	E108	163531	1	4	25.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	161111	3	59	5.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	163530	1	4	25.0	5.0	✓
Dissolved Inorganic Carbon by Combustion	E353-L	162233	1	2	50.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	161111	3	59	5.0	5.0	✓
Matrix Spikes (MS)							
Dissolved Inorganic Carbon by Combustion	E353-L	162233	1	2	50.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	161111	3	59	5.0	5.0	✓



## Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
pH by Meter	E108  Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally $20 \pm 5^\circ\text{C}$ ). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Alkalinity Species by Titration	E290  Vancouver - 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.
Dissolved Inorganic Carbon by Combustion	E353-L  Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Inorganic Carbon is determined on a sample which is filtered through a 0.45 micron filter prior to analysis by the high temperature combustion method with measurement by an infrared detector, where the sample is acidified in a reaction chamber to convert all inorganic carbons (carbonates) to carbon dioxide for analysis.
Total Metals in Water by CRC ICPMS	E420  Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Hardness (Calculated) from Total Ca/Mg	EC100A  Vancouver - Environmental	Water	APHA 2340B	"Hardness (as $\text{CaCO}_3$ ), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in $\text{CaCO}_3$ 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. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.



## QUALITY CONTROL REPORT

Work Order : **VA21A4293**

Page : 1 of 18

Client : District of Wells  
Contact : Richard Radloff  
Address : Box 219 4243 Saunders Avenue  
Wells BC Canada V0K 2R0  
Telephone : ----  
Project : ----  
PO : ----  
C-O-C number : 20-885691/92  
Sampler : ----  
Site : ----  
Quote number : KS21-DOWL100-001  
No. of samples received : 18  
No. of samples analysed : 18

Laboratory : Vancouver - Environmental  
Account Manager : Amanda Lampreau  
Address : 8081 Lougheed Highway  
Burnaby, British Columbia Canada V5A 1W9  
Telephone : 1 250 372 3588  
Date Samples Received : 09-Mar-2021 13:38  
Date Analysis Commenced : 10-Mar-2021  
Issue Date : 16-Mar-2021 10:49

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
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia



## General Comments

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

### Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts 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: 163530)											
VA21A4296-006	Anonymous	alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	454	455	0.110%	20%	----
Physical Tests (QC Lot: 163531)											
VA21A4296-006	Anonymous	pH	----	E108	0.10	pH units	7.88	7.89	0.127%	4%	----
Organic / Inorganic Carbon (QC Lot: 162233)											
VA21A4293-014	#13B1	carbon, dissolved inorganic [DIC]	----	E353-L	1.00	mg/L	32.4	36.2	10.9%	20%	----
Total Metals (QC Lot: 161111)											
VA21A4273-001	Anonymous	aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0933	0.0874	6.59%	20%	----
		antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		barium, total	7440-39-3	E420	0.00010	mg/L	0.00285	0.00290	1.85%	20%	----
		beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000060	<0.0000050	0.0000010	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.050	mg/L	3.80	3.80	0.0773%	20%	----
		cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.00050	mg/L	0.00067	0.00061	0.00005	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.010	mg/L	0.082	0.065	0.017	Diff <2x LOR	----
		lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		magnesium, total	7439-95-4	E420	0.0050	mg/L	0.313	0.315	0.616%	20%	----
		manganese, total	7439-96-5	E420	0.00010	mg/L	0.00648	0.00636	1.89%	20%	----
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.050	mg/L	0.087	0.084	0.003	Diff <2x LOR	----
		rubidium, total	7440-17-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		silicon, total	7440-21-3	E420	0.10	mg/L	1.14	1.18	3.56%	20%	----



Sub-Matrix: **Water**

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
Total Metals (QC Lot: 161111) - continued											
VA21A4273-001	Anonymous	silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, total	17341-25-2	E420	0.050	mg/L	0.824	0.830	0.700%	20%	----
		strontium, total	7440-24-6	E420	0.00020	mg/L	0.0112	0.0112	0.0471%	20%	----
		sulfur, total	7704-34-9	E420	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
		tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.00030	mg/L	0.00264	0.00280	0.00016	Diff <2x LOR	----
		tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.000010	mg/L	0.000012	0.000012	0.0000003	Diff <2x LOR	----
		vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
Total Metals (QC Lot: 161135)											
KS2100655-001	Anonymous	aluminum, total	7429-90-5	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
		antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00644	0.00642	0.389%	20%	----
		barium, total	7440-39-3	E420	0.00010	mg/L	0.0616	0.0607	1.35%	20%	----
		beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.010	mg/L	0.125	0.123	1.58%	20%	----
		cadmium, total	7440-43-9	E420	0.0000100	mg/L	<0.0000100	<0.0000100	0	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.050	mg/L	108	108	0.424%	20%	----
		cesium, total	7440-46-2	E420	0.000010	mg/L	0.000010	0.000012	0.000002	Diff <2x LOR	----
		chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.010	mg/L	0.141	0.140	0.488%	20%	----
		lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, total	7439-93-2	E420	0.0010	mg/L	0.0065	0.0064	0.00003	Diff <2x LOR	----
		magnesium, total	7439-95-4	E420	0.0050	mg/L	103	103	0.211%	20%	----
		manganese, total	7439-96-5	E420	0.00010	mg/L	0.323	0.321	0.449%	20%	----
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.00760	0.00758	0.224%	20%	----
		nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----



Sub-Matrix: **Water**

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
Total Metals (QC Lot: 161135) - continued											
KS2100655-001	Anonymous	phosphorus, total	7723-14-0	E420	0.050	mg/L	0.085	0.076	0.009	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.050	mg/L	11.4	11.2	0.944%	20%	----
		rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00117	0.00110	0.00007	Diff <2x LOR	----
		selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	0.000052	0.000002	Diff <2x LOR	----
		silicon, total	7440-21-3	E420	0.10	mg/L	10.6	10.4	1.50%	20%	----
		silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, total	17341-25-2	E420	0.050	mg/L	76.6	76.5	0.154%	20%	----
		strontium, total	7440-24-6	E420	0.00020	mg/L	1.74	1.75	0.321%	20%	----
		sulfur, total	7704-34-9	E420	0.50	mg/L	170	167	1.38%	20%	----
		tellurium, total	13494-80-9	E420	0.00020	mg/L	0.00033	0.00050	0.00017	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.000010	mg/L	0.00236	0.00239	1.12%	20%	----
		vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0030	mg/L	0.0060	0.0052	0.0008	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
Total Metals (QC Lot: 161610)											
VA21A4461-001	Anonymous	aluminum, total	7429-90-5	E420	0.0030	mg/L	0.160	0.157	1.48%	20%	----
		antimony, total	7440-36-0	E420	0.00010	mg/L	0.0100	0.0101	0.432%	20%	----
		arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00844	0.00856	1.43%	20%	----
		barium, total	7440-39-3	E420	0.00010	mg/L	0.0430	0.0428	0.585%	20%	----
		beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.010	mg/L	0.107	0.110	2.76%	20%	----
		cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000082	0.0000059	0.0000023	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.050	mg/L	25.7	26.9	4.31%	20%	----
		cesium, total	7440-46-2	E420	0.000010	mg/L	0.00140	0.00140	0.0498%	20%	----
		chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.010	mg/L	0.018	0.018	0.0003	Diff <2x LOR	----
		lead, total	7439-92-1	E420	0.000050	mg/L	0.000283	0.000273	0.000010	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
<b>Total Metals (QC Lot: 161610) - continued</b>											
VA21A4461-001	Anonymous	lithium, total	7439-93-2	E420	0.0010	mg/L	0.0562	0.0587	4.34%	20%	----
		magnesium, total	7439-95-4	E420	0.100	mg/L	1.44	1.47	1.49%	20%	----
		manganese, total	7439-96-5	E420	0.00010	mg/L	0.0332	0.0313	5.93%	20%	----
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.00725	0.00727	0.299%	20%	----
		nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E420	0.300	mg/L	<0.300	<0.300	0	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.050	mg/L	11.0	11.1	0.962%	20%	----
		rubidium, total	7440-17-7	E420	0.00020	mg/L	0.0138	0.0140	0.757%	20%	----
		selenium, total	7782-49-2	E420	0.000050	mg/L	0.00134	0.00136	1.51%	20%	----
		silicon, total	7440-21-3	E420	0.10	mg/L	1.92	2.00	3.89%	20%	----
		silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, total	17341-25-2	E420	0.050	mg/L	30.8	30.8	0.134%	20%	----
		strontium, total	7440-24-6	E420	0.00020	mg/L	0.568	0.584	2.77%	20%	----
		sulfur, total	7704-34-9	E420	0.50	mg/L	21.5	21.7	0.870%	20%	----
		tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.000010	mg/L	0.000065	0.000059	0.000005	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
		tungsten, total	7440-33-7	E420	0.00010	mg/L	0.00117	0.00115	1.67%	20%	----
		uranium, total	7440-61-1	E420	0.000010	mg/L	0.000522	0.000499	4.43%	20%	----
		vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	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
<b>Physical Tests (QCLot: 163530)</b>						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
<b>Organic / Inorganic Carbon (QCLot: 162233)</b>						
carbon, dissolved inorganic [DIC]	----	E353-L	0.5	mg/L	<0.50	----
<b>Total Metals (QCLot: 161111)</b>						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
sodium, total	17341-25-2	E420	0.05	mg/L	<0.050	----
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Total Metals (QCLot: 161111) - continued</b>						
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----
<b>Total Metals (QCLot: 161135)</b>						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Total Metals (QCLot: 161135) - continued</b>						
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
sodium, total	17341-25-2	E420	0.05	mg/L	<0.050	----
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----
<b>Total Metals (QCLot: 161610)</b>						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----



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>
<b>Total Metals (QCLot: 161610) - continued</b>						
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
sodium, total	17341-25-2	E420	0.05	mg/L	<0.050	----
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E420	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	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 163530)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	98.6	85.0	115	----
Physical Tests (QCLot: 163531)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Organic / Inorganic Carbon (QCLot: 162233)									
carbon, dissolved inorganic [DIC]	----	E353-L	0.5	mg/L	8 mg/L	99.7	80.0	120	----
Total Metals (QCLot: 161111)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	99.1	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	106	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	101	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	101	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	98.9	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	100.0	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	92.2	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	101	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	98.3	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	102	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	100	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	101	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	100	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	101	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	103	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	98.7	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	96.9	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	99.4	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	95.9	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	100	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	106	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	102	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	101	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	99.9	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	103	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	101	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
Total Metals (QCLot: 161111) - continued									
sodium, total	17341-25-2	E420	0.05	mg/L	50 mg/L	104	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	104	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	94.6	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	103	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	104	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	98.0	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	98.1	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	92.4	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	99.1	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	102	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	104	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	99.0	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	95.6	80.0	120	----
Total Metals (QCLot: 161135)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	108	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	105	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	102	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	101	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	101	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	96.1	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	99.8	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	104	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	100	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	104	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	102	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	108	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	101	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	98.9	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	105	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	105	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	103	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	108	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	105	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	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
<b>Total Metals (QCLot: 161135) - continued</b>									
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	110	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	104	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	104	80.0	120	----
sodium, total	17341-25-2	E420	0.05	mg/L	50 mg/L	107	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	103	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	# 122	80.0	120	MES
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	103	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	103	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	95.7	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	99.4	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	94.6	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	101	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	95.1	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	103	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	103	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	95.2	80.0	120	----
<b>Total Metals (QCLot: 161610)</b>									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	107	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	111	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	104	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	107	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	104	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	110	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	106	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	104	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	107	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	105	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	107	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	106	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	105	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	97.6	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	106	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	101	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	107	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	105	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	104	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 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
Total Metals (QCLot: 161610) - continued									
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	111	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	108	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	110	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	104	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	103	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	107	80.0	120	----
sodium, total	17341-25-2	E420	0.05	mg/L	50 mg/L	108	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	110	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	103	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	101	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	107	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	101	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	102	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	101	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	101	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	100	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	108	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	108	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	99.7	80.0	120	----

Qualifiers

Qualifier	Description
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).





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
Organic / Inorganic Carbon (QCLot: 162233)										
VA21A4293-017	#14B1	carbon, dissolved inorganic [DIC]	----	E353-L	ND mg/L	10 mg/L	ND	70.0	130	----
Total Metals (QCLot: 161111)										
VA21A4273-001	Anonymous	aluminum, total	7429-90-5	E420	0.181 mg/L	0.2 mg/L	90.4	70.0	130	----
		antimony, total	7440-36-0	E420	0.0196 mg/L	0.02 mg/L	98.0	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0199 mg/L	0.02 mg/L	99.5	70.0	130	----
		barium, total	7440-39-3	E420	0.0196 mg/L	0.02 mg/L	98.1	70.0	130	----
		beryllium, total	7440-41-7	E420	0.0394 mg/L	0.04 mg/L	98.6	70.0	130	----
		bismuth, total	7440-69-9	E420	0.0107 mg/L	0.01 mg/L	107	70.0	130	----
		boron, total	7440-42-8	E420	0.095 mg/L	0.1 mg/L	94.6	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00423 mg/L	0.004 mg/L	106	70.0	130	----
		calcium, total	7440-70-2	E420	3.78 mg/L	4 mg/L	94.6	70.0	130	----
		cesium, total	7440-46-2	E420	0.0108 mg/L	0.01 mg/L	108	70.0	130	----
		chromium, total	7440-47-3	E420	0.0410 mg/L	0.04 mg/L	102	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0206 mg/L	0.02 mg/L	103	70.0	130	----
		copper, total	7440-50-8	E420	0.0203 mg/L	0.02 mg/L	102	70.0	130	----
		iron, total	7439-89-6	E420	2.01 mg/L	2 mg/L	100	70.0	130	----
		lead, total	7439-92-1	E420	0.0207 mg/L	0.02 mg/L	103	70.0	130	----
		lithium, total	7439-93-2	E420	0.0990 mg/L	0.1 mg/L	99.0	70.0	130	----
		magnesium, total	7439-95-4	E420	0.941 mg/L	1 mg/L	94.1	70.0	130	----
		manganese, total	7439-96-5	E420	0.0199 mg/L	0.02 mg/L	99.7	70.0	130	----
		molybdenum, total	7439-98-7	E420	0.0189 mg/L	0.02 mg/L	94.4	70.0	130	----
		nickel, total	7440-02-0	E420	0.0408 mg/L	0.04 mg/L	102	70.0	130	----
		phosphorus, total	7723-14-0	E420	9.55 mg/L	10 mg/L	95.5	70.0	130	----
		potassium, total	7440-09-7	E420	4.02 mg/L	4 mg/L	100	70.0	130	----
		rubidium, total	7440-17-7	E420	0.0194 mg/L	0.02 mg/L	97.0	70.0	130	----
		selenium, total	7782-49-2	E420	0.0411 mg/L	0.04 mg/L	103	70.0	130	----
		silicon, total	7440-21-3	E420	9.49 mg/L	10 mg/L	94.9	70.0	130	----
		silver, total	7440-22-4	E420	0.00411 mg/L	0.004 mg/L	103	70.0	130	----
		sodium, total	17341-25-2	E420	2.20 mg/L	2 mg/L	110	70.0	130	----
		strontium, total	7440-24-6	E420	0.0208 mg/L	0.02 mg/L	104	70.0	130	----
		sulfur, total	7704-34-9	E420	20.1 mg/L	20 mg/L	101	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
Total Metals (QCLot: 161111) - continued										
VA21A4273-001	Anonymous	tellurium, total	13494-80-9	E420	0.0404 mg/L	0.04 mg/L	101	70.0	130	----
		thallium, total	7440-28-0	E420	0.00402 mg/L	0.004 mg/L	101	70.0	130	----
		thorium, total	7440-29-1	E420	0.0215 mg/L	0.02 mg/L	107	70.0	130	----
		tin, total	7440-31-5	E420	0.0194 mg/L	0.02 mg/L	97.2	70.0	130	----
		titanium, total	7440-32-6	E420	0.0388 mg/L	0.04 mg/L	96.9	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0193 mg/L	0.02 mg/L	96.6	70.0	130	----
		uranium, total	7440-61-1	E420	0.00413 mg/L	0.004 mg/L	103	70.0	130	----
		vanadium, total	7440-62-2	E420	0.103 mg/L	0.1 mg/L	103	70.0	130	----
		zinc, total	7440-66-6	E420	0.398 mg/L	0.4 mg/L	99.4	70.0	130	----
		zirconium, total	7440-67-7	E420	0.0409 mg/L	0.04 mg/L	102	70.0	130	----
Total Metals (QCLot: 161135)										
KS2100655-001	Anonymous	aluminum, total	7429-90-5	E420	0.210 mg/L	0.2 mg/L	105	70.0	130	----
		antimony, total	7440-36-0	E420	0.0200 mg/L	0.02 mg/L	99.9	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0199 mg/L	0.02 mg/L	99.4	70.0	130	----
		barium, total	7440-39-3	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, total	7440-41-7	E420	0.0386 mg/L	0.04 mg/L	96.6	70.0	130	----
		bismuth, total	7440-69-9	E420	0.00859 mg/L	0.01 mg/L	85.9	70.0	130	----
		boron, total	7440-42-8	E420	ND mg/L	0.1 mg/L	ND	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00386 mg/L	0.004 mg/L	96.6	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	0.00965 mg/L	0.01 mg/L	96.5	70.0	130	----
		chromium, total	7440-47-3	E420	0.0399 mg/L	0.04 mg/L	99.7	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0189 mg/L	0.02 mg/L	94.3	70.0	130	----
		copper, total	7440-50-8	E420	0.0180 mg/L	0.02 mg/L	90.1	70.0	130	----
		iron, total	7439-89-6	E420	1.95 mg/L	2 mg/L	97.7	70.0	130	----
		lead, total	7439-92-1	E420	0.0176 mg/L	0.02 mg/L	88.2	70.0	130	----
		lithium, total	7439-93-2	E420	0.0948 mg/L	0.1 mg/L	94.8	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, total	7439-98-7	E420	0.0201 mg/L	0.02 mg/L	101	70.0	130	----
		nickel, total	7440-02-0	E420	0.0373 mg/L	0.04 mg/L	93.2	70.0	130	----
		phosphorus, total	7723-14-0	E420	10.8 mg/L	10 mg/L	108	70.0	130	----
		potassium, total	7440-09-7	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, total	7440-17-7	E420	0.0196 mg/L	0.02 mg/L	98.1	70.0	130	----
		selenium, total	7782-49-2	E420	0.0461 mg/L	0.04 mg/L	115	70.0	130	----
		silicon, total	7440-21-3	E420	ND mg/L	10 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
Total Metals (QCLot: 161135) - continued										
KS2100655-001	Anonymous	silver, total	7440-22-4	E420	0.00386 mg/L	0.004 mg/L	96.4	70.0	130	----
		sodium, total	17341-25-2	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E420	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, total	13494-80-9	E420	0.0404 mg/L	0.04 mg/L	101	70.0	130	----
		thallium, total	7440-28-0	E420	0.00356 mg/L	0.004 mg/L	88.9	70.0	130	----
		thorium, total	7440-29-1	E420	0.0183 mg/L	0.02 mg/L	91.6	70.0	130	----
		tin, total	7440-31-5	E420	0.0196 mg/L	0.02 mg/L	98.2	70.0	130	----
		titanium, total	7440-32-6	E420	0.0400 mg/L	0.04 mg/L	99.9	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0192 mg/L	0.02 mg/L	95.9	70.0	130	----
		uranium, total	7440-61-1	E420	0.00352 mg/L	0.004 mg/L	88.0	70.0	130	----
		vanadium, total	7440-62-2	E420	0.102 mg/L	0.1 mg/L	102	70.0	130	----
		zinc, total	7440-66-6	E420	0.368 mg/L	0.4 mg/L	92.0	70.0	130	----
		zirconium, total	7440-67-7	E420	0.0397 mg/L	0.04 mg/L	99.2	70.0	130	----
Total Metals (QCLot: 161610)										
VA21A4461-001	Anonymous	aluminum, total	7429-90-5	E420	0.188 mg/L	0.2 mg/L	93.8	70.0	130	----
		antimony, total	7440-36-0	E420	0.0210 mg/L	0.02 mg/L	105	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0211 mg/L	0.02 mg/L	106	70.0	130	----
		barium, total	7440-39-3	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, total	7440-41-7	E420	0.0428 mg/L	0.04 mg/L	107	70.0	130	----
		bismuth, total	7440-69-9	E420	0.0104 mg/L	0.01 mg/L	104	70.0	130	----
		boron, total	7440-42-8	E420	ND mg/L	0.1 mg/L	ND	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00413 mg/L	0.004 mg/L	103	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	0.0109 mg/L	0.01 mg/L	109	70.0	130	----
		chromium, total	7440-47-3	E420	0.0419 mg/L	0.04 mg/L	105	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0209 mg/L	0.02 mg/L	105	70.0	130	----
		copper, total	7440-50-8	E420	0.0206 mg/L	0.02 mg/L	103	70.0	130	----
		iron, total	7439-89-6	E420	2.00 mg/L	2 mg/L	100	70.0	130	----
		lead, total	7439-92-1	E420	0.0198 mg/L	0.02 mg/L	99.3	70.0	130	----
		lithium, total	7439-93-2	E420	0.102 mg/L	0.1 mg/L	102	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, total	7439-98-7	E420	0.0206 mg/L	0.02 mg/L	103	70.0	130	----
		nickel, total	7440-02-0	E420	0.0413 mg/L	0.04 mg/L	103	70.0	130	----
		phosphorus, total	7723-14-0	E420	11.5 mg/L	10 mg/L	115	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
Total Metals (QCLot: 161610) - continued										
VA21A4461-001	Anonymous	potassium, total	7440-09-7	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, total	7440-17-7	E420	0.0204 mg/L	0.02 mg/L	102	70.0	130	----
		selenium, total	7782-49-2	E420	0.0433 mg/L	0.04 mg/L	108	70.0	130	----
		silicon, total	7440-21-3	E420	9.52 mg/L	10 mg/L	95.2	70.0	130	----
		silver, total	7440-22-4	E420	0.00422 mg/L	0.004 mg/L	106	70.0	130	----
		sodium, total	17341-25-2	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E420	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, total	13494-80-9	E420	0.0423 mg/L	0.04 mg/L	106	70.0	130	----
		thallium, total	7440-28-0	E420	0.00396 mg/L	0.004 mg/L	99.0	70.0	130	----
		thorium, total	7440-29-1	E420	0.0215 mg/L	0.02 mg/L	107	70.0	130	----
		tin, total	7440-31-5	E420	0.0213 mg/L	0.02 mg/L	106	70.0	130	----
		titanium, total	7440-32-6	E420	0.0414 mg/L	0.04 mg/L	103	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0198 mg/L	0.02 mg/L	99.1	70.0	130	----
		uranium, total	7440-61-1	E420	0.00405 mg/L	0.004 mg/L	101	70.0	130	----
		vanadium, total	7440-62-2	E420	0.108 mg/L	0.1 mg/L	108	70.0	130	----
		zinc, total	7440-66-6	E420	0.428 mg/L	0.4 mg/L	107	70.0	130	----
		zirconium, total	7440-67-7	E420	0.0416 mg/L	0.04 mg/L	104	70.0	130	----



COC Number: 20 - 885691

**Canada Toll Free: 1 800 668 9878**

Page 1 of 2

<b>Report To</b> Contact and company name below will appear on the final report		<b>Reports / Recipients</b>		<b>Turnaround Time (TAT) Requested</b>		<b>AFFIX ALS BARCODE LABEL HERE</b> (ALS use only)	
Company: <b>R. Radloff and Associates</b>		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL)		<input checked="" type="checkbox"/> Routine [R] if received by 3pm M-F - no surcharges apply			
Contact: <b>Richard Radloff</b>		Merge QC/QCI Reports with COA <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A		<input type="checkbox"/> 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum			
Phone: <b>250-8562-6861</b>		<input checked="" type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked		<input type="checkbox"/> 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum			
Company address below will appear on the final report		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX		<input type="checkbox"/> 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum			
Street: <b>1820 3rd Ave</b>		Email 1 or Fax: <b>richard.radloff@radloffeng.com</b>		<input type="checkbox"/> 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum			
City/Province: <b>Prince George / BC</b>		Email 2		<input type="checkbox"/> Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests			
Postal Code: <b>V2M 1G4</b>		Email 3		Date and Time Required for all E&P TATs:		dd-mm-yy hh:mm am/pm	
Invoice To: Same as Report To <input type="checkbox"/> YES <input type="checkbox"/> NO		Invoice Recipients		For all tests with rush TATs requested, please contact your AM to confirm availability.			
Copy of Invoice with Report <input type="checkbox"/> YES <input type="checkbox"/> NO		Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX		<b>Analysis Request</b>			
Company:		Email 1 or Fax: <b>admin1@wells.ca</b>		Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below			
Contact:		Email 2					
<b>Project Information</b>		<b>Oil and Gas Required Fields (client use)</b>					
ALS Account # / Quote #: <b>DOWL100</b>		AFE/Cost Center:		PO#			
Job #:		Major/Minor Code:		Routing Code:			
PO / AFE:		Requisitioner:					
LSD:		Location:					
ALS Lab Work Order # (ALS use only): <b>4293</b>		ALS Contact:		Sampler:			
ALS Sample # (ALS use only)		Sample Identification and/or Coordinates (This description will appear on the report)		Date (dd-mm-yy)		Time (hh:mm)	
				Sample Type			
#1				01-03-21		7:41 water	
#2						7:44	
#3						7:50	
#4						7:55	
#5						8:05	
#6						8:12	
#7						8:19	
#8						8:33	
#9						9:00	
#10						9:04	
#11						11:40	
#12						3:02	
<b>Drinking Water (DW) Samples (client use)</b>		Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)		<b>SAMPLE RECEIPT-DETAILS (ALS use only)</b>			
Are samples taken from a Regulated DW System? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO				Cooling Method: <input type="checkbox"/> NONE <input type="checkbox"/> ICE <input type="checkbox"/> ICE PACKS <input type="checkbox"/> FROZEN <input type="checkbox"/> COOLING INITIATED			
Are samples for human consumption/ use? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO				Submission Comments identified on Sample Receipt Notification: <input type="checkbox"/> YES <input type="checkbox"/> NO			
				Cooler Custody Seal's Intact: <input type="checkbox"/> YES <input type="checkbox"/> N/A Sample Custody Seal's Intact: <input type="checkbox"/> YES <input type="checkbox"/> N/A			
				INITIAL COOLER TEMPERATURES °C			
				FINAL COOLER TEMPERATURES °C			
				2.4			
<b>SHIPMENT RELEASE (client use)</b>		<b>INITIAL SHIPMENT RECEPTION (ALS use only)</b>		<b>FINAL SHIPMENT RECEPTION (ALS use only)</b>			
Released by: <b>Richard Radloff</b>		Received by: <b>MB</b>		Received by: <b>MB</b>			
Date: <b>2021/03/08</b>		Date: <b>2021/03/08</b>		Date: <b>2021/03/08</b>			
Time: <b>10:30</b>		Time: <b>10:30</b>		Time: <b>8:25A</b>			

REFER TO BACK PAGE FOR ALL 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**.

WHITE - LABORATORY COPY      YELLOW - CLIENT COPY

AUG 2020 FROM



COC Number: 20 - 885692

Page 2 of 2

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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

WHITE - LABORATORY COPY      YELLOW - CLIENT COPY

AUG 30 1960 FROM

## CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

<b>Work Order</b>	<b>: VA21A8306</b>	<b>Page</b>	<b>: 1 of 4</b>
<b>Client</b>	<b>: District of Wells</b>	<b>Laboratory</b>	<b>: Vancouver - Environmental</b>
<b>Contact</b>	<b>: Donna Forseille</b>	<b>Account Manager</b>	<b>: Amanda Lampreau</b>
<b>Address</b>	<b>: Box 219 4243 Saunders Avenue Wells BC Canada V0K 2R0</b>	<b>Address</b>	<b>: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9</b>
<b>Telephone</b>	<b>: ----</b>	<b>Telephone</b>	<b>: 1 250 372 3588</b>
<b>Project</b>	<b>: ----</b>	<b>Date Samples Received</b>	<b>: 03-May-2021 12:50</b>
<b>PO</b>	<b>: ----</b>	<b>Date Analysis Commenced</b>	<b>: 04-May-2021</b>
<b>C-O-C number</b>	<b>: 20-886018</b>	<b>Issue Date</b>	<b>: 07-May-2021 17:19</b>
<b>Sampler</b>	<b>: Richard Radloff</b>		
<b>Site</b>	<b>: ----</b>		
<b>Quote number</b>	<b>: KS21-DOWL100-001</b>		
<b>No. of samples received</b>	<b>: 10</b>		
<b>No. of samples analysed</b>	<b>: 10</b>		

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
- Guideline Comparison

**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>
Kim Jensen	Department Manager - Metals	Metals, 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.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key : LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
mg/L	milligrams per litre

>: greater than.

<: less than.

Red shading is applied where the result is equal to or greater than the Guideline Upper Limit or the result is lower than the Guideline Lower Limit.





## Analytical Results Evaluation

Matrix: Water

			Client sample ID					
			207 <span style="border: 1px solid red; padding: 0 2px;">A</span>	208 <span style="border: 1px solid red; padding: 0 2px;">A</span>	209 <span style="border: 1px solid red; padding: 0 2px;">A</span>	210 <span style="border: 1px solid red; padding: 0 2px;">A</span>	211 <span style="border: 1px solid red; padding: 0 2px;">A</span>	226
			Sampling date/time					
			19-Apr-2021 03:30	19-Apr-2021 03:30	19-Apr-2021 03:30	19-Apr-2021 03:30	19-Apr-2021 03:32	27-Apr-2021 16:09
			Sub-Matrix					
			Water	Water	Water	Water	Water	Water
Analyte	CAS Number	Unit	VA21A8306-001	VA21A8306-002	VA21A8306-003	VA21A8306-004	VA21A8306-005	VA21A8306-006
Total Metals								
lead, total	7439-92-1	mg/L	0.000487	0.000070	0.000058	0.000075	0.000190	0.00593

## Analytical Results Evaluation

Matrix: Water

			Client sample ID					
			228	406	407	----	----	----
			Sampling date/time					
			27-Apr-2021 16:09	27-Apr-2021 12:59	27-Apr-2021 12:17	----	----	----
			Sub-Matrix					
			Water	Water	Water	----	----	----
Analyte	CAS Number	Unit	VA21A8306-008	VA21A8306-009	VA21A8306-010	-----	-----	-----
Total Metals								
lead, total	7439-92-1	mg/L	0.00227	0.000138	0.00347	----	----	----

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

## Summary of Guideline Breaches by Sample

Client sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
226	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.00593 mg/L	0.005 mg/L



Summary of Guideline Limits

Analyte	CAS Number	Unit	BCDWQG MAC						
Total Metals									
lead, total	7439-92-1	mg/L	0.005						

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

Key:

BCDWQG

MAC

British Columbia Drinking Water Quality Guidelines (JAN, 2021)

Maximum Acceptable Concentrations

## CERTIFICATE OF ANALYSIS

**Work Order** : **VA21A8306**  
**Client** : **District of Wells**  
**Contact** : Donna Forseille  
**Address** : Box 219 4243 Saunders Avenue  
    Wells BC Canada V0K 2R0  
**Telephone** : ----  
**Project** : ----  
**PO** : ----  
**C-O-C number** : 20-886018  
**Sampler** : Richard Radloff  
**Site** : ----  
**Quote number** : KS21-DOWL100-001  
**No. of samples received** : 10  
**No. of samples analysed** : 10

**Page** : 1 of 3  
**Laboratory** : Vancouver - Environmental  
**Account Manager** : Amanda Lampreau  
**Address** : 8081 Lougheed Highway  
    Burnaby BC Canada V5A 1W9  
**Telephone** : 1 250 372 3588  
**Date Samples Received** : 03-May-2021 12:50  
**Date Analysis Commenced** : 04-May-2021  
**Issue Date** : 07-May-2021 17:19

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>
Kim Jensen	Department Manager - Metals	Metals, 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>
mg/L	milligrams per litre

<: less than.

>: greater than.

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

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

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



## Analytical Results

Sub-Matrix: Water					Client sample ID	207 <span>A</span>	208 <span>A</span>	209 <span>A</span>	210 <span>A</span>	211 <span>A</span>
(Matrix: Water)										
					Client sampling date / time	19-Apr-2021 03:30	19-Apr-2021 03:30	19-Apr-2021 03:30	19-Apr-2021 03:30	19-Apr-2021 03:32
Analyte		CAS Number	Method	LOR	Unit	VA21A8306-001	VA21A8306-002	VA21A8306-003	VA21A8306-004	VA21A8306-005
						Result	Result	Result	Result	Result
Total Metals										
lead, total		7439-92-1	E420	0.000050	mg/L	0.000487	0.000070	0.000058	0.000075	0.000190

## QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: <b>VA21A8306</b>	Page	: 1 of 5
Client	: <b>District of Wells</b>	Laboratory	: Vancouver - Environmental
Contact	: Donna Forseille	Account Manager	: Amanda Lampreau
Address	: Box 219 4243 Saunders Avenue Wells BC Canada V0K 2R0	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: 1 250 372 3588
Project	: ----	Date Samples Received	: 03-May-2021 12:50
PO	: ----	Issue Date	: 07-May-2021 17:19
C-O-C number	: 20-886018		
Sampler	: Richard Radloff		
Site	: ----		
Quote number	: KS21-DOWL100-001		
No. of samples received	: 10		
No. of samples analysed	: 10		

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)

- No Analysis Holding Time Outliers exist.

### 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	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 207	E420	19-Apr-2021	----	----	----		04-May-2021	180 days	16 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 208	E420	19-Apr-2021	----	----	----		04-May-2021	180 days	16 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 209	E420	19-Apr-2021	----	----	----		04-May-2021	180 days	16 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 210	E420	19-Apr-2021	----	----	----		04-May-2021	180 days	16 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 211	E420	19-Apr-2021	----	----	----		04-May-2021	180 days	16 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 226	E420	27-Apr-2021	----	----	----		04-May-2021	180 days	8 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 227	E420	27-Apr-2021	----	----	----		04-May-2021	180 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	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 228	E420	27-Apr-2021	----	----	----		04-May-2021	180 days	8 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 406	E420	27-Apr-2021	----	----	----		04-May-2021	180 days	8 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 407	E420	27-Apr-2021	----	----	----		04-May-2021	180 days	8 days	✓

**Legend & Qualifier Definitions**

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: <b>Water</b>			Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.				
Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
Analytical Methods			QC	Regular	Actual	Expected	Evaluation
Laboratory Duplicates (DUP)							
Total Metals in Water by CRC ICPMS	E420	190574	2	39	5.1	5.0	✔
Laboratory Control Samples (LCS)							
Total Metals in Water by CRC ICPMS	E420	190574	2	39	5.1	5.0	✔
Method Blanks (MB)							
Total Metals in Water by CRC ICPMS	E420	190574	2	39	5.1	5.0	✔
Matrix Spikes (MS)							
Total Metals in Water by CRC ICPMS	E420	190574	2	39	5.1	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
Total Metals in Water by CRC ICPMS	E420  Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.



Environmental

## QUALITY CONTROL REPORT

Work Order : **VA21A8306**

Page : 1 of 3

Client : District of Wells  
Contact : Donna Forseille  
Address : Box 219 4243 Saunders Avenue  
Wells BC Canada V0K 2R0  
Telephone : ----  
Project : ----  
PO : ----  
C-O-C number : 20-886018  
Sampler : Richard Radloff  
Site : ----  
Quote number : KS21-DOWL100-001  
No. of samples received : 10  
No. of samples analysed : 10

Laboratory : Vancouver - Environmental  
Account Manager : Amanda Lampreau  
Address : 8081 Lougheed Highway  
Burnaby, British Columbia Canada V5A 1W9  
Telephone : 1 250 372 3588  
Date Samples Received : 03-May-2021 12:50  
Date Analysis Commenced : 04-May-2021  
Issue Date : 07-May-2021 17:19

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
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia



General Comments

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

- Key :
- Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
  - CAS Number = Chemical Abstracts 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
Total Metals (QC Lot: 190574)											
VA21A8300-001	Anonymous	lead, total	7439-92-1	E420	0.000050	mg/L	0.0189	0.0184	2.53%	20%	----
Total Metals (QC Lot: 190585)											
VA21A8306-006	226	lead, total	7439-92-1	E420	0.000050	mg/L	0.00593	0.00584	1.55%	20%	----

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
Total Metals (QC Lot: 190574)						
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
Total Metals (QC Lot: 190585)						
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----



Laboratory Control Sample (LCS) Report

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

Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 190574)									
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	98.5	80.0	120	----
Total Metals (QCLot: 190585)									
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	98.5	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
Total Metals (QCLot: 190574)									
VA21A8300-001	Anonymous	lead, total	7439-92-1	E420	0.0201 mg/L	0.02 mg/L	100	70.0	130
Total Metals (QCLot: 190585)									
VA21A8306-006	226	lead, total	7439-92-1	E420	0.0186 mg/L	0.02 mg/L	93.3	70.0	130



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Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 666 9878

COC Number: 20 - 886018

Page of

<b>Report To</b>		Contact and company name below will appear on the final report	
Company:		R. Radloff and Associates	
Contact:		Richard Radloff	
Phone:		350-562-6861	
Street:		1820 3rd Ave	
City/Province:		Vancouver, BC	
Postal Code:		V6V 1E6	
Invoice To		Same as Report To <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
Company:		Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
Contact:		District of Columbia	
ALS Account # / Quote #		DOU100	
Job #:		Project Information	
PO / AFE:		AFECost Center	
LSD:		Major/Minor Code	
ALS Lab Work Order # (ALS use only):		8306	
ALS Sample # (ALS use only)		Sample Identification and/or Coordinates (This description will appear on the report)	
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**Environmental**

## CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

**Work Order** : **VA21A8300**

**Client** : **District of Wells**

**Contact** : Donna Forseille

**Address** : Box 219 4243 Saunders Avenue  
Wells BC Canada V0K 2R0

**Telephone** : ----

**Project** : ----

**PO** : ----

**C-O-C number** : 20-907460

**Sampler** : ----

**Site** : ----

**Quote number** : KS21-DOWL100-001

**No. of samples received** : 7

**No. of samples analysed** : 7

**Page** : 1 of 4

**Laboratory** : Vancouver - Environmental

**Account Manager** : Amanda Lampreau

**Address** : 8081 Lougheed Highway  
Burnaby, British Columbia Canada V5A 1W9

**Telephone** : 1 250 372 3588

**Date Samples Received** : 03-May-2021 12:50

**Date Analysis Commenced** : 04-May-2021

**Issue Date** : 07-May-2021 17:26

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
- Guideline Comparison

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

### Signatories

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

*Signatories*

*Position*

*Laboratory Department*

Kim Jensen

Department Manager - Metals

Metals, 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.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key : LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
mg/L	milligrams per litre

>: greater than.

<: less than.

Red shading is applied where the result is equal to or greater than the Guideline Upper Limit or the result is lower than the Guideline Lower Limit.





## Analytical Results Evaluation

Matrix: Water

			Client sample ID	212	213	214	215	216	217	218
			Sampling date/time	19-Apr-2021 03:45	19-Apr-2021 15:50	19-Apr-2021 15:50	19-Apr-2021 15:50	19-Apr-2021 15:50	19-Apr-2021 15:50	19-Apr-2021 15:50
			Sub-Matrix	Water	Water	Water	Water	Water	Water	Water
Analyte	CAS Number	Unit		VA21A8300-001	VA21A8300-002	VA21A8300-003	VA21A8300-004	VA21A8300-005	VA21A8300-006	VA21A8300-007
<b>Total Metals</b>										
lead, total	7439-92-1	mg/L		0.0189	0.0139	0.00834	0.0143	0.0408	0.0410	0.0193

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

## Summary of Guideline Breaches by Sample

Client sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
212	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.0189 mg/L	0.005 mg/L
213	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.0139 mg/L	0.005 mg/L
214	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.00834 mg/L	0.005 mg/L
215	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.0143 mg/L	0.005 mg/L
216	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.0408 mg/L	0.005 mg/L
217	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.0410 mg/L	0.005 mg/L
218	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.0193 mg/L	0.005 mg/L



Summary of Guideline Limits

Analyte	CAS Number	Unit	BCDWQG MAC						
Total Metals									
lead, total	7439-92-1	mg/L	0.005						

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

Key:

BCDWQG

MAC

British Columbia Drinking Water Quality Guidelines (JAN, 2021)

Maximum Acceptable Concentrations

## CERTIFICATE OF ANALYSIS

**Work Order** : **VA21A8300**  
**Client** : **District of Wells**  
**Contact** : Donna Forseille  
**Address** : Box 219 4243 Saunders Avenue  
    Wells BC Canada V0K 2R0  
**Telephone** : ----  
**Project** : ----  
**PO** : ----  
**C-O-C number** : 20-907460  
**Sampler** : ----  
**Site** : ----  
**Quote number** : KS21-DOWL100-001  
**No. of samples received** : 7  
**No. of samples analysed** : 7

**Page** : 1 of 3  
**Laboratory** : Vancouver - Environmental  
**Account Manager** : Amanda Lampreau  
**Address** : 8081 Lougheed Highway  
    Burnaby BC Canada V5A 1W9  
**Telephone** : 1 250 372 3588  
**Date Samples Received** : 03-May-2021 12:50  
**Date Analysis Commenced** : 04-May-2021  
**Issue Date** : 07-May-2021 17:26

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>
Kim Jensen	Department Manager - Metals	Metals, 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>
mg/L	milligrams per litre

<: less than.

>: greater than.

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

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

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



## Analytical Results

Sub-Matrix: Water					Client sample ID	212	213	214	215	216
(Matrix: Water)										
					Client sampling date / time	19-Apr-2021 03:45	19-Apr-2021 15:50	19-Apr-2021 15:50	19-Apr-2021 15:50	19-Apr-2021 15:50
Analyte	CAS Number	Method	LOR	Unit		VA21A8300-001	VA21A8300-002	VA21A8300-003	VA21A8300-004	VA21A8300-005
						Result	Result	Result	Result	Result
Total Metals										
lead, total	7439-92-1	E420	0.000050	mg/L		0.0189	0.0139	0.00834	0.0143	0.0408

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

## Analytical Results

Sub-Matrix: Water					Client sample ID	217	218	----	----	----
(Matrix: Water)										
					Client sampling date / time	19-Apr-2021 15:50	19-Apr-2021 15:50	----	----	----
Analyte	CAS Number	Method	LOR	Unit		VA21A8300-006	VA21A8300-007	-----	-----	-----
						Result	Result	----	----	----
Total Metals										
lead, total	7439-92-1	E420	0.000050	mg/L		0.0410	0.0193	----	----	----

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

## QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: <b>VA21A8300</b>	Page	: 1 of 5
Client	: <b>District of Wells</b>	Laboratory	: Vancouver - Environmental
Contact	: Donna Forseille	Account Manager	: Amanda Lampreau
Address	: Box 219 4243 Saunders Avenue Wells BC Canada V0K 2R0	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: 1 250 372 3588
Project	: ----	Date Samples Received	: 03-May-2021 12:50
PO	: ----	Issue Date	: 07-May-2021 17:26
C-O-C number	: 20-907460		
Sampler	: ----		
Site	: ----		
Quote number	: KS21-DOWL100-001		
No. of samples received	: 7		
No. of samples analysed	: 7		

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)

- No Analysis Holding Time Outliers exist.

### 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	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 212	E420	19-Apr-2021	----	----	----		04-May-2021	180 days	16 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 213	E420	19-Apr-2021	----	----	----		04-May-2021	180 days	16 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 214	E420	19-Apr-2021	----	----	----		04-May-2021	180 days	16 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 215	E420	19-Apr-2021	----	----	----		04-May-2021	180 days	16 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 216	E420	19-Apr-2021	----	----	----		04-May-2021	180 days	16 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 217	E420	19-Apr-2021	----	----	----		04-May-2021	180 days	16 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 218	E420	19-Apr-2021	----	----	----		04-May-2021	180 days	16 days	✓

[Legend & Qualifier Definitions](#)



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: <b>Water</b>			Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.				
Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
Analytical Methods			QC	Regular	Actual	Expected	Evaluation
Laboratory Duplicates (DUP)							
Total Metals in Water by CRC ICPMS	E420	190574	1	19	5.2	5.0	✔
Laboratory Control Samples (LCS)							
Total Metals in Water by CRC ICPMS	E420	190574	1	19	5.2	5.0	✔
Method Blanks (MB)							
Total Metals in Water by CRC ICPMS	E420	190574	1	19	5.2	5.0	✔
Matrix Spikes (MS)							
Total Metals in Water by CRC ICPMS	E420	190574	1	19	5.2	5.0	✔



## Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Metals in Water by CRC ICPMS	E420  Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.



## QUALITY CONTROL REPORT

Work Order : **VA21A8300**

Page : 1 of 3

Client : District of Wells  
Contact : Donna Forseille  
Address : Box 219 4243 Saunders Avenue  
Wells BC Canada V0K 2R0  
Telephone : ----  
Project : ----  
PO : ----  
C-O-C number : 20-907460  
Sampler : ----  
Site : ----  
Quote number : KS21-DOWL100-001  
No. of samples received : 7  
No. of samples analysed : 7

Laboratory : Vancouver - Environmental  
Account Manager : Amanda Lampreau  
Address : 8081 Lougheed Highway  
Burnaby, British Columbia Canada V5A 1W9  
Telephone : 1 250 372 3588  
Date Samples Received : 03-May-2021 12:50  
Date Analysis Commenced : 04-May-2021  
Issue Date : 07-May-2021 17:26

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
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia



General Comments

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

- Key :
- Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
  - CAS Number = Chemical Abstracts 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).

					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
Total Metals (QC Lot: 190574)											
VA21A8300-001	212	lead, total	7439-92-1	E420	0.000050	mg/L	0.0189	0.0184	2.53%	20%	----

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.

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 190574)						
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----



Laboratory Control Sample (LCS) Report

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

Sub-Matrix: Water

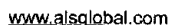
					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 190574)									
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	98.5	80.0	120	----

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
Total Metals (QCLot: 190574)									
VA21A8300-001	212	lead, total	7439-92-1	E420	0.0201 mg/L	0.02 mg/L	100	70.0	130



COC Number: 20 - 907460

Page 1 of

<b>Report To</b> Company: R. Radloff and Associates Contact: Richard Radloff Phone: 250-562-8861 Company address below will appear on the final report Street: 1820 3rd Ave City/Province: Prince George / BC Postal Code: V2K 1E2		<b>Reports / Recipients</b> Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL) Merge QC/QCI Reports with COA <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A <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: richard.radloff@radloffeng.com Email 2: Email 3:		<b>Turnaround Time (TAT) Requested</b> <input type="checkbox"/> Routine [R] if received by 3pm M-F - no surcharges apply <input type="checkbox"/> 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum <input type="checkbox"/> 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum <input type="checkbox"/> 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum <input type="checkbox"/> 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum <input type="checkbox"/> Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests		<b>AFFIX ALS BARCODE LABEL HERE</b> (ALS use only)											
<b>Invoice To</b> Same as Report To <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Company: District of Wells Contact: Donna Forsythe Project Information ALS Account # / Quote #: DOWL100 Job #: PO / AFE: LSD:		<b>Invoice Recipients</b> Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: admin1@wells.ca Email 2: Oil and Gas Required Fields (client use) AFE/Cost Center: Major/Minor Code: Requisitioner: Location: ALS Lab Work Order # (ALS use only): 830 ALS Contact: Sampler:		<b>Date and Time Required for all E&amp;P TATs:</b> dd-mm-yy hh:mm am/pm		<b>Analysis Request</b> For all tests with rush TATs requested, please contact your AM to confirm availability.											
<b>ALS Sample # (ALS use only)</b> 1 2 3 4 5 6 7		<b>Sample Identification and/or Coordinates (This description will appear on the report)</b> 212 213 214 215 216 217 218		<b>Date (dd-mm-yy)</b> 19-04-21		<b>Time (hh:mm)</b> 3:34 3:50		<b>Sample Type</b> Water Water		<b>NUMBER OF CONTAINERS</b> Lead		<b>PLATES ON HOLD</b>		<b>UNDETECTED STORAGE REQUIRED</b>		<b>SUSPECTED HAZARD (see notes)</b>	
<b>Drinking Water (DW) Samples<sup>1</sup> (client use)</b> Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input type="checkbox"/> NO Are samples for human consumption/ use? <input type="checkbox"/> YES <input type="checkbox"/> NO		<b>Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)</b>		<b>SAMPLE RECEIPT DETAILS (ALS use only)</b> Cooling Method: <input checked="" type="checkbox"/> NONE <input type="checkbox"/> ICE <input type="checkbox"/> ICE PACKS <input type="checkbox"/> FROZEN <input type="checkbox"/> COOLING INITIATED Submission Comments identified on Sample Receipt Notification: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Cooler Custody Seals Intact: <input type="checkbox"/> YES <input checked="" type="checkbox"/> N/A Sample Custody Seals Intact: <input type="checkbox"/> YES <input checked="" type="checkbox"/> N/A INITIAL COOLER TEMPERATURES °C: 12° FINAL COOLER TEMPERATURES °C: 12°		<b>SHIPMENT RELEASE (client use)</b> Released by: Date: Time:		<b>INITIAL SHIPMENT RECEPTION (ALS use only)</b> Received by: Date: Time:		<b>FINAL SHIPMENT RECEPTION (ALS use only)</b> Received by: [Signature] Date: Mar 3/2021 Time: 12:50							

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**.

WHITE - LABORATORY COPY      YELLOW - CLIENT COPY

AUG 2020 FROM



**Environmental**

## CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

**Work Order** : **VA21A8303**

**Client** : **District of Wells**

**Contact** : Donna Forseille

**Address** : Box 219 4243 Saunders Avenue  
Wells BC Canada V0K 2R0

**Telephone** : ----

**Project** : ----

**PO** : ----

**C-O-C number** : 20-907461

**Sampler** : ----

**Site** : ----

**Quote number** : KS21-DOWL100-001

**No. of samples received** : 7

**No. of samples analysed** : 7

**Page** : 1 of 4

**Laboratory** : Vancouver - Environmental

**Account Manager** : Amanda Lampreau

**Address** : 8081 Lougheed Highway  
Burnaby, British Columbia Canada V5A 1W9

**Telephone** : 1 250 372 3588

**Date Samples Received** : 03-May-2021 12:50

**Date Analysis Commenced** : 04-May-2021

**Issue Date** : 07-May-2021 17:28

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
- Guideline Comparison

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

### Signatories

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

*Signatories*

*Position*

*Laboratory Department*

Kim Jensen

Department Manager - Metals

Metals, 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.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key : LOR: Limit of Reporting (detection limit).

Unit	Description
mg/L	milligrams per litre

>: greater than.

<: less than.

Red shading is applied where the result is equal to or greater than the Guideline Upper Limit or the result is lower than the Guideline Lower Limit.





Analytical Results Evaluation

Matrix: Water

			Client sample ID	219	220	221	222	223	224	225
			Sampling date/time	19-Apr-2021 03:50	19-Apr-2021 15:50	19-Apr-2021 15:50	19-Apr-2021 15:50	19-Apr-2021 15:50	19-Apr-2021 15:50	19-Apr-2021 15:50
			Sub-Matrix	Water	Water	Water	Water	Water	Water	Water
Analyte	CAS Number	Unit		VA21A8303-001	VA21A8303-002	VA21A8303-003	VA21A8303-004	VA21A8303-005	VA21A8303-006	VA21A8303-007
Total Metals										
lead, total	7439-92-1	mg/L		0.00978	0.00647	0.00523	0.00458	0.00428	0.00410	0.00391

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

Summary of Guideline Breaches by Sample

Client sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
219	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.00978 mg/L	0.005 mg/L
220	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.00647 mg/L	0.005 mg/L
221	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.00523 mg/L	0.005 mg/L

Summary of Guideline Limits

Analyte	CAS Number	Unit	BCDWQG MAC						
Total Metals									
lead, total	7439-92-1	mg/L	0.005						

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



**Key:**

BCDWQG	British Columbia Drinking Water Quality Guidelines (JAN, 2021)
MAC	Maximum Acceptable Concentrations

## CERTIFICATE OF ANALYSIS

**Work Order** : **VA21A8303**  
**Client** : **District of Wells**  
**Contact** : Donna Forseille  
**Address** : Box 219 4243 Saunders Avenue  
    Wells BC Canada V0K 2R0  
**Telephone** : ----  
**Project** : ----  
**PO** : ----  
**C-O-C number** : 20-907461  
**Sampler** : ----  
**Site** : ----  
**Quote number** : KS21-DOWL100-001  
**No. of samples received** : 7  
**No. of samples analysed** : 7

**Page** : 1 of 3  
**Laboratory** : Vancouver - Environmental  
**Account Manager** : Amanda Lampreau  
**Address** : 8081 Lougheed Highway  
    Burnaby BC Canada V5A 1W9  
**Telephone** : 1 250 372 3588  
**Date Samples Received** : 03-May-2021 12:50  
**Date Analysis Commenced** : 04-May-2021  
**Issue Date** : 07-May-2021 17:28

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>
Kim Jensen	Department Manager - Metals	Metals, 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>
mg/L	milligrams per litre

<: less than.

>: greater than.

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

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

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



## Analytical Results

Sub-Matrix: Water					Client sample ID	219	220	221	222	223
(Matrix: Water)										
Client sampling date / time						19-Apr-2021 03:50	19-Apr-2021 15:50	19-Apr-2021 15:50	19-Apr-2021 15:50	19-Apr-2021 15:50
Analyte	CAS Number	Method	LOR	Unit		VA21A8303-001	VA21A8303-002	VA21A8303-003	VA21A8303-004	VA21A8303-005
						Result	Result	Result	Result	Result
Total Metals										
lead, total	7439-92-1	E420	0.000050	mg/L		0.00978	0.00647	0.00523	0.00458	0.00428

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

## Analytical Results

Sub-Matrix: Water					Client sample ID	224	225	----	----	----
(Matrix: Water)										
Client sampling date / time						19-Apr-2021 15:50	19-Apr-2021 15:50	----	----	----
Analyte	CAS Number	Method	LOR	Unit		VA21A8303-006	VA21A8303-007	-----	-----	-----
						Result	Result	----	----	----
Total Metals										
lead, total	7439-92-1	E420	0.000050	mg/L		0.00410	0.00391	----	----	----

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

## QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: <b>VA21A8303</b>	Page	: 1 of 5
Client	: <b>District of Wells</b>	Laboratory	: Vancouver - Environmental
Contact	: Donna Forseille	Account Manager	: Amanda Lampreau
Address	: Box 219 4243 Saunders Avenue Wells BC Canada V0K 2R0	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: 1 250 372 3588
Project	: ----	Date Samples Received	: 03-May-2021 12:50
PO	: ----	Issue Date	: 07-May-2021 17:28
C-O-C number	: 20-907461		
Sampler	: ----		
Site	: ----		
Quote number	: KS21-DOWL100-001		
No. of samples received	: 7		
No. of samples analysed	: 7		

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)

- No Analysis Holding Time Outliers exist.

### 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	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 219	E420	19-Apr-2021	----	----	----		04-May-2021	180 days	16 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 220	E420	19-Apr-2021	----	----	----		04-May-2021	180 days	16 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 221	E420	19-Apr-2021	----	----	----		04-May-2021	180 days	16 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 222	E420	19-Apr-2021	----	----	----		04-May-2021	180 days	16 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 223	E420	19-Apr-2021	----	----	----		04-May-2021	180 days	16 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 224	E420	19-Apr-2021	----	----	----		04-May-2021	180 days	16 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 225	E420	19-Apr-2021	----	----	----		04-May-2021	180 days	16 days	✓



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





## Quality Control Parameter Frequency Compliance

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

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	Method	QC Lot #	QC	Regular	Actual	Expected	Evaluation
Laboratory Duplicates (DUP)							
Total Metals in Water by CRC ICPMS	E420	190574	1	19	5.2	5.0	✓
Laboratory Control Samples (LCS)							
Total Metals in Water by CRC ICPMS	E420	190574	1	19	5.2	5.0	✓
Method Blanks (MB)							
Total Metals in Water by CRC ICPMS	E420	190574	1	19	5.2	5.0	✓
Matrix Spikes (MS)							
Total Metals in Water by CRC ICPMS	E420	190574	1	19	5.2	5.0	✓



## Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Metals in Water by CRC ICPMS	E420  Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.



Environmental

## QUALITY CONTROL REPORT

Work Order : **VA21A8303**

Page : 1 of 3

Client : District of Wells  
Contact : Donna Forseille  
Address : Box 219 4243 Saunders Avenue  
Wells BC Canada V0K 2R0  
Telephone : ----  
Project : ----  
PO : ----  
C-O-C number : 20-907461  
Sampler : ----  
Site : ----  
Quote number : KS21-DOWL100-001  
No. of samples received : 7  
No. of samples analysed : 7

Laboratory : Vancouver - Environmental  
Account Manager : Amanda Lampreau  
Address : 8081 Lougheed Highway  
Burnaby, British Columbia Canada V5A 1W9  
Telephone : 1 250 372 3588  
Date Samples Received : 03-May-2021 12:50  
Date Analysis Commenced : 04-May-2021  
Issue Date : 07-May-2021 17:28

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
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia



General Comments

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

- Key :
- Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
  - CAS Number = Chemical Abstracts 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).

					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
Total Metals (QC Lot: 190574)											
VA21A8300-001	Anonymous	lead, total	7439-92-1	E420	0.000050	mg/L	0.0189	0.0184	2.53%	20%	----

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.

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QC Lot: 190574)						
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----



Laboratory Control Sample (LCS) Report

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

Sub-Matrix: Water

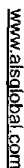
					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 190574)									
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	98.5	80.0	120	----

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
Total Metals (QCLot: 190574)									
VA21A8300-001	Anonymous	lead, total	7439-92-1	E420	0.0201 mg/L	0.02 mg/L	100	70.0	130

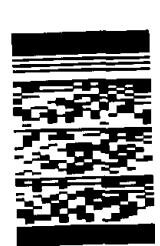


## Chain of Custody (COC) / Analytical Request Form

**Canada Toll Free: 1 800 668 9878**

COC Number: 20 - 907461

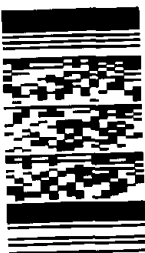
Page 1 of 1

Report To		Contract and company name below will appear on the final report	
Company:	R. Rodloff and Associates	Select Report Format:	<input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EOD (Digital)
Contact:	R. Rodloff	Merge QC/QCI Reports with COA	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A
Phone:	250-562-6861	Compare Results to Criteria on Report - provide details below if box checked	<input checked="" type="checkbox"/> Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX
Street:	1820 3rd Ave	Email 1 or Fax	richard.rodloff@rodloffeng.com
City/Province:	Prince George BC	Email 2	
Postal Code:	V2C 1E2	Email 3	
Invoice To	Same as Report To	Invoice Recipients	
Company:	Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Select Invoice Distribution:	<input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX
Contact:	Dana Farselle	Email 1 or Fax	admin@bells.ca
ALS Account # / Quote #	08061100	Oil and Gas Required Fields (client use)	
Job #:		AFE/Coal Center:	PO#
PO / AFE:		Major/Minor Code:	Rolling Code:
LSD:		Requisitioner:	
ALS Lab Work Order # (ALS use only):	8303	Location:	
ALS Sample # (ALS use only)	219	ALS Contact:	Sampler:
Sample Identification and/or Coordinates (This description will appear on the report)		Date (dd-mm-yy)	Time (hh:mm)
2	220	19-04-21	15:50
2	221		
4	222		
5	223		
6	224		
7	225		
Drinking Water (DW) Samples (client use)		Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)	
Are samples taken from a Regulated DW System?			
Are samples for human consumption/ use?			
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (ALS use only)	
Turnaround Time (TAT) Requested		Analysis Request	
<input checked="" type="checkbox"/> Routine [R] if received by 3pm M-F - no surcharges apply <input type="checkbox"/> 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum <input type="checkbox"/> 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum <input type="checkbox"/> 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum <input type="checkbox"/> 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum <input type="checkbox"/> Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests		For all tests with rush TATs requested, please contact your AAM to confirm availability. dd-mm-yy hh:mm am/pm	
NUMBER OF CONTAINERS		SAMPLES ON HOLD	
Lead		EXTENDED STORAGE REQUIRED	
		SUSPECTED HAZARD (see notes)	
Cooling Method: <input type="checkbox"/> NONE <input type="checkbox"/> ICE <input checked="" type="checkbox"/> ICE PACKS <input type="checkbox"/> FROZEN <input type="checkbox"/> COOLING INITIATED Submission Comments identified on Sample Receipt/Notification: <input type="checkbox"/> YES <input type="checkbox"/> NO Cooler Custody Seals Intact: <input type="checkbox"/> YES <input checked="" type="checkbox"/> N/A Sample Custody Seals Intact: <input type="checkbox"/> YES <input checked="" type="checkbox"/> N/A INITIAL COOLER TEMPERATURES °C: FINAL COOLER TEMPERATURES °C:		Environmental Division Vancouver Work Order Reference VA21A8303 Telephone : +1 604 253 4188 	

**AFFIX ALS BARCODE LABEL HERE**  
**(ALS use only)**

**Environmental Division  
Vancouver  
Work Order Reference  
VA21A8303**

Telephone : +1 604 253 4188





**Environmental**

## CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

**Work Order** : **VA21A8309**

**Client** : **District of Wells**

**Contact** : Donna Forseille

**Address** : Box 219 4243 Saunders Avenue  
Wells BC Canada V0K 2R0

**Telephone** : ----

**Project** : ----

**PO** : ----

**C-O-C number** : 20-886017

**Sampler** : Richard

**Site** : ----

**Quote number** : KS21-DOWL100-001

**No. of samples received** : 11

**No. of samples analysed** : 11

**Page** : 1 of 4

**Laboratory** : Vancouver - Environmental

**Account Manager** : Amanda Lampreau

**Address** : 8081 Lougheed Highway  
Burnaby, British Columbia Canada V5A 1W9

**Telephone** : 1 250 372 3588

**Date Samples Received** : 03-May-2021 12:50

**Date Analysis Commenced** : 04-May-2021

**Issue Date** : 07-May-2021 17:24

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
- Guideline Comparison

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

### Signatories

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

*Signatories*

*Position*

*Laboratory Department*

Kim Jensen

Department Manager - Metals

Metals, 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.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key : LOR: Limit of Reporting (detection limit).

Unit	Description
mg/L	milligrams per litre

>: greater than.

<: less than.

Red shading is applied where the result is equal to or greater than the Guideline Upper Limit or the result is lower than the Guideline Lower Limit.





## Analytical Results Evaluation

Matrix: Water

			Client sample ID	200	201	202	203	204	205	206
			Sampling date/time	19-Apr-2021 08:24	19-Apr-2021 08:24	19-Apr-2021 08:25	19-Apr-2021 09:09	19-Apr-2021 09:09	19-Apr-2021 09:13	19-Apr-2021 09:25
			Sub-Matrix	Water	Water	Water	Water	Water	Water	Water
Analyte	CAS Number	Unit		VA21A8309-001	VA21A8309-002	VA21A8309-003	VA21A8309-004	VA21A8309-005	VA21A8309-006	VA21A8309-007
Total Metals										
lead, total	7439-92-1	mg/L		0.000310	<0.000050	<0.000050	0.000789	0.000150	0.000054	0.00733

## Analytical Results Evaluation

Matrix: Water

			Client sample ID	207	208	209	210	----	----	----
			Sampling date/time	19-Apr-2021 09:25	19-Apr-2021 09:26	19-Apr-2021 09:26	19-Apr-2021 09:26	----	----	----
			Sub-Matrix	Water	Water	Water	Water	----	----	----
Analyte	CAS Number	Unit		VA21A8309-008	VA21A8309-009	VA21A8309-010	VA21A8309-011	-----	-----	-----
Total Metals										
lead, total	7439-92-1	mg/L		0.000696	0.000586	0.000326	0.000086	----	----	----

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

## Summary of Guideline Breaches by Sample

Client sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
206	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.00733 mg/L	0.005 mg/L



Summary of Guideline Limits

Analyte	CAS Number	Unit	BCDWQG MAC						
Total Metals									
lead, total	7439-92-1	mg/L	0.005						

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

Key:

BCDWQG

MAC

British Columbia Drinking Water Quality Guidelines (JAN, 2021)

Maximum Acceptable Concentrations

## CERTIFICATE OF ANALYSIS

**Work Order** : **VA21A8309**  
**Client** : **District of Wells**  
**Contact** : Donna Forseille  
**Address** : Box 219 4243 Saunders Avenue  
    Wells BC Canada V0K 2R0  
**Telephone** : ----  
**Project** : ----  
**PO** : ----  
**C-O-C number** : 20-886017  
**Sampler** : Richard  
**Site** : ----  
**Quote number** : KS21-DOWL100-001  
**No. of samples received** : 11  
**No. of samples analysed** : 11

**Page** : 1 of 3  
**Laboratory** : Vancouver - Environmental  
**Account Manager** : Amanda Lampreau  
**Address** : 8081 Lougheed Highway  
    Burnaby BC Canada V5A 1W9  
**Telephone** : 1 250 372 3588  
**Date Samples Received** : 03-May-2021 12:50  
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**Issue Date** : 07-May-2021 17:24

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>
Kim Jensen	Department Manager - Metals	Metals, 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>
mg/L	milligrams per litre

<: less than.

>: greater than.

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

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

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



## Analytical Results

Sub-Matrix: Water					Client sample ID	200	201	202	203	204
(Matrix: Water)										
					Client sampling date / time	19-Apr-2021 08:24	19-Apr-2021 08:24	19-Apr-2021 08:25	19-Apr-2021 09:09	19-Apr-2021 09:09
Analyte	CAS Number	Method	LOR	Unit		VA21A8309-001	VA21A8309-002	VA21A8309-003	VA21A8309-004	VA21A8309-005
						Result	Result	Result	Result	Result
Total Metals										
lead, total	7439-92-1	E420	0.000050	mg/L		0.000310	<0.000050	<0.000050	0.000789	0.000150

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

## Analytical Results

Sub-Matrix: Water					Client sample ID	205	206	207	208	209
(Matrix: Water)										
					Client sampling date / time	19-Apr-2021 09:13	19-Apr-2021 09:25	19-Apr-2021 09:25	19-Apr-2021 09:26	19-Apr-2021 09:26
Analyte	CAS Number	Method	LOR	Unit		VA21A8309-006	VA21A8309-007	VA21A8309-008	VA21A8309-009	VA21A8309-010
						Result	Result	Result	Result	Result
Total Metals										
lead, total	7439-92-1	E420	0.000050	mg/L		0.000054	0.00733	0.000696	0.000586	0.000326

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

## Analytical Results

Sub-Matrix: Water					Client sample ID	210	----	----	----	----
(Matrix: Water)										
					Client sampling date / time	19-Apr-2021 09:26	----	----	----	----
Analyte	CAS Number	Method	LOR	Unit		VA21A8309-011	-----	-----	-----	-----
						Result	----	----	----	----
Total Metals										
lead, total	7439-92-1	E420	0.000050	mg/L		0.000086	----	----	----	----

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

## QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: <b>VA21A8309</b>	Page	: 1 of 5
Client	: <b>District of Wells</b>	Laboratory	: Vancouver - Environmental
Contact	: Donna Forseille	Account Manager	: Amanda Lampreau
Address	: Box 219 4243 Saunders Avenue Wells BC Canada V0K 2R0	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: 1 250 372 3588
Project	: ----	Date Samples Received	: 03-May-2021 12:50
PO	: ----	Issue Date	: 07-May-2021 17:24
C-O-C number	: 20-886017		
Sampler	: Richard		
Site	: ----		
Quote number	: KS21-DOWL100-001		
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)

- No Analysis Holding Time Outliers exist.

### 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	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 200	E420	19-Apr-2021	----	----	----		04-May-2021	180 days	16 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 201	E420	19-Apr-2021	----	----	----		04-May-2021	180 days	16 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 202	E420	19-Apr-2021	----	----	----		04-May-2021	180 days	16 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 203	E420	19-Apr-2021	----	----	----		04-May-2021	180 days	16 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 204	E420	19-Apr-2021	----	----	----		04-May-2021	180 days	16 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 205	E420	19-Apr-2021	----	----	----		04-May-2021	180 days	16 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 206	E420	19-Apr-2021	----	----	----		04-May-2021	180 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	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 207	E420	19-Apr-2021	----	----	----		04-May-2021	180 days	16 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 208	E420	19-Apr-2021	----	----	----		04-May-2021	180 days	16 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 209	E420	19-Apr-2021	----	----	----		04-May-2021	180 days	16 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 210	E420	19-Apr-2021	----	----	----		04-May-2021	180 days	16 days	✓

**Legend & Qualifier Definitions**

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: <b>Water</b>			Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.				
Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
Analytical Methods			QC	Regular	Actual	Expected	Evaluation
Laboratory Duplicates (DUP)							
Total Metals in Water by CRC ICPMS	E420	190585	2	27	7.4	5.0	✔
Laboratory Control Samples (LCS)							
Total Metals in Water by CRC ICPMS	E420	190585	2	27	7.4	5.0	✔
Method Blanks (MB)							
Total Metals in Water by CRC ICPMS	E420	190585	2	27	7.4	5.0	✔
Matrix Spikes (MS)							
Total Metals in Water by CRC ICPMS	E420	190585	2	27	7.4	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
Total Metals in Water by CRC ICPMS	E420  Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

## QUALITY CONTROL REPORT

**Work Order** : **VA21A8309**

**Page** : 1 of 3

**Client** : District of Wells  
**Contact** : Donna Forseille  
**Address** : Box 219 4243 Saunders Avenue  
Wells BC Canada V0K 2R0  
**Telephone** : ----  
**Project** : ----  
**PO** : ----  
**C-O-C number** : 20-886017  
**Sampler** : Richard  
**Site** : ----  
**Quote number** : KS21-DOWL100-001  
**No. of samples received** : 11  
**No. of samples analysed** : 11

**Laboratory** : Vancouver - Environmental  
**Account Manager** : Amanda Lampreau  
**Address** : 8081 Lougheed Highway  
Burnaby, British Columbia Canada V5A 1W9  
**Telephone** : 1 250 372 3588  
**Date Samples Received** : 03-May-2021 12:50  
**Date Analysis Commenced** : 04-May-2021  
**Issue Date** : 07-May-2021 17:25

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
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia



General Comments

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

- Key :
- Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
  - CAS Number = Chemical Abstracts 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
Total Metals (QC Lot: 190585)											
VA21A8306-006	Anonymous	lead, total	7439-92-1	E420	0.000050	mg/L	0.00593	0.00584	1.55%	20%	----
Total Metals (QC Lot: 190588)											
VA21A8309-006	205	lead, total	7439-92-1	E420	0.000050	mg/L	0.000054	0.000051	0.000003	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
Total Metals (QC Lot: 190585)						
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
Total Metals (QC Lot: 190588)						
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----



Laboratory Control Sample (LCS) Report

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

Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 190585)									
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	98.5	80.0	120	----
Total Metals (QCLot: 190588)									
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	99.3	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
Total Metals (QCLot: 190585)									
VA21A8306-006	Anonymous	lead, total	7439-92-1	E420	0.0186 mg/L	0.02 mg/L	93.3	70.0	130
Total Metals (QCLot: 190588)									
VA21A8309-006	205	lead, total	7439-92-1	E420	0.0184 mg/L	0.02 mg/L	91.8	70.0	130



COC Number: 20 - 886017

**Canada Toll Free: 1 800 668 9878**

Page of

<b>Report To</b> Company: <u>R. Radloff and Associates</u> Contact: <u>Richard Radloff</u> Phone: <u>250-562-6861</u> Company address below will appear on the final report		<b>Reports / Recipients</b> Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL) Merge QC/QCI Reports with COA <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A <input checked="" 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: <u>richard.radloff@radloffeng.com</u> Email 2: Email 3:		<b>Turnaround Time (TAT) Requested</b> <input checked="" type="checkbox"/> Routine [R] if received by 3pm M-F - no surcharges apply <input type="checkbox"/> 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum <input type="checkbox"/> 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum <input type="checkbox"/> 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum <input type="checkbox"/> 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum <input type="checkbox"/> Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests		<b>AFFIX ALS BARCODE LABEL HERE</b> (ALS use only)									
Street: <u>1820 3rd Ave</u> City/Province: <u>Prince George, BC</u> Postal Code: <u>V2K 1E2</u>		Invoice Recipients Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: <u>admin@wells.ca</u> Email 2: Email 3:		Date and Time Required for all E&P TATs: _____ dd-mm-yy hh:mm am/pm For all tests with rush TATs requested, please contact your AM to confirm availability.											
Invoice To: Same as Report To <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Company: <u>District of Wells</u> Contact: <u>Donna Forsythe</u>		Project Information ALS Account # / Quote #: <u>DOWL100</u> Job #: PO / AFE: LSD:		Oil and Gas Required Fields (client use) AFE/Cost Center: _____ PO#: Major/Minor Code: _____ Routing Code: Requisitioner: Location:		Analysis Request Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below									
ALS Lab Work Order # (ALS use only): <u>5309</u>		ALS Contact:		Sampler: <u>Richard</u>		NUMBER OF CONTAINERS									
ALS Sample # (ALS use only)		Sample Identification and/or Coordinates (This description will appear on the report)		Date (dd-mm-yy)		Time (hh:mm)		Sample Type		IMPLES ON HOLD		EXTENDED STORAGE REQUIRED		SUSPECTED HAZARD (see notes)	
1		200		19/04/21		8:24		Water							
2		201				8:24									
3		202				8:25									
4		203				9:09									
5		204				9:09									
6		205				9:13									
7		206				9:25									
8		207				9:25									
9		208				9:26									
10		209				9:26									
11		210				9:26									
Drinking Water (DW) Samples <sup>1</sup> (client use)		Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)		SAMPLE RECEIPT DETAILS (ALS use only)		Cooling Method: <input type="checkbox"/> NONE <input type="checkbox"/> ICE <input checked="" type="checkbox"/> ICE PACKS <input type="checkbox"/> FROZEN <input type="checkbox"/> COOLING INITIATED		Submission Comments identified on Sample Receipt Notification: <input type="checkbox"/> YES <input type="checkbox"/> NO		Cooler Custody Seals Intact: <input type="checkbox"/> YES <input checked="" type="checkbox"/> N/A Sample Custody Seals Intact: <input type="checkbox"/> YES <input checked="" type="checkbox"/> N/A		INITIAL COOLER TEMPERATURES °C		FINAL COOLER TEMPERATURES °C	
Are samples taken from a Regulated DW System? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO															
Are samples for human consumption/ use? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO															
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (ALS use only)		FINAL SHIPMENT RECEPTION (ALS use only)		Relegated by: <u>Richard Radloff</u> Date: <u>21/04/30</u> Time: <u>9:00</u>		Received by: <u>[Signature]</u> Date: <u>21/04/30</u> Time: <u>12:50</u>							

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**.

WHITE - LABORATORY COPY      YELLOW - CLIENT COPY

AUG 2020 ERC

## CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

<b>Work Order</b>	<b>: VA21A8307</b>	<b>Page</b>	<b>: 1 of 4</b>
<b>Client</b>	<b>: District of Wells</b>	<b>Laboratory</b>	<b>: Vancouver - Environmental</b>
<b>Contact</b>	<b>: Donna Forseille</b>	<b>Account Manager</b>	<b>: Amanda Lampreau</b>
<b>Address</b>	<b>: Box 219 4243 Saunders Avenue Wells BC Canada V0K 2R0</b>	<b>Address</b>	<b>: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9</b>
<b>Telephone</b>	<b>: ----</b>	<b>Telephone</b>	<b>: 1 250 372 3588</b>
<b>Project</b>	<b>: ----</b>	<b>Date Samples Received</b>	<b>: 03-May-2021 12:50</b>
<b>PO</b>	<b>: ----</b>	<b>Date Analysis Commenced</b>	<b>: 04-May-2021</b>
<b>C-O-C number</b>	<b>: 20-907459</b>	<b>Issue Date</b>	<b>: 07-May-2021 17:21</b>
<b>Sampler</b>	<b>: ----</b>		
<b>Site</b>	<b>: ----</b>		
<b>Quote number</b>	<b>: KS21-DOWL100-001</b>		
<b>No. of samples received</b>	<b>: 10</b>		
<b>No. of samples analysed</b>	<b>: 10</b>		

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
- Guideline Comparison

**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>
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia



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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.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key : LOR: Limit of Reporting (detection limit).

Unit	Description
mg/L	milligrams per litre

>: greater than.

<: less than.

Red shading is applied where the result is equal to or greater than the Guideline Upper Limit or the result is lower than the Guideline Lower Limit.





## Analytical Results Evaluation

Matrix: Water

			Client sample ID	318	319	320	321	322	323	324
			Sampling date/time	27-Apr-2021 10:01	27-Apr-2021 10:01	27-Apr-2021 10:01	27-Apr-2021 10:01	27-Apr-2021 10:02	27-Apr-2021 10:23	27-Apr-2021 10:23
			Sub-Matrix	Water	Water	Water	Water	Water	Water	Water
Analyte	CAS Number	Unit		VA21A8307-001	VA21A8307-002	VA21A8307-003	VA21A8307-004	VA21A8307-005	VA21A8307-006	VA21A8307-007
Total Metals										
lead, total	7439-92-1	mg/L		0.000126	0.000257	0.000076	<0.000050	0.000084	0.0597	0.0149

## Analytical Results Evaluation

Matrix: Water

			Client sample ID	325	326	327	----	----	----	----
			Sampling date/time	27-Apr-2021 10:23	27-Apr-2021 10:23	27-Apr-2021 10:24	----	----	----	----
			Sub-Matrix	Water	Water	Water	----	----	----	----
Analyte	CAS Number	Unit		VA21A8307-008	VA21A8307-009	VA21A8307-010	-----	-----	-----	-----
Total Metals										
lead, total	7439-92-1	mg/L		0.00243	0.00290	0.00104	----	----	----	----

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

## Summary of Guideline Breaches by Sample

Client sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
323	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.0597 mg/L	0.005 mg/L
324	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.0149 mg/L	0.005 mg/L



Summary of Guideline Limits

Analyte	CAS Number	Unit	BCDWQG MAC						
Total Metals									
lead, total	7439-92-1	mg/L	0.005						

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

Key:

BCDWQG

MAC

British Columbia Drinking Water Quality Guidelines (JAN, 2021)

Maximum Acceptable Concentrations

## CERTIFICATE OF ANALYSIS

**Work Order** : **VA21A8307**  
**Client** : **District of Wells**  
**Contact** : Donna Forseille  
**Address** : Box 219 4243 Saunders Avenue  
    Wells BC Canada V0K 2R0  
**Telephone** : ----  
**Project** : ----  
**PO** : ----  
**C-O-C number** : 20-907459  
**Sampler** : ----  
**Site** : ----  
**Quote number** : KS21-DOWL100-001  
**No. of samples received** : 10  
**No. of samples analysed** : 10

**Page** : 1 of 3  
**Laboratory** : Vancouver - Environmental  
**Account Manager** : Amanda Lampreau  
**Address** : 8081 Lougheed Highway  
    Burnaby BC Canada V5A 1W9  
**Telephone** : 1 250 372 3588  
**Date Samples Received** : 03-May-2021 12:50  
**Date Analysis Commenced** : 04-May-2021  
**Issue Date** : 07-May-2021 17:21

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>
Kim Jensen	Department Manager - Metals	Metals, 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>
mg/L	milligrams per litre

<: less than.

>: greater than.

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

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

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



## Analytical Results

Sub-Matrix: Water					Client sample ID	318	319	320	321	322
(Matrix: Water)					Client sampling date / time	27-Apr-2021 10:01	27-Apr-2021 10:01	27-Apr-2021 10:01	27-Apr-2021 10:01	27-Apr-2021 10:02
Analyte	CAS Number	Method	LOR	Unit		VA21A8307-001	VA21A8307-002	VA21A8307-003	VA21A8307-004	VA21A8307-005
						Result	Result	Result	Result	Result
<b>Total Metals</b>										
lead, total	7439-92-1	E420	0.000050	mg/L		0.000126	0.000257	0.000076	<0.000050	0.000084

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

## Analytical Results

Sub-Matrix: Water					Client sample ID	323	324	325	326	327
(Matrix: Water)					Client sampling date / time	27-Apr-2021 10:23	27-Apr-2021 10:23	27-Apr-2021 10:23	27-Apr-2021 10:23	27-Apr-2021 10:24
Analyte	CAS Number	Method	LOR	Unit		VA21A8307-006	VA21A8307-007	VA21A8307-008	VA21A8307-009	VA21A8307-010
						Result	Result	Result	Result	Result
<b>Total Metals</b>										
lead, total	7439-92-1	E420	0.000050	mg/L		0.0597	0.0149	0.00243	0.00290	0.00104

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

## QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: <b>VA21A8307</b>	Page	: 1 of 5
Client	: <b>District of Wells</b>	Laboratory	: Vancouver - Environmental
Contact	: Donna Forseille	Account Manager	: Amanda Lampreau
Address	: Box 219 4243 Saunders Avenue Wells BC Canada V0K 2R0	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: 1 250 372 3588
Project	: ----	Date Samples Received	: 03-May-2021 12:50
PO	: ----	Issue Date	: 07-May-2021 17:21
C-O-C number	: 20-907459		
Sampler	: ----		
Site	: ----		
Quote number	: KS21-DOWL100-001		
No. of samples received	: 10		
No. of samples analysed	: 10		

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)

- No Analysis Holding Time Outliers exist.

### 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	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 318	E420	27-Apr-2021	----	----	----		04-May-2021	180 days	8 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 319	E420	27-Apr-2021	----	----	----		04-May-2021	180 days	8 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 320	E420	27-Apr-2021	----	----	----		04-May-2021	180 days	8 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 321	E420	27-Apr-2021	----	----	----		04-May-2021	180 days	8 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 322	E420	27-Apr-2021	----	----	----		04-May-2021	180 days	8 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 323	E420	27-Apr-2021	----	----	----		04-May-2021	180 days	8 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 324	E420	27-Apr-2021	----	----	----		04-May-2021	180 days	8 days	✓



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

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 325	E420	27-Apr-2021	----	----	----		04-May-2021	180 days	8 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 326	E420	27-Apr-2021	----	----	----		04-May-2021	180 days	8 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 327	E420	27-Apr-2021	----	----	----		04-May-2021	180 days	8 days	✓

**Legend & Qualifier Definitions**

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: <b>Water</b>			Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.					
Quality Control Sample Type		Method	QC Lot #	Count		Frequency (%)		
				QC	Regular	Actual	Expected	Evaluation
Analytical Methods								
Laboratory Duplicates (DUP)								
Total Metals in Water by CRC ICPMS		E420	190585	1	20	5.0	5.0	✔
Laboratory Control Samples (LCS)								
Total Metals in Water by CRC ICPMS		E420	190585	1	20	5.0	5.0	✔
Method Blanks (MB)								
Total Metals in Water by CRC ICPMS		E420	190585	1	20	5.0	5.0	✔
Matrix Spikes (MS)								
Total Metals in Water by CRC ICPMS		E420	190585	1	20	5.0	5.0	✔



## Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Metals in Water by CRC ICPMS	E420  Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.



Environmental

## QUALITY CONTROL REPORT

Work Order : **VA21A8307**

Page : 1 of 3

Client : District of Wells  
Contact : Donna Forseille  
Address : Box 219 4243 Saunders Avenue  
Wells BC Canada V0K 2R0  
Telephone : ----  
Project : ----  
PO : ----  
C-O-C number : 20-907459  
Sampler : ----  
Site : ----  
Quote number : KS21-DOWL100-001  
No. of samples received : 10  
No. of samples analysed : 10

Laboratory : Vancouver - Environmental  
Account Manager : Amanda Lampreau  
Address : 8081 Lougheed Highway  
Burnaby, British Columbia Canada V5A 1W9  
Telephone : 1 250 372 3588  
Date Samples Received : 03-May-2021 12:50  
Date Analysis Commenced : 04-May-2021  
Issue Date : 07-May-2021 17:21

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
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia



General Comments

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

- Key :
- Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
  - CAS Number = Chemical Abstracts 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
Total Metals (QC Lot: 190585)											
VA21A8306-006	Anonymous	lead, total	7439-92-1	E420	0.000050	mg/L	0.00593	0.00584	1.55%	20%	----

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
Total Metals (QC Lot: 190585)						
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----



Laboratory Control Sample (LCS) Report

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

Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 190585)									
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	98.5	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
Total Metals (QCLot: 190585)									
VA21A8306-006	Anonymous	lead, total	7439-92-1	E420	0.0186 mg/L	0.02 mg/L	93.3	70.0	130



www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

COC Number: 20 - 907459

Page 1 of 1

Contact and company name below will appear on the final report

Reports / Recipients

Turnaround Time (TAT) Requested

dd-mm-yy hh:mm am/pm

Company: R. Radloff and Associates

Select Report Format: ☒ PDF ☒ EXCEL ☐ BOD (DIGITAL)

☐ Routine (R) if received by 3pm M-F - no surcharges apply

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Contact: Richard Radloff

Merge QC/QCI Reports with COA ☒ YES ☐ NO ☐ N/A

☐ 4 day (P) if received by 3pm M-F - 20% rush surcharge minimum

Phone: 250-562-6861

☐ Compare Results to Criteria on Report - provide details below if box checked

☐ 3 day (P) if received by 3pm M-F - 25% rush surcharge minimum

Company address below will appear on the final report

Select Distribution: ☒ EMAIL ☐ MAIL ☐ FAX

☐ 2 day (P) if received by 3pm M-F - 50% rush surcharge minimum

Street: 1620 3rd Ave

Email 1 or Fax: Richard.Radloff@radloff.ca

☐ 1 day (E) if received by 3pm M-F - 100% rush surcharge minimum

City/Province: Victoria BC

Email 2

☐ Same day (E) if received by 10am M-F - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

Postal Code: V8K 1E2

Email 3

Date and Time Required for all EAP TATs:

Invoice To: Same as Report To ☐ YES ☒ NO

Invoice Recipients

For all tests with rush TATs requested, please contact your AM to confirm availability.

Company: District of Cells

Select Invoice Distribution: ☒ EMAIL ☐ MAIL ☐ FAX

Analysis Request

Contact: Donna Forstelle

Email 1 or Fax: admin@cells.ca

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

Project Information

Oil and Gas Required Fields (client use)

SAMPLES ON HOLD

ALS Account # / Quote # DOWL 100

AFE/Cost Center: PO#

EXTENDED STORAGE REQUIRED

Job #:

Major/Minor Code: Routing Code:

SUSPECTED HAZARD (see notes)

PO / AFE:

Requisitioner:

Location:

Location:

ALS Lab Work Order # (ALS use only): 8907

ALS Contact:

SAMPLES ON HOLD

ALS Sample # (ALS use only):

Sample Identification and/or Coordinates (This description will appear on the report)

NUMBER OF CONTAINERS

EXTENDED STORAGE REQUIRED

1 318

Date (dd-mm-yy) 27-04-21

Time (hh:mm) 10:01

SUSPECTED HAZARD (see notes)

2 319

Time (hh:mm) 10:01

Sample Type Water

3 320

Date (dd-mm-yy) 27-04-21

Time (hh:mm) 10:01

4 321

Date (dd-mm-yy) 27-04-21

Time (hh:mm) 10:01

5 322

Date (dd-mm-yy) 27-04-21

Time (hh:mm) 10:02

6 323

Date (dd-mm-yy) 27-04-21

Time (hh:mm) 10:23

7 324

Date (dd-mm-yy) 27-04-21

Time (hh:mm) 10:23

8 325

Date (dd-mm-yy) 27-04-21

Time (hh:mm) 10:23

9 326

Date (dd-mm-yy) 27-04-21

Time (hh:mm) 10:23

10 327

Date (dd-mm-yy) 27-04-21

Time (hh:mm) 10:24

Drinking Water (DW) Samples (client use)

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Cooling Method: ☒ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☒ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☒ N/A Sample Custody Seals Intact: ☐ YES ☒ N/A

INITIAL COOLER TEMPERATURES °C: ☐ YES ☒ NO

INITIAL COOLER TEMPERATURES °C: ☐ YES ☒ NO

SHIPMENT RELEASE (client use)

INITIAL SHIPMENT RECEPTION (ALS use only)

FINAL SHIPMENT RECEPTION (ALS use only)

Released By: Richard Radloff

Date: 21/04/20

Time: 9:00

Time: 12:50

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.

Handwritten signature and initials: (A2) and PWC



## CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

<b>Work Order</b>	<b>: VA21A8311</b>	<b>Page</b>	<b>: 1 of 4</b>
<b>Client</b>	<b>: District of Wells</b>	<b>Laboratory</b>	<b>: Vancouver - Environmental</b>
<b>Contact</b>	<b>: Donna Forseille</b>	<b>Account Manager</b>	<b>: Amanda Lampreau</b>
<b>Address</b>	<b>: Box 219 4243 Saunders Avenue Wells BC Canada V0K 2R0</b>	<b>Address</b>	<b>: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9</b>
<b>Telephone</b>	<b>: ----</b>	<b>Telephone</b>	<b>: 1 250 372 3588</b>
<b>Project</b>	<b>: ----</b>	<b>Date Samples Received</b>	<b>: 03-May-2021 12:50</b>
<b>PO</b>	<b>: ----</b>	<b>Date Analysis Commenced</b>	<b>: 04-May-2021</b>
<b>C-O-C number</b>	<b>: 20-907457, 20-907458</b>	<b>Issue Date</b>	<b>: 10-May-2021 16:07</b>
<b>Sampler</b>	<b>: ----</b>		
<b>Site</b>	<b>: ----</b>		
<b>Quote number</b>	<b>: KS21-DOWL100-001</b>		
<b>No. of samples received</b>	<b>: 18</b>		
<b>No. of samples analysed</b>	<b>: 18</b>		

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
- Guideline Comparison

**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>
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, 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.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key : LOR: Limit of Reporting (detection limit).

Unit	Description
mg/L	milligrams per litre

>: greater than.

<: less than.

Red shading is applied where the result is equal to or greater than the Guideline Upper Limit or the result is lower than the Guideline Lower Limit.





### Analytical Results Evaluation

Matrix: <b>Water</b>			Client sample ID	300	301	302	303	304	305	306
			Sampling date/time	27-Apr-2021 07:33	27-Apr-2021 07:34	27-Apr-2021 07:38	27-Apr-2021 07:39	27-Apr-2021 07:44	27-Apr-2021 07:45	27-Apr-2021 07:52
			Sub-Matrix	Water	Water	Water	Water	Water	Water	Water
Analyte	CAS Number	Unit		VA21A8311-001	VA21A8311-002	VA21A8311-003	VA21A8311-004	VA21A8311-005	VA21A8311-006	VA21A8311-007
Total Metals										
lead, total	7439-92-1	mg/L		0.00102	0.000859	0.00130	0.00128	0.000988	0.00197	0.000241

### Analytical Results Evaluation

Matrix: <b>Water</b>			Client sample ID	307	308	309	310	311	312	313
			Sampling date/time	27-Apr-2021 07:53	27-Apr-2021 08:02	27-Apr-2021 08:02	27-Apr-2021 08:03	27-Apr-2021 09:22	27-Apr-2021 09:23	27-Apr-2021 09:31
			Sub-Matrix	Water	Water	Water	Water	Water	Water	Water
Analyte	CAS Number	Unit		VA21A8311-008	VA21A8311-009	VA21A8311-010	VA21A8311-011	VA21A8311-012	VA21A8311-013	VA21A8311-014
Total Metals										
lead, total	7439-92-1	mg/L		0.000197	0.000695	0.000062	0.000062	0.00166	0.000664	0.00235

### Analytical Results Evaluation

Matrix: <b>Water</b>			Client sample ID	314	315	316	317	----	----	----
			Sampling date/time	27-Apr-2021 09:31	27-Apr-2021 09:31	27-Apr-2021 09:32	27-Apr-2021 09:32	----	----	----
			Sub-Matrix	Water	Water	Water	Water	----	----	----
Analyte	CAS Number	Unit		VA21A8311-015	VA21A8311-016	VA21A8311-017	VA21A8311-018	-----	-----	-----
Total Metals										
lead, total	7439-92-1	mg/L		0.000483	0.000263	0.00108	0.000519	----	----	----

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



No Breaches Found

Summary of Guideline Limits

Analyte	CAS Number	Unit	BCDWQG MAC						
Total Metals									
lead, total	7439-92-1	mg/L	0.005						

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

Key:

BCDWQG

MAC

British Columbia Drinking Water Quality Guidelines (JAN, 2021)

Maximum Acceptable Concentrations



## Environmental

Work Order	: VA21A8311
Client	: District of Wells
Contact	: Donna Forseille
Address	: Box 219 4243 Saunders Avenue Wells BC Canada V0K 2R0
Telephone	: ---
Project	: ---
PO	: ---
C-O-C number	: 20-907457, 20-907458
Sampler	: ---
Site	: ---
Quote number	: KS21-DOWL100-001
No. of samples received	: 18
No. of samples analysed	: 18

Page	: 1 of 4
Laboratory	: Vancouver - Environmental
Account Manager	: Amanda Lampreau
Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	: 1 250 372 3588
Date Samples Received	: 03-May-2021 12:50
Date Analysis Commenced	: 04-May-2021
Issue Date	: 10-May-2021 16:07

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>
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, 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>
mg/L	milligrams per litre

<: less than.

>: greater than.

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

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

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



## Analytical Results

Sub-Matrix: Water					Client sample ID	300	301	302	303	304
(Matrix: Water)										
Client sampling date / time						27-Apr-2021 07:33	27-Apr-2021 07:34	27-Apr-2021 07:38	27-Apr-2021 07:39	27-Apr-2021 07:44
Analyte	CAS Number	Method	LOR	Unit		VA21A8311-001	VA21A8311-002	VA21A8311-003	VA21A8311-004	VA21A8311-005
Total Metals						Result	Result	Result	Result	Result
lead, total	7439-92-1	E420	0.000050	mg/L		0.00102	0.000859	0.00130	0.00128	0.000988

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

## Analytical Results

Sub-Matrix: Water					Client sample ID	305	306	307	308	309
(Matrix: Water)										
Client sampling date / time						27-Apr-2021 07:45	27-Apr-2021 07:52	27-Apr-2021 07:53	27-Apr-2021 08:02	27-Apr-2021 08:02
Analyte	CAS Number	Method	LOR	Unit		VA21A8311-006	VA21A8311-007	VA21A8311-008	VA21A8311-009	VA21A8311-010
Total Metals						Result	Result	Result	Result	Result
lead, total	7439-92-1	E420	0.000050	mg/L		0.00197	0.000241	0.000197	0.000695	0.000062

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

## Analytical Results

Sub-Matrix: Water					Client sample ID	310	311	312	313	314
(Matrix: Water)										
Client sampling date / time						27-Apr-2021 08:03	27-Apr-2021 09:22	27-Apr-2021 09:23	27-Apr-2021 09:31	27-Apr-2021 09:31
Analyte	CAS Number	Method	LOR	Unit		VA21A8311-011	VA21A8311-012	VA21A8311-013	VA21A8311-014	VA21A8311-015
Total Metals						Result	Result	Result	Result	Result
lead, total	7439-92-1	E420	0.000050	mg/L		0.000062	0.00166	0.000664	0.00235	0.000483

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



## Analytical Results

Sub-Matrix: <b>Water</b>					Client sample ID	315	316	317	----	----
(Matrix: <b>Water</b> )										
					Client sampling date / time	27-Apr-2021 09:31	27-Apr-2021 09:32	27-Apr-2021 09:32	----	----
Analyte	CAS Number	Method	LOR	Unit	VA21A8311-016	VA21A8311-017	VA21A8311-018	-----	-----	
					Result	Result	Result	----	----	
<b>Total Metals</b>										
lead, total	7439-92-1	E420	0.000050	mg/L	0.000263	0.00108	0.000519	----	----	

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

## QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: <b>VA21A8311</b>	Page	: 1 of 6
Client	: <b>District of Wells</b>	Laboratory	: Vancouver - Environmental
Contact	: Donna Forseille	Account Manager	: Amanda Lampreau
Address	: Box 219 4243 Saunders Avenue Wells BC Canada V0K 2R0	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: 1 250 372 3588
Project	: ----	Date Samples Received	: 03-May-2021 12:50
PO	: ----	Issue Date	: 10-May-2021 16:07
C-O-C number	: 20-907457, 20-907458		
Sampler	: ----		
Site	: ----		
Quote number	: KS21-DOWL100-001		
No. of samples received	: 18		
No. of samples analysed	: 18		

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)

- No Analysis Holding Time Outliers exist.

### 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	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 314	E420	27-Apr-2021	----	----	----		04-May-2021	180 days	8 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 300	E420	27-Apr-2021	----	----	----		05-May-2021	180 days	9 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 301	E420	27-Apr-2021	----	----	----		05-May-2021	180 days	9 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 302	E420	27-Apr-2021	----	----	----		05-May-2021	180 days	9 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 303	E420	27-Apr-2021	----	----	----		05-May-2021	180 days	9 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 304	E420	27-Apr-2021	----	----	----		05-May-2021	180 days	9 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 305	E420	27-Apr-2021	----	----	----		05-May-2021	180 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	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 306	E420	27-Apr-2021	----	----	----		05-May-2021	180 days	9 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 307	E420	27-Apr-2021	----	----	----		05-May-2021	180 days	9 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 308	E420	27-Apr-2021	----	----	----		05-May-2021	180 days	9 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 309	E420	27-Apr-2021	----	----	----		05-May-2021	180 days	9 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 310	E420	27-Apr-2021	----	----	----		05-May-2021	180 days	9 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 311	E420	27-Apr-2021	----	----	----		05-May-2021	180 days	9 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 312	E420	27-Apr-2021	----	----	----		05-May-2021	180 days	9 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 313	E420	27-Apr-2021	----	----	----		05-May-2021	180 days	9 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 315	E420	27-Apr-2021	----	----	----		05-May-2021	180 days	9 days	✓



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

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 316	E420	27-Apr-2021	----	----	----		05-May-2021	180 days	9 days	✔
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 317	E420	27-Apr-2021	----	----	----		05-May-2021	180 days	9 days	✔

Legend & Qualifier Definitions

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



## Quality Control Parameter Frequency Compliance

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

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	Method	QC Lot #	QC	Regular	Actual	Expected	Evaluation
Laboratory Duplicates (DUP)							
Total Metals in Water by CRC ICPMS	E420	190588	2	24	8.3	5.0	✓
Laboratory Control Samples (LCS)							
Total Metals in Water by CRC ICPMS	E420	190588	2	24	8.3	5.0	✓
Method Blanks (MB)							
Total Metals in Water by CRC ICPMS	E420	190588	2	24	8.3	5.0	✓
Matrix Spikes (MS)							
Total Metals in Water by CRC ICPMS	E420	190588	2	24	8.3	5.0	✓



## Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Metals in Water by CRC ICPMS	E420  Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

## QUALITY CONTROL REPORT

**Work Order** : **VA21A8311**

**Page** : 1 of 3

**Client** : District of Wells  
**Contact** : Donna Forseille  
**Address** : Box 219 4243 Saunders Avenue  
Wells BC Canada V0K 2R0  
**Telephone** : ----  
**Project** : ----  
**PO** : ----  
**C-O-C number** : 20-907457, 20-907458  
**Sampler** : ----  
**Site** : ----  
**Quote number** : KS21-DOWL100-001  
**No. of samples received** : 18  
**No. of samples analysed** : 18

**Laboratory** : Vancouver - Environmental  
**Account Manager** : Amanda Lampreau  
**Address** : 8081 Lougheed Highway  
Burnaby, British Columbia Canada V5A 1W9  
**Telephone** : 1 250 372 3588  
**Date Samples Received** : 03-May-2021 12:50  
**Date Analysis Commenced** : 04-May-2021  
**Issue Date** : 10-May-2021 16:07

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>
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia



General Comments

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

- Key :
- Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
  - CAS Number = Chemical Abstracts 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
Total Metals (QC Lot: 190588)											
VA21A8309-006	Anonymous	lead, total	7439-92-1	E420	0.000050	mg/L	0.000054	0.000051	0.000003	Diff <2x LOR	----
Total Metals (QC Lot: 190590)											
VA21A8311-001	300	lead, total	7439-92-1	E420	0.000050	mg/L	0.00102	0.00103	0.324%	20%	----

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
Total Metals (QC Lot: 190588)						
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
Total Metals (QC Lot: 190590)						
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----



Laboratory Control Sample (LCS) Report

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

Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 190588)									
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	99.3	80.0	120	----
Total Metals (QCLot: 190590)									
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	98.6	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
Total Metals (QCLot: 190588)									
VA21A8309-006	Anonymous	lead, total	7439-92-1	E420	0.0184 mg/L	0.02 mg/L	91.8	70.0	130
Total Metals (QCLot: 190590)									
VA21A8311-001	300	lead, total	7439-92-1	E420	0.0184 mg/L	0.02 mg/L	91.8	70.0	130



COC Number: 20 - 907457

**Canada Toll Free: 1 800 668 9878**

Page 1 of 2

Environmental Division  
Vancouver  
Work Order Reference  
**VA21A8311**

Telephone : +1 304 253 4188

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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**.





COC Number: 20-907458

**Canada Toll Free: 1 800 668 9878**

Page 2 of 2

Report To		Contact and company name below will appear on the final report		
Company:		P. Radloff and Associates		
Contact:		Richard Radloff		
Phone:		250-617-6140		
		Company address below will appear on the final report		
Street:		1820 3rd Ave		
City/Province:		Prince George BC		
Postal Code:		V2K 1E2		
Invoice To		Same as Report To <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
		Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
Company:		District of Delta		
Contact:		Dana Forcellie		
		Project Information		
ALS Account # / Quote #:		AFR/Cost Center:		
Job #:		Major/Minor Code:		
PO / AFE:		Requisitioner:		
LSD:		Location:		
ALS Lab Work Order # (ALS use only):		ALS Contact:		
		Sampler: Richard		
ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mm-yy)	Time (hh:mm)	Sample Type
13	312	27-04-21	9:23	Water
14	313		9:31	
15	314		9:31	
16	315		9:31	
17	316		9:32	
18	317		9:32	
19	<del>318</del>			
Drinking Water (DW) Samples <sup>1</sup> (client use)		Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)		
Are samples taken from a Regulated DW System? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO				
Are samples for human consumption/ use? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO				
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (ALS use only)		
Released by: Richard Radloff	Date: 21/04/30	Received by:	Date:	
Time: 9:00		Time:		
		FINAL SHIPMENT RECEPTION (ALS use only)		
		Received by: [Signature]	Date: 21/04/21	
		Time: 12:00		

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**.

WHITE - LABORATORY COPY      YELLOW - CLIENT COPY

AUG 2020 FEB 21

## APPENDIX D – LEAD RESULTS: EXTERNAL SAMPLING



**Environmental**

## CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	: <b>KS2100063</b>	Page	: 1 of 9
Client	: <b>District of Wells</b>	Laboratory	: Kamloops - Environmental
Contact	: Clint Stroud	Account Manager	: Amanda Lampreau
Address	: Box 219 4243 Saunders Avenue Wells BC Canada V0K 2R0	Address	: 1445 McGill Road, Unit 2B Kamloops, British Columbia Canada V2C 6K7
Telephone	: 250 994 3330	Telephone	: 1 250 372 3588
Project	: Lead Testing	Date Samples Received	: 08-Jan-2021 09:20
PO	: ----	Date Analysis Commenced	: 11-Jan-2021
C-O-C number	: ----	Issue Date	: 12-Jan-2021 10:53
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 6		
No. of samples analysed	: 6		

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
- Guideline Comparison

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

### Signatories

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

Signatories	Position	Laboratory Department
Kim Jensen	Department Manager - Metals	Metals, 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.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key : LOR: Limit of Reporting (detection limit).

Unit	Description
mg/L	milligrams per litre

>: greater than.

<: less than.

Red shading is applied where the result is equal to or greater than the Guideline Upper Limit or the result is lower than the Guideline Lower Limit.



## Analytical Results Evaluation

Matrix: Water

				Client sample ID	Wells School #1	Wells School #2	District Office	Fire Hall	Wells Hall
				Sampling date/time	06-Jan-2021 13:10	06-Jan-2021 13:15	06-Jan-2021 13:25	06-Jan-2021 13:00	06-Jan-2021 13:35
				Sub-Matrix	Water	Water	Water	Water	Water
Analyte	Method	LOR	Unit		KS2100063-001	KS2100063-002	KS2100063-003	KS2100063-004	KS2100063-005
Total Metals									
lead, total	E420	0.000050	mg/L		0.0109	0.250	0.0130	0.0117	0.00840

## Analytical Results Evaluation

Matrix: Water

				Client sample ID	Raw Well	----	----	----	----
				Sampling date/time	06-Jan-2021 13:30	----	----	----	----
				Sub-Matrix	Water	----	----	----	----
Analyte	Method	LOR	Unit		KS2100063-006	-----	-----	-----	-----
Total Metals									
lead, total	E420	0.000050	mg/L		0.000371	----	----	----	----

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



### Summary of Guideline Breaches by Sample

Client sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
Wells School #1	Water	lead, total	Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years). Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans. MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building.	CDWG	MAC	0.0109 mg/L	0.005 mg/L
	Water	lead, total	Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years). Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans. MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building.	CDWG	MAC-SGW	0.0109 mg/L	0.005 mg/L



Client sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
	Water	lead, total	Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years). Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans. MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building.	CDWG	MAC-TW	0.0109 mg/L	0.005 mg/L
Wells School #2	Water	lead, total	Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years). Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans. MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building.	CDWG	MAC	0.250 mg/L	0.005 mg/L
	Water	lead, total	Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years). Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans. MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building.	CDWG	MAC-SGW	0.250 mg/L	0.005 mg/L



Client sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
	Water	lead, total	Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years). Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans. MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building.	CDWG	MAC-TW	0.250 mg/L	0.005 mg/L
District Office	Water	lead, total	Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years). Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans. MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building.	CDWG	MAC	0.0130 mg/L	0.005 mg/L
	Water	lead, total	Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years). Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans. MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building.	CDWG	MAC-SGW	0.0130 mg/L	0.005 mg/L





Client sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
	Water	lead, total	Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years). Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans. MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building.	CDWG	MAC-TW	0.0130 mg/L	0.005 mg/L
Fire Hall	Water	lead, total	Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years). Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans. MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building.	CDWG	MAC	0.0117 mg/L	0.005 mg/L
	Water	lead, total	Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years). Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans. MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building.	CDWG	MAC-SGW	0.0117 mg/L	0.005 mg/L



Client sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
	Water	lead, total	Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years). Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans. MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building.	CDWG	MAC-TW	0.0117 mg/L	0.005 mg/L
Wells Hall	Water	lead, total	Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years). Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans. MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building.	CDWG	MAC	0.00840 mg/L	0.005 mg/L
	Water	lead, total	Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years). Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans. MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building.	CDWG	MAC-SGW	0.00840 mg/L	0.005 mg/L



Client sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
	Water	lead, total	Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years). Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans. MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building.	CDWG	MAC-TW	0.00840 mg/L	0.005 mg/L

### Summary of Guideline Limits

Guideline	Category	Analyte	Limit
CDWG	MAC	lead, total	0.01 mg/L
	MAC-SGW	lead, total	0.01 mg/L
	MAC-TW	lead, total	0.01 mg/L

#### Keys:

CDWG

MAC

MAC-SGW

MAC-TW

Canada Guidelines for Canadian Drinking Water Quality (JAN, 2021)

Maximum Acceptable Concentrations

Maximum Acceptable Concentrations for Secure GW source

Maximum Acceptable Concentrations for Treated Water

## QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: <b>KS2100063</b>	Page	: 1 of 5
Client	: <b>District of Wells</b>	Laboratory	: Kamloops - Environmental
Contact	: Clint Stroud	Account Manager	: Amanda Lampreau
Address	: Box 219 4243 Saunders Avenue Wells BC Canada V0K 2R0	Address	: 1445 McGill Road, Unit 2B Kamloops, British Columbia Canada V2C 6K7
Telephone	: 250 994 3330	Telephone	: 1 250 372 3588
Project	: Lead Testing	Date Samples Received	: 08-Jan-2021 09:20
PO	: ----	Issue Date	: 12-Jan-2021 10:53
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 6		
No. of samples analysed	: 6		

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)

- No Analysis Holding Time Outliers exist.

### 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	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) District Office	E420	06-Jan-2021	----	----	----		11-Jan-2021	180 days	5 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) Fire Hall	E420	06-Jan-2021	----	----	----		11-Jan-2021	180 days	5 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) Raw Well	E420	06-Jan-2021	----	----	----		11-Jan-2021	180 days	5 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) Wells Hall	E420	06-Jan-2021	----	----	----		11-Jan-2021	180 days	5 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) Wells School #1	E420	06-Jan-2021	----	----	----		11-Jan-2021	180 days	5 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) Wells School #2	E420	06-Jan-2021	----	----	----		11-Jan-2021	180 days	5 days	✓

### Legend & Qualifier Definitions

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: <b>Water</b>			Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.				
Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
Analytical Methods							
Laboratory Duplicates (DUP)							
Total Metals in Water by CRC ICPMS	E420	139634	1	18	5.5	5.0	✔
Laboratory Control Samples (LCS)							
Total Metals in Water by CRC ICPMS	E420	139634	1	18	5.5	5.0	✔
Method Blanks (MB)							
Total Metals in Water by CRC ICPMS	E420	139634	1	18	5.5	5.0	✔
Matrix Spikes (MS)							
Total Metals in Water by CRC ICPMS	E420	139634	1	18	5.5	5.0	✔



## Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Metals in Water by CRC ICPMS	E420  Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.



## QUALITY CONTROL REPORT

**Work Order** : **KS2100063**

**Page** : 1 of 3

**Client** : District of Wells  
**Contact** : Clint Stroud  
**Address** : Box 219 4243 Saunders Avenue  
                   Wells BC Canada V0K 2R0  
**Telephone** : 250 994 3330  
**Project** : Lead Testing  
**PO** : ----  
**C-O-C number** : ----  
**Sampler** : ----  
**Site** : ----  
**Quote number** : ----  
**No. of samples received** : 6  
**No. of samples analysed** : 6

**Laboratory** : Kamloops - Environmental  
**Account Manager** : Amanda Lampreau  
**Address** : 1445 McGill Road, Unit 2B  
                   Kamloops, British Columbia Canada V2C 6K7  
**Telephone** : 1 250 372 3588  
**Date Samples Received** : 08-Jan-2021 09:20  
**Date Analysis Commenced** : 11-Jan-2021  
**Issue Date** : 12-Jan-2021 10:53

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>
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia



General Comments

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

- Key :
- Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
  - CAS Number = Chemical Abstracts 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
Total Metals (QC Lot: 139634)											
KS2100064-001	Anonymous	lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	<0.000050	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
Total Metals (QCLot: 139634)						
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----



Laboratory Control Sample (LCS) Report

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

Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 139634)									
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 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
Total Metals (QCLot: 139634)									
KS2100064-001	Anonymous	lead, total	7439-92-1	E420	0.0192 mg/L	0.02 mg/L	95.9	70.0	130



COC Number: 20 - 885332

Canada Toll Free: 1 800 668 9878

Page of

[illegible]

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**.

ALVZ 2020 FRIC

## CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

<b>Work Order</b>	<b>: KS2100439</b>	<b>Page</b>	<b>: 1 of 13</b>
<b>Client</b>	<b>: District of Wells</b>	<b>Laboratory</b>	<b>: Kamloops - Environmental</b>
<b>Contact</b>	<b>: Donna Forseille</b>	<b>Account Manager</b>	<b>: Amanda Lampreau</b>
<b>Address</b>	<b>: Box 219 4243 Saunders Avenue Wells BC Canada V0K 2R0</b>	<b>Address</b>	<b>: 1445 McGill Road, Unit 2B Kamloops, British Columbia Canada V2C 6K7</b>
<b>Telephone</b>	<b>: ----</b>	<b>Telephone</b>	<b>: 1 250 372 3588</b>
<b>Project</b>	<b>: ----</b>	<b>Date Samples Received</b>	<b>: 17-Feb-2021 09:30</b>
<b>PO</b>	<b>: ----</b>	<b>Date Analysis Commenced</b>	<b>: 20-Feb-2021</b>
<b>C-O-C number</b>	<b>: ----</b>	<b>Issue Date</b>	<b>: 23-Feb-2021 16:19</b>
<b>Sampler</b>	<b>: ----</b>		
<b>Site</b>	<b>: ----</b>		
<b>Quote number</b>	<b>: ----</b>		
<b>No. of samples received</b>	<b>: 22</b>		
<b>No. of samples analysed</b>	<b>: 22</b>		

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
- Guideline Comparison

**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>
Dee Lee	Analyst	Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, 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.

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Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key : LOR: Limit of Reporting (detection limit).

Unit	Description
mg/L	milligrams per litre

>: greater than.

<: less than.

Red shading is applied where the result is equal to or greater than the Guideline Upper Limit or the result is lower than the Guideline Lower Limit.





road maintenance  
building - tap after  
flushing

road maintenance  
building - mercury  
test

WTP - tap ?before/  
after flushing

## Analytical Results Evaluation

Matrix: Water

				Client sample ID	EMCON #1	EMCON #2	EMCON #3	Treatment Post Filter #1	Treatment Post Filter #2
				date/time	12-Feb-2021 12:45	12-Feb-2021 12:30	12-Feb-2021 12:00	12-Feb-2021 11:00	12-Feb-2021 11:30
				Sub-Matrix	Water	Water	Water	Water	Water
Analyte	Unit	Unit	Unit	Unit	KS2100439-001	KS2100439-002	KS2100439-003	KS2100439-004	KS2100439-005
<b>Total Metals</b>									
aluminum, total	E420	0.0030	mg/L		0.0032	<0.0030	----	<0.0030	<0.0030
antimony, total	E420	0.00010	mg/L		<0.00010	<0.00010	----	0.00031	<0.00010
arsenic, total	E420	0.00010	mg/L		0.00065	0.00091	----	0.00064	0.00093
barium, total	E420	0.00010	mg/L		0.0362	0.0349	----	0.0359	0.0355
beryllium, total	E420	0.000020	mg/L		<0.000020	<0.000020	----	<0.000020	<0.000020
bismuth, total	E420	0.000050	mg/L		<0.000050	<0.000050	----	0.000165	<0.000050
boron, total	E420	0.010	mg/L		0.031	<0.010	----	<0.010	<0.010
cadmium, total	E420	0.0000050	mg/L		0.0000511	<0.0000050	----	0.0000496	<0.0000050
calcium, total	E420	0.050	mg/L		65.2	71.1	----	71.8	73.6
cesium, total	E420	0.000010	mg/L		0.000010	<0.000010	----	<0.000010	<0.000010
chromium, total	E420	0.00050	mg/L		<0.00050	<0.00050	----	<0.00050	<0.00050
cobalt, total	E420	0.00010	mg/L		0.00015	<0.00010	----	<0.00010	<0.00010
copper, total	E420	0.00050	mg/L		0.122	0.00334	----	0.0285	0.0432
iron, total	E420	0.010	mg/L		0.132	0.027	----	<0.010	0.016
lead, total	E420	0.000050	mg/L		0.00345	0.000062	----	0.0215	0.00426
lithium, total	E420	0.0010	mg/L		0.0060	0.0011	----	0.0011	0.0011
magnesium, total	E420	0.0050	mg/L		18.1	18.6	----	18.4	18.2
manganese, total	E420	0.00010	mg/L		0.0141	0.00307	----	0.00317	0.00243
mercury, total	E508	0.0000050	mg/L		----	----	<0.0000050	----	----
molybdenum, total	E420	0.000050	mg/L		0.000713	0.000757	----	0.000797	0.000793
nickel, total	E420	0.00050	mg/L		0.00560	<0.00050	----	0.0542	0.00073
phosphorus, total	E420	0.050	mg/L		<0.050	<0.050	----	<0.050	<0.050
potassium, total	E420	0.050	mg/L		0.300	0.282	----	0.282	0.279
rubidium, total	E420	0.00020	mg/L		0.00024	0.00024	----	0.00022	0.00023
selenium, total	E420	0.000050	mg/L		<0.000050	<0.000050	----	<0.000050	<0.000050
silicon, total	E420	0.10	mg/L		3.73	3.56	----	3.73	3.69

road maintenance  
building - tap  
before flushing



## Analytical Results Evaluation

Matrix: Water

				Client sample ID	EMCON #1	EMCON #2	EMCON #3	Treatment Post Filter #1	Treatment Post Filter #2
				Sampling date/time	12-Feb-2021 12:45	12-Feb-2021 12:30	12-Feb-2021 12:00	12-Feb-2021 11:00	12-Feb-2021 11:30
				Sub-Matrix	Water	Water	Water	Water	Water
Analyte	Method	LOR	Unit		KS2100439-001	KS2100439-002	KS2100439-003	KS2100439-004	KS2100439-005
<b>Total Metals</b>									
silver, total	E420	0.000010	mg/L		<0.000010	<0.000010	----	<0.000010	<0.000010
sodium, total	E420	0.050	mg/L		2.76	2.64	----	2.64	2.61
strontium, total	E420	0.00020	mg/L		0.309	0.326	----	0.331	0.330
sulfur, total	E420	0.50	mg/L		29.2	28.1	----	31.9	29.6
tellurium, total	E420	0.00020	mg/L		<0.00020	<0.00020	----	<0.00020	<0.00020
thallium, total	E420	0.000010	mg/L		<0.000010	<0.000010	----	<0.000010	<0.000010
thorium, total	E420	0.00010	mg/L		<0.00010	<0.00010	----	<0.00010	<0.00010
tin, total	E420	0.00010	mg/L		<0.00010	<0.00010	----	0.00241	<0.00010
titanium, total	E420	0.00030	mg/L		<0.00030	<0.00030	----	<0.00030	<0.00030
tungsten, total	E420	0.00010	mg/L		<0.00010	<0.00010	----	<0.00010	<0.00010
uranium, total	E420	0.000010	mg/L		0.000649	0.000994	----	0.000809	0.00100
vanadium, total	E420	0.00050	mg/L		<0.00050	<0.00050	----	<0.00050	<0.00050
zinc, total	E420	0.0030	mg/L		1.13	0.0054	----	1.60	0.0222
zirconium, total	E420	0.00020	mg/L		0.00032	<0.00020	----	<0.00020	<0.00020



Water line to  
former modular  
school office -  
before/after  
flushing

Tap kitchen  
Municipal Hall -  
before flushing



## Analytical Results Evaluation

Matrix: Water

WTP mercury test

Client sample ID

Sampling date/time

Sub-Matrix

Analyte	Method	LOR	Unit	Treatment Post Filter #3	Portable #1	Portable #2	Portable #3	Hall Bar #1
				12-Feb-2021 11:30	12-Feb-2021 11:00	12-Feb-2021 11:00	12-Feb-2021 11:00	12-Feb-2021 10:00
				Water	Water	Water	Water	Water
				KS2100439-006	KS2100439-007	KS2100439-008	KS2100439-009	KS2100439-010
<b>Total Metals</b>								
aluminum, total	E420	0.0030	mg/L	----	0.0482	0.0034	----	<0.0030
antimony, total	E420	0.00010	mg/L	----	0.00023	<0.00010	----	<0.00010
arsenic, total	E420	0.00010	mg/L	----	0.00266	0.00173	----	0.00079
barium, total	E420	0.00010	mg/L	----	0.0379	0.0412	----	0.0345
beryllium, total	E420	0.000020	mg/L	----	<0.000020	<0.000020	----	<0.000020
bismuth, total	E420	0.000050	mg/L	----	0.0107	0.000542	----	<0.000050
boron, total	E420	0.010	mg/L	----	<0.010	<0.010	----	<0.010
cadmium, total	E420	0.0000050	mg/L	----	0.0000511	0.0000058	----	<0.0000050
calcium, total	E420	0.050	mg/L	----	70.8	73.4	----	71.4
cesium, total	E420	0.000010	mg/L	----	0.000011	<0.000010	----	<0.000010
chromium, total	E420	0.00050	mg/L	----	<0.00050	<0.00050	----	<0.00050
cobalt, total	E420	0.00010	mg/L	----	0.00010	<0.00010	----	<0.00010
copper, total	E420	0.00050	mg/L	----	0.129	0.00511	----	0.00330
iron, total	E420	0.010	mg/L	----	1.21	1.70	----	0.081
lead, total	E420	0.000050	mg/L	----	0.0361	0.00429	----	0.000418
lithium, total	E420	0.0010	mg/L	----	0.0011	0.0011	----	0.0010
magnesium, total	E420	0.0050	mg/L	----	18.7	20.7	----	18.1
manganese, total	E420	0.00010	mg/L	----	0.0390	0.00503	----	0.00234
mercury, total	E508	0.0000050	mg/L	<0.0000050	----	----	<0.0000050	----
molybdenum, total	E420	0.000050	mg/L	----	0.000753	0.000785	----	0.000695
nickel, total	E420	0.00050	mg/L	----	0.00194	<0.00050	----	<0.00050
phosphorus, total	E420	0.050	mg/L	----	<0.050	<0.050	----	<0.050
potassium, total	E420	0.050	mg/L	----	0.295	0.335	----	0.282
rubidium, total	E420	0.00020	mg/L	----	0.00026	0.00028	----	0.00025
selenium, total	E420	0.000050	mg/L	----	<0.000050	<0.000050	----	<0.000050
silicon, total	E420	0.10	mg/L	----	3.66	3.79	----	3.54
silver, total	E420	0.000010	mg/L	----	<0.000010	<0.000010	----	<0.000010
sodium, total	E420	0.050	mg/L	----	2.66	2.93	----	2.59
strontium, total	E420	0.00020	mg/L	----	0.336	0.338	----	0.320



## Analytical Results Evaluation

Matrix: Water

				Client sample ID	Treatment Post Filter #3	Portable #1	Portable #2	Portable #3	Hall Bar #1
				Sampling date/time	12-Feb-2021 11:30	12-Feb-2021 11:00	12-Feb-2021 11:00	12-Feb-2021 11:00	12-Feb-2021 10:00
				Sub-Matrix	Water	Water	Water	Water	Water
Analyte	Method	LOR	Unit		KS2100439-006	KS2100439-007	KS2100439-008	KS2100439-009	KS2100439-010
<b>Total Metals</b>									
sulfur, total	E420	0.50	mg/L		----	30.6	31.0	----	29.2
tellurium, total	E420	0.00020	mg/L		----	<0.00020	<0.00020	----	<0.00020
thallium, total	E420	0.000010	mg/L		----	<0.000010	<0.000010	----	<0.000010
thorium, total	E420	0.00010	mg/L		----	<0.00010	<0.00010	----	<0.00010
tin, total	E420	0.00010	mg/L		----	0.00874	0.00044	----	<0.00010
titanium, total	E420	0.00030	mg/L		----	0.00086	<0.00030	----	<0.00030
tungsten, total	E420	0.00010	mg/L		----	<0.00010	<0.00010	----	<0.00010
uranium, total	E420	0.000010	mg/L		----	0.00108	0.000971	----	0.000999
vanadium, total	E420	0.00050	mg/L		----	<0.00050	<0.00050	----	<0.00050
zinc, total	E420	0.0030	mg/L		----	0.0298	<0.0030	----	0.0215
zirconium, total	E420	0.00020	mg/L		----	<0.00020	<0.00020	----	<0.00020



Fire Hall before  
flushing

District office tap -  
before flushing

Kitchen Municipal  
Hall after flushing

## Analytical Results Evaluation

Matrix: Water

				Client sample ID	Hall Bar #2 Kitchen	Hall Bar #3	Fire Hall #2	Fire Hall #3	District Office #1
				Sampling date/time	12-Feb-2021 10:00	12-Feb-2021 10:00	12-Feb-2021 14:45	12-Feb-2021 13:30	16-Feb-2021 09:00
				Sub-Matrix	Water	Water	Water	Water	Water
Analyte	Method	LOR	Unit		KS2100439-011	KS2100439-012	KS2100439-014	KS2100439-015	KS2100439-016
<b>Total Metals</b>									
aluminum, total	E420	0.0030	mg/L		<0.0030	----	<0.0030	----	0.0100
antimony, total	E420	0.00010	mg/L		<0.00010	----	<0.00010	----	0.00193
arsenic, total	E420	0.00010	mg/L		0.00110	----	0.00127	----	0.00112
barium, total	E420	0.00010	mg/L		0.0358	----	0.0349	----	0.0295
beryllium, total	E420	0.000020	mg/L		<0.000020	----	<0.000020	----	<0.000020
bismuth, total	E420	0.000050	mg/L		<0.000050	----	<0.000050	----	<0.000050
boron, total	E420	0.010	mg/L		<0.010	----	<0.010	----	<0.010
cadmium, total	E420	0.0000050	mg/L		0.0000134	----	0.0000067	----	0.000416
calcium, total	E420	0.050	mg/L		70.7	----	71.7	----	51.9
cesium, total	E420	0.000010	mg/L		<0.000010	----	<0.000010	----	<0.000010
chromium, total	E420	0.00050	mg/L		<0.00050	----	<0.00050	----	<0.00050
cobalt, total	E420	0.00010	mg/L		<0.00010	----	<0.00010	----	0.00021
copper, total	E420	0.00050	mg/L		0.0160	----	0.0486	----	0.427
iron, total	E420	0.010	mg/L		0.121	----	0.154	----	0.675
lead, total	E420	0.000050	mg/L		0.00136	----	0.00638	----	0.0188
lithium, total	E420	0.0010	mg/L		0.0011	----	0.0011	----	0.0012
magnesium, total	E420	0.0050	mg/L		17.8	----	20.0	----	23.7
manganese, total	E420	0.00010	mg/L		0.00560	----	0.00457	----	0.0369
mercury, total	E508	0.0000050	mg/L		----	<0.0000050	----	<0.0000050	----
molybdenum, total	E420	0.000050	mg/L		0.000756	----	0.000703	----	0.000634
nickel, total	E420	0.00050	mg/L		0.00068	----	0.0100	----	0.0723
phosphorus, total	E420	0.050	mg/L		<0.050	----	<0.050	----	<0.050
potassium, total	E420	0.050	mg/L		0.282	----	0.302	----	0.310
rubidium, total	E420	0.00020	mg/L		0.00022	----	0.00026	----	0.00025
selenium, total	E420	0.000050	mg/L		<0.000050	----	<0.000050	----	<0.000050
silicon, total	E420	0.10	mg/L		3.64	----	3.63	----	2.37
silver, total	E420	0.000010	mg/L		<0.000010	----	0.000024	----	0.000017
sodium, total	E420	0.050	mg/L		2.56	----	2.71	----	2.82
strontium, total	E420	0.00020	mg/L		0.331	----	0.331	----	0.202



## Analytical Results Evaluation

Matrix: Water

				Client sample ID	Hall Bar #2 Kitchen	Hall Bar #3	Fire Hall #2	Fire Hall #3	District Office #1
				Sampling date/time	12-Feb-2021 10:00	12-Feb-2021 10:00	12-Feb-2021 14:45	12-Feb-2021 13:30	16-Feb-2021 09:00
				Sub-Matrix	Water	Water	Water	Water	Water
Analyte	Method	LOR	Unit		KS2100439-011	KS2100439-012	KS2100439-014	KS2100439-015	KS2100439-016
<b>Total Metals</b>									
sulfur, total	E420	0.50	mg/L		30.5	----	32.9	----	40.8
tellurium, total	E420	0.00020	mg/L		<0.00020	----	<0.00020	----	<0.00020
thallium, total	E420	0.000010	mg/L		<0.000010	----	<0.000010	----	0.000179
thorium, total	E420	0.00010	mg/L		<0.00010	----	<0.00010	----	<0.00010
tin, total	E420	0.00010	mg/L		<0.00010	----	0.00207	----	0.00032
titanium, total	E420	0.00030	mg/L		<0.00030	----	<0.00030	----	<0.00030
tungsten, total	E420	0.00010	mg/L		<0.00010	----	<0.00010	----	<0.00010
uranium, total	E420	0.000010	mg/L		0.00100	----	0.00102	----	0.000334
vanadium, total	E420	0.00050	mg/L		<0.00050	----	<0.00050	----	<0.00050
zinc, total	E420	0.0030	mg/L		0.0253	----	0.0497	----	0.950
zirconium, total	E420	0.00020	mg/L		<0.00020	----	<0.00020	----	0.00022



## Analytical Results Evaluation

Matrix: Water

Client sample ID

Sampling date/time

Sub-Matrix

School lead  
detected below  
limit

Matrix: Water				Client sample ID	limit		Office	School Staff	School Staff	School Staff
				#2	#3	Kitchen #1	Kitchen #2	Kitchen #3		
				Sampling date/time	16-Feb-2021 09:15	16-Feb-2021 09:20	16-Feb-2021 11:00	16-Feb-2021 11:00	16-Feb-2021 10:30	
Sub-Matrix				Water	Water	Water	Water	Water		
Analyte	Method	LOR	Unit	KS2100439-017	KS2100439-018	KS2100439-019	KS2100439-020	KS2100439-021		
Total Metals										
aluminum, total	E420	0.0030	mg/L	<0.0030	----	<0.0030	<0.0030	----		
antimony, total	E420	0.00010	mg/L	<0.00010	----	0.00037	<0.00010	----		
arsenic, total	E420	0.00010	mg/L	0.00100	----	0.00042	0.00066	----		
barium, total	E420	0.00010	mg/L	0.0361	----	0.0326	0.0342	----		
beryllium, total	E420	0.000020	mg/L	<0.000020	----	<0.000020	<0.000020	----		
bismuth, total	E420	0.000050	mg/L	<0.000050	----	0.000737	<0.000050	----		
boron, total	E420	0.010	mg/L	<0.010	----	<0.010	<0.010	----		
cadmium, total	E420	0.0000050	mg/L	0.0000194	----	0.0000117	<0.0000050	----		
calcium, total	E420	0.050	mg/L	70.8	----	65.9	71.6	----		
cesium, total	E420	0.000010	mg/L	<0.000010	----	<0.000010	<0.000010	----		
chromium, total	E420	0.00050	mg/L	<0.00050	----	<0.00050	<0.00050	----		
cobalt, total	E420	0.00010	mg/L	<0.00010	----	0.00141	<0.00010	----		
copper, total	E420	0.00050	mg/L	0.00571	----	0.0454	0.00640	----		
iron, total	E420	0.010	mg/L	0.121	----	0.028	0.068	----		
lead, total	E420	0.000050	mg/L	0.000395	----	0.00268	0.000052	----		
lithium, total	E420	0.0010	mg/L	0.0010	----	0.0013	0.0010	----		
magnesium, total	E420	0.0050	mg/L	18.3	----	18.3	18.0	----		
manganese, total	E420	0.00010	mg/L	0.00331	----	0.00396	0.00216	----		
mercury, total	E508	0.0000050	mg/L	----	<0.0000050	----	----	<0.0000050		
molybdenum, total	E420	0.000050	mg/L	0.000740	----	0.000733	0.000690	----		
nickel, total	E420	0.00050	mg/L	<0.00050	----	2.88	0.00123	----		
phosphorus, total	E420	0.050	mg/L	<0.050	----	<0.050	<0.050	----		
potassium, total	E420	0.050	mg/L	0.288	----	0.280	0.284	----		
rubidium, total	E420	0.00020	mg/L	0.00022	----	0.00022	0.00023	----		
selenium, total	E420	0.000050	mg/L	<0.000050	----	<0.000050	<0.000050	----		
silicon, total	E420	0.10	mg/L	3.52	----	3.38	3.66	----		
silver, total	E420	0.000010	mg/L	<0.000010	----	<0.000010	<0.000010	----		
sodium, total	E420	0.050	mg/L	2.61	----	2.58	2.59	----		
strontium, total	E420	0.00020	mg/L	0.316	----	0.285	0.320	----		



## Analytical Results Evaluation

Matrix: Water

				Client sample ID	District Office #2	District Office #3	School Staff Kitchen #1	School Staff Kitchen #2	School Staff Kitchen #3
				Sampling date/time	16-Feb-2021 09:15	16-Feb-2021 09:20	16-Feb-2021 11:00	16-Feb-2021 11:00	16-Feb-2021 10:30
				Sub-Matrix	Water	Water	Water	Water	Water
Analyte	Method	LOR	Unit		KS2100439-017	KS2100439-018	KS2100439-019	KS2100439-020	KS2100439-021
<b>Total Metals</b>									
sulfur, total	E420	0.50	mg/L		29.4	----	30.3	30.5	----
tellurium, total	E420	0.00020	mg/L		<0.00020	----	<0.00020	<0.00020	----
thallium, total	E420	0.000010	mg/L		<0.000010	----	<0.000010	<0.000010	----
thorium, total	E420	0.00010	mg/L		<0.00010	----	<0.00010	<0.00010	----
tin, total	E420	0.00010	mg/L		<0.00010	----	<0.00010	<0.00010	----
titanium, total	E420	0.00030	mg/L		<0.00030	----	<0.00030	<0.00030	----
tungsten, total	E420	0.00010	mg/L		<0.00010	----	<0.00010	<0.00010	----
uranium, total	E420	0.000010	mg/L		0.000975	----	0.000786	0.000973	----
vanadium, total	E420	0.00050	mg/L		<0.00050	----	<0.00050	<0.00050	----
zinc, total	E420	0.0030	mg/L		0.0123	----	1.31	0.0276	----
zirconium, total	E420	0.00020	mg/L		<0.00020	----	<0.00020	<0.00020	----



## Analytical Results Evaluation

				Client sample ID	3932 RCMP #1	3932 RCMP #2	----	----	----
Matrix: Water				Sampling date/time	12-Feb-2021 12:15	12-Feb-2021 12:15	----	----	----
				Sub-Matrix	Water	Water	----	----	----
Analyte	Method	LOR	Unit		KS2100439-022	KS2100439-023	-----	-----	-----
<b>Total Metals</b>									
aluminum, total	E420	0.0030	mg/L		<0.0030	0.0035	----	----	----
antimony, total	E420	0.00010	mg/L		<0.00010	<0.00010	----	----	----
arsenic, total	E420	0.00010	mg/L		0.00027	0.00037	----	----	----
barium, total	E420	0.00010	mg/L		0.0150	0.0199	----	----	----
beryllium, total	E420	0.000020	mg/L		<0.000020	<0.000020	----	----	----
bismuth, total	E420	0.000050	mg/L		<0.000050	<0.000050	----	----	----
boron, total	E420	0.010	mg/L		<0.010	<0.010	----	----	----
cadmium, total	E420	0.0000050	mg/L		0.0000439	0.0000126	----	----	----
calcium, total	E420	0.050	mg/L		44.8	60.7	----	----	----
cesium, total	E420	0.000010	mg/L		<0.000010	<0.000010	----	----	----
chromium, total	E420	0.00050	mg/L		<0.00050	<0.00050	----	----	----
cobalt, total	E420	0.00010	mg/L		0.00014	<0.00010	----	----	----
copper, total	E420	0.00050	mg/L		0.105	0.0271	----	----	----
iron, total	E420	0.010	mg/L		0.010	0.022	----	----	----
lead, total	E420	0.000050	mg/L		0.0106	0.00114	----	----	----
lithium, total	E420	0.0010	mg/L		0.0022	0.0018	----	----	----
magnesium, total	E420	0.0050	mg/L		14.7	18.2	----	----	----
manganese, total	E420	0.00010	mg/L		0.00110	0.00069	----	----	----
molybdenum, total	E420	0.000050	mg/L		0.000739	0.000700	----	----	----
nickel, total	E420	0.00050	mg/L		0.00066	<0.00050	----	----	----
phosphorus, total	E420	0.050	mg/L		<0.050	<0.050	----	----	----
potassium, total	E420	0.050	mg/L		0.302	0.390	----	----	----
rubidium, total	E420	0.00020	mg/L		0.00028	0.00031	----	----	----
selenium, total	E420	0.000050	mg/L		<0.000050	<0.000050	----	----	----
silicon, total	E420	0.10	mg/L		3.68	3.63	----	----	----
silver, total	E420	0.000010	mg/L		<0.000010	<0.000010	----	----	----
sodium, total	E420	0.050	mg/L		40.2	14.6	----	----	----
strontium, total	E420	0.00020	mg/L		0.185	0.239	----	----	----
sulfur, total	E420	0.50	mg/L		30.9	28.7	----	----	----



## Analytical Results Evaluation

Matrix: Water

				Client sample ID	3932 RCMP #1	3932 RCMP #2	----	----	----
				Sampling date/time	12-Feb-2021 12:15	12-Feb-2021 12:15	----	----	----
				Sub-Matrix	Water	Water	----	----	----
Analyte	Method	LOR	Unit	KS2100439-022	KS2100439-023	-----	-----	-----	-----
<b>Total Metals</b>									
tellurium, total	E420	0.00020	mg/L	<0.00020	<0.00020	----	----	----	----
thallium, total	E420	0.000010	mg/L	<0.000010	<0.000010	----	----	----	----
thorium, total	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----	----
tin, total	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----	----
titanium, total	E420	0.00030	mg/L	<0.00030	<0.00030	----	----	----	----
tungsten, total	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----	----
uranium, total	E420	0.000010	mg/L	0.00164	0.000906	----	----	----	----
vanadium, total	E420	0.00050	mg/L	<0.00050	<0.00050	----	----	----	----
zinc, total	E420	0.0030	mg/L	0.205	0.0201	----	----	----	----
zirconium, total	E420	0.00020	mg/L	<0.00020	<0.00020	----	----	----	----

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

## Summary of Guideline Breaches by Sample

Client sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit





**Keys:**

BCDWQG	British Columbia Drinking Water Quality Guidelines (JAN, 2021)
AO	Aesthetic Objective/Other Value
MAC	Maximum Acceptable Concentrations

## QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: <b>KS2100439</b>	Page	: 1 of 7
Client	: <b>District of Wells</b>	Laboratory	: Kamloops - Environmental
Contact	: Donna Forseille	Account Manager	: Amanda Lampreau
Address	: Box 219 4243 Saunders Avenue Wells BC Canada V0K 2R0	Address	: 1445 McGill Road, Unit 2B Kamloops, British Columbia Canada V2C 6K7
Telephone	: ----	Telephone	: 1 250 372 3588
Project	: ----	Date Samples Received	: 17-Feb-2021 09:30
PO	: ----	Issue Date	: 23-Feb-2021 16:19
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 22		
No. of samples analysed	: 22		

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)

- No Analysis Holding Time Outliers exist.

### 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 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	
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) EMCON #3	E508	12-Feb-2021	----	----	----		23-Feb-2021	28 days	10 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) Fire Hall #3	E508	12-Feb-2021	----	----	----		23-Feb-2021	28 days	10 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) Hall Bar #3	E508	12-Feb-2021	----	----	----		23-Feb-2021	28 days	10 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) Portable #3	E508	12-Feb-2021	----	----	----		23-Feb-2021	28 days	10 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) Treatment Post Filter #3	E508	12-Feb-2021	----	----	----		23-Feb-2021	28 days	10 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) District Office #3	E508	16-Feb-2021	----	----	----		23-Feb-2021	28 days	6 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) School Staff Kitchen #3	E508	16-Feb-2021	----	----	----		23-Feb-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	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) District Office #1	E420	16-Feb-2021	----	----	----		20-Feb-2021	180 days	4 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) District Office #2	E420	16-Feb-2021	----	----	----		20-Feb-2021	180 days	4 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) School Staff Kitchen #1	E420	16-Feb-2021	----	----	----		20-Feb-2021	180 days	4 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) School Staff Ktichen #2	E420	16-Feb-2021	----	----	----		20-Feb-2021	180 days	4 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 3932 RCMP #1	E420	12-Feb-2021	----	----	----		20-Feb-2021	180 days	7 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 3932 RCMP #2	E420	12-Feb-2021	----	----	----		20-Feb-2021	180 days	7 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) EMCON #1	E420	12-Feb-2021	----	----	----		20-Feb-2021	180 days	7 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) EMCON #2	E420	12-Feb-2021	----	----	----		20-Feb-2021	180 days	7 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) Fire Hall #2	E420	12-Feb-2021	----	----	----		20-Feb-2021	180 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	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) Hall Bar #1	E420	12-Feb-2021	----	----	----		20-Feb-2021	180 days	8 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) Hall Bar #2 Kitchen	E420	12-Feb-2021	----	----	----		20-Feb-2021	180 days	8 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) Portable #1	E420	12-Feb-2021	----	----	----		20-Feb-2021	180 days	8 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) Portable #2	E420	12-Feb-2021	----	----	----		20-Feb-2021	180 days	8 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) Treatment Post Filter #1	E420	12-Feb-2021	----	----	----		20-Feb-2021	180 days	8 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) Treatment Post Filter #2	E420	12-Feb-2021	----	----	----		20-Feb-2021	180 days	8 days	✓

**Legend & Qualifier Definitions**

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



## Quality Control Parameter Frequency Compliance

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

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	Method	QC Lot #	QC	Regular	Actual	Expected	Evaluation
Laboratory Duplicates (DUP)							
Total Mercury in Water by CVAAS	E508	154093	1	20	5.0	5.0	✔
Total Metals in Water by CRC ICPMS	E420	152999	1	19	5.2	5.0	✔
Laboratory Control Samples (LCS)							
Total Mercury in Water by CVAAS	E508	154093	1	20	5.0	5.0	✔
Total Metals in Water by CRC ICPMS	E420	152999	1	19	5.2	5.0	✔
Method Blanks (MB)							
Total Mercury in Water by CVAAS	E508	154093	1	20	5.0	5.0	✔
Total Metals in Water by CRC ICPMS	E420	152999	1	19	5.2	5.0	✔
Matrix Spikes (MS)							
Total Mercury in Water by CVAAS	E508	154093	1	20	5.0	5.0	✔
Total Metals in Water by CRC ICPMS	E420	152999	1	19	5.2	5.0	✔



## Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Metals in Water by CRC ICPMS	E420  Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508  Vancouver - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS





## QUALITY CONTROL REPORT

Work Order : **KS2100439**

Page : 1 of 10

Client : District of Wells  
Contact : Donna Forseille  
Address : Box 219 4243 Saunders Avenue  
Wells BC Canada V0K 2R0  
Telephone : ----  
Project : ----  
PO : ----  
C-O-C number : ----  
Sampler : ----  
Site : ----  
Quote number : ----  
No. of samples received : 22  
No. of samples analysed : 22

Laboratory : Kamloops - Environmental  
Account Manager : Amanda Lampreau  
Address : 1445 McGill Road, Unit 2B  
Kamloops, British Columbia Canada V2C 6K7  
Telephone : 1 250 372 3588  
Date Samples Received : 17-Feb-2021 09:30  
Date Analysis Commenced : 20-Feb-2021  
Issue Date : 23-Feb-2021 16:19

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
Dee Lee	Analyst	Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia



## General Comments

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

### Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts 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
<b>Total Metals (QC Lot: 152999)</b>											
KS2100442-001	Anonymous	aluminum, total	7429-90-5	E420	0.0060	mg/L	<0.0060	<0.0060	0	Diff <2x LOR	----
		antimony, total	7440-36-0	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00020	mg/L	0.00036	0.00036	0.00000001	Diff <2x LOR	----
		barium, total	7440-39-3	E420	0.00020	mg/L	0.0118	0.0116	1.30%	20%	----
		beryllium, total	7440-41-7	E420	0.000200	mg/L	<0.000200	<0.000200	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.0000100	mg/L	<0.0000100	<0.0000100	0	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.100	mg/L	134	123	8.61%	20%	----
		cesium, total	7440-46-2	E420	0.000020	mg/L	0.00246	0.00239	2.77%	20%	----
		chromium, total	7440-47-3	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.00100	mg/L	0.00122	<0.00100	0.00022	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.020	mg/L	0.663	0.678	2.20%	20%	----
		lead, total	7439-92-1	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		lithium, total	7439-93-2	E420	0.0020	mg/L	0.0045	0.0040	0.0004	Diff <2x LOR	----
		magnesium, total	7439-95-4	E420	0.0100	mg/L	85.0	82.1	3.54%	20%	----
		manganese, total	7439-96-5	E420	0.00020	mg/L	0.138	0.135	1.65%	20%	----
		molybdenum, total	7439-98-7	E420	0.000100	mg/L	0.000192	0.000195	0.000002	Diff <2x LOR	----
		nickel, total	7440-02-0	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E420	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.100	mg/L	2.50	2.45	2.25%	20%	----
		rubidium, total	7440-17-7	E420	0.00040	mg/L	0.00685	0.00679	0.959%	20%	----
		selenium, total	7782-49-2	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		silicon, total	7440-21-3	E420	0.20	mg/L	22.2	22.0	0.880%	20%	----
		silver, total	7440-22-4	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		sodium, total	17341-25-2	E420	0.100	mg/L	18.6	17.7	4.79%	20%	----
		strontium, total	7440-24-6	E420	0.00040	mg/L	7.98	7.66	4.08%	20%	----
		sulfur, total	7704-34-9	E420	1.00	mg/L	184	182	0.966%	20%	----
		tellurium, total	13494-80-9	E420	0.00040	mg/L	0.00138	0.00118	0.00020	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	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
Total Metals (QC Lot: 152999) - continued											
KS2100442-001	Anonymous	tin, total	7440-31-5	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.00060	mg/L	<0.00060	<0.00060	0	Diff <2x LOR	----
		tungsten, total	7440-33-7	E420	0.00020	mg/L	0.00020	<0.00020	0.000002	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.000020	mg/L	0.000029	0.000024	0.000005	Diff <2x LOR	----
		vanadium, total	7440-62-2	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0060	mg/L	0.0210	0.0210	0.00002	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.00040	mg/L	<0.00040	<0.00040	0	Diff <2x LOR	----
Total Metals (QC Lot: 154093)											
KS2100439-003	EMCON #3	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	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
<b>Total Metals (QCLot: 152999)</b>						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
sodium, total	17341-25-2	E420	0.05	mg/L	<0.050	----
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 152999) - continued						
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----
Total Metals (QCLot: 154093)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----



Laboratory Control Sample (LCS) Report

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

Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 152999)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	106	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	111	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	110	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	107	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	102	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	100	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	93.2	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	108	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	104	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	106	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	109	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	109	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	110	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	99.4	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	102	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	99.5	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	103	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	108	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	109	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	106	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	100	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	111	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	107	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	103	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	110	80.0	120	----
sodium, total	17341-25-2	E420	0.05	mg/L	50 mg/L	107	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	111	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	90.2	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	106	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	103	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	99.6	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	107	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 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
Total Metals (QCLot: 152999) - continued									
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	102	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	102	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	109	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	105	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	104	80.0	120	----
Total Metals (QCLot: 154093)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	96.0	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.

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 152999)										
KS2100442-001	Anonymous	aluminum, total	7429-90-5	E420	0.400 mg/L	0.4 mg/L	100.0	70.0	130	----
		antimony, total	7440-36-0	E420	0.0416 mg/L	0.04 mg/L	104	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0427 mg/L	0.04 mg/L	107	70.0	130	----
		barium, total	7440-39-3	E420	0.0418 mg/L	0.04 mg/L	104	70.0	130	----
		beryllium, total	7440-41-7	E420	0.0766 mg/L	0.08 mg/L	95.8	70.0	130	----
		bismuth, total	7440-69-9	E420	0.0188 mg/L	0.02 mg/L	94.3	70.0	130	----
		boron, total	7440-42-8	E420	0.179 mg/L	0.2 mg/L	89.5	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00861 mg/L	0.008 mg/L	108	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	8 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		chromium, total	7440-47-3	E420	0.0823 mg/L	0.08 mg/L	103	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0409 mg/L	0.04 mg/L	102	70.0	130	----
		copper, total	7440-50-8	E420	0.0408 mg/L	0.04 mg/L	102	70.0	130	----
		iron, total	7439-89-6	E420	4.05 mg/L	4 mg/L	101	70.0	130	----
		lead, total	7439-92-1	E420	0.0383 mg/L	0.04 mg/L	95.7	70.0	130	----
		lithium, total	7439-93-2	E420	0.180 mg/L	0.2 mg/L	90.1	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	ND mg/L	0.04 mg/L	ND	70.0	130	----
		molybdenum, total	7439-98-7	E420	0.0411 mg/L	0.04 mg/L	103	70.0	130	----
		nickel, total	7440-02-0	E420	0.0830 mg/L	0.08 mg/L	104	70.0	130	----
		phosphorus, total	7723-14-0	E420	20.8 mg/L	20 mg/L	104	70.0	130	----
		potassium, total	7440-09-7	E420	8.32 mg/L	8 mg/L	104	70.0	130	----
		rubidium, total	7440-17-7	E420	0.0413 mg/L	0.04 mg/L	103	70.0	130	----
		selenium, total	7782-49-2	E420	0.0874 mg/L	0.08 mg/L	109	70.0	130	----
		silicon, total	7440-21-3	E420	ND mg/L	20 mg/L	ND	70.0	130	----
		silver, total	7440-22-4	E420	0.00805 mg/L	0.008 mg/L	101	70.0	130	----
		sodium, total	17341-25-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		strontium, total	7440-24-6	E420	ND mg/L	0.04 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E420	ND mg/L	40 mg/L	ND	70.0	130	----
		tellurium, total	13494-80-9	E420	0.0815 mg/L	0.08 mg/L	102	70.0	130	----
		thallium, total	7440-28-0	E420	0.00767 mg/L	0.008 mg/L	95.9	70.0	130	----
		thorium, total	7440-29-1	E420	0.0416 mg/L	0.04 mg/L	104	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
Total Metals (QCLot: 152999) - continued										
KS2100442-001	Anonymous	tin, total	7440-31-5	E420	0.0410 mg/L	0.04 mg/L	103	70.0	130	----
		titanium, total	7440-32-6	E420	0.0838 mg/L	0.08 mg/L	105	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0390 mg/L	0.04 mg/L	97.6	70.0	130	----
		uranium, total	7440-61-1	E420	0.00803 mg/L	0.008 mg/L	100	70.0	130	----
		vanadium, total	7440-62-2	E420	0.214 mg/L	0.2 mg/L	107	70.0	130	----
		zinc, total	7440-66-6	E420	0.796 mg/L	0.8 mg/L	99.5	70.0	130	----
		zirconium, total	7440-67-7	E420	0.0824 mg/L	0.08 mg/L	103	70.0	130	----
Total Metals (QCLot: 154093)										
KS2100439-006	Treatment Post Filter #3	mercury, total	7439-97-6	E508	0.0000947 mg/L	0.0001 mg/L	94.7	70.0	130	----



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# Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

COC Number: 20 - 005101

Page

Environmental Division  
Kamloops  
Work Order Reference  
**KS2100439**



Telephone : +1 250 372 3588

Report To		Reports / Recipients		Turnaround Time (TAT) Requested	
Company:	District of Wells	Select Report Format:	<input checked="" type="checkbox"/> PDF <input type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL)	<input type="checkbox"/> Routine [R] if received by 3pm M-F - no surcharges apply	
Contact:	Donna Forseille	Merge QC/QCI Reports with COA	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A	<input type="checkbox"/> 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum	
Phone:	250-994-3330	<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked		<input type="checkbox"/> 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum	
Company address below will appear on the final report		Select Distribution:	<input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX	<input type="checkbox"/> 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum	
Street:	4243 Sanders	Email 1 or Fax	Admin1@Wells.ca	<input type="checkbox"/> 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum	
City/Province:	Wells B.C.	Email 2		<input type="checkbox"/> Same day [E2] if received by 10am M-S - 200% rush surcharge. Addit may apply to rush requests on weekends, statutory holidays and non-rout	
Postal Code:	V0K 2R0	Email 3		Date and Time Required for all E&P TATs:	
Invoice To	Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Invoice Recipients		For all tests with rush TATs requested, please contact your account manager	
	Copy of Invoice with Report <input type="checkbox"/> YES <input type="checkbox"/> NO	Select Invoice Distribution:	<input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX	Analysis Request	
Company:		Email 1 or Fax		Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below	
Contact:		Email 2			
Project Information		Oil and Gas Required Fields (client use)		NUMBER OF CONTAINERS	
ALS Account # / Quote #:		AFE/Cost Center:	PO#	TOTAL METALS	
Job #:		Major/Minor Code:	Routing Code:	MERCURY	
PO / AFE:		Requisitioner:			
LSD:		Location:			
ALS Lab Work Order # (ALS use only): KS2100439		ALS Contact:	Sampler:		
ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mm-yy)	Time (hh:mm)	Sample Type	
1	EMCON #1	12/2/21	12:45		
2	EMCON #2	12/2/21	12:30		
3	EMCON #3	12/2/21	12:00		
4	Treatment Post Filter #1	12/2/21	11:00		
5	Treatment Post Filter #2	12/2/21	11:30		
6	Treatment Post Filter #3	12/2/21	11:30		
7	Portable #1	12/2/21	11:00		
8	Portable #2	12/2/21	11:00		
9	Portable #3	12/2/21	11:00		
10	Hall Bar #1	12/2/21	10:00		
11	Hall Bar #2 Kitchen	12/2/21	10:00		
12	Hall Bar #3	12/2/21	10:00		
Drinking Water (DW) Samples <sup>1</sup> (client use)		Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)		SAMPLE RECEIPT DETAILS (ALS use only)	
Are samples taken from a Regulated DW System?				Cooling Method: <input type="checkbox"/> NONE <input type="checkbox"/> ICE <input type="checkbox"/> ICE PACKS <input type="checkbox"/> FROZEN <input type="checkbox"/> COOLING INITIATED	
<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO				Submission Comments identified on Sample Receipt Notification: <input type="checkbox"/> YES <input type="checkbox"/> NO	
Are samples for human consumption/ use?				Cooler Custody Seals Intact: <input type="checkbox"/> YES <input type="checkbox"/> N/A Sample Custody Seals Intact: <input type="checkbox"/> YES <input type="checkbox"/> N/A	
<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO				INITIAL COOLER TEMPERATURES °C	
				FINAL COOLER TEMPERATURES °C	
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (ALS use only)		FINAL SHIPMENT RECEPTION (ALS use only)	
Released by:	Date:	Time:	Received by:	Date:	Time:
C. STROUD	16/2/21	3:00	04	FEB 17 2021	13:00

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.





# 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 - 722235

Page of

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<b>Report To</b> Contact and company name below will appear on the final report		<b>Report Format / Distribution</b>		<b>Select Service Level Below - Contact your AM to confirm all E&amp;P TATs (surcharges may apply)</b>	
Company: District of Wells		Select Report Format: <input checked="" type="checkbox"/> PDF <input type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL)		Regular [R] <input type="checkbox"/> Standard TAT: if received by 3 pm - business days - no surcharges apply	
Contact: Donna Forssille		Quality Control (QC) Report with Report <input type="checkbox"/> YES <input type="checkbox"/> NO		4 day [P4-20%] <input type="checkbox"/> 1 Business day [E-100%] <input type="checkbox"/>	
Phone: 250-994-8330		<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%] (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		2 day [P2-50%] <input type="checkbox"/>	
Street: 4243 Sandberg		Email 1 or Fax Admin 2@wells.ca		Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm	
City/Province: Wells B.C.		Email 2		For tests that can not be performed according to the service level selected, you will be contacted.	
Postal Code: V0K 2R0		Email 3		<b>Analysis Request</b>	
<b>Invoice To</b>		<b>Invoice Distribution</b>		Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below	
Same as Report To <input type="checkbox"/> YES <input type="checkbox"/> NO		Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			
Copy of Invoice with Report <input type="checkbox"/> YES <input type="checkbox"/> NO		Email 1 or Fax			
Company:		Email 2			
Contact:					
<b>Project Information</b>		<b>Oil and Gas Required Fields (client use)</b>			
ALS Account # / Quote #:		AFE/Cost Center:			
Job #:		Major/Minor Code:			
PO / AFE:		Requisitioner:			
LSD:		Location:			
ALS Lab Work Order # (lab use only): KS2100439		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	
13	Fire Hall #1	16/2/21	10:45		
14	Fire Hall #2	12/2/21	2:45		
15	Fire Hall #3	12/2/21	1:30		
16	District Office #1	16/2/21	9:00		
17	District Office #2	16/2/21	9:15		
18	District Office #3	16/2/21	9:20		
19	School Staff Kitchen #1	16/2/21	11:00		
20	School Staff Kitchen #2	16/2/21	11:00		
21	School Staff Kitchen #3	16/2/21	10:30		
<b>Drinking Water (DW) Samples<sup>1</sup> (client use)</b>		<b>Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)</b>		<b>SAMPLE CONDITION AS RECEIVED (lab use only)</b>	
Are samples taken from a Regulated DW System? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO				Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>	
Are samples for human consumption/ use? <input checked="" type="checkbox"/> YES <input 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	
<b>SHIPMENT RELEASE (client use)</b>		<b>INITIAL SHIPMENT RECEPTION (lab use only)</b>		<b>FINAL SHIPMENT RECEPTION (lab use only)</b>	
Released by: C. Stroud	Date: 16/2/21	Time: 3:00	Received by: OF	Date: FEB 17 2021	Time: 9:30

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 (GUIDELINE EVALUATION)

<b>Work Order</b>	<b>: KS2100501</b>	<b>Page</b>	<b>: 1 of 4</b>
<b>Client</b>	<b>: Cash Clients Canada</b>	<b>Laboratory</b>	<b>: Kamloops - Environmental</b>
<b>Contact</b>	<b>: Stu Lebeck</b>	<b>Account Manager</b>	<b>: Caitlin Fountain</b>
<b>Address</b>	<b>:</b>	<b>Address</b>	<b>: 1445 McGill Road, Unit 2B</b>
	<b>BC Canada</b>		<b>Kamloops, British Columbia Canada V2C 6K7</b>
<b>Telephone</b>	<b>: 250-255-0419</b>	<b>Telephone</b>	<b>: 250 372 3588</b>
<b>Project</b>	<b>:</b>	<b>Date Samples Received</b>	<b>: 23-Feb-2021 12:00</b>
<b>PO</b>	<b>: ----</b>	<b>Date Analysis Commenced</b>	<b>: 25-Feb-2021</b>
<b>C-O-C number</b>	<b>: ----</b>	<b>Issue Date</b>	<b>: 01-Mar-2021 09:39</b>
<b>Sampler</b>	<b>: ----</b>		
<b>Site</b>	<b>: ----</b>		
<b>Quote number</b>	<b>: 21CASH100KS06 (Wells Lead)</b>		
<b>No. of samples received</b>	<b>: 2</b>		
<b>No. of samples analysed</b>	<b>: 2</b>		

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
- Guideline Comparison

**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>
Kim Jensen	Department Manager - Metals	Metals, 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.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key : LOR: Limit of Reporting (detection limit).

Unit	Description
mg/L	milligrams per litre

>: greater than.

<: less than.

Red shading is applied where the result is equal to or greater than the Guideline Upper Limit or the result is lower than the Guideline Lower Limit.

✓ Codes good on post flush

## Analytical Results

Sub-Matrix: Water  
 (Matrix: Water)

Client sample ID  
 Sampling date/time

Lebeck Post Flush

21-Feb-2021  
 07:15

Analyte	Method	LOR	Unit	KS2100501-002	BCDWQG MAC					
<b>Total Metals</b>										
lead, total	E420	0.000050	mg/L	0.000118	0.005					

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

## Summary of Guideline Breaches by Sample

Client Sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
			No description available for this compound in this guideline				

Page : 3 of 4  
 Work Order : KS2100501  
 Client : Cash Clients Canada  
 Project :



**Keys:**  
 BCDWQG British Columbia Drinking Water Quality Guidelines (JAN, 2021)  
 MAC Maximum Acceptable Concentrations

### General Comments

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Unit	Description
mg/L	milligrams per litre

>: greater than.

<: less than.

Red shading is applied where the result is equal to or greater than the Guideline Upper Limit or the result is lower than the Guideline Lower Limit.

### Analytical Results

Sub-Matrix: Water  
 (Matrix: Water)

Client sample ID	Lebeck Pre Flush
Sampling date/time	21-Feb-2021 07:00

Analyte	Method	LOR	Unit	KS2100501-001	BCDWQG MAC					
<b>Total Metals</b>										
lead, total	E420	0.000050	mg/L	0.0184	0.005					

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

Not good on Pre-flush.  
 Quite over really.



Summary of Guideline Breaches by Sample

Client Sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
			No description available for this compound in this guideline				

Keys:

BCDWQG

MAC

British Columbia Drinking Water Quality Guidelines (JAN, 2021)

Maximum Acceptable Concentrations