



## **BI-WEEKLY STATUS REPORT**

### **Cobble Hill Landfill Closure**

<b>PROJECT # : PRJ18074</b>	<b>File #:</b> 18074- BWR-68
<b>REPORT #:</b> 68	<b>Date:</b> May 15, 2020
<b>SHA REPRESENTATIVES:</b> Dr. Tony Sperling, P.Eng. Scott Garthwaite Carly Wolfe, EIT	<b>Owner:</b> Cobble Hill Holdings Ltd.  <b>Contractor:</b> Allterra Construction Ltd.

#### **Semi Monthly Reporting Requirements SPO MO1701**

##### **Per SPO MO1701 Section 4:**

Commencing in the month that closure activities commence pursuant to the approved Updated Final Closure Plan, the Named Parties must submit semi-monthly status reports, certified by a Qualified Professional. The reports must include the status of closure activities, inspection results, quality control and testing results, photographs which support/document the quality control and testing results, inspection reports and other supporting documents as needed to fully document all stages and components of the closure activities.

##### **Per Condition 10 of June 26, 2019 Letter Re: Second Amended Spill Prevention Order MO1701, dated June 29, 2017 – Final Closure Plan:**

Identification of any deviations from the quality management plan and the construction activities work plan and implementation schedule referenced in conditions 3 and 4 of this approval; The results of inspections, repairs, quality controls and testing, in accordance with the quality management plan referenced in condition 5 of this approval; The planned activities (and associated timing) for the next reporting cycle; and The environmental monitoring program laboratory reports and tabulated results (Quarterly Only-Submitted quarterly, reviewed annually by others). Copies of all soil relocation documentation as required in condition 7 of this approval.

Status reports must be submitted by the 15th and 30th of each month (or the next business day thereafter if the 15th or 30th of the month is not a business day) until closure activities have been completed. Submissions must be made electronically to the following email inbox: [EnvironmentalCompliance@gov.bc.ca](mailto:EnvironmentalCompliance@gov.bc.ca).

## 1. Status of Closure Activities

- Activities related to QMP “Construction Activities” occurred this reporting cycle.
- Completion of the PEA toe drainage soak away trench occurred this reporting period.
- Location of leachate and leak detection pipes and installation of cleanouts occurred this reporting period. Sperling Hansen Associates, Dr. Sperling, P.Eng. was on-site to inspect activities.
- Placement of 50 mm thick sand layer on PEA north slope occurred this period.
- Deployment of 12 oz. non-woven geotextile over sand layer on PEA north slope occurred this period.
- Placement of 200 mm thick drainage gravel layer over 12 oz. geotextile on PEA north slope occurred this period.
- Placement of upper 8 oz. non-woven geotextile over gravel drainage layer occurred this period.
- Installation of soak away trench on east side of PEA occurred this period.
- Placement and compaction of common fill soil stabilizing wedge at toe of PEA occurred this period.
- Soil imporation continued this reporting period.

## 2. Inspection Results

- Permanent Encapsulation Area (PEA): Liner appears to be in good condition. Areas where the PEA geomembrane cover was cut to expose the leachate and leak detection pipes have been professionally repaired, patched, and welded by Western Tank & Lining (WTL).
- Soil Management Area (SMA): All works are in good condition. A small amount of soil was relocated to the SMA this reporting period as detailed in attached daily reports.
- Cut-off ditch upland of PEA: All works are in good condition, ditch still performing well.
- Pictures detailing inspection results are shown at the end of this report.

## 3. Results of Inspections, Repairs, Quality Controls and Testing, in Accordance with the Quality Management Plan

- PEA liner cutting and repairing occurred this reporting cycle and has been documented in the attached daily site inspection reports.
- QP was on-site during liner works and visually inspected all liner patches and boots for integrity.
- All repairs completed with an extrusion welding machine were tested with a Vac-Box test.
- A small hole accidentally punched into bottom liner while attempting to locate west clean out. Area around hole was exposed and cleaned, a patch was welded over the perforation. Patch was inspected and tested to confirm integrity.

**4. Identification of Any Deviations from the Quality Management Plan and the Construction Activities Work Plan and Implementation Schedule**

<input type="checkbox"/> NO DEVIATIONS OCCURRED THIS REPORTING PERIOD	Notes:
<input checked="" type="checkbox"/> DEVIATIONS OCCURRED THIS REPORTING PERIOD	<p>Cobble Hill Landfill Closure Construction 2020 schedule is attached</p> <p>A design modification was introduced with respect to clean-outs given the site geometry. To make clean outs more reliable and easier to access it was determined that it would be much better to run the clean outs laterally to the east and extend the western cleanout vertically rather than extend them up-slope with sharp bends to the crest of the landfill.</p> <p>It was determined on site that the western sub-liner leak detection clean out on the west side of the landfill could not be safely located without undertaking a major excavation and damage to the bottom liner. It was determined that a single clean out on the east side of the landfill could be used to reliably clean out the entire sub liner perforated pipe using a jetting tool launched from the east clean out so that the west clean out was not necessary. A field decision was made to implement same.</p>

**5. The Planned Activities (and associated timing) for the Next Reporting Cycle**

- Soil importation is to continue into the subsequent reporting cycle.
- Placement of 50 mm thick sand layer on PEA is to continue into the subsequent reporting cycle.
- Deployment of 12 oz. geotextile over sand layer on PEA is to continue into the subsequent reporting cycle.
- Placement of drainage gravel over 12 oz. geotextile layer on PEA is to continue into the subsequent reporting cycle.
- Placement and compaction of common fill soil stabilizing wedge is to continue into the subsequent reporting cycle.

## 6. Environmental Monitoring Program Laboratory Reports and Tabulated Results

- Tabulated results and laboratory certificates are attached for SW-1 (April 30, 2020).

## 7. Copies of All Soil Relocation Documentation

- Origin site land use was assessed via Technical Guidance 10 on Contaminated Sites. Soil quality was confirmed per letters of assurance provided by CSAP to BC ENV.

## 8. Leachate Volumes Over Reporting Period

- Total Leachate Collected: 6.46 m<sup>3</sup>
- Total Leachate Stored: 15.00 m<sup>3</sup>
- Total Leachate Transferred: 0.00 m<sup>3</sup>

## 9. Photographs



**Picture # 1: Looking west at PEA**



**Picture #2: Looking west at common fill at toe of PEA**



**Picture #3: Looking east at common fill at toe of PEA**



**Picture #4: Looking east at north slope of PEA. Sand blanket, 12 oz. geotextile, and drainage gravel installed on lower north slope.**



**Picture #5: On May 12, 2020 there was a small rain induced failure of the sand blanket on the north slope of the PEA, which Allterra repaired.**

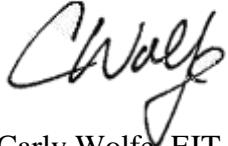


**Picture #6: Allterra repaired sand blanket and deployed 12 oz. geotextile and drainage gravel**



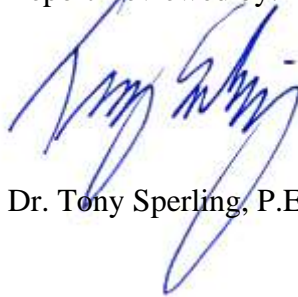
**Picture #7 : Allterra placed and compacted common fill against PEA slope to secure sand blanket and cover layers. Geotextile intentionally peeled back to show underlying gravel layer**

Report prepared by:



Carly Wolfe, EIT

Report Reviewed by:



Dr. Tony Sperling, P.Eng.



May 13, 2020

**Note:** Report prepared by Sperling Hansen Associates Inc. If those in attendance have additions or objections to these notes, they should report back to Sperling Hansen Associates (SHA) within 3 days of receipt, otherwise, these notes will be considered a complete and accurate permanent record of this reporting period.

**Attachments:**

*Cobble Hill Landfill Closure Construction 2020 schedule*

*SIR #2 Cobble Hill Landfill Closure Site Inspection Report – May 7, 2020*

*SIR #3 Cobble Hill Landfill Closure Site Inspection Report – May 11, 2020*

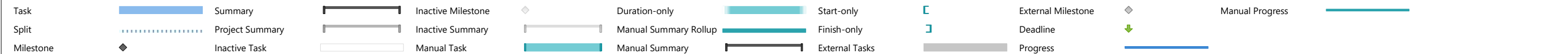
*Analytical tables for April 2020 Sampling*

*COAs for SW-1*

Cobble Hill Landfill Closure Construction 2020



Project: CHH Mine  
Date: May 4, 2020







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## **SITE INSPECTION REPORT**

### **Cobble Hill Landfill Closure**

**PROJECT # : PRJ18074**

**File #:** 18074- SIR#2

**SHA REPRESENTATIVE:**

**Date:** May 7, 2020

Dr. Tony Sperling, P.Eng.

**Time:** 9:30AM – 3:30PM

**Owner:**

Cobble Hill Holdings Ltd.

**Weather**

**Morning:** Sun

**Contractor:**

Allterra Construction Ltd

**Afternoon:** Mixed Sun and Cloud

#### **Construction Activities:**

Sperling Hansen Associates (SHA) performed a site inspection on May 7, 2020 at the Cobble Hill Landfill (Landfill) to assess the site construction progress and the implementation of the Closure Plan design. This report summarizes the Landfill site inspection findings and concludes by identifying action items.



**Picture # 1:** Looking at east side of Permanent Encapsulation Area (PEA). Allterra's goal for the day was to locate and expose the existing leachate collection and sub liner leak detection pipes to install a total of four (4) cleanouts. Refer to attached Figure 4-6 for cross section showing detail for leachate collection and leak detection piping.



**Picture # 2:** Allterra cutting hole in PEA geomembrane on east side to expose existing leachate collector pipe to install cleanouts.



**Picture # 3:** Allterra excavated out the material located under the PEA cover geomembrane in the exposed areas. All excavated soil was either backfilled under the PEA geomembrane or placed into mega bags and stored in the Soil Management Area (SMA).



**Picture # 4:** Allterra located the leachate collection pipe on the east side. Allterra also hand excavated material and exposed the leak detection pipe located under the basal liner.



**Picture # 5:** Allterra located the leachate collection pipe on the west side and installed cleanout pipe extension .

During the excavation the bottom liner was punctured by the back hoe. A temporary patch was glued over the tear and plans were made for WTL to patch the tear properly on Monday, May 11<sup>th</sup>.

Due to the steep slope west of the liner limits it was not possible to attempt to locate the sub liner leak detection piping on the west side of the PEA (the pipe was installed before the bottom liner and at the time there were no plans for clean outs. SHA proposed adding clean outs only after our company took over the engineering of this landfill.)

A decision was made in the field by SHA's Dr. Sperling in consultation with Raymond Lam of Allterra to instead rely on a single clean out on the east side of the leak detection piping. It was decided that it would be acceptable to utilize only the eastern cleanout for the leak detection pipe as opposed to having cleanouts on both the west and east sides of the pipe. In the event that the leak detection pipe needs to be cleaned, the intention is to use a device such as a hydrojet from the east cleanout to clean the line.



**Picture # 6:** Completed soak away trench at toe of north slope covered with 8 oz. geotextile and fill material. The upper geotextile is temporarily extended over the gravel drainage layer. This layer was later folded back and over the 200 mm gravel drainage layer placed on the slope with a stone slinger.

**Notes:**

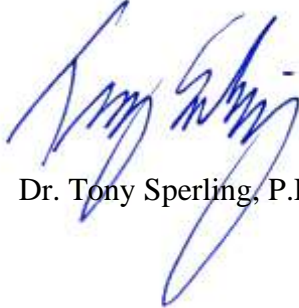
1. During excavation at the west side leachate collection pipe cleanout area, a rip occurred in the bottom liner. WTL is scheduled to be on site next week to install the necessary patches and repairs.

Report prepared by:



Carly Wolfe, EIT.

Report reviewed by:



Dr. Tony Sperling, P.Eng.



**Note:** Report prepared by Sperling Hansen Associates Inc. If those in attendance have additions or objections to these notes, they should report back to Sperling Hansen Associates (SHA) within 3 days of receipt, otherwise, these notes will be considered a complete and accurate permanent record of this day.

*Enclosure: Nil*



SPERLING  
HANSEN  
ASSOCIATES

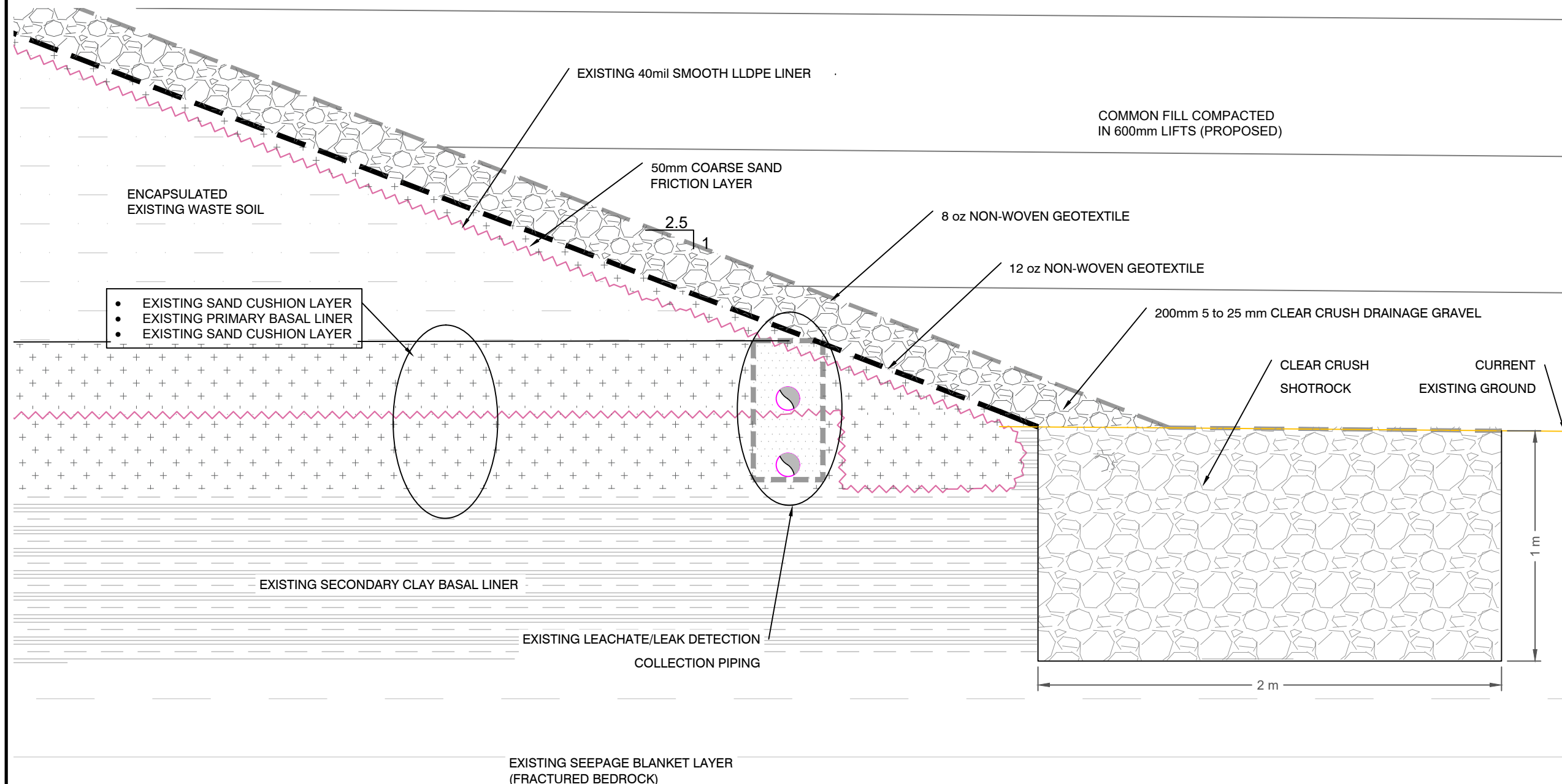
Landfill Services Group

- Landfill Siting
- Design & Operations Plans
- Landfill Closure
- Environmental Monitoring

#8 - 1225 East Keith Road  
North Vancouver, B.C. V7J 1J3  
Phone: (604) 986-7723  
Fax: (604) 986-7734

LEGEND:

- EXISTING PIPING
- PROPOSED PIPING
- EXISTING GROUND
- EXISTING 40mil LLDPE SMOOTH LINER
- PROPOSED 12oz NON-WOVEN GEOTEXTILE
- PROPOSED 8oz NON-WOVEN GEOTEXTILE



- EXISTING SAND CUSHION LAYER
- EXISTING PRIMARY BASAL LINER
- EXISTING SAND CUSHION LAYER

**PEA TOE DRAINAGE SOAK AWAY TRENCH**  
SCALE 1:20

CLIENT:  
**COBBLE HILL HOLDINGS LTD.**

PROJECT:  
**COBBLE HILL LANDFILL  
UPDATED FINAL CLOSURE PLAN  
2019**

TITLE:  
**PEA TOE DRAINAGE SOAK  
AWAY TRENCH**

SCALE: 1:20	DATE: 2018/01/22 <small>yyyy/mm/dd</small>	PROJECT NO: PRJ 18074
DESIGNED SG	DRAWING NO: <b>FIGURE 4-6</b>	
DRAWN MG		
CHECKED TS		



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## **SITE INSPECTION REPORT**

### **Cobble Hill Landfill Closure**

**PROJECT # : PRJ18074**

**File #:** 18074- SIR#3

**SHA REPRESENTATIVE:**

**Date:** May 11, 2020

Dr. Tony Sperling, P.Eng.

**Time:** 10:30AM – 5:00 PM

**Owner:**

Cobble Hill Holdings Ltd.

**Weather**

**Morning:** Sun

**Contractor:**

Allterra Construction Ltd

**Afternoon:** Sun

#### **Construction Activities:**

Sperling Hansen Associates (SHA) performed a site inspection on Monday, May 11, 2020 at the Cobble Hill Landfill (Landfill) to assess the site construction progress and the implementation of the Closure Plan design. This report summarizes the Landfill site inspection findings and concludes by identifying action items.





**Picture # 1:** Western Tank & Lining (WTL) was on-site to install patches and boots on the areas where the PEA geomembrane was cut to expose the leachate collection pipes.



**Picture # 2:** WTL installing patch on PEA geomembrane with extrusion welding machine.



**Picture # 3:** Close up of WTL extrusion welding patch on PEA geomembrane.



**Picture # 4:** WTL tech used a vacuum to remove small amount of water pooled below the invert of the leachate collector pipe at the west leachate collector cleanout so that WTL could repair liner hole on the bottom liner.



**Picture # 5:** WTL extrusion welding patch on bottom liner at west cleanout area.



**Picture # 6:** WTL completed pipe liner penetration boot on east side of PEA. All extrusion welds were inspected and tested.



**Picture # 7:** Allterra workers stretching lower geotextile on east edge of PEAso a stone slinger can place gravel layer (min. 200 mm thick) on PEA north side slopes over the sand layer.



**Picture # 8:** Allterra used a stone slinger to place 200 mm thick layer of 5 to 25 mm clear crush drainage gravel on the PEA north side slopes above the 12 oz. geotextile.



**Picture # 9:** North side slope of PEA with 5-25 mm drainage gravel layer, geotextile, and sand layer installed.



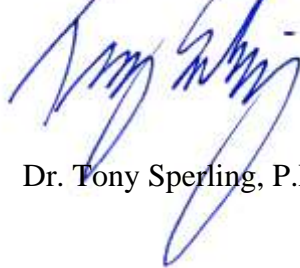
**Picture # 10:** Allterra ensured direct hydraulic contact between drainage gravel on side slopes and soak away trench at north toe of the PEA.

Report prepared by:



Carly Wolfe, EIT.

Report reviewed by:



Dr. Tony Sperling, P.Eng.



May 13, 2020

**Note:** Report prepared by Sperling Hansen Associates Inc. If those in attendance have additions or objections to these notes, they should report back to Sperling Hansen Associates (SHA) within 3 days of receipt, otherwise, these notes will be considered a complete and accurate permanent record of this day.

Enclosure: Nil

## Analytical Table Footnotes: Leachate and Surface Water

All concentrations in mg/L, except pH or as indicated.

"<" less than the laboratory detection limit indicated.

"-" means not analyzed or no standard or guideline applies.

\* RPDs are not normally calculated where one or more concentrations are less than five times RDL.

(1) Guideline of 15 mg/L Pt for Drinking Water. Once background levels are established, colour should also not exceed 5 mg/L above background, to protect for Aquatic Life. This is considered a clearwater system (background less than 20 mg/L Pt.)

(2) Nitrite BCAWWQG Guideline is Chloride dependent

(3) Standard is calculated based on the hardness dependent BCAWWQG formula, and has been calculated and shown for each individual result

(4) pH-dependent maximum where instant pH < 6.5

**BOLD, UNDERLINE**

Laboratory Detection Limit exceeds one or more applicable Standard

**BOLD, BLUE SHADING**

Concentration greater than BCAWWQG Guideline

**BOLD, BEIGE SHADING**

Concentration greater than BCAWWQG Chronic Guideline

**BOLD, GREEN SHADING**

Concentration greater than BC Ministry of Environment Drinking Water Sources



Table 1: Analytical Results for Nutrients			SHA-SW-1
Laboratory ID			0050065-01
Sample ID	BC DRINKING WATER QUALITY GUIDELINES	BC FRESHWATER AQUATIC LIFE WATER QUALITY GUIDELINES	SW1
Date Sampled/Time			2020-04-30
<b>Physical Tests</b>			
Colour, True (Colour Units)	15 TCU	15 <sup>(1)</sup> units absolute, or 5 units above background (30-day average)	<5.0
Total Dissolved Solids (mg/L)	-	-	241
Total Suspended Solids (mg/L)	-	25 mg/L above background (24-hr during clear flow)	<2.0
pH	7-10.5	6.5-9	7.63
Conductivity (uS/cm)	-	-	350
Hardness (as CaCO <sub>3</sub> )	-	-	173
Turbidity (NTU)	Δ1 NTU	8 NTU above background (24-hr during clear flow)	0.26
<b>Anions and Nutrients mg/L</b>			
Alkalinity Bicarbonate (as CaCO <sub>3</sub> )	<10 high sensitivity to acid inputs 10-20 moderate sensitivity to acid inputs >20 low sensitivity to acid inputs		138
Alkalinity Carbonate (as CaCO <sub>3</sub> )			<1.0
Acid Sensitivity			Low
Chloride (Cl)	250 mg/L	600 mg/L (instant max), 150 mg/L (30-day average)	9.24
Fluoride (F)	1.5 mg/L (instant max) 1.0 mg/L (30-day average)	0.4 (Hardness <10mg/L)	<0.10
		Hardness-Dependent AW (Hardness is >10mg/L) <sup>(3)</sup>	0.30
Nitrate (as N)	45 mg/L	32.8 mg/L (instant maximum) 3.0 mg/L (30-day average)	0.17
Nitrite (as N) <sup>(2)</sup>	3 mg/L	Cl > 10 mg/L 0.6 mg/L (MAX), 0.2 mg/L (30-day average)	<0.010
Sulfate (SO <sub>4</sub> ) H 0-30 mg/L	500 mg/L	128 mg/L 30-day average)	
H 31 - 75 mg/L		218 mg/L (30-day average)	
H 76 - 180 mg/L		309 mg/L (30-day average)	66.6
H 181 - 250 mg/L		429 mg/L (30-day average)	
H > 250 mg/L		TBD	

Notes: Refer to Table Endnotes (attached)

Table 2: Analytical Results for Total Metals			SHA-SW-1
Laboratory ID	BC DRINKING WATER QUALITY GUIDELINES	BC FRESHWATER AQUATIC LIFE WATER QUALITY GUIDELINES	0050065-01
Sample ID			SW1
Date Sampled/Time			2020-04-30
<b>Physical Tests</b>			
Hardness (as CaCO <sub>3</sub> ) (mg/L)	-	-	173
pH	7-10.5	6.5-9	7.63
<b>Total Metals (mg/L)</b>			
Aluminum (Al)-Total	0.2	-	0.0114
Antimony (Sb)-Total	-	-	<0.00020
Arsenic (As)-Total	0.01	0.005	<0.00050
Barium (Ba)-Total	-	-	0.0096
Beryllium (Be)-Total	-	-	<0.00010
Bismuth, total	-	-	<0.00010
Boron (B)-Total	5	1.2	0.192
Cadmium (Cd)-Total	-	-	<0.000010
Calcium (Ca)-Total	-	-	55.1
Chromium (Cr)-Total	-	-	<0.00050
Chromium (Cr(III))	-	-	
Chromium (Cr(VI))	-	-	
Cobalt (Co)-Total	-	0.110 (Short Term), 0.004 (Long Term Average)	<0.00010
Copper (Cu)-Total	0.5	Hardness-Dependent <sup>(2)</sup>	0.00145
		Hardness-Dependent BCAWQG to protect AW <sup>(3)</sup> (instant max)	0.0183
		Hardness-Dependent BCAWQG to protect AW <sup>(3)</sup> (30-d average)	0.0069
Iron (Fe)-Total	-	1	0.013
Lead (Pb)-Total	0.01	Hardness-Dependent <sup>(3)</sup>	<0.00020
		Hardness-Dependent BCAWQG to protect AW <sup>(3)</sup> (instant max)	0.1640
		Hardness-Dependent BCAWQG to protect AW <sup>(3)</sup> (30-d average)	0.0097
Lithium (Li)-Total	-	-	0.00013
Magnesium (Mg)-Total	-	-	7.9
Manganese (Mn)-Total	-	Hardness Dependent <sup>(3)</sup>	0.00186
		Hardness-Dependent BCAWQG to protect AW <sup>(3)</sup> (instant max)	2.4
		Hardness-Dependent BCAWQG to protect AW <sup>(3)</sup> (30-d average)	1.4
Mercury (Hg)-Total	0.001	0.00002	-
Molybdenum (Mo)-Total	0.25	≤1 (instant max) 2 (30-d average)	0.00066
Nickel (Ni)-Total	-	0.025 (Hardness-Dependent <sup>(3)</sup> BCAWQG to protect AW H<60mg/L)	0.00057
		Calculated Hardness-Dependent <sup>(3)</sup> BCAWQG to protect AW 60SHs180 mg/L CaCO <sub>3</sub>	0.145
Phosphorus(P)-Total	-	-	<0.050
Potassium (K)-Total	-	-	0.67
Selenium (Se)-Total	0.01	0.002	<0.00050
Silicon (Si)-Total	-	-	4.9
Silver (Ag)-Total	-	HARDNESS <100mg/L 0.0001 (SHORT TERM), 0.00005 (LONG TERM), HARDNESS >100mg/L 0.003 (SHORT TERM), 0.0015 (LONG TERM)	<0.000050
Sodium (Na)-Total	-	-	7.17
Strontium (Sr)-Total	-	-	0.154
Sulfur (S)-Total	-	-	22.5
Tellurium (Te)-Total	-	-	<0.00050
Thallium (Tl)-Total	-	-	<0.000020
Thorium (Th)-Total	-	-	<0.00010
Tin (Sn)-Total	-	-	<0.00020
Titanium (Ti)-Total	-	-	<0.0050
Tungsten (W)-Total	-	-	<0.0010
Uranium (U)-Total	-	-	0.000857
Vanadium (V)-Total	-	-	0.001
Zinc (Zn)-Total	5.0	Hardness >90 mg/L	<0.0040
		Hardness-Dependent BCAWQG to protect AW <sup>(3)</sup> (instant max)	0.095
		Hardness-Dependent BCAWQG to protect AW <sup>(3)</sup> (30-d average)	0.070
Zirconium (Zr)-Total	-	-	<0.00010

Table 3: Analytical Results for Dissolved Metals			SHA-SW-1
Laboratory ID			0050065-01
Sample ID	BC DRINKING WATER QUALITY GUIDELINES	BC FRESHWATER AQUATIC LIFE WATER QUALITY GUIDELINES	SW1
Date Sampled/Time			2020-04-30
Physical Tests			
Hardness (as CaCO3) (mg/L)	-	-	173
pH	7-10.5	6.5-9	7.63
Dissolved Metals (mg/L)			
Aluminum (Al)-Dissolved	-	0.05 (30-day average where median pH > 6.5) 0.1 (maximum where instantaneous pH > 6.5) *** indicates pH-dependent maximum where instantaneous pH ≤ 6.5	<0.0050
		pH/Hardness Dependent BCAWQG to protect AW <sup>(4)</sup> (instant max)	0.521
		pH/Hardness Dependent BCAWQG to protect AW <sup>(4)</sup> (30-d Mean)	0.683
Antimony (Sb)-Dissolved	-	-	<0.00020
Arsenic (As)-Dissolved	-	-	<0.00050
Barium (Ba)-Dissolved	-	-	0.009
Beryllium (Be)-Dissolved	-	-	<0.00010
Bismuth (Bi)-Dissolved	-	-	<0.00010
Boron (B)-Dissolved	-	-	0.0055
		Hardness-Dependent <sup>(3)</sup>	<0.000010
Cadmium (Cd)-Dissolved	-	Calculated Hardness-Dependent <sup>(3)</sup> BCAWQG to protect AW (short-term max) $e^{[1.03 * \ln(Hss) - 5.274]}$ ug/L H<455mg/L	0.00103
	-	Calculated Hardness-Dependent BCAWQG to protect AW <sup>(5)</sup> (long-term max) $e^{[0.736 * \ln(Hss) - 4.943]}$ ug/L H<285mg/L	0.00032
Calcium (Ca)-Dissolved	-	up to 4, highly sensitive to acid inputs 4 to 8, moderately sensitive over 8 low sensitivity	57.6 Low
Chromium (Cr)-Dissolved	-	-	<0.00050
Cobalt (Co)-Dissolved	-	-	<0.00010
Copper (Cu)-Dissolved	-	-	0.00082
Iron (Fe)-Dissolved	-	0.35	<0.010
Lead (Pb)-Dissolved	-	-	<0.00020
Lithium, dissolved	-	-	<0.00010
Magnesium (Mg)-Dissolved	-	-	7.07
Manganese (Mn)-Dissolved	-	-	0.00078
Mercury (Hg)-Dissolved	-	-	-
Molybdenum (Mo)-Dissolved	-	-	0.00058
Nickel (Ni)-Dissolved	-	-	<0.00040
Phosphorus (P)-Dissolved	-	-	<0.050
Potassium (K)-Dissolved	-	-	0.59
Selenium (Se)-Dissolved	-	-	<0.00050
Silicon (Si)-Dissolved	-	-	4.8
Silver (Ag)-Dissolved	-	-	<0.000050
Sodium (Na)-Dissolved	-	-	6.46
Strontium (Sr)-dissolved	-	-	0.147
Sulfur (S)-Dissolved	-	-	21.5
Tellurium (Te)-Dissolved	-	-	<0.00050
Thallium (Tl)-Dissolved	-	-	<0.000020
Thorium (Th)-Dissolved	-	-	<0.00010
Tin (Sn)-Dissolved	-	-	<0.00020
Titanium (Ti)-Dissolved	-	-	<0.0050
Tungsten (W)-Dissolved	-	-	<0.0010
Uranium (U)-Dissolved	-	-	0.000783
Vanadium (V)-Dissolved	-	-	<0.0010
Zinc (Zn)-Dissolved	-	-	<0.0040
Zirconium (Zr)-Dissolved	-	-	<0.00010

Notes: Refer to Table Endnotes (attached)

Table 4: Analytical Results for Hydrocarbons and PAHs			SHA-SW-1
Laboratory ID	BC DRINKING WATER QUALITY GUIDELINES	BC FRESHWATER AQUATIC LIFE WATER QUALITY GUIDELINES	0050065-01
Sample ID			SW1
Date Sampled/ Time			2020-04-30
<b>Hydrocarbons ug/L</b>			
LEPH	-	-	<250
HEPH	-	-	<250
<b>Polycyclic Aromatic</b>			
Acenaphthene	-	6 (LONG TERM)	<0.050
Acenaphthylene	-	-	<0.200
Acridine	-	3 (LONG TERM), 0.05 (PHOTOTOXIC)	<0.050
Anthracene	-	4 (LONG TERM), 0.1 (PHOTOTOXIC)	<0.010
Benz(a)anthracene	0.01	0.1 (LONG TERM), 0.1 (PHOTOTOXIC)	<0.010
Benzo(a)pyrene	-	0.01 (LONG TERM)	<0.010
Benzo(b)fluoranthene	-	-	-
Benzo(b+j)fluoranthene	-	-	<0.050
Benzo(g,h,i)perylene	-	-	<0.050
Benzo(k)fluoranthene	-	-	<0.050
2-Chloronaphthalene			<0.100
Chrysene	-	-	<0.050
Dibenz(a,h)anthracene	-	-	<0.010
Fluoranthene	-	4 (LONG TERM), 0.2 (PHOTOTOXIC)	<0.030
Fluorene	-	12 (LONG TERM)	<0.050
Indeno(1,2,3-c,d)pyrene	-	-	<0.050
1-Methylnaphthalene			<0.100
2-Methylnaphthalene			<0.100
Naphthalene	-	1 (LONG TERM)	<0.200
Phenanthrene	-	0.3 (LONG TERM)	<0.100
Pyrene	-	0.02 (PHOTOTOXIC)	<0.020
Quinoline	-	-	<0.050

Notes: Refer to Table Endnotes (attached)

## CERTIFICATE OF ANALYSIS

**REPORTED TO** Allterra Construction  
2158 Millstream Road  
Victoria, BC V9B 6H4

**ATTENTION** Rahim Gaidhar

**PO NUMBER** 17-932

**PROJECT** 17-932

**PROJECT INFO**

**WORK ORDER** 0050065

**RECEIVED / TEMP** 2020-05-01 11:00 / 5°C  
**REPORTED** 2020-05-08 15:13

**COC NUMBER** B72251

### Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO 17025:2005 for specific tests listed in the scope of accreditation approved by CALA.

#### *Big Picture Sidekicks*



You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

#### *We've Got Chemistry*



It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

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Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

If you have any questions or concerns, please contact me at [nyjpp@caro.ca](mailto:nyjpp@caro.ca)

#### Authorized By:

Nicole Yipp  
Team Lead, Client Service

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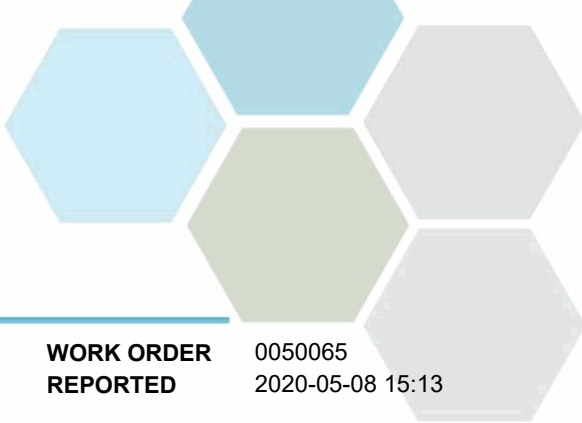
#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7

## TEST RESULTS

**REPORTED TO PROJECT** Allterra Construction  
17-932

**WORK ORDER REPORTED** 0050065  
2020-05-08 15:13

Analyte	Result	RL	Units	Analyzed	Qualifier
<b>SW1 (0050065-01)   Matrix: Water   Sampled: 2020-04-30 11:00</b>					
<b>Anions</b>					
Chloride	9.24	0.10	mg/L	2020-05-02	
Fluoride	< 0.10	0.10	mg/L	2020-05-02	
Nitrate (as N)	0.170	0.010	mg/L	2020-05-02	
Nitrite (as N)	< 0.010	0.010	mg/L	2020-05-02	
Sulfate	66.6	1.0	mg/L	2020-05-02	
<b>BCMOE Aggregate Hydrocarbons</b>					
EPHw10-19	< 250	250	µg/L	2020-05-08	
EPHw19-32	< 250	250	µg/L	2020-05-08	
LEPHw	< 250	250	µg/L	N/A	
HEPHw	< 250	250	µg/L	N/A	
Surrogate: 2-Methylnonane (EPH/F2-4)	83	60-126	%	2020-05-08	
<b>Calculated Parameters</b>					
Hardness, Total (as CaCO3)	173	0.500	mg/L	N/A	
<b>Dissolved Metals</b>					
Lithium, dissolved	< 0.00010	0.00010	mg/L	2020-05-08	
Aluminum, dissolved	< 0.0050	0.0050	mg/L	2020-05-08	
Antimony, dissolved	< 0.00020	0.00020	mg/L	2020-05-08	
Arsenic, dissolved	< 0.00050	0.00050	mg/L	2020-05-08	
Barium, dissolved	0.0090	0.0050	mg/L	2020-05-08	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2020-05-08	
Bismuth, dissolved	< 0.00010	0.00010	mg/L	2020-05-08	
Boron, dissolved	0.0055	0.0050	mg/L	2020-05-08	
Cadmium, dissolved	< 0.000010	0.000010	mg/L	2020-05-08	
Calcium, dissolved	57.6	0.20	mg/L	2020-05-08	
Chromium, dissolved	< 0.00050	0.00050	mg/L	2020-05-08	
Cobalt, dissolved	< 0.00010	0.00010	mg/L	2020-05-08	
Copper, dissolved	0.00082	0.00040	mg/L	2020-05-08	
Iron, dissolved	< 0.010	0.010	mg/L	2020-05-08	
Lead, dissolved	< 0.00020	0.00020	mg/L	2020-05-08	
Magnesium, dissolved	7.07	0.010	mg/L	2020-05-08	
Manganese, dissolved	0.00078	0.00020	mg/L	2020-05-08	
Molybdenum, dissolved	0.00058	0.00010	mg/L	2020-05-08	
Nickel, dissolved	< 0.00040	0.00040	mg/L	2020-05-08	
Phosphorus, dissolved	< 0.050	0.050	mg/L	2020-05-08	
Potassium, dissolved	0.59	0.10	mg/L	2020-05-08	
Selenium, dissolved	< 0.00050	0.00050	mg/L	2020-05-08	
Silicon, dissolved	4.8	1.0	mg/L	2020-05-08	
Silver, dissolved	< 0.000050	0.000050	mg/L	2020-05-08	
Sodium, dissolved	6.46	0.10	mg/L	2020-05-08	
Strontium, dissolved	0.147	0.0010	mg/L	2020-05-08	



# TEST RESULTS

**REPORTED TO PROJECT** Allterra Construction  
17-932

**WORK ORDER REPORTED** 0050065  
2020-05-08 15:13

Analyte	Result	RL	Units	Analyzed	Qualifier
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**SW1 (0050065-01) | Matrix: Water | Sampled: 2020-04-30 11:00, Continued**

**Dissolved Metals, Continued**

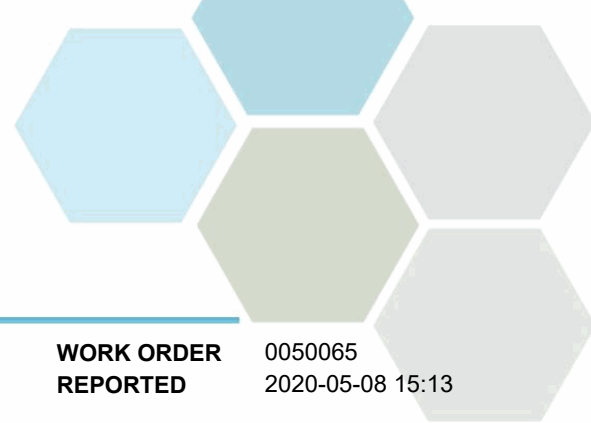
Sulfur, dissolved	21.5	3.0	mg/L	2020-05-08	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2020-05-08	
Thallium, dissolved	< 0.000020	0.000020	mg/L	2020-05-08	
Thorium, dissolved	< 0.00010	0.00010	mg/L	2020-05-08	
Tin, dissolved	< 0.00020	0.00020	mg/L	2020-05-08	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2020-05-08	
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2020-05-08	
Uranium, dissolved	0.000783	0.000020	mg/L	2020-05-08	
Vanadium, dissolved	< 0.0010	0.0010	mg/L	2020-05-08	
Zinc, dissolved	< 0.0040	0.0040	mg/L	2020-05-08	
Zirconium, dissolved	< 0.00010	0.00010	mg/L	2020-05-08	

**General Parameters**

Alkalinity, Total (as CaCO3)	138	1.0	mg/L	2020-05-05	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2020-05-05	
Alkalinity, Bicarbonate (as CaCO3)	138	1.0	mg/L	2020-05-05	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2020-05-05	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2020-05-05	
Conductivity (EC)	350	2.0	µS/cm	2020-05-05	
pH	7.63	0.10	pH units	2020-05-05	HT2
Solids, Total Dissolved	241	15	mg/L	2020-05-05	
Solids, Total Suspended	< 2.0	2.0	mg/L	2020-05-05	
Turbidity	0.26	0.10	NTU	2020-05-02	

**Polycyclic Aromatic Hydrocarbons (PAH)**

Acenaphthene	< 0.050	0.050	µg/L	2020-05-08	
Acenaphthylene	< 0.200	0.200	µg/L	2020-05-08	
Acridine	< 0.050	0.050	µg/L	2020-05-08	
Anthracene	< 0.010	0.010	µg/L	2020-05-08	
Benz(a)anthracene	< 0.010	0.010	µg/L	2020-05-08	
Benzo(a)pyrene	< 0.010	0.010	µg/L	2020-05-08	
Benzo(b+j)fluoranthene	< 0.050	0.050	µg/L	2020-05-08	
Benzo(g,h,i)perylene	< 0.050	0.050	µg/L	2020-05-08	
Benzo(k)fluoranthene	< 0.050	0.050	µg/L	2020-05-08	
2-Chloronaphthalene	< 0.100	0.100	µg/L	2020-05-08	
Chrysene	< 0.050	0.050	µg/L	2020-05-08	
Dibenz(a,h)anthracene	< 0.010	0.010	µg/L	2020-05-08	
Fluoranthene	< 0.030	0.030	µg/L	2020-05-08	
Fluorene	< 0.050	0.050	µg/L	2020-05-08	
Indeno(1,2,3-cd)pyrene	< 0.050	0.050	µg/L	2020-05-08	
1-Methylnaphthalene	< 0.100	0.100	µg/L	2020-05-08	
2-Methylnaphthalene	< 0.100	0.100	µg/L	2020-05-08	
Naphthalene	< 0.200	0.200	µg/L	2020-05-08	



# TEST RESULTS

**REPORTED TO PROJECT** Allterra Construction  
17-932

**WORK ORDER REPORTED** 0050065  
2020-05-08 15:13

Analyte	Result	RL	Units	Analyzed	Qualifier
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**SW1 (0050065-01) | Matrix: Water | Sampled: 2020-04-30 11:00, Continued**

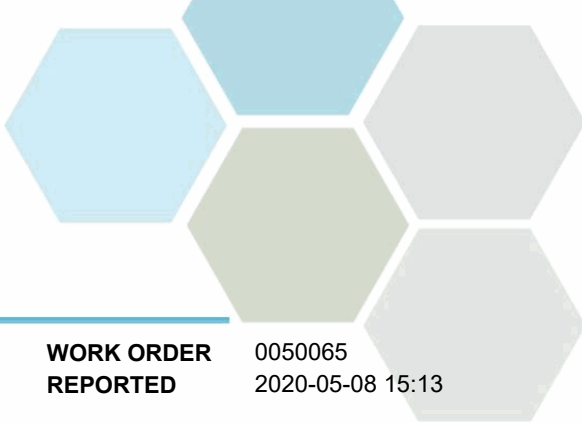
*Polycyclic Aromatic Hydrocarbons (PAH), Continued*

Phenanthrene	< 0.100	0.100	µg/L	2020-05-08	
Pyrene	< 0.020	0.020	µg/L	2020-05-08	
Quinoline	< 0.050	0.050	µg/L	2020-05-08	
Surrogate: Acridine-d9	90	50-140	%	2020-05-08	
Surrogate: Naphthalene-d8	129	50-140	%	2020-05-08	
Surrogate: Perylene-d12	116	50-140	%	2020-05-08	

**Total Metals**

Aluminum, total	0.0114	0.0050	mg/L	2020-05-07	
Antimony, total	< 0.00020	0.00020	mg/L	2020-05-07	
Arsenic, total	< 0.00050	0.00050	mg/L	2020-05-07	
Barium, total	0.0096	0.0050	mg/L	2020-05-07	
Beryllium, total	< 0.00010	0.00010	mg/L	2020-05-07	
Bismuth, total	< 0.00010	0.00010	mg/L	2020-05-07	
Boron, total	0.192	0.0050	mg/L	2020-05-07	
Cadmium, total	< 0.000010	0.000010	mg/L	2020-05-07	
Calcium, total	55.1	0.20	mg/L	2020-05-07	
Chromium, total	< 0.00050	0.00050	mg/L	2020-05-07	
Cobalt, total	< 0.00010	0.00010	mg/L	2020-05-07	
Copper, total	0.00145	0.00040	mg/L	2020-05-07	
Iron, total	0.013	0.010	mg/L	2020-05-07	
Lead, total	< 0.00020	0.00020	mg/L	2020-05-07	
Lithium, total	0.00013	0.00010	mg/L	2020-05-07	
Magnesium, total	7.90	0.010	mg/L	2020-05-07	
Manganese, total	0.00186	0.00020	mg/L	2020-05-07	
Molybdenum, total	0.00066	0.00010	mg/L	2020-05-07	
Nickel, total	0.00057	0.00040	mg/L	2020-05-07	
Phosphorus, total	< 0.050	0.050	mg/L	2020-05-07	
Potassium, total	0.67	0.10	mg/L	2020-05-07	
Selenium, total	< 0.00050	0.00050	mg/L	2020-05-07	
Silicon, total	4.9	1.0	mg/L	2020-05-07	
Silver, total	< 0.000050	0.000050	mg/L	2020-05-07	
Sodium, total	7.17	0.10	mg/L	2020-05-07	
Strontium, total	0.154	0.0010	mg/L	2020-05-07	
Sulfur, total	22.5	3.0	mg/L	2020-05-07	
Tellurium, total	< 0.00050	0.00050	mg/L	2020-05-07	
Thallium, total	< 0.000020	0.000020	mg/L	2020-05-07	
Thorium, total	< 0.00010	0.00010	mg/L	2020-05-07	
Tin, total	< 0.00020	0.00020	mg/L	2020-05-07	
Titanium, total	< 0.0050	0.0050	mg/L	2020-05-07	
Tungsten, total	< 0.0010	0.0010	mg/L	2020-05-07	
Uranium, total	0.000857	0.000020	mg/L	2020-05-07	
Vanadium, total	0.0010	0.0010	mg/L	2020-05-07	





## TEST RESULTS

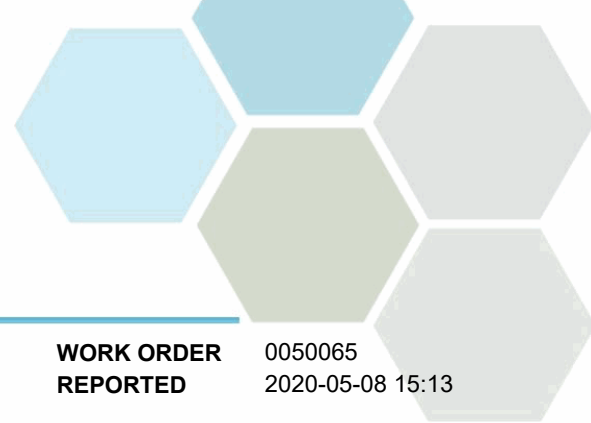
**REPORTED TO** Allterra Construction  
**PROJECT** 17-932

**WORK ORDER** 0050065  
**REPORTED** 2020-05-08 15:13

Analyte	Result	RL	Units	Analyzed	Qualifier
<b>SW1 (0050065-01)   Matrix: Water   Sampled: 2020-04-30 11:00, Continued</b>					
<i>Total Metals, Continued</i>					
Zinc, total	< 0.0040	0.0040	mg/L	2020-05-07	
Zirconium, total	< 0.00010	0.00010	mg/L	2020-05-07	

**Sample Qualifiers:**

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.



## APPENDIX 1: SUPPORTING INFORMATION

**REPORTED TO PROJECT** Allterra Construction  
17-932

**WORK ORDER REPORTED** 0050065  
2020-05-08 15:13

Analysis Description	Method Ref.	Technique	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	Kelowna
Dissolved Metals in Water	EPA 200.8 / EPA 6020B	0.45 µm Filtration / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	Richmond
EPH in Water	EPA 3511* / BCMOE EPHw	Hexane MicroExtraction (Base/Neutral) / Gas Chromatography (GC-FID)	Richmond
Hardness in Water	SM 2340 B (2017)	Calculation: 2.497 [diss Ca] + 4.118 [diss Mg]	N/A
HEPHw in Water	BCMOE LEPH/HEPH	Calculation	N/A
LEPHw in Water	BCMOE LEPH/HEPH	Calculation	N/A
pH in Water	SM 4500-H+ B (2017)	Electrometry	Kelowna
Polycyclic Aromatic Hydrocarbons in Water	EPA 3511* / EPA 8270D	Hexane MicroExtraction (Base/Neutral) / GC-MSD (SIM)	Richmond
Solids, Total Dissolved in Water	SM 2540 C* (2017)	Gravimetry (Dried at 103-105C)	Kelowna
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	Kelowna
Total Metals in Water	EPA 200.2* / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	Richmond
Turbidity in Water	SM 2130 B (2017)	Nephelometry	Kelowna

*Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method*

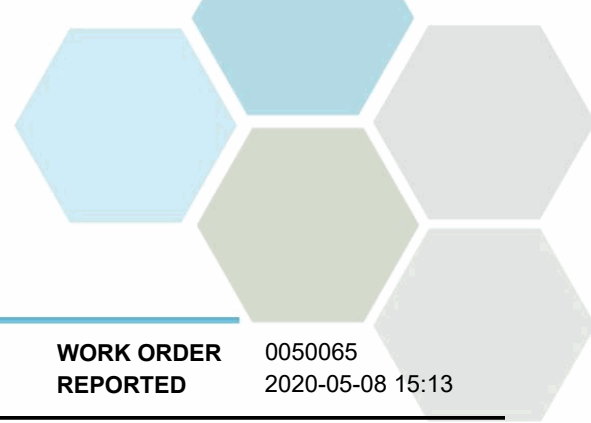
### Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
mg/L	Milligrams per litre
NTU	Nephelometric Turbidity Units
pH units	pH < 7 = acidic, pH > 7 = basic
µg/L	Micrograms per litre
µS/cm	Microsiemens per centimetre
BCMOE	British Columbia Environmental Laboratory Manual, British Columbia Ministry of Environment
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

### General Comments:

The results in this report apply to the samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Samples will be disposed of 30 days after the test report has been issued unless otherwise agreed to in writing.

Results in **Bold** indicate values that are above CARO's method reporting limits. Any results that are above regulatory limits are highlighted **red**. Please note that results will only be highlighted red if the regulatory limits are included on the CARO report. Any Bold and/or highlighted results do not take into account method uncertainty. If you would like method uncertainty or regulatory limits to be included on your report, please contact your Account Manager: [nyipp@caro.ca](mailto:nyipp@caro.ca)



## APPENDIX 2: QUALITY CONTROL RESULTS

**REPORTED TO PROJECT** Allterra Construction  
17-932

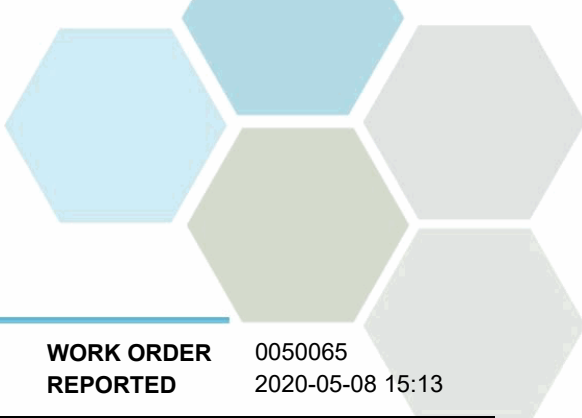
**WORK ORDER REPORTED** 0050065  
2020-05-08 15:13

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk):** A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup):** An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS):** A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS):** A second aliquot of sample is fortified with with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM):** A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
<b>Anions, Batch B0E0076</b>									
<b>Blank (B0E0076-BLK1)</b>			Prepared: 2020-05-02, Analyzed: 2020-05-02						
Chloride	< 0.10	0.10 mg/L							
Fluoride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
Sulfate	< 1.0	1.0 mg/L							
<b>Blank (B0E0076-BLK2)</b>			Prepared: 2020-05-02, Analyzed: 2020-05-02						
Chloride	< 0.10	0.10 mg/L							
Fluoride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
Sulfate	< 1.0	1.0 mg/L							
<b>LCS (B0E0076-BS1)</b>			Prepared: 2020-05-02, Analyzed: 2020-05-02						
Chloride	16.0	0.10 mg/L	16.0		100	90-110			
Fluoride	4.00	0.10 mg/L	4.00		100	88-108			
Nitrate (as N)	3.91	0.010 mg/L	4.00		98	90-110			
Nitrite (as N)	2.01	0.010 mg/L	2.00		101	85-115			
Sulfate	16.1	1.0 mg/L	16.0		100	90-110			
<b>LCS (B0E0076-BS2)</b>			Prepared: 2020-05-02, Analyzed: 2020-05-02						
Chloride	15.9	0.10 mg/L	16.0		100	90-110			
Fluoride	3.97	0.10 mg/L	4.00		99	88-108			
Nitrate (as N)	3.86	0.010 mg/L	4.00		97	90-110			
Nitrite (as N)	2.01	0.010 mg/L	2.00		101	85-115			
Sulfate	16.0	1.0 mg/L	16.0		100	90-110			
<b>BCMOE Aggregate Hydrocarbons, Batch B0E0544</b>									
<b>Blank (B0E0544-BLK1)</b>			Prepared: 2020-05-07, Analyzed: 2020-05-08						
EPHw10-19	< 250	250 µg/L							
EPHw19-32	< 250	250 µg/L							
Surrogate: 2-Methylnonane (EPH/F2-4)	553	µg/L	889		62	60-126			



## APPENDIX 2: QUALITY CONTROL RESULTS

**REPORTED TO PROJECT** Allterra Construction  
17-932

**WORK ORDER REPORTED** 0050065  
2020-05-08 15:13

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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### BCMOE Aggregate Hydrocarbons, Batch B0E0544, Continued

#### LCS (B0E0544-BS2)

Prepared: 2020-05-07, Analyzed: 2020-05-08

EPHw10-19	25900	250 µg/L	30900		84	70-117			
EPHw19-32	37600	250 µg/L	44900		84	70-113			
Surrogate: 2-Methylnonane (EPH/F2-4)	633	µg/L	889		71	60-126			

#### LCS Dup (B0E0544-BS2)

Prepared: 2020-05-07, Analyzed: 2020-05-08

EPHw10-19	27600	250 µg/L	30900		89	70-117	6	20	
EPHw19-32	40500	250 µg/L	44900		90	70-113	8	20	
Surrogate: 2-Methylnonane (EPH/F2-4)	685	µg/L	889		77	60-126			

### Dissolved Metals, Batch B0E0507

#### Blank (B0E0507-BLK1)

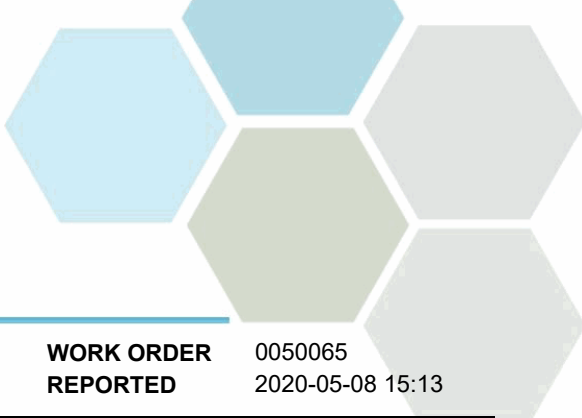
Prepared: 2020-05-08, Analyzed: 2020-05-08

Lithium, dissolved	< 0.00010	0.00010 mg/L							
Aluminum, dissolved	< 0.0050	0.0050 mg/L							
Antimony, dissolved	< 0.00020	0.00020 mg/L							
Arsenic, dissolved	< 0.00050	0.00050 mg/L							
Barium, dissolved	< 0.0050	0.0050 mg/L							
Beryllium, dissolved	< 0.00010	0.00010 mg/L							
Bismuth, dissolved	< 0.00010	0.00010 mg/L							
Boron, dissolved	< 0.0050	0.0050 mg/L							
Cadmium, dissolved	< 0.000010	0.000010 mg/L							
Calcium, dissolved	< 0.20	0.20 mg/L							
Chromium, dissolved	< 0.00050	0.00050 mg/L							
Cobalt, dissolved	< 0.00010	0.00010 mg/L							
Copper, dissolved	< 0.00040	0.00040 mg/L							
Iron, dissolved	< 0.010	0.010 mg/L							
Lead, dissolved	< 0.00020	0.00020 mg/L							
Magnesium, dissolved	< 0.010	0.010 mg/L							
Manganese, dissolved	< 0.00020	0.00020 mg/L							
Molybdenum, dissolved	< 0.00010	0.00010 mg/L							
Nickel, dissolved	< 0.00040	0.00040 mg/L							
Phosphorus, dissolved	< 0.050	0.050 mg/L							
Potassium, dissolved	< 0.10	0.10 mg/L							
Selenium, dissolved	< 0.00050	0.00050 mg/L							
Silicon, dissolved	< 1.0	1.0 mg/L							
Silver, dissolved	< 0.000050	0.000050 mg/L							
Sodium, dissolved	< 0.10	0.10 mg/L							
Strontium, dissolved	< 0.0010	0.0010 mg/L							
Sulfur, dissolved	< 3.0	3.0 mg/L							
Tellurium, dissolved	< 0.00050	0.00050 mg/L							
Thallium, dissolved	< 0.000020	0.000020 mg/L							
Thorium, dissolved	< 0.00010	0.00010 mg/L							
Tin, dissolved	< 0.00020	0.00020 mg/L							
Titanium, dissolved	< 0.0050	0.0050 mg/L							
Tungsten, dissolved	< 0.0010	0.0010 mg/L							
Uranium, dissolved	< 0.000020	0.000020 mg/L							
Vanadium, dissolved	< 0.0010	0.0010 mg/L							
Zinc, dissolved	< 0.0040	0.0040 mg/L							
Zirconium, dissolved	< 0.00010	0.00010 mg/L							

#### LCS (B0E0507-BS1)

Prepared: 2020-05-08, Analyzed: 2020-05-08

Lithium, dissolved	0.0204	0.00010 mg/L	0.0200		102	80-120			
Aluminum, dissolved	0.0181	0.0050 mg/L	0.0199		91	80-120			
Antimony, dissolved	0.0193	0.00020 mg/L	0.0200		96	80-120			
Arsenic, dissolved	0.0195	0.00050 mg/L	0.0200		98	80-120			

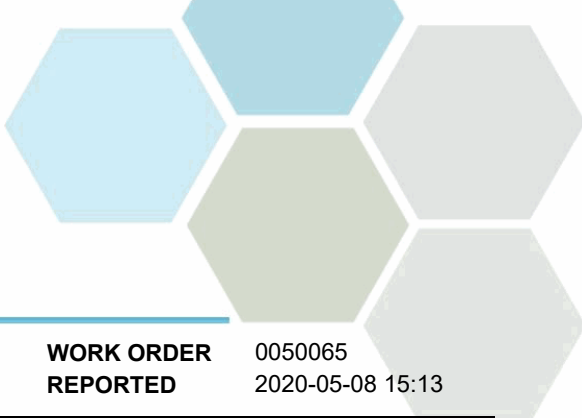


## APPENDIX 2: QUALITY CONTROL RESULTS

**REPORTED TO PROJECT** Allterra Construction  
17-932

**WORK ORDER REPORTED** 0050065  
2020-05-08 15:13

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
<b>Dissolved Metals, Batch B0E0507, Continued</b>									
<b>LCS (B0E0507-BS1), Continued</b>					Prepared: 2020-05-08, Analyzed: 2020-05-08				
Barium, dissolved	0.0186	0.0050 mg/L	0.0198		94	80-120			
Beryllium, dissolved	0.0194	0.00010 mg/L	0.0198		98	80-120			
Bismuth, dissolved	0.0202	0.00010 mg/L	0.0200		101	80-120			
Boron, dissolved	0.0178	0.0050 mg/L	0.0200		89	80-120			
Cadmium, dissolved	0.0194	0.000010 mg/L	0.0199		98	80-120			
Calcium, dissolved	1.92	0.20 mg/L	2.02		95	80-120			
Chromium, dissolved	0.0191	0.00050 mg/L	0.0198		96	80-120			
Cobalt, dissolved	0.0194	0.00010 mg/L	0.0199		98	80-120			
Copper, dissolved	0.0200	0.00040 mg/L	0.0200		100	80-120			
Iron, dissolved	1.93	0.10 mg/L	2.02		96	80-120			
Lead, dissolved	0.0197	0.00020 mg/L	0.0199		99	80-120			
Magnesium, dissolved	1.88	0.10 mg/L	2.02		93	80-120			
Manganese, dissolved	0.0198	0.00020 mg/L	0.0199		100	80-120			
Molybdenum, dissolved	0.0181	0.00010 mg/L	0.0200		90	80-120			
Nickel, dissolved	0.0195	0.00040 mg/L	0.0200		97	80-120			
Phosphorus, dissolved	1.83	0.050 mg/L	2.00		91	80-120			
Potassium, dissolved	1.98	0.10 mg/L	2.02		98	80-120			
Selenium, dissolved	0.0205	0.00050 mg/L	0.0200		102	80-120			
Silicon, dissolved	2.0	1.0 mg/L	2.00		100	80-120			
Silver, dissolved	0.0194	0.000050 mg/L	0.0200		97	80-120			
Sodium, dissolved	1.85	0.10 mg/L	2.02		92	80-120			
Strontium, dissolved	0.0184	0.0010 mg/L	0.0200		92	80-120			
Sulfur, dissolved	5.0	3.0 mg/L	5.00		100	80-120			
Tellurium, dissolved	0.0178	0.00050 mg/L	0.0200		89	80-120			
Thallium, dissolved	0.0199	0.000020 mg/L	0.0199		100	80-120			
Thorium, dissolved	0.0186	0.00010 mg/L	0.0200		93	80-120			
Tin, dissolved	0.0186	0.00020 mg/L	0.0200		93	80-120			
Titanium, dissolved	0.0182	0.0050 mg/L	0.0200		91	80-120			
Tungsten, dissolved	0.0191	0.0010 mg/L	0.0200		95	80-120			
Uranium, dissolved	0.0190	0.000020 mg/L	0.0200		95	80-120			
Vanadium, dissolved	0.0188	0.0010 mg/L	0.0200		94	80-120			
Zinc, dissolved	0.0207	0.0040 mg/L	0.0200		103	80-120			
Zirconium, dissolved	0.0181	0.00010 mg/L	0.0200		91	80-120			
<b>Reference (B0E0507-SRM1)</b>					Prepared: 2020-05-08, Analyzed: 2020-05-08				
Lithium, dissolved	0.107	0.00010 mg/L	0.100		107	77-127			
Aluminum, dissolved	0.202	0.0050 mg/L	0.235		86	79-114			
Antimony, dissolved	0.0464	0.00020 mg/L	0.0431		108	89-123			
Arsenic, dissolved	0.436	0.00050 mg/L	0.423		103	87-113			
Barium, dissolved	2.88	0.0050 mg/L	3.30		87	85-114			
Beryllium, dissolved	0.209	0.00010 mg/L	0.209		100	79-122			
Boron, dissolved	1.45	0.0050 mg/L	1.65		88	79-117			
Cadmium, dissolved	0.216	0.000010 mg/L	0.221		98	89-112			
Calcium, dissolved	7.85	0.20 mg/L	7.72		102	85-120			
Chromium, dissolved	0.427	0.00050 mg/L	0.434		98	87-113			
Cobalt, dissolved	0.127	0.00010 mg/L	0.124		102	90-117			
Copper, dissolved	0.837	0.00040 mg/L	0.815		103	90-115			
Iron, dissolved	1.28	0.10 mg/L	1.27		100	86-112			
Lead, dissolved	0.109	0.00020 mg/L	0.110		99	90-113			
Magnesium, dissolved	6.16	0.10 mg/L	6.59		94	84-116			
Manganese, dissolved	0.346	0.00020 mg/L	0.342		101	85-113			
Molybdenum, dissolved	0.395	0.00010 mg/L	0.404		98	87-112			
Nickel, dissolved	0.842	0.00040 mg/L	0.835		101	90-114			
Phosphorus, dissolved	0.470	0.050 mg/L	0.499		94	74-119			
Potassium, dissolved	2.90	0.10 mg/L	2.88		101	78-119			
Selenium, dissolved	0.0354	0.00050 mg/L	0.0324		109	89-123			

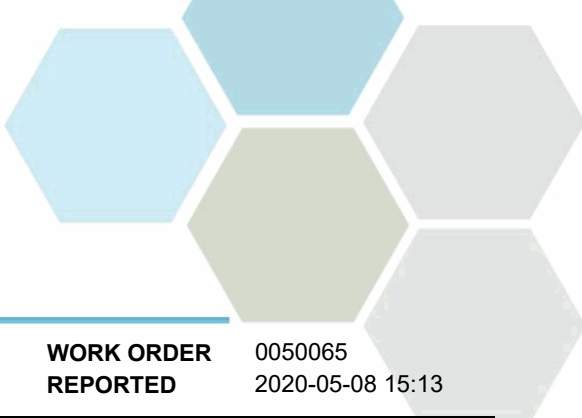


## APPENDIX 2: QUALITY CONTROL RESULTS

**REPORTED TO PROJECT** Allterra Construction  
17-932

**WORK ORDER REPORTED** 0050065  
2020-05-08 15:13

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
<b>Dissolved Metals, Batch B0E0507, Continued</b>									
<b>Reference (B0E0507-SRM1), Continued</b>					Prepared: 2020-05-08, Analyzed: 2020-05-08				
Sodium, dissolved	16.7	0.10 mg/L	18.0		93	81-117			
Strontium, dissolved	0.881	0.0010 mg/L	0.935		94	82-111			
Thallium, dissolved	0.0386	0.000020 mg/L	0.0385		100	90-113			
Uranium, dissolved	0.240	0.000020 mg/L	0.258		93	87-113			
Vanadium, dissolved	0.827	0.0010 mg/L	0.873		95	85-110			
Zinc, dissolved	0.874	0.0040 mg/L	0.848		103	88-114			
<b>General Parameters, Batch B0E0104</b>									
<b>Blank (B0E0104-BLK1)</b>					Prepared: 2020-05-02, Analyzed: 2020-05-02				
Turbidity	< 0.10	0.10 NTU							
<b>LCS (B0E0104-BS1)</b>					Prepared: 2020-05-02, Analyzed: 2020-05-02				
Turbidity	39.6	0.10 NTU	40.0		99	90-110			
<b>General Parameters, Batch B0E0240</b>									
<b>Blank (B0E0240-BLK1)</b>					Prepared: 2020-05-05, Analyzed: 2020-05-05				
Solids, Total Dissolved	< 15	15 mg/L							
<b>LCS (B0E0240-BS1)</b>					Prepared: 2020-05-05, Analyzed: 2020-05-05				
Solids, Total Dissolved	234	15 mg/L	240		98	85-115			
<b>General Parameters, Batch B0E0242</b>									
<b>Blank (B0E0242-BLK1)</b>					Prepared: 2020-05-05, Analyzed: 2020-05-05				
Solids, Total Suspended	< 2.0	2.0 mg/L							
<b>LCS (B0E0242-BS1)</b>					Prepared: 2020-05-05, Analyzed: 2020-05-05				
Solids, Total Suspended	97.0	10.0 mg/L	100		97	85-115			
<b>General Parameters, Batch B0E0246</b>									
<b>Blank (B0E0246-BLK1)</b>					Prepared: 2020-05-05, Analyzed: 2020-05-05				
Alkalinity, Total (as CaCO3)	< 1.0	1.0 mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0 mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0 mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0 mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0 mg/L							
Conductivity (EC)	< 2.0	2.0 µS/cm							
<b>Blank (B0E0246-BLK2)</b>					Prepared: 2020-05-05, Analyzed: 2020-05-05				
Alkalinity, Total (as CaCO3)	< 1.0	1.0 mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0 mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0 mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0 mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0 mg/L							
Conductivity (EC)	< 2.0	2.0 µS/cm							
<b>LCS (B0E0246-BS1)</b>					Prepared: 2020-05-05, Analyzed: 2020-05-05				
Alkalinity, Total (as CaCO3)	103	1.0 mg/L	100		103	80-120			
<b>LCS (B0E0246-BS2)</b>					Prepared: 2020-05-05, Analyzed: 2020-05-05				
Alkalinity, Total (as CaCO3)	102	1.0 mg/L	100		102	80-120			



## APPENDIX 2: QUALITY CONTROL RESULTS

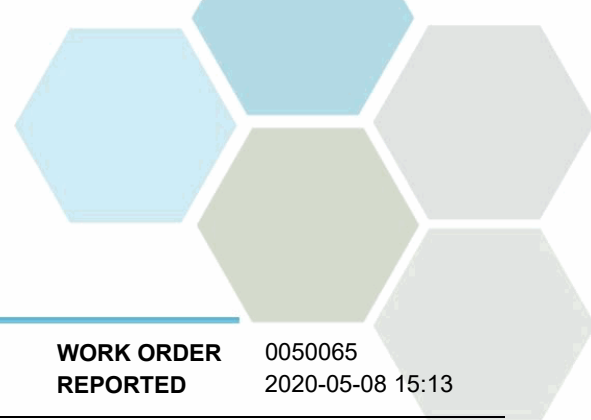
**REPORTED TO PROJECT** Allterra Construction  
17-932

**WORK ORDER REPORTED** 0050065  
2020-05-08 15:13

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
<b>General Parameters, Batch B0E0246, Continued</b>									
<b>LCS (B0E0246-BS3)</b>			Prepared: 2020-05-05, Analyzed: 2020-05-05						
Conductivity (EC)	1370	2.0 µS/cm	1410		97	95-104			
<b>LCS (B0E0246-BS4)</b>			Prepared: 2020-05-05, Analyzed: 2020-05-05						
Conductivity (EC)	1390	2.0 µS/cm	1410		98	95-104			
<b>Duplicate (B0E0246-DUP1)</b>			<b>Source: 0050065-01</b>		Prepared: 2020-05-05, Analyzed: 2020-05-05				
Alkalinity, Total (as CaCO3)	134	1.0 mg/L		138			2	10	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0 mg/L		< 1.0				10	
Alkalinity, Bicarbonate (as CaCO3)	134	1.0 mg/L		138			2	10	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0 mg/L		< 1.0				10	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0 mg/L		< 1.0				10	
Conductivity (EC)	349	2.0 µS/cm		350			< 1	5	
pH	7.61	0.10 pH units		7.63			< 1	4	
<b>Reference (B0E0246-SRM1)</b>			Prepared: 2020-05-05, Analyzed: 2020-05-05						
pH	7.03	0.10 pH units		7.01			100	98-102	
<b>Reference (B0E0246-SRM2)</b>			Prepared: 2020-05-05, Analyzed: 2020-05-05						
pH	7.03	0.10 pH units		7.01			100	98-102	

### Polycyclic Aromatic Hydrocarbons (PAH), Batch B0E0544

<b>Blank (B0E0544-BLK1)</b>			Prepared: 2020-05-07, Analyzed: 2020-05-07						
Acenaphthene	< 0.050	0.050 µg/L							
Acenaphthylene	< 0.200	0.200 µg/L							
Acridine	< 0.050	0.050 µg/L							
Anthracene	< 0.010	0.010 µg/L							
Benz(a)anthracene	< 0.010	0.010 µg/L							
Benzo(a)pyrene	< 0.010	0.010 µg/L							
Benzo(b+j)fluoranthene	< 0.050	0.050 µg/L							
Benzo(g,h,i)perylene	< 0.050	0.050 µg/L							
Benzo(k)fluoranthene	< 0.050	0.050 µg/L							
2-Chloronaphthalene	< 0.100	0.100 µg/L							
Chrysene	< 0.050	0.050 µg/L							
Dibenz(a,h)anthracene	< 0.010	0.010 µg/L							
Fluoranthene	< 0.030	0.030 µg/L							
Fluorene	< 0.050	0.050 µg/L							
Indeno(1,2,3-cd)pyrene	< 0.050	0.050 µg/L							
1-Methylnaphthalene	< 0.100	0.100 µg/L							
2-Methylnaphthalene	< 0.100	0.100 µg/L							
Naphthalene	< 0.200	0.200 µg/L							
Phenanthrene	< 0.100	0.100 µg/L							
Pyrene	< 0.020	0.020 µg/L							
Quinoline	< 0.050	0.050 µg/L							
Surrogate: Acridine-d9	5.68	µg/L	8.93		64	50-140			
Surrogate: Naphthalene-d8	9.17	µg/L	8.89		103	50-140			
Surrogate: Perylene-d12	9.48	µg/L	8.89		107	50-140			
<b>LCS (B0E0544-BS1)</b>			Prepared: 2020-05-07, Analyzed: 2020-05-07						
Acenaphthene	9.09	0.050 µg/L	8.89		102	55-137			
Acenaphthylene	9.13	0.200 µg/L	8.89		103	53-140			
Acridine	8.07	0.050 µg/L	8.84		91	50-120			
Anthracene	8.99	0.010 µg/L	8.89		101	64-130			
Benz(a)anthracene	9.08	0.010 µg/L	8.89		102	57-140			
Benzo(a)pyrene	10.1	0.010 µg/L	8.89		113	63-133			
Benzo(b+j)fluoranthene	20.1	0.050 µg/L	17.8		113	60-129			



## APPENDIX 2: QUALITY CONTROL RESULTS

**REPORTED TO** Allterra Construction  
**PROJECT** 17-932

**WORK ORDER** 0050065  
**REPORTED** 2020-05-08 15:13

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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### Polycyclic Aromatic Hydrocarbons (PAH), Batch B0E0544, Continued

#### LCS (B0E0544-BS1), Continued

Prepared: 2020-05-07, Analyzed: 2020-05-07

Benzo(g,h,i)perylene	10.6	0.050 µg/L	8.89		119	52-139			
Benzo(k)fluoranthene	9.54	0.050 µg/L	8.89		107	50-138			
2-Chloronaphthalene	8.08	0.100 µg/L	8.98		90	50-139			
Chrysene	9.00	0.050 µg/L	8.89		101	59-140			
Dibenz(a,h)anthracene	9.94	0.010 µg/L	8.89		112	53-136			
Fluoranthene	9.27	0.030 µg/L	8.89		104	67-135			
Fluorene	8.91	0.050 µg/L	8.89		100	57-134			
Indeno(1,2,3-cd)pyrene	10.3	0.050 µg/L	8.89		116	52-129			
1-Methylnaphthalene	8.84	0.100 µg/L	8.89		99	50-140			
2-Methylnaphthalene	9.27	0.100 µg/L	8.89		104	50-140			
Naphthalene	10.4	0.200 µg/L	8.89		117	50-140			
Phenanthrene	9.51	0.100 µg/L	8.89		107	61-134			
Pyrene	9.30	0.020 µg/L	8.89		105	66-131			
Quinoline	9.32	0.100 µg/L	9.60		97	50-140			
Surrogate: Acridine-d9	8.31	µg/L	8.93		93	50-140			
Surrogate: Naphthalene-d8	10.7	µg/L	8.89		120	50-140			
Surrogate: Perylene-d12	9.72	µg/L	8.89		109	50-140			

#### LCS Dup (B0E0544-BSD1)

Prepared: 2020-05-07, Analyzed: 2020-05-07

Acenaphthene	8.98	0.050 µg/L	8.89		101	55-137	1	18	
Acenaphthylene	9.12	0.200 µg/L	8.89		103	53-140	< 1	20	
Acridine	7.98	0.050 µg/L	8.84		90	50-120	1	30	
Anthracene	8.97	0.010 µg/L	8.89		101	64-130	< 1	15	
Benzo(a)anthracene	9.28	0.010 µg/L	8.89		104	57-140	2	25	
Benzo(a)pyrene	10.0	0.010 µg/L	8.89		113	63-133	< 1	18	
Benzo(b+j)fluoranthene	20.6	0.050 µg/L	17.8		116	60-129	3	17	
Benzo(g,h,i)perylene	10.7	0.050 µg/L	8.89		120	52-139	1	22	
Benzo(k)fluoranthene	9.72	0.050 µg/L	8.89		109	50-138	2	26	
2-Chloronaphthalene	8.01	0.100 µg/L	8.98		89	50-139	< 1	23	
Chrysene	9.23	0.050 µg/L	8.89		104	59-140	3	23	
Dibenz(a,h)anthracene	10.1	0.010 µg/L	8.89		114	53-136	2	21	
Fluoranthene	9.23	0.030 µg/L	8.89		104	67-135	< 1	18	
Fluorene	8.97	0.050 µg/L	8.89		101	57-134	< 1	18	
Indeno(1,2,3-cd)pyrene	10.4	0.050 µg/L	8.89		117	52-129	1	21	
1-Methylnaphthalene	8.68	0.100 µg/L	8.89		98	50-140	2	20	
2-Methylnaphthalene	8.77	0.100 µg/L	8.89		99	50-140	6	21	
Naphthalene	9.11	0.200 µg/L	8.89		103	50-140	13	22	
Phenanthrene	9.53	0.100 µg/L	8.89		107	61-134	< 1	17	
Pyrene	9.08	0.020 µg/L	8.89		102	66-131	2	19	
Quinoline	9.26	0.100 µg/L	9.60		96	50-140	< 1	14	
Surrogate: Acridine-d9	8.20	µg/L	8.93		92	50-140			
Surrogate: Naphthalene-d8	9.49	µg/L	8.89		107	50-140			
Surrogate: Perylene-d12	9.57	µg/L	8.89		108	50-140			

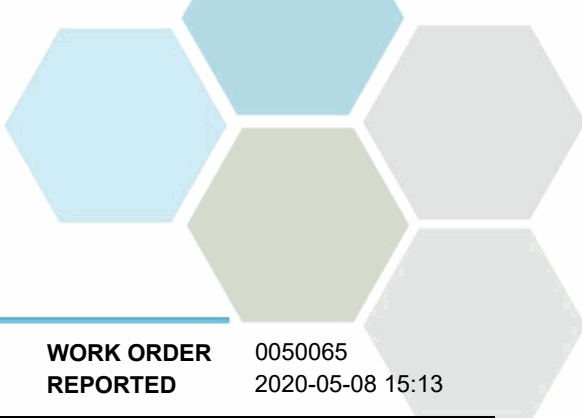
### Total Metals, Batch B0E0437

#### Blank (B0E0437-BLK1)

Prepared: 2020-05-06, Analyzed: 2020-05-07

Aluminum, total	< 0.0500	0.0500 mg/L							
Antimony, total	< 0.00200	0.00200 mg/L							
Arsenic, total	< 0.00500	0.00500 mg/L							
Barium, total	< 0.0500	0.0500 mg/L							
Beryllium, total	< 0.00100	0.00100 mg/L							
Bismuth, total	< 0.00100	0.00100 mg/L							
Boron, total	< 0.0500	0.0500 mg/L							
Cadmium, total	< 0.000100	0.000100 mg/L							





## APPENDIX 2: QUALITY CONTROL RESULTS

**REPORTED TO PROJECT** Allterra Construction  
17-932

**WORK ORDER REPORTED** 0050065  
2020-05-08 15:13

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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**Total Metals, Batch B0E0437, Continued**

**Blank (B0E0437-BLK1), Continued**

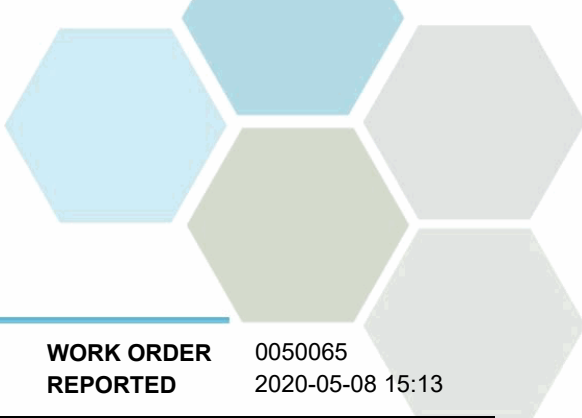
Prepared: 2020-05-06, Analyzed: 2020-05-07

Calcium, total	< 2.00	2.00 mg/L							
Chromium, total	< 0.00500	0.00500 mg/L							
Cobalt, total	< 0.00100	0.00100 mg/L							
Copper, total	< 0.00400	0.00400 mg/L							
Iron, total	< 0.100	0.100 mg/L							
Lead, total	< 0.00200	0.00200 mg/L							
Lithium, total	< 0.00100	0.00100 mg/L							
Magnesium, total	< 0.100	0.100 mg/L							
Manganese, total	< 0.00200	0.00200 mg/L							
Molybdenum, total	< 0.00100	0.00100 mg/L							
Nickel, total	< 0.00400	0.00400 mg/L							
Phosphorus, total	< 0.500	0.500 mg/L							
Potassium, total	< 1.00	1.00 mg/L							
Selenium, total	< 0.00500	0.00500 mg/L							
Silicon, total	< 10.0	10.0 mg/L							
Silver, total	< 0.000500	0.000500 mg/L							
Sodium, total	< 1.00	1.00 mg/L							
Strontium, total	< 0.0100	0.0100 mg/L							
Sulfur, total	< 30.0	30.0 mg/L							
Tellurium, total	< 0.00500	0.00500 mg/L							
Thallium, total	< 0.000200	0.000200 mg/L							
Thorium, total	< 0.00100	0.00100 mg/L							
Tin, total	< 0.00200	0.00200 mg/L							
Titanium, total	< 0.0500	0.0500 mg/L							
Tungsten, total	< 0.0100	0.0100 mg/L							
Uranium, total	< 0.000200	0.000200 mg/L							
Vanadium, total	< 0.0100	0.0100 mg/L							
Zinc, total	< 0.0400	0.0400 mg/L							
Zirconium, total	< 0.00100	0.00100 mg/L							

**LCS (B0E0437-BS1)**

Prepared: 2020-05-06, Analyzed: 2020-05-07

Aluminum, total	0.0186	0.0050 mg/L	0.0199		93	80-120			
Antimony, total	0.0206	0.00020 mg/L	0.0200		103	80-120			
Arsenic, total	0.0218	0.00050 mg/L	0.0200		109	80-120			
Barium, total	0.0208	0.0050 mg/L	0.0198		105	80-120			
Beryllium, total	0.0221	0.00010 mg/L	0.0198		111	80-120			
Bismuth, total	0.0225	0.00010 mg/L	0.0200		112	80-120			
Boron, total	0.0199	0.0050 mg/L	0.0200		100	80-120			
Cadmium, total	0.0215	0.000010 mg/L	0.0199		108	80-120			
Calcium, total	2.11	0.20 mg/L	2.02		104	80-120			
Chromium, total	0.0227	0.00050 mg/L	0.0198		115	80-120			
Cobalt, total	0.0207	0.00010 mg/L	0.0199		104	80-120			
Copper, total	0.0217	0.00040 mg/L	0.0200		108	80-120			
Iron, total	2.19	0.010 mg/L	2.02		108	80-120			
Lead, total	0.0217	0.00020 mg/L	0.0199		109	80-120			
Lithium, total	0.0221	0.00010 mg/L	0.0200		111	80-120			
Magnesium, total	2.00	0.010 mg/L	2.02		99	80-120			
Manganese, total	0.0202	0.00020 mg/L	0.0199		101	80-120			
Molybdenum, total	0.0209	0.00010 mg/L	0.0200		104	80-120			
Nickel, total	0.0211	0.00040 mg/L	0.0200		106	80-120			
Phosphorus, total	2.05	0.050 mg/L	2.00		102	80-120			
Potassium, total	2.07	0.10 mg/L	2.02		103	80-120			
Selenium, total	0.0225	0.00050 mg/L	0.0200		112	80-120			
Silicon, total	1.8	1.0 mg/L	2.00		92	80-120			
Silver, total	0.0212	0.000050 mg/L	0.0200		106	80-120			
Sodium, total	1.97	0.010 mg/L	2.02		97	80-120			

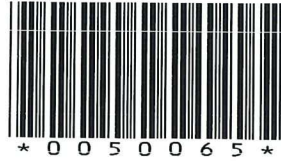


## APPENDIX 2: QUALITY CONTROL RESULTS

**REPORTED TO PROJECT** Allterra Construction  
17-932

**WORK ORDER REPORTED** 0050065  
2020-05-08 15:13

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
<b>Total Metals, Batch B0E0437, Continued</b>									
<b>LCS (B0E0437-BS1), Continued</b>					Prepared: 2020-05-06, Analyzed: 2020-05-07				
Strontium, total	0.0201	0.0010 mg/L	0.0200		100	80-120			
Sulfur, total	5.0	3.0 mg/L	5.00		100	80-120			
Tellurium, total	0.0211	0.00050 mg/L	0.0200		105	80-120			
Thallium, total	0.0222	0.000020 mg/L	0.0199		111	80-120			
Thorium, total	0.0215	0.00010 mg/L	0.0200		108	80-120			
Tin, total	0.0206	0.00020 mg/L	0.0200		103	80-120			
Titanium, total	0.0200	0.0050 mg/L	0.0200		100	80-120			
Tungsten, total	0.0214	0.0010 mg/L	0.0200		107	80-120			
Uranium, total	0.0219	0.000020 mg/L	0.0200		109	80-120			
Vanadium, total	0.0233	0.0010 mg/L	0.0200		117	80-120			
Zinc, total	0.0221	0.0040 mg/L	0.0200		110	80-120			
Zirconium, total	0.0202	0.00010 mg/L	0.0200		101	80-120			
<b>Reference (B0E0437-SRM1)</b>					Prepared: 2020-05-06, Analyzed: 2020-05-07				
Aluminum, total	0.272	0.0500 mg/L	0.303		90	82-114			
Antimony, total	0.0543	0.00200 mg/L	0.0511		106	88-115			
Arsenic, total	0.127	0.00500 mg/L	0.118		108	88-111			
Barium, total	0.809	0.0500 mg/L	0.823		98	83-110			
Beryllium, total	0.0543	0.00100 mg/L	0.0496		109	80-119			
Boron, total	3.39	0.0500 mg/L	3.45		98	80-118			
Cadmium, total	0.0509	0.000100 mg/L	0.0495		103	90-110			
Calcium, total	11.9	2.00 mg/L	11.6		102	85-113			
Chromium, total	0.275	0.00500 mg/L	0.250		110	88-111			
Cobalt, total	0.0390	0.00100 mg/L	0.0377		104	90-114			
Copper, total	0.522	0.00400 mg/L	0.486		107	90-117			
Iron, total	0.532	0.100 mg/L	0.488		109	90-116			
Lead, total	0.214	0.00200 mg/L	0.204		105	90-110			
Lithium, total	0.431	0.00100 mg/L	0.403		107	79-118			
Magnesium, total	3.74	0.100 mg/L	3.79		99	88-116			
Manganese, total	0.111	0.00200 mg/L	0.109		102	88-108			
Molybdenum, total	0.200	0.00100 mg/L	0.198		101	88-110			
Nickel, total	0.257	0.00400 mg/L	0.249		103	90-112			
Potassium, total	7.65	1.00 mg/L	7.21		106	87-116			
Selenium, total	0.126	0.00500 mg/L	0.121		104	90-122			
Sodium, total	7.41	1.00 mg/L	7.54		98	86-118			
Strontium, total	0.370	0.0100 mg/L	0.375		99	86-110			
Thallium, total	0.0868	0.000200 mg/L	0.0805		108	90-113			
Uranium, total	0.0320	0.000200 mg/L	0.0306		105	88-112			
Vanadium, total	0.422	0.0100 mg/L	0.386		109	87-110			
Zinc, total	2.60	0.0400 mg/L	2.49		104	90-113			



C V6V 2K9  
IC V1X 5C3  
B T5S 1H7

RELINQUISHED BY: <u>RG.</u>	DATE: <u>Apr 30 2020</u>	RECEIVED BY: <u>Max. EXPRESS TL</u>	DATE: <u>05/10</u>
	TIME: <u>3pm</u>		TIME: <u>1600</u>

<b>REPORT TO:</b>		<b>TURNAROUND TIME REQUESTED:</b>	<b>REGULATORY APPLICATION:</b>
COMPANY: <u>Allterra Construction LTD.</u>		Routine: (5-7 Days) <input checked="" type="checkbox"/>	Canadian Drinking Water Quality <input type="checkbox"/> BC WQG <input type="checkbox"/> BC HWR <input type="checkbox"/>
ADDRESS: <u>258 Millstream Road</u>	ADDRESS:	Rush: 1 Day* <input type="checkbox"/> 2 Day* <input type="checkbox"/> 3 Day* <input type="checkbox"/>	BC CSR Soil: WL <input type="checkbox"/> AL <input type="checkbox"/> PL <input type="checkbox"/> RL-LD <input type="checkbox"/> RL-HD <input type="checkbox"/> CL <input type="checkbox"/> IL <input type="checkbox"/>
CONTACT: <u>Victoria, BC V9B 6H4</u>	CONTACT:	Other* <input type="checkbox"/>	BC CSR Water: AW <input type="checkbox"/> IW <input type="checkbox"/> LW <input type="checkbox"/> DW <input type="checkbox"/>
DELIVERY METHOD: EMAIL <input checked="" type="checkbox"/> MAIL <input type="checkbox"/> OTHER* <input type="checkbox"/>	DELIVERY METHOD: EMAIL <input checked="" type="checkbox"/> MAIL <input type="checkbox"/> OTHER* <input type="checkbox"/>	*Contact Lab To Confirm. Surcharge May Apply	CCME: OTHER:
DATA FORMAT: EXCEL <input checked="" type="checkbox"/> WATERTRAX <input type="checkbox"/> ESdat <input type="checkbox"/>	DATA FORMAT: EXCEL <input checked="" type="checkbox"/> WATERTRAX <input type="checkbox"/> ESdat <input type="checkbox"/>	PROJECT NUMBER / INFO: <u>17-932</u>	
EQUIP <input type="checkbox"/> BC EMS <input type="checkbox"/> OTHER* <input checked="" type="checkbox"/>	EQUIP <input type="checkbox"/> BC EMS <input type="checkbox"/> OTHER* <input checked="" type="checkbox"/>	A: Biohazard D: Asbestos G: Strong Odour B: Cyanide E: Heavy Metals H: High Contamination C: PCBs F: Flammable I: Other (please specify*)	
EMAIL 1: <u>Raymond@allterraconstruction.ca</u>	EMAIL 1:	<b>ANALYSES REQUESTED:</b>	
EMAIL 2: <u>rgaudhwa@blanderengineering.com</u>	EMAIL 2:		
EMAIL 3:	EMAIL 3:		
PO #: <u>17-932</u>	PO #:		

\*\* If you would like to sign up for ClientConnect and/or Envirochain, CARO's online service offerings, please check here:

CLIENT SAMPLE ID:	MATRIX:				SAMPLING:		COMMENTS:			ANALYSES REQUESTED														HOLD	POSSIBLE SAMPLE HAZARD CODE(S)																																							
	DRINKING WATER	OTHER WATER	SOIL	OTHER	DATE YYYY-MM-DD	TIME HH:MM	CHLORINATED	FILTERED	PRESERVED	(e.g. flow/volume media ID/notes)	BTEX	VPH	PHC F1	VOC	VPH	PHC F2-F4	PAH	L/HEPH	PHENOLS Chlorinated	Non-Chlor.	PCB	GLYCOLS	HAA			PESTICIDES	ACID HERBICIDES	METALS - WATER TOTAL	Hg	METALS - WATER DISSOLVED	Hg	METALS - SOIL (SALM)	inc. pH	pH	EC	ALK	TDS	TSS	VSS	BOD	COD	TOG	MOG	FECAL COLIFORMS	HPC	TOTAL COLIFORMS	E. coli	ASBESTOS																
GWI	X				2020-09-30	11:00											X									X	X					X	X													X	X	X																

<b>SHIPPING INSTRUCTIONS:</b> Return Cooler(s) <input type="checkbox"/> Supplies Needed:	<b>SAMPLE RETENTION:</b> 30 Days (default) <input type="checkbox"/> 60 Days <input type="checkbox"/> 90 Days <input type="checkbox"/> Other (surcharges will apply):	<b>* OTHER INSTRUCTIONS:</b>  If you would like to talk to a real live Scientist about your project requirements, please check here: <input type="checkbox"/>	<b>SAMPLE RECEIPT CONDITION:</b> COOLER 1 (°C): <u>4.8</u> ICE: Y <input checked="" type="checkbox"/> N <input type="checkbox"/> COOLER 2 (°C): _____ ICE: Y <input type="checkbox"/> N <input type="checkbox"/> COOLER 3 (°C): _____ ICE: Y <input type="checkbox"/> N <input type="checkbox"/> CUSTODY SEALS INTACT: NA <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/>
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