

RE: Water lease payment schedule

From: Bailey, Annette FLNR:EX
To: Michelle Dorjgotov <michelled@deepwaterrecovery.com>
Cc: Mark Jurisich <mark@deepwaterrecovery.com>
Sent: October 19, 2021 10:51:54 AM PDT
Attachments: image001.png
Hi Michelle

I have spoken to our Finance department and they have provided the following information regarding your request for the payment plan.

You are required to send an email to this address

CoastRevenue@gov.bc.ca

The email should contain your file number 0021050, company name, the reason why you want monthly payments including the amount of your new rent versus your old rent. You can also indicate that I am the land officer on the file.

Finance has indicated they will discuss the request with you and will send your request for approval.

Thanks
Annette

From: Michelle Dorjgotov <michelled@deepwaterrecovery.com>
Sent: October 19, 2021 8:43 AM
To: Bailey, Annette FLNR:EX <Annette.Bailey@gov.bc.ca>
Cc: Mark Jurisich <mark@deepwaterrecovery.com>
Subject: Water lease payment schedule

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Hi Annette,

I was wondering whether a monthly payment schedule would be considered in order to facilitate our cash flow. Please advise.

Kind regards,
Michelle Dorjgotov
Administration Manager
Office: +1(778) 427-1133



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*This email is not spam.

FW: File No 0021050

From: Bailey, Annette FLNR:EX
To: Mark Jurisich <mark@deepwaterrecovery.com>
Cc: Michelle Dorjgotov <michelled@deepwaterrecovery.com>
Sent: October 21, 2021 12:01:36 PM PDT
Attachments: image006.png, image008.png, image001.png, image007.png
Here is the amount owing

Thanks
Annette

From: Bailey, Annette FLNR:EX
Sent: October 21, 2021 11:52 AM
To: 'Michelle Dorjgotov' <michelled@deepwaterrecovery.com>
Subject: RE: File No 0021050

Hi Michelle

I spoke to Mark this morning and he indicated he would write a check today and deliver it.

The amount owing on the tenure is \$57,522.13

This is the remainder owing as indicated in the Notice of Final review when you subtract the cheque we have already received.

Thanks
Annette

From: Michelle Dorjgotov <michelled@deepwaterrecovery.com>
Sent: October 20, 2021 4:46 PM
To: Bailey, Annette FLNR:EX <Annette.Bailey@gov.bc.ca>
Subject: Re: File No 0021050

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Annette,

Thanks for looking into this matter closely. Much appreciated.

Kind regards,
Michelle Dorjgotov
Administration Manager
Office: +1(778) 427-1133



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From: "Bailey, Annette FLNR:EX" <Annette.Bailey@gov.bc.ca>
Date: Wednesday, October 20, 2021 at 2:55 PM
To: Michelle Dorjgotov <michelled@deepwaterrecovery.com>
Subject: RE: File No 0021050

Hi Michelle

Thank you for the information.

I have spoken with Finance to understand the process a bit more.

As it turns out it is not possible to extend credit prior to Deepwater having a current tenure for the new purpose.

A payment plan cannot be offered until the new tenure is in place and in good standing.

Payment plans are not offered for a long time but are a temporary fix to help companies through a rough patch.

A payment plan can probably be revisited at the tenure anniversary date.

Thanks

Annette

From: Michelle Dorjgotov <michelled@deepwaterrecovery.com>

Sent: October 20, 2021 8:46 AM

To: Bailey, Annette FLNR:EX <Annette.Bailey@gov.bc.ca>

Subject: FW: File No 0021050

Importance: High

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Hi Annette,

I received below reply ... Please advise.

Kind regards,

Michelle Dorjgotov

Administration Manager

Office: +1(778) 427-1133



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From: "CoastRevenue CSNR:EX" <CoastRevenue@gov.bc.ca>

Date: Wednesday, October 20, 2021 at 8:10 AM

To: Michelle Dorjgotov <michelled@deepwaterrecovery.com>

Subject: RE: File No 0021050

Hi Michelle,

I must apologize. It looks like I have misinformed you. I cannot provide a payment plan for the new amount on your tenure as it doesn't appear to be completed yet. On the system you are only owing so far, for the \$5382.72. You will need to reach out to your tenure contact and let them know your situation and see if you can come to an agreement with them. It might be a good idea to start with them to have a better idea on how to make your payment. After that, they will inform me on how to proceed. Again, I apologize and if you require anything further, please let me know.

Thank you,

Shilo Nicholson
Corporate Services Analyst
Coast Area | Client Services Branch | Corporate Services
Corporate Services for the Natural Resource Ministries

From: Michelle Dorjgotov <michelled@deepwaterrecovery.com>
Sent: October 19, 2021 2:04 PM
To: CoastRevenue CSNR:EX <CoastRevenue@gov.bc.ca>
Subject: Re: File No 0021050

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Hi Shilo,

Thanks for your response. How about 11 payments of \$4,900 and then the last one will be 4,650.68 in Sept 2022?

Kind regards,
Michelle Dorjgotov
Administration Manager
Office: +1(778) 427-1133



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From: "CoastRevenue CSNR:EX" <CoastRevenue@gov.bc.ca>
Date: Tuesday, October 19, 2021 at 1:56 PM
To: Michelle Dorjgotov <michelled@deepwaterrecovery.com>
Subject: RE: File No 0021050

Hi Michelle,

I am happy to help with this. Do you have an amount in mind that you are able to afford, or do you want me to crunch the numbers and let you know? I see a total of \$58,550.68 that will need to be paid by September 2022. Let me know your thoughts and I am happy to get the process moving for you.

Thank you,

Shilo Nicholson
Corporate Services Analyst
Coast Area | Client Services Branch | Corporate Services
Corporate Services for the Natural Resource Ministries

From: Michelle Dorjgotov <michelled@deepwaterrecovery.com>
Sent: October 19, 2021 11:42 AM
To: CoastRevenue CSNR:EX <CoastRevenue@gov.bc.ca>
Subject: File No 0021050

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Hello,

I am reaching out to your office to request a monthly payment plan. The reason is to facilitate our cash flow because our old rent was \$5,382.72 but our new rent is \$54,734.00.

- File No 0021050
- Company Name: Deep Water Recovery Ltd

Please note that Annette Bailey is the land officer on the file.

Kind regards,
Michelle Dorjgotov
Administration Manager
Office: +1(778) 427-1133



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Concerns received regarding land tenure

From: Bailey, Annette FLNR:EX
To: Mark Jurisich <mark@deepwaterrecovery.com>
Sent: November 23, 2021 2:26:38 PM PST
Hi Mark

I want to keep you informed about a recent concern that was received by the K'omoks First Nation. The concern was submitted by a person who wishes to remain anonymous. Here is a summary of the concern;

November 22nd, 2021

On the weekend of November 20th, 2021 the Guardians received an anonymous tip of hazardous work and potentially illegal operations at the industrial property north of Union Bay owned by Deep Water Recovery (formerly a log sort). The property was purchased to dismantle ships by way of beaching the ship and cutting apart on the shore. The anonymous caller said they are not using any means of containing the hazardous materials that may come from the ship such as lead paint, oils, and other waste materials. The staff are not wearing the proper PPE when working. They had an issue with flooding on the property and used excavators to landscape the property and went over their property line and into the park to the left of the property. One of the ships was being dismantled and they discovered a caustic material that was bubbling and spilling onto the shore and into the ocean. They tried sucking the material out of the ship with a truck (possibly a hydro vac). The material began to melt the hoses on the truck, so they dug a hole on the property and buried the material.

This site is within close proximity to salmon bearing streams, important cultural and archaeological sites, and many aquaculture farms in Baynes Sound. This site was deemed contaminated before Deep Water Recovery purchased it and should never have been allowed to beach large ships which disturb the already contaminated sediments, nor should they have excavated on the property.

K'omoks First Nation has contacted the Province Compliance and Enforcement (C&E) division. Earlier today I spoke to the lead C&E person and he has indicated they are doing a bit of investigation and will probably do a site visit this week to view and address the concerns.

I am not sure if you have heard from C&E but I wanted to give you this information.

K'omoks First Nation have indicated they would like to meet with the Province to discuss developing a robust compliance regime to address their concerns.

I will keep you posted if I receive any further information.

Thanks

Annette Bailey, RPBio
Senior Project Manager
Habitat Officer | Water Officer
South Island Natural Resource District
4885 Cherry Creek Road
Port Alberni, BC V9Y 8E9
250-736-6843

Voice Mail (45 seconds)

From: s.22
s.15, Microsoft Outlook

To: Bailey, Annette FLNR:EX <Annette.Bailey@gov.bc.ca>

Sent: November 30, 2021 12:18:05 PM PST

Attachments: s.22 (45 seconds) Voice Mail.mp3

You received a voice message from s.22

Caller-Id: s.22

Sump Facility Monitoring - Sampling Event

From: Rob Waters <s.22 >
To: Mark Jurisich <mark@deepwaterrecovery.com>
Cc: Bailey, Annette FLNR:EX <Annette.Bailey@gov.bc.ca>, Dena Balla <dena@deepwaterrecovery.com>
Sent: December 1, 2021 3:16:57 PM PST

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Hi Marc,

Further to our telephone conversation this morning on sampling the sump at DeepWater Recovery my plan is to make the site visit Tuesday December 14, 2021.

The water and sediment sampling will follow the procedures as laid out in the proposed sampling plan.

I trust this is satisfactory.

Regards,

Rob

Castor Consultants Ltd.
13719 Jennifer Road
Ladysmith BC V9G 1G4

s.22

Telephone: 250-245-0225

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Withheld pursuant to/removed as

s.21

Fwd: Deep Water Recovery Sump Sampling Rescheduled

From: Rob Waters <s.22 >
To: Bailey, Annette FLNR:EX <Annette.Bailey@gov.bc.ca>
Sent: December 14, 2021 9:09:54 AM PST

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Warmer weather!!

Cheers
Rob

Sent from my iPhone

Begin forwarded message:

From: Rob Waters <s.22 >
Date: December 14, 2021 at 9:01:39 AM PST
To: "Bailey, Annette FLNR:EX" <Annette.Bailey@gov.bc.ca>
Subject: Re: Deep Water Recovery Sump Sampling Rescheduled

Hi Annette
Well perhaps the next sampling event will have warmer better!

Given the holiday season I would anticipate getting the results in January. I'll keep you posted.

Best wishes of the season to you and the staff!

Rob

Sent from my iPhone

On Dec 14, 2021, at 8:26 AM, Bailey, Annette FLNR:EX
<Annette.Bailey@gov.bc.ca> wrote:

Thanks Rob.

I am unable to attend the 17th but we are interested in the reports. When will you have the results from the reports?

Thanks

Annette

-----Original Message-----

From: Rob Waters <s.22 >

Sent: December 14, 2021 6:49 AM

To: Bailey, Annette FLNR:EX <Annette.Bailey@gov.bc.ca>

Cc: Mark Jurisich <mark@deepwaterrecovery.com>

Subject: Deep Water Recovery Sump Sampling Rescheduled

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Good morning Annette,

Sorry for the short notice but todays scheduled sampling at Deep Water Recovery in union Bay has been postponed to this Friday December 17, 2021.

Regards

Rob

Castor Consultants Ltd.

13719 Jennifer Road

Ladysmith BC V9G 1G4

s.22

Telephone: 250-245-0225

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s.21

Voice Mail (18 seconds)

From: s.22
s.15, Microsoft Outlook

To: Bailey, Annette FLNR:EX <Annette.Bailey@gov.bc.ca>

Sent: December 23, 2021 9:30:29 AM PST

Attachments: s.22 (18 seconds) Voice Mail.mp3

You received a voice message from s.22

Caller-Id: s.22

2021-12-30 Insurance w/Environmental 0021050

From: Bailey, Annette FLNR:EX <Annette.Bailey@gov.bc.ca>
To: Blight, Melanie FLNR:EX <Melanie.Blight@gov.bc.ca>
Sent: December 30, 2021 8:43:24 AM PST
Attachments: image003.png, image004.png, Deep Water Recovery Ltd - PLL Binder.pdf
For the file

From: Michelle Dorjgotov <michelled@deepwaterrecovery.com>
Sent: December 29, 2021 7:04 PM
To: Bailey, Annette FLNR:EX <Annette.Bailey@gov.bc.ca>
Subject: FW: Pollution binder

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Hi Annette,

Thanks for your email. Please find attached.

Kind regards,
Michelle Dorjgotov
Administration Manager
Office: +1(778) 427-1133
A picture containing drawing
Description automatically generated

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s.21

Page 021 of 166 to/à Page 025 of 166

Withheld pursuant to/removed as

s.21

0021050 Pollution binder insurance

From: Bailey, Annette FLNR:EX
To: Blight, Melanie FLNR:EX <Melanie.Blight@gov.bc.ca>
Sent: December 30, 2021 8:43:24 AM PST
Attachments: image003.png, image004.png, Deep Water Recovery Ltd - PLL Binder.pdf
For the file

From: Michelle Dorjgotov <michelled@deepwaterrecovery.com>
Sent: December 29, 2021 7:04 PM
To: Bailey, Annette FLNR:EX <Annette.Bailey@gov.bc.ca>
Subject: FW: Pollution binder

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Hi Annette,

Thanks for your email. Please find attached.

Kind regards,
Michelle Dorjgotov
Administration Manager
Office: +1(778) 427-1133
A picture containing drawing
Description automatically generated

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Page 027 of 166 to/à Page 028 of 166

Withheld pursuant to/removed as

s.21

Re: Results from testing

From: Rob Waters <s.22>
To: Bailey, Annette FLNR:EX <Annette.Bailey@gov.bc.ca>
Cc: Michelle Dorjgotov <michelled@deepwaterrecovery.com>
Sent: January 12, 2022 8:30:08 AM PST

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Good morning Annette

The lab advised it is working through a holiday backlog. Will be in touch on that in due course. On inspection reports over the holidays perhaps Michelle can advise.

Cheers

Rob

Sent from my iPhone

On Jan 11, 2022, at 10:57 AM, R WATERS <s.22> wrote:

Happy New Year Annette,

Thanks for the note. I am awaiting feedback from the lab on the results.

I will let you know.

Cheers

Rob
Castor Consultants Ltd.
13719 Jennifer Road,
Ladysmith, BC
V9G 1G4

s.22

Office: 250-245-0225

From: "Annette FLNR Bailey, EX" <Annette.Bailey@gov.bc.ca>
To: "robwaters" <s.22>
Cc: "Michelle Dorjgotov" <michelled@deepwaterrecovery.com>
Sent: Tuesday, January 11, 2022 9:15:45 AM
Subject: Results from testing

Hi Rob

Happy New Year

I am wondering if you have any results back from the water sampling at Union Bay, or any inspection reports from the vessels that have arrived at the site.

Thanks

Annette Bailey, RPBio
Senior Project Manager
Habitat Officer | Water Officer
South Island Natural Resource District
4885 Cherry Creek Road
Port Alberni, BC V9Y 8E9
250-736-6843

Question regarding 0021050 - Union Bay

From: Bailey, Annette FLNR:EX
To: R WATERS <[s.22](#)>
Sent: March 2, 2022 8:49:22 AM PST
Hi Rob

I just wanted to check in with you regarding the water sampling at Deepwater Recovery site. Do you have any further results available?

I will be requesting a copy of the reports/results from Mark today.

Thanks

Annette

Re: Report

From: R WATERS <s.22 >
To: Bailey, Annette FLNR:EX <Annette.Bailey@gov.bc.ca>
Cc: Mark <mark@deepwaterrecovery.com>, Michelle Dorjgotov <michelled@deepwaterrecovery.com>
Sent: March 10, 2022 5:19:20 PM PST
Attachments: Table 1 December 2021 Results Summary.xlsx, VA21C8170_0_COA - Merged.pdf, VA21C8170.xlsx, VA22A1190_0_XLR.xlsx, VA22A1190.xlsx, image001.png, VA22A1190_0_COA - Merged.pdf, VA21C8170_0_XLR.xlsx, Table 3 Field Observations Deep water Recovery Runoff Water Testing Results Summary December 16 2021.xlsx, Table 4 Field Obs Deep water Recovery Runoff Water Testing Results Summary January 20, 2022.xlsx, Table 2 January 2022 Results Summary.xlsx, Draft Deep Water Recovery Runoff Water Quality Data Review February 2, 2022.docx

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Good afternoon,

As requested please find attached the ALS lab reports and our draft summary report for the initial sampling of the sumps and nearby flows at the Deep Water Recovery site in Union Bay. The main and southern sumps were sampled on Dec 16, 2021. The main and southern sumps as well as the nearby flows were sampled January 20, 2022.

Regards

Rob

Castor Consultants Ltd.
13719 Jennifer Road,
Ladysmith, BC
V9G 1G4

s.22

Office: 250-245-0225

From: "Mark" <mark@deepwaterrecovery.com>
To: "robwaters" <s.22 >
Cc: "Annette FLNR Bailey, EX" <Annette.Bailey@gov.bc.ca>
Sent: Friday, March 4, 2022 11:48:49 AM
Subject: Report

Hi Rob,

I was trying to forward to Annette the Water Sampling data and associated reports that you had put together, but I did not have time to go through everything and make a file in order of chronological date order.

Could you please send Annette the correct data and corresponding reports in the order that they were done?

Kind Regards,
Mark R. Jurisich
Operations Manager - Canada



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Report To Rob Waters, Castor Consultants Limited
13719 Jennifer Road

Ladysmith, BC V9G 1G4, Canada

Date Received 17-Dec-2021 09:20
Issue Date 13-Jan-2022 12:17
Amendment 0
Version FINAL

Client Phone **s.22**

Certificate of Analysis

Lab Work Order # VA21C8170
Project PO #
Project DEEP WATER RECOVERY
Legal Site Description
C of C Numbers 17-835609

Comments

Where possible, RLC will store samples for the following durations, measured from date of sample submission: 30 days for soil and water samples, 6 months for Tissue/Biota samples; 14 days for air samples collected on re-usable media; and 3 days for water samples submitted for microbiological testing. Longer storage times are available upon request.

Temperature 4

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.

<u>Signatories</u>	<u>Position</u>	<u>Laboratory Department</u>
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Paul Cushing	Team Leader - Organics	Organics, Burnaby, British Columbia
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Owen Cheng		Metals, Burnaby, British Columbia
Dee Lee	Analyst	Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Christopher Li	Lab Assistant	Metals, Burnaby, British Columbia

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Results of Analysis VA21C8170

Project
Report To
Date Received
Issue Date
Amendment

DEEP WATER RECOVERY
Risk Waters, Center Consultants Limited
17-Dec-2021 09:20
13-Jan-2022 12:17
0

Analyte	ALS Sample ID	Client Sample ID	Matrix	Sub-Matrix	Method	Results	Detection Limit	Units	Qual	Date Sampled	Time Sampled	Prep Date	Analysis Date	QC Lot	QC Eval	Hold Time Eval
Physical Tests (Matrix: Water)																
hardness (as CaCO ₃), dissolved	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	EC100	50.9	0.60	mg/L		16-Dec-2021	12:00		13-Jan-2022		✓	✓
hardness (as CaCO ₃), from total Ca/Mg	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	EC100A	79.8	0.60	mg/L		16-Dec-2021	12:00		16-Jan-2022		✓	✓
pH	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E108	7.51	0.10	pH units		16-Dec-2021	12:00	24-Dec-2021	24-Dec-2021	376396	✓	✗
turbidity	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E121	261	0.10	NTU		16-Dec-2021	12:00		16-Dec-2021	371977	✓	✓
Total Metals (Matrix: Water)																
aluminum, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	11.8	0.0030	mg/L		16-Dec-2021	12:00	08-Jan-2022	09-Jan-2022	382322	✓	✓
antimony, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	0.00003	0.00010	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
arsenic, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	0.00004	0.00010	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
barium, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	0.0633	0.0010	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
beryllium, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	0.000137	0.000100	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
bismuth, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	<0.00050	0.000050	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
boron, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	0.007	0.010	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
cadmium, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	0.000195	0.000050	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
calcium, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	15.6	0.050	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
cesium, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	0.000233	0.000010	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
chromium, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	0.0046	0.00050	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
cobalt, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	0.00666	0.00010	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
copper, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	1.20	0.00050	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
iron, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	19.5	0.010	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
lead, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	0.0001	0.000050	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
lithium, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	0.00055	0.0010	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
magnesium, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	8.86	0.0050	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
manganese, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	0.728	0.00010	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
mercury, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E509	0.0000119	0.000010	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
molybdenum, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	0.000007	0.000050	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
nickel, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	0.0188	0.00050	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
phosphorus, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	0.378	0.050	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
potassium, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	1.77	0.050	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
rubidium, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	0.000044	0.000030	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
selenium, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	0.000182	0.000050	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
silicon, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	16.7	0.10	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
silver, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	0.000078	0.000010	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
sodium, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	34.8	0.050	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
strontium, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	0.0046	0.00030	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
sulfur, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	4.15	0.50	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
thallium, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	<0.000020	0.000020	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
thorium, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	0.0000119	0.000010	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
tin, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	0.00016	0.00010	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
titanium, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	0.894	0.00030	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
tungsten, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	<0.00010	0.000010	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
uranium, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	0.000131	0.000010	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
vanadium, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	0.0446	0.00050	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
zinc, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	0.341	0.0030	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
zirconium, total	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E420	0.000007	0.000030	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
Dissolved Metals (Matrix: Water)																
aluminum, dissolved	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E421	0.872	0.0010	mg/L		16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
antimony, dissolved	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E421	0.000008	0.000010	mg/L		16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
arsenic, dissolved	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E421	0.00002	0.00010	mg/L		16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
barium, dissolved	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E421	0.0190	0.00010	mg/L		16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
beryllium, dissolved	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E421	<0.000100	0.000100	mg/L		16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
bismuth, dissolved	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E421	<0.000050	0.000050	mg/L		16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
boron, dissolved	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E421	0.027	0.010	mg/L		16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
cadmium, dissolved	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E421	0.0000321	0.0000050	mg/L		16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
calcium, dissolved	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E421	12.1	0.050	mg/L		16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
cesium, dissolved	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E421	0.000004	0.000010	mg/L		16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
chromium, dissolved	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E421	0.00008	0.00050	mg/L		16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
cobalt, dissolved	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E421	0.00056	0.00010	mg/L		16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
copper, dissolved	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E421	0.0204	0.00030	mg/L		16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
iron, dissolved	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E421	1.45	0.010	mg/L		16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
lead, dissolved	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E421	0.000371	0.000050	mg/L		16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
lithium, dissolved	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E421	<0.0010	0.0010	mg/L		16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
magnesium, dissolved	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E421	5.02	0.0050	mg/L		16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
mercury, dissolved	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E509	0.0000046	0.0000050	mg/L		16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	381686	✓	✓
molybdenum, dissolved	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E421	0.0000777	0.000050	mg/L		16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
nickel, dissolved	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E421	0.000233	0.00050	mg/L		16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
phosphorus, dissolved	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E421	<0.002	0.0050	mg/L		16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
potassium, dissolved	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E421	1.65	0.050	mg/L		16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
rubidium, dissolved	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E421	0.000070	0.00030	mg/L		16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
selenium, dissolved	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E421	0.000085	0.000050	mg/L		16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
silver, dissolved	VA21C8170-001	DEE WATER DWR - SUMP 1	Water	Water	E421	0.00001	0.00010	mg/L		16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
sulfur, dissolved	VA21C8170-001	DEE WATER DWR - SUMP 1</														

cadmium, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	0.037	0.010	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
calcium, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	0.000967	0.000050	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
caesium, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	27.9	0.050	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
cesium, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	0.000219	0.000010	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
chromium, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	0.0180	0.00000	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
cobalt, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	0.00086	0.00010	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
copper, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	0.109	0.00000	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
iron, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	15.1	0.010	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
lead, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	0.0156	0.000050	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
lithium, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	0.0051	0.0010	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
magnesium, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	11.2	0.0000	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
manganese, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	0.762	0.00010	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
mercury, total	VA21C8170-002	DWR-SUMP2	Water	Water	E508	0.0000434	0.000050	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	381296	✓	✓
molybdenum, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	0.000392	0.000050	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
nickel, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	0.0131	0.00000	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
phosphorus, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	0.264	0.050	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
potassium, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	2.39	0.050	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
rubidium, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	0.00051	0.00030	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
selenium, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	0.000173	0.000050	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
silicon, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	19.3	0.10	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
silver, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	0.000056	0.000010	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
sodium, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	27.4	0.050	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
strontium, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	0.122	0.00030	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
sulfur, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	2.81	0.050	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
tellurium, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	<0.00020	0.00030	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
thallium, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	0.000016	0.000010	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
thorium, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	0.00016	0.00010	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
tin, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	0.00021	0.00010	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
titanium, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	0.706	0.00030	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
tungsten, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	<0.00010	0.00010	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
uranium, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	0.000140	0.000010	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
vanadium, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	0.0403	0.00050	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
zinc, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	0.0115	0.0000	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
zincium, total	VA21C8170-002	DWR-SUMP2	Water	Water	E420	0.00158	0.00030	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	382322	✓	✓
Dissolved Metals (Matrix: Water)															
aluminum, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E421	0.668	0.0010	mg/L	16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
antimony, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E421	0.00016	0.00010	mg/L	16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
arsenic, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E421	0.00061	0.00010	mg/L	16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
barium, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E421	0.0162	0.00010	mg/L	16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
beryllium, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E421	<0.000100	0.000100	mg/L	16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
bismuth, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E421	<0.00050	0.000050	mg/L	16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
boron, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E421	0.034	0.010	mg/L	16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
cadmium, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E421	0.0000138	0.000050	mg/L	16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
calcium, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E421	23.7	0.050	mg/L	16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
cesium, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E421	<0.00010	0.000010	mg/L	16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
chromium, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E421	0.00185	0.00030	mg/L	16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
cobalt, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E421	0.00035	0.00010	mg/L	16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
copper, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E421	0.0249	0.00030	mg/L	16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
iron, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E421	1.20	0.010	mg/L	16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
lead, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E421	0.00188	0.000050	mg/L	16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
lithium, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E421	<0.0010	0.00010	mg/L	16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
magnesium, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E421	6.16	0.0050	mg/L	16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
manganese, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E421	0.0084	0.00010	mg/L	16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
mercury, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E509	0.0000101	0.000050	mg/L	16-Dec-2021	12:00	08-Jan-2022	08-Jan-2022	381686	✓	✓
molybdenum, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E421	0.00376	0.000050	mg/L	16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
nickel, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E421	0.00125	0.00010	mg/L	16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
phosphorus, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E421	<0.030	0.050	mg/L	16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
potassium, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E421	2.20	0.050	mg/L	16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
rubidium, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E421	0.000174	0.00030	mg/L	16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
selenium, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E421	0.000080	0.000050	mg/L	16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
silicon, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E421	7.27	0.050	mg/L	16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
silver, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E421	0.000011	0.000010	mg/L	16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
sodium, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E421	25.1	0.050	mg/L	16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
strontium, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E421	0.105	0.00030	mg/L	16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
sulfur, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E421	2.86	0.050	mg/L	16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
tellurium, dissolved	VA21C8170-002	DWR-SUMP2	Water	Water	E421	<0.00020	0.00030	mg/L	16-Dec-2021	12:00	11-Jan-2022	11-Jan-2022	383503	✓	✓
thallium, dissolved	VA21C8170-002	DWR-SUMP2													

Detection Limits VA21C8170

Project DEEP WATER RECOVERY
Report To Rob Waters, Castor Consultants Limited
Date Received 17-Dec-2021 09:20
Issue Date 13-Jan-2022 12:17
Amendment 0

Client Sample ID	DEE WATER DWR - SUMP 1	DWR-SUMP2
Date Sampled	16-Dec-2021	16-Dec-2021
Time Sampled	12:00	12:00
ALS Sample ID	VA21C8170-001	VA21C8170-002
Analyte	Units	Sub-Matrix: Water

Physical Tests (Matrix: Water)

hardness (as CaCO ₃), dissolved	mg/L	0.60	0.60
hardness (as CaCO ₃), from total Ca/Mg	mg/L	0.60	0.60
pH	pH units	0.10	0.10
turbidity	NTU	0.10	0.10

Total Metals (Matrix: Water)

aluminum, total	mg/L	0.0030	0.0030
antimony, total	mg/L	0.00010	0.00010
arsenic, total	mg/L	0.00010	0.00010
barium, total	mg/L	0.00010	0.00010
beryllium, total	mg/L	0.000100	0.000100
bismuth, total	mg/L	0.000050	0.000050
boron, total	mg/L	0.010	0.010
cadmium, total	mg/L	0.0000050	0.0000050
calcium, total	mg/L	0.050	0.050
cesium, total	mg/L	0.000010	0.000010
chromium, total	mg/L	0.00050	0.00050
cobalt, total	mg/L	0.00010	0.00010
copper, total	mg/L	0.00050	0.00050
iron, total	mg/L	0.010	0.010
lead, total	mg/L	0.000050	0.000050
lithium, total	mg/L	0.0010	0.0010
magnesium, total	mg/L	0.0050	0.0050
manganese, total	mg/L	0.00010	0.00010
mercury, total	mg/L	0.0000050	0.0000050
molybdenum, total	mg/L	0.000050	0.000050
nickel, total	mg/L	0.00050	0.00050
phosphorus, total	mg/L	0.050	0.050
potassium, total	mg/L	0.050	0.050
rubidium, total	mg/L	0.00020	0.00020
selenium, total	mg/L	0.000050	0.000050
silicon, total	mg/L	0.10	0.10
silver, total	mg/L	0.000010	0.000010
sodium, total	mg/L	0.050	0.050
strontium, total	mg/L	0.00020	0.00020
sulfur, total	mg/L	0.50	0.50
tellurium, total	mg/L	0.00020	0.00020
thallium, total	mg/L	0.000010	0.000010
thorium, total	mg/L	0.00010	0.00010

tin, total	mg/L	0.00010	0.00010
titanium, total	mg/L	0.00030	0.00030
tungsten, total	mg/L	0.00010	0.00010
uranium, total	mg/L	0.000010	0.000010
vanadium, total	mg/L	0.00050	0.00050
zinc, total	mg/L	0.0030	0.0030
zirconium, total	mg/L	0.00020	0.00020

Dissolved Metals (Matrix: Water)

aluminum, dissolved	mg/L	0.0010	0.0010
antimony, dissolved	mg/L	0.00010	0.00010
arsenic, dissolved	mg/L	0.00010	0.00010
barium, dissolved	mg/L	0.00010	0.00010
beryllium, dissolved	mg/L	0.000100	0.000100
bismuth, dissolved	mg/L	0.000050	0.000050
boron, dissolved	mg/L	0.010	0.010
cadmium, dissolved	mg/L	0.0000050	0.0000050
calcium, dissolved	mg/L	0.050	0.050
cesium, dissolved	mg/L	0.000010	0.000010
chromium, dissolved	mg/L	0.00050	0.00050
cobalt, dissolved	mg/L	0.00010	0.00010
copper, dissolved	mg/L	0.00020	0.00020
iron, dissolved	mg/L	0.010	0.010
lead, dissolved	mg/L	0.000050	0.000050
lithium, dissolved	mg/L	0.0010	0.0010
magnesium, dissolved	mg/L	0.0050	0.0050
manganese, dissolved	mg/L	0.00010	0.00010
mercury, dissolved	mg/L	0.0000050	0.0000050
molybdenum, dissolved	mg/L	0.000050	0.000050
nickel, dissolved	mg/L	0.00050	0.00050
phosphorus, dissolved	mg/L	0.050	0.050
potassium, dissolved	mg/L	0.050	0.050
rubidium, dissolved	mg/L	0.00020	0.00020
selenium, dissolved	mg/L	0.000050	0.000050
silicon, dissolved	mg/L	0.050	0.050
silver, dissolved	mg/L	0.000010	0.000010
sodium, dissolved	mg/L	0.050	0.050
strontium, dissolved	mg/L	0.00020	0.00020
sulfur, dissolved	mg/L	0.50	0.50
tellurium, dissolved	mg/L	0.00020	0.00020
thallium, dissolved	mg/L	0.000010	0.000010
thorium, dissolved	mg/L	0.00010	0.00010
tin, dissolved	mg/L	0.00010	0.00010
titanium, dissolved	mg/L	0.00030	0.00030
tungsten, dissolved	mg/L	0.00010	0.00010
uranium, dissolved	mg/L	0.000010	0.000010
vanadium, dissolved	mg/L	0.00050	0.00050
zinc, dissolved	mg/L	0.0010	0.0010
zirconium, dissolved	mg/L	0.00020	0.00020
dissolved mercury filtration location			
dissolved metals filtration location			

Hydrocarbons (Matrix: Water)

EPH (C10-C19)	µg/L	250	250
EPH (C19-C32)	µg/L	250	250

LEPHw	µg/L	250	250
HEPHw	µg/L	250	250

Hydrocarbons Surrogates (Matrix: Water)

bromobenzotrifluoride, 2- (EPH surr)	%	1.0	1.0
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Polycyclic Aromatic Hydrocarbons (Matrix: Water)

acenaphthene	µg/L	0.010	0.010
acenaphthylene	µg/L	0.010	0.010
acridine	µg/L	0.015	0.010
anthracene	µg/L	0.027	0.021
benz(a)anthracene	µg/L	0.010	0.010
benzo(a)pyrene	µg/L	0.0050	0.0050
benzo(b+j)fluoranthene	µg/L	0.010	0.010
benzo(b+j+k)fluoranthene	µg/L	0.015	0.015
benzo(g,h,i)perylene	µg/L	0.010	0.010
benzo(k)fluoranthene	µg/L	0.010	0.010
chrysene	µg/L	0.010	0.010
dibenz(a,h)anthracene	µg/L	0.0050	0.0050
fluoranthene	µg/L	0.010	0.010
fluorene	µg/L	0.010	0.010
indeno(1,2,3-c,d)pyrene	µg/L	0.010	0.010
methylnaphthalene, 1-	µg/L	0.010	0.010
methylnaphthalene, 2-	µg/L	0.010	0.010
naphthalene	µg/L	0.050	0.050
phenanthrene	µg/L	0.020	0.020
pyrene	µg/L	0.010	0.010
quinoline	µg/L	0.050	0.060

Polycyclic Aromatic Hydrocarbons Surrogates (Matrix: Water)

chrysene-d12	%	0.1	0.1
naphthalene-d8	%	0.1	0.1
phenanthrene-d10	%	0.1	0.1

Duplicates VA21C8170

Project DEEP WATER RECOVERY
Report To Rob Waters, Castor Consultants Limited
Date Received 17-Dec-2021 09:20
Issue Date 13-Jan-2022 12:17
Amendment 0

ALS ID	Reference	Client Sample ID	QC Type	QC Lot	Analyte	Method	Sample Result	Duplicate Result	Detection Limit Units	RPD(%) or Diff.	Duplicate Limits	Qual	Eval
Physical Tests (Matrix: Water)													
QC-371977-004	Anonymous	Anonymous	DUP	371977	turbidity	E121	3.65	3.54	0.1 NTU	2.84%	15		✓
QC-MRG3-376398006	Anonymous	Anonymous	DUP	376396	pH	E108	5.22	5.23	0.1 pH units	0.230%	4		✓
Total Metals (Matrix: Water)													
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	aluminum, total	E420	<0.0150	<0.0150	0.003 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	antimony, total	E420	0.00062	0.00059	0.0001 mg/L	0.00004	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	arsenic, total	E420	0.00596	0.00619	0.0001 mg/L	3.84%	20		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	barium, total	E420	0.0347	0.0348	0.0001 mg/L	0.145%	20		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	beryllium, total	E420	<0.000100	<0.000100	0.00002 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	bismuth, total	E420	<0.000250	<0.000250	0.00005 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	boron, total	E420	1.64	1.62	0.01 mg/L	1.01%	20		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	cadmium, total	E420	<0.0000300	<0.0000300	0.000005 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	calcium, total	E420	257	251	0.05 mg/L	2.19%	20		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	cesium, total	E420	<0.000050	<0.000050	0.00001 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	chromium, total	E420	<0.00250	<0.00250	0.0005 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	cobalt, total	E420	<0.00050	<0.00050	0.0001 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	copper, total	E420	0.00788	0.00880	0.0005 mg/L	0.00092	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	iron, total	E420	<0.050	<0.050	0.01 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	lead, total	E420	<0.000250	<0.000250	0.00005 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	lithium, total	E420	0.0200	0.0203	0.001 mg/L	0.0003	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	magnesium, total	E420	347	340	0.005 mg/L	2.22%	20		✓
QC-381296-004	Anonymous	Anonymous	DUP	381296	mercury, total	E508	0.0000053	0.0000065	0.000005 mg/L	0.0000012	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	molybdenum, total	E420	0.0564	0.0551	0.00005 mg/L	2.31%	20		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	nickel, total	E420	<0.00250	<0.00250	0.0005 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	phosphorus, total	E420	<0.250	<0.250	0.05 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	potassium, total	E420	40.2	40.3	0.05 mg/L	0.257%	20		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	rubidium, total	E420	0.00445	0.00433	0.0002 mg/L	0.00012	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	selenium, total	E420	0.0126	0.0138	0.00005 mg/L	9.07%	20		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	sulfur, total	E420	13.7	13.4	0.1 mg/L	2.22%	20		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	silver, total	E420	<0.000050	<0.000050	0.00001 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	sodium, total	E420	602	586	0.05 mg/L	2.55%	20		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	strontium, total	E420	6.04	5.89	0.0002 mg/L	2.52%	20		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	sulfur, total	E420	1000	1000	0.5 mg/L	0.252%	20		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	tellurium, total	E420	<0.00100	<0.00100	0.0002 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	thallium, total	E420	<0.000050	<0.000050	0.00001 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	thorium, total	E420	<0.00050	<0.00050	0.0001 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	tin, total	E420	<0.00050	<0.00050	0.0001 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	titanium, total	E420	<0.00150	<0.00150	0.0003 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	tungsten, total	E420	<0.00050	<0.00050	0.0001 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	uranium, total	E420	0.00656	0.00651	0.00001 mg/L	0.877%	20		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	vanadium, total	E420	<0.00250	<0.00250	0.0005 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	zinc, total	E420	<0.0150	<0.0150	0.003 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	zirconium, total	E420	<0.00100	<0.00100	0.0002 mg/L	0	Diff <2x LOR		✓
Dissolved Metals (Matrix: Water)													
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	aluminum, dissolved	E421	<0.0100	<0.0100	0.001 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	antimony, dissolved	E421	0.00561	0.00593	0.0001 mg/L	0.00031	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	arsenic, dissolved	E421	0.0142	0.0140	0.0001 mg/L	1.14%	20		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	barium, dissolved	E421	0.0220	0.0224	0.0001 mg/L	2.07%	20		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	beryllium, dissolved	E421	<0.000200	<0.000200	0.00002 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	bismuth, dissolved	E421	<0.000500	<0.000500	0.00005 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	boron, dissolved	E421	2.13	2.19	0.01 mg/L	2.80%	20		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	cadmium, dissolved	E421	0.0000540	0.0000604	0.000005 mg/L	0.0000065	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	calcium, dissolved	E421	332	343	0.05 mg/L	3.18%	20		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	cesium, dissolved	E421	0.000111	0.000116	0.00001 mg/L	0.000005	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	chromium, dissolved	E421	<0.00500	<0.00500	0.0005 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	cobalt, dissolved	E421	<0.00100	<0.00100	0.0001 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	copper, dissolved	E421	0.0704	0.0720	0.0002 mg/L	2.35%	20		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	iron, dissolved	E421	<0.100	<0.100	0.01 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	lead, dissolved	E421	<0.000500	<0.000500	0.00005 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	lithium, dissolved	E421	0.0281	0.0287	0.001 mg/L	0.0006	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	magnesium, dissolved	E421	562	576	0.005 mg/L	2.44%	20		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	manganese, dissolved	E421	0.00502	0.00484	0.0001 mg/L	0.00017	Diff <2x LOR		✓
QC-381686-004	Anonymous	Anonymous	DUP	381686	mercury, dissolved	E509	<0.0000050	<0.0000050	0.000005 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	molybdenum, dissolved	E421	0.0883	0.0900	0.00005 mg/L	1.93%	20		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	nickel, dissolved	E421	0.00576	0.00593	0.0005 mg/L	0.00017	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	phosphorus, dissolved	E421	<0.500	<0.500	0.05 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	potassium, dissolved	E421	110	115	0.05 mg/L	3.80%	20		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	rubidium, dissolved	E421	0.0751	0.0761	0.0002 mg/L	1.25%	20		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	selenium, dissolved	E421	0.0318	0.0315	0.00005 mg/L	0.770%	20		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	silicon, dissolved	E421	6.58	6.72	0.05 mg/L	2.10%	20		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	silver, dissolved	E421	<0.000100	<0.000100	0.00001 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	sodium, dissolved	E421	1290	1290	0.05 mg/L	0.0741%	20		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	strontium, dissolved	E421	13.0	13.3	0.0002 mg/L	1.65%	20		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	sulfur, dissolved	E421	2010	2010	0.5 mg/L	0.0219%	20		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	tellurium, dissolved	E421	<0.00200	<0.00200	0.0002 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	thallium, dissolved	E421	<0.000100	<0.000100	0.00001 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	thorium, dissolved	E421	<0.00100	<0.00100	0.0001 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	tin, dissolved	E421	<0.00100	<0.00100	0.0001 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	titanium, dissolved	E421	<0.00300	<0.00300	0.0003 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	tungsten, dissolved	E421	<0.00100	<0.00100	0.0001 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	uranium, dissolved	E421	0.0276	0.0276	0.00001 mg/L	0.0676%	20		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	vanadium, dissolved	E421	0.00817	0.00827	0.0005 mg/L	0.00010	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	zinc, dissolved	E421	0.0106	<0.0100	0.001 mg/L	0.0006	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	zirconium, dissolved	E421	<0.00300	<0.00300	0.0002 mg/L	0	Diff <2x LOR		✓

Evaluation Legend

✓ QC Lot met ALS Data Quality Objectives

Hold Time Exceedance Details VA21C8170

Project DEEP WATER RECOVERY
Report To Rob Waters, Castor Consultants Limited
Date Received 17-Dec-2021 09:20
Issue Date 13-Jan-2022 12:17
Amendment 0

				Preparation				Analysis					
ALS Method Description	Client Sample ID	Method	Sampling Date	Preparation Date	Recommended Holding Time	Actual Holding Times	Eval	Qualifier	Analysis Date	Recommended Holding Time	Actual Holding Times	Eval	Qualifier
Physical Tests (Matrix: Water)													
pH by Meter	DEE WATER DWR - E108		16-Dec-2021						24-Dec-2021 11:54	0.25 hrs	191 hrs	x	EHTR-FM
pH by Meter	DWR-SUMP2	E108	16-Dec-2021						24-Dec-2021 11:54	0.25 hrs	191 hrs	x	EHTR-FM

Legend & Qualifier Definitions

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

Evaluation Legend

x = holding time exceedance

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 above represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added.

If samples are identified above 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 chain of custody, the date of receipt with the time at 00:00 is used for calculation purposes.

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

Methodology VA21C8170

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Method	ALS Test Description	Lab Location	Matrix	Method Reference	Methodology Description
Dissolved Metals (Matrix: Water)					
E421	Dissolved Metals in Water by CRC ICPMS	Vancouver - EnvironmerWater		APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
E509	Dissolved Mercury in Water by CVAAS	Vancouver - EnvironmerWater		APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
EP421	Dissolved Metals Water Filtration	Vancouver - EnvironmerWater		APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
EP509	Dissolved Mercury Water Filtration	Vancouver - EnvironmerWater		APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
Hydrocarbons (Matrix: Water)					
E601A	BC PHCs - EPH by GC-FID	Vancouver - EnvironmerWater		BC MOE Lab Manual	Sample extracts are analyzed by GC-FID for BC hydrocarbon fractions. Light Extractable Petroleum Hydrocarbons (LEPH) and Heavy Extractable Petroleum Hydrocarbons (HEPH) are calculated as follows: LEPH = Extractable Petroleum Hydrocarbons (EPH10-19) minus Acenaphthene, Acridine, Anthracene, Fluorene, Naphthalene and Phenanthrene; HEPH = Extractable Petroleum Hydrocarbons (EPH19-32) minus
EC600A	LEPH and HEPH: EPH-PAH	Vancouver - EnvironmerWater		BC MOE Lab Manual (LEPH and HEPH) (moBenz(a)anthracene, Benzo(a)pyrene, Fluoranthene, and Pyrene.	
Hydrocarbons Surrogates (Matrix: Water)					
E601A	BC PHCs - EPH by GC-FID	Vancouver - EnvironmerWater		BC MOE Lab Manual	Sample extracts are analyzed by GC-FID for BC hydrocarbon fractions.
Physical Tests (Matrix: Water)					
E108	pH by Meter	Vancouver - EnvironmerWater		APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
E121	Turbidity by Nephelometry	Vancouver - EnvironmerWater		APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
EC100A	Hardness (Calculated) from Total Ca/Mg	Vancouver - EnvironmerWater		APHA 2340B	"Hardness (as CaCO3), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
EC100	Dissolved Hardness (Calculated)	Vancouver - EnvironmerWater		APHA 2340B	"Hardness (as CaCO3), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Polycyclic Aromatic Hydrocarbons (Matrix: Water)					
E641A	PAHs by Hexane LVI GC-MS	Vancouver - EnvironmerWater		EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by large volume injection (LVI) GC-MS.
Polycyclic Aromatic Hydrocarbons Surrogates (Matrix: Water)					
E641A	PAHs by Hexane LVI GC-MS	Vancouver - EnvironmerWater		EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by large volume injection (LVI) GC-MS.
Total Metals (Matrix: Water)					
E420	Total Metals in Water by CRC ICPMS	Vancouver - EnvironmerWater		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.
E508	Total Mercury in Water by CVAAS	Vancouver - EnvironmerWater		EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS

Method References

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

Quality Control VA21C8170

Project DEEP WATER RECOVERY
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Amendment 0

QC Type	Analyte	QC Lot	ALS QC ID	Method	Result	Target	Units	%	Limit	Units	Qual	Eval
Physical Tests (Matrix: Water)												
LCS	turbidity	371977	QC-371977-002	E121	205	200 NTU	NTU	102	85-115	%		✓
LCS	pH	376396	QC-376396-001	E108	6.99	7 pH units	pH units	99.9	98-102	%		✓
MB	turbidity	371977	QC-371977-001	E121	<0.10		NTU	-	0.1	NTU		✓
Total Metals (Matrix: Water)												
LCS	mercury, total	381296	QC-381296-002	E508	0.0000927	0.0001 mg/L	mg/L	92.7	80-120	%		✓
MS	mercury, total	381296	Anonymous	E508	0.0000989	0.0001 mg/L	mg/L	98.9	70-130	%		✓
MS	aluminum, total	382322	Anonymous	E420	1.09	1 mg/L	mg/L	109	70-130	%		✓
MS	antimony, total	382322	Anonymous	E420	0.106	0.1 mg/L	mg/L	106	70-130	%		✓
MS	arsenic, total	382322	Anonymous	E420	0.110	0.1 mg/L	mg/L	110	70-130	%		✓
MS	barium, total	382322	Anonymous	E420	ND	0.02 mg/L	mg/L	ND	70-130	%		✓
MS	beryllium, total	382322	Anonymous	E420	0.209	0.2 mg/L	mg/L	104	70-130	%		✓
MS	bismuth, total	382322	Anonymous	E420	0.0460	0.05 mg/L	mg/L	92.1	70-130	%		✓
MS	boron, total	382322	Anonymous	E420	ND	0.1 mg/L	mg/L	ND	70-130	%		✓
MS	cadmium, total	382322	Anonymous	E420	0.0203	0.02 mg/L	mg/L	101	70-130	%		✓
MS	calcium, total	382322	Anonymous	E420	ND	4 mg/L	mg/L	ND	70-130	%		✓
MS	cesium, total	382322	Anonymous	E420	0.0521	0.05 mg/L	mg/L	104	70-130	%		✓
MS	chromium, total	382322	Anonymous	E420	0.206	0.2 mg/L	mg/L	103	70-130	%		✓
MS	cobalt, total	382322	Anonymous	E420	0.0999	0.1 mg/L	mg/L	99.9	70-130	%		✓
MS	copper, total	382322	Anonymous	E420	0.0967	0.1 mg/L	mg/L	96.7	70-130	%		✓
MS	iron, total	382322	Anonymous	E420	10.00	10 mg/L	mg/L	100.0	70-130	%		✓
MS	lead, total	382322	Anonymous	E420	0.0939	0.1 mg/L	mg/L	93.9	70-130	%		✓
MS	lithium, total	382322	Anonymous	E420	0.502	0.5 mg/L	mg/L	100	70-130	%		✓
MS	magnesium, total	382322	Anonymous	E420	ND	1 mg/L	mg/L	ND	70-130	%		✓
MS	molybdenum, total	382322	Anonymous	E420	ND	0.02 mg/L	mg/L	ND	70-130	%		✓
MS	nickel, total	382322	Anonymous	E420	0.196	0.2 mg/L	mg/L	98.2	70-130	%		✓
MS	phosphorus, total	382322	Anonymous	E420	58.4	50 mg/L	mg/L	117	70-130	%		✓
MS	potassium, total	382322	Anonymous	E420	ND	4 mg/L	mg/L	ND	70-130	%		✓
MS	rubidium, total	382322	Anonymous	E420	0.105	0.1 mg/L	mg/L	105	70-130	%		✓
MS	selenium, total	382322	Anonymous	E420	0.219	0.2 mg/L	mg/L	110	70-130	%		✓
MS	silicon, total	382322	Anonymous	E420	ND	10 mg/L	mg/L	ND	70-130	%		✓
MS	silver, total	382322	Anonymous	E420	0.0197	0.02 mg/L	mg/L	98.3	70-130	%		✓
MS	sodium, total	382322	Anonymous	E420	ND	2 mg/L	mg/L	ND	70-130	%		✓
MS	strontium, total	382322	Anonymous	E420	ND	0.02 mg/L	mg/L	ND	70-130	%		✓
MS	sulfur, total	382322	Anonymous	E420	ND	20 mg/L	mg/L	ND	70-130	%		✓
MS	tellurium, total	382322	Anonymous	E420	0.208	0.2 mg/L	mg/L	104	70-130	%		✓
MS	thallium, total	382322	Anonymous	E420	0.0186	0.02 mg/L	mg/L	92.9	70-130	%		✓
MS	thorium, total	382322	Anonymous	E420	0.114	0.1 mg/L	mg/L	114	70-130	%		✓
MS	tin, total	382322	Anonymous	E420	0.103	0.1 mg/L	mg/L	103	70-130	%		✓
MS	titanium, total	382322	Anonymous	E420	0.218	0.2 mg/L	mg/L	109	70-130	%		✓
MS	tungsten, total	382322	Anonymous	E420	0.0981	0.1 mg/L	mg/L	98.1	70-130	%		✓
MS	uranium, total	382322	Anonymous	E420	ND	0.004 mg/L	mg/L	ND	70-130	%		✓
MS	zinc, total	382322	Anonymous	E420	2.02	2 mg/L	mg/L	101	70-130	%		✓
MS	zirconium, total	382322	Anonymous	E420	0.222	0.2 mg/L	mg/L	111	70-130	%		✓
MS	manganese, total	382322	Anonymous	E420	0.0995	0.1 mg/L	mg/L	99.5	70-130	%		✓
MS	vanadium, total	382322	Anonymous	E420	0.521	0.5 mg/L	mg/L	104	70-130	%		✓
LCS	aluminum, total	382322	QC-MRG2-382322002	E420	2.28	2 mg/L	mg/L	114	80-120	%		✓
LCS	antimony, total	382322	QC-MRG2-382322002	E420	1.05	1 mg/L	mg/L	105	80-120	%		✓
LCS	arsenic, total	382322	QC-MRG2-382322002	E420	1.05	1 mg/L	mg/L	105	80-120	%		✓
LCS	barium, total	382322	QC-MRG2-382322002	E420	0.248	0.25 mg/L	mg/L	99.4	80-120	%		✓
LCS	beryllium, total	382322	QC-MRG2-382322002	E420	0.100	0.1 mg/L	mg/L	100	80-120	%		✓
LCS	bismuth, total	382322	QC-MRG2-382322002	E420	1.00	1 mg/L	mg/L	100	80-120	%		✓
LCS	boron, total	382322	QC-MRG2-382322002	E420	1.17	1 mg/L	mg/L	117	80-120	%		✓
LCS	cadmium, total	382322	QC-MRG2-382322002	E420	0.101	0.1 mg/L	mg/L	101	80-120	%		✓
LCS	calcium, total	382322	QC-MRG2-382322002	E420	50.2	50 mg/L	mg/L	100	80-120	%		✓
LCS	cesium, total	382322	QC-MRG2-382322002	E420	0.0496	0.05 mg/L	mg/L	99.2	80-120	%		✓
LCS	chromium, total	382322	QC-MRG2-382322002	E420	0.259	0.25 mg/L	mg/L	104	80-120	%		✓
LCS	cobalt, total	382322	QC-MRG2-382322002	E420	0.255	0.25 mg/L	mg/L	102	80-120	%		✓
LCS	copper, total	382322	QC-MRG2-382322002	E420	0.259	0.25 mg/L	mg/L	103	80-120	%		✓
LCS	iron, total	382322	QC-MRG2-382322002	E420	1.08	1 mg/L	mg/L	108	80-120	%		✓
LCS	lead, total	382322	QC-MRG2-382322002	E420	0.499	0.5 mg/L	mg/L	99.7	80-120	%		✓
LCS	lithium, total	382322	QC-MRG2-382322002	E420	0.255	0.25 mg/L	mg/L	102	80-120	%		✓
LCS	magnesium, total	382322	QC-MRG2-382322002	E420	52.2	50 mg/L	mg/L	104	80-120	%		✓
LCS	manganese, total	382322	QC-MRG2-382322002	E420	0.261	0.25 mg/L	mg/L	104	80-120	%		✓
LCS	molybdenum, total	382322	QC-MRG2-382322002	E420	0.261	0.25 mg/L	mg/L	104	80-120	%		✓
LCS	nickel, total	382322	QC-MRG2-382322002	E420	0.513	0.5 mg/L	mg/L	103	80-120	%		✓
LCS	phosphorus, total	382322	QC-MRG2-382322002	E420	11.6	10 mg/L	mg/L	116	80-120	%		✓
LCS	potassium, total	382322	QC-MRG2-382322002	E420	52.7	50 mg/L	mg/L	105	80-120	%		✓
LCS	rubidium, total	382322	QC-MRG2-382322002	E420	0.108	0.1 mg/L	mg/L	108	80-120	%		✓
LCS	selenium, total	382322	QC-MRG2-382322002	E420	1.07	1 mg/L	mg/L	107	80-120	%		✓
LCS	silicon, total	382322	QC-MRG2-382322002	E420	11.1	10 mg/L	mg/L	111	80-120	%		✓
LCS	silver, total	382322	QC-MRG2-382322002	E420	0.0927	0.1 mg/L	mg/L	92.7	80-120	%		✓
LCS	sodium, total	382322	QC-MRG2-382322002	E420	56.4	50 mg/L	mg/L	113	80-120	%		✓
LCS	strontium, total	382322	QC-MRG2-382322002	E420	0.260	0.25 mg/L	mg/L	104	80-120	%		✓
LCS	sulfur, total	382322	QC-MRG2-382322002	E420	54.5	50 mg/L	mg/L	109	80-120	%		✓
LCS	tellurium, total	382322	QC-MRG2-382322002	E420	0.105	0.1 mg/L	mg/L	105	80-120	%		✓
LCS	thallium, total	382322	QC-MRG2-382322002	E420	0.996	1 mg/L	mg/L	99.6	80-120	%		✓
LCS	thorium, total	382322	QC-MRG2-382322002	E420	0.104	0.1 mg/L	mg/L	104	80-120	%		✓
LCS	tin, total	382322	QC-MRG2-382322002	E420	0.493	0.5 mg/L	mg/L	98.7	80-120	%		✓

LCS	titanium, total	382322	QC-MRG2-382322002	E420	0.264	0.25 mg/L	mg/L	105	80-120	%	✓
LCS	tungsten, total	382322	QC-MRG2-382322002	E420	0.0955	0.1 mg/L	mg/L	95.5	80-120	%	✓
LCS	uranium, total	382322	QC-MRG2-382322002	E420	0.00528	0.005 mg/L	mg/L	106	80-120	%	✓
LCS	vanadium, total	382322	QC-MRG2-382322002	E420	0.514	0.5 mg/L	mg/L	103	80-120	%	✓
LCS	zinc, total	382322	QC-MRG2-382322002	E420	0.514	0.5 mg/L	mg/L	103	80-120	%	✓
LCS	zirconium, total	382322	QC-MRG2-382322002	E420	0.0986	0.1 mg/L	mg/L	98.6	80-120	%	✓
MB	mercury, total	381296	QC-381296-001	E508	<0.0000050		mg/L	-	0.000005	mg/L	✓
MB	aluminum, total	382322	QC-MRG2-382322001	E420	<0.0030		mg/L	-	0.003	mg/L	✓
MB	antimony, total	382322	QC-MRG2-382322001	E420	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	arsenic, total	382322	QC-MRG2-382322001	E420	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	barium, total	382322	QC-MRG2-382322001	E420	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	beryllium, total	382322	QC-MRG2-382322001	E420	<0.000020		mg/L	-	0.00002	mg/L	✓
MB	bismuth, total	382322	QC-MRG2-382322001	E420	<0.000050		mg/L	-	0.00005	mg/L	✓
MB	boron, total	382322	QC-MRG2-382322001	E420	<0.010		mg/L	-	0.01	mg/L	✓
MB	cadmium, total	382322	QC-MRG2-382322001	E420	<0.0000050		mg/L	-	0.000005	mg/L	✓
MB	calcium, total	382322	QC-MRG2-382322001	E420	<0.050		mg/L	-	0.05	mg/L	✓
MB	cesium, total	382322	QC-MRG2-382322001	E420	<0.000010		mg/L	-	0.00001	mg/L	✓
MB	chromium, total	382322	QC-MRG2-382322001	E420	<0.00050		mg/L	-	0.0005	mg/L	✓
MB	cobalt, total	382322	QC-MRG2-382322001	E420	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	copper, total	382322	QC-MRG2-382322001	E420	<0.00050		mg/L	-	0.0005	mg/L	✓
MB	iron, total	382322	QC-MRG2-382322001	E420	<0.010		mg/L	-	0.01	mg/L	✓
MB	lead, total	382322	QC-MRG2-382322001	E420	<0.000050		mg/L	-	0.00005	mg/L	✓
MB	lithium, total	382322	QC-MRG2-382322001	E420	<0.0010		mg/L	-	0.001	mg/L	✓
MB	magnesium, total	382322	QC-MRG2-382322001	E420	<0.0050		mg/L	-	0.005	mg/L	✓
MB	manganese, total	382322	QC-MRG2-382322001	E420	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	molybdenum, total	382322	QC-MRG2-382322001	E420	<0.000050		mg/L	-	0.00005	mg/L	✓
MB	nickel, total	382322	QC-MRG2-382322001	E420	<0.00050		mg/L	-	0.0005	mg/L	✓
MB	phosphorus, total	382322	QC-MRG2-382322001	E420	<0.050		mg/L	-	0.05	mg/L	✓
MB	potassium, total	382322	QC-MRG2-382322001	E420	<0.050		mg/L	-	0.05	mg/L	✓
MB	rubidium, total	382322	QC-MRG2-382322001	E420	<0.00020		mg/L	-	0.0002	mg/L	✓
MB	selenium, total	382322	QC-MRG2-382322001	E420	<0.000050		mg/L	-	0.00005	mg/L	✓
MB	silicon, total	382322	QC-MRG2-382322001	E420	<0.10		mg/L	-	0.1	mg/L	✓
MB	silver, total	382322	QC-MRG2-382322001	E420	<0.000010		mg/L	-	0.00001	mg/L	✓
MB	sodium, total	382322	QC-MRG2-382322001	E420	<0.050		mg/L	-	0.05	mg/L	✓
MB	strontium, total	382322	QC-MRG2-382322001	E420	<0.00020		mg/L	-	0.0002	mg/L	✓
MB	sulfur, total	382322	QC-MRG2-382322001	E420	<0.50		mg/L	-	0.5	mg/L	✓
MB	tellurium, total	382322	QC-MRG2-382322001	E420	<0.00020		mg/L	-	0.0002	mg/L	✓
MB	thallium, total	382322	QC-MRG2-382322001	E420	<0.000010		mg/L	-	0.00001	mg/L	✓
MB	thorium, total	382322	QC-MRG2-382322001	E420	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	tin, total	382322	QC-MRG2-382322001	E420	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	titanium, total	382322	QC-MRG2-382322001	E420	<0.00030		mg/L	-	0.0003	mg/L	✓
MB	tungsten, total	382322	QC-MRG2-382322001	E420	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	uranium, total	382322	QC-MRG2-382322001	E420	<0.000010		mg/L	-	0.00001	mg/L	✓
MB	zinc, total	382322	QC-MRG2-382322001	E420	<0.0030		mg/L	-	0.003	mg/L	✓
MB	zirconium, total	382322	QC-MRG2-382322001	E420	<0.00020		mg/L	-	0.0002	mg/L	✓
MB	vanadium, total	382322	QC-MRG2-382322001	E420	<0.00050		mg/L	-	0.0005	mg/L	✓

Dissolved Metals (Matrix: Water)

MB	dissolved mercury filtration location	381686	QC-381686-001	EP509	Laboratory	-	-				✓
MB	dissolved metals filtration location	383503	QC-383503-001	EP421	Laboratory	-	-				✓
LCS	mercury, dissolved	381686	QC-381686-002	E509	0.000104	0.0001 mg/L	mg/L	104	80-120	%	✓
LCS	dissolved mercury filtration location	381686	QC-381686-002	EP509	N/A	-	-		0-0	%	✓
MS	mercury, dissolved	381686	DEE WATER DWR - SUMP 1	E509	0.0000997	0.0001 mg/L	mg/L	99.7	70-130	%	✓
LCS	dissolved metals filtration location	383503	QC-383503-002	EP421	N/A	-	-		0-0	%	✓
LCS	aluminum, dissolved	383503	QC-MRG2-383503002	E421	1.96	2 mg/L	mg/L	97.9	80-120	%	✓
LCS	antimony, dissolved	383503	QC-MRG2-383503002	E421	1.02	1 mg/L	mg/L	102	80-120	%	✓
LCS	arsenic, dissolved	383503	QC-MRG2-383503002	E421	0.973	1 mg/L	mg/L	97.3	80-120	%	✓
LCS	barium, dissolved	383503	QC-MRG2-383503002	E421	0.249	0.25 mg/L	mg/L	99.6	80-120	%	✓
LCS	beryllium, dissolved	383503	QC-MRG2-383503002	E421	0.0996	0.1 mg/L	mg/L	99.6	80-120	%	✓
LCS	bismuth, dissolved	383503	QC-MRG2-383503002	E421	0.944	1 mg/L	mg/L	94.4	80-120	%	✓
LCS	boron, dissolved	383503	QC-MRG2-383503002	E421	1.10	1 mg/L	mg/L	110	80-120	%	✓
LCS	cadmium, dissolved	383503	QC-MRG2-383503002	E421	0.100	0.1 mg/L	mg/L	100.0	80-120	%	✓
LCS	calcium, dissolved	383503	QC-MRG2-383503002	E421	47.8	50 mg/L	mg/L	95.5	80-120	%	✓
LCS	cesium, dissolved	383503	QC-MRG2-383503002	E421	0.0501	0.05 mg/L	mg/L	100	80-120	%	✓
LCS	chromium, dissolved	383503	QC-MRG2-383503002	E421	0.240	0.25 mg/L	mg/L	96.2	80-120	%	✓
LCS	cobalt, dissolved	383503	QC-MRG2-383503002	E421	0.240	0.25 mg/L	mg/L	96.2	80-120	%	✓
LCS	copper, dissolved	383503	QC-MRG2-383503002	E421	0.244	0.25 mg/L	mg/L	97.7	80-120	%	✓
LCS	iron, dissolved	383503	QC-MRG2-383503002	E421	1.04	1 mg/L	mg/L	104	80-120	%	✓
LCS	lead, dissolved	383503	QC-MRG2-383503002	E421	0.480	0.5 mg/L	mg/L	96.0	80-120	%	✓
LCS	lithium, dissolved	383503	QC-MRG2-383503002	E421	0.246	0.25 mg/L	mg/L	98.3	80-120	%	✓
LCS	magnesium, dissolved	383503	QC-MRG2-383503002	E421	49.8	50 mg/L	mg/L	99.6	80-120	%	✓
LCS	manganese, dissolved	383503	QC-MRG2-383503002	E421	0.243	0.25 mg/L	mg/L	97.1	80-120	%	✓
LCS	molybdenum, dissolved	383503	QC-MRG2-383503002	E421	0.253	0.25 mg/L	mg/L	101	80-120	%	✓
LCS	nickel, dissolved	383503	QC-MRG2-383503002	E421	0.489	0.5 mg/L	mg/L	97.8	80-120	%	✓
LCS	phosphorus, dissolved	383503	QC-MRG2-383503002	E421	9.97	10 mg/L	mg/L	99.7	80-120	%	✓
LCS	potassium, dissolved	383503	QC-MRG2-383503002	E421	53.0	50 mg/L	mg/L	106	80-120	%	✓
LCS	rubidium, dissolved	383503	QC-MRG2-383503002	E421	0.0992	0.1 mg/L	mg/L	99.2	80-120	%	✓
LCS	selenium, dissolved	383503	QC-MRG2-383503002	E421	1.01	1 mg/L	mg/L	101	80-120	%	✓
LCS	silicon, dissolved	383503	QC-MRG2-383503002	E421	10.6	10 mg/L	mg/L	106	80-120	%	✓
LCS	silver, dissolved	383503	QC-MRG2-383503002	E421	0.0913	0.1 mg/L	mg/L	91.3	80-120	%	✓
LCS	sodium, dissolved	383503	QC-MRG2-383503002	E421	50.8	50 mg/L	mg/L	102	80-120	%	✓
LCS	strontium, dissolved	383503	QC-MRG2-383503002	E421	0.252	0.25 mg/L	mg/L	101	80-120	%	✓
LCS	sulfur, dissolved	383503	QC-MRG2-383503002	E421	51.3	50 mg/L	mg/L	103	80-120	%	✓
LCS	tellurium, dissolved	383503	QC-MRG2-383503002	E421	0.102	0.1 mg/L	mg/L	102	80-120	%	✓
LCS	thallium, dissolved	383503	QC-MRG2-383503002	E421	0.968	1 mg/L	mg/L	96.8	80-120	%	✓
LCS	thorium, dissolved	383503	QC-MRG2-383503002	E421	0.0929	0.1 mg/L	mg/L	92.9	80-120	%	✓
LCS	tin, dissolved	383503	QC-MRG2-383503002	E421	0.505	0.5 mg/L	mg/L	101	80-120	%	✓
LCS	titanium, dissolved	383503	QC-MRG2-383503002	E421	0.240	0.25 mg/L	mg/L	95.9	80-120	%	✓
LCS	tungsten, dissolved	383503	QC-MRG2-383503002	E421	0.0982	0.1 mg/L	mg/L	98.2	80-120	%	✓
LCS	uranium, dissolved	383503	QC-MRG2-383503002	E421	0.00483	0.005 mg/L	mg/L	96.6	80-120	%	✓

LCS	vanadium, dissolved	383503	QC-MRG2-383503002	E421	0.492	0.5 mg/L	mg/L	98.4	80-120	%	✓
LCS	zinc, dissolved	383503	QC-MRG2-383503002	E421	0.508	0.5 mg/L	mg/L	102	80-120	%	✓
LCS	zirconium, dissolved	383503	QC-MRG2-383503002	E421	0.0974	0.1 mg/L	mg/L	97.4	80-120	%	✓
MS	aluminum, dissolved	383503	Anonymous	E421	10.2	10 mg/L	mg/L	102	70-130	%	✓
MS	antimony, dissolved	383503	Anonymous	E421	1.02	1 mg/L	mg/L	102	70-130	%	✓
MS	arsenic, dissolved	383503	Anonymous	E421	0.960	1 mg/L	mg/L	96.0	70-130	%	✓
MS	barium, dissolved	383503	Anonymous	E421	0.964	1 mg/L	mg/L	96.4	70-130	%	✓
MS	beryllium, dissolved	383503	Anonymous	E421	2.13	2 mg/L	mg/L	107	70-130	%	✓
MS	bismuth, dissolved	383503	Anonymous	E421	0.448	0.5 mg/L	mg/L	89.7	70-130	%	✓
MS	boron, dissolved	383503	Anonymous	E421	5.44	5 mg/L	mg/L	109	70-130	%	✓
MS	cadmium, dissolved	383503	Anonymous	E421	0.194	0.2 mg/L	mg/L	97.2	70-130	%	✓
MS	calcium, dissolved	383503	Anonymous	E421	ND	200 mg/L	mg/L	ND	70-130	%	✓
MS	cesium, dissolved	383503	Anonymous	E421	0.516	0.5 mg/L	mg/L	103	70-130	%	✓
MS	chromium, dissolved	383503	Anonymous	E421	1.92	2 mg/L	mg/L	96.0	70-130	%	✓
MS	cobalt, dissolved	383503	Anonymous	E421	0.934	1 mg/L	mg/L	93.4	70-130	%	✓
MS	copper, dissolved	383503	Anonymous	E421	0.914	1 mg/L	mg/L	91.4	70-130	%	✓
MS	iron, dissolved	383503	Anonymous	E421	96.4	100 mg/L	mg/L	96.4	70-130	%	✓
MS	lead, dissolved	383503	Anonymous	E421	0.933	1 mg/L	mg/L	93.3	70-130	%	✓
MS	lithium, dissolved	383503	Anonymous	E421	5.37	5 mg/L	mg/L	107	70-130	%	✓
MS	magnesium, dissolved	383503	Anonymous	E421	ND	50 mg/L	mg/L	ND	70-130	%	✓
MS	manganese, dissolved	383503	Anonymous	E421	0.962	1 mg/L	mg/L	96.2	70-130	%	✓
MS	molybdenum, dissolved	383503	Anonymous	E421	1.07	1 mg/L	mg/L	107	70-130	%	✓
MS	nickel, dissolved	383503	Anonymous	E421	1.86	2 mg/L	mg/L	92.8	70-130	%	✓
MS	phosphorus, dissolved	383503	Anonymous	E421	494	500 mg/L	mg/L	98.8	70-130	%	✓
MS	potassium, dissolved	383503	Anonymous	E421	ND	200 mg/L	mg/L	ND	70-130	%	✓
MS	rubidium, dissolved	383503	Anonymous	E421	0.971	1 mg/L	mg/L	97.1	70-130	%	✓
MS	selenium, dissolved	383503	Anonymous	E421	1.94	2 mg/L	mg/L	96.9	70-130	%	✓
MS	silicon, dissolved	383503	Anonymous	E421	528	500 mg/L	mg/L	106	70-130	%	✓
MS	silver, dissolved	383503	Anonymous	E421	0.192	0.2 mg/L	mg/L	96.2	70-130	%	✓
MS	sodium, dissolved	383503	Anonymous	E421	ND	100 mg/L	mg/L	ND	70-130	%	✓
MS	strontium, dissolved	383503	Anonymous	E421	ND	1 mg/L	mg/L	ND	70-130	%	✓
MS	sulfur, dissolved	383503	Anonymous	E421	ND	1000 mg/L	mg/L	ND	70-130	%	✓
MS	tellurium, dissolved	383503	Anonymous	E421	1.93	2 mg/L	mg/L	96.7	70-130	%	✓
MS	thallium, dissolved	383503	Anonymous	E421	0.186	0.2 mg/L	mg/L	92.9	70-130	%	✓
MS	thorium, dissolved	383503	Anonymous	E421	0.959	1 mg/L	mg/L	95.9	70-130	%	✓
MS	tin, dissolved	383503	Anonymous	E421	1.01	1 mg/L	mg/L	101	70-130	%	✓
MS	titanium, dissolved	383503	Anonymous	E421	2.03	2 mg/L	mg/L	102	70-130	%	✓
MS	tungsten, dissolved	383503	Anonymous	E421	0.996	1 mg/L	mg/L	99.6	70-130	%	✓
MS	uranium, dissolved	383503	Anonymous	E421	0.190	0.2 mg/L	mg/L	95.3	70-130	%	✓
MS	vanadium, dissolved	383503	Anonymous	E421	5.01	5 mg/L	mg/L	100	70-130	%	✓
MS	zinc, dissolved	383503	Anonymous	E421	19.5	20 mg/L	mg/L	97.6	70-130	%	✓
MS	zirconium, dissolved	383503	Anonymous	E421	2.18	2 mg/L	mg/L	109	70-130	%	✓
MB	mercury, dissolved	381686	QC-381686-001	E509	<0.0000050		mg/L	-	0.000005	mg/L	✓
MB	aluminum, dissolved	383503	QC-MRG2-383503001	E421	<0.0010		mg/L	-	0.001	mg/L	✓
MB	antimony, dissolved	383503	QC-MRG2-383503001	E421	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	arsenic, dissolved	383503	QC-MRG2-383503001	E421	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	barium, dissolved	383503	QC-MRG2-383503001	E421	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	beryllium, dissolved	383503	QC-MRG2-383503001	E421	<0.000020		mg/L	-	0.00002	mg/L	✓
MB	bismuth, dissolved	383503	QC-MRG2-383503001	E421	<0.000050		mg/L	-	0.00005	mg/L	✓
MB	boron, dissolved	383503	QC-MRG2-383503001	E421	<0.010		mg/L	-	0.01	mg/L	✓
MB	cadmium, dissolved	383503	QC-MRG2-383503001	E421	<0.0000050		mg/L	-	0.000005	mg/L	✓
MB	calcium, dissolved	383503	QC-MRG2-383503001	E421	<0.050		mg/L	-	0.05	mg/L	✓
MB	cesium, dissolved	383503	QC-MRG2-383503001	E421	<0.000010		mg/L	-	0.00001	mg/L	✓
MB	chromium, dissolved	383503	QC-MRG2-383503001	E421	<0.00050		mg/L	-	0.0005	mg/L	✓
MB	cobalt, dissolved	383503	QC-MRG2-383503001	E421	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	copper, dissolved	383503	QC-MRG2-383503001	E421	<0.00020		mg/L	-	0.0002	mg/L	✓
MB	iron, dissolved	383503	QC-MRG2-383503001	E421	<0.010		mg/L	-	0.01	mg/L	✓
MB	lead, dissolved	383503	QC-MRG2-383503001	E421	<0.000050		mg/L	-	0.00005	mg/L	✓
MB	lithium, dissolved	383503	QC-MRG2-383503001	E421	<0.0010		mg/L	-	0.001	mg/L	✓
MB	magnesium, dissolved	383503	QC-MRG2-383503001	E421	<0.0050		mg/L	-	0.005	mg/L	✓
MB	manganese, dissolved	383503	QC-MRG2-383503001	E421	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	molybdenum, dissolved	383503	QC-MRG2-383503001	E421	<0.000050		mg/L	-	0.00005	mg/L	✓
MB	nickel, dissolved	383503	QC-MRG2-383503001	E421	<0.00050		mg/L	-	0.0005	mg/L	✓
MB	phosphorus, dissolved	383503	QC-MRG2-383503001	E421	<0.050		mg/L	-	0.05	mg/L	✓
MB	potassium, dissolved	383503	QC-MRG2-383503001	E421	<0.050		mg/L	-	0.05	mg/L	✓
MB	rubidium, dissolved	383503	QC-MRG2-383503001	E421	<0.00020		mg/L	-	0.0002	mg/L	✓
MB	selenium, dissolved	383503	QC-MRG2-383503001	E421	<0.000050		mg/L	-	0.00005	mg/L	✓
MB	silicon, dissolved	383503	QC-MRG2-383503001	E421	<0.050		mg/L	-	0.05	mg/L	✓
MB	silver, dissolved	383503	QC-MRG2-383503001	E421	<0.000010		mg/L	-	0.00001	mg/L	✓
MB	sodium, dissolved	383503	QC-MRG2-383503001	E421	<0.050		mg/L	-	0.05	mg/L	✓
MB	strontium, dissolved	383503	QC-MRG2-383503001	E421	<0.00020		mg/L	-	0.0002	mg/L	✓
MB	sulfur, dissolved	383503	QC-MRG2-383503001	E421	<0.50		mg/L	-	0.5	mg/L	✓
MB	tellurium, dissolved	383503	QC-MRG2-383503001	E421	<0.00020		mg/L	-	0.0002	mg/L	✓
MB	thallium, dissolved	383503	QC-MRG2-383503001	E421	<0.000010		mg/L	-	0.00001	mg/L	✓
MB	thorium, dissolved	383503	QC-MRG2-383503001	E421	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	tin, dissolved	383503	QC-MRG2-383503001	E421	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	titanium, dissolved	383503	QC-MRG2-383503001	E421	<0.00030		mg/L	-	0.0003	mg/L	✓
MB	tungsten, dissolved	383503	QC-MRG2-383503001	E421	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	uranium, dissolved	383503	QC-MRG2-383503001	E421	<0.000010		mg/L	-	0.00001	mg/L	✓
MB	vanadium, dissolved	383503	QC-MRG2-383503001	E421	<0.00050		mg/L	-	0.0005	mg/L	✓
MB	zinc, dissolved	383503	QC-MRG2-383503001	E421	<0.0010		mg/L	-	0.001	mg/L	✓
MB	zirconium, dissolved	383503	QC-MRG2-383503001	E421	<0.00020		mg/L	-	0.0002	mg/L	✓

Hydrocarbons (Matrix: Water)

LCS	EPH (C10-C19)	377550	QC-377550-002	E601A	5840	6491 µg/L	µg/L	90.0	70-130	%	✓
LCS	EPH (C19-C32)	377550	QC-377550-002	E601A	3150	3363 µg/L	µg/L	93.7	70-130	%	✓
MB	EPH (C10-C19)	377550	QC-MRG2-377550001	E601A	<250		µg/L	-	250	µg/L	✓
MB	EPH (C19-C32)	377550	QC-MRG2-377550001	E601A	<250		µg/L	-	250	µg/L	✓

Hydrocarbons Surrogates (Matrix: Water)

LCS	bromobenzotrifluoride, 2- (EPH surr)	377550	QC-377550-002	E601A	5170	6315.8 µg/L	µg/L	81.9	60-140	%	
MB	bromobenzotrifluoride, 2- (EPH surr)	377550	QC-MRG2-377550001	E601A	78.2		µg/L	-	60-140	%	
Polycyclic Aromatic Hydrocarbons (Matrix: Water)											
LCS	acenaphthene	377551	QC-377551-002	E641A	0.579	0.5 µg/L	µg/L	116	60-130	%	✓
LCS	acenaphthylene	377551	QC-377551-002	E641A	0.560	0.5 µg/L	µg/L	112	60-130	%	✓
LCS	acridine	377551	QC-377551-002	E641A	0.575	0.5 µg/L	µg/L	115	60-130	%	✓
LCS	anthracene	377551	QC-377551-002	E641A	0.583	0.5 µg/L	µg/L	116	60-130	%	✓
LCS	benz(a)anthracene	377551	QC-377551-002	E641A	0.583	0.5 µg/L	µg/L	116	60-130	%	✓
LCS	benzo(a)pyrene	377551	QC-377551-002	E641A	0.561	0.5 µg/L	µg/L	112	60-130	%	✓
LCS	benzo(b+j)fluoranthene	377551	QC-377551-002	E641A	0.593	0.5 µg/L	µg/L	119	60-130	%	✓
LCS	benzo(g,h,i)perylene	377551	QC-377551-002	E641A	0.627	0.5 µg/L	µg/L	125	60-130	%	✓
LCS	benzo(k)fluoranthene	377551	QC-377551-002	E641A	0.599	0.5 µg/L	µg/L	120	60-130	%	✓
LCS	chrysene	377551	QC-377551-002	E641A	0.596	0.5 µg/L	µg/L	119	60-130	%	✓
LCS	dibenz(a,h)anthracene	377551	QC-377551-002	E641A	0.592	0.5 µg/L	µg/L	118	60-130	%	✓
LCS	fluoranthene	377551	QC-377551-002	E641A	0.576	0.5 µg/L	µg/L	115	60-130	%	✓
LCS	fluorene	377551	QC-377551-002	E641A	0.571	0.5 µg/L	µg/L	114	60-130	%	✓
LCS	indeno(1,2,3-c,d)pyrene	377551	QC-377551-002	E641A	0.616	0.5 µg/L	µg/L	123	60-130	%	✓
LCS	methylnaphthalene, 1-	377551	QC-377551-002	E641A	0.606	0.5 µg/L	µg/L	121	60-130	%	✓
LCS	methylnaphthalene, 2-	377551	QC-377551-002	E641A	0.589	0.5 µg/L	µg/L	118	60-130	%	✓
LCS	naphthalene	377551	QC-377551-002	E641A	0.582	0.5 µg/L	µg/L	116	50-130	%	✓
LCS	phenanthrene	377551	QC-377551-002	E641A	0.570	0.5 µg/L	µg/L	114	60-130	%	✓
LCS	pyrene	377551	QC-377551-002	E641A	0.590	0.5 µg/L	µg/L	118	60-130	%	✓
LCS	quinoline	377551	QC-377551-002	E641A	0.619	0.5 µg/L	µg/L	124	60-130	%	✓
MB	acenaphthene	377551	QC-MRG2-377550001	E641A	<0.010		µg/L	-	0.01	µg/L	✓
MB	acenaphthylene	377551	QC-MRG2-377550001	E641A	<0.010		µg/L	-	0.01	µg/L	✓
MB	acridine	377551	QC-MRG2-377550001	E641A	<0.010		µg/L	-	0.01	µg/L	✓
MB	anthracene	377551	QC-MRG2-377550001	E641A	<0.010		µg/L	-	0.01	µg/L	✓
MB	benz(a)anthracene	377551	QC-MRG2-377550001	E641A	<0.010		µg/L	-	0.01	µg/L	✓
MB	benzo(a)pyrene	377551	QC-MRG2-377550001	E641A	<0.0050		µg/L	-	0.005	µg/L	✓
MB	benzo(b+j)fluoranthene	377551	QC-MRG2-377550001	E641A	<0.010		µg/L	-	0.01	µg/L	✓
MB	benzo(g,h,i)perylene	377551	QC-MRG2-377550001	E641A	<0.010		µg/L	-	0.01	µg/L	✓
MB	benzo(k)fluoranthene	377551	QC-MRG2-377550001	E641A	<0.010		µg/L	-	0.01	µg/L	✓
MB	chrysene	377551	QC-MRG2-377550001	E641A	<0.010		µg/L	-	0.01	µg/L	✓
MB	dibenz(a,h)anthracene	377551	QC-MRG2-377550001	E641A	<0.0050		µg/L	-	0.005	µg/L	✓
MB	fluoranthene	377551	QC-MRG2-377550001	E641A	<0.010		µg/L	-	0.01	µg/L	✓
MB	fluorene	377551	QC-MRG2-377550001	E641A	<0.010		µg/L	-	0.01	µg/L	✓
MB	indeno(1,2,3-c,d)pyrene	377551	QC-MRG2-377550001	E641A	<0.010		µg/L	-	0.01	µg/L	✓
MB	methylnaphthalene, 1-	377551	QC-MRG2-377550001	E641A	<0.010		µg/L	-	0.01	µg/L	✓
MB	methylnaphthalene, 2-	377551	QC-MRG2-377550001	E641A	<0.010		µg/L	-	0.01	µg/L	✓
MB	naphthalene	377551	QC-MRG2-377550001	E641A	<0.050		µg/L	-	0.05	µg/L	✓
MB	phenanthrene	377551	QC-MRG2-377550001	E641A	<0.020		µg/L	-	0.02	µg/L	✓
MB	pyrene	377551	QC-MRG2-377550001	E641A	<0.010		µg/L	-	0.01	µg/L	✓
MB	quinoline	377551	QC-MRG2-377550001	E641A	<0.050		µg/L	-	0.05	µg/L	✓
Polycyclic Aromatic Hydrocarbons Surrogates (Matrix: Water)											
LCS	chrysene-d12	377551	QC-377551-002	E641A	0.9	0.8421 µg/L	µg/L	106	60-130	%	
LCS	naphthalene-d8	377551	QC-377551-002	E641A	0.8	0.8421 µg/L	µg/L	99.5	50-130	%	
LCS	phenanthrene-d10	377551	QC-377551-002	E641A	0.9	0.8421 µg/L	µg/L	106	60-130	%	
MB	chrysene-d12	377551	QC-MRG2-377550001	E641A	98.2		µg/L	-	60-130	%	
MB	naphthalene-d8	377551	QC-MRG2-377550001	E641A	103		µg/L	-	50-130	%	
MB	phenanthrene-d10	377551	QC-MRG2-377550001	E641A	109		µg/L	-	60-130	%	

Evaluation Legend

- ✓ QC Lot met ALS Data Quality Objectives
- x QC Lot did not meet ALS Data Quality Objectives

Table 1 December 2021 Results Summary VA21C8170

Project DEEP WATER RECOVERY
Report To Rob Waters, Castor Consultants Limited
Date Received 17-Dec-2021 09:20
Issue Date 13-Jan-2022 12:17
Amendment 0

Client Sample ID	DEEP WATER DWR - SUMP 1			DWR-SUMP2		BC Approved WQG	BC Approved WQG
Date Sampled	16-Dec-2021			16-Dec-2021		Marine	Freshwater
Time Sampled	12:00			12:00			
ALS Sample ID	VA21C8170-001			VA21C8170-002			
Analyte	Lowest Detection Limit	Units	Sub-Matrix: Water	Sub-Matrix: Water			
Physical Tests (Matrix: Water)							
hardness (as CaCO3), dissolved	0.60	mg/L	50.9	92.8			
hardness (as CaCO3), from total Ca/Mg	0.60	mg/L	75.8	116			
pH	0.10	pH units	7.51	7.46	>7 <8.7	6.5 - 9	
turbidity	0.10	NTU	261	254	5 NTU from BG est BG NTU <50	5 NTU from BG	
Total Metals (Matrix: Water)							
aluminum, total	0.0030	mg/L	11.8	10.7	nr		
antimony, total	0.00010	mg/L	0.00063	0.00031	0.27		
arsenic, total	0.00010	mg/L	0.00304	0.00302	0.0125	0.005	
barium, total	0.00010	mg/L	0.0633	0.0504			
beryllium, total	0.000100	mg/L	0.000137	0.000141	0.1		
bismuth, total	0.000050	mg/L	<0.000050	<0.000050			
boron, total	0.010	mg/L	0.037	0.037	1.2		
cadmium, total	0.0000050	mg/L	0.000195	0.0000967	0.00012		
calcium, total	0.050	mg/L	15.6	27.9			
cesium, total	0.000010	mg/L	0.000233	0.000219			
chromium, total	0.00050	mg/L	0.0245	0.0180	nr BI 0.050		
cobalt, total	0.00010	mg/L	0.00866	0.00686			
copper, total	0.00050	mg/L	0.120	0.109	0.003/0.002		
iron, total	0.010	mg/L	19.5	15.1		1	
lead, total	0.000050	mg/L	0.0301	0.0156	0.140/0.002		
lithium, total	0.0010	mg/L	0.0055	0.0051			
magnesium, total	0.0050	mg/L	8.95	11.2			
manganese, total	0.00010	mg/L	0.728	0.762			
mercury, total	0.0000050	mg/L	0.0000313	0.0000434	0.002/0.00002		
molybdenum, total	0.000050	mg/L	0.000907	0.000392			
nickel, total	0.00050	mg/L	0.0188	0.0131	0.0083		
phosphorus, total	0.050	mg/L	0.278	0.264			
potassium, total	0.050	mg/L	1.77	2.39			
rubidium, total	0.00020	mg/L	0.00244	0.00251			
selenium, total	0.000050	mg/L	0.000192	0.000173	0.002		
silicon, total	0.10	mg/L	16.7	19.3			
silver, total	0.000010	mg/L	0.000078	0.000056	0.003/0.0015		
sodium, total	0.050	mg/L	34.8	27.4			
strontium, total	0.00020	mg/L	0.0946	0.122			
sulfur, total	0.50	mg/L	4.15	2.91			
tellurium, total	0.00020	mg/L	<0.00020	<0.00020			
thallium, total	0.000010	mg/L	0.000015	0.000016			
thorium, total	0.00010	mg/L	0.00016	0.00016			
tin, total	0.00010	mg/L	0.00071	0.00031			
titanium, total	0.00030	mg/L	0.994	0.706			
tungsten, total	0.00010	mg/L	<0.00010	<0.00010			
uranium, total	0.000010	mg/L	0.000131	0.000140			
vanadium, total	0.00050	mg/L	0.0446	0.0453	0.05		
zinc, total	0.0030	mg/L	0.341	0.115	0.055/ 0.010		
zirconium, total	0.00020	mg/L	0.00207	0.00158			
					0.002/0.00002		

Dissolved Metals (Matrix: Water)

aluminum, dissolved	0.0010	mg/L	0.872	0.668
antimony, dissolved	0.00010	mg/L	0.00028	0.00016
arsenic, dissolved	0.00010	mg/L	0.00052	0.00061
barium, dissolved	0.00010	mg/L	0.0180	0.0102
beryllium, dissolved	0.000100	mg/L	<0.000100	<0.000100
bismuth, dissolved	0.000050	mg/L	<0.000050	<0.000050
boron, dissolved	0.010	mg/L	0.027	0.034
cadmium, dissolved	0.000050	mg/L	0.0000321	0.0000138
calcium, dissolved	0.050	mg/L	12.1	23.7
cesium, dissolved	0.000010	mg/L	0.000014	<0.000010
chromium, dissolved	0.00050	mg/L	0.00288	0.00195
cobalt, dissolved	0.00010	mg/L	0.00056	0.00035
copper, dissolved	0.00020	mg/L	0.0294	0.0240
iron, dissolved	0.010	mg/L	1.45	1.20
lead, dissolved	0.000050	mg/L	0.00371	0.00188
lithium, dissolved	0.0010	mg/L	<0.0010	<0.0010
magnesium, dissolved	0.0050	mg/L	5.02	8.16
manganese, dissolved	0.00010	mg/L	0.0340	0.0284
mercury, dissolved	0.000050	mg/L	0.0000106	0.0000101
molybdenum, dissolved	0.000050	mg/L	0.000777	0.000354
nickel, dissolved	0.00050	mg/L	0.00223	0.00125
phosphorus, dissolved	0.050	mg/L	<0.050	<0.050
potassium, dissolved	0.050	mg/L	1.65	2.20
rubidium, dissolved	0.00020	mg/L	0.00070	0.00074
selenium, dissolved	0.000050	mg/L	0.000085	0.000082
silicon, dissolved	0.050	mg/L	2.81	7.27
silver, dissolved	0.000010	mg/L	<0.000010	0.000011
sodium, dissolved	0.050	mg/L	33.9	25.1
strontium, dissolved	0.00020	mg/L	0.0741	0.105
sulfur, dissolved	0.50	mg/L	4.02	2.66
tellurium, dissolved	0.00020	mg/L	<0.00020	<0.00020
thallium, dissolved	0.000010	mg/L	<0.000010	<0.000010
thorium, dissolved	0.00010	mg/L	<0.00010	<0.00010
tin, dissolved	0.00010	mg/L	<0.00010	<0.00010
titanium, dissolved	0.00030	mg/L	0.0767	0.0727
tungsten, dissolved	0.00010	mg/L	<0.00010	<0.00010
uranium, dissolved	0.000010	mg/L	0.000030	0.000044
vanadium, dissolved	0.00050	mg/L	0.00488	0.00571
zinc, dissolved	0.0010	mg/L	0.0515	0.0123
zirconium, dissolved	0.00020	mg/L	0.00090	0.00102
dissolved mercury filtration location			Laboratory	Laboratory
dissolved metals filtration location			Laboratory	Laboratory

0.003/0.002

0.35

0.055/0.010

Hydrocarbons (Matrix: Water)

EPH (C10-C19)	250	µg/L	<250	<250
EPH (C19-C32)	250	µg/L	<250	<250
LEPHw	250	µg/L	<250	<250
HEPHw	250	µg/L	<250	<250

500 CSR

Hydrocarbons Surrogates (Matrix: Water)

bromobenzotrifluoride, 2- (EPH surr)	1.0	%	86.9	84.2
--------------------------------------	-----	---	------	------

Polycyclic Aromatic Hydrocarbons (Matrix: Water)

acenaphthene	0.010	µg/L	0.012	0.020
acenaphthylene	0.010	µg/L	<0.010	<0.010
acridine	0.010	µg/L	<0.015	<0.010
anthracene	0.010	µg/L	<0.027	<0.021
benz(a)anthracene	0.010	µg/L	0.067	0.045
benzo(a)pyrene	0.0050	µg/L	0.0239	0.0164
benzo(b+j)fluoranthene	0.010	µg/L	0.048	0.030
benzo(b+j+k)fluoranthene	0.015	µg/L	0.064	0.041
benzo(g,h,i)perylene	0.010	µg/L	0.015	<0.010
benzo(k)fluoranthene	0.010	µg/L	0.016	0.011
chrysene	0.010	µg/L	0.069	0.045

6

6

3 /0.05

0.01

0.01

0.1

dibenz(a,h)anthracene	0.0050	µg/L	<0.0050	<0.0050		
fluoranthene	0.010	µg/L	0.207	0.107		4
fluorene	0.010	µg/L	0.016	0.024	12	12
indeno(1,2,3-c,d)pyrene	0.010	µg/L	0.015	<0.010		
methylnaphthalene, 1-	0.010	µg/L	<0.010	0.042		
methylnaphthalene, 2-	0.010	µg/L	<0.010	0.018		
naphthalene	0.050	µg/L	<0.050	<0.050	1	1
phenanthrene	0.020	µg/L	0.127	0.079		0.3
pyrene	0.010	µg/L	0.210	0.137		0.02
quinoline	0.050	µg/L	<0.050	<0.060		
Polycyclic Aromatic Hydrocarbons Surrogates (Matrix: Water)						
chrysene-d12	0.1	%	106	110		
naphthalene-d8	0.1	%	97.6	98.5		
phenanthrene-d10	0.1	%	108	112		

Qualifier Legend

DLCI

Detection Limit Raised: Chromatographic interference due to co-elution.

DLQ

Detection Limit raised due to co-eluting interference. GCMS qualifier ion ratio did not meet acceptance criteria.

Sample Summary VA21C8170

Project DEEP WATER RECOVERY
Report To Rob Waters, Castor Consultants Limited
Date Received 17-Dec-2021 09:20
Issue Date 13-Jan-2022 12:17
Amendment 0

Sample Details

ALS Sample ID	Client Sample ID	Matrix	Sub-Matrix	Date Sampled	Time Sampled
VA21C8170-001	DEE WATER DWR -	Water	Water	16-Dec-2021	12:00
VA21C8170-002	DWR-SUMP2	Water	Water	16-Dec-2021	12:00

CERTIFICATE OF ANALYSIS

Work Order : **VA21C8170**
Client : **Castor Consultants Limited**
Contact : **Rob Waters**
Address : **13719 Jennifer Road**
Ladysmith BC Canada V9G 1G4
Telephone : **----**
Project : **DEEP WATER RECOVERY**
PO : **----**
C-O-C number : **17-835609**
Sampler : **----**
Site : **----**
Quote number : **VA20-CAST100-001**
No. of samples received : **2**
No. of samples analysed : **2**

Page : **1 of 7**
Laboratory : **Vancouver - Environmental**
Account Manager : **Can Dang**
Address : **8081 Lougheed Highway**
Burnaby BC Canada V5A 1W9
Telephone : **+1 604 253 4188**
Date Samples Received : **17-Dec-2021 09:20**
Date Analysis Commenced : **19-Dec-2021**
Issue Date : **13-Jan-2022 12:17**

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Christopher Li	Lab Assistant	Metals, Burnaby, British Columbia
Dee Lee	Analyst	Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Owen Cheng		Metals, Burnaby, British Columbia
Paul Cushing	Team Leader - Organics	Organics, Burnaby, British Columbia



General Comments

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

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

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

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

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

Unit	Description
-	No Unit
µg/L	micrograms per litre
mg/L	milligrams per litre
NTU	nephelometric turbidity units
pH units	pH units

<: less than.

>: greater than.

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

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

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

Qualifiers

Qualifier	Description
DLCI	Detection Limit Raised: Chromatographic interference due to co-elution.
DLQ	Detection Limit raised due to co-eluting interference. GCMS qualifier ion ratio did not meet acceptance criteria.



Analytical Results

Sub-Matrix: **Water**

Client sample ID

(Matrix: **Water**)

					DEE WATER DWR - SUMP 1	DWR-SUMP2	----	----	----
Client sampling date / time					16-Dec-2021 12:00	16-Dec-2021 12:00	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA21C8170-001	VA21C8170-002	-----	-----	-----
					Result	Result	----	----	----
Physical Tests									
hardness (as CaCO ₃), dissolved	----	EC100	0.60	mg/L	50.9	92.8	----	----	----
hardness (as CaCO ₃), from total Ca/Mg	----	EC100A	0.60	mg/L	75.8	116	----	----	----
pH	----	E108	0.10	pH units	7.51	7.46	----	----	----
turbidity	----	E121	0.10	NTU	261	254	----	----	----
Total Metals									
aluminum, total	7429-90-5	E420	0.0030	mg/L	11.8	10.7	----	----	----
antimony, total	7440-36-0	E420	0.00010	mg/L	0.00063	0.00031	----	----	----
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00304	0.00302	----	----	----
barium, total	7440-39-3	E420	0.00010	mg/L	0.0633	0.0504	----	----	----
beryllium, total	7440-41-7	E420	0.000100	mg/L	0.000137	0.000141	----	----	----
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	----	----	----
boron, total	7440-42-8	E420	0.010	mg/L	0.037	0.037	----	----	----
cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.000195	0.0000967	----	----	----
calcium, total	7440-70-2	E420	0.050	mg/L	15.6	27.9	----	----	----
cesium, total	7440-46-2	E420	0.000010	mg/L	0.000233	0.000219	----	----	----
chromium, total	7440-47-3	E420	0.00050	mg/L	0.0245	0.0180	----	----	----
cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00866	0.00686	----	----	----
copper, total	7440-50-8	E420	0.00050	mg/L	0.120	0.109	----	----	----
iron, total	7439-89-6	E420	0.010	mg/L	19.5	15.1	----	----	----
lead, total	7439-92-1	E420	0.000050	mg/L	0.0301	0.0156	----	----	----
lithium, total	7439-93-2	E420	0.0010	mg/L	0.0055	0.0051	----	----	----
magnesium, total	7439-95-4	E420	0.0050	mg/L	8.95	11.2	----	----	----
manganese, total	7439-96-5	E420	0.00010	mg/L	0.728	0.762	----	----	----
mercury, total	7439-97-6	E508	0.0000050	mg/L	0.0000313	0.0000434	----	----	----
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000907	0.000392	----	----	----
nickel, total	7440-02-0	E420	0.00050	mg/L	0.0188	0.0131	----	----	----
phosphorus, total	7723-14-0	E420	0.050	mg/L	0.278	0.264	----	----	----
potassium, total	7440-09-7	E420	0.050	mg/L	1.77	2.39	----	----	----
rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00244	0.00251	----	----	----
selenium, total	7782-49-2	E420	0.000050	mg/L	0.000192	0.000173	----	----	----



Analytical Results

Sub-Matrix: **Water**

Client sample ID

(Matrix: **Water**)

					DEE WATER DWR - SUMP 1	DWR-SUMP2	----	----	----
Client sampling date / time					16-Dec-2021 12:00	16-Dec-2021 12:00	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA21C8170-001	VA21C8170-002	-----	-----	-----
					Result	Result	----	----	----
Total Metals									
silicon, total	7440-21-3	E420	0.10	mg/L	16.7	19.3	----	----	----
silver, total	7440-22-4	E420	0.000010	mg/L	0.000078	0.000056	----	----	----
sodium, total	7440-23-5	E420	0.050	mg/L	34.8	27.4	----	----	----
strontium, total	7440-24-6	E420	0.00020	mg/L	0.0946	0.122	----	----	----
sulfur, total	7704-34-9	E420	0.50	mg/L	4.15	2.91	----	----	----
tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	----	----	----
thallium, total	7440-28-0	E420	0.000010	mg/L	0.000015	0.000016	----	----	----
thorium, total	7440-29-1	E420	0.00010	mg/L	0.00016	0.00016	----	----	----
tin, total	7440-31-5	E420	0.00010	mg/L	0.00071	0.00031	----	----	----
titanium, total	7440-32-6	E420	0.00030	mg/L	0.994	0.706	----	----	----
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----
uranium, total	7440-61-1	E420	0.000010	mg/L	0.000131	0.000140	----	----	----
vanadium, total	7440-62-2	E420	0.00050	mg/L	0.0446	0.0453	----	----	----
zinc, total	7440-66-6	E420	0.0030	mg/L	0.341	0.115	----	----	----
zirconium, total	7440-67-7	E420	0.00020	mg/L	0.00207	0.00158	----	----	----
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.872	0.668	----	----	----
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00028	0.00016	----	----	----
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00052	0.00061	----	----	----
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0180	0.0102	----	----	----
beryllium, dissolved	7440-41-7	E421	0.000100	mg/L	<0.000100	<0.000100	----	----	----
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	----	----	----
boron, dissolved	7440-42-8	E421	0.010	mg/L	0.027	0.034	----	----	----
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000321	0.0000138	----	----	----
calcium, dissolved	7440-70-2	E421	0.050	mg/L	12.1	23.7	----	----	----
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000014	<0.000010	----	----	----
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	0.00288	0.00195	----	----	----
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00056	0.00035	----	----	----
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.0294	0.0240	----	----	----
iron, dissolved	7439-89-6	E421	0.010	mg/L	1.45	1.20	----	----	----
lead, dissolved	7439-92-1	E421	0.000050	mg/L	0.00371	0.00188	----	----	----



Analytical Results

Sub-Matrix: **Water**

Client sample ID

(Matrix: **Water**)

					DEE WATER DWR - SUMP 1	DWR-SUMP2	----	----	----
Client sampling date / time					16-Dec-2021 12:00	16-Dec-2021 12:00	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA21C8170-001	VA21C8170-002	-----	-----	-----
					Result	Result	----	----	----
Dissolved Metals									
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	<0.0010	<0.0010	----	----	----
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	5.02	8.16	----	----	----
manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.0340	0.0284	----	----	----
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	0.0000106	0.0000101	----	----	----
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000777	0.000354	----	----	----
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00223	0.00125	----	----	----
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	----	----	----
potassium, dissolved	7440-09-7	E421	0.050	mg/L	1.65	2.20	----	----	----
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00070	0.00074	----	----	----
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000085	0.000082	----	----	----
silicon, dissolved	7440-21-3	E421	0.050	mg/L	2.81	7.27	----	----	----
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	0.000011	----	----	----
sodium, dissolved	7440-23-5	E421	0.050	mg/L	33.9	25.1	----	----	----
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0741	0.105	----	----	----
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	4.02	2.66	----	----	----
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	----	----	----
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	----	----	----
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	----	----	----
tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	----	----	----
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	0.0767	0.0727	----	----	----
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	----	----	----
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000030	0.000044	----	----	----
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	0.00488	0.00571	----	----	----
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0515	0.0123	----	----	----
zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	0.00090	0.00102	----	----	----
dissolved mercury filtration location	----	EP509	-	-	Laboratory	Laboratory	----	----	----
dissolved metals filtration location	----	EP421	-	-	Laboratory	Laboratory	----	----	----
Hydrocarbons									
EPH (C10-C19)	----	E601A	250	µg/L	<250	<250	----	----	----
EPH (C19-C32)	----	E601A	250	µg/L	<250	<250	----	----	----
HEPHw	----	EC600A	250	µg/L	<250	<250	----	----	----



Analytical Results

Sub-Matrix: **Water**

Client sample ID

(Matrix: **Water**)

					DEE WATER DWR - SUMP 1	DWR-SUMP2	----	----	----
Client sampling date / time					16-Dec-2021 12:00	16-Dec-2021 12:00	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA21C8170-001	VA21C8170-002	-----	-----	-----
					Result	Result	----	----	----
Hydrocarbons									
LEPHw	----	EC600A	250	µg/L	<250	<250	----	----	----
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	1.0	%	86.9	84.2	----	----	----
Polycyclic Aromatic Hydrocarbons									
acenaphthene	83-32-9	E641A	0.010	µg/L	0.012	0.020	----	----	----
acenaphthylene	208-96-8	E641A	0.010	µg/L	<0.010	<0.010	----	----	----
acridine	260-94-6	E641A	0.010	µg/L	<0.015 ^{DLCL}	<0.010	----	----	----
anthracene	120-12-7	E641A	0.010	µg/L	<0.027 ^{DLQ}	<0.021 ^{DLQ}	----	----	----
benz(a)anthracene	56-55-3	E641A	0.010	µg/L	0.067	0.045	----	----	----
benzo(a)pyrene	50-32-8	E641A	0.0050	µg/L	0.0239	0.0164	----	----	----
benzo(b+j)fluoranthene	n/a	E641A	0.010	µg/L	0.048	0.030	----	----	----
benzo(b+j+k)fluoranthene	n/a	E641A	0.015	µg/L	0.064	0.041	----	----	----
benzo(g,h,i)perylene	191-24-2	E641A	0.010	µg/L	0.015	<0.010	----	----	----
benzo(k)fluoranthene	207-08-9	E641A	0.010	µg/L	0.016	0.011	----	----	----
chrysene	218-01-9	E641A	0.010	µg/L	0.069	0.045	----	----	----
dibenz(a,h)anthracene	53-70-3	E641A	0.0050	µg/L	<0.0050	<0.0050	----	----	----
fluoranthene	206-44-0	E641A	0.010	µg/L	0.207	0.107	----	----	----
fluorene	86-73-7	E641A	0.010	µg/L	0.016	0.024	----	----	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.010	µg/L	0.015	<0.010	----	----	----
methylnaphthalene, 1-	90-12-0	E641A	0.010	µg/L	<0.010	0.042	----	----	----
methylnaphthalene, 2-	91-57-6	E641A	0.010	µg/L	<0.010	0.018	----	----	----
naphthalene	91-20-3	E641A	0.050	µg/L	<0.050	<0.050	----	----	----
phenanthrene	85-01-8	E641A	0.020	µg/L	0.127	0.079	----	----	----
pyrene	129-00-0	E641A	0.010	µg/L	0.210	0.137	----	----	----
quinoline	91-22-5	E641A	0.050	µg/L	<0.050	<0.060 ^{DLQ}	----	----	----
Polycyclic Aromatic Hydrocarbons Surrogates									
chrysene-d12	1719-03-5	E641A	0.1	%	106	110	----	----	----
naphthalene-d8	1146-65-2	E641A	0.1	%	97.6	98.5	----	----	----
phenanthrene-d10	1517-22-2	E641A	0.1	%	108	112	----	----	----

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



QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: VA21C8170	Page	: 1 of 7
Client	: Castor Consultants Limited	Laboratory	: Vancouver - Environmental
Contact	: Rob Waters	Account Manager	: Can Dang
Address	: 13719 Jennifer Road Ladysmith BC Canada V9G 1G4	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ---	Telephone	: +1 604 253 4188
Project	: DEEP WATER RECOVERY	Date Samples Received	: 17-Dec-2021 09:20
PO	: ---	Issue Date	: 13-Jan-2022 12:17
C-O-C number	: 17-835609		
Sampler	: ---		
Site	: ---		
Quote number	: VA20-CAST100-001		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

Key

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

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

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water**

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial - dissolved (lab preserved) DEE WATER DWR - SUMP 1	E509	16-Dec-2021	06-Jan-2022	----	----		06-Jan-2022	28 days	21 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial - dissolved (lab preserved) DWR-SUMP2	E509	16-Dec-2021	06-Jan-2022	----	----		06-Jan-2022	28 days	21 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) DEE WATER DWR - SUMP 1	E421	16-Dec-2021	11-Jan-2022	----	----		11-Jan-2022	180 days	26 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) DWR-SUMP2	E421	16-Dec-2021	11-Jan-2022	----	----		11-Jan-2022	180 days	26 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) DEE WATER DWR - SUMP 1	E601A	16-Dec-2021	28-Dec-2021	14 days	12 days	✓	30-Dec-2021	40 days	1 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) DWR-SUMP2	E601A	16-Dec-2021	28-Dec-2021	14 days	12 days	✓	30-Dec-2021	40 days	1 days	✓
Physical Tests : pH by Meter										
HDPE DEE WATER DWR - SUMP 1	E108	16-Dec-2021	----	----	----		24-Dec-2021	0.25 hrs	191 hrs	* EHTR-FM



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	
Physical Tests : pH by Meter										
HDPE DWR-SUMP2	E108	16-Dec-2021	----	----	----		24-Dec-2021	0.25 hrs	191 hrs	* EHTR-FM
Physical Tests : Turbidity by Nephelometry										
HDPE DEE WATER DWR - SUMP 1	E121	16-Dec-2021	----	----	----		19-Dec-2021	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE DWR-SUMP2	E121	16-Dec-2021	----	----	----		19-Dec-2021	3 days	3 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) DEE WATER DWR - SUMP 1	E641A	16-Dec-2021	28-Dec-2021	14 days	12 days	✓	30-Dec-2021	40 days	2 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) DWR-SUMP2	E641A	16-Dec-2021	28-Dec-2021	14 days	12 days	✓	30-Dec-2021	40 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial - total (lab preserved) DEE WATER DWR - SUMP 1	E508	16-Dec-2021	----	----	----		05-Jan-2022	28 days	20 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial - total (lab preserved) DWR-SUMP2	E508	16-Dec-2021	----	----	----		05-Jan-2022	28 days	20 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) DEE WATER DWR - SUMP 1	E420	16-Dec-2021	----	----	----		08-Jan-2022	180 days	23 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) DWR-SUMP2	E420	16-Dec-2021	----	----	----		08-Jan-2022	180 days	23 days	✓

Legend & Qualifier Definitions

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

Page : 4 of 7
Work Order : VA21C8170
Client : Castor Consultants Limited
Project : DEEP WATER RECOVERY



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)							
Dissolved Mercury in Water by CVAAS	E509	381686	1	6	16.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	383503	1	7	14.2	5.0	✓
pH by Meter	E108	376396	1	19	5.2	5.0	✓
Total Mercury in Water by CVAAS	E508	381296	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	382322	1	20	5.0	5.0	✓
Turbidity by Nephelometry	E121	371977	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
BC PHCs - EPH by GC-FID	E601A	377550	1	10	10.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	381686	1	6	16.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	383503	1	7	14.2	5.0	✓
PAHs by Hexane LVI GC-MS	E641A	377551	1	12	8.3	5.0	✓
pH by Meter	E108	376396	1	19	5.2	5.0	✓
Total Mercury in Water by CVAAS	E508	381296	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	382322	1	20	5.0	5.0	✓
Turbidity by Nephelometry	E121	371977	1	20	5.0	5.0	✓
Method Blanks (MB)							
BC PHCs - EPH by GC-FID	E601A	377550	1	10	10.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	381686	1	6	16.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	383503	1	7	14.2	5.0	✓
PAHs by Hexane LVI GC-MS	E641A	377551	1	12	8.3	5.0	✓
Total Mercury in Water by CVAAS	E508	381296	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	382322	1	20	5.0	5.0	✓
Turbidity by Nephelometry	E121	371977	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Dissolved Mercury in Water by CVAAS	E509	381686	1	6	16.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	383503	1	7	14.2	5.0	✓
Total Mercury in Water by CVAAS	E508	381296	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	382322	1	20	5.0	5.0	✓



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally $20 \pm 5^\circ\text{C}$). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 Vancouver - Environmental	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
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.
Dissolved Metals in Water by CRC ICPMS	E421 Vancouver - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 μm), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
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
Dissolved Mercury in Water by CVAAS	E509 Vancouver - Environmental	Water	APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 μm), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
BC PHCs - EPH by GC-FID	E601A Vancouver - Environmental	Water	BC MOE Lab Manual	Sample extracts are analyzed by GC-FID for BC hydrocarbon fractions.
PAHs by Hexane LVI GC-MS	E641A Vancouver - Environmental	Water	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by large volume injection (LVI) GC-MS.
Dissolved Hardness (Calculated)	EC100 Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO_3), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO_3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.



<i>Analytical Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Hardness (Calculated) from Total Ca/Mg	EC100A Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
LEPH and HEPH: EPH-PAH	EC600A Vancouver - Environmental	Water	BC MOE Lab Manual (LEPH and HEPH) (mod)	Light Extractable Petroleum Hydrocarbons (LEPH) and Heavy Extractable Petroleum Hydrocarbons (HEPH) are calculated as follows: LEPH = Extractable Petroleum Hydrocarbons (EPH10-19) minus Acenaphthene, Acridine, Anthracene, Fluorene, Naphthalene and Phenanthrene; HEPH = Extractable Petroleum Hydrocarbons (EPH19-32) minus Benz(a)anthracene, Benzo(a)pyrene, Fluoranthene, and Pyrene.
<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Dissolved Metals Water Filtration	EP421 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO ₃ .
Dissolved Mercury Water Filtration	EP509 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
PHCs and PAHs Hexane Extraction	EP601 Vancouver - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

QUALITY CONTROL REPORT

Work Order	: VA21C8170	Page	: 1 of 16
Client	: Castor Consultants Limited	Laboratory	: Vancouver - Environmental
Contact	: Rob Waters	Account Manager	: Can Dang
Address	: 13719 Jennifer Road	Address	: 8081 Lougheed Highway
	Ladysmith BC Canada V9G 1G4		Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: DEEP WATER RECOVERY	Date Samples Received	: 17-Dec-2021 09:20
PO	: ----	Date Analysis Commenced	: 19-Dec-2021
C-O-C number	: 17-835609	Issue Date	: 13-Jan-2022 12:17
Sampler	: ----		
Site	: ----		
Quote number	: VA20-CAST100-001		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative 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>
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Christopher Li	Lab Assistant	Metals, Burnaby, British Columbia
Dee Lee	Analyst	Metals, Burnaby, British Columbia
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Paul Cushing	Team Leader - Organics	Organics, 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: 371977)											
FJ2101480-001	Anonymous	turbidity	----	E121	0.10	NTU	3.65	3.54	2.84%	15%	----
Physical Tests (QC Lot: 376396)											
VA21C8340-003	Anonymous	pH	----	E108	0.10	pH units	5.22	5.23	0.230%	4%	----
Total Metals (QC Lot: 381296)											
VA21C8129-008	Anonymous	mercury, total	7439-97-6	E508	0.0000050	mg/L	0.0000053	0.0000065	0.0000012	Diff <2x LOR	----
Total Metals (QC Lot: 382322)											
KS2104246-003	Anonymous	aluminum, total	7429-90-5	E420	0.0150	mg/L	<0.0150	<0.0150	0	Diff <2x LOR	----
		antimony, total	7440-36-0	E420	0.00050	mg/L	0.00062	0.00059	0.00004	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00050	mg/L	0.00596	0.00619	3.84%	20%	----
		barium, total	7440-39-3	E420	0.00050	mg/L	0.0347	0.0348	0.145%	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	0.000250	mg/L	<0.000250	<0.000250	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.050	mg/L	1.64	1.62	1.01%	20%	----
		cadmium, total	7440-43-9	E420	0.0000300	mg/L	<0.0000300	<0.0000300	0	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.250	mg/L	257	251	2.19%	20%	----
		cesium, total	7440-46-2	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		chromium, total	7440-47-3	E420	0.00250	mg/L	<0.00250	<0.00250	0	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.00250	mg/L	0.00788	0.00880	0.00092	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		lead, total	7439-92-1	E420	0.000250	mg/L	<0.000250	<0.000250	0	Diff <2x LOR	----
		lithium, total	7439-93-2	E420	0.0050	mg/L	0.0200	0.0203	0.0003	Diff <2x LOR	----
		magnesium, total	7439-95-4	E420	0.0250	mg/L	347	340	2.22%	20%	----
		molybdenum, total	7439-98-7	E420	0.000250	mg/L	0.0564	0.0551	2.31%	20%	----
		nickel, total	7440-02-0	E420	0.00250	mg/L	<0.00250	<0.00250	0	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E420	0.250	mg/L	<0.250	<0.250	0	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.250	mg/L	40.2	40.3	0.257%	20%	----
		rubidium, total	7440-17-7	E420	0.00100	mg/L	0.00445	0.00433	0.00012	Diff <2x LOR	----
		selenium, total	7782-49-2	E420	0.000250	mg/L	0.0126	0.0138	9.07%	20%	----
		silicon, total	7440-21-3	E420	0.50	mg/L	13.7	13.4	2.22%	20%	----
		silver, total	7440-22-4	E420	0.000050	mg/L	<0.000050	<0.000050	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: 382322) - continued											
KS2104246-003	Anonymous	sodium, total	7440-23-5	E420	0.250	mg/L	602	586	2.55%	20%	----
		strontium, total	7440-24-6	E420	0.00100	mg/L	6.04	5.89	2.52%	20%	----
		sulfur, total	7704-34-9	E420	2.50	mg/L	1000	1000	0.252%	20%	----
		tellurium, total	13494-80-9	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.00150	mg/L	<0.00150	<0.00150	0	Diff <2x LOR	----
		tungsten, total	7440-33-7	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.000050	mg/L	0.00656	0.00651	0.877%	20%	----
		vanadium, total	7440-62-2	E420	0.00250	mg/L	<0.00250	<0.00250	0	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0150	mg/L	<0.0150	<0.0150	0	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 381686)											
YL2101767-001	Anonymous	mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 383503)											
KS2104271-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00100	mg/L	0.00561	0.00593	0.00031	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00100	mg/L	0.0142	0.0140	1.14%	20%	----
		barium, dissolved	7440-39-3	E421	0.00100	mg/L	0.0220	0.0224	2.07%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000200	mg/L	<0.000200	<0.000200	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.100	mg/L	2.13	2.19	2.80%	20%	----
		cadmium, dissolved	7440-43-9	E421	0.0000500	mg/L	0.0000540	0.0000604	0.0000065	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.500	mg/L	332	343	3.18%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000100	mg/L	0.000111	0.000116	0.000005	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00200	mg/L	0.0704	0.0720	2.35%	20%	----
		iron, dissolved	7439-89-6	E421	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0100	mg/L	0.0281	0.0287	0.0006	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.0500	mg/L	562	576	2.44%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00100	mg/L	0.00502	0.00484	0.00017	Diff <2x LOR	----
		molybdenum, dissolved	7439-98-7	E421	0.000500	mg/L	0.0883	0.0900	1.93%	20%	----



Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 383503) - continued											
KS2104271-001	Anonymous	nickel, dissolved	7440-02-0	E421	0.00500	mg/L	0.00576	0.00593	0.00017	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	0.500	mg/L	<0.500	<0.500	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.500	mg/L	110	115	3.80%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00200	mg/L	0.0751	0.0761	1.25%	20%	----
		selenium, dissolved	7782-49-2	E421	0.000500	mg/L	0.0318	0.0315	0.770%	20%	----
		silicon, dissolved	7440-21-3	E421	0.500	mg/L	6.58	6.72	2.10%	20%	----
		silver, dissolved	7440-22-4	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	0.500	mg/L	1290	1290	0.0741%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00200	mg/L	13.0	13.3	1.65%	20%	----
		sulfur, dissolved	7704-34-9	E421	5.00	mg/L	2010	2010	0.0219%	20%	----
		tellurium, dissolved	13494-80-9	E421	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00300	mg/L	<0.00300	<0.00300	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000100	mg/L	0.0276	0.0276	0.0676%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00500	mg/L	0.00817	0.00827	0.00010	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0100	mg/L	0.0106	<0.0100	0.0006	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00300	mg/L	<0.00300	<0.00300	0	Diff <2x LOR	----



Method Blank (MB) Report

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

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 371977)						
turbidity	----	E121	0.1	NTU	<0.10	----
Total Metals (QCLot: 381296)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Total Metals (QCLot: 382322)						
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	7440-23-5	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
Total Metals (QCLot: 382322) - continued						
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	----
Dissolved Metals (QCLot: 381686)						
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 383503)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 383503) - continued						
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Hydrocarbons (QCLot: 377550)						
EPH (C10-C19)	----	E601A	250	µg/L	<250	----
EPH (C19-C32)	----	E601A	250	µg/L	<250	----
Polycyclic Aromatic Hydrocarbons (QCLot: 377551)						
acenaphthene	83-32-9	E641A	0.01	µg/L	<0.010	----
acenaphthylene	208-96-8	E641A	0.01	µg/L	<0.010	----
acridine	260-94-6	E641A	0.01	µg/L	<0.010	----
anthracene	120-12-7	E641A	0.01	µg/L	<0.010	----
benz(a)anthracene	56-55-3	E641A	0.01	µg/L	<0.010	----
benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	<0.0050	----
benzo(b+j)fluoranthene	n/a	E641A	0.01	µg/L	<0.010	----
benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	<0.010	----
benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	<0.010	----
chrysene	218-01-9	E641A	0.01	µg/L	<0.010	----
dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	<0.0050	----
fluoranthene	206-44-0	E641A	0.01	µg/L	<0.010	----
fluorene	86-73-7	E641A	0.01	µg/L	<0.010	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	<0.010	----
methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	<0.010	----
methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	<0.010	----

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 Work Order : VA21C8170
 Client : Castor Consultants Limited
 Project : DEEP WATER RECOVERY



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>
Polycyclic Aromatic Hydrocarbons (QCLot: 377551) - continued						
naphthalene	91-20-3	E641A	0.05	µg/L	<0.050	----
phenanthrene	85-01-8	E641A	0.02	µg/L	<0.020	----
pyrene	129-00-0	E641A	0.01	µg/L	<0.010	----
quinoline	91-22-5	E641A	0.05	µg/L	<0.050	----



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: 371977)									
turbidity	----	E121	0.1	NTU	200 NTU	102	85.0	115	----
Physical Tests (QCLot: 376396)									
pH	----	E108	----	pH units	7 pH units	99.9	98.0	102	----
Total Metals (QCLot: 381296)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	92.7	80.0	120	----
Total Metals (QCLot: 382322)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	114	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	105	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	99.4	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	100	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	117	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	100	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	99.2	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	102	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	103	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	99.7	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	102	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	104	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	104	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	116	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	108	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	111	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	92.7	80.0	120	----
sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	113	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: 382322) - continued									
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	109	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	105	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	99.6	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	104	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	98.7	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	105	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	95.5	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	106	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	98.6	80.0	120	----
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	104	80.0	120	----
Dissolved Metals (QCLot: 383503)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	97.9	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	102	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	97.3	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	99.6	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	99.6	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	94.4	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	110	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	100.0	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	95.5	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	100	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	96.2	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	96.2	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	97.7	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	104	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	96.0	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	98.3	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	99.6	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	97.1	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	101	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	97.8	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	99.7	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	106	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	99.2	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 383503) - continued									
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	101	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	106	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	91.3	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	102	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	101	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	103	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	102	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	96.8	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	92.9	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	101	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	95.9	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	98.2	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	96.6	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	98.4	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	102	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	97.4	80.0	120	----
Hydrocarbons (QCLot: 377550)									
EPH (C10-C19)	----	E601A	250	µg/L	6491 µg/L	90.0	70.0	130	----
EPH (C19-C32)	----	E601A	250	µg/L	3363 µg/L	93.7	70.0	130	----
Polycyclic Aromatic Hydrocarbons (QCLot: 377551)									
acenaphthene	83-32-9	E641A	0.01	µg/L	0.5 µg/L	116	60.0	130	----
acenaphthylene	208-96-8	E641A	0.01	µg/L	0.5 µg/L	112	60.0	130	----
acridine	260-94-6	E641A	0.01	µg/L	0.5 µg/L	115	60.0	130	----
anthracene	120-12-7	E641A	0.01	µg/L	0.5 µg/L	116	60.0	130	----
benz(a)anthracene	56-55-3	E641A	0.01	µg/L	0.5 µg/L	116	60.0	130	----
benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	0.5 µg/L	112	60.0	130	----
benzo(b+j)fluoranthene	n/a	E641A	0.01	µg/L	0.5 µg/L	119	60.0	130	----
benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	0.5 µg/L	125	60.0	130	----
benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	0.5 µg/L	120	60.0	130	----
chrysene	218-01-9	E641A	0.01	µg/L	0.5 µg/L	119	60.0	130	----
dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	0.5 µg/L	118	60.0	130	----
fluoranthene	206-44-0	E641A	0.01	µg/L	0.5 µg/L	115	60.0	130	----
fluorene	86-73-7	E641A	0.01	µg/L	0.5 µg/L	114	60.0	130	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	0.5 µg/L	123	60.0	130	----
methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	0.5 µg/L	121	60.0	130	----
methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	0.5 µg/L	118	60.0	130	----

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 Work Order : VA21C8170
 Client : Castor Consultants Limited
 Project : DEEP WATER RECOVERY



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 377551) - continued									
naphthalene	91-20-3	E641A	0.05	µg/L	0.5 µg/L	116	50.0	130	----
phenanthrene	85-01-8	E641A	0.02	µg/L	0.5 µg/L	114	60.0	130	----
pyrene	129-00-0	E641A	0.01	µg/L	0.5 µg/L	118	60.0	130	----
quinoline	91-22-5	E641A	0.05	µg/L	0.5 µg/L	124	60.0	130	----



Matrix Spike (MS) Report

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

Sub-Matrix: **Water**

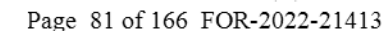
					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 381296)										
VA21C8129-009	Anonymous	mercury, total	7439-97-6	E508	0.0000989 mg/L	0.0001 mg/L	98.9	70.0	130	----
Total Metals (QCLot: 382322)										
KS2104246-003	Anonymous	aluminum, total	7429-90-5	E420	1.09 mg/L	1 mg/L	109	70.0	130	----
		antimony, total	7440-36-0	E420	0.106 mg/L	0.1 mg/L	106	70.0	130	----
		arsenic, total	7440-38-2	E420	0.110 mg/L	0.1 mg/L	110	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	0.209 mg/L	0.2 mg/L	104	70.0	130	----
		bismuth, total	7440-69-9	E420	0.0460 mg/L	0.05 mg/L	92.1	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	0.0203 mg/L	0.02 mg/L	101	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	0.0521 mg/L	0.05 mg/L	104	70.0	130	----
		chromium, total	7440-47-3	E420	0.206 mg/L	0.2 mg/L	103	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0999 mg/L	0.1 mg/L	99.9	70.0	130	----
		copper, total	7440-50-8	E420	0.0967 mg/L	0.1 mg/L	96.7	70.0	130	----
		iron, total	7439-89-6	E420	10.00 mg/L	10 mg/L	100.0	70.0	130	----
		lead, total	7439-92-1	E420	0.0939 mg/L	0.1 mg/L	93.9	70.0	130	----
		lithium, total	7439-93-2	E420	0.502 mg/L	0.5 mg/L	100	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	0.0995 mg/L	0.1 mg/L	99.5	70.0	130	----
		molybdenum, total	7439-98-7	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		nickel, total	7440-02-0	E420	0.196 mg/L	0.2 mg/L	98.2	70.0	130	----
		phosphorus, total	7723-14-0	E420	58.4 mg/L	50 mg/L	117	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	0.105 mg/L	0.1 mg/L	105	70.0	130	----
		selenium, total	7782-49-2	E420	0.219 mg/L	0.2 mg/L	110	70.0	130	----
		silicon, total	7440-21-3	E420	ND mg/L	10 mg/L	ND	70.0	130	----
		silver, total	7440-22-4	E420	0.0197 mg/L	0.02 mg/L	98.3	70.0	130	----
		sodium, total	7440-23-5	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	----



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: 382322) - continued										
KS2104246-003	Anonymous	tellurium, total	13494-80-9	E420	0.208 mg/L	0.2 mg/L	104	70.0	130	----
		thallium, total	7440-28-0	E420	0.0186 mg/L	0.02 mg/L	92.9	70.0	130	----
		thorium, total	7440-29-1	E420	0.114 mg/L	0.1 mg/L	114	70.0	130	----
		tin, total	7440-31-5	E420	0.103 mg/L	0.1 mg/L	103	70.0	130	----
		titanium, total	7440-32-6	E420	0.218 mg/L	0.2 mg/L	109	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0981 mg/L	0.1 mg/L	98.1	70.0	130	----
		uranium, total	7440-61-1	E420	ND mg/L	0.004 mg/L	ND	70.0	130	----
		vanadium, total	7440-62-2	E420	0.521 mg/L	0.5 mg/L	104	70.0	130	----
		zinc, total	7440-66-6	E420	2.02 mg/L	2 mg/L	101	70.0	130	----
		zirconium, total	7440-67-7	E420	0.222 mg/L	0.2 mg/L	111	70.0	130	----
Dissolved Metals (QCLot: 381686)										
VA21C8170-001	DEE WATER DWR - SUMP 1	mercury, dissolved	7439-97-6	E509	0.0000997 mg/L	0.0001 mg/L	99.7	70.0	130	----
Dissolved Metals (QCLot: 383503)										
KS2104271-002	Anonymous	aluminum, dissolved	7429-90-5	E421	10.2 mg/L	10 mg/L	102	70.0	130	----
		antimony, dissolved	7440-36-0	E421	1.02 mg/L	1 mg/L	102	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.960 mg/L	1 mg/L	96.0	70.0	130	----
		barium, dissolved	7440-39-3	E421	0.964 mg/L	1 mg/L	96.4	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	2.13 mg/L	2 mg/L	107	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.448 mg/L	0.5 mg/L	89.7	70.0	130	----
		boron, dissolved	7440-42-8	E421	5.44 mg/L	5 mg/L	109	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.194 mg/L	0.2 mg/L	97.2	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	200 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.516 mg/L	0.5 mg/L	103	70.0	130	----
		chromium, dissolved	7440-47-3	E421	1.92 mg/L	2 mg/L	96.0	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.934 mg/L	1 mg/L	93.4	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.914 mg/L	1 mg/L	91.4	70.0	130	----
		iron, dissolved	7439-89-6	E421	96.4 mg/L	100 mg/L	96.4	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.933 mg/L	1 mg/L	93.3	70.0	130	----
		lithium, dissolved	7439-93-2	E421	5.37 mg/L	5 mg/L	107	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	50 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	0.962 mg/L	1 mg/L	96.2	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	1.07 mg/L	1 mg/L	107	70.0	130	----
		nickel, dissolved	7440-02-0	E421	1.86 mg/L	2 mg/L	92.8	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	494 mg/L	500 mg/L	98.8	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	200 mg/L	ND	70.0	130	----



Sub-Matrix: Water					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 383503) - continued										
KS2104271-002	Anonymous	rubidium, dissolved	7440-17-7	E421	0.971 mg/L	1 mg/L	97.1	70.0	130	----
		selenium, dissolved	7782-49-2	E421	1.94 mg/L	2 mg/L	96.9	70.0	130	----
		silicon, dissolved	7440-21-3	E421	528 mg/L	500 mg/L	106	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.192 mg/L	0.2 mg/L	96.2	70.0	130	----
		sodium, dissolved	7440-23-5	E421	ND mg/L	100 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	ND mg/L	1000 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	1.93 mg/L	2 mg/L	96.7	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.186 mg/L	0.2 mg/L	92.9	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.959 mg/L	1 mg/L	95.9	70.0	130	----
		tin, dissolved	7440-31-5	E421	1.01 mg/L	1 mg/L	101	70.0	130	----
		titanium, dissolved	7440-32-6	E421	2.03 mg/L	2 mg/L	102	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.996 mg/L	1 mg/L	99.6	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.190 mg/L	0.2 mg/L	95.3	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	5.01 mg/L	5 mg/L	100	70.0	130	----
		zinc, dissolved	7440-66-6	E421	19.5 mg/L	20 mg/L	97.6	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	2.18 mg/L	2 mg/L	109	70.0	130	----



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Report To Rob Waters, Castor Consultants Limited
13719 Jennifer Road

Ladysmith, BC V9G 1G4, Canada

Date Received 21-Jan-2022 08:40
Issue Date 31-Jan-2022 15:19
Amendment 0
Version FINAL

Client Phone s.22

Certificate of Analysis

Lab Work Order # VA22A1190
Project PO #
Project
Legal Site Description
C of C Numbers 17-719917

Comments

Where possible, RLC will store samples for the following durations, measured from date of sample submission: 30 days for soil and water samples, 6 months for Tissue/Biota samples; 14 days for air samples collected on re-usable media; and 3 days for water samples submitted for microbiological testing. Longer storage times are available upon request.

Temperature 4

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.

<u>Signatories</u>	<u>Position</u>	<u>Laboratory Department</u>
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia
Dan Gebert	Laboratory Analyst	Metals, Burnaby, British Columbia
Ilnaz Badbezanchi	Team Leader - Metals preparation	Metals, Burnaby, British Columbia
Caleb Deroche	Lab Analyst	Metals, Burnaby, British Columbia
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Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Monica Ko	Lab Assistant	Metals, Burnaby, British Columbia

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Results of Analysis VA22A1190

Project
Report To Rob Waters, Caster Consultants Limited
Date Received 21-Jan-2022 08:40
Issue Date 31-Jan-2022 15:19
Amendment 0

ALS Sample ID		Client Sample ID	Matrix	Sub-Matrix	Method	Results	Detection Limit	Units	Qual	Date Sampled	Time Sampled	Prep Date	Analysis Date	QC Lot	QC Eval	Hold Time Eval
Physical Tests (Matrix: Water)																
Acidness (as CaCO3), from total Ca/Mg	VA22A1190-001	N. Creek	Water	Water	EC100A	17.0	0.55	mg/L		20-Jan-2022	00:00		29-Jan-2022		✓	✓
pH	VA22A1190-001	N. Creek	Water	Water	E108	6.84	0.15	pH units		20-Jan-2022	00:00	21-Jan-2022	21-Jan-2022	390457	✓	✖
turbidity	VA22A1190-001	N. Creek	Water	Water	E101	4.92	0.15	NTU		20-Jan-2022	00:00		23-Jan-2022	390126	✓	✓
Organic / Inorganic Carbon (Matrix: Water)																
carbon, dissolved organic (DOC)	VA22A1190-001	N. Creek	Water	Water	E395-L	7.37	0.55	mg/L		20-Jan-2022	00:00	27-Jan-2022	27-Jan-2022	390173	✓	✖
Total Metals (Matrix: Water)																
aluminum, total	VA22A1190-001	N. Creek	Water	Water	E430	0.481	0.0030	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
antimony, total	VA22A1190-001	N. Creek	Water	Water	E430	<0.00010	0.00010	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
arsenic, total	VA22A1190-001	N. Creek	Water	Water	E430	0.00019	0.00010	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
barium, total	VA22A1190-001	N. Creek	Water	Water	E430	0.00385	0.00010	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
beryllium, total	VA22A1190-001	N. Creek	Water	Water	E430	<0.000050	0.000020	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
bismuth, total	VA22A1190-001	N. Creek	Water	Water	E430	<0.000050	0.000020	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
boron, total	VA22A1190-001	N. Creek	Water	Water	E430	<0.010	0.010	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
cadmium, total	VA22A1190-001	N. Creek	Water	Water	E430	<0.000050	0.000020	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
calcium, total	VA22A1190-001	N. Creek	Water	Water	E430	4.85	0.050	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
cesium, total	VA22A1190-001	N. Creek	Water	Water	E430	<0.000010	0.000010	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
chromium, total	VA22A1190-001	N. Creek	Water	Water	E430	0.00077	0.00050	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
cobalt, total	VA22A1190-001	N. Creek	Water	Water	E430	0.00017	0.00010	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
copper, total	VA22A1190-001	N. Creek	Water	Water	E430	0.00214	0.00050	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
iron, total	VA22A1190-001	N. Creek	Water	Water	E430	0.417	0.010	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
lead, total	VA22A1190-001	N. Creek	Water	Water	E430	0.000068	0.000050	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
lithium, total	VA22A1190-001	N. Creek	Water	Water	E430	<0.0010	0.0010	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
magnesium, total	VA22A1190-001	N. Creek	Water	Water	E430	1.55	0.050	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
manganese, total	VA22A1190-001	N. Creek	Water	Water	E430	0.00279	0.00010	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
molybdenum, total	VA22A1190-001	N. Creek	Water	Water	E430	<0.000050	0.000050	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
nickel, total	VA22A1190-001	N. Creek	Water	Water	E430	<0.00050	0.00050	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
phosphorus, total	VA22A1190-001	N. Creek	Water	Water	E430	<0.050	0.050	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
potassium, total	VA22A1190-001	N. Creek	Water	Water	E430	0.271	0.050	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
rubidium, total	VA22A1190-001	N. Creek	Water	Water	E430	0.00040	0.00020	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
silver, total	VA22A1190-001	N. Creek	Water	Water	E430	0.000082	0.000050	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
selenium, total	VA22A1190-001	N. Creek	Water	Water	E430	4.84	0.15	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
silica, total	VA22A1190-001	N. Creek	Water	Water	E430	<0.000010	0.000010	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
strontium, total	VA22A1190-001	N. Creek	Water	Water	E430	4.81	0.050	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
sulfur, total	VA22A1190-001	N. Creek	Water	Water	E430	0.0179	0.00020	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
thallium, total	VA22A1190-001	N. Creek	Water	Water	E430	<0.010	0.010	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
thorium, total	VA22A1190-001	N. Creek	Water	Water	E430	<0.000050	0.000020	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
tin, total	VA22A1190-001	N. Creek	Water	Water	E430	<0.00010	0.00010	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
vanadium, total	VA22A1190-001	N. Creek	Water	Water	E430	<0.00010	0.00010	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
zinc, total	VA22A1190-001	N. Creek	Water	Water	E430	0.00066	0.00020	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
zirconium, total	VA22A1190-001	N. Creek	Water	Water	E430	<0.00010	0.00010	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390176	✓	✓
Dissolved Metals (Matrix: Water)																
aluminum, dissolved	VA22A1190-001	N. Creek	Water	Water	E421	0.312	0.010	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390061	✓	✓
antimony, dissolved	VA22A1190-001	N. Creek	Water	Water	E421	<0.00010	0.00010	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390061	✓	✓
arsenic, dissolved	VA22A1190-001	N. Creek	Water	Water	E421	0.00015	0.00010	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390061	✓	✓
barium, dissolved	VA22A1190-001	N. Creek	Water	Water	E421	0.00281	0.00010	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390061	✓	✓
beryllium, dissolved	VA22A1190-001	N. Creek	Water	Water	E421	<0.000050	0.000020	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390061	✓	✓
bismuth, dissolved	VA22A1190-001	N. Creek	Water	Water	E421	<0.000050	0.000020	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390061	✓	✓
boron, dissolved	VA22A1190-001	N. Creek	Water	Water	E421	<0.010	0.010	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390061	✓	✓
cadmium, dissolved	VA22A1190-001	N. Creek	Water	Water	E421	<0.000050	0.000020	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390061	✓	✓
calcium, dissolved	VA22A1190-001	N. Creek	Water	Water	E421	3.88	0.050	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390061	✓	✓
cesium, dissolved	VA22A1190-001	N. Creek	Water	Water	E421	<0.000010	0.000010	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390061	✓	✓
chromium, dissolved	VA22A1190-001	N. Creek	Water	Water	E421	0.00087	0.00050	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390061	✓	✓
cobalt, dissolved	VA22A1190-001	N. Creek	Water	Water	E421	<0.00010	0.00010	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390061	✓	✓
copper, dissolved	VA22A1190-001	N. Creek	Water	Water	E421	0.00162	0.00020	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390061	✓	✓
iron, dissolved	VA22A1190-001	N. Creek	Water	Water	E421	0.345	0.010	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390061	✓	✓
lead, dissolved	VA22A1190-001	N. Creek	Water	Water	E421	<0.000050	0.000020	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390061	✓	✓
lithium, dissolved	VA22A1190-001	N. Creek	Water	Water	E421	<0.0010	0.0010	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390061	✓	✓
magnesium, dissolved	VA22A1190-001	N. Creek	Water	Water	E421	1.43	0.050	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390061	✓	✓
manganese, dissolved	VA22A1190-001	N. Creek	Water	Water	E421	0.0123	0.00010	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390061	✓	✓
molybdenum, dissolved	VA22A1190-001	N. Creek	Water	Water	E421	<0.000050	0.000020	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390061	✓	✓
nickel, dissolved	VA22A1190-001	N. Creek	Water	Water	E421	<0.00050	0.00050	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390061	✓	✓
phosphorus, dissolved	VA22A1190-001	N. Creek	Water	Water	E421	<0.010	0.010	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390061	✓	✓
potassium, dissolved	VA22A1190-001	N. Creek	Water	Water	E421	0.254	0.050	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390061	✓	✓
rubidium, dissolved	VA22A1190-001	N. Creek	Water	Water	E421	0.00035	0.00020	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390061	✓	✓
silver, dissolved	VA22A1190-001	N. Creek	Water	Water	E421	0.000082	0.000050	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390061	✓	✓
selenium, dissolved	VA22A1190-001	N. Creek	Water	Water	E421	4.84	0.050	mg/L		20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	390061	✓	✓
silica, dissolved	VA22A1190-001	N. Creek	Water	Water	E421	<0.000010	0.000010	mg/L		20-Jan-2022	00:00	28-Jan-2022				

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magnesium, total	VAZDA1130-005	S. Creek	Water	Water	E420	8.73	0.0050	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
manganese, total	VAZDA1130-005	S. Creek	Water	Water	E420	0.0123	0.0010	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
nickel, total	VAZDA1130-005	S. Creek	Water	Water	E420	<0.00050	0.00050	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
phosphorus, total	VAZDA1130-005	S. Creek	Water	Water	E420	<0.050	0.050	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
potassium, total	VAZDA1130-005	S. Creek	Water	Water	E420	2.80	0.050	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
rubidium, total	VAZDA1130-005	S. Creek	Water	Water	E420	0.00128	0.00020	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
silicon, total	VAZDA1130-005	S. Creek	Water	Water	E420	<0.00050	0.00050	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
silver, total	VAZDA1130-005	S. Creek	Water	Water	E420	5.52	0.15	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
strontium, total	VAZDA1130-005	S. Creek	Water	Water	E420	<0.00010	0.00010	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
sulfur, total	VAZDA1130-005	S. Creek	Water	Water	E420	5.54	0.55	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
thallium, total	VAZDA1130-005	S. Creek	Water	Water	E420	<0.00030	0.00030	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
thorium, total	VAZDA1130-005	S. Creek	Water	Water	E420	0.00476	0.00030	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
tin, total	VAZDA1130-005	S. Creek	Water	Water	E420	<0.00010	0.00010	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
vanadium, total	VAZDA1130-005	S. Creek	Water	Water	E420	<0.00010	0.00010	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
zinc, total	VAZDA1130-005	S. Creek	Water	Water	E420	<0.00030	0.00030	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
zirconium, total	VAZDA1130-005	S. Creek	Water	Water	E420	0.00028	0.00030	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
Dissolved Metals (Metric: Water)															
aluminum, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	0.9542	0.0010	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
antimony, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	<0.00010	0.00010	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
arsenic, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	0.00020	0.00010	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
barium, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	0.0130	0.0010	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
beryllium, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	<0.000050	0.000050	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
bismuth, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	<0.000050	0.000050	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
boron, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	0.958	0.010	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
cadmium, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	<0.000050	0.000050	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
calcium, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	26.8	0.50	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
cesium, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	<0.00010	0.00010	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
chromium, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	<0.00050	0.00050	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
cobalt, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	<0.00010	0.00010	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
copper, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	0.00160	0.00030	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
iron, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	0.877	0.010	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
lead, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	<0.000050	0.000050	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
lithium, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	<0.0010	0.0010	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
magnesium, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	8.30	0.050	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
manganese, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	0.000050	0.000050	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
nickel, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	<0.00050	0.00050	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
phosphorus, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	<0.050	0.050	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
potassium, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	1.90	0.050	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
rubidium, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	0.00122	0.00020	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
silicon, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	0.000277	0.000050	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
silver, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	5.61	0.50	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
strontium, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	<0.00010	0.00010	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
sulfur, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	13.7	0.50	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
thallium, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	0.143	0.00030	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
thorium, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	4.76	0.010	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
tin, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	<0.00030	0.00030	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
vanadium, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	<0.00010	0.00010	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
zinc, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	<0.00010	0.00010	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
zirconium, dissolved	VAZDA1130-005	S. Creek	Water	Water	E421	<0.00010	0.00010	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
dissolved metals (Metric: location)	VAZDA1130-005	S. Creek	Water	Water	EP421	Laboratory		mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396061	✓	✓
Physical Tests (Metric: Water)															
hardness (as CaCO3), non total Ca/Mg	VAZDA1130-006	Culvert S. Creek	Water	Water	EC100A	74.6	0.55	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396457	✓	✓
pH	VAZDA1130-006	Culvert S. Creek	Water	Water	E108	7.34	0.15	pH units	20-Jan-2022	00:00	27-Jan-2022	27-Jan-2022	396457	✓	✓
turbidity	VAZDA1130-006	Culvert S. Creek	Water	Water	E121	50.1	0.12	NTU	20-Jan-2022	00:00	23-Jan-2022	23-Jan-2022	396127	✓	✓
Organic (Inorganic Carbon (Metric: Water)															
carbon, dissolved organic (DOC)	VAZDA1130-006	Culvert S. Creek	Water	Water	E308-L	<0.50	0.50	mg/L	20-Jan-2022	00:00	27-Jan-2022	27-Jan-2022	396179	✓	✓
Total Metals (Metric: Water)															
aluminum, total	VAZDA1130-006	Culvert S. Creek	Water	Water	E420	3.70	0.0030	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
antimony, total	VAZDA1130-006	Culvert S. Creek	Water	Water	E420	<0.00010	0.00010	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
arsenic, total	VAZDA1130-006	Culvert S. Creek	Water	Water	E420	0.00122	0.00010	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
barium, total	VAZDA1130-006	Culvert S. Creek	Water	Water	E420	0.0150	0.0010	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
beryllium, total	VAZDA1130-006	Culvert S. Creek	Water	Water	E420	0.000045	0.000050	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
bismuth, total	VAZDA1130-006	Culvert S. Creek	Water	Water	E420	<0.000050	0.000050	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
boron, total	VAZDA1130-006	Culvert S. Creek	Water	Water	E420	0.930	0.010	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
cadmium, total	VAZDA1130-006	Culvert S. Creek	Water	Water	E420	0.000018	0.000050	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
calcium, total	VAZDA1130-006	Culvert S. Creek	Water	Water	E420	16.7	0.50	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
cesium, total	VAZDA1130-006	Culvert S. Creek	Water	Water	E420	0.000008	0.00010	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
chromium, total	VAZDA1130-006	Culvert S. Creek	Water	Water	E420	0.00050	0.00050	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
cobalt, total	VAZDA1130-006	Culvert S. Creek	Water	Water	E420	0.00015	0.00010	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
copper, total	VAZDA1130-006	Culvert S. Creek	Water	Water	E420	0.0125	0.00050	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
iron, total	VAZDA1130-006	Culvert S. Creek	Water	Water	E420	4.96	0.010	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
lead, total	VAZDA1130-006	Culvert S. Creek	Water	Water	E420	0.000054	0.000050	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
lithium, total	VAZDA1130-006	Culvert S. Creek	Water	Water	E420	0.0019	0.0010	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
magnesium, total	VAZDA1130-006	Culvert S. Creek	Water	Water	E420	6.77	0.050	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
manganese, total	VAZDA1130-006	Culvert S. Creek	Water	Water	E420	0.765	0.0010	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
molybdenum, total	VAZDA1130-006	Culvert S. Creek	Water	Water	E420	0.00018	0.000050	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
nickel, total	VAZDA1130-006	Culvert S. Creek	Water	Water	E420	0.00098	0.00050	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
phosphorus, total	VAZDA1130-006	Culvert S. Creek	Water	Water	E420	0.0001	0.050	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
potassium, total	VAZDA1130-006	Culvert S. Creek	Water	Water	E420	1.52	0.050	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
rubidium, total	VAZDA1130-006	Culvert S. Creek	Water	Water	E420	0.00158	0.00030	mg/L	20-Jan-2022	00:00	28-Jan-2022	28-Jan-2022	396176	✓	✓
silicon, total	VAZDA1130-006	Culvert S. Creek	Water	Water											

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Detection Limits VA22A1190

Project

Report To

Rob Waters, Castor Consultants Limited

Date Received

21-Jan-2022 08:40

Issue Date

31-Jan-2022 15:19

Amendment

0

Client Sample ID		N. Creek	Sump1	Sump2	Sump2A	S. Creek	Culvert S. Creek	S. Creek A	Background
Date Sampled		20-Jan-2022	20-Jan-2022	20-Jan-2022	20-Jan-2022	20-Jan-2022	20-Jan-2022	20-Jan-2022	20-Jan-2022
Time Sampled		00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00
ALS Sample ID		VA22A1190-001	VA22A1190-002	VA22A1190-003	VA22A1190-004	VA22A1190-005	VA22A1190-006	VA22A1190-007	VA22A1190-008
Analyte	Units	Sub-Matrix: Water	Sub-Matrix: Water	Sub-Matrix: Water	Sub-Matrix: Water	Sub-Matrix: Water	Sub-Matrix: Water	Sub-Matrix: Water	Sub-Matrix: Water
Physical Tests (Matrix: Water)									
hardness (as CaCO3), from total Ca/Mg	mg/L	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
pH	pH units	0.10	0.10	0.10	0.10	0.10	0.10	0.10	
turbidity	NTU	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Organic / Inorganic Carbon (Matrix: Water)									
carbon, dissolved organic [DOC]	mg/L	0.50				0.50	0.50	0.50	
Total Metals (Matrix: Water)									
aluminum, total	mg/L	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	
antimony, total	mg/L	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	
arsenic, total	mg/L	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	
barium, total	mg/L	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	
beryllium, total	mg/L	0.000020	0.000100	0.000100	0.000020	0.000020	0.000020	0.000020	
bismuth, total	mg/L	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	
boron, total	mg/L	0.010	0.010	0.010	0.010	0.010	0.010	0.010	
cadmium, total	mg/L	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	
calcium, total	mg/L	0.050	0.050	0.050	0.050	0.050	0.050	0.050	
cesium, total	mg/L	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	
chromium, total	mg/L	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	
cobalt, total	mg/L	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	
copper, total	mg/L	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	
iron, total	mg/L	0.010	0.010	0.010	0.010	0.010	0.010	0.010	
lead, total	mg/L	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	
lithium, total	mg/L	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	
magnesium, total	mg/L	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	
manganese, total	mg/L	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	
mercury, total	mg/L		0.0000050	0.0000050					
molybdenum, total	mg/L	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	
nickel, total	mg/L	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	
phosphorus, total	mg/L	0.050	0.050	0.050	0.050	0.050	0.050	0.050	
potassium, total	mg/L	0.050	0.050	0.050	0.050	0.050	0.050	0.050	
rubidium, total	mg/L	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	
selenium, total	mg/L	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	
silicon, total	mg/L	0.10	0.10	0.10	0.10	0.10	0.10	0.10	
silver, total	mg/L	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	
sodium, total	mg/L	0.050	0.050	0.050	0.050	0.050	0.050	0.050	
strontium, total	mg/L	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	
sulfur, total	mg/L	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
tellurium, total	mg/L	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	
thallium, total	mg/L	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	
thorium, total	mg/L	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	
tin, total	mg/L	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	
titanium, total	mg/L	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	
tungsten, total	mg/L	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	
uranium, total	mg/L	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	
vanadium, total	mg/L	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	
zinc, total	mg/L	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	
zirconium, total	mg/L	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	
Dissolved Metals (Matrix: Water)									
aluminum, dissolved	mg/L	0.0010				0.0010	0.0010	0.0010	
antimony, dissolved	mg/L	0.00010				0.00010	0.00010	0.00010	
arsenic, dissolved	mg/L	0.00010				0.00010	0.00010	0.00010	
barium, dissolved	mg/L	0.00010				0.00010	0.00010	0.00010	
beryllium, dissolved	mg/L	0.000020				0.000020	0.000020	0.000020	
bismuth, dissolved	mg/L	0.000050				0.000050	0.000050	0.000050	
boron, dissolved	mg/L	0.010				0.010	0.010	0.010	
cadmium, dissolved	mg/L	0.0000050				0.0000050	0.0000050	0.0000050	
calcium, dissolved	mg/L	0.050				0.050	0.050	0.050	
cesium, dissolved	mg/L	0.000010				0.000010	0.000010	0.000010	
chromium, dissolved	mg/L	0.00050				0.00050	0.00050	0.00050	
cobalt, dissolved	mg/L	0.00010				0.00010	0.00010	0.00010	
copper, dissolved	mg/L	0.00020				0.00020	0.00020	0.00020	
iron, dissolved	mg/L	0.010				0.010	0.010	0.010	
lead, dissolved	mg/L	0.000050				0.000050	0.000050	0.000050	
lithium, dissolved	mg/L	0.0010				0.0010	0.0010	0.0010	
magnesium, dissolved	mg/L	0.0050				0.0050	0.0050	0.0050	
manganese, dissolved	mg/L	0.00010				0.00010	0.00010	0.00010	
molybdenum, dissolved	mg/L	0.000050				0.000050	0.000050	0.000050	
nickel, dissolved	mg/L	0.00050				0.00050	0.00050	0.00050	
phosphorus, dissolved	mg/L	0.050				0.050	0.050	0.050	
potassium, dissolved	mg/L	0.050				0.050	0.050	0.050	
rubidium, dissolved	mg/L	0.00020				0.00020	0.00020	0.00020	
selenium, dissolved	mg/L	0.000050				0.000050	0.000050	0.000050	
silicon, dissolved	mg/L	0.050				0.050	0.050	0.050	
silver, dissolved	mg/L	0.000010				0.000010	0.000010	0.000010	
sodium, dissolved	mg/L	0.050				0.050	0.050	0.050	
strontium, dissolved	mg/L	0.00020				0.00020	0.00020	0.00020	
sulfur, dissolved	mg/L	0.50				0.50	0.50	0.50	
tellurium, dissolved	mg/L	0.00020				0.00020	0.00020	0.00020	
thallium, dissolved	mg/L	0.000010				0.000010	0.000010	0.000010	
thorium, dissolved	mg/L	0.00010				0.00010	0.00010	0.00010	
tin, dissolved	mg/L	0.00010				0.00010	0.00010	0.00010	
titanium, dissolved	mg/L	0.00030				0.00030	0.00030	0.00030	
tungsten, dissolved	mg/L	0.00010				0.00010	0.00010	0.00010	
uranium, dissolved	mg/L	0.000010				0.000010	0.000010	0.000010	

vanadium, dissolved	mg/L	0.00050	0.00050	0.00050	0.00050
zinc, dissolved	mg/L	0.0010	0.0010	0.0010	0.0010
zirconium, dissolved	mg/L	0.00030	0.00030	0.00030	0.00030
dissolved metals filtration location					
Hydrocarbons (Matrix: Water)					
EPH (C10-C19)	µg/L	250	250		
EPH (C19-C32)	µg/L	250	250		
LEPHw	µg/L	250	250		
HEPHw	µg/L	250	250		
Hydrocarbons Surrogates (Matrix: Water)					
bromobenzotrifluoride, 2- (EPH surr)	%	1.0	1.0		
Polycyclic Aromatic Hydrocarbons (Matrix: Water)					
acenaphthene	µg/L	0.010	0.010		
acenaphthylene	µg/L	0.010	0.010		
acridine	µg/L	0.070	0.010		
anthracene	µg/L	0.025	0.010		
benz(a)anthracene	µg/L	0.010	0.010		
benzo(a)pyrene	µg/L	0.0050	0.0050		
benzo(b+j)fluoranthene	µg/L	0.010	0.010		
benzo(b+j+k)fluoranthene	µg/L	0.015	0.015		
benzo(g,h,i)perylene	µg/L	0.010	0.010		
benzo(k)fluoranthene	µg/L	0.010	0.010		
chrysene	µg/L	0.010	0.010		
dibenz(a,h)anthracene	µg/L	0.0092	0.0050		
fluoranthene	µg/L	0.010	0.010		
fluorene	µg/L	0.010	0.010		
indeno(1,2,3-c,d)pyrene	µg/L	0.010	0.010		
methylnaphthalene, 1-	µg/L	0.010	0.010		
methylnaphthalene, 2-	µg/L	0.010	0.010		
naphthalene	µg/L	0.050	0.050		
phenanthrene	µg/L	0.020	0.020		
pyrene	µg/L	0.010	0.010		
quinoline	µg/L	0.050	0.050		
Polycyclic Aromatic Hydrocarbons Surrogates (Matrix: Water)					
chrysene-d12	%	0.1	0.1		
naphthalene-d8	%	0.1	0.1		
phenanthrene-d10	%	0.1	0.1		

Duplicates VA22A1190

Project
Report To Rob Waters, Castor Consultants Limited
Date Received 21-Jan-2022 08:40
Issue Date 31-Jan-2022 15:19
Amendment 0

ALS ID	Reference	Client Sample ID	QC Type	QC Lot	Analyte	Method	Sample Result	Duplicate Result	Detection Limit Units	RPD(%) or Diff.	Duplicate Limits	Qual	Eval
Physical Tests (Matrix: Water)													
QC-393126-004	Anonymous	Anonymous	DUP	393126	turbidity	E121	6.43	5.60	0.1	NTU	13.7%	15	✓
QC-393127-004	VA22A1190-004	Sump2A	DUP	393127	turbidity	E121	119	118	0.1	NTU	0.844%	15	✓
QC-MRG3-392457003	Anonymous	Anonymous	DUP	392457	pH	E108	7.89	7.88	0.1	pH units	0.127%	4	✓
Organic / Inorganic Carbon (Matrix: Water)													
QC-396173-004	VA22A1190-001	N. Creek	DUP	396173	carbon, dissolved organic [DOC]	E358-L	7.37	7.75	0.5	mg/L	5.01%	20	✓
Total Metals (Matrix: Water)													
QC-396770-004	Anonymous	Anonymous	DUP	396770	aluminum, total	E420	134	0.150	0.003	mg/L	11.8%	20	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	antimony, total	E420	0.13	0.00014	0.0001	mg/L	0.000008	Diff <2x LOR	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	arsenic, total	E420	0.60	0.00065	0.0001	mg/L	0.00004	Diff <2x LOR	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	barium, total	E420	29.2	0.0297	0.0001	mg/L	1.89%	20	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	beryllium, total	E420	<0.100	<0.000100	0.00002	mg/L	0	Diff <2x LOR	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	bismuth, total	E420	<0.050	<0.000050	0.00005	mg/L	0	Diff <2x LOR	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	boron, total	E420	<10	<0.010	0.01	mg/L	0	Diff <2x LOR	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	cadmium, total	E420	0.328	0.000326	0.000005	mg/L	0.833%	20	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	calcium, total	E420	42500	43.0	0.05	mg/L	1.14%	20	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	cesium, total	E420	0.074	0.000079	0.00001	mg/L	0.000005	Diff <2x LOR	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	chromium, total	E420	<0.50	<0.00050	0.0005	mg/L	0	Diff <2x LOR	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	cobalt, total	E420	0.43	0.00043	0.0001	mg/L	0.000002	Diff <2x LOR	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	copper, total	E420	1.20	0.00123	0.0005	mg/L	0.00003	Diff <2x LOR	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	iron, total	E420	267	0.282	0.01	mg/L	5.56%	20	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	lead, total	E420	0.757	0.000775	0.00005	mg/L	2.31%	20	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	lithium, total	E420	1.1	0.0012	0.001	mg/L	0.00006	Diff <2x LOR	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	magnesium, total	E420	9850	9.95	0.005	mg/L	0.995%	20	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	manganese, total	E420	239	0.240	0.0001	mg/L	0.263%	20	✓
QC-394806-004	Anonymous	Anonymous	DUP	394806	mercury, total	E508	<0.0000050	<0.0000050	0.000005	mg/L	0	Diff <2x LOR	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	molybdenum, total	E420	0.702	0.000698	0.00005	mg/L	0.539%	20	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	nickel, total	E420	1.10	0.00111	0.0005	mg/L	0.000004	Diff <2x LOR	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	phosphorus, total	E420	<50	<0.050	0.05	mg/L	0	Diff <2x LOR	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	potassium, total	E420	1900	1.90	0.05	mg/L	0.0825%	20	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	rubidium, total	E420	0.74	0.00087	0.0002	mg/L	0.00013	Diff <2x LOR	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	selenium, total	E420	0.157	0.000191	0.00005	mg/L	0.000035	Diff <2x LOR	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	silicon, total	E420	5730	5.68	0.1	mg/L	0.792%	20	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	silver, total	E420	<0.010	<0.000010	0.00001	mg/L	0	Diff <2x LOR	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	sodium, total	E420	3490	3.52	0.05	mg/L	0.921%	20	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	strontium, total	E420	211	0.214	0.0002	mg/L	1.41%	20	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	sulfur, total	E420	22700	22.3	0.5	mg/L	1.82%	20	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	tellurium, total	E420	<0.20	<0.00020	0.0002	mg/L	0	Diff <2x LOR	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	thallium, total	E420	<0.010	<0.000010	0.00001	mg/L	0	Diff <2x LOR	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	thorium, total	E420	<0.10	<0.00010	0.0001	mg/L	0	Diff <2x LOR	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	tin, total	E420	<0.10	<0.00010	0.0001	mg/L	0	Diff <2x LOR	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	titanium, total	E420	3.90	0.00450	0.0003	mg/L	14.4%	20	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	tungsten, total	E420	<0.10	<0.00010	0.0001	mg/L	0	Diff <2x LOR	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	uranium, total	E420	4.40	0.00454	0.00001	mg/L	3.19%	20	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	vanadium, total	E420	<0.50	<0.00050	0.0005	mg/L	0	Diff <2x LOR	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	zinc, total	E420	70.3	0.0696	0.003	mg/L	1.00%	20	✓
QC-396770-004	Anonymous	Anonymous	DUP	396770	zirconium, total	E420	<0.20	<0.00020	0.0002	mg/L	0	Diff <2x LOR	✓
Dissolved Metals (Matrix: Water)													
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	aluminum, dissolved	E421	0.0022	0.0027	0.001	mg/L	0.0005	Diff <2x LOR	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	antimony, dissolved	E421	0.00279	0.00285	0.0001	mg/L	2.06%	20	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	arsenic, dissolved	E421	0.00042	0.00043	0.0001	mg/L	0.00002	Diff <2x LOR	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	barium, dissolved	E421	3.18	3.08	0.0001	mg/L	3.27%	20	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	beryllium, dissolved	E421	<0.040	<0.000040	0.00002	mg/L	0	Diff <2x LOR	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	bismuth, dissolved	E421	<0.000100	<0.000100	0.00005	mg/L	0	Diff <2x LOR	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	boron, dissolved	E421	0.237	0.230	0.01	mg/L	3.21%	20	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	cadmium, dissolved	E421	0.0306	0.0000236	0.000005	mg/L	0.0000069	Diff <2x LOR	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	calcium, dissolved	E421	55.2	54.1	0.05	mg/L	1.89%	20	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	cesium, dissolved	E421	0.000486	0.000492	0.00001	mg/L	1.11%	20	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	chromium, dissolved	E421	<0.00100	<0.00100	0.0005	mg/L	0	Diff <2x LOR	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	cobalt, dissolved	E421	0.00277	0.00278	0.0001	mg/L	0.558%	20	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	copper, dissolved	E421	<0.00040	<0.00040	0.0002	mg/L	0	Diff <2x LOR	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	iron, dissolved	E421	<0.020	<0.020	0.01	mg/L	0	Diff <2x LOR	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	lead, dissolved	E421	<0.000100	<0.000100	0.00005	mg/L	0	Diff <2x LOR	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	lithium, dissolved	E421	2.07	2.04	0.001	mg/L	1.59%	20	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	magnesium, dissolved	E421	15.3	15.3	0.005	mg/L	0.00936%	20	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	manganese, dissolved	E421	0.121	0.125	0.0001	mg/L	2.89%	20	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	molybdenum, dissolved	E421	0.0127	0.0128	0.00005	mg/L	0.787%	20	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	nickel, dissolved	E421	0.0146	0.0145	0.0005	mg/L	0.835%	20	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	phosphorus, dissolved	E421	<0.100	<0.100	0.05	mg/L	0	Diff <2x LOR	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	potassium, dissolved	E421	12.2	12.6	0.05	mg/L	2.92%	20	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	rubidium, dissolved	E421	0.0238	0.0235	0.0002	mg/L	1.17%	20	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	selenium, dissolved	E421	0.609	0.000531	0.00005	mg/L	0.000078	Diff <2x LOR	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	silicon, dissolved	E421	4.52	4.55	0.05	mg/L	0.636%	20	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	silver, dissolved	E421	<0.000020	<0.000020	0.00001	mg/L	0	Diff <2x LOR	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	sodium, dissolved	E421	316	324	0.05	mg/L	2.29%	20	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	strontium, dissolved	E421	1.68	1.71	0.0002	mg/L	1.60%	20	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	sulfur, dissolved	E421	2.79	2.99	0.5	mg/L	0.20	Diff <2x LOR	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	tellurium, dissolved	E421	<0.00040	<0.00040	0.0002	mg/L	0	Diff <2x LOR	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	thallium, dissolved	E421	0.000026	0.000021	0.00001	mg/L	0.000004	Diff <2x LOR	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	thorium, dissolved	E421	<0.00020	<0.00020	0.0001	mg/L	0	Diff <2x LOR	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	tin, dissolved	E421	<0.00020	<0.00020	0.0001	mg/L	0	Diff <2x LOR	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	titanium, dissolved	E421	<0.00060	<0.00060	0.0003	mg/L	0	Diff <2x LOR	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	tungsten, dissolved	E421	<0.00020	<0.00020	0.0001	mg/L	0	Diff <2x LOR	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	uranium, dissolved	E421	0.000654	0.000684	0.00001	mg/L	4.62%	20	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	vanadium, dissolved	E421	<0.00100	<0.00100	0.0005	mg/L	0	Diff <2x LOR	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	zinc, dissolved	E421	0.0034	0.0034	0.001	mg/L	0.00006	Diff <2x LOR	✓
QC-MRG2-396801004	Anonymous	Anonymous	DUP	396801	zirconium, dissolved	E421	0.00228	0.00237	0.0002	mg/L	0.00008	Diff <2x LOR	✓

Evaluation Legend
 ✓ QC Lot met ALS Data Quality Objectives

Hold Time Exceedance Details VA22A1190

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				Preparation					Analysis				
ALS Method Description	Client Sample ID	Method	Sampling Date	Preparation Date	Recommended Holding Time	Actual Holding Times	Eval	Qualifier	Analysis Date	Recommended Holding Time	Actual Holding Times	Eval	Qualifier
Physical Tests (Matrix: Water)													
pH by Meter	N. Creek	E108	20-Jan-2022						21-Jan-2022 20:02	0.25 hrs	44 hrs	x	EHTR-FM
pH by Meter	Sump1	E108	20-Jan-2022						21-Jan-2022 20:02	0.25 hrs	44 hrs	x	EHTR-FM
pH by Meter	Sump2	E108	20-Jan-2022						21-Jan-2022 20:02	0.25 hrs	44 hrs	x	EHTR-FM
pH by Meter	Sump2A	E108	20-Jan-2022						21-Jan-2022 20:02	0.25 hrs	44 hrs	x	EHTR-FM
pH by Meter	S. Creek	E108	20-Jan-2022						21-Jan-2022 20:02	0.25 hrs	44 hrs	x	EHTR-FM
pH by Meter	Culvert S. Creek	E108	20-Jan-2022						21-Jan-2022 20:02	0.25 hrs	44 hrs	x	EHTR-FM
pH by Meter	S. Creek A	E108	20-Jan-2022						21-Jan-2022 20:02	0.25 hrs	44 hrs	x	EHTR-FM
Organic / Inorganic Carbon (Matrix: Water)													
Dissolved Organic Carbon by Combustion (LoN. Creek	E358-L	20-Jan-2022	27-Jan-2022 13:00	3 days	8 days	x	EHT	27-Jan-2022 13:22	28 days	0 days	✓		
Dissolved Organic Carbon by Combustion (LoS. Creek	E358-L	20-Jan-2022	27-Jan-2022 13:00	3 days	8 days	x	EHT	27-Jan-2022 13:22	28 days	0 days	✓		
Dissolved Organic Carbon by Combustion (LoCulvert S. Creek	E358-L	20-Jan-2022	27-Jan-2022 13:00	3 days	8 days	x	EHT	27-Jan-2022 13:22	28 days	0 days	✓		
Dissolved Organic Carbon by Combustion (LoS. Creek A	E358-L	20-Jan-2022	27-Jan-2022 13:00	3 days	8 days	x	EHT	27-Jan-2022 13:22	28 days	0 days	✓		

Legend & Qualifier Definitions

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

Evaluation Legend

✓ = within holding time
 x = holding time exceedance

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 above represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added.

If samples are identified above 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 chain of custody, the date of receipt with the time at 00:00 is used for calculation purposes.

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

Methodology VA22A1190

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Method	ALS Test Description	Lab Location	Matrix	Method Reference	Methodology Description
Dissolved Metals (Matrix: Water)					
E421	Dissolved Metals in Water by CRC ICPMS	Vancouver - Environmer	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 µm), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
EP421	Dissolved Metals Water Filtration	Vancouver - Environmer	Water	APHA 3030B	Water samples are filtered (0.45 µm), and preserved with HNO ₃ .
Hydrocarbons (Matrix: Water)					
E601A	BC PHCs - EPH by GC-FID	Vancouver - Environmer	Water	BC MOE Lab Manual	Sample extracts are analyzed by GC-FID for BC hydrocarbon fractions. Light Extractable Petroleum Hydrocarbons (LEPH) and Heavy Extractable Petroleum Hydrocarbons (HEPH) are calculated as follows: LEPH = Extractable Petroleum Hydrocarbons (EPH10-19) minus Acenaphthene, Acridine, Anthracene, Fluorene, Naphthalene and Phenanthrene; HEPH = Extractable Petroleum Hydrocarbons (EPH19-32) minus
EC600A	LEPH and HEPH: EPH-PAH	Vancouver - Environmer	Water	BC MOE Lab Manual (LEPH and HEPH)	(moBenz(a)anthracene, Benzo(a)pyrene, Fluoranthene, and Pyrene.
Hydrocarbons Surrogates (Matrix: Water)					
E601A	BC PHCs - EPH by GC-FID	Vancouver - Environmer	Water	BC MOE Lab Manual	Sample extracts are analyzed by GC-FID for BC hydrocarbon fractions.
Organic / Inorganic Carbon (Matrix: Water)					
E358-L	Dissolved Organic Carbon by Combustion (Low Level)	Vancouver - Environmer	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO ₂ . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Physical Tests (Matrix: Water)					
E108	pH by Meter	Vancouver - Environmer	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
E121	Turbidity by Nephelometry	Vancouver - Environmer	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
EC100A	Hardness (Calculated) from Total Ca/Mg	Vancouver - Environmer	Water	APHA 2340B	"Hardness (as CaCO ₃), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
Polycyclic Aromatic Hydrocarbons (Matrix: Water)					
E641A	PAHs by Hexane LVI GC-MS	Vancouver - Environmer	Water	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by large volume injection (LVI) GC-MS.
Polycyclic Aromatic Hydrocarbons Surrogates (Matrix: Water)					
E641A	PAHs by Hexane LVI GC-MS	Vancouver - Environmer	Water	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by large volume injection (LVI) GC-MS.
Total Metals (Matrix: Water)					
E420	Total Metals in Water by CRC ICPMS	Vancouver - Environmer	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.
E508	Total Mercury in Water by CVAAS	Vancouver - Environmer	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS

Method References

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

Quality Control VA22A1190

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QC Type	Analyte	QC Lot	ALS QC ID	Method	Result	Target	Units	%	Limit	Units	Qual	Eval
Physical Tests (Matrix: Water)												
LCS	pH	392457	QC-392457-001	E108	7.02	7 pH units	pH units	100	98-102	%		✓
LCS	turbidity	393126	QC-393126-002	E121	215	200 NTU	NTU	108	85-115	%		✓
LCS	turbidity	393127	QC-393127-002	E121	216	200 NTU	NTU	108	85-115	%		✓
MB	turbidity	393126	QC-393126-001	E121	<0.10		NTU	-	0.1	NTU		✓
MB	turbidity	393127	QC-393127-001	E121	<0.10		NTU	-	0.1	NTU		✓
Organic / Inorganic Carbon (Matrix: Water)												
LCS	carbon, dissolved organic [DOC]	396173	QC-396173-002	E358-L	8.81	8.57 mg/L	mg/L	103	80-120	%		✓
MS	carbon, dissolved organic [DOC]	396173	S. Creek	E358-L	ND	5 mg/L	mg/L	ND	70-130	%		✓
MB	carbon, dissolved organic [DOC]	396173	QC-396173-001	E358-L	<0.50		mg/L	-	0.5	mg/L		✓
Total Metals (Matrix: Water)												
LCS	mercury, total	394806	QC-394806-002	E508	0.000101	0.0001 mg/L	mg/L	101	80-120	%		✓
MS	mercury, total	394806	Anonymous	E508	0.000101	0.0001 mg/L	mg/L	101	70-130	%		✓
LCS	aluminum, total	396770	QC-396770-002	E420	1.97	2 mg/L	mg/L	98.6	80-120	%		✓
LCS	antimony, total	396770	QC-396770-002	E420	1.20	1 mg/L	mg/L	120	80-120	%		✓
LCS	arsenic, total	396770	QC-396770-002	E420	1.02	1 mg/L	mg/L	102	80-120	%		✓
LCS	barium, total	396770	QC-396770-002	E420	0.250	0.25 mg/L	mg/L	99.9	80-120	%		✓
LCS	beryllium, total	396770	QC-396770-002	E420	0.100	0.1 mg/L	mg/L	100.0	80-120	%		✓
LCS	bismuth, total	396770	QC-396770-002	E420	1.03	1 mg/L	mg/L	103	80-120	%		✓
LCS	boron, total	396770	QC-396770-002	E420	1.01	1 mg/L	mg/L	101	80-120	%		✓
LCS	cadmium, total	396770	QC-396770-002	E420	0.0968	0.1 mg/L	mg/L	96.8	80-120	%		✓
LCS	calcium, total	396770	QC-396770-002	E420	50.9	50 mg/L	mg/L	102	80-120	%		✓
LCS	cesium, total	396770	QC-396770-002	E420	0.0501	0.05 mg/L	mg/L	100	80-120	%		✓
LCS	chromium, total	396770	QC-396770-002	E420	0.250	0.25 mg/L	mg/L	100	80-120	%		✓
LCS	cobalt, total	396770	QC-396770-002	E420	0.249	0.25 mg/L	mg/L	99.5	80-120	%		✓
LCS	copper, total	396770	QC-396770-002	E420	0.250	0.25 mg/L	mg/L	99.9	80-120	%		✓
LCS	iron, total	396770	QC-396770-002	E420	1.02	1 mg/L	mg/L	102	80-120	%		✓
LCS	lead, total	396770	QC-396770-002	E420	0.503	0.5 mg/L	mg/L	100	80-120	%		✓
LCS	lithium, total	396770	QC-396770-002	E420	0.249	0.25 mg/L	mg/L	99.6	80-120	%		✓
LCS	magnesium, total	396770	QC-396770-002	E420	51.2	50 mg/L	mg/L	102	80-120	%		✓
LCS	manganese, total	396770	QC-396770-002	E420	0.254	0.25 mg/L	mg/L	102	80-120	%		✓
LCS	molybdenum, total	396770	QC-396770-002	E420	0.268	0.25 mg/L	mg/L	107	80-120	%		✓
LCS	nickel, total	396770	QC-396770-002	E420	0.498	0.5 mg/L	mg/L	99.5	80-120	%		✓
LCS	phosphorus, total	396770	QC-396770-002	E420	10.7	10 mg/L	mg/L	107	80-120	%		✓
LCS	potassium, total	396770	QC-396770-002	E420	52.6	50 mg/L	mg/L	105	80-120	%		✓
LCS	rubidium, total	396770	QC-396770-002	E420	0.103	0.1 mg/L	mg/L	103	80-120	%		✓
LCS	selenium, total	396770	QC-396770-002	E420	1.05	1 mg/L	mg/L	105	80-120	%		✓
LCS	silicon, total	396770	QC-396770-002	E420	9.79	10 mg/L	mg/L	97.9	80-120	%		✓
LCS	silver, total	396770	QC-396770-002	E420	0.0970	0.1 mg/L	mg/L	97.0	80-120	%		✓
LCS	sodium, total	396770	QC-396770-002	E420	52.2	50 mg/L	mg/L	104	80-120	%		✓
LCS	strontium, total	396770	QC-396770-002	E420	0.273	0.25 mg/L	mg/L	109	80-120	%		✓
LCS	sulfur, total	396770	QC-396770-002	E420	46.4	50 mg/L	mg/L	92.8	80-120	%		✓
LCS	tellurium, total	396770	QC-396770-002	E420	0.103	0.1 mg/L	mg/L	103	80-120	%		✓
LCS	thallium, total	396770	QC-396770-002	E420	1.04	1 mg/L	mg/L	104	80-120	%		✓
LCS	thorium, total	396770	QC-396770-002	E420	0.101	0.1 mg/L	mg/L	101	80-120	%		✓
LCS	tin, total	396770	QC-396770-002	E420	0.492	0.5 mg/L	mg/L	98.5	80-120	%		✓
LCS	titanium, total	396770	QC-396770-002	E420	0.256	0.25 mg/L	mg/L	102	80-120	%		✓
LCS	tungsten, total	396770	QC-396770-002	E420	0.0985	0.1 mg/L	mg/L	98.5	80-120	%		✓
LCS	uranium, total	396770	QC-396770-002	E420	0.00532	0.005 mg/L	mg/L	106	80-120	%		✓
LCS	vanadium, total	396770	QC-396770-002	E420	0.510	0.5 mg/L	mg/L	102	80-120	%		✓
LCS	zinc, total	396770	QC-396770-002	E420	0.505	0.5 mg/L	mg/L	101	80-120	%		✓
LCS	zirconium, total	396770	QC-396770-002	E420	0.0999	0.1 mg/L	mg/L	99.9	80-120	%		✓
MS	aluminum, total	396770	Anonymous	E420	0.188	0.2 mg/L	mg/L	94.2	70-130	%		✓
MS	antimony, total	396770	Anonymous	E420	0.0228	0.02 mg/L	mg/L	114	70-130	%		✓
MS	arsenic, total	396770	Anonymous	E420	0.0200	0.02 mg/L	mg/L	100	70-130	%		✓
MS	barium, total	396770	Anonymous	E420	ND	0.02 mg/L	mg/L	ND	70-130	%		✓
MS	beryllium, total	396770	Anonymous	E420	0.0379	0.04 mg/L	mg/L	94.8	70-130	%		✓
MS	bismuth, total	396770	Anonymous	E420	0.00947	0.01 mg/L	mg/L	94.7	70-130	%		✓
MS	boron, total	396770	Anonymous	E420	0.099	0.1 mg/L	mg/L	99.5	70-130	%		✓
MS	cadmium, total	396770	Anonymous	E420	0.00398	0.004 mg/L	mg/L	99.6	70-130	%		✓
MS	calcium, total	396770	Anonymous	E420	ND	4 mg/L	mg/L	ND	70-130	%		✓
MS	cesium, total	396770	Anonymous	E420	0.0104	0.01 mg/L	mg/L	104	70-130	%		✓
MS	chromium, total	396770	Anonymous	E420	0.0391	0.04 mg/L	mg/L	97.8	70-130	%		✓
MS	cobalt, total	396770	Anonymous	E420	0.0189	0.02 mg/L	mg/L	94.6	70-130	%		✓
MS	copper, total	396770	Anonymous	E420	0.0186	0.02 mg/L	mg/L	92.9	70-130	%		✓
MS	iron, total	396770	Anonymous	E420	1.92	2 mg/L	mg/L	96.2	70-130	%		✓
MS	lead, total	396770	Anonymous	E420	0.0186	0.02 mg/L	mg/L	92.8	70-130	%		✓
MS	lithium, total	396770	Anonymous	E420	0.0927	0.1 mg/L	mg/L	92.7	70-130	%		✓
MS	magnesium, total	396770	Anonymous	E420	ND	1 mg/L	mg/L	ND	70-130	%		✓
MS	manganese, total	396770	Anonymous	E420	ND	0.02 mg/L	mg/L	ND	70-130	%		✓
MS	molybdenum, total	396770	Anonymous	E420	0.0223	0.02 mg/L	mg/L	112	70-130	%		✓
MS	nickel, total	396770	Anonymous	E420	0.0366	0.04 mg/L	mg/L	91.6	70-130	%		✓
MS	phosphorus, total	396770	Anonymous	E420	9.91	10 mg/L	mg/L	99.1	70-130	%		✓
MS	potassium, total	396770	Anonymous	E420	3.73	4 mg/L	mg/L	93.3	70-130	%		✓
MS	rubidium, total	396770	Anonymous	E420	0.0198	0.02 mg/L	mg/L	99.1	70-130	%		✓
MS	selenium, total	396770	Anonymous	E420	0.0422	0.04 mg/L	mg/L	106	70-130	%		✓

MS	silicon, total	396770	Anonymous	E420	9.26	10 mg/L	mg/L	92.6	70-130	%	✓
MS	silver, total	396770	Anonymous	E420	0.00410	0.004 mg/L	mg/L	102	70-130	%	✓
MS	sodium, total	396770	Anonymous	E420	ND	2 mg/L	mg/L	ND	70-130	%	✓
MS	strontium, total	396770	Anonymous	E420	ND	0.02 mg/L	mg/L	ND	70-130	%	✓
MS	sulfur, total	396770	Anonymous	E420	ND	20 mg/L	mg/L	ND	70-130	%	✓
MS	tellurium, total	396770	Anonymous	E420	0.0416	0.04 mg/L	mg/L	104	70-130	%	✓
MS	thallium, total	396770	Anonymous	E420	0.00367	0.004 mg/L	mg/L	91.8	70-130	%	✓
MS	thorium, total	396770	Anonymous	E420	0.0224	0.02 mg/L	mg/L	112	70-130	%	✓
MS	tin, total	396770	Anonymous	E420	0.0205	0.02 mg/L	mg/L	102	70-130	%	✓
MS	titanium, total	396770	Anonymous	E420	0.0403	0.04 mg/L	mg/L	101	70-130	%	✓
MS	tungsten, total	396770	Anonymous	E420	0.0195	0.02 mg/L	mg/L	97.7	70-130	%	✓
MS	uranium, total	396770	Anonymous	E420	ND	0.004 mg/L	mg/L	ND	70-130	%	✓
MS	vanadium, total	396770	Anonymous	E420	0.100	0.1 mg/L	mg/L	100	70-130	%	✓
MS	zinc, total	396770	Anonymous	E420	0.371	0.4 mg/L	mg/L	92.8	70-130	%	✓
MS	zirconium, total	396770	Anonymous	E420	0.0422	0.04 mg/L	mg/L	105	70-130	%	✓
MB	mercury, total	394806	QC-394806-001	E508	<0.0000050		mg/L	-	0.000005	mg/L	✓
MB	aluminum, total	396770	QC-396770-001	E420	<0.0030		mg/L	-	0.003	mg/L	✓
MB	antimony, total	396770	QC-396770-001	E420	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	arsenic, total	396770	QC-396770-001	E420	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	barium, total	396770	QC-396770-001	E420	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	beryllium, total	396770	QC-396770-001	E420	<0.000020		mg/L	-	0.00002	mg/L	✓
MB	bismuth, total	396770	QC-396770-001	E420	<0.000050		mg/L	-	0.00005	mg/L	✓
MB	boron, total	396770	QC-396770-001	E420	<0.010		mg/L	-	0.01	mg/L	✓
MB	cadmium, total	396770	QC-396770-001	E420	<0.0000050		mg/L	-	0.000005	mg/L	✓
MB	calcium, total	396770	QC-396770-001	E420	<0.050		mg/L	-	0.05	mg/L	✓
MB	cesium, total	396770	QC-396770-001	E420	<0.000010		mg/L	-	0.00001	mg/L	✓
MB	chromium, total	396770	QC-396770-001	E420	<0.00050		mg/L	-	0.0005	mg/L	✓
MB	cobalt, total	396770	QC-396770-001	E420	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	copper, total	396770	QC-396770-001	E420	<0.00050		mg/L	-	0.0005	mg/L	✓
MB	iron, total	396770	QC-396770-001	E420	<0.010		mg/L	-	0.01	mg/L	✓
MB	lead, total	396770	QC-396770-001	E420	<0.000050		mg/L	-	0.00005	mg/L	✓
MB	lithium, total	396770	QC-396770-001	E420	<0.0010		mg/L	-	0.001	mg/L	✓
MB	magnesium, total	396770	QC-396770-001	E420	<0.0050		mg/L	-	0.005	mg/L	✓
MB	manganese, total	396770	QC-396770-001	E420	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	molybdenum, total	396770	QC-396770-001	E420	<0.000050		mg/L	-	0.00005	mg/L	✓
MB	nickel, total	396770	QC-396770-001	E420	<0.00050		mg/L	-	0.0005	mg/L	✓
MB	phosphorus, total	396770	QC-396770-001	E420	<0.050		mg/L	-	0.05	mg/L	✓
MB	potassium, total	396770	QC-396770-001	E420	<0.050		mg/L	-	0.05	mg/L	✓
MB	rubidium, total	396770	QC-396770-001	E420	<0.00020		mg/L	-	0.0002	mg/L	✓
MB	selenium, total	396770	QC-396770-001	E420	<0.000050		mg/L	-	0.00005	mg/L	✓
MB	silicon, total	396770	QC-396770-001	E420	<0.10		mg/L	-	0.1	mg/L	✓
MB	silver, total	396770	QC-396770-001	E420	<0.000010		mg/L	-	0.00001	mg/L	✓
MB	sodium, total	396770	QC-396770-001	E420	<0.050		mg/L	-	0.05	mg/L	✓
MB	strontium, total	396770	QC-396770-001	E420	<0.00020		mg/L	-	0.0002	mg/L	✓
MB	sulfur, total	396770	QC-396770-001	E420	<0.50		mg/L	-	0.5	mg/L	✓
MB	tellurium, total	396770	QC-396770-001	E420	<0.00020		mg/L	-	0.0002	mg/L	✓
MB	thallium, total	396770	QC-396770-001	E420	<0.000010		mg/L	-	0.00001	mg/L	✓
MB	thorium, total	396770	QC-396770-001	E420	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	tin, total	396770	QC-396770-001	E420	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	titanium, total	396770	QC-396770-001	E420	<0.00030		mg/L	-	0.0003	mg/L	✓
MB	tungsten, total	396770	QC-396770-001	E420	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	uranium, total	396770	QC-396770-001	E420	<0.000010		mg/L	-	0.00001	mg/L	✓
MB	vanadium, total	396770	QC-396770-001	E420	<0.00050		mg/L	-	0.0005	mg/L	✓
MB	zinc, total	396770	QC-396770-001	E420	<0.0030		mg/L	-	0.003	mg/L	✓
MB	zirconium, total	396770	QC-396770-001	E420	<0.00020		mg/L	-	0.0002	mg/L	✓

Dissolved Metals (Matrix: Water)

MB	dissolved metals filtration location	396801	QC-396801-001	EP421	Laboratory	-	-	-	-	%	✓
LCS	dissolved metals filtration location	396801	QC-396801-002	EP421	N/A	-	-	-	0-0	%	✓
MS	aluminum, dissolved	396801	Anonymous	E421	0.180	0.2 mg/L	mg/L	90.0	70-130	%	✓
MS	antimony, dissolved	396801	Anonymous	E421	0.0198	0.02 mg/L	mg/L	99.0	70-130	%	✓
MS	arsenic, dissolved	396801	Anonymous	E421	0.0192	0.02 mg/L	mg/L	96.3	70-130	%	✓
MS	barium, dissolved	396801	Anonymous	E421	0.0192	0.02 mg/L	mg/L	95.8	70-130	%	✓
MS	beryllium, dissolved	396801	Anonymous	E421	0.0397	0.04 mg/L	mg/L	99.3	70-130	%	✓
MS	bismuth, dissolved	396801	Anonymous	E421	0.00941	0.01 mg/L	mg/L	94.1	70-130	%	✓
MS	boron, dissolved	396801	Anonymous	E421	0.102	0.1 mg/L	mg/L	102	70-130	%	✓
MS	cadmium, dissolved	396801	Anonymous	E421	0.00393	0.004 mg/L	mg/L	98.2	70-130	%	✓
MS	calcium, dissolved	396801	Anonymous	E421	ND	4 mg/L	mg/L	ND	70-130	%	✓
MS	cesium, dissolved	396801	Anonymous	E421	0.00970	0.01 mg/L	mg/L	97.0	70-130	%	✓
MS	chromium, dissolved	396801	Anonymous	E421	0.0387	0.04 mg/L	mg/L	96.8	70-130	%	✓
MS	cobalt, dissolved	396801	Anonymous	E421	0.0189	0.02 mg/L	mg/L	94.5	70-130	%	✓
MS	copper, dissolved	396801	Anonymous	E421	0.0186	0.02 mg/L	mg/L	93.1	70-130	%	✓
MS	iron, dissolved	396801	Anonymous	E421	1.90	2 mg/L	mg/L	95.2	70-130	%	✓
MS	lead, dissolved	396801	Anonymous	E421	0.0194	0.02 mg/L	mg/L	97.3	70-130	%	✓
MS	lithium, dissolved	396801	Anonymous	E421	0.0956	0.1 mg/L	mg/L	95.6	70-130	%	✓
MS	magnesium, dissolved	396801	Anonymous	E421	0.954	1 mg/L	mg/L	95.4	70-130	%	✓
MS	manganese, dissolved	396801	Anonymous	E421	0.0191	0.02 mg/L	mg/L	95.3	70-130	%	✓
MS	molybdenum, dissolved	396801	Anonymous	E421	0.0193	0.02 mg/L	mg/L	96.7	70-130	%	✓
MS	nickel, dissolved	396801	Anonymous	E421	0.0375	0.04 mg/L	mg/L	93.7	70-130	%	✓
MS	phosphorus, dissolved	396801	Anonymous	E421	9.31	10 mg/L	mg/L	93.1	70-130	%	✓
MS	potassium, dissolved	396801	Anonymous	E421	3.82	4 mg/L	mg/L	95.4	70-130	%	✓
MS	rubidium, dissolved	396801	Anonymous	E421	0.0203	0.02 mg/L	mg/L	102	70-130	%	✓
MS	selenium, dissolved	396801	Anonymous	E421	0.0406	0.04 mg/L	mg/L	101	70-130	%	✓
MS	silicon, dissolved	396801	Anonymous	E421	9.10	10 mg/L	mg/L	91.0	70-130	%	✓
MS	silver, dissolved	396801	Anonymous	E421	0.00381	0.004 mg/L	mg/L	95.2	70-130	%	✓
MS	sodium, dissolved	396801	Anonymous	E421	1.84	2 mg/L	mg/L	91.8	70-130	%	✓
MS	strontium, dissolved	396801	Anonymous	E421	ND	0.02 mg/L	mg/L	ND	70-130	%	✓
MS	sulfur, dissolved	396801	Anonymous	E421	19.7	20 mg/L	mg/L	98.3	70-130	%	✓

MS	tellurium, dissolved	396801	Anonymous	E421	0.0419	0.04 mg/L	mg/L	105	70-130	%	✓
MS	thallium, dissolved	396801	Anonymous	E421	0.00386	0.004 mg/L	mg/L	96.4	70-130	%	✓
MS	thorium, dissolved	396801	Anonymous	E421	0.0202	0.02 mg/L	mg/L	101	70-130	%	✓
MS	tin, dissolved	396801	Anonymous	E421	0.0196	0.02 mg/L	mg/L	97.9	70-130	%	✓
MS	titanium, dissolved	396801	Anonymous	E421	0.0384	0.04 mg/L	mg/L	95.9	70-130	%	✓
MS	tungsten, dissolved	396801	Anonymous	E421	0.0193	0.02 mg/L	mg/L	96.3	70-130	%	✓
MS	uranium, dissolved	396801	Anonymous	E421	0.00397	0.004 mg/L	mg/L	99.4	70-130	%	✓
MS	vanadium, dissolved	396801	Anonymous	E421	0.0962	0.1 mg/L	mg/L	96.2	70-130	%	✓
MS	zinc, dissolved	396801	Anonymous	E421	0.376	0.4 mg/L	mg/L	94.1	70-130	%	✓
MS	zirconium, dissolved	396801	Anonymous	E421	0.0393	0.04 mg/L	mg/L	98.3	70-130	%	✓
LCS	aluminum, dissolved	396801	QC-MRG2-396801002	E421	2.05	2 mg/L	mg/L	102	80-120	%	✓
LCS	antimony, dissolved	396801	QC-MRG2-396801002	E421	1.08	1 mg/L	mg/L	108	80-120	%	✓
LCS	arsenic, dissolved	396801	QC-MRG2-396801002	E421	1.02	1 mg/L	mg/L	102	80-120	%	✓
LCS	barium, dissolved	396801	QC-MRG2-396801002	E421	0.259	0.25 mg/L	mg/L	104	80-120	%	✓
LCS	beryllium, dissolved	396801	QC-MRG2-396801002	E421	0.103	0.1 mg/L	mg/L	103	80-120	%	✓
LCS	bismuth, dissolved	396801	QC-MRG2-396801002	E421	1.04	1 mg/L	mg/L	104	80-120	%	✓
LCS	boron, dissolved	396801	QC-MRG2-396801002	E421	1.06	1 mg/L	mg/L	106	80-120	%	✓
LCS	cadmium, dissolved	396801	QC-MRG2-396801002	E421	0.103	0.1 mg/L	mg/L	103	80-120	%	✓
LCS	calcium, dissolved	396801	QC-MRG2-396801002	E421	51.3	50 mg/L	mg/L	102	80-120	%	✓
LCS	cesium, dissolved	396801	QC-MRG2-396801002	E421	0.0525	0.05 mg/L	mg/L	105	80-120	%	✓
LCS	chromium, dissolved	396801	QC-MRG2-396801002	E421	0.261	0.25 mg/L	mg/L	104	80-120	%	✓
LCS	cobalt, dissolved	396801	QC-MRG2-396801002	E421	0.253	0.25 mg/L	mg/L	101	80-120	%	✓
LCS	copper, dissolved	396801	QC-MRG2-396801002	E421	0.248	0.25 mg/L	mg/L	99.3	80-120	%	✓
LCS	iron, dissolved	396801	QC-MRG2-396801002	E421	1.05	1 mg/L	mg/L	105	80-120	%	✓
LCS	lead, dissolved	396801	QC-MRG2-396801002	E421	0.509	0.5 mg/L	mg/L	102	80-120	%	✓
LCS	lithium, dissolved	396801	QC-MRG2-396801002	E421	0.263	0.25 mg/L	mg/L	105	80-120	%	✓
LCS	magnesium, dissolved	396801	QC-MRG2-396801002	E421	50.6	50 mg/L	mg/L	101	80-120	%	✓
LCS	manganese, dissolved	396801	QC-MRG2-396801002	E421	0.259	0.25 mg/L	mg/L	104	80-120	%	✓
LCS	molybdenum, dissolved	396801	QC-MRG2-396801002	E421	0.263	0.25 mg/L	mg/L	105	80-120	%	✓
LCS	nickel, dissolved	396801	QC-MRG2-396801002	E421	0.496	0.5 mg/L	mg/L	99.2	80-120	%	✓
LCS	phosphorus, dissolved	396801	QC-MRG2-396801002	E421	10.8	10 mg/L	mg/L	108	80-120	%	✓
LCS	potassium, dissolved	396801	QC-MRG2-396801002	E421	51.1	50 mg/L	mg/L	102	80-120	%	✓
LCS	rubidium, dissolved	396801	QC-MRG2-396801002	E421	0.107	0.1 mg/L	mg/L	107	80-120	%	✓
LCS	selenium, dissolved	396801	QC-MRG2-396801002	E421	0.996	1 mg/L	mg/L	99.6	80-120	%	✓
LCS	silicon, dissolved	396801	QC-MRG2-396801002	E421	10.3	10 mg/L	mg/L	103	80-120	%	✓
LCS	silver, dissolved	396801	QC-MRG2-396801002	E421	0.0968	0.1 mg/L	mg/L	96.8	80-120	%	✓
LCS	sodium, dissolved	396801	QC-MRG2-396801002	E421	51.1	50 mg/L	mg/L	102	80-120	%	✓
LCS	strontium, dissolved	396801	QC-MRG2-396801002	E421	0.268	0.25 mg/L	mg/L	107	80-120	%	✓
LCS	sulfur, dissolved	396801	QC-MRG2-396801002	E421	49.2	50 mg/L	mg/L	98.4	80-120	%	✓
LCS	tellurium, dissolved	396801	QC-MRG2-396801002	E421	0.110	0.1 mg/L	mg/L	110	80-120	%	✓
LCS	thallium, dissolved	396801	QC-MRG2-396801002	E421	1.06	1 mg/L	mg/L	106	80-120	%	✓
LCS	thorium, dissolved	396801	QC-MRG2-396801002	E421	0.100	0.1 mg/L	mg/L	100.0	80-120	%	✓
LCS	tin, dissolved	396801	QC-MRG2-396801002	E421	0.521	0.5 mg/L	mg/L	104	80-120	%	✓
LCS	titanium, dissolved	396801	QC-MRG2-396801002	E421	0.258	0.25 mg/L	mg/L	103	80-120	%	✓
LCS	tungsten, dissolved	396801	QC-MRG2-396801002	E421	0.102	0.1 mg/L	mg/L	102	80-120	%	✓
LCS	uranium, dissolved	396801	QC-MRG2-396801002	E421	0.00534	0.005 mg/L	mg/L	107	80-120	%	✓
LCS	vanadium, dissolved	396801	QC-MRG2-396801002	E421	0.519	0.5 mg/L	mg/L	104	80-120	%	✓
LCS	zinc, dissolved	396801	QC-MRG2-396801002	E421	0.474	0.5 mg/L	mg/L	94.9	80-120	%	✓
LCS	zirconium, dissolved	396801	QC-MRG2-396801002	E421	0.102	0.1 mg/L	mg/L	102	80-120	%	✓
MB	aluminum, dissolved	396801	QC-MRG2-396801001	E421	<0.0010		mg/L	-	0.001	mg/L	✓
MB	antimony, dissolved	396801	QC-MRG2-396801001	E421	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	arsenic, dissolved	396801	QC-MRG2-396801001	E421	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	barium, dissolved	396801	QC-MRG2-396801001	E421	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	beryllium, dissolved	396801	QC-MRG2-396801001	E421	<0.000020		mg/L	-	0.00002	mg/L	✓
MB	bismuth, dissolved	396801	QC-MRG2-396801001	E421	<0.000050		mg/L	-	0.00005	mg/L	✓
MB	boron, dissolved	396801	QC-MRG2-396801001	E421	<0.010		mg/L	-	0.01	mg/L	✓
MB	cadmium, dissolved	396801	QC-MRG2-396801001	E421	<0.0000050		mg/L	-	0.000005	mg/L	✓
MB	calcium, dissolved	396801	QC-MRG2-396801001	E421	<0.050		mg/L	-	0.05	mg/L	✓
MB	cesium, dissolved	396801	QC-MRG2-396801001	E421	<0.000010		mg/L	-	0.00001	mg/L	✓
MB	chromium, dissolved	396801	QC-MRG2-396801001	E421	<0.00050		mg/L	-	0.0005	mg/L	✓
MB	cobalt, dissolved	396801	QC-MRG2-396801001	E421	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	copper, dissolved	396801	QC-MRG2-396801001	E421	<0.00020		mg/L	-	0.0002	mg/L	✓
MB	iron, dissolved	396801	QC-MRG2-396801001	E421	<0.010		mg/L	-	0.01	mg/L	✓
MB	lead, dissolved	396801	QC-MRG2-396801001	E421	<0.000050		mg/L	-	0.00005	mg/L	✓
MB	lithium, dissolved	396801	QC-MRG2-396801001	E421	<0.0010		mg/L	-	0.001	mg/L	✓
MB	magnesium, dissolved	396801	QC-MRG2-396801001	E421	<0.0050		mg/L	-	0.005	mg/L	✓
MB	manganese, dissolved	396801	QC-MRG2-396801001	E421	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	molybdenum, dissolved	396801	QC-MRG2-396801001	E421	<0.000050		mg/L	-	0.00005	mg/L	✓
MB	nickel, dissolved	396801	QC-MRG2-396801001	E421	<0.00050		mg/L	-	0.0005	mg/L	✓
MB	phosphorus, dissolved	396801	QC-MRG2-396801001	E421	<0.050		mg/L	-	0.05	mg/L	✓
MB	potassium, dissolved	396801	QC-MRG2-396801001	E421	<0.050		mg/L	-	0.05	mg/L	✓
MB	rubidium, dissolved	396801	QC-MRG2-396801001	E421	<0.00020		mg/L	-	0.0002	mg/L	✓
MB	selenium, dissolved	396801	QC-MRG2-396801001	E421	<0.000050		mg/L	-	0.00005	mg/L	✓
MB	silicon, dissolved	396801	QC-MRG2-396801001	E421	<0.050		mg/L	-	0.05	mg/L	✓
MB	silver, dissolved	396801	QC-MRG2-396801001	E421	<0.000010		mg/L	-	0.00001	mg/L	✓
MB	sodium, dissolved	396801	QC-MRG2-396801001	E421	<0.050		mg/L	-	0.05	mg/L	✓
MB	strontium, dissolved	396801	QC-MRG2-396801001	E421	<0.00020		mg/L	-	0.0002	mg/L	✓
MB	sulfur, dissolved	396801	QC-MRG2-396801001	E421	<0.50		mg/L	-	0.5	mg/L	✓
MB	tellurium, dissolved	396801	QC-MRG2-396801001	E421	<0.00020		mg/L	-	0.0002	mg/L	✓
MB	thallium, dissolved	396801	QC-MRG2-396801001	E421	<0.000010		mg/L	-	0.00001	mg/L	✓
MB	thorium, dissolved	396801	QC-MRG2-396801001	E421	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	tin, dissolved	396801	QC-MRG2-396801001	E421	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	titanium, dissolved	396801	QC-MRG2-396801001	E421	<0.00030		mg/L	-	0.0003	mg/L	✓
MB	tungsten, dissolved	396801	QC-MRG2-396801001	E421	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	uranium, dissolved	396801	QC-MRG2-396801001	E421	<0.000010		mg/L	-	0.00001	mg/L	✓
MB	vanadium, dissolved	396801	QC-MRG2-396801001	E421	<0.00050		mg/L	-	0.0005	mg/L	✓
MB	zinc, dissolved	396801	QC-MRG2-396801001	E421	<0.0010		mg/L	-	0.001	mg/L	✓
MB	zirconium, dissolved	396801	QC-MRG2-396801001	E421	<0.00020		mg/L	-	0.0002	mg/L	✓

Hydrocarbons (Matrix: Water)										
LCS	EPH (C10-C19)	396345	QC-396345-002	E601A	6360	6491 µg/L	µg/L	98.0	70-130	%
LCS	EPH (C19-C32)	396345	QC-396345-002	E601A	3160	3363 µg/L	µg/L	94.1	70-130	%
LCS	EPH (C10-C19)	397165	QC-397165-002	E601A	7100	6491 µg/L	µg/L	109	70-130	%
LCS	EPH (C19-C32)	397165	QC-397165-002	E601A	3590	3363 µg/L	µg/L	107	70-130	%
MB	EPH (C10-C19)	396345	QC-MRG2-396345001	E601A	<250		µg/L	-	250	µg/L
MB	EPH (C19-C32)	396345	QC-MRG2-396345001	E601A	<250		µg/L	-	250	µg/L
MB	EPH (C10-C19)	397165	QC-MRG2-397165001	E601A	<250		µg/L	-	250	µg/L
MB	EPH (C19-C32)	397165	QC-MRG2-397165001	E601A	<250		µg/L	-	250	µg/L
Hydrocarbons Surrogates (Matrix: Water)										
LCS	bromobenzotrifluoride, 2- (EPH surr)	396345	QC-396345-002	E601A	5370	6315.8 µg/L	µg/L	85.0	60-140	%
LCS	bromobenzotrifluoride, 2- (EPH surr)	397165	QC-397165-002	E601A	5360	6315.8 µg/L	µg/L	84.8	60-140	%
MB	bromobenzotrifluoride, 2- (EPH surr)	396345	QC-MRG2-396345001	E601A	74.3		µg/L	-	60-140	%
MB	bromobenzotrifluoride, 2- (EPH surr)	397165	QC-MRG2-397165001	E601A	85.4		µg/L	-	60-140	%
Polycyclic Aromatic Hydrocarbons (Matrix: Water)										
LCS	acenaphthene	396346	QC-396346-002	E641A	0.525	0.5 µg/L	µg/L	105	60-130	%
LCS	acenaphthylene	396346	QC-396346-002	E641A	0.525	0.5 µg/L	µg/L	105	60-130	%
LCS	acridine	396346	QC-396346-002	E641A	0.554	0.5 µg/L	µg/L	111	60-130	%
LCS	anthracene	396346	QC-396346-002	E641A	0.544	0.5 µg/L	µg/L	109	60-130	%
LCS	benz(a)anthracene	396346	QC-396346-002	E641A	0.511	0.5 µg/L	µg/L	102	60-130	%
LCS	benzo(a)pyrene	396346	QC-396346-002	E641A	0.509	0.5 µg/L	µg/L	102	60-130	%
LCS	benzo(b+j)fluoranthene	396346	QC-396346-002	E641A	0.541	0.5 µg/L	µg/L	108	60-130	%
LCS	benzo(g,h,i)perylene	396346	QC-396346-002	E641A	0.502	0.5 µg/L	µg/L	100	60-130	%
LCS	benzo(k)fluoranthene	396346	QC-396346-002	E641A	0.540	0.5 µg/L	µg/L	108	60-130	%
LCS	chrysene	396346	QC-396346-002	E641A	0.497	0.5 µg/L	µg/L	99.5	60-130	%
LCS	dibenz(a,h)anthracene	396346	QC-396346-002	E641A	0.517	0.5 µg/L	µg/L	103	60-130	%
LCS	fluoranthene	396346	QC-396346-002	E641A	0.507	0.5 µg/L	µg/L	101	60-130	%
LCS	fluorene	396346	QC-396346-002	E641A	0.514	0.5 µg/L	µg/L	103	60-130	%
LCS	indeno(1,2,3-c,d)pyrene	396346	QC-396346-002	E641A	0.536	0.5 µg/L	µg/L	107	60-130	%
LCS	methylnaphthalene, 1-	396346	QC-396346-002	E641A	0.543	0.5 µg/L	µg/L	108	60-130	%
LCS	methylnaphthalene, 2-	396346	QC-396346-002	E641A	0.523	0.5 µg/L	µg/L	104	60-130	%
LCS	naphthalene	396346	QC-396346-002	E641A	0.533	0.5 µg/L	µg/L	106	50-130	%
LCS	phenanthrene	396346	QC-396346-002	E641A	0.531	0.5 µg/L	µg/L	106	60-130	%
LCS	pyrene	396346	QC-396346-002	E641A	0.519	0.5 µg/L	µg/L	104	60-130	%
LCS	quinoline	396346	QC-396346-002	E641A	0.604	0.5 µg/L	µg/L	121	60-130	%
LCS	acenaphthene	397166	QC-397166-002	E641A	0.621	0.5 µg/L	µg/L	124	60-130	%
LCS	acenaphthylene	397166	QC-397166-002	E641A	0.612	0.5 µg/L	µg/L	122	60-130	%
LCS	acridine	397166	QC-397166-002	E641A	0.287	0.25 µg/L	µg/L	115	60-130	%
LCS	anthracene	397166	QC-397166-002	E641A	0.650	0.5 µg/L	µg/L	130	60-130	%
LCS	benz(a)anthracene	397166	QC-397166-002	E641A	0.646	0.5 µg/L	µg/L	129	60-130	%
LCS	benzo(a)pyrene	397166	QC-397166-002	E641A	0.622	0.5 µg/L	µg/L	124	60-130	%
LCS	benzo(b+j)fluoranthene	397166	QC-397166-002	E641A	0.646	0.5 µg/L	µg/L	129	60-130	%
LCS	benzo(g,h,i)perylene	397166	QC-397166-002	E641A	0.544	0.5 µg/L	µg/L	109	60-130	%
LCS	benzo(k)fluoranthene	397166	QC-397166-002	E641A	0.637	0.5 µg/L	µg/L	127	60-130	%
LCS	chrysene	397166	QC-397166-002	E641A	0.636	0.5 µg/L	µg/L	127	60-130	%
LCS	dibenz(a,h)anthracene	397166	QC-397166-002	E641A	0.549	0.5 µg/L	µg/L	110	60-130	%
LCS	fluoranthene	397166	QC-397166-002	E641A	0.586	0.5 µg/L	µg/L	117	60-130	%
LCS	fluorene	397166	QC-397166-002	E641A	0.607	0.5 µg/L	µg/L	121	60-130	%
LCS	indeno(1,2,3-c,d)pyrene	397166	QC-397166-002	E641A	0.544	0.5 µg/L	µg/L	109	60-130	%
LCS	methylnaphthalene, 1-	397166	QC-397166-002	E641A	0.622	0.5 µg/L	µg/L	124	60-130	%
LCS	methylnaphthalene, 2-	397166	QC-397166-002	E641A	0.628	0.5 µg/L	µg/L	126	60-130	%
LCS	naphthalene	397166	QC-397166-002	E641A	0.621	0.5 µg/L	µg/L	124	50-130	%
LCS	phenanthrene	397166	QC-397166-002	E641A	0.629	0.5 µg/L	µg/L	126	60-130	%
LCS	pyrene	397166	QC-397166-002	E641A	0.605	0.5 µg/L	µg/L	121	60-130	%
LCS	quinoline	397166	QC-397166-002	E641A	0.293	0.25 µg/L	µg/L	117	60-130	%
MB	acenaphthene	396346	QC-MRG2-396345001	E641A	<0.010		µg/L	-	0.01	µg/L
MB	acenaphthylene	396346	QC-MRG2-396345001	E641A	<0.010		µg/L	-	0.01	µg/L
MB	acridine	396346	QC-MRG2-396345001	E641A	<0.010		µg/L	-	0.01	µg/L
MB	anthracene	396346	QC-MRG2-396345001	E641A	<0.010		µg/L	-	0.01	µg/L
MB	benz(a)anthracene	396346	QC-MRG2-396345001	E641A	<0.010		µg/L	-	0.01	µg/L
MB	benzo(a)pyrene	396346	QC-MRG2-396345001	E641A	<0.0050		µg/L	-	0.005	µg/L
MB	benzo(b+j)fluoranthene	396346	QC-MRG2-396345001	E641A	<0.010		µg/L	-	0.01	µg/L
MB	benzo(g,h,i)perylene	396346	QC-MRG2-396345001	E641A	<0.010		µg/L	-	0.01	µg/L
MB	benzo(k)fluoranthene	396346	QC-MRG2-396345001	E641A	<0.010		µg/L	-	0.01	µg/L
MB	chrysene	396346	QC-MRG2-396345001	E641A	<0.010		µg/L	-	0.01	µg/L
MB	dibenz(a,h)anthracene	396346	QC-MRG2-396345001	E641A	<0.0050		µg/L	-	0.005	µg/L
MB	fluoranthene	396346	QC-MRG2-396345001	E641A	<0.010		µg/L	-	0.01	µg/L
MB	fluorene	396346	QC-MRG2-396345001	E641A	<0.010		µg/L	-	0.01	µg/L
MB	indeno(1,2,3-c,d)pyrene	396346	QC-MRG2-396345001	E641A	<0.010		µg/L	-	0.01	µg/L
MB	methylnaphthalene, 1-	396346	QC-MRG2-396345001	E641A	<0.010		µg/L	-	0.01	µg/L
MB	methylnaphthalene, 2-	396346	QC-MRG2-396345001	E641A	<0.010		µg/L	-	0.01	µg/L
MB	naphthalene	396346	QC-MRG2-396345001	E641A	<0.050		µg/L	-	0.05	µg/L
MB	phenanthrene	396346	QC-MRG2-396345001	E641A	<0.020		µg/L	-	0.02	µg/L
MB	pyrene	396346	QC-MRG2-396345001	E641A	<0.010		µg/L	-	0.01	µg/L
MB	quinoline	396346	QC-MRG2-396345001	E641A	<0.050		µg/L	-	0.05	µg/L
MB	acenaphthene	397166	QC-MRG2-397165001	E641A	<0.010		µg/L	-	0.01	µg/L
MB	acenaphthylene	397166	QC-MRG2-397165001	E641A	<0.010		µg/L	-	0.01	µg/L
MB	acridine	397166	QC-MRG2-397165001	E641A	<0.010		µg/L	-	0.01	µg/L
MB	anthracene	397166	QC-MRG2-397165001	E641A	<0.010		µg/L	-	0.01	µg/L
MB	benz(a)anthracene	397166	QC-MRG2-397165001	E641A	<0.010		µg/L	-	0.01	µg/L
MB	benzo(a)pyrene	397166	QC-MRG2-397165001	E641A	<0.0050		µg/L	-	0.005	µg/L
MB	benzo(b+j)fluoranthene	397166	QC-MRG2-397165001	E641A	<0.010		µg/L	-	0.01	µg/L
MB	benzo(g,h,i)perylene	397166	QC-MRG2-397165001	E641A	<0.010		µg/L	-	0.01	µg/L
MB	benzo(k)fluoranthene	397166	QC-MRG2-397165001	E641A	<0.010		µg/L	-	0.01	µg/L
MB	chrysene	397166	QC-MRG2-397165001	E641A	<0.010		µg/L	-	0.01	µg/L

MB	dibenz(a,h)anthracene	397166	QC-MRG2-397165001	E641A	<0.0050	µg/L	-	0.005	µg/L	✓
MB	fluoranthene	397166	QC-MRG2-397165001	E641A	<0.010	µg/L	-	0.01	µg/L	✓
MB	fluorene	397166	QC-MRG2-397165001	E641A	<0.010	µg/L	-	0.01	µg/L	✓
MB	indeno(1,2,3-c,d)pyrene	397166	QC-MRG2-397165001	E641A	<0.010	µg/L	-	0.01	µg/L	✓
MB	methylnaphthalene, 1-	397166	QC-MRG2-397165001	E641A	<0.010	µg/L	-	0.01	µg/L	✓
MB	methylnaphthalene, 2-	397166	QC-MRG2-397165001	E641A	<0.010	µg/L	-	0.01	µg/L	✓
MB	naphthalene	397166	QC-MRG2-397165001	E641A	<0.050	µg/L	-	0.05	µg/L	✓
MB	phenanthrene	397166	QC-MRG2-397165001	E641A	<0.020	µg/L	-	0.02	µg/L	✓
MB	pyrene	397166	QC-MRG2-397165001	E641A	<0.010	µg/L	-	0.01	µg/L	✓
MB	quinoline	397166	QC-MRG2-397165001	E641A	<0.050	µg/L	-	0.05	µg/L	✓

Polycyclic Aromatic Hydrocarbons Surrogates (Matrix: Water)

LCS	chrysene-d12	396346	QC-396346-002	E641A	0.8	0.8421 µg/L	µg/L	97.3	60-130	%
LCS	naphthalene-d8	396346	QC-396346-002	E641A	0.8	0.8421 µg/L	µg/L	100	50-130	%
LCS	phenanthrene-d10	396346	QC-396346-002	E641A	0.9	0.8421 µg/L	µg/L	104	60-130	%
LCS	chrysene-d12	397166	QC-397166-002	E641A	2.0	1.6842 µg/L	µg/L	116	60-130	%
LCS	naphthalene-d8	397166	QC-397166-002	E641A	2.0	1.6842 µg/L	µg/L	118	50-130	%
LCS	phenanthrene-d10	397166	QC-397166-002	E641A	2.0	1.6842 µg/L	µg/L	122	60-130	%
MB	chrysene-d12	396346	QC-MRG2-396345001	E641A	97.1		µg/L	-	60-130	%
MB	naphthalene-d8	396346	QC-MRG2-396345001	E641A	108		µg/L	-	50-130	%
MB	phenanthrene-d10	396346	QC-MRG2-396345001	E641A	111		µg/L	-	60-130	%
MB	chrysene-d12	397166	QC-MRG2-397165001	E641A	125		µg/L	-	60-130	%
MB	naphthalene-d8	397166	QC-MRG2-397165001	E641A	127		µg/L	-	50-130	%
MB	phenanthrene-d10	397166	QC-MRG2-397165001	E641A	125		µg/L	-	60-130	%

Evaluation Legend

- ✓ QC Lot met ALS Data Quality Objectives
- ✗ QC Lot did not meet ALS Data Quality Objectives

Results Summary VA22A1190

Project
Report To Rob Waters, Castor Consultants Limited
Date Received 21-Jan-2022 08:40
Issue Date 31-Jan-2022 15:19
Amendment 0

Client Sample ID			N. Creek	Sump1	Sump2	Sump2A	S. Creek	Culvert S. Creek	S. Creek A	Background
Date Sampled			20-Jan-2022	20-Jan-2022	20-Jan-2022	20-Jan-2022	20-Jan-2022	20-Jan-2022	20-Jan-2022	20-Jan-2022
Time Sampled			00:00	06:00	06:00	00:00	00:00	00:00	00:00	00:00
ALS Sample ID			VA22A1190-001	VA22A1190-002	VA22A1190-003	VA22A1190-004	VA22A1190-005	VA22A1190-006	VA22A1190-007	VA22A1190-008
Analyte	Lowest Detection Limit	Units	Sub-Matrix: Water	Sub-Matrix: Water	Sub-Matrix: Water	Sub-Matrix: Water	Sub-Matrix: Water	Sub-Matrix: Water	Sub-Matrix: Water	Sub-Matrix: Water
Physical Tests (Matrix: Water)										
hardness (as CaCO3), from total Ca/Mg	0.50	mg/L	17.0	31.6	106	132	111	74.6	54.0	
pH	0.10	pH units	6.84	7.33	7.21	7.53	7.01	7.24	6.85	
turbidity	0.10	NTU	4.22	114	276	119	0.87	59.1	5.16	3.17
Organic / Inorganic Carbon (Matrix: Water)										
carbon, dissolved organic [DOC]	0.50	mg/L	7.37				11.9	<0.50	3.72	
Total Metals (Matrix: Water)										
aluminum, total	0.0030	mg/L	0.461	4.38	13.7	6.25	0.0882	3.70	0.410	
antimony, total	0.00010	mg/L	<0.00010	0.00041	0.00033	0.00020	<0.00010	<0.00010	<0.00010	
arsenic, total	0.00010	mg/L	0.00019	0.00171	0.00490	0.00274	0.00022	0.00122	0.00023	
barium, total	0.00010	mg/L	0.00355	0.0341	0.0670	0.0410	0.0123	0.0250	0.00984	
beryllium, total	0.000020	mg/L	<0.000020	<0.000100	0.000189	0.000090	<0.000020	0.000045	<0.000020	
bismuth, total	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
boron, total	0.010	mg/L	<0.010	0.014	0.030	0.030	0.057	0.030	<0.010	
cadmium, total	0.0000050	mg/L	<0.0000050	0.000105	0.0000733	0.0000333	<0.0000050	0.0000184	0.0000131	
calcium, total	0.050	mg/L	4.25	6.86	25.5	33.0	29.9	18.7	13.8	
cesium, total	0.000010	mg/L	<0.000010	0.000105	0.000444	0.000215	<0.000010	0.000088	0.000014	
chromium, total	0.00050	mg/L	0.00077	0.0118	0.0245	0.0112	<0.00050	0.00580	0.00074	
cobalt, total	0.00010	mg/L	0.00017	0.00374	0.00752	0.00366	0.00012	0.00215	0.00016	
copper, total	0.00050	mg/L	0.00214	0.0491	0.0688	0.0271	0.00201	0.0125	0.00279	
iron, total	0.010	mg/L	0.417	8.97	19.3	9.17	0.113	4.06	0.486	
lead, total	0.000050	mg/L	0.000086	0.0171	0.00768	0.00230	<0.000050	0.000694	0.000259	
lithium, total	0.0010	mg/L	<0.0010	0.0019	0.0072	0.0040	<0.0010	0.0019	<0.0010	
magnesium, total	0.0050	mg/L	1.55	3.51	10.3	12.0	8.73	6.77	4.74	
manganese, total	0.00010	mg/L	0.0279	0.294	0.760	0.870	0.0103	0.795	0.0191	
mercury, total	0.0000050	mg/L	0.0000153	0.0000348						
molybdenum, total	0.000050	mg/L	<0.000050	0.000467	0.000425	0.000300	<0.000050	0.000118	<0.000050	
nickel, total	0.00050	mg/L	<0.00050	0.00791	0.0153	0.00729	<0.00050	0.00398	0.00067	
phosphorus, total	0.050	mg/L	<0.050	0.130	0.304	0.145	<0.050	0.091	<0.050	
potassium, total	0.050	mg/L	0.271	0.964	2.30	1.56	2.00	1.52	0.423	
rubidium, total	0.00020	mg/L	0.00040	0.00135	0.00401	0.00212	0.00126	0.00158	0.00040	
selenium, total	0.000050	mg/L	0.000082	0.000081	0.000183	0.000128	<0.000050	0.000146	<0.000050	
silicon, total	0.10	mg/L	4.54	7.07	23.0	15.8	5.82	9.35	5.68	
silver, total	0.000010	mg/L	<0.000010	0.000035	0.000076	0.000032	<0.000010	0.000026	<0.000010	
sodium, total	0.050	mg/L	4.61	13.6	16.3	15.3	14.5	6.48	13.4	
strontium, total	0.00020	mg/L	0.0179	0.0408	0.114	0.143	0.152	0.0778	0.0718	
sulfur, total	0.50	mg/L	<0.50	1.38	1.46	1.57	5.04	<0.50	<0.50	
tellurium, total	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
thallium, total	0.000010	mg/L	<0.000010	<0.000010	0.000038	0.000016	<0.000010	<0.000010	<0.000010	
thorium, total	0.00010	mg/L	<0.00010	0.00010	0.00031	0.00015	<0.00010	<0.00010	<0.00010	
tin, total	0.00010	mg/L	<0.00010	0.00040	0.00022	0.00011	<0.00010	<0.00010	<0.00010	
titanium, total	0.00030	mg/L	0.0295	0.453	0.982	0.493	0.00476	0.277	0.0243	
tungsten, total	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
uranium, total	0.000010	mg/L	0.000012	0.000053	0.000163	0.000114	0.000010	0.000093	<0.000010	
vanadium, total	0.00050	mg/L	0.00159	0.0199	0.0576	0.0290	0.00075	0.0152	0.00158	
zinc, total	0.0030	mg/L	<0.0030	0.249	0.0994	0.0320	<0.0030	0.0066	0.0034	
zirconium, total	0.00020	mg/L	0.00040	0.00108	0.00115	0.00063	0.00028	0.00070	0.00030	
Dissolved Metals (Matrix: Water)										
aluminum, dissolved	0.0010	mg/L	0.312				0.0542	1.64	0.114	
antimony, dissolved	0.00010	mg/L	<0.00010				<0.00010	<0.00010	<0.00010	
arsenic, dissolved	0.00010	mg/L	0.00015				0.00020	0.00074	0.00013	
barium, dissolved	0.00010	mg/L	0.00281				0.0120	0.0114	0.00724	
beryllium, dissolved	0.000020	mg/L	<0.000020				<0.000020	<0.000020	<0.000020	
bismuth, dissolved	0.000050	mg/L	<0.000050				<0.000050	<0.000050	<0.000050	
boron, dissolved	0.010	mg/L	<0.010				0.058	0.031	0.010	
cadmium, dissolved	0.0000050	mg/L	<0.0000050				<0.0000050	0.0000068	<0.0000050	
calcium, dissolved	0.050	mg/L	3.98				28.9	18.1	13.5	
cesium, dissolved	0.000010	mg/L	<0.000010				<0.000010	0.000023	<0.000010	
chromium, dissolved	0.00050	mg/L	0.00057				<0.00050	0.00255	<0.00050	
cobalt, dissolved	0.00010	mg/L	<0.00010				<0.00010	0.00076	<0.00010	
copper, dissolved	0.00020	mg/L	0.00162				0.00160	0.00694	0.00119	
iron, dissolved	0.010	mg/L	0.245				0.057	1.59	0.140	
lead, dissolved	0.000050	mg/L	<0.000050				<0.000050	0.000250	<0.000050	
lithium, dissolved	0.0010	mg/L	<0.0010				<0.0010	<0.0010	<0.0010	
magnesium, dissolved	0.0050	mg/L	1.43				8.36	6.07	4.26	
manganese, dissolved	0.00010	mg/L	0.0123				0.00149	0.621	0.00408	
molybdenum, dissolved	0.000050	mg/L	<0.000050				0.000090	0.000121	<0.000050	
nickel, dissolved	0.00050	mg/L	<0.00050				<0.00050	0.00188	<0.00050	
phosphorus, dissolved	0.050	mg/L	<0.050				<0.050	<0.050	<0.050	
potassium, dissolved	0.050	mg/L	0.254				1.90	1.41	0.350	
rubidium, dissolved	0.00020	mg/L	0.00035				0.00122	0.00107	0.00029	
selenium, dissolved	0.000050	mg/L	0.000060				0.000077	0.000106	<0.000050	
silicon, dissolved	0.050	mg/L	4.29				5.61	7.01	5.05	
silver, dissolved	0.000010	mg/L	<0.000010				<0.000010	0.000012	<0.000010	
sodium, dissolved	0.050	mg/L	4.25				13.7	6.20	12.4	
strontium, dissolved	0.00020	mg/L	0.0172				0.143	0.0701	0.0659	
sulfur, dissolved	0.50	mg/L	<0.50				4.76	<0.50	<0.50	
tellurium, dissolved	0.00020	mg/L	<0.00020				<0.00020	<0.00020	<0.00020	
thallium, dissolved	0.000010	mg/L	<0.000010				<0.000010	<0.000010	<0.000010	
thorium, dissolved	0.00010	mg/L	<0.00010				<0.00010	<0.00010	<0.00010	
tin, dissolved	0.00010	mg/L	<0.00010				<0.00010	<0.00010	<0.00010	
titanium, dissolved	0.00030	mg/L	0.0190				0.00187	0.134	0.00953	
tungsten, dissolved	0.00010	mg/L	<0.00010				<0.00010	<0.00010	<0.00010	
uranium, dissolved	0.000010	mg/L	<0.000010				<0.000010	0.000062	<0.000010	
vanadium, dissolved	0.00050	mg/L	0.00105				0.00058	0.00748	0.00068	
zinc, dissolved	0.0010	mg/L	<0.0010				<0.0010	0.0020	<0.0010	
zirconium, dissolved	0.00030	mg/L	0.00056				0.00030	0.00178	<0.00030	
dissolved metals filtration location			Laboratory				Laboratory	Laboratory	Laboratory	
Hydrocarbons (Matrix: Water)										
EPH (C10-C19)	250	µg/L		<250	<250					
EPH (C19-C32)	250	µg/L		260	<250					
LEPHw	250	µg/L		<250	<250					
HEPHw	250	µg/L		260	<250					

Hydrocarbons Surrogates (Matrix: Water)					
bromobenzotrifluoride, 2- (EPH sum)	1.0	%	83.5	99.0	
Polycyclic Aromatic Hydrocarbons (Matrix: Water)					
acenaphthene	0.010	µg/L	<0.010	<0.010	
acenaphthylene	0.010	µg/L	<0.010	<0.010	
acridine	0.010	µg/L	<0.070	<0.010	
anthracene	0.010	µg/L	<0.025	<0.010	
benzo(a)anthracene	0.010	µg/L	0.058	0.013	
benzo(a)pyrene	0.0050	µg/L	0.0425	0.0067	
benzo(b+ j)fluoranthene	0.010	µg/L	0.072	0.012	
benzo(b+ k)fluoranthene	0.015	µg/L	0.096	<0.015	
benzo(g, h, i)perylene	0.010	µg/L	0.036	<0.010	
benzo(k)fluoranthene	0.010	µg/L	0.024	<0.010	
chrysene	0.010	µg/L	0.067	0.017	
dbenz(a, h)anthracene	0.0050	µg/L	<0.0092	<0.0050	
fluoranthene	0.010	µg/L	0.130	0.014	
fluorene	0.010	µg/L	0.013	<0.010	
indeno(1,2,3-c, d)pyrene	0.010	µg/L	0.035	<0.010	
methylanthracene, 1-	0.010	µg/L	<0.010	<0.010	
methylanthracene, 2-	0.010	µg/L	<0.010	<0.010	
naphthalene	0.050	µg/L	<0.050	<0.050	
phenanthrene	0.020	µg/L	0.069	<0.020	
pyrene	0.010	µg/L	0.160	0.036	
quinoline	0.050	µg/L	<0.050	<0.050	
Polycyclic Aromatic Hydrocarbons Surrogates (Matrix: Water)					
chrysene-d12	0.1	%	106	121	
naphthalene-d8	0.1	%	115	120	
phenanthrene-d10	0.1	%	121	123	

Qualifier Legend

DLCI	Detection Limit Raised: Chromatographic interference due to co-elution.
DLO	Detection Limit raised due to co-eluting interference. GCMS qualifier ion ratio did not meet acceptance criteria.
DTC	Dissolved concentration exceeds total. Results were confirmed by re-analysis.

Sample Summary VA22A1190

Project

Report To Rob Waters, Castor Consultants Limited
Date Received 21-Jan-2022 08:40
Issue Date 31-Jan-2022 15:19
Amendment 0

Sample Details

ALS Sample ID	Client Sample ID	Matrix	Sub-Matrix	Date Sampled	Time Sampled
VA22A1190-001	N. Creek	Water	Water	20-Jan-2022	00:00
VA22A1190-002	Sump1	Water	Water	20-Jan-2022	00:00
VA22A1190-003	Sump2	Water	Water	20-Jan-2022	00:00
VA22A1190-004	Sump2A	Water	Water	20-Jan-2022	00:00
VA22A1190-005	S. Creek	Water	Water	20-Jan-2022	00:00
VA22A1190-006	Culvert S. Creek	Water	Water	20-Jan-2022	00:00
VA22A1190-007	S. Creek A	Water	Water	20-Jan-2022	00:00
VA22A1190-008	Background	Water	Water	20-Jan-2022	00:00

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215	1216	1217	1218	1219	1220	1221	12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CERTIFICATE OF ANALYSIS

Work Order : **VA22A1190**
Client : **Castor Consultants Limited**
Contact : **Rob Waters**
Address : **13719 Jennifer Road**
Ladysmith BC Canada V9G 1G4
Telephone : **----**
Project : **----**
PO : **----**
C-O-C number : **17-719917**
Sampler : **----**
Site : **----**
Quote number : **VA20-CAST100-001**
No. of samples received : **8**
No. of samples analysed : **8**

Page : **1 of 9**
Laboratory : **Vancouver - Environmental**
Account Manager : **Can Dang**
Address : **8081 Lougheed Highway**
Burnaby BC Canada V5A 1W9
Telephone : **+1 604 253 4188**
Date Samples Received : **21-Jan-2022 08:40**
Date Analysis Commenced : **21-Jan-2022**
Issue Date : **31-Jan-2022 15:19**

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
- Surrogate Control Limits

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

Signatories

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

Signatories	Position	Laboratory Department
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Caleb Deroche	Lab Analyst	Metals, Burnaby, British Columbia
Dan Gebert	Laboratory Analyst	Metals, Burnaby, British Columbia
Ilnaz Badbezanchi	Team Leader - Metals preparation	Metals, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Monica Ko	Lab Assistant	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).

Unit	Description
-	No Unit
µg/L	micrograms per litre
mg/L	milligrams per litre
NTU	nephelometric turbidity units
pH units	pH units

<: less than.

>: greater than.

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

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

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

Qualifiers

Qualifier	Description
DLCI	Detection Limit Raised: Chromatographic interference due to co-elution.
DLQ	Detection Limit raised due to co-eluting interference. GCMS qualifier ion ratio did not meet acceptance criteria.
DTC	Dissolved concentration exceeds total. Results were confirmed by re-analysis.



Analytical Results

Sub-Matrix: **Water**

Client sample ID

(Matrix: **Water**)

					N. Creek	Sump1	Sump2	Sump2A	S. Creek
Client sampling date / time					20-Jan-2022	20-Jan-2022	20-Jan-2022	20-Jan-2022	20-Jan-2022
Analyte	CAS Number	Method	LOR	Unit	VA22A1190-001	VA22A1190-002	VA22A1190-003	VA22A1190-004	VA22A1190-005
					Result	Result	Result	Result	Result
Physical Tests									
hardness (as CaCO ₃), from total Ca/Mg	----	EC100A	0.50	mg/L	17.0	----	----	132	111
hardness (as CaCO ₃), from total Ca/Mg	----	EC100A	0.60	mg/L	----	31.6	106	----	----
pH	----	E108	0.10	pH units	6.84	7.33	7.21	7.53	7.01
turbidity	----	E121	0.10	NTU	4.22	114	276	119	0.87
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	7.37	----	----	----	11.9
Total Metals									
aluminum, total	7429-90-5	E420	0.0030	mg/L	0.461	4.38	13.7	6.25	0.0882
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	0.00041	0.00033	0.00020	<0.00010
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00019	0.00171	0.00490	0.00274	0.00022
barium, total	7440-39-3	E420	0.00010	mg/L	0.00355	0.0341	0.0670	0.0410	0.0123
beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	----	----	0.000090	<0.000020
beryllium, total	7440-41-7	E420	0.000100	mg/L	----	<0.000100	0.000188	----	----
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
boron, total	7440-42-8	E420	0.010	mg/L	<0.010	0.014	0.030	0.030	0.057
cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.0000050	0.000105	0.0000733	0.0000333	<0.0000050
calcium, total	7440-70-2	E420	0.050	mg/L	4.25	6.86	25.5	33.0	29.9
cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	0.000105	0.000444	0.000215	<0.000010
chromium, total	7440-47-3	E420	0.00050	mg/L	0.00077	0.0118	0.0245	0.0112	<0.00050
cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00017	0.00374	0.00752	0.00366	0.00012
copper, total	7440-50-8	E420	0.00050	mg/L	0.00214	0.0491	0.0688	0.0271	0.00201
iron, total	7439-89-6	E420	0.010	mg/L	0.417	8.97	19.3	9.17	0.113
lead, total	7439-92-1	E420	0.000050	mg/L	0.000086	0.0171	0.00768	0.00230	<0.000050
lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	0.0019	0.0072	0.0040	<0.0010
magnesium, total	7439-95-4	E420	0.0050	mg/L	1.55	3.51	10.3	12.0	8.73
manganese, total	7439-96-5	E420	0.00010	mg/L	0.0279	0.294	0.760	0.870	0.0103
mercury, total	7439-97-6	E508	0.0000050	mg/L	----	0.0000153	0.0000348	----	----
molybdenum, total	7439-98-7	E420	0.000050	mg/L	<0.000050	0.000467	0.000425	0.000300	<0.000050
nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	0.00791	0.0153	0.00729	<0.00050
phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	0.130	0.304	0.145	<0.050
potassium, total	7440-09-7	E420	0.050	mg/L	0.271	0.964	2.30	1.56	2.00



Analytical Results

Sub-Matrix: **Water**

Client sample ID

					N. Creek	Sump1	Sump2	Sump2A	S. Creek
(Matrix: Water)									
Client sampling date / time					20-Jan-2022	20-Jan-2022	20-Jan-2022	20-Jan-2022	20-Jan-2022
Analyte	CAS Number	Method	LOR	Unit	VA22A1190-001	VA22A1190-002	VA22A1190-003	VA22A1190-004	VA22A1190-005
					Result	Result	Result	Result	Result
Total Metals									
rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00040	0.00135	0.00401	0.00212	0.00126
selenium, total	7782-49-2	E420	0.000050	mg/L	0.000082	0.000081	0.000183	0.000128	<0.000050
silicon, total	7440-21-3	E420	0.10	mg/L	4.54	7.07	23.0	15.8	5.82
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	0.000035	0.000076	0.000032	<0.000010
sodium, total	7440-23-5	E420	0.050	mg/L	4.61	13.6	16.3	15.3	14.5
strontium, total	7440-24-6	E420	0.00020	mg/L	0.0179	0.0408	0.114	0.143	0.152
sulfur, total	7704-34-9	E420	0.50	mg/L	<0.50	1.38	1.46	1.57	5.04
tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	0.000038	0.000016	<0.000010
thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	0.00010	0.00031	0.00015	<0.00010
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	0.00040	0.00022	0.00011	<0.00010
titanium, total	7440-32-6	E420	0.00030	mg/L	0.0295	0.453	0.982	0.493	0.00476
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
uranium, total	7440-61-1	E420	0.000010	mg/L	0.000012	0.000053	0.000163	0.000114	0.000010
vanadium, total	7440-62-2	E420	0.00050	mg/L	0.00159	0.0199	0.0576	0.0290	0.00075
zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	0.249	0.0994	0.0320	<0.0030
zirconium, total	7440-67-7	E420	0.00020	mg/L	0.00040	0.00108	0.00115	0.00063	0.00028
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.312	----	----	----	0.0542
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	----	----	----	<0.00010
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00015	----	----	----	0.00020
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.00281	----	----	----	0.0120
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	----	----	----	<0.000020
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	----	----	----	<0.000050
boron, dissolved	7440-42-8	E421	0.010	mg/L	<0.010	----	----	----	0.058
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	----	----	----	<0.0000050
calcium, dissolved	7440-70-2	E421	0.050	mg/L	3.98	----	----	----	28.9
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	----	----	----	<0.000010
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	0.00057	----	----	----	<0.00050
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.00010	----	----	----	<0.00010
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00162	----	----	----	0.00160
iron, dissolved	7439-89-6	E421	0.010	mg/L	0.245	----	----	----	0.057



Analytical Results

Sub-Matrix: **Water**

Client sample ID

(Matrix: **Water**)

Client sampling date / time					N. Creek	Sump1	Sump2	Sump2A	S. Creek
Analyte					CAS Number	Method	LOR	Unit	
					VA22A1190-001	VA22A1190-002	VA22A1190-003	VA22A1190-004	VA22A1190-005
					Result	Result	Result	Result	Result
Dissolved Metals									
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	----	----	----	<0.000050
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	<0.0010	----	----	----	<0.0010
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	1.43	----	----	----	8.36
manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.0123	----	----	----	0.00149
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	<0.000050	----	----	----	0.000090
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	----	----	----	<0.00050
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	----	----	----	<0.050
potassium, dissolved	7440-09-7	E421	0.050	mg/L	0.254	----	----	----	1.90
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00035	----	----	----	0.00122
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000060	----	----	----	0.000077
silicon, dissolved	7440-21-3	E421	0.050	mg/L	4.29	----	----	----	5.61
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	----	----	----	<0.000010
sodium, dissolved	7440-23-5	E421	0.050	mg/L	4.25	----	----	----	13.7
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0172	----	----	----	0.143
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	<0.50	----	----	----	4.76
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	----	----	----	<0.00020
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	----	----	----	<0.000010
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	----	----	----	<0.00010
tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	----	----	----	<0.00010
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	0.0190	----	----	----	0.00187
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	----	----	----	<0.00010
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	<0.000010	----	----	----	<0.000010
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	0.00105	----	----	----	0.00058
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	----	----	----	<0.0010
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	0.00056	----	----	----	0.00030
dissolved metals filtration location	----	EP421	-	-	Laboratory	----	----	----	Laboratory
Hydrocarbons									
EPH (C10-C19)	----	E601A	250	µg/L	----	<250	<250	----	----
EPH (C19-C32)	----	E601A	250	µg/L	----	260	<250	----	----
HEPHw	----	EC600A	250	µg/L	----	260	<250	----	----
LEPHw	----	EC600A	250	µg/L	----	<250	<250	----	----
Hydrocarbons Surrogates									



Analytical Results

Sub-Matrix: **Water**

Client sample ID

(Matrix: **Water**)

					N. Creek	Sump1	Sump2	Sump2A	S. Creek
Client sampling date / time					20-Jan-2022	20-Jan-2022	20-Jan-2022	20-Jan-2022	20-Jan-2022
Analyte	CAS Number	Method	LOR	Unit	VA22A1190-001	VA22A1190-002	VA22A1190-003	VA22A1190-004	VA22A1190-005
					Result	Result	Result	Result	Result
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	1.0	%	----	83.5	99.0	----	----
Polycyclic Aromatic Hydrocarbons									
acenaphthene	83-32-9	E641A	0.010	µg/L	----	<0.010	<0.010	----	----
acenaphthylene	208-96-8	E641A	0.010	µg/L	----	<0.010	<0.010	----	----
acridine	260-94-6	E641A	0.010	µg/L	----	<0.070 ^{DLCL}	<0.010	----	----
anthracene	120-12-7	E641A	0.010	µg/L	----	<0.025 ^{DLQ}	<0.010	----	----
benz(a)anthracene	56-55-3	E641A	0.010	µg/L	----	0.058	0.013	----	----
benzo(a)pyrene	50-32-8	E641A	0.0050	µg/L	----	0.0425	0.0067	----	----
benzo(b+j)fluoranthene	n/a	E641A	0.010	µg/L	----	0.072	0.012	----	----
benzo(b+j+k)fluoranthene	n/a	E641A	0.015	µg/L	----	0.096	<0.015	----	----
benzo(g,h,i)perylene	191-24-2	E641A	0.010	µg/L	----	0.036	<0.010	----	----
benzo(k)fluoranthene	207-08-9	E641A	0.010	µg/L	----	0.024	<0.010	----	----
chrysene	218-01-9	E641A	0.010	µg/L	----	0.067	0.017	----	----
dibenz(a,h)anthracene	53-70-3	E641A	0.0050	µg/L	----	<0.0092 ^{DLQ}	<0.0050	----	----
fluoranthene	206-44-0	E641A	0.010	µg/L	----	0.130	0.014	----	----
fluorene	86-73-7	E641A	0.010	µg/L	----	0.013	<0.010	----	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.010	µg/L	----	0.035	<0.010	----	----
methylnaphthalene, 1-	90-12-0	E641A	0.010	µg/L	----	<0.010	<0.010	----	----
methylnaphthalene, 2-	91-57-6	E641A	0.010	µg/L	----	<0.010	<0.010	----	----
naphthalene	91-20-3	E641A	0.050	µg/L	----	<0.050	<0.050	----	----
phenanthrene	85-01-8	E641A	0.020	µg/L	----	0.089	<0.020	----	----
pyrene	129-00-0	E641A	0.010	µg/L	----	0.160	0.036	----	----
quinoline	91-22-5	E641A	0.050	µg/L	----	<0.050	<0.050	----	----
Polycyclic Aromatic Hydrocarbons Surrogates									
chrysene-d12	1719-03-5	E641A	0.1	%	----	106	121	----	----
naphthalene-d8	1146-65-2	E641A	0.1	%	----	115	120	----	----
phenanthrene-d10	1517-22-2	E641A	0.1	%	----	121	123	----	----

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



Analytical Results

Sub-Matrix: **Water**

Client sample ID

(Matrix: **Water**)

					Culvert S. Creek	S. Creek A	Background	----	----
Client sampling date / time					20-Jan-2022	20-Jan-2022	20-Jan-2022	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22A1190-006	VA22A1190-007	VA22A1190-008	-----	-----
					Result	Result	Result	----	----
Physical Tests									
hardness (as CaCO ₃), from total Ca/Mg	----	EC100A	0.50	mg/L	74.6	54.0	----	----	----
pH	----	E108	0.10	pH units	7.24	6.85	----	----	----
turbidity	----	E121	0.10	NTU	59.1	5.16	3.17	----	----
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	<0.50	3.72	----	----	----
Total Metals									
aluminum, total	7429-90-5	E420	0.0030	mg/L	3.70	0.410	----	----	----
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00122	0.00023	----	----	----
barium, total	7440-39-3	E420	0.00010	mg/L	0.0250	0.00984	----	----	----
beryllium, total	7440-41-7	E420	0.000020	mg/L	0.000045	<0.000020	----	----	----
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	----	----	----
boron, total	7440-42-8	E420	0.010	mg/L	0.030	<0.010	----	----	----
cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000184	0.0000131	----	----	----
calcium, total	7440-70-2	E420	0.050	mg/L	18.7	13.8	----	----	----
cesium, total	7440-46-2	E420	0.000010	mg/L	0.000088	0.000014	----	----	----
chromium, total	7440-47-3	E420	0.00050	mg/L	0.00580	0.00074	----	----	----
cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00215	0.00016	----	----	----
copper, total	7440-50-8	E420	0.00050	mg/L	0.0125	0.00279	----	----	----
iron, total	7439-89-6	E420	0.010	mg/L	4.06	0.486	----	----	----
lead, total	7439-92-1	E420	0.000050	mg/L	0.000694	0.000259	----	----	----
lithium, total	7439-93-2	E420	0.0010	mg/L	0.0019	<0.0010	----	----	----
magnesium, total	7439-95-4	E420	0.0050	mg/L	6.77	4.74	----	----	----
manganese, total	7439-96-5	E420	0.00010	mg/L	0.795	0.0191	----	----	----
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000118	<0.000050	----	----	----
nickel, total	7440-02-0	E420	0.00050	mg/L	0.00398	0.00067	----	----	----
phosphorus, total	7723-14-0	E420	0.050	mg/L	0.091	<0.050	----	----	----
potassium, total	7440-09-7	E420	0.050	mg/L	1.52	0.423	----	----	----
rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00158	0.00040	----	----	----
selenium, total	7782-49-2	E420	0.000050	mg/L	0.000146	<0.000050	----	----	----
silicon, total	7440-21-3	E420	0.10	mg/L	9.35	5.68	----	----	----
silver, total	7440-22-4	E420	0.000010	mg/L	0.000026	<0.000010	----	----	----



Analytical Results

Sub-Matrix: **Water**

Client sample ID

(Matrix: **Water**)

Client sampling date / time					Culvert S. Creek	S. Creek A	Background	----	----
Analyte					CAS Number	Method	LOR	Unit	
					VA22A1190-006	VA22A1190-007	VA22A1190-008	-----	-----
					Result	Result	Result	----	----
Total Metals									
sodium, total	7440-23-5	E420	0.050	mg/L	6.48	13.4	----	----	----
strontium, total	7440-24-6	E420	0.00020	mg/L	0.0778	0.0718	----	----	----
sulfur, total	7704-34-9	E420	0.50	mg/L	<0.50	<0.50	----	----	----
tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	----	----	----
thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	----	----	----
thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----
titanium, total	7440-32-6	E420	0.00030	mg/L	0.277	0.0243	----	----	----
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----
uranium, total	7440-61-1	E420	0.000010	mg/L	0.000083	<0.000010	----	----	----
vanadium, total	7440-62-2	E420	0.00050	mg/L	0.0152	0.00158	----	----	----
zinc, total	7440-66-6	E420	0.0030	mg/L	0.0066	0.0034	----	----	----
zirconium, total	7440-67-7	E420	0.00020	mg/L	0.00070	0.00030	----	----	----
Dissolved Metals									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	1.64	0.114	----	----	----
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	----	----	----
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00074	0.00013	----	----	----
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0114	0.00724	----	----	----
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	----	----	----
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	----	----	----
boron, dissolved	7440-42-8	E421	0.010	mg/L	0.031	0.010	----	----	----
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000068	<0.0000050	----	----	----
calcium, dissolved	7440-70-2	E421	0.050	mg/L	18.1	13.5	----	----	----
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000023	<0.000010	----	----	----
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	0.00255	<0.00050	----	----	----
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00076	<0.00010	----	----	----
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00694	0.00119	----	----	----
iron, dissolved	7439-89-6	E421	0.010	mg/L	1.59	0.140	----	----	----
lead, dissolved	7439-92-1	E421	0.000050	mg/L	0.000250	<0.000050	----	----	----
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	<0.0010	<0.0010	----	----	----
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	6.07	4.26	----	----	----
manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.621	0.00408	----	----	----



Analytical Results

Sub-Matrix: **Water**

Client sample ID

(Matrix: **Water**)

Client sampling date / time					Culvert S. Creek	S. Creek A	Background	----	----
Analyte					CAS Number	Method	LOR	Unit	
					VA22A1190-006	VA22A1190-007	VA22A1190-008	-----	-----
					Result	Result	Result	----	----
Dissolved Metals									
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000121	<0.000050	----	----	----
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00188	<0.00050	----	----	----
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	----	----	----
potassium, dissolved	7440-09-7	E421	0.050	mg/L	1.41	0.350	----	----	----
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00107	0.00029	----	----	----
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000106	<0.000050	----	----	----
silicon, dissolved	7440-21-3	E421	0.050	mg/L	7.01	5.05	----	----	----
silver, dissolved	7440-22-4	E421	0.000010	mg/L	0.000012	<0.000010	----	----	----
sodium, dissolved	7440-23-5	E421	0.050	mg/L	6.20	12.4	----	----	----
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0701	0.0659	----	----	----
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	<0.50	<0.50	----	----	----
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	----	----	----
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	----	----	----
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	----	----	----
tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	----	----	----
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	0.134	0.00953	----	----	----
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	----	----	----
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000062	<0.000010	----	----	----
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	0.00748	0.00068	----	----	----
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0020	<0.0010	----	----	----
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	0.00178 ^{DTC}	<0.00030	----	----	----
dissolved metals filtration location	----	EP421	-	-	Laboratory	Laboratory	----	----	----

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: VA22A1190	Page	: 1 of 9
Client	: Castor Consultants Limited	Laboratory	: Vancouver - Environmental
Contact	: Rob Waters	Account Manager	: Can Dang
Address	: 13719 Jennifer Road Ladysmith BC Canada V9G 1G4	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ---	Telephone	: +1 604 253 4188
Project	: ---	Date Samples Received	: 21-Jan-2022 08:40
PO	: ---	Issue Date	: 31-Jan-2022 15:19
C-O-C number	: 17-719917		
Sampler	: ---		
Site	: ---		
Quote number	: VA20-CAST100-001		
No. of samples received	: 8		
No. of samples analysed	: 8		

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

Key

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

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

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water**

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) Culvert S. Creek	E421	20-Jan-2022	28-Jan-2022	----	----		28-Jan-2022	180 days	9 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) N. Creek	E421	20-Jan-2022	28-Jan-2022	----	----		28-Jan-2022	180 days	9 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) S. Creek	E421	20-Jan-2022	28-Jan-2022	----	----		28-Jan-2022	180 days	9 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) S. Creek A	E421	20-Jan-2022	28-Jan-2022	----	----		28-Jan-2022	180 days	9 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) Sump1	E601A	20-Jan-2022	27-Jan-2022	14 days	8 days	✓	28-Jan-2022	40 days	1 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) Sump2	E601A	20-Jan-2022	28-Jan-2022	14 days	8 days	✓	31-Jan-2022	40 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) Culvert S. Creek	E358-L	20-Jan-2022	27-Jan-2022	3 days	8 days	* EHT	27-Jan-2022	28 days	0 days	✓



Matrix: **Water**

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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) N. Creek	E358-L	20-Jan-2022	27-Jan-2022	3 days	8 days	* EHT	27-Jan-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) S. Creek	E358-L	20-Jan-2022	27-Jan-2022	3 days	8 days	* EHT	27-Jan-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) S. Creek A	E358-L	20-Jan-2022	27-Jan-2022	3 days	8 days	* EHT	27-Jan-2022	28 days	0 days	✓
Physical Tests : pH by Meter										
HDPE Culvert S. Creek	E108	20-Jan-2022	----	----	----		21-Jan-2022	0.25 hrs	44 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE N. Creek	E108	20-Jan-2022	----	----	----		21-Jan-2022	0.25 hrs	44 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE S. Creek	E108	20-Jan-2022	----	----	----		21-Jan-2022	0.25 hrs	44 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE S. Creek A	E108	20-Jan-2022	----	----	----		21-Jan-2022	0.25 hrs	44 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE Sump1	E108	20-Jan-2022	----	----	----		21-Jan-2022	0.25 hrs	44 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE Sump2	E108	20-Jan-2022	----	----	----		21-Jan-2022	0.25 hrs	44 hrs	* EHTR-FM



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	
Physical Tests : pH by Meter										
HDPE Sump2A	E108	20-Jan-2022	----	----	----		21-Jan-2022	0.25 hrs	44 hrs	* EHTR-FM
Physical Tests : Turbidity by Nephelometry										
HDPE Background	E121	20-Jan-2022	----	----	----		23-Jan-2022	3 days	4 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE Culvert S. Creek	E121	20-Jan-2022	----	----	----		23-Jan-2022	3 days	4 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE N. Creek	E121	20-Jan-2022	----	----	----		23-Jan-2022	3 days	4 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE S. Creek	E121	20-Jan-2022	----	----	----		23-Jan-2022	3 days	4 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE S. Creek A	E121	20-Jan-2022	----	----	----		23-Jan-2022	3 days	4 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE Sump1	E121	20-Jan-2022	----	----	----		23-Jan-2022	3 days	4 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE Sump2	E121	20-Jan-2022	----	----	----		23-Jan-2022	3 days	4 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE Sump2A	E121	20-Jan-2022	----	----	----		23-Jan-2022	3 days	4 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	
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) Sump1	E641A	20-Jan-2022	27-Jan-2022	14 days	8 days	✓	28-Jan-2022	40 days	0 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) Sump2	E641A	20-Jan-2022	28-Jan-2022	14 days	8 days	✓	28-Jan-2022	40 days	0 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial - total (lab preserved) Sump1	E508	20-Jan-2022	----	----	----		26-Jan-2022	28 days	6 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial - total (lab preserved) Sump2	E508	20-Jan-2022	----	----	----		26-Jan-2022	28 days	6 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) Culvert S. Creek	E420	20-Jan-2022	----	----	----		28-Jan-2022	180 days	9 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) N. Creek	E420	20-Jan-2022	----	----	----		28-Jan-2022	180 days	9 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) S. Creek	E420	20-Jan-2022	----	----	----		28-Jan-2022	180 days	9 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) S. Creek A	E420	20-Jan-2022	----	----	----		28-Jan-2022	180 days	9 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) Sump1	E420	20-Jan-2022	----	----	----		28-Jan-2022	180 days	9 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) Sump2	E420	20-Jan-2022	----	----	----		28-Jan-2022	180 days	9 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) Sump2A	E420	20-Jan-2022	----	----	----		28-Jan-2022	180 days	9 days	✓

Legend & Qualifier Definitions

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

EHT: Exceeded ALS recommended hold time prior to analysis.

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



Quality Control Parameter Frequency Compliance

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

Matrix: **Water**

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
Analytical Methods							
Laboratory Duplicates (DUP)							
Dissolved Metals in Water by CRC ICPMS	E421	396801	1	10	10.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	396173	1	20	5.0	5.0	✓
pH by Meter	E108	392457	1	19	5.2	5.0	✓
Total Mercury in Water by CVAAS	E508	394806	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	396770	1	19	5.2	5.0	✓
Turbidity by Nephelometry	E121	393127	2	33	6.0	5.0	✓
Laboratory Control Samples (LCS)							
BC PHCs - EPH by GC-FID	E601A	397165	2	23	8.7	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	396801	1	10	10.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	396173	1	20	5.0	5.0	✓
PAHs by Hexane LVI GC-MS	E641A	397166	2	25	8.0	5.0	✓
pH by Meter	E108	392457	1	19	5.2	5.0	✓
Total Mercury in Water by CVAAS	E508	394806	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	396770	1	19	5.2	5.0	✓
Turbidity by Nephelometry	E121	393127	2	33	6.0	5.0	✓
Method Blanks (MB)							
BC PHCs - EPH by GC-FID	E601A	397165	2	23	8.7	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	396801	1	10	10.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	396173	1	20	5.0	5.0	✓
PAHs by Hexane LVI GC-MS	E641A	397166	2	25	8.0	5.0	✓
Total Mercury in Water by CVAAS	E508	394806	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	396770	1	19	5.2	5.0	✓
Turbidity by Nephelometry	E121	393127	2	33	6.0	5.0	✓
Matrix Spikes (MS)							
Dissolved Metals in Water by CRC ICPMS	E421	396801	1	10	10.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	396173	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	394806	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	396770	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
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.
Turbidity by Nephelometry	E121 Vancouver - Environmental	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2 . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
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.
Dissolved Metals in Water by CRC ICPMS	E421 Vancouver - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 μm), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
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
BC PHCs - EPH by GC-FID	E601A Vancouver - Environmental	Water	BC MOE Lab Manual	Sample extracts are analyzed by GC-FID for BC hydrocarbon fractions.
PAHs by Hexane LVI GC-MS	E641A Vancouver - Environmental	Water	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by large volume injection (LVI) GC-MS.



<i>Analytical Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Hardness (Calculated) from Total Ca/Mg	EC100A Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
LEPH and HEPH: EPH-PAH	EC600A Vancouver - Environmental	Water	BC MOE Lab Manual (LEPH and HEPH) (mod)	Light Extractable Petroleum Hydrocarbons (LEPH) and Heavy Extractable Petroleum Hydrocarbons (HEPH) are calculated as follows: LEPH = Extractable Petroleum Hydrocarbons (EPH10-19) minus Acenaphthene, Acridine, Anthracene, Fluorene, Naphthalene and Phenanthrene; HEPH = Extractable Petroleum Hydrocarbons (EPH19-32) minus Benz(a)anthracene, Benzo(a)pyrene, Fluoranthene, and Pyrene.
<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Preparation for Dissolved Organic Carbon for Combustion	EP358 Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Dissolved Metals Water Filtration	EP421 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO ₃ .
PHCs and PAHs Hexane Extraction	EP601 Vancouver - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

QUALITY CONTROL REPORT

Work Order
: VA22A1190
Page
: 1 of 16

Client : Castor Consultants Limited
 Contact : Rob Waters
 Address : 13719 Jennifer Road
 Ladysmith BC Canada V9G 1G4
 Telephone : ----
 Project : ----
 PO : ----
 C-O-C number : 17-719917
 Sampler : ----
 Site : ----
 Quote number : VA20-CAST100-001
 No. of samples received : 8
 No. of samples analysed : 8

Laboratory : Vancouver - Environmental
 Account Manager : Can Dang
 Address : 8081 Lougheed Highway
 Burnaby, British Columbia Canada V5A 1W9
 Telephone : +1 604 253 4188
 Date Samples Received : 21-Jan-2022 08:40
 Date Analysis Commenced : 21-Jan-2022
 Issue Date : 31-Jan-2022 15:19

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
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Caleb Deroche	Lab Analyst	Metals, Burnaby, British Columbia
Dan Gebert	Laboratory Analyst	Metals, Burnaby, British Columbia
Ilnaz Badbezanchi	Team Leader - Metals preparation	Metals, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Monica Ko	Lab Assistant	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
Physical Tests (QC Lot: 392457)											
VA22A1178-001	Anonymous	pH	----	E108	0.10	pH units	7.89	7.88	0.127%	4%	----
Physical Tests (QC Lot: 393126)											
FJ2200188-001	Anonymous	turbidity	----	E121	0.10	NTU	6.43	5.60	13.7%	15%	----
Physical Tests (QC Lot: 393127)											
VA22A1190-004	Sump2A	turbidity	----	E121	0.10	NTU	119	118	0.844%	15%	----
Organic / Inorganic Carbon (QC Lot: 396173)											
VA22A1190-001	N. Creek	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	7.37	7.75	5.01%	20%	----
Total Metals (QC Lot: 394806)											
VA22A1159-009	Anonymous	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Total Metals (QC Lot: 396770)											
VA22A1177-001	Anonymous	aluminum, total	7429-90-5	E420	3.0	mg/L	134 µg/L	0.150	11.6%	20%	----
		antimony, total	7440-36-0	E420	0.10	mg/L	0.13 µg/L	0.00014	0.000008	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.10	mg/L	0.60 µg/L	0.00065	0.00004	Diff <2x LOR	----
		barium, total	7440-39-3	E420	0.10	mg/L	29.2 µg/L	0.0297	1.89%	20%	----
		beryllium, total	7440-41-7	E420	0.100	mg/L	<0.100 µg/L	<0.000100	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.050	mg/L	<0.050 µg/L	<0.000050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	10	mg/L	<10 µg/L	<0.010	0	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.0050	mg/L	0.328 µg/L	0.000326	0.833%	20%	----
		calcium, total	7440-70-2	E420	50	mg/L	42500 µg/L	43.0	1.14%	20%	----
		cesium, total	7440-46-2	E420	0.010	mg/L	0.074 µg/L	0.000079	0.000005	Diff <2x LOR	----
		chromium, total	7440-47-3	E420	0.50	mg/L	<0.50 µg/L	<0.00050	0	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.10	mg/L	0.43 µg/L	0.00043	0.000002	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.50	mg/L	1.20 µg/L	0.00123	0.00003	Diff <2x LOR	----
		iron, total	7439-89-6	E420	10	mg/L	267 µg/L	0.282	5.56%	20%	----
		lead, total	7439-92-1	E420	0.050	mg/L	0.757 µg/L	0.000775	2.31%	20%	----
		lithium, total	7439-93-2	E420	1.0	mg/L	1.1 µg/L	0.0012	0.00006	Diff <2x LOR	----
		magnesium, total	7439-95-4	E420	5.0	mg/L	9850 µg/L	9.95	0.995%	20%	----
		manganese, total	7439-96-5	E420	0.10	mg/L	239 µg/L	0.240	0.263%	20%	----
		molybdenum, total	7439-98-7	E420	0.050	mg/L	0.702 µg/L	0.000698	0.539%	20%	----
		nickel, total	7440-02-0	E420	0.50	mg/L	1.10 µg/L	0.00111	0.000004	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E420	50	mg/L	<50 µg/L	<0.050	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: 396770) - continued											
VA22A1177-001	Anonymous	potassium, total	7440-09-7	E420	50	mg/L	1900 µg/L	1.90	0.0825%	20%	----
		rubidium, total	7440-17-7	E420	0.20	mg/L	0.74 µg/L	0.00087	0.00013	Diff <2x LOR	----
		selenium, total	7782-49-2	E420	0.050	mg/L	0.157 µg/L	0.000191	0.000035	Diff <2x LOR	----
		silicon, total	7440-21-3	E420	100	mg/L	5730 µg/L	5.68	0.792%	20%	----
		silver, total	7440-22-4	E420	0.010	mg/L	<0.010 µg/L	<0.000010	0	Diff <2x LOR	----
		sodium, total	7440-23-5	E420	50	mg/L	3490 µg/L	3.52	0.921%	20%	----
		strontium, total	7440-24-6	E420	0.20	mg/L	211 µg/L	0.214	1.41%	20%	----
		sulfur, total	7704-34-9	E420	500	mg/L	22700 µg/L	22.3	1.82%	20%	----
		tellurium, total	13494-80-9	E420	0.20	mg/L	<0.20 µg/L	<0.00020	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.010	mg/L	<0.010 µg/L	<0.000010	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.10	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.10	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.30	mg/L	3.90 µg/L	0.00450	14.4%	20%	----
		tungsten, total	7440-33-7	E420	0.10	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.010	mg/L	4.40 µg/L	0.00454	3.19%	20%	----
		vanadium, total	7440-62-2	E420	0.50	mg/L	<0.50 µg/L	<0.00050	0	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	3.0	mg/L	70.3 µg/L	0.0696	1.00%	20%	----
		zirconium, total	7440-67-7	E420	0.20	mg/L	<0.20 µg/L	<0.00020	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 396801)											
CG2200836-002	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0020	mg/L	0.0022	0.0027	0.0005	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00020	mg/L	0.00279	0.00285	2.06%	20%	----
		arsenic, dissolved	7440-38-2	E421	0.00020	mg/L	0.00042	0.00043	0.00002	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.00020	mg/L	3.18	3.08	3.27%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.040	mg/L	<0.040 µg/L	<0.000040	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.020	mg/L	0.237	0.230	3.21%	20%	----
		cadmium, dissolved	7440-43-9	E421	0.0100	mg/L	0.0306 µg/L	0.0000236	0.0000069	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.100	mg/L	55.2	54.1	1.89%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000020	mg/L	0.000486	0.000492	1.11%	20%	----
		chromium, dissolved	7440-47-3	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00020	mg/L	0.00277	0.00278	0.558%	20%	----
		copper, dissolved	7440-50-8	E421	0.00040	mg/L	<0.00040	<0.00040	0	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0020	mg/L	2.07	2.04	1.59%	20%	----



Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 396801) - continued											
CG2200836-002	Anonymous	magnesium, dissolved	7439-95-4	E421	0.0100	mg/L	15.3	15.3	0.00936%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00020	mg/L	0.121	0.125	2.89%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000100	mg/L	0.0127	0.0128	0.787%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00100	mg/L	0.0146	0.0145	0.835%	20%	----
		phosphorus, dissolved	7723-14-0	E421	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.100	mg/L	12.2	12.6	2.92%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00040	mg/L	0.0238	0.0235	1.17%	20%	----
		selenium, dissolved	7782-49-2	E421	0.100	mg/L	0.609 µg/L	0.000531	0.000078	Diff <2x LOR	----
		silicon, dissolved	7440-21-3	E421	0.100	mg/L	4.52	4.55	0.636%	20%	----
		silver, dissolved	7440-22-4	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	0.100	mg/L	316	324	2.29%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00040	mg/L	1.68	1.71	1.60%	20%	----
		sulfur, dissolved	7704-34-9	E421	1.00	mg/L	2.79	2.99	0.20	Diff <2x LOR	----
		tellurium, dissolved	13494-80-9	E421	0.00040	mg/L	<0.00040	<0.00040	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000020	mg/L	0.000026	0.000021	0.000004	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00060	mg/L	<0.00060	<0.00060	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000020	mg/L	0.000654	0.000684	4.62%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0020	mg/L	0.0034	0.0034	0.00006	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00060	mg/L	0.00228	0.00237	0.00008	Diff <2x LOR	----



Method Blank (MB) Report

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

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 393126)						
turbidity	----	E121	0.1	NTU	<0.10	----
Physical Tests (QCLot: 393127)						
turbidity	----	E121	0.1	NTU	<0.10	----
Organic / Inorganic Carbon (QCLot: 396173)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 394806)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Total Metals (QCLot: 396770)						
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
Total Metals (QCLot: 396770) - continued						
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
sodium, total	7440-23-5	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	----
Dissolved Metals (QCLot: 396801)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 396801) - continued						
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Hydrocarbons (QCLot: 396345)						
EPH (C10-C19)	----	E601A	250	µg/L	<250	----
EPH (C19-C32)	----	E601A	250	µg/L	<250	----
Hydrocarbons (QCLot: 397165)						
EPH (C10-C19)	----	E601A	250	µg/L	<250	----
EPH (C19-C32)	----	E601A	250	µg/L	<250	----
Polycyclic Aromatic Hydrocarbons (QCLot: 396346)						
acenaphthene	83-32-9	E641A	0.01	µg/L	<0.010	----
acenaphthylene	208-96-8	E641A	0.01	µg/L	<0.010	----
acridine	260-94-6	E641A	0.01	µg/L	<0.010	----
anthracene	120-12-7	E641A	0.01	µg/L	<0.010	----
benz(a)anthracene	56-55-3	E641A	0.01	µg/L	<0.010	----
benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	<0.0050	----
benzo(b+j)fluoranthene	n/a	E641A	0.01	µg/L	<0.010	----
benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	<0.010	----
benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	<0.010	----
chrysene	218-01-9	E641A	0.01	µg/L	<0.010	----
dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	<0.0050	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 396346) - continued						
fluoranthene	206-44-0	E641A	0.01	µg/L	<0.010	----
fluorene	86-73-7	E641A	0.01	µg/L	<0.010	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	<0.010	----
methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	<0.010	----
methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	<0.010	----
naphthalene	91-20-3	E641A	0.05	µg/L	<0.050	----
phenanthrene	85-01-8	E641A	0.02	µg/L	<0.020	----
pyrene	129-00-0	E641A	0.01	µg/L	<0.010	----
quinoline	91-22-5	E641A	0.05	µg/L	<0.050	----
Polycyclic Aromatic Hydrocarbons (QCLot: 397166)						
acenaphthene	83-32-9	E641A	0.01	µg/L	<0.010	----
acenaphthylene	208-96-8	E641A	0.01	µg/L	<0.010	----
acridine	260-94-6	E641A	0.01	µg/L	<0.010	----
anthracene	120-12-7	E641A	0.01	µg/L	<0.010	----
benz(a)anthracene	56-55-3	E641A	0.01	µg/L	<0.010	----
benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	<0.0050	----
benzo(b+j)fluoranthene	n/a	E641A	0.01	µg/L	<0.010	----
benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	<0.010	----
benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	<0.010	----
chrysene	218-01-9	E641A	0.01	µg/L	<0.010	----
dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	<0.0050	----
fluoranthene	206-44-0	E641A	0.01	µg/L	<0.010	----
fluorene	86-73-7	E641A	0.01	µg/L	<0.010	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	<0.010	----
methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	<0.010	----
methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	<0.010	----
naphthalene	91-20-3	E641A	0.05	µg/L	<0.050	----
phenanthrene	85-01-8	E641A	0.02	µg/L	<0.020	----
pyrene	129-00-0	E641A	0.01	µg/L	<0.010	----
quinoline	91-22-5	E641A	0.05	µg/L	<0.050	----



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: 392457)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 393126)									
turbidity	----	E121	0.1	NTU	200 NTU	108	85.0	115	----
Physical Tests (QCLot: 393127)									
turbidity	----	E121	0.1	NTU	200 NTU	108	85.0	115	----
Organic / Inorganic Carbon (QCLot: 396173)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	103	80.0	120	----
Total Metals (QCLot: 394806)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	101	80.0	120	----
Total Metals (QCLot: 396770)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	98.6	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	120	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	99.9	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	100.0	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	103	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	101	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	96.8	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	102	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	100	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	99.5	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	99.9	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	102	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	100	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	99.6	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	102	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	107	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	99.5	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	107	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	105	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: 396770) - continued									
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	103	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	105	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	97.9	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	97.0	80.0	120	----
sodium, total	7440-23-5	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	109	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	92.8	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	101	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	98.5	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	102	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	98.5	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	106	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	102	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	101	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	99.9	80.0	120	----
Dissolved Metals (QCLot: 396801)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	102	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	108	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	102	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	103	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	104	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	106	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	103	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	102	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	105	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	104	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	101	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	99.3	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	105	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	102	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	105	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	101	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	105	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 396801) - continued									
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	99.2	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	108	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	102	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	107	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	99.6	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	103	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	96.8	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	102	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	107	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	98.4	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	110	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	106	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	100.0	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	104	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	103	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	102	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	107	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	104	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	94.9	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	102	80.0	120	----
Hydrocarbons (QCLot: 396345)									
EPH (C10-C19)	----	E601A	250	µg/L	6491 µg/L	98.0	70.0	130	----
EPH (C19-C32)	----	E601A	250	µg/L	3363 µg/L	94.1	70.0	130	----
Hydrocarbons (QCLot: 397165)									
EPH (C10-C19)	----	E601A	250	µg/L	6491 µg/L	109	70.0	130	----
EPH (C19-C32)	----	E601A	250	µg/L	3363 µg/L	107	70.0	130	----
Polycyclic Aromatic Hydrocarbons (QCLot: 396346)									
acenaphthene	83-32-9	E641A	0.01	µg/L	0.5 µg/L	105	60.0	130	----
acenaphthylene	208-96-8	E641A	0.01	µg/L	0.5 µg/L	105	60.0	130	----
acridine	260-94-6	E641A	0.01	µg/L	0.5 µg/L	111	60.0	130	----
anthracene	120-12-7	E641A	0.01	µg/L	0.5 µg/L	109	60.0	130	----
benz(a)anthracene	56-55-3	E641A	0.01	µg/L	0.5 µg/L	102	60.0	130	----
benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	0.5 µg/L	102	60.0	130	----
benzo(b+j)fluoranthene	n/a	E641A	0.01	µg/L	0.5 µg/L	108	60.0	130	----
benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	0.5 µg/L	100	60.0	130	----
benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	0.5 µg/L	108	60.0	130	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 396346) - continued									
chrysene	218-01-9	E641A	0.01	µg/L	0.5 µg/L	99.5	60.0	130	----
dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	0.5 µg/L	103	60.0	130	----
fluoranthene	206-44-0	E641A	0.01	µg/L	0.5 µg/L	101	60.0	130	----
fluorene	86-73-7	E641A	0.01	µg/L	0.5 µg/L	103	60.0	130	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	0.5 µg/L	107	60.0	130	----
methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	0.5 µg/L	108	60.0	130	----
methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	0.5 µg/L	104	60.0	130	----
naphthalene	91-20-3	E641A	0.05	µg/L	0.5 µg/L	106	50.0	130	----
phenanthrene	85-01-8	E641A	0.02	µg/L	0.5 µg/L	106	60.0	130	----
pyrene	129-00-0	E641A	0.01	µg/L	0.5 µg/L	104	60.0	130	----
quinoline	91-22-5	E641A	0.05	µg/L	0.5 µg/L	121	60.0	130	----
Polycyclic Aromatic Hydrocarbons (QCLot: 397166)									
acenaphthene	83-32-9	E641A	0.01	µg/L	0.5 µg/L	124	60.0	130	----
acenaphthylene	208-96-8	E641A	0.01	µg/L	0.5 µg/L	122	60.0	130	----
acridine	260-94-6	E641A	0.01	µg/L	0.25 µg/L	115	60.0	130	----
anthracene	120-12-7	E641A	0.01	µg/L	0.5 µg/L	130	60.0	130	----
benz(a)anthracene	56-55-3	E641A	0.01	µg/L	0.5 µg/L	129	60.0	130	----
benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	0.5 µg/L	124	60.0	130	----
benzo(b+j)fluoranthene	n/a	E641A	0.01	µg/L	0.5 µg/L	129	60.0	130	----
benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	0.5 µg/L	109	60.0	130	----
benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	0.5 µg/L	127	60.0	130	----
chrysene	218-01-9	E641A	0.01	µg/L	0.5 µg/L	127	60.0	130	----
dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	0.5 µg/L	110	60.0	130	----
fluoranthene	206-44-0	E641A	0.01	µg/L	0.5 µg/L	117	60.0	130	----
fluorene	86-73-7	E641A	0.01	µg/L	0.5 µg/L	121	60.0	130	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	0.5 µg/L	109	60.0	130	----
methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	0.5 µg/L	124	60.0	130	----
methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	0.5 µg/L	126	60.0	130	----
naphthalene	91-20-3	E641A	0.05	µg/L	0.5 µg/L	124	50.0	130	----
phenanthrene	85-01-8	E641A	0.02	µg/L	0.5 µg/L	126	60.0	130	----
pyrene	129-00-0	E641A	0.01	µg/L	0.5 µg/L	121	60.0	130	----
quinoline	91-22-5	E641A	0.05	µg/L	0.25 µg/L	117	60.0	130	----



Matrix Spike (MS) Report

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

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Organic / Inorganic Carbon (QCLot: 396173)										
VA22A1190-005	S. Creek	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Total Metals (QCLot: 394806)										
VA22A1159-010	Anonymous	mercury, total	7439-97-6	E508	0.000101 mg/L	0.0001 mg/L	101	70.0	130	----
Total Metals (QCLot: 396770)										
VA22A1177-002	Anonymous	aluminum, total	7429-90-5	E420	0.188 mg/L	0.2 mg/L	94.2	70.0	130	----
		antimony, total	7440-36-0	E420	0.0228 mg/L	0.02 mg/L	114	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0200 mg/L	0.02 mg/L	100	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	0.0379 mg/L	0.04 mg/L	94.8	70.0	130	----
		bismuth, total	7440-69-9	E420	0.00947 mg/L	0.01 mg/L	94.7	70.0	130	----
		boron, total	7440-42-8	E420	0.099 mg/L	0.1 mg/L	99.5	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00398 mg/L	0.004 mg/L	99.6	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	0.0104 mg/L	0.01 mg/L	104	70.0	130	----
		chromium, total	7440-47-3	E420	0.0391 mg/L	0.04 mg/L	97.8	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0189 mg/L	0.02 mg/L	94.6	70.0	130	----
		copper, total	7440-50-8	E420	0.0186 mg/L	0.02 mg/L	92.9	70.0	130	----
		iron, total	7439-89-6	E420	1.92 mg/L	2 mg/L	96.2	70.0	130	----
		lead, total	7439-92-1	E420	0.0186 mg/L	0.02 mg/L	92.8	70.0	130	----
		lithium, total	7439-93-2	E420	0.0927 mg/L	0.1 mg/L	92.7	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	0.0223 mg/L	0.02 mg/L	112	70.0	130	----
		nickel, total	7440-02-0	E420	0.0366 mg/L	0.04 mg/L	91.6	70.0	130	----
		phosphorus, total	7723-14-0	E420	9.91 mg/L	10 mg/L	99.1	70.0	130	----
		potassium, total	7440-09-7	E420	3.73 mg/L	4 mg/L	93.3	70.0	130	----
		rubidium, total	7440-17-7	E420	0.0198 mg/L	0.02 mg/L	99.1	70.0	130	----
		selenium, total	7782-49-2	E420	0.0422 mg/L	0.04 mg/L	106	70.0	130	----
		silicon, total	7440-21-3	E420	9.26 mg/L	10 mg/L	92.6	70.0	130	----
		silver, total	7440-22-4	E420	0.00410 mg/L	0.004 mg/L	102	70.0	130	----
		sodium, total	7440-23-5	E420	ND mg/L	2 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: 396770) - continued										
VA22A1177-002	Anonymous	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	0.0416 mg/L	0.04 mg/L	104	70.0	130	----
		thallium, total	7440-28-0	E420	0.00367 mg/L	0.004 mg/L	91.8	70.0	130	----
		thorium, total	7440-29-1	E420	0.0224 mg/L	0.02 mg/L	112	70.0	130	----
		tin, total	7440-31-5	E420	0.0205 mg/L	0.02 mg/L	102	70.0	130	----
		titanium, total	7440-32-6	E420	0.0403 mg/L	0.04 mg/L	101	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0195 mg/L	0.02 mg/L	97.7	70.0	130	----
		uranium, total	7440-61-1	E420	ND mg/L	0.004 mg/L	ND	70.0	130	----
		vanadium, total	7440-62-2	E420	0.100 mg/L	0.1 mg/L	100	70.0	130	----
		zinc, total	7440-66-6	E420	0.371 mg/L	0.4 mg/L	92.8	70.0	130	----
		zirconium, total	7440-67-7	E420	0.0422 mg/L	0.04 mg/L	105	70.0	130	----
Dissolved Metals (QCLot: 396801)										
VA22A1326-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.180 mg/L	0.2 mg/L	90.0	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0198 mg/L	0.02 mg/L	99.0	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0192 mg/L	0.02 mg/L	96.3	70.0	130	----
		barium, dissolved	7440-39-3	E421	0.0192 mg/L	0.02 mg/L	95.8	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0397 mg/L	0.04 mg/L	99.3	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00941 mg/L	0.01 mg/L	94.1	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.102 mg/L	0.1 mg/L	102	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00393 mg/L	0.004 mg/L	98.2	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.00970 mg/L	0.01 mg/L	97.0	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0387 mg/L	0.04 mg/L	96.8	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0189 mg/L	0.02 mg/L	94.5	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0186 mg/L	0.02 mg/L	93.1	70.0	130	----
		iron, dissolved	7439-89-6	E421	1.90 mg/L	2 mg/L	95.2	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0194 mg/L	0.02 mg/L	97.3	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.0956 mg/L	0.1 mg/L	95.6	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	0.954 mg/L	1 mg/L	95.4	70.0	130	----
		manganese, dissolved	7439-96-5	E421	0.0191 mg/L	0.02 mg/L	95.3	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0193 mg/L	0.02 mg/L	96.7	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0375 mg/L	0.04 mg/L	93.7	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	9.31 mg/L	10 mg/L	93.1	70.0	130	----
		potassium, dissolved	7440-09-7	E421	3.82 mg/L	4 mg/L	95.4	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0203 mg/L	0.02 mg/L	102	70.0	130	----



Sub-Matrix: Water					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 396801) - continued										
VA22A1326-001	Anonymous	selenium, dissolved	7782-49-2	E421	0.0406 mg/L	0.04 mg/L	101	70.0	130	----
		silicon, dissolved	7440-21-3	E421	9.10 mg/L	10 mg/L	91.0	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00381 mg/L	0.004 mg/L	95.2	70.0	130	----
		sodium, dissolved	7440-23-5	E421	1.84 mg/L	2 mg/L	91.8	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	19.7 mg/L	20 mg/L	98.3	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0419 mg/L	0.04 mg/L	105	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00386 mg/L	0.004 mg/L	96.4	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0196 mg/L	0.02 mg/L	97.9	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0384 mg/L	0.04 mg/L	95.9	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0193 mg/L	0.02 mg/L	96.3	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.00397 mg/L	0.004 mg/L	99.4	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.0962 mg/L	0.1 mg/L	96.2	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.376 mg/L	0.4 mg/L	94.1	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0393 mg/L	0.04 mg/L	98.3	70.0	130	----



Canada Toll Free: 1 800 668 9878

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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**.

Report To Rob Waters, Castor Consultants Limited
13719 Jennifer Road

Ladysmith, BC V9G 1G4, Canada

Date Received 17-Dec-2021 09:20
Issue Date 13-Jan-2022 12:17
Amendment 0
Version FINAL

Client Phone **s.22**

Certificate of Analysis

Lab Work Order # VA21C8170
Project PO #
Project DEEP WATER RECOVERY
Legal Site Description
C of C Numbers 17-835609

Comments

Where possible, RLC will store samples for the following durations, measured from date of sample submission: 30 days for soil and water samples, 6 months for Tissue/Biota samples; 14 days for air samples collected on re-usable media; and 3 days for water samples submitted for microbiological testing. Longer storage times are available upon request.

Temperature 4

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.

<u>Signatories</u>	<u>Position</u>	<u>Laboratory Department</u>
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Paul Cushing	Team Leader - Organics	Organics, Burnaby, British Columbia
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
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Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Christopher Li	Lab Assistant	Metals, Burnaby, British Columbia

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Results of Analysis VA21C8170

silver, total	VAZICR179-002	DWR-SUMP2	Water	Water	E420	0.00090	0.00010	mg/L	18-Dec-2021	12.00	08-Jan-2022	08-Jun-2022	362332	✓	✓
sodium, total	VAZICR179-002	DWR-SUMP2	Water	Water	E420	27.4	0.05	mg/L	18-Dec-2021	12.00	08-Jan-2022	08-Jun-2022	362332	✓	✓
arsenic, total	VAZICR179-002	DWR-SUMP2	Water	Water	E420	0.100	0.00050	mg/L	18-Dec-2021	12.00	08-Jan-2022	08-Jun-2022	362332	✓	✓
sulfur, total	VAZICR179-002	DWR-SUMP2	Water	Water	E420	2.01	0.50	mg/L	18-Dec-2021	12.00	08-Jan-2022	08-Jun-2022	362332	✓	✓
nitrogen, total	VAZICR179-002	DWR-SUMP2	Water	Water	E420	<0.00030	0.00030	mg/L	18-Dec-2021	12.00	08-Jan-2022	08-Jun-2022	362332	✓	✓
barium, total	VAZICR179-002	DWR-SUMP2	Water	Water	E420	0.000090	0.000010	mg/L	18-Dec-2021	12.00	08-Jan-2022	08-Jun-2022	362332	✓	✓
potassium, total	VAZICR179-002	DWR-SUMP2	Water	Water	E420	0.00010	0.00010	mg/L	18-Dec-2021	12.00	08-Jan-2022	08-Jun-2022	362332	✓	✓
tin, total	VAZICR179-002	DWR-SUMP2	Water	Water	E420	0.00001	0.00010	mg/L	18-Dec-2021	12.00	08-Jan-2022	08-Jun-2022	362332	✓	✓
barium, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E420	0.706	0.00050	mg/L	18-Dec-2021	12.00	08-Jan-2022	08-Jun-2022	362332	✓	✓
tungsten, total	VAZICR179-002	DWR-SUMP2	Water	Water	E420	<0.00010	0.00010	mg/L	18-Dec-2021	12.00	08-Jan-2022	08-Jun-2022	362332	✓	✓
vanadium, total	VAZICR179-002	DWR-SUMP2	Water	Water	E420	0.000100	0.000010	mg/L	18-Dec-2021	12.00	08-Jan-2022	08-Jun-2022	362332	✓	✓
zinc, total	VAZICR179-002	DWR-SUMP2	Water	Water	E420	0.0403	0.00050	mg/L	18-Dec-2021	12.00	08-Jan-2022	08-Jun-2022	362332	✓	✓
chromium, total	VAZICR179-002	DWR-SUMP2	Water	Water	E420	0.115	0.0030	mg/L	18-Dec-2021	12.00	08-Jan-2022	08-Jun-2022	362332	✓	✓
chromium, total	VAZICR179-002	DWR-SUMP2	Water	Water	E420	0.00198	0.00020	mg/L	18-Dec-2021	12.00	08-Jan-2022	08-Jun-2022	362332	✓	✓
Dissolved Metals (Matrix: Water)															
aluminum, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	0.008	0.0010	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
antimony, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	0.00019	0.00010	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
arsenic, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	0.00041	0.00010	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
barium, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	0.0102	0.00010	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
beryllium, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	<0.000100	0.000100	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
bismuth, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	<0.000090	0.000050	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
boron, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	0.004	0.01	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
calcium, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	0.0000108	0.0000056	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
cadmium, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	23.7	0.05	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
cesium, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	<0.000010	0.000010	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
chromium, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	0.00198	0.00020	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
cobalt, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	0.00035	0.00010	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
copper, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	0.0040	0.00030	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
iron, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	1.20	0.01	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
lead, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	0.00188	0.000050	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
lithium, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	<0.00010	0.00010	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
magnesium, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	0.00198	0.00020	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
manganese, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	0.0084	0.00010	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
mercury, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E309	0.0000101	0.0000006	mg/L	18-Dec-2021	12.00	08-Jan-2022	08-Jun-2022	361686	✓	✓
molybdenum, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	0.000054	0.000050	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
nickel, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	0.00105	0.00050	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
phosphorus, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	<0.05	0.05	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
potassium, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	0.000010	0.00010	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
rubidium, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	0.00074	0.00020	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
selenium, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	0.000002	0.000050	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
silver, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	0.000011	0.000010	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
sodium, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	25.1	0.05	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
strontium, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	0.106	0.00050	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
sulfur, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	2.66	0.50	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
nitrogen, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	<0.000030	0.000030	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
potassium, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	<0.000010	0.000010	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
potassium, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	<0.00010	0.00010	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
tin, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	<0.00010	0.00010	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
barium, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	0.00071	0.00020	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
tungsten, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	<0.00010	0.00010	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
vanadium, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	0.000044	0.000010	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
zinc, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	0.0109	0.0010	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
chromium, dissolved	VAZICR179-002	DWR-SUMP2	Water	Water	E421	0.00102	0.00020	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
dissolved mercury (Matrix: Water)	VAZICR179-002	DWR-SUMP2	Water	Water	E309	0.000010	0.0000006	mg/L	18-Dec-2021	12.00	08-Jan-2022	08-Jun-2022	361686	✓	✓
dissolved metals (Matrix: Water)	VAZICR179-002	DWR-SUMP2	Water	Water	E421	0.00198	0.00020	mg/L	18-Dec-2021	12.00	11-Jan-2022	11-Jun-2022	360503	✓	✓
Hydrocarbons (Matrix: Water)															
EPH (C10-C18)	VAZICR179-002	DWR-SUMP2	Water	Water	E801A	<250	250	µg/L	18-Dec-2021	12.00	28-Dec-2021	30-Dec-2021	377550	✓	✓
EPH (C10-C32)	VAZICR179-002	DWR-SUMP2	Water	Water	E801A	<250	250	µg/L	18-Dec-2021	12.00	28-Dec-2021	30-Dec-2021	377550	✓	✓
EPHw	VAZICR179-002	DWR-SUMP2	Water	Water	E800A	<250	250	µg/L	18-Dec-2021	12.00	30-Dec-2021	30-Dec-2021	377550	✓	✓
Hydrocarbons Surrogate (Matrix: Water)	VAZICR179-002	DWR-SUMP2	Water	Water	E801A	84.2	1.0	%	18-Dec-2021	12.00	28-Dec-2021	30-Dec-2021	377550	✓	✓
Polycyclic Aromatic Hydrocarbons (Matrix: Water)															
acronaphthalene	VAZICR179-002	DWR-SUMP2	Water	Water	E801A	0.020	0.01	µg/L	18-Dec-2021	12.00	28-Dec-2021	30-Dec-2021	377551	✓	✓
acronaphthalene	VAZICR179-002	DWR-SUMP2	Water	Water	E801A	<0.010	0.01	µg/L	18-Dec-2021	12.00	28-Dec-2021	30-Dec-2021	377551	✓	✓
anthracene	VAZICR179-002	DWR-SUMP2	Water	Water	E801A	<0.021	0.021	µg/L	18-Dec-2021	12.00	28-Dec-2021	30-Dec-2021	377551	✓	✓
benz[a]anthracene	VAZICR179-002	DWR-SUMP2	Water	Water	E801A	0.040	0.01	µg/L	18-Dec-2021	12.00	28-Dec-2021	30-Dec-2021	377551	✓	✓
benz[a]pyrene	VAZICR179-002	DWR-SUMP2	Water	Water	E801A	0.0104	0.0050	µg/L	18-Dec-2021	12.00	28-Dec-2021	30-Dec-2021	377551	✓	✓
benz[b]fluoranthene	VAZICR179-002	DWR-SUMP2	Water	Water	E801A	0.008	0.01	µg/L	18-Dec-2021	12.00	28-Dec-2021	30-Dec-2021	377551	✓	✓
benz[b]fluoranthene	VAZICR179-002	DWR-SUMP2	Water	Water	E801A	0.041	0.01	µg/L	18-Dec-2021	12.00	28-Dec-2021	30-Dec-2021	377551	✓	✓
benz[e]pyrene	VAZICR179-002	DWR-SUMP2	Water	Water	E801A	<0.010	0.01	µg/L	18-Dec-2021	12.00	28-Dec-2021	30-Dec-2021	377551	✓	✓
benzofluoranthene	VAZICR179-002	DWR-SUMP2	Water	Water	E801A	0.011	0.01	µg/L	18-Dec-2021	12.00	28-Dec-2021	30-Dec-2021	377551	✓	✓
chrysene	VAZICR179-002	DWR-SUMP2	Water	Water	E801A	0.040	0.01	µg/L	18-Dec-2021	12.00	28-Dec-2021	30-Dec-2021	377551	✓	✓
dibenz[a,h]anthracene	VAZICR179-002	DWR-SUMP2	Water	Water	E801A	<0.0006	0.00050	µg/L	18-Dec-2021	12.00	28-Dec-2021	30-Dec-2021	377551	✓	✓
fluoranthene	VAZICR179-002	DWR-SUMP2	Water	Water											

Detection Limits VA21C8170

Project DEEP WATER RECOVERY
Report To Rob Waters, Castor Consultants Limited
Date Received 17-Dec-2021 09:20
Issue Date 13-Jan-2022 12:17
Amendment 0

Client Sample ID	DEE WATER DWR - SUMP 1	DWR-SUMP2
Date Sampled	16-Dec-2021	16-Dec-2021
Time Sampled	12:00	12:00
ALS Sample ID	VA21C8170-001	VA21C8170-002
Analyte	Units	Sub-Matrix: Water

Physical Tests (Matrix: Water)

hardness (as CaCO ₃), dissolved	mg/L	0.60	0.60
hardness (as CaCO ₃), from total Ca/Mg	mg/L	0.60	0.60
pH	pH units	0.10	0.10
turbidity	NTU	0.10	0.10

Total Metals (Matrix: Water)

aluminum, total	mg/L	0.0030	0.0030
antimony, total	mg/L	0.00010	0.00010
arsenic, total	mg/L	0.00010	0.00010
barium, total	mg/L	0.00010	0.00010
beryllium, total	mg/L	0.000100	0.000100
bismuth, total	mg/L	0.000050	0.000050
boron, total	mg/L	0.010	0.010
cadmium, total	mg/L	0.0000050	0.0000050
calcium, total	mg/L	0.050	0.050
cesium, total	mg/L	0.000010	0.000010
chromium, total	mg/L	0.00050	0.00050
cobalt, total	mg/L	0.00010	0.00010
copper, total	mg/L	0.00050	0.00050
iron, total	mg/L	0.010	0.010
lead, total	mg/L	0.000050	0.000050
lithium, total	mg/L	0.0010	0.0010
magnesium, total	mg/L	0.0050	0.0050
manganese, total	mg/L	0.00010	0.00010
mercury, total	mg/L	0.0000050	0.0000050
molybdenum, total	mg/L	0.000050	0.000050
nickel, total	mg/L	0.00050	0.00050
phosphorus, total	mg/L	0.050	0.050
potassium, total	mg/L	0.050	0.050
rubidium, total	mg/L	0.00020	0.00020
selenium, total	mg/L	0.000050	0.000050
silicon, total	mg/L	0.10	0.10
silver, total	mg/L	0.000010	0.000010
sodium, total	mg/L	0.050	0.050
strontium, total	mg/L	0.00020	0.00020
sulfur, total	mg/L	0.50	0.50
tellurium, total	mg/L	0.00020	0.00020
thallium, total	mg/L	0.000010	0.000010
thorium, total	mg/L	0.00010	0.00010

tin, total	mg/L	0.00010	0.00010
titanium, total	mg/L	0.00030	0.00030
tungsten, total	mg/L	0.00010	0.00010
uranium, total	mg/L	0.000010	0.000010
vanadium, total	mg/L	0.00050	0.00050
zinc, total	mg/L	0.0030	0.0030
zirconium, total	mg/L	0.00020	0.00020

Dissolved Metals (Matrix: Water)

aluminum, dissolved	mg/L	0.0010	0.0010
antimony, dissolved	mg/L	0.00010	0.00010
arsenic, dissolved	mg/L	0.00010	0.00010
barium, dissolved	mg/L	0.00010	0.00010
beryllium, dissolved	mg/L	0.000100	0.000100
bismuth, dissolved	mg/L	0.000050	0.000050
boron, dissolved	mg/L	0.010	0.010
cadmium, dissolved	mg/L	0.0000050	0.0000050
calcium, dissolved	mg/L	0.050	0.050
cesium, dissolved	mg/L	0.000010	0.000010
chromium, dissolved	mg/L	0.00050	0.00050
cobalt, dissolved	mg/L	0.00010	0.00010
copper, dissolved	mg/L	0.00020	0.00020
iron, dissolved	mg/L	0.010	0.010
lead, dissolved	mg/L	0.000050	0.000050
lithium, dissolved	mg/L	0.0010	0.0010
magnesium, dissolved	mg/L	0.0050	0.0050
manganese, dissolved	mg/L	0.00010	0.00010
mercury, dissolved	mg/L	0.0000050	0.0000050
molybdenum, dissolved	mg/L	0.000050	0.000050
nickel, dissolved	mg/L	0.00050	0.00050
phosphorus, dissolved	mg/L	0.050	0.050
potassium, dissolved	mg/L	0.050	0.050
rubidium, dissolved	mg/L	0.00020	0.00020
selenium, dissolved	mg/L	0.000050	0.000050
silicon, dissolved	mg/L	0.050	0.050
silver, dissolved	mg/L	0.000010	0.000010
sodium, dissolved	mg/L	0.050	0.050
strontium, dissolved	mg/L	0.00020	0.00020
sulfur, dissolved	mg/L	0.50	0.50
tellurium, dissolved	mg/L	0.00020	0.00020
thallium, dissolved	mg/L	0.000010	0.000010
thorium, dissolved	mg/L	0.00010	0.00010
tin, dissolved	mg/L	0.00010	0.00010
titanium, dissolved	mg/L	0.00030	0.00030
tungsten, dissolved	mg/L	0.00010	0.00010
uranium, dissolved	mg/L	0.000010	0.000010
vanadium, dissolved	mg/L	0.00050	0.00050
zinc, dissolved	mg/L	0.0010	0.0010
zirconium, dissolved	mg/L	0.00020	0.00020
dissolved mercury filtration location			
dissolved metals filtration location			

Hydrocarbons (Matrix: Water)

EPH (C10-C19)	µg/L	250	250
EPH (C19-C32)	µg/L	250	250

LEPHw	µg/L	250	250
HEPHw	µg/L	250	250

Hydrocarbons Surrogates (Matrix: Water)

bromobenzotrifluoride, 2- (EPH surr)	%	1.0	1.0
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Polycyclic Aromatic Hydrocarbons (Matrix: Water)

acenaphthene	µg/L	0.010	0.010
acenaphthylene	µg/L	0.010	0.010
acridine	µg/L	0.015	0.010
anthracene	µg/L	0.027	0.021
benz(a)anthracene	µg/L	0.010	0.010
benzo(a)pyrene	µg/L	0.0050	0.0050
benzo(b+j)fluoranthene	µg/L	0.010	0.010
benzo(b+j+k)fluoranthene	µg/L	0.015	0.015
benzo(g,h,i)perylene	µg/L	0.010	0.010
benzo(k)fluoranthene	µg/L	0.010	0.010
chrysene	µg/L	0.010	0.010
dibenz(a,h)anthracene	µg/L	0.0050	0.0050
fluoranthene	µg/L	0.010	0.010
fluorene	µg/L	0.010	0.010
indeno(1,2,3-c,d)pyrene	µg/L	0.010	0.010
methylnaphthalene, 1-	µg/L	0.010	0.010
methylnaphthalene, 2-	µg/L	0.010	0.010
naphthalene	µg/L	0.050	0.050
phenanthrene	µg/L	0.020	0.020
pyrene	µg/L	0.010	0.010
quinoline	µg/L	0.050	0.060

Polycyclic Aromatic Hydrocarbons Surrogates (Matrix: Water)

chrysene-d12	%	0.1	0.1
naphthalene-d8	%	0.1	0.1
phenanthrene-d10	%	0.1	0.1

Duplicates VA21C8170

Project DEEP WATER RECOVERY
Report To Rob Waters, Castor Consultants Limited
Date Received 17-Dec-2021 09:20
Issue Date 13-Jan-2022 12:17
Amendment 0

ALS ID	Reference	Client Sample ID	QC Type	QC Lot	Analyte	Method	Sample Result	Duplicate Result	Detection Limit Units	RPD(%) or Diff.	Duplicate Limits	Qual	Eval
Physical Tests (Matrix: Water)													
QC-371977-004	Anonymous	Anonymous	DUP	371977	turbidity	E121	3.65	3.54	0.1 NTU	2.84%	15		✓
QC-MRG3-376398006	Anonymous	Anonymous	DUP	376396	pH	E108	5.22	5.23	0.1 pH units	0.230%	4		✓
Total Metals (Matrix: Water)													
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	aluminum, total	E420	<0.0150	<0.0150	0.003 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	antimony, total	E420	0.00062	0.00059	0.0001 mg/L	0.00004	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	arsenic, total	E420	0.00596	0.00619	0.0001 mg/L	3.84%	20		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	barium, total	E420	0.0347	0.0348	0.0001 mg/L	0.145%	20		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	beryllium, total	E420	<0.000100	<0.000100	0.00002 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	bismuth, total	E420	<0.000250	<0.000250	0.00005 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	boron, total	E420	1.64	1.62	0.01 mg/L	1.01%	20		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	cadmium, total	E420	<0.0000300	<0.0000300	0.000005 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	calcium, total	E420	257	251	0.05 mg/L	2.19%	20		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	cesium, total	E420	<0.000050	<0.000050	0.00001 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	chromium, total	E420	<0.00250	<0.00250	0.0005 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	cobalt, total	E420	<0.00050	<0.00050	0.0001 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	copper, total	E420	0.00788	0.00880	0.0005 mg/L	0.00092	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	iron, total	E420	<0.050	<0.050	0.01 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	lead, total	E420	<0.000250	<0.000250	0.00005 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	lithium, total	E420	0.0200	0.0203	0.001 mg/L	0.0003	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	magnesium, total	E420	347	340	0.005 mg/L	2.22%	20		✓
QC-381296-004	Anonymous	Anonymous	DUP	381296	mercury, total	E508	0.0000053	0.0000065	0.000005 mg/L	0.0000012	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	molybdenum, total	E420	0.0564	0.0551	0.00005 mg/L	2.31%	20		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	nickel, total	E420	<0.00250	<0.00250	0.0005 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	phosphorus, total	E420	<0.250	<0.250	0.05 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	potassium, total	E420	40.2	40.3	0.05 mg/L	0.257%	20		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	rubidium, total	E420	0.00445	0.00433	0.0002 mg/L	0.00012	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	selenium, total	E420	0.0126	0.0138	0.00005 mg/L	9.07%	20		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	sulfur, total	E420	13.7	13.4	0.1 mg/L	2.22%	20		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	silver, total	E420	<0.000050	<0.000050	0.00001 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	sodium, total	E420	602	586	0.05 mg/L	2.55%	20		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	strontium, total	E420	6.04	5.89	0.0002 mg/L	2.52%	20		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	sulfur, total	E420	1000	1000	0.5 mg/L	0.252%	20		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	tellurium, total	E420	<0.00100	<0.00100	0.0002 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	thallium, total	E420	<0.000050	<0.000050	0.00001 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	thorium, total	E420	<0.00050	<0.00050	0.0001 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	tin, total	E420	<0.00050	<0.00050	0.0001 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	titanium, total	E420	<0.00150	<0.00150	0.0003 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	tungsten, total	E420	<0.00050	<0.00050	0.0001 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	uranium, total	E420	0.00656	0.00651	0.00001 mg/L	0.877%	20		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	vanadium, total	E420	<0.00250	<0.00250	0.0005 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	zinc, total	E420	<0.0150	<0.0150	0.003 mg/L	0	Diff <2x LOR		✓
QC-MRG2-382323004	Anonymous	Anonymous	DUP	382322	zirconium, total	E420	<0.00100	<0.00100	0.0002 mg/L	0	Diff <2x LOR		✓
Dissolved Metals (Matrix: Water)													
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	aluminum, dissolved	E421	<0.0100	<0.0100	0.001 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	antimony, dissolved	E421	0.00561	0.00593	0.0001 mg/L	0.00031	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	arsenic, dissolved	E421	0.0142	0.0140	0.0001 mg/L	1.14%	20		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	barium, dissolved	E421	0.0220	0.0224	0.0001 mg/L	2.07%	20		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	beryllium, dissolved	E421	<0.000200	<0.000200	0.00002 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	bismuth, dissolved	E421	<0.000500	<0.000500	0.00005 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	boron, dissolved	E421	2.13	2.19	0.01 mg/L	2.80%	20		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	cadmium, dissolved	E421	0.0000540	0.0000604	0.000005 mg/L	0.0000065	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	calcium, dissolved	E421	332	343	0.05 mg/L	3.18%	20		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	cesium, dissolved	E421	0.000111	0.000116	0.00001 mg/L	0.000005	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	chromium, dissolved	E421	<0.00500	<0.00500	0.0005 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	cobalt, dissolved	E421	<0.00100	<0.00100	0.0001 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	copper, dissolved	E421	0.0704	0.0720	0.0002 mg/L	2.35%	20		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	iron, dissolved	E421	<0.100	<0.100	0.01 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	lead, dissolved	E421	<0.000500	<0.000500	0.00005 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	lithium, dissolved	E421	0.0281	0.0287	0.001 mg/L	0.0006	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	magnesium, dissolved	E421	562	576	0.005 mg/L	2.44%	20		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	manganese, dissolved	E421	0.00502	0.00484	0.0001 mg/L	0.00017	Diff <2x LOR		✓
QC-381686-004	Anonymous	Anonymous	DUP	381686	mercury, dissolved	E509	<0.0000050	<0.0000050	0.000005 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	molybdenum, dissolved	E421	0.0883	0.0900	0.00005 mg/L	1.93%	20		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	nickel, dissolved	E421	0.00576	0.00593	0.0005 mg/L	0.00017	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	phosphorus, dissolved	E421	<0.500	<0.500	0.05 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	potassium, dissolved	E421	110	115	0.05 mg/L	3.80%	20		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	rubidium, dissolved	E421	0.0751	0.0761	0.0002 mg/L	1.25%	20		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	selenium, dissolved	E421	0.0318	0.0315	0.00005 mg/L	0.770%	20		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	silicon, dissolved	E421	6.58	6.72	0.05 mg/L	2.10%	20		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	silver, dissolved	E421	<0.000100	<0.000100	0.00001 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	sodium, dissolved	E421	1290	1290	0.05 mg/L	0.0741%	20		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	strontium, dissolved	E421	13.0	13.3	0.0002 mg/L	1.65%	20		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	sulfur, dissolved	E421	2010	2010	0.5 mg/L	0.0219%	20		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	tellurium, dissolved	E421	<0.00200	<0.00200	0.0002 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	thallium, dissolved	E421	<0.000100	<0.000100	0.00001 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	thorium, dissolved	E421	<0.00100	<0.00100	0.0001 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	tin, dissolved	E421	<0.00100	<0.00100	0.0001 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	titanium, dissolved	E421	<0.00300	<0.00300	0.0003 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	tungsten, dissolved	E421	<0.00100	<0.00100	0.0001 mg/L	0	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	uranium, dissolved	E421	0.0276	0.0276	0.00001 mg/L	0.0676%	20		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	vanadium, dissolved	E421	0.00817	0.00827	0.0005 mg/L	0.00010	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	zinc, dissolved	E421	0.0106	<0.0100	0.001 mg/L	0.0006	Diff <2x LOR		✓
QC-MRG2-383503004	Anonymous	Anonymous	DUP	383503	zirconium, dissolved	E421	<0.00300	<0.00300	0.0002 mg/L	0	Diff <2x LOR		✓

Evaluation Legend

✓ QC Lot met ALS Data Quality Objectives

Hold Time Exceedance Details VA21C8170

Project DEEP WATER RECOVERY
Report To Rob Waters, Castor Consultants Limited
Date Received 17-Dec-2021 09:20
Issue Date 13-Jan-2022 12:17
Amendment 0

				Preparation				Analysis					
ALS Method Description	Client Sample ID	Method	Sampling Date	Preparation Date	Recommended Holding Time	Actual Holding Times	Eval	Qualifier	Analysis Date	Recommended Holding Time	Actual Holding Times	Eval	Qualifier
Physical Tests (Matrix: Water)													
pH by Meter	DEE WATER DWR - E108		16-Dec-2021						24-Dec-2021 11:54	0.25 hrs	191 hrs	x	EHTR-FM
pH by Meter	DWR-SUMP2	E108	16-Dec-2021						24-Dec-2021 11:54	0.25 hrs	191 hrs	x	EHTR-FM

Legend & Qualifier Definitions

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

Evaluation Legend

x = holding time exceedance

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 above represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added.

If samples are identified above 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 chain of custody, the date of receipt with the time at 00:00 is used for calculation purposes.

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

Methodology VA21C8170

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Method	ALS Test Description	Lab Location	Matrix	Method Reference	Methodology Description
Dissolved Metals (Matrix: Water)					
E421	Dissolved Metals in Water by CRC ICPMS	Vancouver - EnvironmerWater		APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
E509	Dissolved Mercury in Water by CVAAS	Vancouver - EnvironmerWater		APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
EP421	Dissolved Metals Water Filtration	Vancouver - EnvironmerWater		APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
EP509	Dissolved Mercury Water Filtration	Vancouver - EnvironmerWater		APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
Hydrocarbons (Matrix: Water)					
E601A	BC PHCs - EPH by GC-FID	Vancouver - EnvironmerWater		BC MOE Lab Manual	Sample extracts are analyzed by GC-FID for BC hydrocarbon fractions. Light Extractable Petroleum Hydrocarbons (LEPH) and Heavy Extractable Petroleum Hydrocarbons (HEPH) are calculated as follows: LEPH = Extractable Petroleum Hydrocarbons (EPH10-19) minus Acenaphthene, Acridine, Anthracene, Fluorene, Naphthalene and Phenanthrene; HEPH = Extractable Petroleum Hydrocarbons (EPH19-32) minus
EC600A	LEPH and HEPH: EPH-PAH	Vancouver - EnvironmerWater		BC MOE Lab Manual (LEPH and HEPH) (moBenz(a)anthracene, Benzo(a)pyrene, Fluoranthene, and Pyrene.	
Hydrocarbons Surrogates (Matrix: Water)					
E601A	BC PHCs - EPH by GC-FID	Vancouver - EnvironmerWater		BC MOE Lab Manual	Sample extracts are analyzed by GC-FID for BC hydrocarbon fractions.
Physical Tests (Matrix: Water)					
E108	pH by Meter	Vancouver - EnvironmerWater		APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
E121	Turbidity by Nephelometry	Vancouver - EnvironmerWater		APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
EC100A	Hardness (Calculated) from Total Ca/Mg	Vancouver - EnvironmerWater		APHA 2340B	"Hardness (as CaCO3), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
EC100	Dissolved Hardness (Calculated)	Vancouver - EnvironmerWater		APHA 2340B	"Hardness (as CaCO3), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Polycyclic Aromatic Hydrocarbons (Matrix: Water)					
E641A	PAHs by Hexane LVI GC-MS	Vancouver - EnvironmerWater		EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by large volume injection (LVI) GC-MS.
Polycyclic Aromatic Hydrocarbons Surrogates (Matrix: Water)					
E641A	PAHs by Hexane LVI GC-MS	Vancouver - EnvironmerWater		EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by large volume injection (LVI) GC-MS.
Total Metals (Matrix: Water)					
E420	Total Metals in Water by CRC ICPMS	Vancouver - EnvironmerWater		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.
E508	Total Mercury in Water by CVAAS	Vancouver - EnvironmerWater		EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS

Method References

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

Quality Control VA21C8170

Project DEEP WATER RECOVERY
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Date Received 17-Dec-2021 09:20
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Amendment 0

QC Type	Analyte	QC Lot	ALS QC ID	Method	Result	Target	Units	%	Limit	Units	Qual	Eval
Physical Tests (Matrix: Water)												
LCS	turbidity	371977	QC-371977-002	E121	205	200 NTU	NTU	102	85-115	%		✓
LCS	pH	376396	QC-376396-001	E108	6.99	7 pH units	pH units	99.9	98-102	%		✓
MB	turbidity	371977	QC-371977-001	E121	<0.10		NTU	-	0.1	NTU		✓
Total Metals (Matrix: Water)												
LCS	mercury, total	381296	QC-381296-002	E508	0.0000927	0.0001 mg/L	mg/L	92.7	80-120	%		✓
MS	mercury, total	381296	Anonymous	E508	0.0000989	0.0001 mg/L	mg/L	98.9	70-130	%		✓
MS	aluminum, total	382322	Anonymous	E420	1.09	1 mg/L	mg/L	109	70-130	%		✓
MS	antimony, total	382322	Anonymous	E420	0.106	0.1 mg/L	mg/L	106	70-130	%		✓
MS	arsenic, total	382322	Anonymous	E420	0.110	0.1 mg/L	mg/L	110	70-130	%		✓
MS	barium, total	382322	Anonymous	E420	ND	0.02 mg/L	mg/L	ND	70-130	%		✓
MS	beryllium, total	382322	Anonymous	E420	0.209	0.2 mg/L	mg/L	104	70-130	%		✓
MS	bismuth, total	382322	Anonymous	E420	0.0460	0.05 mg/L	mg/L	92.1	70-130	%		✓
MS	boron, total	382322	Anonymous	E420	ND	0.1 mg/L	mg/L	ND	70-130	%		✓
MS	cadmium, total	382322	Anonymous	E420	0.0203	0.02 mg/L	mg/L	101	70-130	%		✓
MS	calcium, total	382322	Anonymous	E420	ND	4 mg/L	mg/L	ND	70-130	%		✓
MS	cesium, total	382322	Anonymous	E420	0.0521	0.05 mg/L	mg/L	104	70-130	%		✓
MS	chromium, total	382322	Anonymous	E420	0.206	0.2 mg/L	mg/L	103	70-130	%		✓
MS	cobalt, total	382322	Anonymous	E420	0.0999	0.1 mg/L	mg/L	99.9	70-130	%		✓
MS	copper, total	382322	Anonymous	E420	0.0967	0.1 mg/L	mg/L	96.7	70-130	%		✓
MS	iron, total	382322	Anonymous	E420	10.00	10 mg/L	mg/L	100.0	70-130	%		✓
MS	lead, total	382322	Anonymous	E420	0.0939	0.1 mg/L	mg/L	93.9	70-130	%		✓
MS	lithium, total	382322	Anonymous	E420	0.502	0.5 mg/L	mg/L	100	70-130	%		✓
MS	magnesium, total	382322	Anonymous	E420	ND	1 mg/L	mg/L	ND	70-130	%		✓
MS	molybdenum, total	382322	Anonymous	E420	ND	0.02 mg/L	mg/L	ND	70-130	%		✓
MS	nickel, total	382322	Anonymous	E420	0.196	0.2 mg/L	mg/L	98.2	70-130	%		✓
MS	phosphorus, total	382322	Anonymous	E420	58.4	50 mg/L	mg/L	117	70-130	%		✓
MS	potassium, total	382322	Anonymous	E420	ND	4 mg/L	mg/L	ND	70-130	%		✓
MS	rubidium, total	382322	Anonymous	E420	0.105	0.1 mg/L	mg/L	105	70-130	%		✓
MS	selenium, total	382322	Anonymous	E420	0.219	0.2 mg/L	mg/L	110	70-130	%		✓
MS	silicon, total	382322	Anonymous	E420	ND	10 mg/L	mg/L	ND	70-130	%		✓
MS	silver, total	382322	Anonymous	E420	0.0197	0.02 mg/L	mg/L	98.3	70-130	%		✓
MS	sodium, total	382322	Anonymous	E420	ND	2 mg/L	mg/L	ND	70-130	%		✓
MS	strontium, total	382322	Anonymous	E420	ND	0.02 mg/L	mg/L	ND	70-130	%		✓
MS	sulfur, total	382322	Anonymous	E420	ND	20 mg/L	mg/L	ND	70-130	%		✓
MS	tellurium, total	382322	Anonymous	E420	0.208	0.2 mg/L	mg/L	104	70-130	%		✓
MS	thallium, total	382322	Anonymous	E420	0.0186	0.02 mg/L	mg/L	92.9	70-130	%		✓
MS	thorium, total	382322	Anonymous	E420	0.114	0.1 mg/L	mg/L	114	70-130	%		✓
MS	tin, total	382322	Anonymous	E420	0.103	0.1 mg/L	mg/L	103	70-130	%		✓
MS	titanium, total	382322	Anonymous	E420	0.218	0.2 mg/L	mg/L	109	70-130	%		✓
MS	tungsten, total	382322	Anonymous	E420	0.0981	0.1 mg/L	mg/L	98.1	70-130	%		✓
MS	uranium, total	382322	Anonymous	E420	ND	0.004 mg/L	mg/L	ND	70-130	%		✓
MS	zinc, total	382322	Anonymous	E420	2.02	2 mg/L	mg/L	101	70-130	%		✓
MS	zirconium, total	382322	Anonymous	E420	0.222	0.2 mg/L	mg/L	111	70-130	%		✓
MS	manganese, total	382322	Anonymous	E420	0.0995	0.1 mg/L	mg/L	99.5	70-130	%		✓
MS	vanadium, total	382322	Anonymous	E420	0.521	0.5 mg/L	mg/L	104	70-130	%		✓
LCS	aluminum, total	382322	QC-MRG2-382322002	E420	2.28	2 mg/L	mg/L	114	80-120	%		✓
LCS	antimony, total	382322	QC-MRG2-382322002	E420	1.05	1 mg/L	mg/L	105	80-120	%		✓
LCS	arsenic, total	382322	QC-MRG2-382322002	E420	1.05	1 mg/L	mg/L	105	80-120	%		✓
LCS	barium, total	382322	QC-MRG2-382322002	E420	0.248	0.25 mg/L	mg/L	99.4	80-120	%		✓
LCS	beryllium, total	382322	QC-MRG2-382322002	E420	0.100	0.1 mg/L	mg/L	100	80-120	%		✓
LCS	bismuth, total	382322	QC-MRG2-382322002	E420	1.00	1 mg/L	mg/L	100	80-120	%		✓
LCS	boron, total	382322	QC-MRG2-382322002	E420	1.17	1 mg/L	mg/L	117	80-120	%		✓
LCS	cadmium, total	382322	QC-MRG2-382322002	E420	0.101	0.1 mg/L	mg/L	101	80-120	%		✓
LCS	calcium, total	382322	QC-MRG2-382322002	E420	50.2	50 mg/L	mg/L	100	80-120	%		✓
LCS	cesium, total	382322	QC-MRG2-382322002	E420	0.0496	0.05 mg/L	mg/L	99.2	80-120	%		✓
LCS	chromium, total	382322	QC-MRG2-382322002	E420	0.259	0.25 mg/L	mg/L	104	80-120	%		✓
LCS	cobalt, total	382322	QC-MRG2-382322002	E420	0.255	0.25 mg/L	mg/L	102	80-120	%		✓
LCS	copper, total	382322	QC-MRG2-382322002	E420	0.259	0.25 mg/L	mg/L	103	80-120	%		✓
LCS	iron, total	382322	QC-MRG2-382322002	E420	1.08	1 mg/L	mg/L	108	80-120	%		✓
LCS	lead, total	382322	QC-MRG2-382322002	E420	0.499	0.5 mg/L	mg/L	99.7	80-120	%		✓
LCS	lithium, total	382322	QC-MRG2-382322002	E420	0.255	0.25 mg/L	mg/L	102	80-120	%		✓
LCS	magnesium, total	382322	QC-MRG2-382322002	E420	52.2	50 mg/L	mg/L	104	80-120	%		✓
LCS	manganese, total	382322	QC-MRG2-382322002	E420	0.261	0.25 mg/L	mg/L	104	80-120	%		✓
LCS	molybdenum, total	382322	QC-MRG2-382322002	E420	0.261	0.25 mg/L	mg/L	104	80-120	%		✓
LCS	nickel, total	382322	QC-MRG2-382322002	E420	0.513	0.5 mg/L	mg/L	103	80-120	%		✓
LCS	phosphorus, total	382322	QC-MRG2-382322002	E420	11.6	10 mg/L	mg/L	116	80-120	%		✓
LCS	potassium, total	382322	QC-MRG2-382322002	E420	52.7	50 mg/L	mg/L	105	80-120	%		✓
LCS	rubidium, total	382322	QC-MRG2-382322002	E420	0.108	0.1 mg/L	mg/L	108	80-120	%		✓
LCS	selenium, total	382322	QC-MRG2-382322002	E420	1.07	1 mg/L	mg/L	107	80-120	%		✓
LCS	silicon, total	382322	QC-MRG2-382322002	E420	11.1	10 mg/L	mg/L	111	80-120	%		✓
LCS	silver, total	382322	QC-MRG2-382322002	E420	0.0927	0.1 mg/L	mg/L	92.7	80-120	%		✓
LCS	sodium, total	382322	QC-MRG2-382322002	E420	56.4	50 mg/L	mg/L	113	80-120	%		✓
LCS	strontium, total	382322	QC-MRG2-382322002	E420	0.260	0.25 mg/L	mg/L	104	80-120	%		✓
LCS	sulfur, total	382322	QC-MRG2-382322002	E420	54.5	50 mg/L	mg/L	109	80-120	%		✓
LCS	tellurium, total	382322	QC-MRG2-382322002	E420	0.105	0.1 mg/L	mg/L	105	80-120	%		✓
LCS	thallium, total	382322	QC-MRG2-382322002	E420	0.996	1 mg/L	mg/L	99.6	80-120	%		✓
LCS	thorium, total	382322	QC-MRG2-382322002	E420	0.104	0.1 mg/L	mg/L	104	80-120	%		✓
LCS	tin, total	382322	QC-MRG2-382322002	E420	0.493	0.5 mg/L	mg/L	98.7	80-120	%		✓

LCS	titanium, total	382322	QC-MRG2-382322002	E420	0.264	0.25 mg/L	mg/L	105	80-120	%	✓
LCS	tungsten, total	382322	QC-MRG2-382322002	E420	0.0955	0.1 mg/L	mg/L	95.5	80-120	%	✓
LCS	uranium, total	382322	QC-MRG2-382322002	E420	0.00528	0.005 mg/L	mg/L	106	80-120	%	✓
LCS	vanadium, total	382322	QC-MRG2-382322002	E420	0.514	0.5 mg/L	mg/L	103	80-120	%	✓
LCS	zinc, total	382322	QC-MRG2-382322002	E420	0.514	0.5 mg/L	mg/L	103	80-120	%	✓
LCS	zirconium, total	382322	QC-MRG2-382322002	E420	0.0986	0.1 mg/L	mg/L	98.6	80-120	%	✓
MB	mercury, total	381296	QC-381296-001	E508	<0.0000050		mg/L	-	0.000005	mg/L	✓
MB	aluminum, total	382322	QC-MRG2-382322001	E420	<0.0030		mg/L	-	0.003	mg/L	✓
MB	antimony, total	382322	QC-MRG2-382322001	E420	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	arsenic, total	382322	QC-MRG2-382322001	E420	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	barium, total	382322	QC-MRG2-382322001	E420	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	beryllium, total	382322	QC-MRG2-382322001	E420	<0.000020		mg/L	-	0.00002	mg/L	✓
MB	bismuth, total	382322	QC-MRG2-382322001	E420	<0.000050		mg/L	-	0.00005	mg/L	✓
MB	boron, total	382322	QC-MRG2-382322001	E420	<0.010		mg/L	-	0.01	mg/L	✓
MB	cadmium, total	382322	QC-MRG2-382322001	E420	<0.0000050		mg/L	-	0.000005	mg/L	✓
MB	calcium, total	382322	QC-MRG2-382322001	E420	<0.050		mg/L	-	0.05	mg/L	✓
MB	cesium, total	382322	QC-MRG2-382322001	E420	<0.000010		mg/L	-	0.00001	mg/L	✓
MB	chromium, total	382322	QC-MRG2-382322001	E420	<0.00050		mg/L	-	0.0005	mg/L	✓
MB	cobalt, total	382322	QC-MRG2-382322001	E420	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	copper, total	382322	QC-MRG2-382322001	E420	<0.00050		mg/L	-	0.0005	mg/L	✓
MB	iron, total	382322	QC-MRG2-382322001	E420	<0.010		mg/L	-	0.01	mg/L	✓
MB	lead, total	382322	QC-MRG2-382322001	E420	<0.000050		mg/L	-	0.00005	mg/L	✓
MB	lithium, total	382322	QC-MRG2-382322001	E420	<0.0010		mg/L	-	0.001	mg/L	✓
MB	magnesium, total	382322	QC-MRG2-382322001	E420	<0.0050		mg/L	-	0.005	mg/L	✓
MB	manganese, total	382322	QC-MRG2-382322001	E420	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	molybdenum, total	382322	QC-MRG2-382322001	E420	<0.000050		mg/L	-	0.00005	mg/L	✓
MB	nickel, total	382322	QC-MRG2-382322001	E420	<0.00050		mg/L	-	0.0005	mg/L	✓
MB	phosphorus, total	382322	QC-MRG2-382322001	E420	<0.050		mg/L	-	0.05	mg/L	✓
MB	potassium, total	382322	QC-MRG2-382322001	E420	<0.050		mg/L	-	0.05	mg/L	✓
MB	rubidium, total	382322	QC-MRG2-382322001	E420	<0.00020		mg/L	-	0.0002	mg/L	✓
MB	selenium, total	382322	QC-MRG2-382322001	E420	<0.000050		mg/L	-	0.00005	mg/L	✓
MB	silicon, total	382322	QC-MRG2-382322001	E420	<0.10		mg/L	-	0.1	mg/L	✓
MB	silver, total	382322	QC-MRG2-382322001	E420	<0.000010		mg/L	-	0.00001	mg/L	✓
MB	sodium, total	382322	QC-MRG2-382322001	E420	<0.050		mg/L	-	0.05	mg/L	✓
MB	strontium, total	382322	QC-MRG2-382322001	E420	<0.00020		mg/L	-	0.0002	mg/L	✓
MB	sulfur, total	382322	QC-MRG2-382322001	E420	<0.50		mg/L	-	0.5	mg/L	✓
MB	tellurium, total	382322	QC-MRG2-382322001	E420	<0.00020		mg/L	-	0.0002	mg/L	✓
MB	thallium, total	382322	QC-MRG2-382322001	E420	<0.000010		mg/L	-	0.00001	mg/L	✓
MB	thorium, total	382322	QC-MRG2-382322001	E420	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	tin, total	382322	QC-MRG2-382322001	E420	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	titanium, total	382322	QC-MRG2-382322001	E420	<0.00030		mg/L	-	0.0003	mg/L	✓
MB	tungsten, total	382322	QC-MRG2-382322001	E420	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	uranium, total	382322	QC-MRG2-382322001	E420	<0.000010		mg/L	-	0.00001	mg/L	✓
MB	zinc, total	382322	QC-MRG2-382322001	E420	<0.0030		mg/L	-	0.003	mg/L	✓
MB	zirconium, total	382322	QC-MRG2-382322001	E420	<0.00020		mg/L	-	0.0002	mg/L	✓
MB	vanadium, total	382322	QC-MRG2-382322001	E420	<0.00050		mg/L	-	0.0005	mg/L	✓

Dissolved Metals (Matrix: Water)

MB	dissolved mercury filtration location	381686	QC-381686-001	EP509	Laboratory	-	-				✓
MB	dissolved metals filtration location	383503	QC-383503-001	EP421	Laboratory	-	-				✓
LCS	mercury, dissolved	381686	QC-381686-002	E509	0.000104	0.0001 mg/L	mg/L	104	80-120	%	✓
LCS	dissolved mercury filtration location	381686	QC-381686-002	EP509	N/A	-	-		0-0	%	✓
MS	mercury, dissolved	381686	DEE WATER DWR - SUMP 1	E509	0.0000997	0.0001 mg/L	mg/L	99.7	70-130	%	✓
LCS	dissolved metals filtration location	383503	QC-383503-002	EP421	N/A	-	-		0-0	%	✓
LCS	aluminum, dissolved	383503	QC-MRG2-383503002	E421	1.96	2 mg/L	mg/L	97.9	80-120	%	✓
LCS	antimony, dissolved	383503	QC-MRG2-383503002	E421	1.02	1 mg/L	mg/L	102	80-120	%	✓
LCS	arsenic, dissolved	383503	QC-MRG2-383503002	E421	0.973	1 mg/L	mg/L	97.3	80-120	%	✓
LCS	barium, dissolved	383503	QC-MRG2-383503002	E421	0.249	0.25 mg/L	mg/L	99.6	80-120	%	✓
LCS	beryllium, dissolved	383503	QC-MRG2-383503002	E421	0.0996	0.1 mg/L	mg/L	99.6	80-120	%	✓
LCS	bismuth, dissolved	383503	QC-MRG2-383503002	E421	0.944	1 mg/L	mg/L	94.4	80-120	%	✓
LCS	boron, dissolved	383503	QC-MRG2-383503002	E421	1.10	1 mg/L	mg/L	110	80-120	%	✓
LCS	cadmium, dissolved	383503	QC-MRG2-383503002	E421	0.100	0.1 mg/L	mg/L	100.0	80-120	%	✓
LCS	calcium, dissolved	383503	QC-MRG2-383503002	E421	47.8	50 mg/L	mg/L	95.5	80-120	%	✓
LCS	cesium, dissolved	383503	QC-MRG2-383503002	E421	0.0501	0.05 mg/L	mg/L	100	80-120	%	✓
LCS	chromium, dissolved	383503	QC-MRG2-383503002	E421	0.240	0.25 mg/L	mg/L	96.2	80-120	%	✓
LCS	cobalt, dissolved	383503	QC-MRG2-383503002	E421	0.240	0.25 mg/L	mg/L	96.2	80-120	%	✓
LCS	copper, dissolved	383503	QC-MRG2-383503002	E421	0.244	0.25 mg/L	mg/L	97.7	80-120	%	✓
LCS	iron, dissolved	383503	QC-MRG2-383503002	E421	1.04	1 mg/L	mg/L	104	80-120	%	✓
LCS	lead, dissolved	383503	QC-MRG2-383503002	E421	0.480	0.5 mg/L	mg/L	96.0	80-120	%	✓
LCS	lithium, dissolved	383503	QC-MRG2-383503002	E421	0.246	0.25 mg/L	mg/L	98.3	80-120	%	✓
LCS	magnesium, dissolved	383503	QC-MRG2-383503002	E421	49.8	50 mg/L	mg/L	99.6	80-120	%	✓
LCS	manganese, dissolved	383503	QC-MRG2-383503002	E421	0.243	0.25 mg/L	mg/L	97.1	80-120	%	✓
LCS	molybdenum, dissolved	383503	QC-MRG2-383503002	E421	0.253	0.25 mg/L	mg/L	101	80-120	%	✓
LCS	nickel, dissolved	383503	QC-MRG2-383503002	E421	0.489	0.5 mg/L	mg/L	97.8	80-120	%	✓
LCS	phosphorus, dissolved	383503	QC-MRG2-383503002	E421	9.97	10 mg/L	mg/L	99.7	80-120	%	✓
LCS	potassium, dissolved	383503	QC-MRG2-383503002	E421	53.0	50 mg/L	mg/L	106	80-120	%	✓
LCS	rubidium, dissolved	383503	QC-MRG2-383503002	E421	0.0992	0.1 mg/L	mg/L	99.2	80-120	%	✓
LCS	selenium, dissolved	383503	QC-MRG2-383503002	E421	1.01	1 mg/L	mg/L	101	80-120	%	✓
LCS	silicon, dissolved	383503	QC-MRG2-383503002	E421	10.6	10 mg/L	mg/L	106	80-120	%	✓
LCS	silver, dissolved	383503	QC-MRG2-383503002	E421	0.0913	0.1 mg/L	mg/L	91.3	80-120	%	✓
LCS	sodium, dissolved	383503	QC-MRG2-383503002	E421	50.8	50 mg/L	mg/L	102	80-120	%	✓
LCS	strontium, dissolved	383503	QC-MRG2-383503002	E421	0.252	0.25 mg/L	mg/L	101	80-120	%	✓
LCS	sulfur, dissolved	383503	QC-MRG2-383503002	E421	51.3	50 mg/L	mg/L	103	80-120	%	✓
LCS	tellurium, dissolved	383503	QC-MRG2-383503002	E421	0.102	0.1 mg/L	mg/L	102	80-120	%	✓
LCS	thallium, dissolved	383503	QC-MRG2-383503002	E421	0.968	1 mg/L	mg/L	96.8	80-120	%	✓
LCS	thorium, dissolved	383503	QC-MRG2-383503002	E421	0.0929	0.1 mg/L	mg/L	92.9	80-120	%	✓
LCS	tin, dissolved	383503	QC-MRG2-383503002	E421	0.505	0.5 mg/L	mg/L	101	80-120	%	✓
LCS	titanium, dissolved	383503	QC-MRG2-383503002	E421	0.240	0.25 mg/L	mg/L	95.9	80-120	%	✓
LCS	tungsten, dissolved	383503	QC-MRG2-383503002	E421	0.0982	0.1 mg/L	mg/L	98.2	80-120	%	✓
LCS	uranium, dissolved	383503	QC-MRG2-383503002	E421	0.00483	0.005 mg/L	mg/L	96.6	80-120	%	✓

LCS	vanadium, dissolved	383503	QC-MRG2-383503002	E421	0.492	0.5 mg/L	mg/L	98.4	80-120	%	✓
LCS	zinc, dissolved	383503	QC-MRG2-383503002	E421	0.508	0.5 mg/L	mg/L	102	80-120	%	✓
LCS	zirconium, dissolved	383503	QC-MRG2-383503002	E421	0.0974	0.1 mg/L	mg/L	97.4	80-120	%	✓
MS	aluminum, dissolved	383503	Anonymous	E421	10.2	10 mg/L	mg/L	102	70-130	%	✓
MS	antimony, dissolved	383503	Anonymous	E421	1.02	1 mg/L	mg/L	102	70-130	%	✓
MS	arsenic, dissolved	383503	Anonymous	E421	0.960	1 mg/L	mg/L	96.0	70-130	%	✓
MS	barium, dissolved	383503	Anonymous	E421	0.964	1 mg/L	mg/L	96.4	70-130	%	✓
MS	beryllium, dissolved	383503	Anonymous	E421	2.13	2 mg/L	mg/L	107	70-130	%	✓
MS	bismuth, dissolved	383503	Anonymous	E421	0.448	0.5 mg/L	mg/L	89.7	70-130	%	✓
MS	boron, dissolved	383503	Anonymous	E421	5.44	5 mg/L	mg/L	109	70-130	%	✓
MS	cadmium, dissolved	383503	Anonymous	E421	0.194	0.2 mg/L	mg/L	97.2	70-130	%	✓
MS	calcium, dissolved	383503	Anonymous	E421	ND	200 mg/L	mg/L	ND	70-130	%	✓
MS	cesium, dissolved	383503	Anonymous	E421	0.516	0.5 mg/L	mg/L	103	70-130	%	✓
MS	chromium, dissolved	383503	Anonymous	E421	1.92	2 mg/L	mg/L	96.0	70-130	%	✓
MS	cobalt, dissolved	383503	Anonymous	E421	0.934	1 mg/L	mg/L	93.4	70-130	%	✓
MS	copper, dissolved	383503	Anonymous	E421	0.914	1 mg/L	mg/L	91.4	70-130	%	✓
MS	iron, dissolved	383503	Anonymous	E421	96.4	100 mg/L	mg/L	96.4	70-130	%	✓
MS	lead, dissolved	383503	Anonymous	E421	0.933	1 mg/L	mg/L	93.3	70-130	%	✓
MS	lithium, dissolved	383503	Anonymous	E421	5.37	5 mg/L	mg/L	107	70-130	%	✓
MS	magnesium, dissolved	383503	Anonymous	E421	ND	50 mg/L	mg/L	ND	70-130	%	✓
MS	manganese, dissolved	383503	Anonymous	E421	0.962	1 mg/L	mg/L	96.2	70-130	%	✓
MS	molybdenum, dissolved	383503	Anonymous	E421	1.07	1 mg/L	mg/L	107	70-130	%	✓
MS	nickel, dissolved	383503	Anonymous	E421	1.86	2 mg/L	mg/L	92.8	70-130	%	✓
MS	phosphorus, dissolved	383503	Anonymous	E421	494	500 mg/L	mg/L	98.8	70-130	%	✓
MS	potassium, dissolved	383503	Anonymous	E421	ND	200 mg/L	mg/L	ND	70-130	%	✓
MS	rubidium, dissolved	383503	Anonymous	E421	0.971	1 mg/L	mg/L	97.1	70-130	%	✓
MS	selenium, dissolved	383503	Anonymous	E421	1.94	2 mg/L	mg/L	96.9	70-130	%	✓
MS	silicon, dissolved	383503	Anonymous	E421	528	500 mg/L	mg/L	106	70-130	%	✓
MS	silver, dissolved	383503	Anonymous	E421	0.192	0.2 mg/L	mg/L	96.2	70-130	%	✓
MS	sodium, dissolved	383503	Anonymous	E421	ND	100 mg/L	mg/L	ND	70-130	%	✓
MS	strontium, dissolved	383503	Anonymous	E421	ND	1 mg/L	mg/L	ND	70-130	%	✓
MS	sulfur, dissolved	383503	Anonymous	E421	ND	1000 mg/L	mg/L	ND	70-130	%	✓
MS	tellurium, dissolved	383503	Anonymous	E421	1.93	2 mg/L	mg/L	96.7	70-130	%	✓
MS	thallium, dissolved	383503	Anonymous	E421	0.186	0.2 mg/L	mg/L	92.9	70-130	%	✓
MS	thorium, dissolved	383503	Anonymous	E421	0.959	1 mg/L	mg/L	95.9	70-130	%	✓
MS	tin, dissolved	383503	Anonymous	E421	1.01	1 mg/L	mg/L	101	70-130	%	✓
MS	titanium, dissolved	383503	Anonymous	E421	2.03	2 mg/L	mg/L	102	70-130	%	✓
MS	tungsten, dissolved	383503	Anonymous	E421	0.996	1 mg/L	mg/L	99.6	70-130	%	✓
MS	uranium, dissolved	383503	Anonymous	E421	0.190	0.2 mg/L	mg/L	95.3	70-130	%	✓
MS	vanadium, dissolved	383503	Anonymous	E421	5.01	5 mg/L	mg/L	100	70-130	%	✓
MS	zinc, dissolved	383503	Anonymous	E421	19.5	20 mg/L	mg/L	97.6	70-130	%	✓
MS	zirconium, dissolved	383503	Anonymous	E421	2.18	2 mg/L	mg/L	109	70-130	%	✓
MB	mercury, dissolved	381686	QC-381686-001	E509	<0.0000050		mg/L	-	0.000005	mg/L	✓
MB	aluminum, dissolved	383503	QC-MRG2-383503001	E421	<0.0010		mg/L	-	0.001	mg/L	✓
MB	antimony, dissolved	383503	QC-MRG2-383503001	E421	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	arsenic, dissolved	383503	QC-MRG2-383503001	E421	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	barium, dissolved	383503	QC-MRG2-383503001	E421	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	beryllium, dissolved	383503	QC-MRG2-383503001	E421	<0.000020		mg/L	-	0.00002	mg/L	✓
MB	bismuth, dissolved	383503	QC-MRG2-383503001	E421	<0.000050		mg/L	-	0.00005	mg/L	✓
MB	boron, dissolved	383503	QC-MRG2-383503001	E421	<0.010		mg/L	-	0.01	mg/L	✓
MB	cadmium, dissolved	383503	QC-MRG2-383503001	E421	<0.0000050		mg/L	-	0.000005	mg/L	✓
MB	calcium, dissolved	383503	QC-MRG2-383503001	E421	<0.050		mg/L	-	0.05	mg/L	✓
MB	cesium, dissolved	383503	QC-MRG2-383503001	E421	<0.000010		mg/L	-	0.00001	mg/L	✓
MB	chromium, dissolved	383503	QC-MRG2-383503001	E421	<0.00050		mg/L	-	0.0005	mg/L	✓
MB	cobalt, dissolved	383503	QC-MRG2-383503001	E421	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	copper, dissolved	383503	QC-MRG2-383503001	E421	<0.00020		mg/L	-	0.0002	mg/L	✓
MB	iron, dissolved	383503	QC-MRG2-383503001	E421	<0.010		mg/L	-	0.01	mg/L	✓
MB	lead, dissolved	383503	QC-MRG2-383503001	E421	<0.000050		mg/L	-	0.00005	mg/L	✓
MB	lithium, dissolved	383503	QC-MRG2-383503001	E421	<0.0010		mg/L	-	0.001	mg/L	✓
MB	magnesium, dissolved	383503	QC-MRG2-383503001	E421	<0.0050		mg/L	-	0.005	mg/L	✓
MB	manganese, dissolved	383503	QC-MRG2-383503001	E421	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	molybdenum, dissolved	383503	QC-MRG2-383503001	E421	<0.000050		mg/L	-	0.00005	mg/L	✓
MB	nickel, dissolved	383503	QC-MRG2-383503001	E421	<0.00050		mg/L	-	0.0005	mg/L	✓
MB	phosphorus, dissolved	383503	QC-MRG2-383503001	E421	<0.050		mg/L	-	0.05	mg/L	✓
MB	potassium, dissolved	383503	QC-MRG2-383503001	E421	<0.050		mg/L	-	0.05	mg/L	✓
MB	rubidium, dissolved	383503	QC-MRG2-383503001	E421	<0.00020		mg/L	-	0.0002	mg/L	✓
MB	selenium, dissolved	383503	QC-MRG2-383503001	E421	<0.000050		mg/L	-	0.00005	mg/L	✓
MB	silicon, dissolved	383503	QC-MRG2-383503001	E421	<0.050		mg/L	-	0.05	mg/L	✓
MB	silver, dissolved	383503	QC-MRG2-383503001	E421	<0.000010		mg/L	-	0.00001	mg/L	✓
MB	sodium, dissolved	383503	QC-MRG2-383503001	E421	<0.050		mg/L	-	0.05	mg/L	✓
MB	strontium, dissolved	383503	QC-MRG2-383503001	E421	<0.00020		mg/L	-	0.0002	mg/L	✓
MB	sulfur, dissolved	383503	QC-MRG2-383503001	E421	<0.50		mg/L	-	0.5	mg/L	✓
MB	tellurium, dissolved	383503	QC-MRG2-383503001	E421	<0.00020		mg/L	-	0.0002	mg/L	✓
MB	thallium, dissolved	383503	QC-MRG2-383503001	E421	<0.000010		mg/L	-	0.00001	mg/L	✓
MB	thorium, dissolved	383503	QC-MRG2-383503001	E421	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	tin, dissolved	383503	QC-MRG2-383503001	E421	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	titanium, dissolved	383503	QC-MRG2-383503001	E421	<0.00030		mg/L	-	0.0003	mg/L	✓
MB	tungsten, dissolved	383503	QC-MRG2-383503001	E421	<0.00010		mg/L	-	0.0001	mg/L	✓
MB	uranium, dissolved	383503	QC-MRG2-383503001	E421	<0.000010		mg/L	-	0.00001	mg/L	✓
MB	vanadium, dissolved	383503	QC-MRG2-383503001	E421	<0.00050		mg/L	-	0.0005	mg/L	✓
MB	zinc, dissolved	383503	QC-MRG2-383503001	E421	<0.0010		mg/L	-	0.001	mg/L	✓
MB	zirconium, dissolved	383503	QC-MRG2-383503001	E421	<0.00020		mg/L	-	0.0002	mg/L	✓

Hydrocarbons (Matrix: Water)

LCS	EPH (C10-C19)	377550	QC-377550-002	E601A	5840	6491 µg/L	µg/L	90.0	70-130	%	✓
LCS	EPH (C19-C32)	377550	QC-377550-002	E601A	3150	3363 µg/L	µg/L	93.7	70-130	%	✓
MB	EPH (C10-C19)	377550	QC-MRG2-377550001	E601A	<250		µg/L	-	250	µg/L	✓
MB	EPH (C19-C32)	377550	QC-MRG2-377550001	E601A	<250		µg/L	-	250	µg/L	✓

Hydrocarbons Surrogates (Matrix: Water)

LCS	bromobenzotrifluoride, 2- (EPH surr)	377550	QC-377550-002	E601A	5170	6315.8 µg/L	µg/L	81.9	60-140	%	
MB	bromobenzotrifluoride, 2- (EPH surr)	377550	QC-MRG2-377550001	E601A	78.2		µg/L	-	60-140	%	
Polycyclic Aromatic Hydrocarbons (Matrix: Water)											
LCS	acenaphthene	377551	QC-377551-002	E641A	0.579	0.5 µg/L	µg/L	116	60-130	%	✓
LCS	acenaphthylene	377551	QC-377551-002	E641A	0.560	0.5 µg/L	µg/L	112	60-130	%	✓
LCS	acridine	377551	QC-377551-002	E641A	0.575	0.5 µg/L	µg/L	115	60-130	%	✓
LCS	anthracene	377551	QC-377551-002	E641A	0.583	0.5 µg/L	µg/L	116	60-130	%	✓
LCS	benz(a)anthracene	377551	QC-377551-002	E641A	0.583	0.5 µg/L	µg/L	116	60-130	%	✓
LCS	benzo(a)pyrene	377551	QC-377551-002	E641A	0.561	0.5 µg/L	µg/L	112	60-130	%	✓
LCS	benzo(b+j)fluoranthene	377551	QC-377551-002	E641A	0.593	0.5 µg/L	µg/L	119	60-130	%	✓
LCS	benzo(g,h,i)perylene	377551	QC-377551-002	E641A	0.627	0.5 µg/L	µg/L	125	60-130	%	✓
LCS	benzo(k)fluoranthene	377551	QC-377551-002	E641A	0.599	0.5 µg/L	µg/L	120	60-130	%	✓
LCS	chrysene	377551	QC-377551-002	E641A	0.596	0.5 µg/L	µg/L	119	60-130	%	✓
LCS	dibenz(a,h)anthracene	377551	QC-377551-002	E641A	0.592	0.5 µg/L	µg/L	118	60-130	%	✓
LCS	fluoranthene	377551	QC-377551-002	E641A	0.576	0.5 µg/L	µg/L	115	60-130	%	✓
LCS	fluorene	377551	QC-377551-002	E641A	0.571	0.5 µg/L	µg/L	114	60-130	%	✓
LCS	indeno(1,2,3-c,d)pyrene	377551	QC-377551-002	E641A	0.616	0.5 µg/L	µg/L	123	60-130	%	✓
LCS	methylnaphthalene, 1-	377551	QC-377551-002	E641A	0.606	0.5 µg/L	µg/L	121	60-130	%	✓
LCS	methylnaphthalene, 2-	377551	QC-377551-002	E641A	0.589	0.5 µg/L	µg/L	118	60-130	%	✓
LCS	naphthalene	377551	QC-377551-002	E641A	0.582	0.5 µg/L	µg/L	116	50-130	%	✓
LCS	phenanthrene	377551	QC-377551-002	E641A	0.570	0.5 µg/L	µg/L	114	60-130	%	✓
LCS	pyrene	377551	QC-377551-002	E641A	0.590	0.5 µg/L	µg/L	118	60-130	%	✓
LCS	quinoline	377551	QC-377551-002	E641A	0.619	0.5 µg/L	µg/L	124	60-130	%	✓
MB	acenaphthene	377551	QC-MRG2-377550001	E641A	<0.010		µg/L	-	0.01	µg/L	✓
MB	acenaphthylene	377551	QC-MRG2-377550001	E641A	<0.010		µg/L	-	0.01	µg/L	✓
MB	acridine	377551	QC-MRG2-377550001	E641A	<0.010		µg/L	-	0.01	µg/L	✓
MB	anthracene	377551	QC-MRG2-377550001	E641A	<0.010		µg/L	-	0.01	µg/L	✓
MB	benz(a)anthracene	377551	QC-MRG2-377550001	E641A	<0.010		µg/L	-	0.01	µg/L	✓
MB	benzo(a)pyrene	377551	QC-MRG2-377550001	E641A	<0.0050		µg/L	-	0.005	µg/L	✓
MB	benzo(b+j)fluoranthene	377551	QC-MRG2-377550001	E641A	<0.010		µg/L	-	0.01	µg/L	✓
MB	benzo(g,h,i)perylene	377551	QC-MRG2-377550001	E641A	<0.010		µg/L	-	0.01	µg/L	✓
MB	benzo(k)fluoranthene	377551	QC-MRG2-377550001	E641A	<0.010		µg/L	-	0.01	µg/L	✓
MB	chrysene	377551	QC-MRG2-377550001	E641A	<0.010		µg/L	-	0.01	µg/L	✓
MB	dibenz(a,h)anthracene	377551	QC-MRG2-377550001	E641A	<0.0050		µg/L	-	0.005	µg/L	✓
MB	fluoranthene	377551	QC-MRG2-377550001	E641A	<0.010		µg/L	-	0.01	µg/L	✓
MB	fluorene	377551	QC-MRG2-377550001	E641A	<0.010		µg/L	-	0.01	µg/L	✓
MB	indeno(1,2,3-c,d)pyrene	377551	QC-MRG2-377550001	E641A	<0.010		µg/L	-	0.01	µg/L	✓
MB	methylnaphthalene, 1-	377551	QC-MRG2-377550001	E641A	<0.010		µg/L	-	0.01	µg/L	✓
MB	methylnaphthalene, 2-	377551	QC-MRG2-377550001	E641A	<0.010		µg/L	-	0.01	µg/L	✓
MB	naphthalene	377551	QC-MRG2-377550001	E641A	<0.050		µg/L	-	0.05	µg/L	✓
MB	phenanthrene	377551	QC-MRG2-377550001	E641A	<0.020		µg/L	-	0.02	µg/L	✓
MB	pyrene	377551	QC-MRG2-377550001	E641A	<0.010		µg/L	-	0.01	µg/L	✓
MB	quinoline	377551	QC-MRG2-377550001	E641A	<0.050		µg/L	-	0.05	µg/L	✓
Polycyclic Aromatic Hydrocarbons Surrogates (Matrix: Water)											
LCS	chrysene-d12	377551	QC-377551-002	E641A	0.9	0.8421 µg/L	µg/L	106	60-130	%	
LCS	naphthalene-d8	377551	QC-377551-002	E641A	0.8	0.8421 µg/L	µg/L	99.5	50-130	%	
LCS	phenanthrene-d10	377551	QC-377551-002	E641A	0.9	0.8421 µg/L	µg/L	106	60-130	%	
MB	chrysene-d12	377551	QC-MRG2-377550001	E641A	98.2		µg/L	-	60-130	%	
MB	naphthalene-d8	377551	QC-MRG2-377550001	E641A	103		µg/L	-	50-130	%	
MB	phenanthrene-d10	377551	QC-MRG2-377550001	E641A	109		µg/L	-	60-130	%	

Evaluation Legend

- ✓ QC Lot met ALS Data Quality Objectives
- × QC Lot did not meet ALS Data Quality Objectives

Results Summary VA21C8170

Project DEEP WATER RECOVERY
Report To Rob Waters, Castor Consultants Limited
Date Received 17-Dec-2021 09:20
Issue Date 13-Jan-2022 12:17
Amendment 0

Client Sample ID			DEE WATER DWR - SUMP 1	DWR-SUMP2
Date Sampled			16-Dec-2021	16-Dec-2021
Time Sampled			12:00	12:00
ALS Sample ID			VA21C8170-001	VA21C8170-002
Analyte	Lowest Detection Limit	Units	Sub-Matrix: Water	Sub-Matrix: Water

Physical Tests (Matrix: Water)

hardness (as CaCO ₃), dissolved	0.60	mg/L	50.9	92.8
hardness (as CaCO ₃), from total Ca/Mg	0.60	mg/L	75.8	116
pH	0.10	pH units	7.51	7.46
turbidity	0.10	NTU	261	254

Total Metals (Matrix: Water)

aluminum, total	0.0030	mg/L	11.8	10.7
antimony, total	0.00010	mg/L	0.00063	0.00031
arsenic, total	0.00010	mg/L	0.00304	0.00302
barium, total	0.00010	mg/L	0.0633	0.0504
beryllium, total	0.000100	mg/L	0.000137	0.000141
bismuth, total	0.000050	mg/L	<0.000050	<0.000050
boron, total	0.010	mg/L	0.037	0.037
cadmium, total	0.0000050	mg/L	0.000195	0.0000967
calcium, total	0.050	mg/L	15.6	27.9
cesium, total	0.000010	mg/L	0.000233	0.000219
chromium, total	0.00050	mg/L	0.0245	0.0180
cobalt, total	0.00010	mg/L	0.00866	0.00686
copper, total	0.00050	mg/L	0.120	0.109
iron, total	0.010	mg/L	19.5	15.1
lead, total	0.000050	mg/L	0.0301	0.0156
lithium, total	0.0010	mg/L	0.0055	0.0051
magnesium, total	0.0050	mg/L	8.95	11.2
manganese, total	0.00010	mg/L	0.728	0.762
mercury, total	0.0000050	mg/L	0.0000313	0.0000434
molybdenum, total	0.000050	mg/L	0.000907	0.000392
nickel, total	0.00050	mg/L	0.0188	0.0131
phosphorus, total	0.050	mg/L	0.278	0.264
potassium, total	0.050	mg/L	1.77	2.39
rubidium, total	0.00020	mg/L	0.00244	0.00251
selenium, total	0.000050	mg/L	0.000192	0.000173
silicon, total	0.10	mg/L	16.7	19.3
silver, total	0.000010	mg/L	0.000078	0.000056
sodium, total	0.050	mg/L	34.8	27.4
strontium, total	0.00020	mg/L	0.0946	0.122
sulfur, total	0.50	mg/L	4.15	2.91
tellurium, total	0.00020	mg/L	<0.00020	<0.00020
thallium, total	0.000010	mg/L	0.000015	0.000016
thorium, total	0.00010	mg/L	0.00016	0.00016

tin, total	0.00010	mg/L	0.00071	0.00031
titanium, total	0.00030	mg/L	0.994	0.706
tungsten, total	0.00010	mg/L	<0.00010	<0.00010
uranium, total	0.000010	mg/L	0.000131	0.000140
vanadium, total	0.00050	mg/L	0.0446	0.0453
zinc, total	0.0030	mg/L	0.341	0.115
zirconium, total	0.00020	mg/L	0.00207	0.00158

Dissolved Metals (Matrix: Water)

aluminum, dissolved	0.0010	mg/L	0.872	0.668
antimony, dissolved	0.00010	mg/L	0.00028	0.00016
arsenic, dissolved	0.00010	mg/L	0.00052	0.00061
barium, dissolved	0.00010	mg/L	0.0180	0.0102
beryllium, dissolved	0.000100	mg/L	<0.000100	<0.000100
bismuth, dissolved	0.000050	mg/L	<0.000050	<0.000050
boron, dissolved	0.010	mg/L	0.027	0.034
cadmium, dissolved	0.0000050	mg/L	0.0000321	0.0000138
calcium, dissolved	0.050	mg/L	12.1	23.7
cesium, dissolved	0.000010	mg/L	0.000014	<0.000010
chromium, dissolved	0.00050	mg/L	0.00288	0.00195
cobalt, dissolved	0.00010	mg/L	0.00056	0.00035
copper, dissolved	0.00020	mg/L	0.0294	0.0240
iron, dissolved	0.010	mg/L	1.45	1.20
lead, dissolved	0.000050	mg/L	0.00371	0.00188
lithium, dissolved	0.0010	mg/L	<0.0010	<0.0010
magnesium, dissolved	0.0050	mg/L	5.02	8.16
manganese, dissolved	0.00010	mg/L	0.0340	0.0284
mercury, dissolved	0.0000050	mg/L	0.0000106	0.0000101
molybdenum, dissolved	0.000050	mg/L	0.000777	0.000354
nickel, dissolved	0.00050	mg/L	0.00223	0.00125
phosphorus, dissolved	0.050	mg/L	<0.050	<0.050
potassium, dissolved	0.050	mg/L	1.65	2.20
rubidium, dissolved	0.00020	mg/L	0.00070	0.00074
selenium, dissolved	0.000050	mg/L	0.000085	0.000082
silicon, dissolved	0.050	mg/L	2.81	7.27
silver, dissolved	0.000010	mg/L	<0.000010	0.000011
sodium, dissolved	0.050	mg/L	33.9	25.1
strontium, dissolved	0.00020	mg/L	0.0741	0.105
sulfur, dissolved	0.50	mg/L	4.02	2.66
tellurium, dissolved	0.00020	mg/L	<0.00020	<0.00020
thallium, dissolved	0.000010	mg/L	<0.000010	<0.000010
thorium, dissolved	0.00010	mg/L	<0.00010	<0.00010
tin, dissolved	0.00010	mg/L	<0.00010	<0.00010
titanium, dissolved	0.00030	mg/L	0.0767	0.0727
tungsten, dissolved	0.00010	mg/L	<0.00010	<0.00010
uranium, dissolved	0.000010	mg/L	0.000030	0.000044
vanadium, dissolved	0.00050	mg/L	0.00488	0.00571
zinc, dissolved	0.0010	mg/L	0.0515	0.0123
zirconium, dissolved	0.00020	mg/L	0.00090	0.00102
dissolved mercury filtration location			Laboratory	Laboratory
dissolved metals filtration location			Laboratory	Laboratory

Hydrocarbons (Matrix: Water)

EPH (C10-C19)	250	µg/L	<250	<250
EPH (C19-C32)	250	µg/L	<250	<250

LEPHw	250	µg/L	<250	<250
HEPHw	250	µg/L	<250	<250

Hydrocarbons Surrogates (Matrix: Water)

bromobenzotrifluoride, 2- (EPH surr)	1.0	%	86.9	84.2
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Polycyclic Aromatic Hydrocarbons (Matrix: Water)

acenaphthene	0.010	µg/L	0.012	0.020
acenaphthylene	0.010	µg/L	<0.010	<0.010
acridine	0.010	µg/L	<0.015	<0.010
anthracene	0.010	µg/L	<0.027	<0.021
benz(a)anthracene	0.010	µg/L	0.067	0.045
benzo(a)pyrene	0.0050	µg/L	0.0239	0.0164
benzo(b+j)fluoranthene	0.010	µg/L	0.048	0.030
benzo(b+j+k)fluoranthene	0.015	µg/L	0.064	0.041
benzo(g,h,i)perylene	0.010	µg/L	0.015	<0.010
benzo(k)fluoranthene	0.010	µg/L	0.016	0.011
chrysene	0.010	µg/L	0.069	0.045
dibenz(a,h)anthracene	0.0050	µg/L	<0.0050	<0.0050
fluoranthene	0.010	µg/L	0.207	0.107
fluorene	0.010	µg/L	0.016	0.024
indeno(1,2,3-c,d)pyrene	0.010	µg/L	0.015	<0.010
methylnaphthalene, 1-	0.010	µg/L	<0.010	0.042
methylnaphthalene, 2-	0.010	µg/L	<0.010	0.018
naphthalene	0.050	µg/L	<0.050	<0.050
phenanthrene	0.020	µg/L	0.127	0.079
pyrene	0.010	µg/L	0.210	0.137
quinoline	0.050	µg/L	<0.050	<0.060

Polycyclic Aromatic Hydrocarbons Surrogates (Matrix: Water)

chrysene-d12	0.1	%	106	110
naphthalene-d8	0.1	%	97.6	98.5
phenanthrene-d10	0.1	%	108	112

Qualifier Legend

DLCI

Detection Limit Raised: Chromatographic interference due to co-elution.

DLQ

Detection Limit raised due to co-eluting interference. GCMS qualifier ion ratio did not meet acceptance criteria.

Sample Summary VA21C8170

Project DEEP WATER RECOVERY
Report To Rob Waters, Castor Consultants Limited
Date Received 17-Dec-2021 09:20
Issue Date 13-Jan-2022 12:17
Amendment 0

Sample Details

ALS Sample ID	Client Sample ID	Matrix	Sub-Matrix	Date Sampled	Time Sampled
VA21C8170-001	DEE WATER DWR -	Water	Water	16-Dec-2021	12:00
VA21C8170-002	DWR-SUMP2	Water	Water	16-Dec-2021	12:00

Table 3. Field Observations Deep Water Recovery Runoff Water Testing (Draft)

16-Dec-21

Field Tests									
Station	1	2	3						
	Main	South Side	North Side						
Water Temperature (°C)	4.7	4.7	NS						
Cond uS	0	0							
Est Flow L/Min	1	1							
Date Sampled	16-Dec	16-Dec							
Time	11:00	11:30							
Air Temperature (°C)	2	2	2						
Weather	overcast, showers	overcast, showers	partly cloudy, showers						

NS = not sampled

**Table 4. Field
Observations**

Deep Water Recovery Runoff Water Testing (Draft) 20-Jan-22

Weather:

Air Temp 6 °C

Clear

Field Tests							
Station	1	2	3	N Creek	S Creek	Culvert S Creek A	S Creek A
	Main	South Side	North Side				
Sampled	Y	Y	N	Y	Y	Y	Y
Est Flow L/Min	1 - 2	1 - 2	0	~600	10	< 1	3

Note: pH and temperature meter not available

TABLE 2. January 2022 Results Summary VA22A1190

Project	DEEP WATER RECOVERY											
Date Sampled	20-Jan-22											
Date Received	21-Jan-2022 08:40											
Issue Date	31-Jan-2022 15:19											
Amendment	0											
Sample ID			N. Creek	Sump1	Sump2	Sump2A	S. Creek	Culvert S. Creek	S. Creek A	Background		
ALS Sample ID			VA22A1190-001	VA22A1190-002	VA22A1190-003	VA22A1190-004	VA22A1190-005	VA22A1190-006	VA22A1190-007	VA22A1190-008		
Analyte	Lowest Detection Limit	Units	Sub-Matrix: Water	Sub-Matrix: Water	Sub-Matrix: Water	Sub-Matrix: Water	Sub-Matrix: Water	Sub-Matrix: Water	Sub-Matrix: Water	Sub-Matrix: Water	BC Approved WQG Marine	BC Approved WQG Freshwater
Physical Tests (Matrix: Water)												
hardness (as CaCO3), from total Ca/Mg	0.50	mg/L	17.0	31.6	106	132	111	74.6	54.0			
pH	0.10	pH units	6.84	7.33	7.21	7.53	7.01	7.24	6.85		>7 <8.7	6.5 - 9
turbidity	0.10	NTU	4.22	114	276	119	0.87	59.1	5.16	3.17	5 NTU from BG	5 NTU from BG
Organic / Inorganic Carbon (Matrix: Water)												
carbon, dissolved organic [DOC]	0.50	mg/L	7.37				11.9	<0.50	3.72			
GUIDANCE COMPUTED FROM BC WQ WEB SITE												
Dissolved Cu FW Guidance (ST/LT)			0.0032/0.00049				0.014/0.0022	0.0002/0.0002	0.0023/0.00036			
Dissolved Cd FW Guidance (ST/LT)			0.000095/0.000057				0.00065/0.00023	0.00043/0.00017	0.00031/0.00013			
Total Pb FW Guidance (ST/LT)			0.0086/0.0036				0.093/0.0069	0.057/0.0055	0.037/0.0048			
Total Ni FW Guidance (ST/LT)			0.025				0.1	0.077	0.025			
Total Zn FW Guidance (ST/LT)			0.033/0.0075				0.049/0.023	0.033/0.0075	0.033/0.0075			
Total Metals (Matrix: Water)												
aluminum, total	0.0030	mg/L	0.461	4.38	13.7	6.25	0.0882	3.70	0.410			
antimony, total	0.00010	mg/L	<0.00010	0.00041	0.00033	0.00020	<0.00010	<0.00010	<0.00010		0.27	
arsenic, total	0.00010	mg/L	0.00019	0.00171	0.00490	0.00274	0.00022	0.00122	0.00023		0.0125	0.005
barium, total	0.00010	mg/L	0.00355	0.0341	0.0670	0.0410	0.0123	0.0250	0.00984			
beryllium, total	0.000020	mg/L	<0.000020	<0.000100	0.000188	0.000090	<0.000020	0.000045	<0.000020		0.1	
bismuth, total	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050			
boron, total	0.010	mg/L	<0.010	0.014	0.030	0.030	0.057	0.030	<0.010		1.2	
cadmium, total	0.000050	mg/L	<0.000050	0.000105	0.0000733	0.0000333	<0.000050	0.0000184	0.0000131		0.00012	
calcium, total	0.050	mg/L	4.25	6.86	25.5	33.0	29.9	18.7	13.8			
cesium, total	0.000010	mg/L	<0.000010	0.000105	0.000444	0.000215	<0.000010	0.000088	0.000014			
chromium, total	0.00050	mg/L	0.00077	0.0118	0.0245	0.0112	<0.00050	0.00580	0.00074		nr BI 0.050	
cobalt, total	0.00010	mg/L	0.00017	0.00374	0.00752	0.00366	0.00012	0.00215	0.00016			
copper, total	0.00050	mg/L	0.00214	0.0491	0.0688	0.0271	0.00201	0.0125	0.00279		0.003/0.002	
iron, total	0.010	mg/L	0.417	8.97	19.3	9.17	0.113	4.06	0.486			1
lead, total	0.000050	mg/L	0.000086	0.0171	0.00768	0.00230	<0.000050	0.000694	0.000259		0.140/0.002	see above
lithium, total	0.0010	mg/L	<0.0010	0.0019	0.0072	0.0040	<0.0010	0.0019	<0.0010			
magnesium, total	0.0050	mg/L	1.55	3.51	10.3	12.0	8.73	6.77	4.74			
manganese, total	0.00010	mg/L	0.0279	0.294	0.760	0.870	0.0103	0.795	0.0191			
mercury, total	0.000050	mg/L		0.0000153	0.0000348						0.002/0.00002	
molybdenum, total	0.000050	mg/L	<0.000050	0.000467	0.000425	0.000300	<0.000050	0.000118	<0.000050		2.0/ 1.0	
nickel, total	0.00050	mg/L	<0.00050	0.00791	0.0153	0.00729	<0.00050	0.00398	0.00067		0.0083	see above
phosphorus, total	0.050	mg/L	<0.050	0.130	0.304	0.145	<0.050	0.091	<0.050			
potassium, total	0.050	mg/L	0.271	0.964	2.30	1.56	2.00	1.52	0.423			
rubidium, total	0.00020	mg/L	0.00040	0.00135	0.00401	0.00212	0.00126	0.00158	0.00040			
selenium, total	0.000050	mg/L	0.000082	0.000081	0.000183	0.000128	<0.000050	0.000146	<0.000050		0.002	
silicon, total	0.10	mg/L	4.54	7.07	23.0	15.8	5.82	9.35	5.68			
silver, total	0.000010	mg/L	<0.000010	0.000035	0.000076	0.000032	<0.000010	0.000026	<0.000010		0.003/0.0015	
sodium, total	0.050	mg/L	4.61	13.6	16.3	15.3	14.5	6.48	13.4			
strontium, total	0.00020	mg/L	0.0179	0.0408	0.114	0.143	0.152	0.0778	0.0718			
sulfur, total	0.50	mg/L	<0.50	1.38	1.46	1.57	5.04	<0.50	<0.50			
tellurium, total	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020			
thallium, total	0.000010	mg/L	<0.000010	<0.000010	0.000038	0.000016	<0.000010	<0.000010	<0.000010			
thorium, total	0.00010	mg/L	<0.00010	0.00010	0.00031	0.00015	<0.00010	<0.00010	<0.00010			
tin, total	0.00010	mg/L	<0.00010	0.00040	0.00022	0.00011	<0.00010	<0.00010	<0.00010			
titanium, total	0.00030	mg/L	0.0295	0.453	0.982	0.493	0.00476	0.277	0.0243			
tungsten, total	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010			
uranium, total	0.000010	mg/L	0.000012	0.000053	0.000163	0.000114	0.000010	0.000083	<0.000010			
vanadium, total	0.00050	mg/L	0.00159	0.0199	0.0576	0.0290	0.00075	0.0152	0.00158		0.05	
zinc, total	0.0030	mg/L	<0.0030	0.249	0.0994	0.0320	<0.0030	0.0066	0.0034		0.055/ 0.010	see above
zirconium, total	0.00020	mg/L	0.00040	0.00108	0.00115	0.00063	0.00028	0.00070	0.00030			
Dissolved Metals (Matrix: Water)												
aluminum, dissolved	0.0010	mg/L	0.312				0.0542	1.64	0.114			
antimony, dissolved	0.00010	mg/L	<0.00010				<0.00010	<0.00010	<0.00010			
arsenic, dissolved	0.00010	mg/L	0.00015				0.00020	0.00074	0.00013			
barium, dissolved	0.00010	mg/L	0.00281				0.0120	0.0114	0.00724			
beryllium, dissolved	0.000020	mg/L	<0.000020				<0.000020	<0.000020	<0.000020			
bismuth, dissolved	0.000050	mg/L	<0.000050				<0.000050	<0.000050	<0.000050			
boron, dissolved	0.010	mg/L	<0.010				0.058	0.031	0.010			
cadmium, dissolved	0.000050	mg/L	<0.000050				<0.000050	0.0000068	<0.000050			see above
calcium, dissolved	0.050	mg/L	3.98				28.9	18.1	13.5			
cesium, dissolved	0.000010	mg/L	<0.000010				<0.000010	0.000023	<0.000010			
chromium, dissolved	0.00050	mg/L	0.00057				<0.00050	0.00255	<0.00050			
cobalt, dissolved	0.00010	mg/L	<0.00010				<0.00010	0.00076	<0.00010			
copper, dissolved	0.00020	mg/L	0.00162				0.00160	0.00694	0.00119		0.003/0.002	see above
iron, dissolved	0.010	mg/L	0.345				0.057	1.58	0.140			0.35
lead, dissolved	0.000050	mg/L	<0.000050				<0.000050	0.000250	<0.000050			
lithium, dissolved	0.0010	mg/L	<0.0010				<0.0010	<0.0010	<0.0010			
magnesium, dissolved	0.0050	mg/L	1.43				8.36	6.07	4.26			
manganese, dissolved	0.00010	mg/L	0.0123				0.00149	0.621	0.00408			
molybdenum, dissolved	0.000050	mg/L	<0.000050				0.000090	0.000121	<0.000050			
nickel, dissolved	0.00050	mg/L	<0.00050				<0.00050	0.00188	<0.00050			

phosphorus, dissolved	0.050	mg/L	<0.050	<0.050	<0.050	<0.050
potassium, dissolved	0.050	mg/L	0.254	1.90	1.41	0.350
rubidium, dissolved	0.00020	mg/L	0.00035	0.00122	0.00107	0.00029
selenium, dissolved	0.000050	mg/L	0.000060	0.000077	0.000106	<0.000050
silicon, dissolved	0.050	mg/L	4.29	5.61	7.01	5.05
silver, dissolved	0.000010	mg/L	<0.000010	<0.000010	0.000012	<0.000010
sodium, dissolved	0.050	mg/L	4.25	13.7	6.20	12.4
strontium, dissolved	0.00020	mg/L	0.0172	0.143	0.0701	0.0659
sulfur, dissolved	0.50	mg/L	<0.50	4.76	<0.50	<0.50
tellurium, dissolved	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020
thallium, dissolved	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010
thorium, dissolved	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010
tin, dissolved	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010
titanium, dissolved	0.00030	mg/L	0.0190	0.00187	0.134	0.00953
tungsten, dissolved	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010
uranium, dissolved	0.000010	mg/L	<0.000010	<0.000010	0.000062	<0.000010
vanadium, dissolved	0.00050	mg/L	0.00105	0.00058	0.00748	0.00068
zinc, dissolved	0.0010	mg/L	<0.0010	<0.0010	0.0020	<0.0010
zirconium, dissolved	0.00030	mg/L	0.00056	0.00030	0.00178	<0.00030
dissolved metals filtration location			Laboratory	Laboratory	Laboratory	Laboratory

0.055/0.010

Hydrocarbons (Matrix: Water)						
EPH (C10-C19)	250	µg/L	<250	<250		
EPH (C19-C32)	250	µg/L	260	<250		
LEPHw	250	µg/L	<250	<250		
HEPHw	250	µg/L	260	<250		

500 CSR

Hydrocarbons Surrogates (Matrix: Water)						
bromobenzotrifluoride, 2- (EPH surr)	1.0	%	83.5	99.0		

Polycyclic Aromatic Hydrocarbons (Matrix: Water)						
acenaphthene	0.010	µg/L	<0.010	<0.010	6	6
acenaphthylene	0.010	µg/L	<0.010	<0.010		
acridine	0.010	µg/L	<0.070	<0.010		3 / 0.05
anthracene	0.010	µg/L	<0.025	<0.010		
benzo(a)anthracene	0.010	µg/L	0.058	0.013		0.1
benzo(a)pyrene	0.0050	µg/L	0.0425	0.0067	0.01	0.01
benzo(b)fluoranthene	0.010	µg/L	0.072	0.012		
benzo(b,j,k)fluoranthene	0.015	µg/L	0.096	<0.015		
benzo(g,h,i)perylene	0.010	µg/L	0.036	<0.010		
benzo(k)fluoranthene	0.010	µg/L	0.024	<0.010		
chrysene	0.010	µg/L	0.067	0.017		
di(1,2,3-c,d)anthracene	0.0050	µg/L	<0.0092	<0.0050	0.1	
fluoranthene	0.010	µg/L	0.130	0.014		4
fluorene	0.010	µg/L	0.013	<0.010	12	12
indeno(1,2,3-c,d)pyrene	0.010	µg/L	0.035	<0.010		
methylnaphthalene, 1-	0.010	µg/L	<0.010	<0.010		
methylnaphthalene, 2-	0.010	µg/L	<0.010	<0.010		
naphthalene	0.050	µg/L	<0.050	<0.050	1	1
phenanthrene	0.020	µg/L	0.089	<0.020		0.3
pyrene	0.010	µg/L	0.160	0.036		0.02
quinoline	0.050	µg/L	<0.050	<0.050		

Polycyclic Aromatic Hydrocarbons Surrogates (Matrix: Water)						
chrysene-d12	0.1	%	106	121		
naphthalene-d8	0.1	%	115	120		
phenanthrene-d10	0.1	%	121	123		

Qualifier Legend

DLCI	Detection Limit Raised: Chromatographic interference due to co-elution.
DLO	Detection Limit raised due to co-eluting interference. GC/MS qualifier ion ratio did not meet acceptance criteria.
OTC	Dissolved concentration exceeds total. Results were confirmed by re-analysis.

**A Draft Report to Deep Water Recovery Ltd.
January 2022 Runoff Water Quality Data Review**

Introduction

The parameters selected for testing focused on metals and selected organics. Metals are important because the operation involves cutting and handling metals. Organics such as petroleum hydrocarbons are common to street runoff and machinery operation, and were included to examine potential site inputs and to determine sump efficiency for dealing with these parameters. Turbidity testing was also included as a measure of runoff water quality.

The summary data sets for the December 2021 and January 2022 sampling events are presented in Tables 1 and 2 where the data are referenced to the provincial government short-term and long-term exposure guidance for available parameters.

See https://bcgov-env.shinyapps.io/bc_wqg/

Field observations are shown in Tables 3 and 4, attached to the email. Flow measurements were made by timing flow into a small bucket. In larger flows such as N Creek the chip method was employed.

Given that the sump runoff flows to the adjacent marine environment the appropriate BC approved marine guidance was used. The freshwater guidance for dissolved metals in selected samples was applied to selected drainage sites for background comparison.

The sampling locations are depicted on Figure 1. The main or central sump (Sump 1) and the southerly sump (Sump 2) were sampled. The northerly sump (Sump 3) was not sampled as there was no flow at the outlet. In addition, three samples were collected from other locations within the site and two from creeks adjacent to the site (N. Creek and S. Creek) at tidewater.



Figure 1. Sample Locations

Overview

Sump 1 exhibited results above marine guidance for copper and zinc in December 2021 and January 2022. Unlike the Sump 1 December results, which exceeded the guidance for cadmium and nickel, these metals met the guidance in January 2022.

Sump 2 exhibited results above marine guidance for copper, nickel, vanadium and zinc. Sump 2A sample, upstream of Sump 2, exhibited results above the marine guidance for copper, near the guidance for zinc, and above the long-term guidance level for zinc.

Of particular interest was that copper was elevated at both sumps in the December 2021 sump sampling results. Copper is known to be used as an anti-foulant on vessels so while some of the copper in Sump 1 might be attributable to site operations, the copper in Sump 2, which lies outside the main work area, does not.

The January 2022 follow-up sampling of creeks and drainages indicates that copper appears prevalent in the area; the total copper results were observed to be above the guidance for marine water quality in all samples. The results for dissolved copper in the selected creek and drainage samples, collected outside the main work area, were also observed to be above the guidance for freshwater quality.

The result for total copper in Sump 1 in December 2021 was 0.120 mg/L and in Sump 2 it was 0.109 mg/L. In January the results were 0.0491 mg/L and 0.0688 mg/L, respectively, both markedly reduced from the December observations. Similarly in December 2021 the Sump 1 result for total zinc was 0.341 mg/L and in Sump 2 it was 0.115 mg/L. In January the results were 0.249 mg/L and 0.0994 mg/L, respectively,

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reflecting a reduction from December results. Distribution of zinc was observed to be less wide-spread than the findings for copper. Based on the limited data of these two sample sets, while the results exceed the guidance there has been an apparent improvement in the sump runoff quality.

Turbidity measurements exceeded the guidance in Sump 1 and Sump 2. Sump 2 outlet flow exhibited a greater turbidity than the inlet flow at Sump 2A. A sample (Culvert S. Creek) taken from the culvert that appears to drain from a work area at the back of the site exhibited greater turbidity than the upstream sample at S Creek A.

Dissolved iron was within the guidance at all sample sites except for Culvert S Creek. This may reflect the apparent recent installation of the steel pipe culvert.

Sump 1 exhibited very low measureable amounts just above detection limit of the heavier extractable petroleum hydrocarbons (HEPH). HEPH was below the detection limit at Sump 2. The lighter end extractable petroleum hydrocarbons (LEPH) were less than detectable in both sumps.

PAHs were measured at both sumps. Only Benzo (a) pyrene from Sump 1 was noted to exceed the marine guidance.

Summary

Based on the January 2022 sample set the consistency of the copper data above the guidance across the site and in adjacent creeks appears to reflect a local copper enrichment. Sump 1 still exhibits the greater levels of copper and zinc found in the sumps, which may in part reflect historic as well as current operational inputs. The results for Sump 1 may not entirely reflect current site operations, particularly when considering the results for Sump 2, which is isolated from the main work area.

Additional samples of the N. Creek and S. Creek sample sites should be collected and tested to confirm the background results. As well, given these findings for copper and the unknown site use history as well as that on the surrounding lands it may be prudent to review any available Phase 1 assessment reports for the site and collect samples well upstream of any potential site influence. While it may be difficult, if not impractical, to meet the copper guidance due to the apparent elevated natural levels in the local water it is suggested that the sump quality should at least meet the background levels detected in the adjacent creeks. The regulators will likely have a say in what standards have to be met but for now this would appear to be a reasonable target.

Turbidity in the sump discharges exhibited elevated levels compared to the background marine receiving environment. Culvert S. Creek turbidity also exceeded the guidance as compared to S. Creek A. These levels were observed in a period of very low flows (< 2-4/L/min). The sumps should be assessed and improved as needed to minimize the turbidity. The metals should be re-sampled during higher flows. The creek flows (N. Creek, S. Creek and S. Creek A) all exhibited turbidity within the guidance.

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It is recommended that controlling the turbidity at the Sumps 1 and 2 would be a good start to improving the runoff quality. Reducing the turbidity to near background levels is key as the fines reflected in the turbidity may in part carry the observed metals. Measures to control the inputs at Sump 2A and Culvert S. Creek A are recommended, e.g. standard silt control devices such as hay bales and silt fabric could be employed. At this point in time the Culvert S. Creek A input doesn't appear to be influencing turbidity at the S. creek outlet to tide water however some measure of control should be implemented as a precautionary measure.

With the improvements in place follow-up metals and turbidity sampling at these sites is recommended.

Prepared by

Rob Waters, R.P.Bio.

Tables 1 and 2 attached in email.

FW: Vessel recycling

From: Mark Jurisich <mark@deepwaterrecovery.com>
To: Morris, Rhonda M FLNR:EX <Rhonda.Morris@gov.bc.ca>
Sent: March 31, 2022 8:47:18 AM PDT
Attachments: image001.png, image002.png

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

From: Mark Jurisich <mark@deepwaterrecovery.com>
Date: Friday, March 11, 2022 at 9:08 AM
To: LWRS.Minister@gov.bc.ca <LWRS.Minister@gov.bc.ca>
Subject: FW: Vessel recycling

Honorable Josie Osborne,

I am forwarding below email according to instructions from the automatic reply.

Name: Mark Jurisich
Address: 5084 Island Hwy South Union Bay V0R 3B0
Phone: 619.823.5925

Kind Regards,
Mark R. Jurisich
Operations Manager - Canada



If you received this email in error, please advise the sender (by return email or otherwise) immediately. You have consented to receive the attached electronically at the above-noted email address; please retain a copy of this confirmation for future reference.

From: Mark Jurisich <mark@deepwaterrecovery.com>
Date: Wednesday, March 9, 2022 at 9:41 PM
To: josie.osborne.MLA@leg.bc.ca <josie.osborne.MLA@leg.bc.ca>
Subject: Vessel recycling

Honorable Josie Osborne,

I am writing to you with regard to the recent series of defamatory articles, and no doubt correspondence that you have most likely been overwhelmed with concerning our facility in Union Bay. As you may be aware, our company has been the subject of a malicious campaign by 3 retired Oil executives from Alberta, organized and led by Robert Kerr, whom purchased in recent years, residential properties adjacent to our facility which has been an industrial site for over 100 years.

I would like to request a meeting with you, preferably at our site so as you can see firsthand the work we are doing and how important it is for these vessels to be removed from the water and to discuss what course of

action can be taken to stop this slander against our company and its staff, as well as the harassment toward the government employees who have been harassed by Robert Kerr.

This situation has now been perpetuated by Daniel Arbour, who is running for re-election this year for the area of Denman island and Union Bay. It should be noted that Daniel Arbour had made a site visit to our facility in January of 2021 at which time he stated on Social media that our facility was compliant with Zoning Regulations. It should also be noted that Daniel Arbor was accompanied by 5 other staff from the Regional District. It seems somewhat ironic that we are now having these problems in an election year, it has been confirmed to us by a source that has requested to remain anonymous, that this harassment is purely of a political nature. We have been operating for 2 years without issue.

In particular the harassment directed towards Ms. Rhonda Morris and her staff at the office of the **South Island Natural Resource District** has been nothing short of disgraceful. Ms. Morris's office deliberated for two years over a decision to amend our water lease, and due to her extensive consultation with everybody from the K'ómoks First nations, and in particular the Comox Valley Regional District, as well as Transport Canada, The Canadian Coast Guard and Environment Canada amongst others, Ms. Morris acted with absolute responsibility and consideration of all parties involved.

The inuendo and other complaints regarding the dismantling of ships and more recent references to "large containerships" is completely false, we have only removed a total of 9 barges and a small vessel (40 feet) for the Canadian Coast Guard at our site, one barge was a repair for Ledcor, 3 were delivered in a sinking state, and 5 were recycled, anybody would think we were a multinational corporation employing thousands of employees considering all of the attention we have received. We are a company of 6 people, myself included.

It was never our intention to establish a vessel de-commissioning facility in Union Bay, we purchased the IM (Industrial Marine) zoned facility as we also needed a solution for the very service we have provided to other companies, as well as the Canadian Coast Guard and Transport Canada. We would like to be appreciated for having taken a pro-active response to a problem that everybody else has largely ignored. An example of the urgency and priority of this service, would be the 98 meter (approx.. 300 ft), ex-ferry "Trailer Princess" which sank in Duncan Bay (5km north of Campbell River) in mid-February with 1,000's of liters of oil, jet fuel, and other fuels on board. Even though we have made our facility immediately available to receive, contain, and recycle this vessel, there would appear to be a reluctance from the responding authorities for fear of negative press. As a result, this vessel remains on the sea floor and continues to pollute the marine environment as I write this letter to you.

As a Province, and as responsible people, we need to accept the urgency of this problem and not be discouraged by the self-interest of a few residents who feel that a Marine Recycling activity should be closed in order to mitigate, by their own admission, any impact our activity may have on their lifestyles and real-estate values. We can't be expected to shoulder the responsibility of their real-estate decisions.

We have continued to support the problem of Derelict Vessel and Marine Debris removal on the British Columbia coastline, and look forward to continuing our efforts with this ever growing problem.

Yours sincerely,
Mark R. Jurisich
Operations Manager - Canada



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MP G.Johns presses...

From: Michelle Dorjgotov <michelled@deepwaterrecovery.com>
To: Morris, Rhonda M FLNR:EX <Rhonda.Morris@gov.bc.ca>
Sent: April 14, 2022 11:39:53 AM PDT

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Hi Rhonda,

Please find the link below: MP Gord Johns Presses Government On Lack Of Hazardous Ship Breaking Regulations

https://www.youtube.com/watch?v=XtYKF_MM3Yo

Kind regards,
Michelle