

Annual Quartz Mining Licence Report for 2020

Property: Sä Dena Hes Mine

Permit# : QML-0004

Company: Sä Dena Hes Operating Corporation c/o
Teck Resources Limited

Prepared By: Michelle Unger B.Sc., Manager Environmental Performance

Issued Date: March 31, 2021



Executive Summary

The Annual Reclamation Report for 2020 for the Sä Dena Hes (SDH) mine site was prepared by Teck Resources Limited on behalf of Sä Dena Hes Mining Corporation, as required in accordance with Yukon Quartz Mining License QML-0004. This annual report describes the progress of closure and reclamation related activities at the Sä Dena Hes Mine in 2020.

The Sä Dena Hes (SDH) property is the site of a former lead-zinc mine that operated from 1991 to 1992. The property is located 45 km north of Watson Lake in the Yukon Territory and is owned by the Sä Dena Hes Mining Corporation which is a joint venture between Teck Resources Limited (Teck) and Pan-Pacific Metal Mining Corp., a wholly-owned subsidiary of Korea Zinc. Teck is the operator under the joint venture agreement for the site.

Permanent closure and decommissioning activities commenced in 2013 and were completed in 2015. Reclamation activities conducted at the site includes applying a simple cover, using natural glacial till materials, to most mine disturbed areas limiting the release of contaminants to the air, water and land. Surface contouring and vegetation have been completed for protection against water erosion. A revegetation program was implemented once the cover system was finished in 2015.

In 2020, samples from all of the required water quality monitoring stations met the standards in water use licence QZ16-051 for all water quality parameters. Water quality monitoring was also conducted under the Adaptive Management Plan (AMP) as part of the Water Licence. Although there were a few specific performance threshold exceedances, review of available water quality data, and information from subsequent sampling events, no additional actions were deemed necessary.

The fifth year of monitoring the planted tree and shrub plugs showed that the tree species continue to grow in size and displayed overall healthy characteristics. The overall survival rate continues to be high; greater than 80% in 11 of the 13 plots. Grass growth has also significantly increased at the seeded locations. Observations of natural colonization of native species continues to increase throughout the revegetated areas. The next assessment is not scheduled until 2025.

Physical work conducted at the site in 2020 included regular maintenance on the main access road culverts, north creek channel, and buttressing the north creek drainage channel.

The 2020 inspection indicated that all the geotechnical structures are stable and are functioning in accordance with the closure design parameters.

Table of Contents

Executive Summary	1
Table of Contents.....	2
1.0 Introduction	3
2.0 2020 Decommissioning and Reclamation Activities.....	3
3.0 2021 Decommissioning and Reclamation Activities.....	5
4.0 Effectiveness of the Remediation Measures	5
5.0 Map showing the status of all decommissioning and reclamation activities.....	5
6.0 Inspection of Engineered structures.....	6
7.0 Results of Studies and Monitoring Programs	7
7.1 Water Licence Monitoring.....	7
7.2 Environmental Effects Monitoring.....	8
7.3 Vegetation Monitoring.....	8
8.0 Invasive Plants	10
9.0 Spills and Accidents	10
10.0 Wildlife Incidents and Other Accidents.....	10
11.0 Site Improvements to address Sediment and Erosion	11
12.0 Closing	11
13.0 References.....	12

LIST OF APPENDED REPORTS

1. Sä Dena Hes – 2020 Annual Report Yukon Water Licenses QZ16-051 dated March 2021, prepared by Ensero Solutions
2. Revegetation Monitoring at the Reclaimed Sä Dena Hes Mining Site, dated January 2021, prepared by Laberge Environmental Services

1.0 Introduction

The Sä Dena Hes (SDH) property is the site of a former lead-zinc mine that operated from 1991 to 1992. The property is located 45 km north of Watson Lake in the Yukon Territory and is owned by the Sä Dena Hes Mining Corporation which is a joint venture between Teck Resources Limited (Teck) and Pan-Pacific Metal Mining Corp., a wholly-owned subsidiary of Korea Zinc. Teck is the operator under the joint venture agreement for the site.

Teck submitted notice to begin “Permanent Closure” to the Ministry of Energy, Mines and Resources (EMR) on February 17, 2012. The Detailed Decommissioning and Reclamation Plan (DDRP) (Teck 2012, 2013) was revised to plan for permanent closure. Permanent closure and decommissioning activities were carried out in 2014 and in 2015. A final DDRP was submitted in August 2015 (Teck, 2015) to account for amendments issued in 2014 and 2015. In 2015 Teck amended the Quartz Mining License (QML-0004), which expires on December 31, 2040. The current status of the site is Permanent Closure and Reclamation.

The objectives of the decommissioning and reclamation plan are to ensure the:

- Protection of public health and safety;
- Implementation of environmental protection measures that minimize adverse environment impacts;
- Ensuring land use commensurate with surrounding lands;
- Post closure monitoring of the site to assess effectiveness of closure measures for the long term.

Reclamation activities conducted at the site includes applying a simple cover, using natural glacial till materials, to most mine disturbed areas limiting the release of contaminants to the air, water and land. Surface contouring and vegetation have been completed for protection against water erosion. A revegetation program was implemented once the cover system was finished in 2015.

The Yukon Water Board regulates water management of the mine site. Water Use Licence QZ16-051 addressing permanent closure came into effect on April 1, 2017. Teck retains a Surface Lease 105A10-011 on the property and is in the process of being renewed in 2021.

2.0 2020 Decommissioning and Reclamation Activities

The QML and Water Use Licence both require post-reclamation environmental monitoring, physical/geotechnical inspections, and maintenance of constructed/engineered structures to be completed under the *Environmental Monitoring, Surveillance and Reporting Plan* (EMSRP, 2017) and Adaptive Management Plan (AMP, 2018).

The following summarizes the activities with details further discussed within the subsequent sections:

- Surface Water and Groundwater Quality Monitoring/Sampling
 - Bi-monthly/quarterly surface water and groundwater monitoring and sampling was conducted from January to December as per the Water Use Licence QZ16-051. Access to some of the locations are conducted using helicopter/snowmobiles in the winter months and an all-terrain vehicle in the snow free months.
 - Due to COVID-19 pandemic territorial border restrictions, two sampling events in 2020 could not be completed for three sample locations that are only accessible by helicopter (MH-30, MH-13, and MH-15).
- Terrestrial Monitoring
 - The 2020 re-vegetation assessment was completed in July to assess the 2015 site planting program.
- Aquatic Resources Monitoring
 - The biennial Environmental Effects Monitoring program under QZ16-051 was conducted in September 2020.
- Physical/geotechnical inspections
 - Spring and fall routine site inspection of physical/geotechnical features was completed by Teck and the site caretaker.
 - The 2020 Annual Mine Waste Facilities Inspection was completed by the engineer of record on July 28, 2020. As per the QML-0004, the Annual Inspection report was submitted on Oct. 26, 2020.
 - Survey completed on the North Dam settlement gauges on July 24, 2020.
- Maintenance of constructed/engineered structures or access road
 - Beaver dam in the North Creek Dyke was removed as needed from July to September. This is to prevent the water level from rising in the pond and reduce the risk of a rapid release that could cause erosion of the riprap protection in the channel.
 - Clean debris from access road culverts; remove beaver dam from under 13.2km bridge; remove debris damaged Beaver screen at 16.2km culvert
 - Re-set erosion gully monitoring pins on Jewelbox waste rock dump. Monitoring pins were established previously to gauge whether the gully was deepening were displaced. The erosion gully appears to be self armoured and there is no impact on the stability of the dump.
 - Re-set North Dam monitoring discharge station (MH-02) as it was observed to be displaced and required adjusting.
 - Fill small sinkhole observed at Landfill. The sinkhole was about 180 mm in diameter and about 50 cm deep. The observation is not considered risk to the landfill cover at this time and will continued to be monitored.

- Flag off erosion area at North Creek second crossing. The north side of the channel has eroded and will continue to erode but will eventually sustain itself without maintenance. No remedial action is required.
- Buttress North Drainage Channel with rip rap and filter cloth, approximately 50m upstream of Sediment Retaining Structure as per the recommendation of the engineer of record. During the annual geotechnical inspection it was observed that seepage from the hillside above the North Drainage channel triggered a subsidence on the west of the channel. To prevent flow from possibly creating a collapse of the channel and disturbing the covered tailings, the geotechnical engineer recommended buttressing the downstream portion of the channel.
- Clear blockages occurring along North Pond drainage swale, as necessary.

3.0 2021 Decommissioning and Reclamation Activities

There are no planned physical activities in 2021 other than monitoring the reclaimed areas and completing maintenance of any areas that may be identified following freshet.

The post closure monitoring as outlined in the EMSRP and AMP will be conducted in 2021 as per the Water Licence issued in April 2017.

4.0 Effectiveness of the Remediation Measures

All the physical remediation and revegetation activities were completed in 2015. Based on the current monitoring programs, the remediation measures appear to be effective. All the engineered structures remain to be in good condition with no signs of surficial movement or erosion with the exception of a few small areas previously identified. The erosion observed along the North Creek channel is due to high flows and beaver activity at the inlet of the channel, however it has been determined to allow the creek to erode until it will eventually sustain itself without maintenance. Beaver dams are removed as required to minimize the water level of the pond.

5.0 Map showing the status of all decommissioning and reclamation activities

All the physical remediation and revegetation activities were completed in 2015. In the 2015 Annual Report, several drawings were included within the AMEC 2015 As-built report. Due to the limited physical work and revegetation completed in 2020 there are no updated maps included within this report.

6.0 Inspection of Engineered structures

The 2020 geotechnical inspection of the structures and features associated with the Tailings Management Area at SDH completed by SRK on July 28, 2020. The inspection report *Sä Dena Hes Mine, Yukon Territory 2020 Annual Mine Waste Facilities Inspection, dated October 2020*, (SRK, 2020) submitted to EMR on October 26, 2020.

The report presents SRK's observations of the following structures and features, identifies any deficiencies and provides recommendations where appropriate:

- The North Dam;
- The decommissioned North Creek Dyke and Second Crossing;
- The relocated Camp Creek Channel;
- The North Channel and South Channel;
- The Sediment Retaining Structure (SRS);
- The Burnick Portals (1200 and 1300) and Waste Rock Dumps;
- The Jewelbox and Main Zone Waste Rock Dump and Portal areas.

The South and Reclaim Dams including the tailings were decommissioned in 2014. The Camp Creek Diversion and Exit Chute were decommissioned in 2015. The North Creek Dyke and spillway including a second crossing culvert system on North Creek downstream below the dyke were decommissioned in 2015.

The North Dam remains as an earthen embankment that retains the stored tailings. A variable depth till cover was placed over the tailings in 2014 as a growth medium and to control the migration of windblown tailings. No resloping of the downstream dam face was needed.

The SRS is an approximately 5 m high berm that was formed during the decommissioning and removal of the South Dam. The berm was designed to retain sediment in runoff from the till tailings cover and incorporates a riprap lined spillway. The spillway has capacity for the 1 in 1000-year flood event.

The Burnick 1200 and 1300 Portals were capped in 2015 with locally available waste rock and graded with a gently sloped face to provide long term stability. The crests of the associated waste rock dumps were recontoured to provide added stability. No resloping of the downstream face of the dumps was required.

The 2020 inspection indicated that all the geotechnical structures are stable and are functioning in accordance with the closure design parameters.

The 2020 Annual Tailings Mine Waste Facilities Recommendations:

- North Creek Channel - 2020-01 Beaver Dam at inlet channel – Remove beaver dam channel – Completed September 2020 – Closed
- Seepage Monitoring at d/s toe of North Dam at MH-02 - 2020-02 Gauge displaced – Re-position pipe gauge – Completed September 2020 – Closed
- Monitoring Pins at base of Jewelbox WR Dump - 2020-03 Erosion gully – Re-establish monitoring pins – Completed September 2020 – Closed
- North Drainage Channel - 2020-04 Side wall subsidence – Buttress with riprap – Completed September 2020 – Closed

7.0 Results of Studies and Monitoring Programs

7.1 Water Licence Monitoring

The water quality standards and monitoring requirements are managed under Water Licence QZ16-051 Effective Date April 1, 2017 with the expiry date of December 31, 2040.

The licence describes the water quality monitoring program for post closure monitoring, which is the applicable program for the current status of the SDH (Permanent Closure and Reclamation). The water quality program outlines the sampling sites, frequency and required water quality parameters.

As required by Licence QZ16-051, water quality data is reported quarterly to the Yukon Territory Water Board. The 2020 monitoring results are discussed in the annual report prepared by Ensero Solutions entitled *Sä Dena Hes – 2020 Annual Report Yukon Water Licence QZ16-051 dated March 2021* (Ensero Solutions, 2021). The report provides a detailed analysis of data and is included as Attachment 1. Surface and groundwater water quality monitoring conducted under the AMP are also included in the water licence monitoring requirements. The AMP describes a means of interpreting data to indicate if water quality is changing from conditions observed over the past 20 years. The plan also describes when and how changes in water quality require a response.

In 2020, samples from all the required water quality monitoring stations met the standards in licence QZ16-051 for all water quality parameters, however, exceedances of the AMP thresholds did occur. Based on the review of available water quality data, and information from subsequent sampling events, no additional actions were deemed necessary.

7.2 Environmental Effects Monitoring

The biennial biological effects monitoring at the site was undertaken by Laberge and Can-Nic-A-Nick Environmental Services from September 7 to September 11, 2020. The work included benthic invertebrate, water quality, and stream sediment sampling at the compliance locations (MH-11 and MH-12), stations MH-04 and MH-13, and reference stations (MH-29 and MH-30). Fish sampling is to be conducted at MH-13 and reference location MH-30. Unfortunately due to heavy rainfall, increased beaver activity, and associated flooding, landing with a helicopter at MH30 was unsuccessful in 2020.

The detailed results of the monitoring are included in the report entitled “*Environmental Monitoring at Sä Dena Hes Mining Site, 2020*” dated February 2021 and is included as Appendix G of Ensero, 2021.

The monitoring program conducted in 2020 represents the second time that licensed requirements for stream sediment and benthic invertebrate monitoring were completed with the exception of MH-13. Although the stream sediment metal concentrations indicate that there could be negative effects on the aquatic biota, the benthic invertebrate communities were diverse and had good representation from the major groups of organisms that are usually present in lotic waters. The abundance of aquatic insects at all sites suggests that the metals documented in the sediments are likely not in a bioavailable form.

Slimy sculpin continues to be the only fish species captured at MH-13. Numbers have been low at this site during the last three sampling events. While the absolute number of captured fish varies over time, the single species captured here continues to be consistent and indicative of a stable fish community. The other licensed fish and benthic invertebrate monitoring site, MH-30, could not be sampled due to flooded conditions as a result of increased beaver activity throughout this reach as well as high rainfall prior to the field work.

The next scheduled EEM event is to occur in 2026.

7.3 Vegetation Monitoring

In 2015, a total 27,000 plugs were planted of *Salix alaxensis*, *S. bebbiana*, *S. barclayi*, *S. planifolia* and *Populus balsamifera* were installed in several discrete areas throughout the reclaim, south pond, north pond and mill areas. The remaining open areas of these sites were planted with approximately 70,000 alder (*Alnus viridis crispa*) plugs. The alder were planted at a much lower density than the other tree species.

The fifth year of revegetation monitoring was conducted in 2020 by Laberge Environmental Services. The detailed results of the monitoring are included in the attached report entitled “*Revegetation Monitoring at the Reclaimed Sä Dena Hes Mining Site, 2020*” dated January 2021 (Laberge, 2021). In summary, 14 permanent tree-monitoring plots were established and

monitored from July 24th to July 27th, 2020. The tree and shrub plugs continue to grow in size and display overall healthy characteristics. Overall the survival rate was high with greater than 80% in 11 of the 13 plots. There are observations of several alder producing cones which will likely produce seeds in the fall. Additionally nitrogen fixing nodules were observed on the alder rooting systems. Observations of natural colonization of native species continues to increase throughout the revegetated areas.



Photograph 1: Alder growth at planted Reclaim Pond Area

In 2015, grass was hand seeded at an application rate of 44 kg/ha, in various areas throughout the mine site. A low elevation seed mix was used on the reclaimed roads and the lower borrow pit. A high elevation seed mix was used at the Burnick and Jewelbox waste rock zones. Seven grass monitoring plots were established. Overall the grass growth was gradually increasing in all plots since the assessment in 2020, with a significant increase in the plots on Jewelbox.



Photograph 2: Grass growth at seeded Jewelbox Waste Dump Area

8.0 Invasive Plants

Similar to past assessments, the most common invasive species was *Crepis tectorum*, (narrowleaf hawksbeard) and was generally found sporadically along the roadsides within the study area and has increased near monitoring plot VMP-9 at the landfill site (Laberge 2021). As the alders increase in size on site, the hawksbeard should eventually die off. These areas will continue to be monitored to ensure the population is manageable. The white sweetclover plants previously identified near the boneyard site and removed has been considered successful as there were not white sweetclover plants observed in 2020.

9.0 Spills and Accidents

There were no reportable spills or accidents in 2020.

10.0 Wildlife Incidents and Other Accidents

There were no direct wildlife incidents or other accidents reported in 2020 other than notable activity of beavers plugging road culverts along the main access road and North Creek Cannel.

It was observed that the ospreys left in mid July rather than the usual early October for no apparent reason.

11.0 Site Improvements to address Sediment and Erosion

There were no signs of major erosion in any of the capped areas in 2020. Erosion has been observed in the North Creek channel, but it is recommended to let it sustain itself without maintenance. In 2020, seepage was observed above the North Drainage Channel which triggered subsidence of the channel. To prevent flow from possibly creating a collapse of the channel and disturbing the covered tailings, the geotechnical engineer recommended buttressing the downstream portion of the channel which was completed in 2020. These areas will continue to be monitored in 2021.

12.0 Closing

I trust this report meets the requirements under Part 5, Section 11.4 of QML-0004. Please contact Michelle Unger at 250-427-8422 michelle.unger@teck.com if you have any questions regarding this report.

Michelle Unger, B.Sc.
Manager, Environmental Performance
Teck Legacy Properties

13.0 References

- Alexco. (2018). *Sa Dena Hes Mine - Post-Reclamation Adaptive Management Plan*, dated February 12, 2018.
- Ensero Solutions. (2021). *Sä Dena Hes – 2020 Annual Report Yukon Water Licence QZ16-051* dated March 2021.
- Laberge. (2021). *Revegetation Monitoring at the Reclaimed Sä Dena Hes Mining Site, 2020*, prepared by Laberge Environmental Services, dated January 2021.
- SRK. (2020). *Sä Dena Hes Mine, Yukon Territory, 2020 Annual Mine Waste Facilities Inspection*, prepared by SRK Consulting (Canada) Inc., dated October 2020.
- Teck. (2017). *Sa Dena Hes Mine – Environmental Monitoring, Surveillance and Reporting Plan*, June 28, 2017.
- Teck. (2018). *Water Licence #QZ16-051 – Sa Dena Hes Mine – Submission of Revised Adaptive Management Plan*, dated March 7, 2018.

APPENDED REPORTS

1. Sä Dena Hes – 2020 Annual Report Yukon Water Licenses QZ16-051 dated March 2021, prepared by Ensero Solutions (*electronically submitted as separate file*)
2. Revegetation Monitoring at the Reclaimed Sä Dena Hes Mining Site, dated January 2021, prepared by Laberge Environmental Services

REVEGETATION MONITORING AT THE RECLAIMED SÄ DENA HES MINE SITE, 2020



Robust alder growth at VMP-11, 2020 (Year 5)

For

**Teck Resources Limited on behalf of
Sä Dena Hes Operating Corporation**

Submitted by



January 2021

LETTER OF TRANSMITTAL

Michelle Unger
Manager, Environmental Performance
Teck Resources Limited
Bag 2000,
Kimberley, BC
V1A 3E1

Dear Michelle:

Re: Revegetation Monitoring at the Reclaimed Sä Dena Hes Mine Site, 2020

This report provides the results for Year Five monitoring of the grass seeded areas and the tree/shrub planted areas at the reclaimed Sä Dena Hes mine site. In addition, a summary of the past five years is provided. Overall to date, the revegetation programs are proving very successful. An invasive plant assessment of the site was also undertaken.

Should you have any questions or comments on the report, please do not hesitate to contact the undersigned.

Sincerely,

Original signed by:

Bonnie Burns
Laberge Environmental Services

TABLE OF CONTENTS

	Page
Letter of Transmittal	i
Table of Contents	ii
Lists of Tables and Figures	iii
1.0 BACKGROUND	1
2.0 REVEGETATION MONITORING	1
2.1 Tree planted areas	1
2.2 Grass Seeded Areas	5
2.3 Transect	7
2.4 Foliar Analysis	8
2.5 Permanent Photo Hubs	11
3.0 SOIL CHARACTERIZATION	11
4.0 INVASIVE PLANT SURVEY	14
5.0 SUMMARY	15
6.0 RECOMMENDATIONS	16
7.0 REFERENCES	16
APPENDICES	
Appendix A	Inventory List of all Plants identified within the Plots, July 2020
Appendix B	Photographs
Appendix C	Vegetation Assessments
Appendix D	Tissue Analysis
Appendix E	Soil Data
Appendix F	Invasive Species

LIST OF TABLES

Table		Page
1	Location of Tree Monitoring Plots	3
2	Heights of Planted Tree Species, July 2020	4
3	Low Elevation Seed Mix and Amounts	5
4	High Elevation Seed Mix and Amounts	5
5	Locations of Grass Monitoring Plots	6
6	Year Five Data for the Grass Monitoring Plots, July 2020	6
7	Line Transect in North Pond Area, TP-1, July 2020	7
8	Foliar Samples for Metals Analysis	8
9	Average Concentration of COPCs per Tissue Type	9
10	Locations of Permanent Photo Hubs, July 2020	11
11	Physical Parameters and Organics in Soils, July 2017 and July 2020	12
12	Changes in Metal Concentrations Following the Addition of Another Layer of Till at VMP-8	13
13	Observations of Invasive Plants in the Study Area, 2020	15

LIST OF FIGURES

Figure		Page
1	Sä Dena Hes Vegetation Monitoring Plots	2

1.0 BACKGROUND

On behalf of Sä Dena Hes Mining Corporation, Teck Resources Limited (Teck) initiated permanent closure of the Sä Dena Hes (SDH) Mine in September of 2013. Decommissioning and reclamation activities were undertaken in 2013, 2014 and 2015. Willow, poplar and alder seeds were collected from the Sä Dena Hes area in 2014. Plugs were grown off-site over winter and planted in 2015 on the tailings management area (TMA), mill site and the landfill site. The waste rock zones at Jewel Box and Burnick were contoured and then seeded with various grass species in 2015. The TMA was seeded in September 2016. Seeding was delayed in the TMA to give the 2015 tree plantings one year with less grass competition.

Teck retained Laberge Environmental Services (Laberge) to:

- monitor the revegetated areas in the summer of 2020;
- collect foliar tissue samples from several species as necessary per plot;
- collect composite soil samples from each plot;
- collect soil and foliar tissue samples from three forest reference sites; and
- conduct an invasive plant assessment while on site.

2.0 REVEGETATION MONITORING

Revegetation monitoring has been conducted annually since 2016 and the results have been included in the QML and Water License annual reports submitted by Teck.

The revegetation program at Sä Dena Hes found increased growth, cover and diversity in Year Five. The majority of planted tree and shrub species display continued growth and vigor, and grass cover has increased at Jewel Box Waste Rock Zone and on the reclaimed roads. Vascular plant diversity is increasing as more native plants establish the site. An inventory list of all the plant species identified at the plots is provided in Appendix A. Photographs of each site are presented in Appendix B with some comparisons over time.

2.1 Tree/Shrub Planted Areas

Details on the methodology of the seed collections, planting of plugs and plot establishment are provided in a previously submitted report by Laberge (2015). The purpose of the willow and poplar planting was to provide some biodiversity over the tailings management area, but not create a major attractant for moose browse. Approximately 27,000 plugs consisting of *Salix alaxensis*, *S. bebbiana*, *S. barclayi*, *S. planifolia* and *Populus balsamifera* were installed in several discrete areas throughout the reclaim pond, south pond, north pond and mill areas. The remaining open areas of these sites as well as the reclaimed landfill area, were planted with approximately 70,000 alder (*Alnus viridis* subsp. *crispa*) plugs. The alder were planted at a much lower density than the other tree species.

Fourteen permanent monitoring plots, eight planted with willows and poplar and six planted with alder, were established in 2015 (Figure 1, Table 1). A new plot for VMP-8 was established in 2020. Intensive soil sampling throughout the original area of VMP-8 in 2017 documented high concentrations of various metals which had been impacting the growth of the planted species. On September 22nd, 2019, a 30 cm till cover was applied to the affected area of 1,384 m² and seeded by hand with seeds collected from various areas of the SDH site. Species applied included alder (*Alnus crispa*), dwarf fireweed (*Chamerion latifolium*), wheatgrass (*Elymus sp.*) and yarrow (*Achillea millefolium*). Several small spruce (*Picea glauca*) and fir (*Abies lasiocarpa*) trees were also transplanted.

506,000

507,000

508,000

509,000

6,713,000

6,712,000

6,711,000

6,710,000

6,709,000

6,708,000

6,713,000

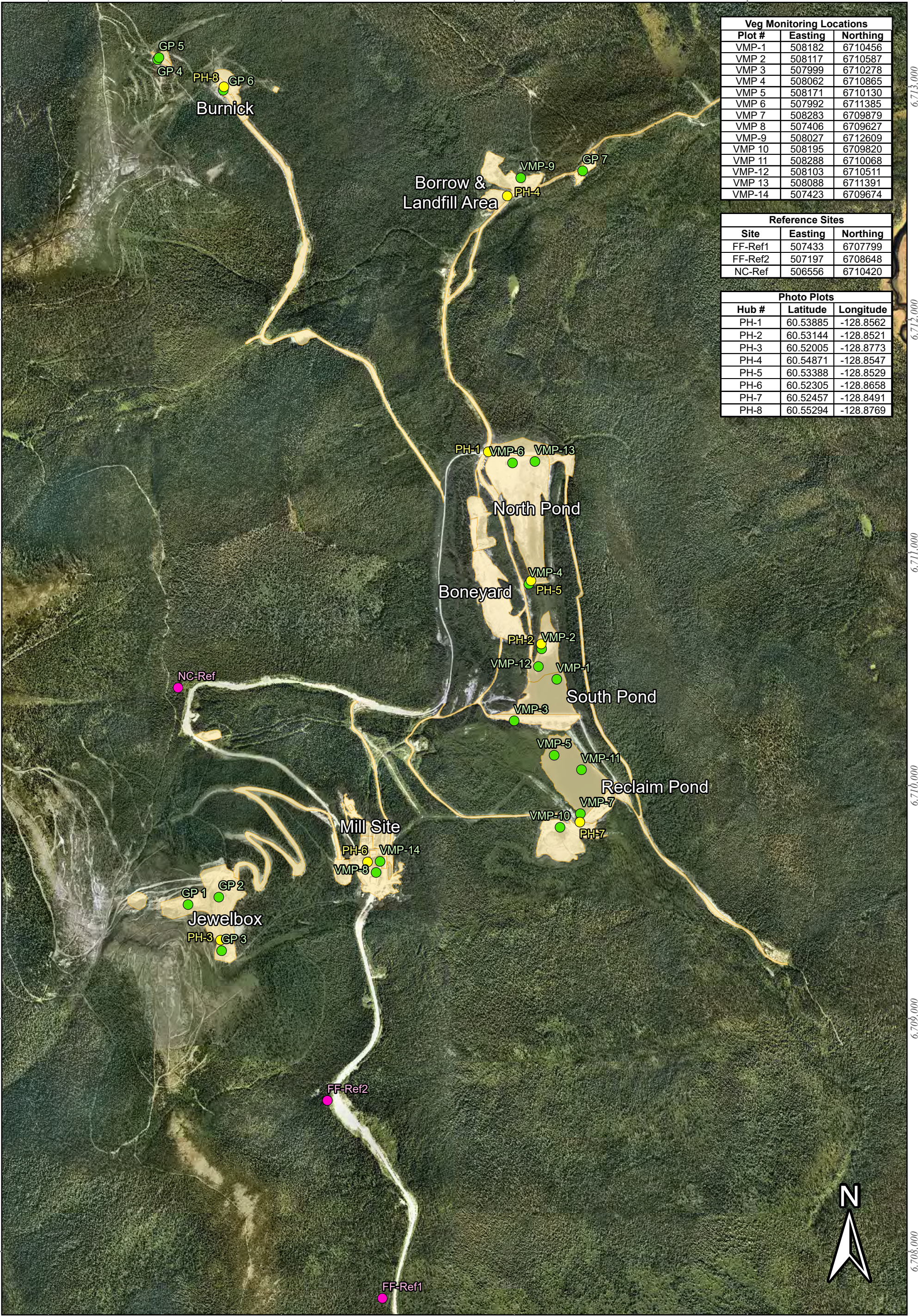
6,712,000

6,711,000

6,710,000

6,709,000

6,708,000



Veg Monitoring Locations		
Plot #	Easting	Northing
VMP-1	508182	6710456
VMP 2	508117	6710587
VMP 3	507999	6710278
VMP 4	508062	6710865
VMP 5	508171	6710130
VMP 6	507992	6711385
VMP 7	508283	6709879
VMP 8	507406	6709627
VMP-9	508027	6712609
VMP 10	508195	6709820
VMP 11	508288	6710068
VMP-12	508103	6710511
VMP 13	508088	6711391
VMP-14	507423	6709674

Reference Sites		
Site	Easting	Northing
FF-Ref1	507433	6707799
FF-Ref2	507197	6708648
NC-Ref	506556	6710420

Photo Plots		
Hub #	Latitude	Longitude
PH-1	60.53885	-128.8562
PH-2	60.53144	-128.8521
PH-3	60.52005	-128.8773
PH-4	60.54871	-128.8547
PH-5	60.53388	-128.8529
PH-6	60.52305	-128.8658
PH-7	60.52457	-128.8491
PH-8	60.55294	-128.8769

506,000

507,000

508,000

509,000

The maps and map data are provided 'as is' without any guarantee, representation, condition or warranty of any kind, either express, implied, or statutory. Teck Resources Limited assumes no liability with respect to any reliance the user places in the maps and map data, and the user assumes the entire risk as to the truth, accuracy, currency, or completeness of the information contained in the maps and map data.

Sa Dena Hes Vegetation Monitoring Plots

- Vegetation Monitoring Locations
- Reference Sites
- Photo Plots
- Reclaimed Areas

*** Aerial photography was obtained from McElhanney from August 15, 2012 LiDAR survey and represents the site prior to reclamation.

1:15,000

DATE: 1/8/2021	FIGURE 1
DRAWN BY: goulton	COORDINATE SYSTEM: NAD 1983 UTM Zone 9N

Plots VMP-1 to VMP-8 were planted at a higher density than the alder plots, VMP-9 to VMP-14. The plots represented each of the areas planted except for the boneyard. Only a small area was planted with alder here as the majority of the boneyard has naturally revegetated over the years with willows, poplar, some alder and forbs. The growth in this planted area was also assessed in 2020.

Plot #	Easting NAD 83	Northing Zone 9V	Elevation (m)	Tree Type	General Location
VMP-1	508182	6710456	1072	willow/poplar	south pond area
VMP-2	508117	6710587	1084.2	willow/poplar	south pond area
VMP-3	507999	6710278	1085.4	willow/poplar	south pond area
VMP-4	508062	6710865	1090.9	willow/poplar	north pond area
VMP-5	508171	6710130	1072.9	willow/poplar	reclaim pond area
VMP-6	507992	6711385	1072.3	willow/poplar	north dam area
VMP-7	508283	6709879	1075.3	willow/poplar	reclaim pond area
VMP-8	507406	6709627	1149.4	willow/poplar	mill site
VMP-9	508027	6712609	1009.2	alder	landfill
VMP 10	508195	6709820	1078.1	alder	Borrow pit G
VMP 11	508288	6710068	1070.2	alder	reclaim pond area
VMP-12	508106	6710513	1069	alder	south pond area
VMP 13	508088	6711391	1088.4	alder	north pond area
VMP-14	507423	6709674	1186.9	alder	mill site

The fourteen plots were monitored from July 24th to 27th, 2020. Table C-1 in Appendix C summarizes the assessment of the fifth year of growth of the planted tree plugs. Photographs were taken of each site and selected photos are presented in Appendix B. All photos have been archived and will be maintained for comparison purposes over time.

Catkins were not evident on the willows preventing positive identification of each species. A total of four willow species were initially planted; *Salix alaxensis*, *S. bebbiana*, *S. barclayi* and *S. planifolia*. The presence of volunteer species within the plots was also noted.

With few exceptions, all tree species were healthy and continuing to grow well in 2020. To further assess the growth, heights of randomly selected trees, (which covered the range of plants per plot) were measured (Table 2). The tallest tree in any of the assessed plots was a poplar at VMP-5 measuring 217 cm.

Rooting depths of each planted species in the plots was determined in Year 5 (Table C-1). A visually healthy plant was chosen, and the soil was gently removed around the roots until the final depth of the rooting system was observed. Following measurement, the soil was then firmly replaced and no tree was sacrificed for the observation. All members of the willow family, Salicaceae, including the genus *Salix* and *Populus*, have shallow rooting systems (Shellby, n.d.). The roots of alders are also shallow and have nodules containing nitrogen fixing microorganisms (Matthews, 1992). Shallow rooting depths were confirmed during this study. Once at depth, the roots then grew laterally. Although the till cover throughout the areas of the planted trees and shrubs is one meter thick, most of the rooting systems depths were around 15 cm. The deepest root was recorded for a poplar in VMP-6, approximately 40 cm. Nitrogen fixing nodules were observed on several of the exposed roots on the alders (Photos 84, 90 and 96).

Site	Species Planted	Random Heights (cm)
VMP-1	Willow	33, 52.5, 33, 55, 50
VMP-2	Poplar	40, 42, 30, 44, 65
	Willow	14, 31, 13, 18, 14.5
VMP-3	Poplar	25, 105, 20, 39.5
	Willow	21.5, 27, 27.5, 31, 50.5
VMP-4	Willow	36, 31, 30, 45, 16
VMP-5	Poplar	197.5, 217, 161, 140.5, 122
	Willow	100, 107, 35, 56.5, 87.5
VMP-6	Poplar	130, 150.5, 50, 107, 102.5
	Willow	57.5, 62, 25, 94.5, 67.5
VMP-7	Poplar	136, 181.5, 103, 67, 44.5
	Willow	59
VMP-8		Plot was reseeded in Sept 2019
VMP-9	Alder	134.5, 171, 149.5, 166, 116
VMP-10	Alder	121.5, 124, 85, 118.5, 88.5
VMP-11	Alder	138, 115, 141, 77.5, 96
VMP-12	Alder	64.5, 103, 80, 137.5, 107
VMP-13	Alder	113, 85.5, 75, 98.5, 105
VMP-14	Alder	81, 97.5, 126, 100, 70.5

Random heights of each tree species per plot has been measured every year since 2016 (Year 1). Figure C-1 in Appendix C plots the average of these heights per species, per plot, per year. The Y-axis for each species is consistent per plot to enable comparisons between plots. Generally the height of willows at Year 1 was around 20 cm, of poplar approximately 30 cm and for alder, 11.5 cm. Overall it appeared that the trees were still becoming established in Year 2 but growth accelerated following Year 3 for all species.

The alders show a steady and similar increase in height over time in all of the plots whereas plant growth was not as consistent for the willow and poplars in all plots. For these species it appears that plots VMP-5 (reclaim pond), VMP-6 (north pond) and VMP-7 (reclaim pond) support the greatest growth. It should be noted that while the planted willow in VMP-7 and the planted poplar in VMP-4 appear dead, many volunteer plants of both these species are now growing within these plots (Table C-1).

During the assessments, other species present in the plots were also recorded. The taxonomic richness per plot has been graphed over time in Figure C-2 in Appendix C. When the seedlings were initially planted, the substrate had been scarified and most plots were completely bare. The majority of plots by Year 1 (2016) had few other species growing except for the planted seedlings. Grass was seeded in some locations in September of 2016 (Laberge, 2016) and these species were frequently identified in Year 2 (Laberge, 2017). By Year 4 there was a significant increase in biodiversity at all of the plots (Laberge, 2019) with a slight increase or leveling off in Year 5. A strong indication of success of the reclamation program is the fact that over the past five years natural colonization of native species continues to increase throughout the revegetated areas (Appendix A).

General observations were made in the planted area of the boneyard on July 25th, 2020. The planted alder were healthy and robust. Many other species were growing in the assessed area; volunteer willows, poplar, alder, aspen, pine, grasses, (including fescues, spike trisetum, bluejoint, wheatgrass, alpine bluegrass, and tickle grass), fleabane, red currant, cinquefoil, sandwort, elegant hawksbeard, dandelion, dwarf fireweed, lupine, foxtail, fireweed, willowherb, horsetail, raspberry, soapberry, yellow mountain avens, smooth leaved mountain avens, alsike clover, conifer seedlings and mustards. An invasive species, narrowleaf hawksbeard, was also growing in the boneyard. The sweet clover was not observed in 2020 and appears to have been successfully eradicated.

2.2 Grass Seeded Areas

Grass was hand seeded at an application rate of 44 kg/ha, in various areas throughout the mine site in 2015. The low elevation seed mix (Table 3) was used on the reclaimed roads and the lower borrow pit. The high elevation seed mix (Table 4) was used at the Burnick and Jewel Box waste rock zones.

Common Name	Scientific Name	Weight %	Composition %
Violet Wheatgrass	<i>Agropyron violaceum</i>	47	13
Northern Fescue	<i>Festuca altaica</i>	24	18
Glacier Alpine Bluegrass	<i>Poa alpina</i>	11	37
Sheep fescue	<i>Festuca ovina</i>	18	32

Common Name	Scientific Name	Weight %	Composition %
Violet Wheatgrass	<i>Agropyron violaceum</i>	45	12
Rocky Mountain Fescue	<i>Festuca saximontana</i>	15	17
Chariot Hard Fescue	<i>Festuca brevipila</i>	15	21
Tufted Hairgrass	<i>Deschampsia caespitosa</i>	14	14
Glacier Alpine Bluegrass	<i>Poa alpina</i>	10	23
Spike Trisetum	<i>Trisetum spicatum</i>	1	13

No plots were established on the reclaimed roads but general observations were made. It appears that some sections were seeded at a high application rate. This may impede the natural colonization of local species from the seed sources of the nearby forest.

The methodology of the establishment of the seven grass plots is detailed in a previously submitted report by Laberge (2017). Table 5 below describes the location of each of these plots.

Plot #	NAD 83, Zone 9V		Elevation (m)	General Location
	Easting	Northing		
GP-1	506599	6709489	1416.4	Jewel Box waste rock zone
GP-2	506731	6709521	1388.7	Jewel Box waste rock zone
GP-3	506743	6709291	1409.7	Jewel Box waste rock zone
GP-4	506468	6713116	1287.2	Burnick 1300 waste rock zone
GP-5	506474	6713125	1288.4	Burnick 1300 waste rock zone
GP-6	506750	6712985	1211.6	Burnick 1200 waste rock zone
GP-7	508293	6712639	1002.2	Gravel Pit area past Landfill

Grass growth had visibly increased at all plots on Jewel Box, notably at GP-1, and many were flowering. However, similar to the previous four years no grasses were present in plot GP-4 and it appears that the upper section of Burnick 1300 was missed during the seeding process. The lower portion did contain some stressed grass and Plot GP-5 was assessed. Mature grasses were growing in most plots and were identified to genus or species. The results of the monitoring of the grass plots are presented in Table 6.

Grass Plot #	% Cover	Planted Grass Species	Random Heights (cm)	Rooting Depth (cm)	Other Species Present	Invasive Species	Signs of Erosion	Comments
GP-1	60	Two species of Fescue, Wheatgrass, Alpine Bluegrass	Fescue: 43.5, 40 alpine bluegrass: 38.5 Wheatgrass: 30, 21.5	0 to 5 cm	small volunteer willows, cushion moss, caribou weed	none	none	grasses appear healthy and growing, 80 to 90% are flowering, fescue dominant
GP-2	15	Fescue, Wheatgrass, Alpine Bluegrass, Spike trisetum	Fescue: 24, 16 Alpine Bluegrass: 6 Wheatgrass: 19.5, 21.5	5 to 10 cm	willow, rockcress, fireweed, caribou weed, artemisia, Stellari	none	none new, just old scarring	even distribution of fescue and wheatgrass, some fescue in flower
GP-3	25	Fescue, Wheatgrass	Fescue: 47.5, 36, 52, 31.5 Wheatgrass: 32	0 to 5 cm	caribou weed, dwarf fireweed	none	old eroded rills, plants growing in them	good growth, most grasses in flower
GP-4	<1	none	none		9 fir seedlings	none	none	This plot appears to not have been seeded in the past, volunteer fir seedlings are very small
GP-5	<1	Fescue	Fescue: 3, 2, 2, 1.5, 2	0 to 1	a few fir seedlings, a bit of moss	none	none	few small blades of stressed grass
GP-6	5%	Fescue, Alpine Bluegrass	Fescue: 27, 12, 13, 38, 7	0 to 5 cm	fir, moss	none	none	Fescue dominant - a few in flower, some leaf litter
GP-7	10	Fescue, Alpine Bluegrass, Wheatgrass, ticklegrass	Fescue: 30, 42.5 Wheatgrass: 34 Ticklegrass: 20 Alpine Bluegrass: 22.5	0 to 5 cm	fleabane, pussytoes, poplar, yarrow, sandwort, rockcress, spruce, cinquefoil, dwarf fireweed, spike trisetum	several Hawksbeard, alsike clover	none	grasses appear a bit stressed. Fescue is dominant grass

The high elevation sites have steep slopes and evidence of erosion in the form of minor rilling was observed at the plots on Jewel Box in the past, however there were no signs of increased erosion in 2020. No signs of erosion were present at the other plots. There was only one grass plot at a low elevation site, GP-7, in an old borrow pit area near the landfill area. Of the grass plots, this was the only one with the presence of invasive species.

Grasses within the plots were measured to assess growth, including rooting depth (Table 7). Density, height and the number of mature grasses continued to increase at the plots on Jewel Box in 2020. Native vascular plants are gradually colonizing the sites.

2.3 Transect

In July 2017, a line transect (TP-1) was set up in the north pond area as a method to determine the success, growth and community structure of the tree planted area where grass had been seeded the following year. The methodology, adapted from EMAN Terrestrial Vegetation Monitoring Protocols Section III (Environment Canada, 1999), is detailed in the report submitted by Laberge (2018^a). The locations and observations within each 1 m² plot were noted (Table 7).

TABLE 7 LINE TRANSECT IN NORTH POND AREA, TP-1, JULY 25, 2020					
Plot #	Zone 9V, NAD 83		% Cover	Species	Comments
	Easting	Northing			
Base stake	508119	6711103			
Q-1	508110	6711102	2	wheatgrass, fescue, moss	none mature
Q-2	508102	6711100	40	1 alder; 86 cm, wheatgrass, fescue, volunteer willow	1 wheatgrass plant in seed, alder growth has increased
Q-3	508099	6711102	1	fescue, wheatgrass, moss, conifer seedling	none mature
Q-4	508092	6711101	4	ticklegass, fescue, volunteer willow, volunteer poplar, fireweed, willowherb, moss, sandwort	mature fescue, increasing biodiversity
Q-5	508088	6711101	8	fescue, alpine bluegrass, alkali grass, volunteer willow-2 species, volunteer poplar, fireweed, willow herb, wheatgrass, cushion moss	Plants appear healthy
Q-6	508082	6711101	35	alpine bluegrass, fescue, wheatgrass, volunteer poplar, fleabane, willowherb	An adjacent alder's branches are overlapping the plot now
Q-7	508077	6711100	20	alpine bluegrass, fescue, altai fescue, volunteer willow, volunteer poplar, spruce seedling, fireweed, willowherb, cushion moss, fleabane, wheatgrass	spruce seedling is growing - branches, Photo #101
Q-8	508069	6711100	45	alpine bluegrass, fescue, 1 alder - 96cm, 1 volunteer feltleaf willow - 53cm, and small willows, fleabane.	The willow and alder have grown significantly since 2019. Photo #102. The alder has produced seed cones.
Q-9	508060	6711099	3	fir, alpine bluegrass, fescue, wheatgrass, willowherb, poplar, fireweed, moss	The fescue is in flower, ants in plot.
Q-10	508054	6711099	2	fir seedling, 1 small volunteer willow, fescue, wheatgrass, moss	The fescue is in flower
End stake	508049	6711098			

Plant coverage had increased significantly from 2017 in plots Q-2 (3% to 40%), Q-6 (2% to 35%), Q-7 (<1% to 20%) and Q-8 (1% to 45%). Leaf litter from previous years' growth was evident in a few of the plots. Volunteer tree seedlings were documented in several of the plots and have increased in size over the years.

2.4 Foliar Analysis

Foliar samples were collected from each plot except VMP-8 and GP-5. Since VMP-8 had just been seeded in 2019 there was insufficient growth for foliar sampling. The sparse stressed growth of a few grasses at GP-5 did not yield adequate biomass for a sample. An additional three sites were sampled for the same species where applicable, at reference sites documented by Azimuth (2015). Table 8 lists the foliar samples that were collected and analyzed per plot.

SITE	Willow Leaves	Willow Twigs	Poplar Leaves	Poplar Twigs	Alder Leaves	Alder Twigs	Grass
VMP-1	√	√					
VMP-2	√		√	√			
VMP-3	√	√					
VMP-4	√	√					
VMP-5	√	√	√	√			
VMP-6	√	√	√	√			
VMP-7			√	√			
VMP-9					√	√	
VMP-10					√	√	
VMP-11					√	√	
VMP-12					√	√	
VMP-13					√	√	
VMP-14					√	√	
GP-1							Fescue and wheatgrass
GP-2							Fescue, wheatgrass and alpine bluegrass
GP-3							Fescue
GP-6							Fescue
GP-7							Mostly fescue, some wheatgrass
FF-Ref-1	√	√			√	√	
FF-Ref-2	√	√			√		
NC-Ref	√	√					
Total:	9	8	4	4	8	7	5

New disposable nitrile gloves were worn for each collection and tissues were placed in new resealable plastic bags. Where possible, separate samples were collected for the tree and shrub leaves and the current season's growth of twigs. Grass tissues were collected at the plots on Jewel Box, a plot on Burnick and at the plot near the landfill. A total of 45 foliar samples were collected and kept cool until delivered to the ALS depot in Whitehorse, Yukon. After they were logged in the samples were frozen and shipped to the ALS laboratory in Burnaby, BC for analysis. Analysis was performed on rinsed tissues.

The foliar samples were homogenized and sub-sampled prior to hot-block digestion with nitric and hydrochloric acids, in combination with the addition of hydrogen peroxide. Metals were analyzed using collision cell inductively coupled plasma-mass spectrometry. Analysis for mercury was done by atomic fluorescence or atomic absorption spectrophotometry.

The complete analytical report is provided in Appendix D. Data have been grouped into tissue types and the results for all parameters, including the range of concentration, are presented in Table D-1 in Appendix D. Throughout various terrestrial ecological and human health risk assessments,

Azimuth (2015) has identified antimony, arsenic, cadmium, copper, lead, molybdenum, nickel, selenium, silver, vanadium and zinc as contaminants of potential concern (COPCs) at the site. These parameters have been tabulated (Table 9). Of the tissue types, poplar leaves had the highest average concentration of arsenic, selenium and zinc. The average concentrations of cadmium and nickel were the greatest in willow leaves, and copper concentrations were the highest in willow twigs. Grasses displayed the highest levels of lead. The highest average concentration of vanadium was recorded in alder leaves, and alder twigs had the greatest average concentration of molybdenum.

COPC	Lowest Detection Limit	Alder Leaves (N=8)	Alder Twigs (N=7)	Grasses (N=5)	Poplar Leaves (N=4)	Poplar Twigs (N=4)	Willow Leaves (N=9)	Willow Twigs (N=8)
Antimony	0.01	0.041	ND	0.031	0.012	0.041	0.033	0.023
Arsenic	0.02	0.092	0.04	0.0956	0.1195	0.1095	0.111	0.049
Cadmium	0.005	0.052	0.048	0.503	13.528	7.695	15.183	9.111
Copper	0.1	5.22	5.77	3.15	4.72	7.54	6.59	8.07
Lead	0.02	0.385	0.151	1.032	0.319	0.154	0.271	0.181
Molybdenum	0.02	2.39	8.26	4.83	0.56	0.07	1.10	0.14
Nickel	0.2	0.79	0.49	0.93	1.17	1.04	1.80	0.79
Selenium	0.05	0.058	0.108	0.473	15.193	4.824	2.709	1.042
Vanadium	0.1	0.72	0.1	0.17	0.24	0.14	0.405	ND
Zinc	0.5	39.2	32.2	57.0	428.8	143.3	285.6	148.2

ND = not detected

To illustrate the range of the concentrations across the SDH site in all tissue types, COPCs have been graphed in Figure D-1 in Appendix D.

Antimony was only detected in 11 of the 45 tissue samples. Concentrations ranged from 0.012 mg/kg in poplar leaves at VMP-2 to 0.052 mg/kg in willow leaves at VMP-2. Antimony was documented in the tissues from VMP-2, VMP-3, VMP-4, VMP-6, VMP-14 and GP-6.

Arsenic was detected in 35 of the 45 tissue samples and ranged from 0.021 mg/kg in willow twigs from VMP-1 to 0.404 mg/kg in willow leaves collected from VMP-2. The majority of tissues had values of less than 0.05 mg/kg.

Cadmium was detected in all tissues and ranged widely from 0.0125 mg/kg in alder leaves at VMP-11 to 71 mg/kg in willow leaves at VMP-5. Values were also quite high in poplar leaves and willow twigs at VMP-5. Additionally, there were rather high concentrations in the willow leaves from the reference site, FF-Ref-2. Concentrations were extremely low in the alder tissues irrelevant of their location.

Copper was detected at all sites and concentrations were relatively consistent throughout the SDH site ranging from 1.95 mg/kg in the grasses from GP-7 to 11.3 mg/kg in the willow twigs at the reference site FF-Ref-1.

Lead was detected in all the tissues except for two samples (alder leaves at VMP-9 and alder twigs at VMP-13) ranging from 0.025 mg/kg in the alder leaves from VMP-13 to 3.23 mg/kg in the grasses at GP-2. Two thirds of the samples had concentrations of less than 0.2 mg/kg.

Molybdenum was detected in all of the tissues and ranged considerably from 0.045 mg/kg in poplar twigs from VMP-6 to 15.4 mg/kg in alder twigs at VMP-14. Concentrations were generally higher in alder twigs and grasses than the other tissue types.

Nickel was detected in 43 of the 45 tissue samples and ranged from 0.38 mg/kg in alder twigs at VMP-11 to 2.47mg/kg in willow leaves from VMP-5. Concentrations were generally greater in willow leaves and the sample collected from the reference site FF-Ref-2 had the second highest concentration overall.

Selenium was detected in 22 of the 45 tissue samples and ranged from 0.058 mg/kg in alder leaves from VMP-13 to 36.6 mg/kg in poplar leaves from VMP-7.

Vanadium was only detected in 8 of the 45 tissue samples and ranged from 0.10 mg/kg in grasses at GP-2 to 0.72 mg/kg in alder leaves at VMP-14.

Zinc was detected in all of the tissue samples and ranged from 12.8 mg/kg in grasses at GP-7 to 742 mg/kg in poplar leaves from VMP-7. Higher concentrations were found in poplar and willow leaves with the second highest concentration of zinc occurring in willow leaves from the reference site FF-Ref-2. Generally, concentrations were low in the alder tissues and most grasses.

Where possible, comparisons to the levels in the tissues from the reference sites have been compared with levels in tissues from the exposed sites. The reference sites are located in the adjacent undisturbed forest and the vegetation community is somewhat different. The only species that could be collected at the reference sites were willows and alders. There were no poplar trees or grass species at these sites. Concentrations of arsenic, cadmium, lead, molybdenum, selenium and zinc in alder and willow tissues have been plotted in Figure D-2 in Appendix D.

Arsenic was detected in alder leaves but not in the twigs, and only at the exposed sites. Willow leaves frequently had greater concentrations than twigs and arsenic was detected at two of the reference sites. Cadmium was present in all alder tissues at each of the sites. Concentrations were significantly higher in willow tissues, notably at VMP-5. Relatively high values were also documented at the reference site, FF-Ref-2. Lead concentrations were relatively similar in both the alder and willow tissues, including the reference sites. Molybdenum concentrations were considerably greater in the alder tissues than the willow tissues. Alder twigs had higher values than the leaves and the reverse was true for the willow tissues. Selenium was detected in alder tissues at VMP-12 and VLP-13 only. Zinc levels were much higher in the willow tissues than the alder tissues. Except for site VMP-14, zinc concentrations at the exposed sites were lower than at the reference sites. Zinc concentrations were higher in the leaves than in the twigs. The greatest value of zinc in willow leaves was documented at the reference site FF-Ref-2.

Tissue samples were collected and analyzed previously from some locations at the SDH site. The only sites and tissue types that overlap with this study are the three reference sites. Vegetation samples were collected from some of the exposed areas prior to reclamation and are not included in this discussion.

Tissues were collected in 2013 (Azimuth, 2015) and selected metals have been plotted to compare between years (Figure D-3 in Appendix D). Only twigs, not leaves were sampled; willow at all three sites and alder only at FF-Ref-1. Concentrations of cadmium, copper, nickel and zinc in the willow tissues were higher at all sites in 2020. Lead concentrations were greater in the willow twigs in 2013 at FF-Ref-1 and NC-Ref. Concentration of molybdenum was higher at FF-Ref-2 in 2013.

Of the selected metals, cadmium and lead were lower in the alder twigs in 2020, whereas copper,

molybdenum and nickel were greater. Zinc concentrations were not included in the graph since levels were much higher than the other parameters. However, both years had very similar concentrations; 37.6 mg/kg in 2013 and 36.0 in 2020.

Although every attempt was made to sample at the same location as was sampled for the reference sites established in 2013 using the provided coordinates, it is possible that slightly different locations were sampled resulting in the discrepancy of some of the metal concentrations.

Azimuth (2015) has determined, based on their review and analyses, that potential risks to plants from metals in the soils are considered negligible or low at all areas of environmental concern at the site.

2.5 Permanent Photo Hubs

As annual monitoring of the plots will not be required until 2025, eight permanent photo hubs were established throughout the revegetated area. The intent of the photo hubs is to document the growing conditions each summer until a full assessment is performed after five years. The locations of the hubs are provided in Table 10 and displayed in Figure 1. Initial photographs from each hub are included in Appendix B. Photographs can be compared in subsequent years and visual assessments can be determined.

Hub #	Latitude	Longitude	Site Description	Bearing (°)
PH-1	60.53885°	128.85624°	At Revegetation sign at the north dam	70 to 80
PH-2	60.53144°	128.85213°	In Second pond near VMP-2, near old access road	360 view
PH-3	60.52005°	128.87726°	Jewell Box, at GW well #MW13-02	346
PH-4	60.54871°	128.85471°	Landfill at GW well #MW14-02	360 view
PH-5	60.53388°	128.85292°	South end of north pond near VMP-4	5 and 65
PH-6	60.52305°	128.86575°	Mill area near access road	360 view
PH-7	60.52457°	128.84914°	Reclaim and Borrow pit G - near osprey nest	360 view
PH-8	60.55294°	128.87687°	Burnick, GP-6, at GW well #MW13-06	220

3.0 SOIL CHARACTERIZATION

Soil samples were collected from each of the tree and grass plots in 2017 to characterize the soil media (Laberge, 2018). This survey was repeated in 2020. An additional three samples were collected from reference sites that had been previously sampled (Azimuth 2015). A stainless steel trowel was used to collect shallow samples of the soil. Up to ten shovelfuls were collected throughout each plot to create one composite sample representative of that plot. Samples were kept cool prior to delivery to the laboratory. One soil pit was dug in each of the reference areas and a composite sample of the layers was collected.

All samples were analyzed for a variety of parameters, including nutrients and metals. The complete analytical report is presented in Appendix E.

Table 11 summarizes the soil data for physical and nutrient parameters for both years. The soil at all exposed sites were slightly alkaline and were near neutral or slightly acidic at the reference sites. Total organic carbon, C:N ratio and total organic matter had increased at the majority of sites from 2017 to 2020. This indicates that plant material is building up in the soil over time.

Understandably the reference sites had higher percentages of organic carbon and organic matter than the exposed planted sites. The moisture content was also much greater at the reference sites with the waste rock dumps exhibiting the driest soils.

Sampling Site	Soluble (2:1) pH		Total Organic Carbon (%)		C:N Ratio		Total Organic Matter (%)		Moisture (%)	
	2017	2020	2017	2020	2017	2020	2017	2020	2017	2020
GP-1	8.27	8.37	0.092	0.24	1.7	14.1	0.16	0.41	3.3	8.47
GP-2	8	8.37	0.11	0.23	2.2	14.7	0.19	0.4	3.7	6.71
GP-3	8.45	8.54	0.065	0.24	1.1	10.4	0.11	0.41	2.9	7.86
GP-5	8.28	7.99	1	0.6	32	46	1.7	1.03	6.9	11.8
GP-6	8.22	8.28	1.2	0.79	28	34.1	2.1	1.36	3.5	7.70
GP-7	8.39	8.52	0.24	0.34	4.7	19.8	0.41	0.58	3.8	7.32
VMP-1	8.39	8.18	0.36	0.68	4.8	11.8	0.63	1.17	10	9.82
VMP-2	8.49	8.51	0.19	0.34	4.3	10.6	0.33	0.58	8.5	8.17
VMP-3	8.42	8.36	0.25	0.49	4.9	11.2	0.44	0.85	11	13.9
VMP-4	8.32	8.39	0.23	0.44	3.7	12.4	0.39	0.76	11	9.60
VMP-5	7.59	7.42	2.8	2.69	17	16.1	4.8	4.64	18	18.2
VMP-6	7.59	8.25	0.6	0.517	11	10.0	1	0.89	5.9	10.5
VMP-7	8.3	8.38	0.26	0.714	5.4	17.1	0.45	1.23	8.4	12.3
VMP-8	7.97	7.90	0.43	0.851	5.6	8.8	0.75	1.47	10	15.0
VMP-9	8.37	7.99	0.5	0.968	11	14.5	0.86	1.67	3.7	8.36
VMP-10	8.47	8.38	0.22	0.44	3.5	10.7	0.38	0.76	7.8	11.8
VMP-11	8.47	8.35	0.17	0.35	2.8	9.4	0.29	0.61	9.3	11.1
VMP-12	8.54	8.47	0.24	0.3	4.1	12.2	0.41	0.51	7.3	12.1
VMP-13	8.56	8.46	0.19	0.45	3	12.7	0.32	0.78	8.3	9.71
VMP-14	8.37	8.22	0.45	0.498	6.7	10.3	0.78	0.86	9.2	8.93
FF-REF-1		6.59		4.14		21.4		7.13		32.4
FF-REF-2		5.77		10.4		21.4		18		51.3
NC-REF		7.47		13.5		15.9		23.2		63.4

Nutrient data was not tabulated as most of the parameters were below detection except at the reference sites (Appendix E). Over time as the plant material decomposes, nutrient levels should increase. Nitrogen should increase over time in the soil due to the decomposition of alder plant material.

Metal concentrations in the soil samples are presented in Table E-1, Appendix E, with comparisons to the Yukon Contaminated Sites (YCS) regulations for the standards established for the protection of soil invertebrates and plants for the land uses agricultural, park and residential.

Of the identified COPCs, arsenic, cadmium, lead, molybdenum, selenium and zinc had at least one sample that exceeded the applicable standards. These are graphed in Figure E-1 in Appendix E and the Standard is represented as a purple horizontal line on each graph. All soil samples were below the applicable standards for antimony, nickel and vanadium. Generally, the highest concentrations were recorded at the mill sites (VMP-8 and VMP-14), at Burnick waste rock dump (GP-5 and GP-6) and occasionally at the reference site NC-Ref.

The exceedances occurred at VMP-8, VMP-14 and GP-6 for arsenic, at GP-5 for cadmium, at NC-Ref for lead, at VMP-8, VMP-14, GP-5, GP-6 and GP-7 for molybdenum, at GP-5 and GP-6 for

selenium and at VMP-14, FF-Ref-2 and NC-Ref for zinc. Note that till was not added at the Burnick sites, and the soils sampled at these plots represent the waste rock. The reference site FF-Ref-2 appears to lie in a mineralized zone however these high concentrations of lead and zinc do not appear to have inhibited plant growth at the site. There were no visual signs of stunted growth or chlorosis (Photo #106) which would indicate toxic effects.

The soil was highly contaminated with cadmium, lead, selenium and zinc at VMP-8 in 2017 and consequently additional till was added in late summer of 2019. Analyses of the 2020 soil sample collected from VMP-8 indicates much reduced levels currently in the upper soil profile (Table 12).

TABLE 12 CHANGE IN METAL CONCENTRATIONS FOLLOWING THE ADDITION OF ANOTHER LAYER OF TILL AT VMP-8		
Site Sampled	VMP-08	
Date Sampled	7/27/2017	7/26/2020
pH (1:2 soil:water)	7.97	7.90
Cadmium (Cd)	78.5	4.33
Lead (Pb)	9910	58.9
Selenium (Se)	7.75	1.91
Zinc (Zn)	14900	455

As a measure of quality assurance and quality control duplicate soil samples were collected from VMP-4 and VMP-7. Relative percent difference (RPD) for all parameters in each replicate sample was calculated to determine the representativeness of sample collection (Appendix E, Table E-2). For soils the RPD should be equal or less than 30% (Canadian Council of Ministers of the Environment, 2016). This value was slightly exceeded at VMP-4 for silver. The RPD for mercury at VMP-7 exceeded 30%. All other parameters in both samples were well below 30%.

When reviewing Figures D-1 and E-1, the high concentrations of some of the COPCs in the soil were also correspondingly high in some of the tissues. Note that tissues were not collected at VMP-8 and GP-5, as explained earlier.

Antimony was not detected in many of the tissues. The highest concentrations occurred in some willow and poplar tissues however the soil concentrations were very low at these sites.

Arsenic levels exceeded the standards at VMP-14 and GP-6 and tissue concentrations from these sites were also relatively high.

Cadmium in the soil appears to have no correlation to concentrations in the tissues. The highest concentrations in the tissues were collected from VMP-5.

The trend for copper was somewhat similar in the soil and the tissues.

The highest concentration of lead in the tissues occurred at GP-2 on Jewel Box waste rock however levels in the soil were very low. Conversely, high concentration of lead was documented in the soil at NC-Ref whereas the tissues collected here had very low concentrations.

Elevated concentrations of molybdenum were documented in the alder twigs at most of the sites however the concentration in the soil was only greater than the standard at VMP-14. Grasses also had elevated levels and the standard in the soil was exceeded at GP-6 and GP-7.

Nickel concentrations were low in both the soil and the tissue samples.

Selenium concentrations were very low except at the plots on Burnick waste rock dump however concentrations were very low in the grass tissues here. Poplar tissues had the highest levels of selenium.

Higher concentrations of vanadium in the soil at VMP-14 appears to be reflected in the alder leaves and in the soil and grass tissues at GP-6. Although soil concentrations were similar at the other sites, only willow and poplar tissues had detected levels of vanadium in their tissues at VMP-2 and VMP-3.

Elevated concentrations of zinc in the soil at FF-REF-2 appears to be reflected in the willow leaves at this site. The soil at VMP-14 had the greatest soil concentration of zinc yet the tissue concentrations at this site were extremely low. Poplar leaves at VMP-5 had the highest zinc concentration however soil concentrations were around average.

4.0 INVASIVE SPECIES ASSESSMENT

Observations regarding the presence of invasive plants were conducted throughout the monitoring program. Invasive species were noted and locations of larger populations were documented with a hand-held GPS.

The population of oxeye daisy (*Leucanthemum vulgare*) that was observed south of the gate at Kilometer 23 in 2016 was eradicated when this area was prepared and seeded with the low elevation grass mixture in the fall of 2016. As with the years since then, no oxeye daisy was observed in 2020.

Similar to the past assessments, the most common invasive species was *Crepis tectorum*, (narrowleaf hawksbeard) and was generally found sporadically along the roadsides within the study area. Hawksbeard is an annual plant of the sunflower family and was introduced from Europe as a contaminant in seed mixes. Hawksbeard is commonly found in cultivated fields and disturbed areas. The population that was documented near the monitoring plot VMP-9 at the landfill site, had continued to increase in 2020. Due to the shade intolerance characteristic of this plant, it will gradually die out when the alder trees increase in size. Similarly, there was a population of hawksbeard east of plot VMP-1 as identified in 2018. Hawksbeard populations have increased throughout the second pond area in 2020. Again it is expected that these plants will gradually die out as the willows, poplars and alder continue to grow and shade them out. Hawksbeard was also observed within some of the monitoring plots (see Tables C-1 and 7). White sweetclover plants (*Melilotus alba*) had been identified near the boneyard site and plants were removed in 2017, 2018 and 2019. No white sweetclover plants were observed here in 2020. Table 13 summarizes all observations.

Waypoint or Plot #	NAD 83 Zone 9V		General Location	Invasive Species
	Easting	Northing		
VMP-1	508182	6710456	south pond area	alsike clover
VMP-4	508062	6710865	north pond area	alfalfa
VMP-5	508171	6710130	reclaim pond area	1 hawksbeard
WP#22	507848	6711377	Boneyard	2 white clover plants
VMP-9	508027	6712609	landfill	hawksbeard, alsike clover
VMP-10	508195	6709820	borrow pit G	hawksbeard
VMP-11	508288	6710068	reclaim pond area	hawksbeard
VMP-13	508088	6711391	north pond area	alsike clover
VMP-14	507423	6709674	mill site	alsike clover, 1 hawksbeard (removed)
GP-7	508293	6712639	small borrow pit	hawksbeard, alsike clover
--			along west side of second pond area	hawksbeard
WP #114	508016	6712629	near VMP-9, near forest	hawksbeard

A roadside survey was completed on the access road on July 26, 2020. The data are presented in Table F-1 in Appendix F. Narrowleaf hawksbeard was the most common species along the road with occasional populations of tall hawkweed, a very similar looking species. The occurrence of sweet white clover is gradually decreasing near the junction with the Robert Campbell Highway.

5.0 SUMMARY

The fifth year of monitoring the planted tree and shrub plugs showed that the tree species continue to grow in size and displayed overall healthy characteristics. The overall survival rate continues to be high; greater than 80% in 11 of the 13 plots. The survival rate at the other two plots was 60%.

Several alder within the plots and throughout the study area were producing cones in July 2020 (Photo #72, 78 and 102) and in all likelihood would have produced seeds in the fall. Additionally nitrogen fixing nodules were observed on the alder rooting systems. There was no evidence yet of catkin development on any willows or poplars.

Grass growth had significantly increased at the plots on Jewel Box.

The documented shallow rooting systems of the species in the plots indicate that the rooting depths have not penetrated the till cover and come into any contact with contaminated soil below. Rooting depths will be measured in 2025 as this will provide the vegetation with 10 years of establishment.

Foliar tissue analysis indicated that metal uptake appeared to be affecting plant health at Burnick waste rock area only, which had not received a till cover. High concentrations of metals in the soil at VMP-14 and the reference site NC-Ref do not appear to be inhibiting vegetative growth at these sites. Plants appeared robust and healthy. Plant species take up various metals to varying degrees. There are no guidelines or standards regarding metal concentrations in plant material for the protection of wildlife, however Azimuth (2015) has concluded that the metal concentrations in the soil at the SDH site pose a negligible or low risk to plant health. Azimuth will review the concentrations. As per the “Environmental Monitoring, Surveillance and Reporting Plan” (EMSRP, Teck 2017), monitoring for terrestrial environment related to human health and ecological risks will continue with the next scheduled event to occur in 2025.

The soils that contained the greatest concentrations of metals occurred at the mill sites (VMP-8 and VMP-14), on Burnick waste rock dump (GP-6 and GP-6) and at a reference site, FF-Ref-2, where

several of the CSR standards were exceeded.

Crepis tectorum (narrowleaf hawksbeard) was the most common invasive species at the site. This species is widespread in the Yukon and readily invades disturbed areas. Currently no management is necessary but observations will continue to be made.

A key indication of success of a reclamation program is increasing ecosystem structure and function and this is evident at the SDH site. The increased growth of the planted species and the increased biodiversity of colonization of native plants from the adjacent areas, are in turn providing habitat for the animal kingdom. Observations and evidence of both invertebrates (insects, arachnids) and vertebrates (birds, mammals) were prevalent throughout the reclaimed sites and the monitored plots.

6.0 RECOMMENDATIONS

- Since the next assessment is not scheduled until 2025, it is recommended that photographs are taken annually from the established permanent photo hubs during the summer when growth is at its peak. Additionally, it may be beneficial to photograph winter conditions, especially on the reclaimed tailings management area, to determine if wind shear has any effect on growth above snow depth.
- If the object of reference sites for foliar analysis is to compare concentrations to those of the exposed sites, it is suggested that reference plots be established similar to the exposed sites (size, signage, etc) and to increase the number of reference sites.
- It is not recommended to attempt any management or control methods for the populations of invasive species at this time. With the encroachment of shrubs and trees along the access road, and the growth of the alders, willows and poplar in the revegetated areas, the narrowleaf hawksbeard, a shade intolerant species, will gradually die out. No invasive species have been observed on the waste rock zones over the past five years.
- Although white sweetclover was not documented anywhere on site in 2020, it is recommended that the locations where it was previously documented be monitored to ensure there is no growth. It is highly likely a seed bank exists at the boneyard and at the gate. Since the seeds are viable up to 30 years plants could appear in the future.

7.0 REFERENCES

Azimuth Consulting Group Partnership. 2015. Sä Dena Hes Mine Volume 1 and Volume 2 of Addendum to the Problem Formulation for the Ecological Risk Assessment. Prepared for Teck Resources Ltd.

Canadian Council of Ministers of the Environment. 2016. Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment, Chapter 4. ISBN 978-1-77202-032-8.

Environment Canada. 1999. EMAN Terrestrial Vegetation Monitoring Protocols, Report #9, Section III Ground Vegetation Biodiversity Monitoring Protocols.

- Laberge Environmental Services. 2015. Tree Planting at the Reclaimed Sä Dena Hes Mining Site, 2015. Prepared for Teck Resources Ltd.
- Laberge Environmental Services. 2017. Revegetation Monitoring at the Reclaimed Sä Dena Hes Mining Site, 2016. Prepared for Teck Resources Ltd.
- Laberge Environmental Services. 2018a. Revegetation Monitoring at the Reclaimed Sä Dena Hes Mining Site, 2017. Prepared for Teck Resources Ltd.
- Laberge Environmental Services. 2018b. Revegetation Monitoring at the Reclaimed Sä Dena Hes Mining Site, 2018. Prepared for Teck Resources Ltd.
- Laberge Environmental Services. 2019. Revegetation Monitoring at the Reclaimed Sä Dena Hes Mining Site, 2019. Prepared for Teck Resources Ltd.
- Matheus, P.E. and C.M. Omtzigt, 2013. Yukon Revegetation Manual, Practical Approaches and Methods. Whitehorse, Yukon. 182 pages. ISBN 978-0-9919499-0-8.
- Matthews, Robin F. 1992. *Alnus viridis* subsp. *crispa*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: <https://www.fs.fed.us/database/feis/plants/shrub/alnvirc/all.html> [2020, December 10].
- Shellby, A. Types of Trees with Shallow Roots. <https://www.hunker.com/12003458/types-of-trees-with-shallow-roots>
- Teck, Sä Dena Hes Mine Environmental Monitoring, Surveillance and Reporting Plan, June 28, 2017.

APPENDIX A
INVENTORY OF SPECIES PRESENT IN PLOTS, 2020

Sa Dena Hes – Species present in revegetation plots – July 23-27, 2020

Trees

<i>Abies lasiocarpa</i>	Subalpine fir
<i>Picea glauca</i>	White spruce
<i>Populus balsamifera</i>	Balsam poplar

Shrubs

<i>Alnus viridis</i> subsp. <i>crispa</i>	Green alder
<i>Ribes</i> sp.	Currant
<i>Rubus idaeus</i>	Red raspberry
<i>Salix glauca</i>	Grey-leaved willow
<i>Salix</i> spp.	Willows
<i>Shepherdia canadensis</i>	Soapberry
<i>Vaccinium uliginosum</i>	Bog blueberry
<i>Fragaria virginiana</i>	Strawberry
<i>Dryas drummondii</i>	Yellow mountain avens
<i>Dryas integrifolia</i>	Smooth-leaved mountain avens

Forbs

<i>Achillea alpina</i> subsp. <i>multiflora</i>	Siberian yarrow
<i>Achillea millefolium</i>	Yarrow
<i>Antennaria</i> sp.	Pussy toes
<i>Arabis</i> sp.	Rockcress
<i>Artemisia norvegica</i>	Mountain sagewort
<i>Artemisia tilesii</i>	Caribou weed
<i>Askillia elegans</i>	Elegant hawksbeard
<i>Astragalus alpinus</i>	Alpine astragalus
Brassicaceae family	Mustard
<i>Braya humilis</i> ssp. <i>humilis</i>	Alpine northern-rockcress
<i>Capsella bursa-pastoris</i>	Shepherd's purse
<i>Cerastium beeringianum</i>	Bering sea chickweed
<i>Chamaenerion angustifolium</i>	Fireweed
<i>Epilobium hornemannii</i>	Hornemann willow-herb
<i>Epilobium latifolium</i>	Dwarf fireweed
<i>Erigeron acris</i>	Bitter Fleabane
<i>Gentianella amarella</i>	Northern gentian
<i>Hordeum jubatum</i>	Foxtail
<i>Lupinus arcticus</i>	Arctic lupine
<i>Luzula parviflora</i>	Small-flowered wood-rush
<i>Minuartia</i> sp.	Stitchwort
<i>Parnassia</i> sp.	Grass of parnasuss
<i>Polygonum</i> sp.	Buckwheat
<i>Potentilla</i> sp.	Cinquefoil
<i>Rumex salicifolius</i>	Willow dock
<i>Senecio</i> sp.	Groundsel
<i>Spergularia ruba</i>	Purple sand spurry

<i>Stellaria sp.</i>	Chickweed
<i>Taraxacum officinale</i>	Common dandelion

Graminoids

<i>Agrostis scabra</i>	Ticklegrass
<i>Calamagrostis canadensis</i>	Bluejoint reedgrass
<i>Carex sp</i>	Sedge
<i>Elymus glaucous</i>	Blue wild rye
<i>Elymus sp.</i>	Wheatgrass
<i>Festuca altaica</i>	Altai fescue
<i>Festuca saximontana</i>	Rocky mountain fescue
<i>Hordeum jubatum</i>	Foxtail barley
<i>Phleum alpinum</i>	Alpine timothy
<i>Poa alpina</i>	Alpine bluegrass
<i>Poa arctica</i>	Arctic bluegrass
<i>Poa pratensis?</i>	Kentucky bluegrass
<i>Puccinellia sp.</i>	Alkali grass
<i>Trisetum spicatum</i>	Spike trisetum

Ferns and Allies

<i>Equisetum sp.</i>	Horsetail
----------------------	-----------

Mosses and lichens

Bryophyta	Cushion moss
-----------	--------------

Invasive species

<i>Crepis tectorum</i>	Narrow-leaved hawksbeard
<i>Medicago sativa</i>	Alfalfa
<i>Melilotus albus</i>	White sweetclover
<i>Taraxacum sp.</i>	Dandelion
<i>Trifolium hybridum</i>	Alsike clover

APPENDIX B

PHOTOGRAPHS, JULY 2020

GRASS PLOTS

GP-1, Looking across plot to the northeast



Photo #1: 2016, Year 1



Photo #2: 2017, Year 2



Photo #3: 2018, Year 3



Photo #4: 2019, Year 4



Photo #5: 2020, Year 5



Photo #6: 2020, caribou weed was present in all 3 plots on Jewel Box for the first time in 2020.

GP-2, Looking upslope due west



Photo #7: 2016, looking upslope



Photo #8: 2018, looking upslope



Photo #9: 2019, looking upslope



Photo #10: 2020, looking upslope.



Photo #11: 2020, *Braya humilis*



Photo #12: 2020, roots of grass, fines in soil

GP-3



Photo #13: 2016, looking downslope



Photo #14: 2017, looking downslope



Photo # 15: 2019, looking downslope



Photo #16: 2020, looking upslope

GP-5



Photo # 17: GP-5, 2020, a few grass blades only.



Photo #18: 2020, a fir seedling at GP-5. Although fir seedlings are documented each year there is no sign of their growth in subsequent assessments.

GP-6, Looking north



Photo #19: 2017, grass growth not evident until close.



Photo #20: 2020, grass growth not evident until close.

GP-7, looking northwest



Photo #21: 2016



Photo #22: 2018, growth generally only on upper half



Photo #23: 2020, increased plant growth



Photo #24: 2020, volunteer willow continues to grow.

WILLOW AND POPLAR PLOTS

VMP-1, Looking south



Photo #25: 2016. This was one of the few plots which already contained other plant growth.



Photo #26: 2017.



Photo #27: 2018.



Photo #28: 2019



Photo #29: 2020.



Photo #30: 2020, bear scat in plot near volunteer alder seedling.

VMP-2



Photo #31: 2016, the planted trees appeared stressed.



Photo#32: 2017, several plants still appear stressed.



Photo #33: 2019, plants recovered considerably.



Photo #34: 2020, plants are generally healthy.

VMP-3, Looking East



Photo #35: 2016



Photo #36: 2020

VMP-4, Looking West



Photo # 37: 2016.



Photo #38: 2016, some plants were stressed.



Photo #39: 2017, some willows were still stressed.



Photo #40: 2018, growth was now healthy.



Photo #41: 2019, continued healthy growth.



Photo #42: 2020, willows healthy, infill of volunteer alders.

VMP-5, Looking east



Photo #43: 2016



Photo #44: 2017



Photo #45: 2018



Photo #46: 2019



Photo #47: 2020, silt fencing has been removed.



Photo #48: 2020, poplar roots, good soil development.

VMP-6, Looking west



Photo #49: 2015, June, willows & poplar planted. Alders will be planted in August after area behind is scarified.



Photo #50: 2016, trees are leaving out.



Photo #51: 2017



Photo #52: 2018, significant growth in past year.



Photo #53: 2019, robust willow.



Photo #54: 2020

VMP-7, Looking east



Photo #55: 2016



Photo #56: 2017



Photo #57: 2018



Photo #58: 2019



Photo #59: 2020



Photo #60: 2020, Osprey nest continues to be utilized.

VMP-8, Looking west



Photo #61: 2016, stressed plants



Photo #62: 2017, willows are barely alive.



Photo #63: 2019, plants continue to be stressed although healthy plants are growing nearby.



Photo #64: 2020, new plot on recapped area.



Photo #65: 2020, wheatgrass seedlings growing from seed head.



Photo #66: 2020, Several yarrow growing from collected and spread seeds the previous fall.

ALDER PLOTS

VMP-9, Looking south

MW 14-02, site of Photo hub #4



Photo #67: 2016



Photo #68: 2017



Photo #69: 2018



Photo #70: 2019

MW 14-02

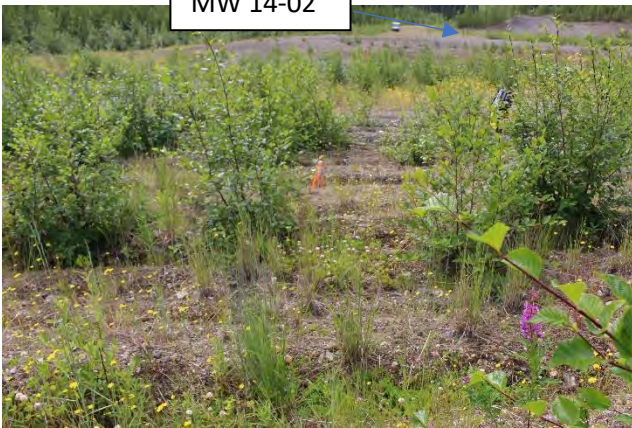


Photo #71: 2020



Photo #72: 2020, Immature seed cones which were also observed in 2019.

VMP-10, looking southwest



Photo #73: 2016, plants struggling, hard to see.



Photo #74: 2017, Alders are now growing.



Photo #75: 2018, alder are getting robust.



Photo #76: 2019, continued growth.



Photo #77: 2020



Photo #78: 2020, many cones on this alder in VMP-10.

VMP-11, Looking south



Photo #79: 2016, some suppressed growth.



Photo #80: 2017, all plants appear healthy and growing.



Photo #81: 2018



Photo #82: 2019



Photo #83: 2020



Photo #84: 2020, nitrogen fixing nodules on alder roots.

VMP-12, Looking north



Photo #85: 2015, Alder plugs have just been planted.



Photo #86: 2017, Year 2.



Photo #87: 2018



Photo #88: 2019



Photo #89: 2020



Photo #90: 2020, nitrogen fixing nodule on alder root.

VMP-13, Looking south



Photo #91: 2016, alder small and hard to see



Photo #92: 2017, alder growing



Photo #93: 2018



Photo #94: 2019



Photo # 95: 2020



Photo #96: 2020, nitrogen fixing nodules on alder roots.

VMP-14, Looking north



Photo #97: 2016, alder are small



Photo #98: 2017, a couple of stressed alder, most healthy.



Photo #99: 2019



Photo #100: 2020

TRANSECT PLOTS, 2020



Photo #101: Volunteer spruce seedling at Q-7.



Photo #102: Planted alder with cones in Q-8.

AERIAL PHOTOGRAPHS:



Photo #103: Aerial shot of the reclaim pond area, foreground, and second pond area, September 2020.



Photo #104: Aerial shot of the north pond area, September 2020.

REFERENCE PLOTS



Photo #105: 2020, rich dark soil at NC-Ref.



Photo #106: 2020, vegetation at NC-Ref.



Photo #107: FF-Ref -1, clay substrate at 30cm.



Photo #108: Vegetation at FF-Ref-2.

PERMANENT PHOTO HUBS, JULY 2020

PH-8, BURNICK



Photo #109: Looking at GP-6 from PH #8.



Photo #110: Looking at PH#8, MW13-06.

PH-1: North Pond Area



Photo #111: Capped tailings on North Pond, September 2014.



Photo #112: North Tailings Pond area looking west and south, July 2020.

PH-5:



Photo #113: North Tailings Pond area looking south and west from PH #5.

PH-2, Second Pond Area



Photo #114: Looking north from PH-2 on second pond area.



Photo #115: Looking south from PH-2 on second pond area.

PH-7, Reclaim Pond Area



VMP-7

Photo #116: PH-7 looking north.



Photo #117: PH-7, looking west.

PH-7, Borrow Pit G



Photo #118: Looking from PH-7 to Borrow Pit G.

PH-4, Landfill



PH-4: Photo #119: Landfill site looking northeast to northwest.



PH-4: Photo #120: Looking southwest



PH-6: Photo #121, Mill site looking north



PH-6: Photo #122: Looking southwest to access road



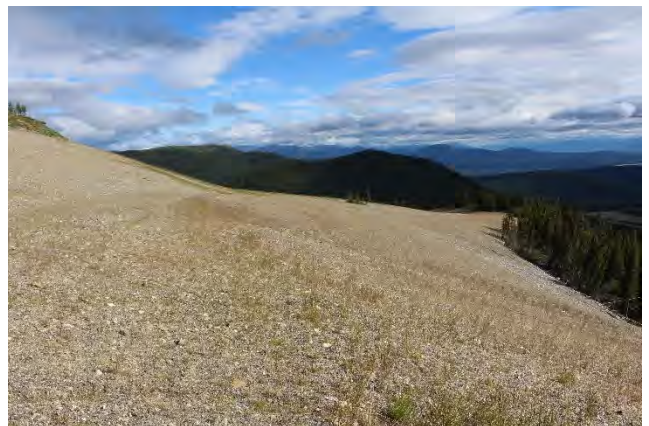
PH-6: Photo #123: Looking southeast



PH-6: Photo #124: Looking west across access road.



PH-3: Photo #125: Looking south across GP-3.



PH-3: Photo #126: Jewel Box looking north.

APPENDIX C

VEGETATION ASSESSMENTS

- **Table C-1, Year 5 Monitoring of Tree Plots, 2020**
 - **Data collected by B. Burns, K. Isbister and J. Barsich**
- **Figure C-1, Growth of Willows, Poplar and Alder (cm) Year 1 through to Year 5 (2016 – 2020)**
- **Figure C-2, Taxonomic Richness per Plot Year 1 through to Year 5 (2016 – 2020)**

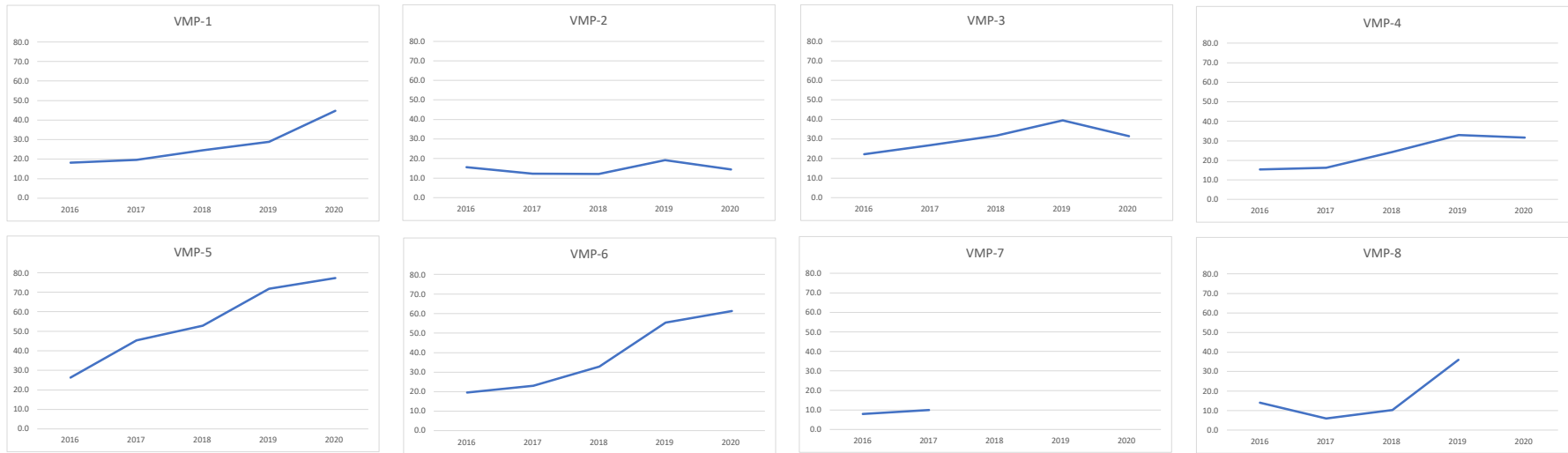
TABLE C-1 YEAR FIVE MONITORING OF TREE PLOTS, JULY 2020

	Site	Date Established	# of plugs planted	Date Assessed	# of live trees	Survival Rate (%)	Tree Species	Rooting Depth (cm)	Other Species	Comments	Invasive Species
Willow / Poplar	VMP-1	6/24/2015	42	7/24/2020	40	95.2	willow	20 - 25	volunteer alder, poplar, <i>Festuca altaica</i> , wheatgrass, dwarf fireweed, gentian, moss, lupine	bear scat in plot, lupine producing seed	alsike clover
	VMP-2	6/26/2015	59	7/24/2020	49	83.1	40 poplar 9 willow	Poplar: 5 - 10 Willow: 5 - 10	several volunteer willow and poplar, wheatgrass, 2 species fescue, sandwort, willowherb, fir, dandelion, cinquefoil, small aster, soapberry	soil is forming a crust which contains biological matter and will help with soil retention	none
	VMP-3	6/27/2015	60	7/24/2020	57	95.0	53 willow 4 poplar	Willow: 15 Poplar: 10	many volunteer alder, volunteer willows and poplar, spruce, foxtail, fescue, fir, cushion moss, dwarf fireweed, ticklegrass, wheatgrass, equisetum	willows on slope are doing well whereas the others appear somewhat stressed	none
	VMP-4	6/29/2015	24	7/25/2020	20	83.3	willow	15 - 20	many volunteer willow poplar and alder, wheatgrass, alfalfa, ticklegrass, fleabane, willowherb, spike trisetum, fireweed, dwarf fireweed, fir, fescue, ticklegrass, lupine, dandelion, equisetum,	significant increase in number of alfalfa growing in plot, spider and blackflies observed in plot	alfalfa
	VMP-5	6/29/2015	24	7/26/2020	27	112.5	18 willow 9 poplar	Willow: 20 - 25 Poplar: 15 - 10	Many volunteer willow, poplar and alder, altai fescue, alpine bluegrass, willowherb, fir, fireweed, cushion moss, dwarf fireweed, mushroom, fleabane, volunteer alder, grass of parnasuss, equisetum, lupine, aspen, groundsel, Carex sp, mushroom, dandelion, fescue	healthy growth of trees, increase in groundcover of equisetum, some wheatgrass and grass of Parnassus is infected by insects, grouse scat in plot	none
	VMP-6	6/30/2015	50	7/24/2020	52	104.0	27 poplar 25 willow	Poplar: 35 - 40 Willow: 15 - 20	volunteer willow, alder and poplar, wheatgrass, <i>Festuca ovina</i> , spruce, lupine, fir, fireweed, dwarf fireweed	most willows are feltleaf, leaf litter build up under willows, lupine in seed, bear sign near by, roots became lateral after reaching recorded depth.	none
	VMP-7	7/1/2015	67	7/26/2020	64	95.5	63 poplar 1 willow	Poplar: 10 - 15	volunteer willow, poplar and alder, fir, wheatgrass, fescue, alpine bluegrass, fleabane, dwarf fireweed, siberian yarrow, fireweed, dandelion, moss	Poplars had very little this year's growth but there was a large growth spurt 3 years ago, no action at the osprey nest during the assessment, daddy longlegs spider in plot	none
	VMP-8*	7/26/2020	0	7/26/2020					2 volunteer poplar from branch, 1 volunteer willow, wheatgrass, fescue, moss, fireweed, yarrow, equisetum,	the 2 poplar growing from dead poplar branch in plot that came in with the till, all plants are very small as just hand seeded last September. 34 small spruce trees planted on periphery of recapped area, 2 dead.	alsike clover
Alder	VMP-9	8/23/2015	12	7/25/2020	14	116.7	alder	5 - 10	volunteer willow, poplar, glaucous wheatgrass, spike trisetum, alpine bluegrass, slender wheatgrass, fescue, ticklegrass, altai fescue, fireweed, cinquefoil, dandelion, willowherb, lupine, strawberry, red current, raspberry, moss, fir seedling,	the small red current bush has berries, good healthy growth of plants	many hawksbeard, alsike clover
	VMP-10	8/25/2015	15	7/26/2020	9	60.0	alder	5 - 10	many volunteer alder, some willow and poplar, alpine bluegrass, ticklegrass, dwarf fireweed, fir elegant hawksbeard, willowherb, fireweed, sandwort, lots of moss	alder are healthy and growing, increase in biodiversity, small nodules on roots	hawksbeard
	VMP-11	8/25/2015	12	7/26/2020	12	100.0	alder	10 - 15	alpine bluegrass, willowherb, willow, dwarf fireweed, fescue, poplar, wheatgrass, foxtail, fir, mustard, dandelion, elegant hawksbeard, moss, sandwort	several alder trees have cones, large nodules observed on roots	hawksbeard
	VMP-12	8/27/2015	15	7/24/2020	13	86.7	alder	15 - 20	volunteer willows and alder, fescue, ticklegrass, wheatgrass, willowherb, fleabane, dandelion, moss	alders appear healthy, several have seed cones, root collars are thickening up, nodules on roots, one right near surface	none
	VMP-13	8/27/2015	7	7/24/2020	8	114.3	alder	15 - 20	volunteer alder, poplar, quite a few volunteer willow, fescue, wheatgrass, dwarf fireweed	seed cones on alder in plot, nodules on root, mosquitoes	2 alsike clover - pulled, 1 alfalfa - removed
	VMP-14	8/27/2015	10	7/24/2020	6	60.0	alder	10 - 15	fir seedling, volunteer willow, poplar and alder, raspberry, spike trisetum, cinquefoil, rock cress, tall bluegrass, sandwort, <i>Spergularia rubra</i> , oxytropis, <i>Draba sp.</i> , dandelion, equisetum, dwarf fireweed, moss, fireweed, strawberry blight, willowherb,	significant increase in biodiversity in this plot	alsike clover 1 hawksbeard - removed

* Monitoring Plot VMP-8 was re-established on July 25, 2020.

FIGURE C-1 GROWTH OF WILLOWS, POPLARS AND ALDERS (cm), YEAR 1 THROUGH TO YEAR 5 (2016 TO 2020)

WILLOW GROWTH (cm) FROM YEAR 1 TO YEAR 5



POPLAR GROWTH (cm) FROM YEAR 1 TO YEAR 5

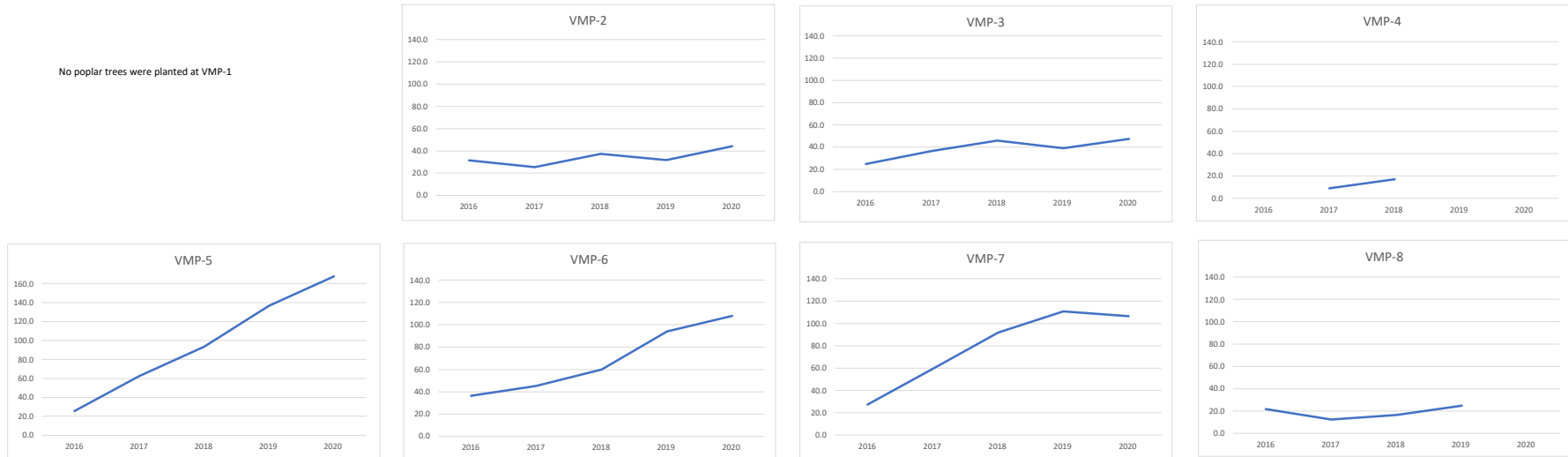


FIGURE C-1 GROWTH OF WILLOWS, POPLARS AND ALDERS (cm), YEAR 1 THROUGH TO YEAR 5 !

ALDER GROWTH (cm) FROM YEAR 1 TO YEAR 5

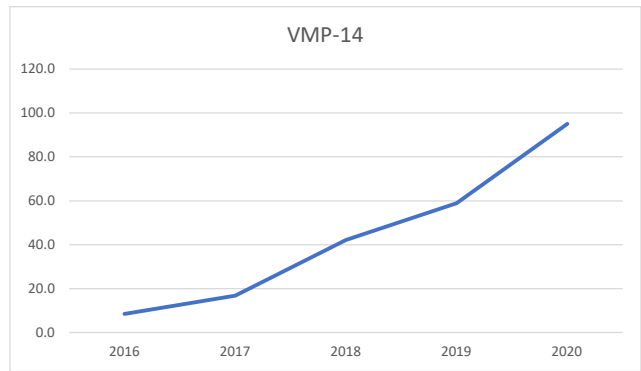
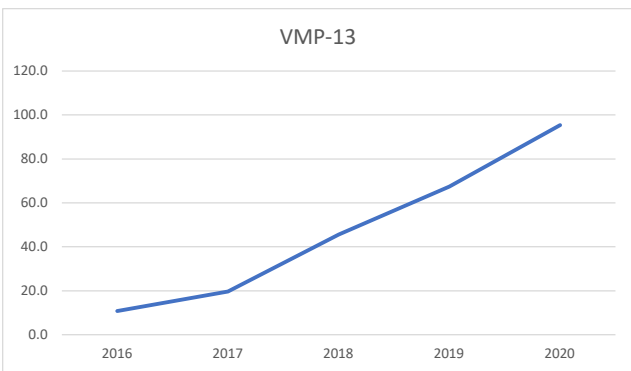
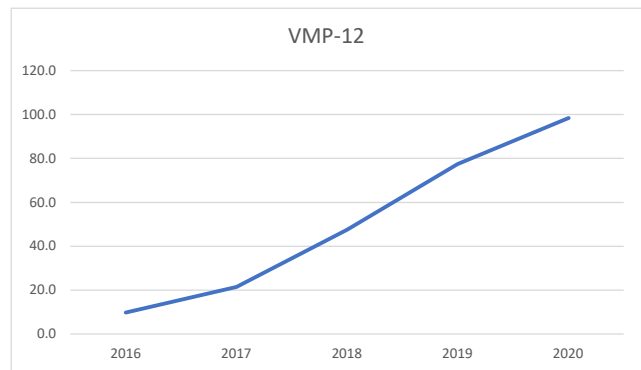
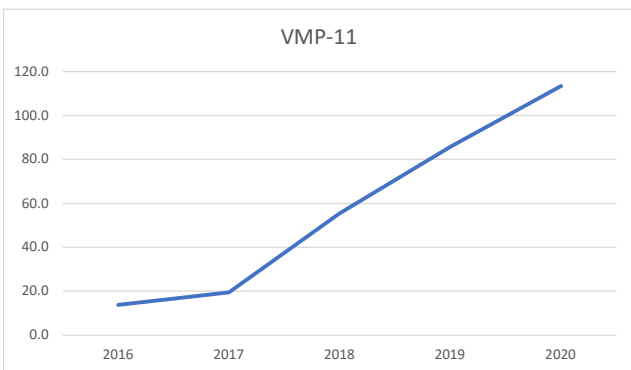
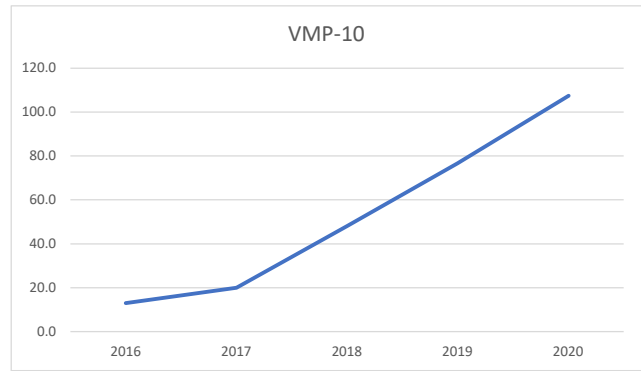
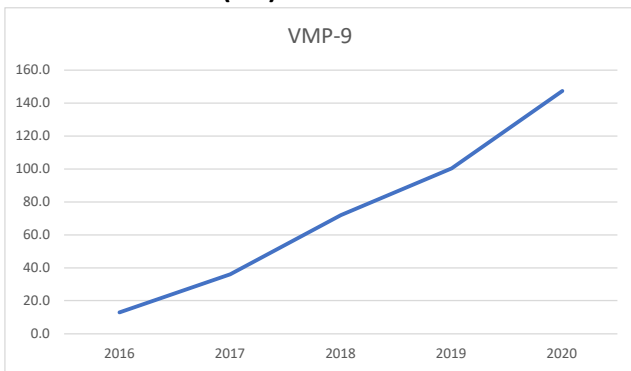
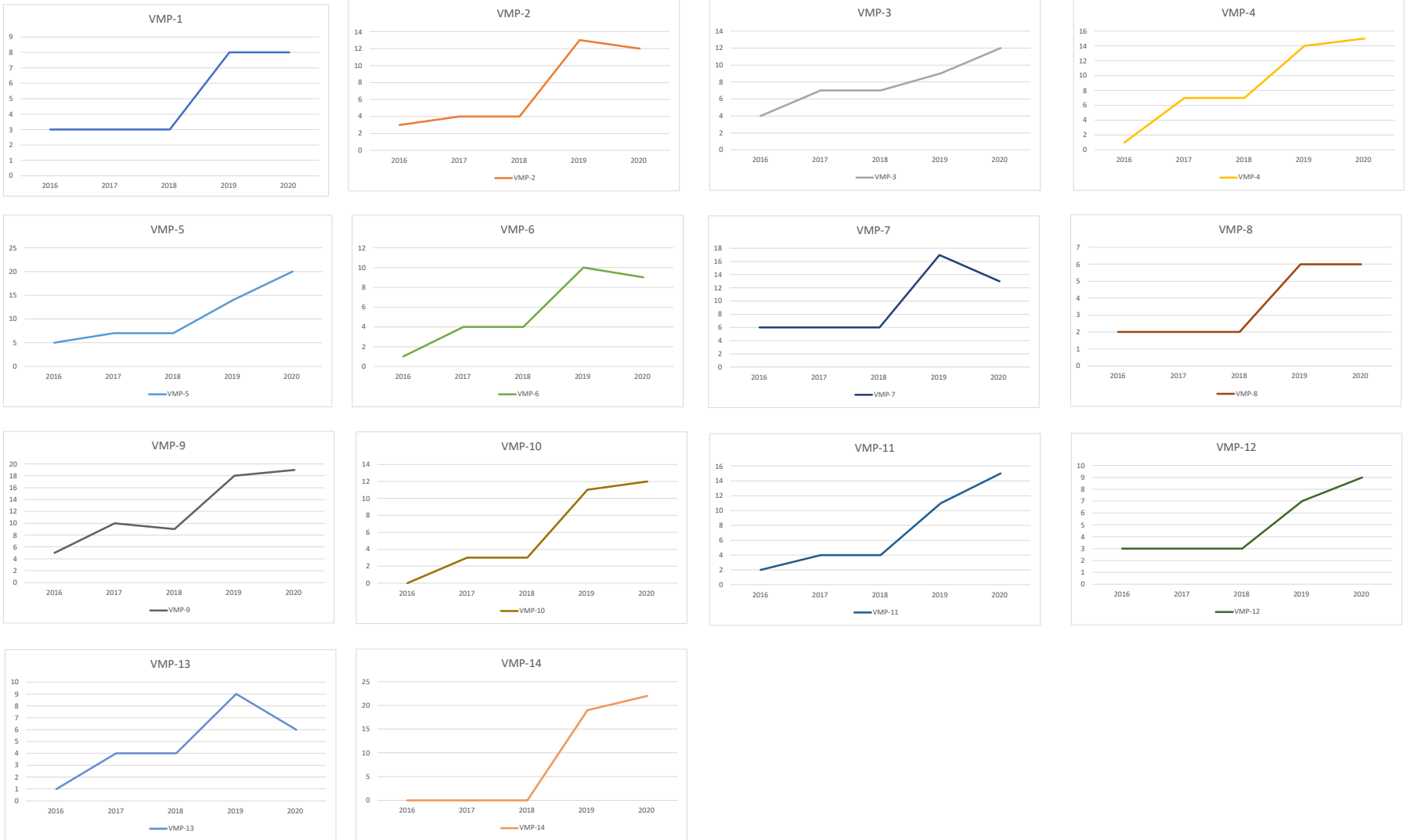


FIGURE C-2 TAXONOMIC RICHNESS PER PLOT YEAR 1 THROUGH TO YEAR 5 (2016 TO 2020)



APPENDIX D

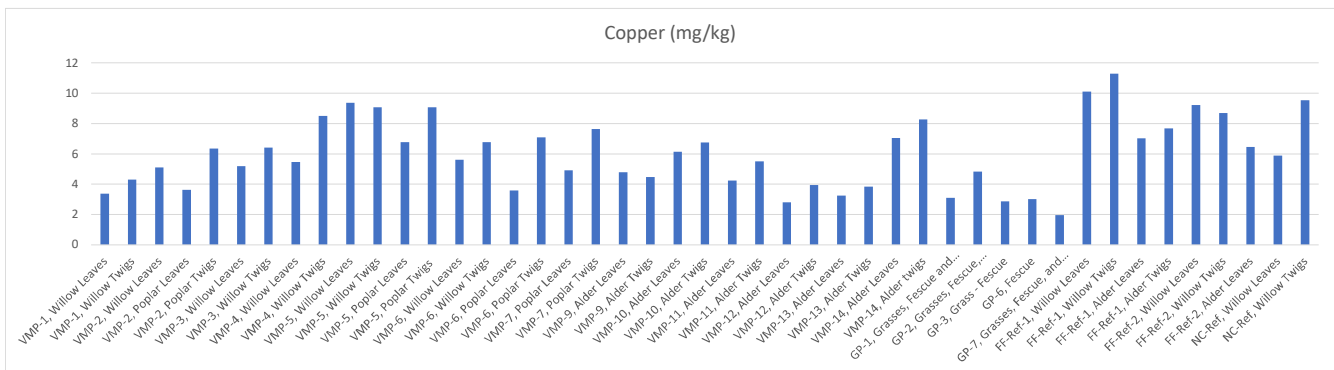
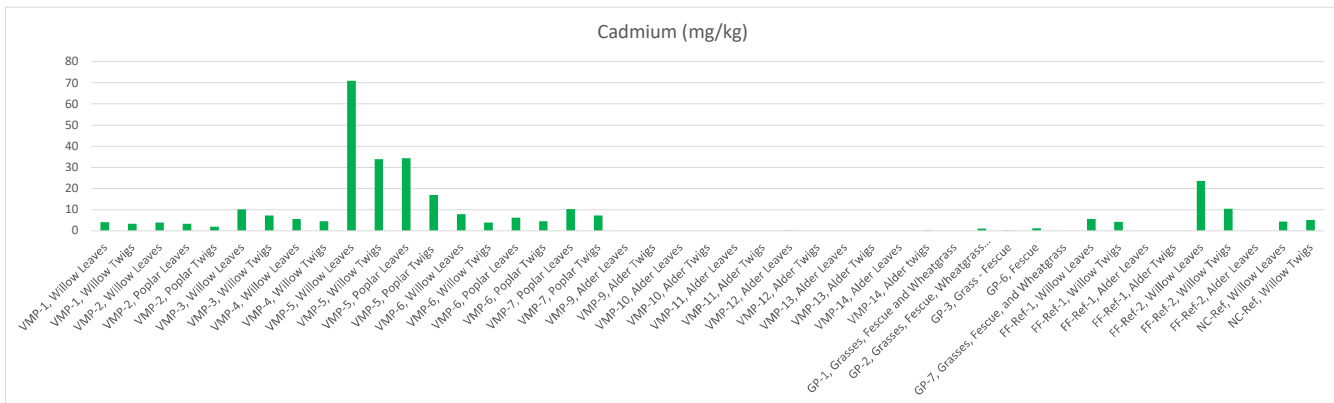
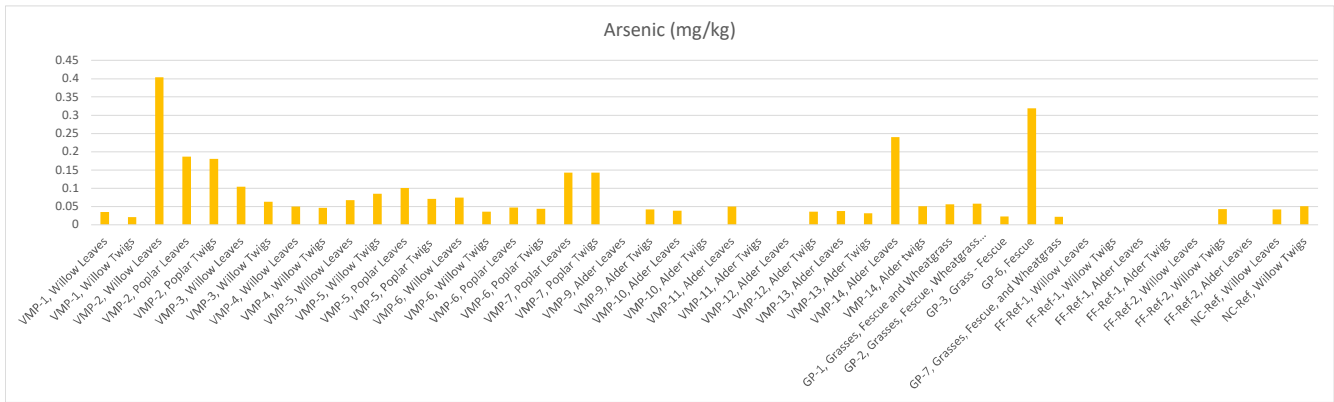
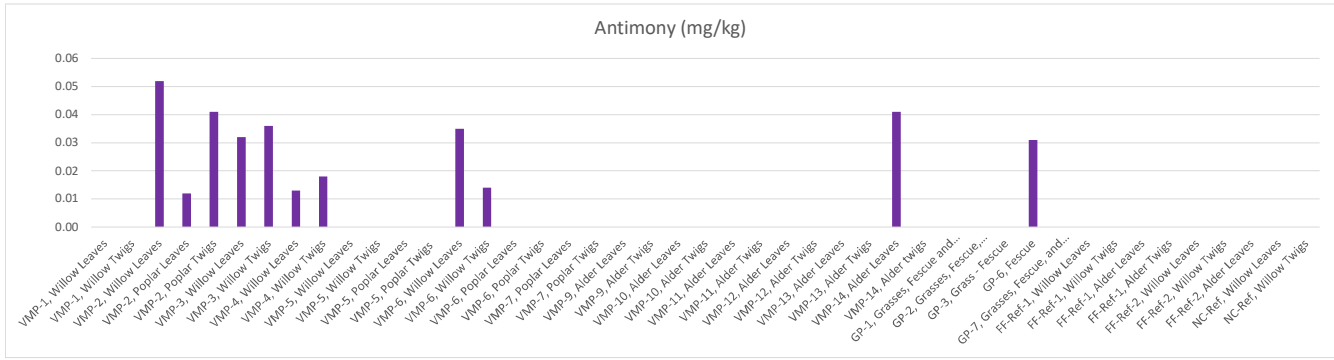
TISSUE ANALYSIS

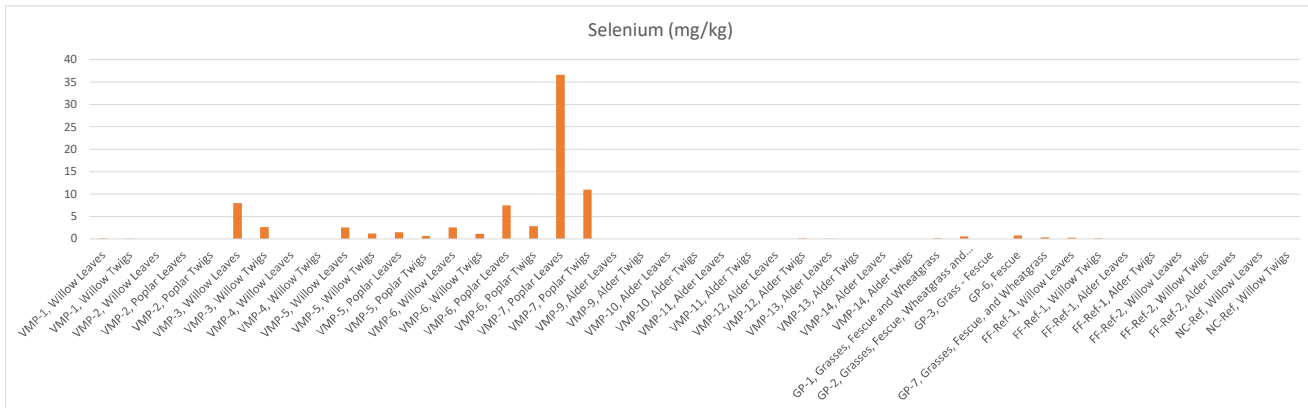
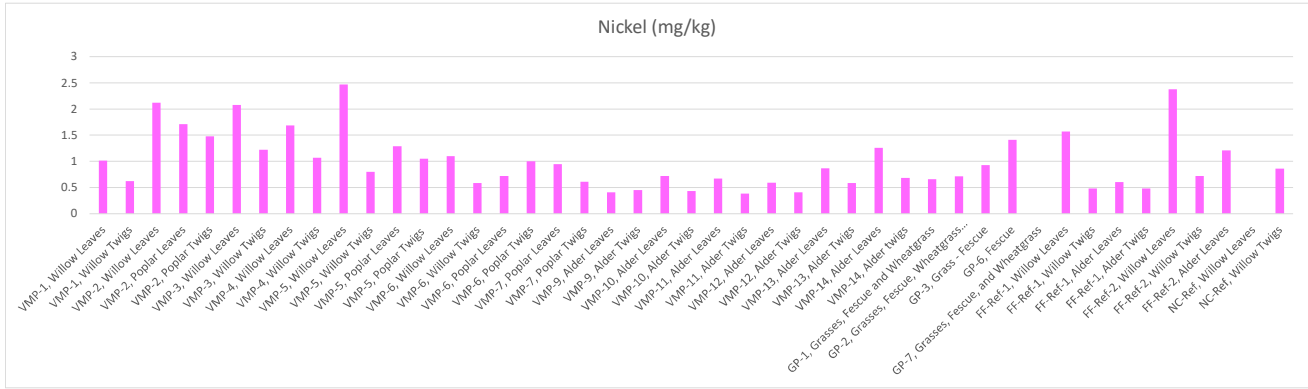
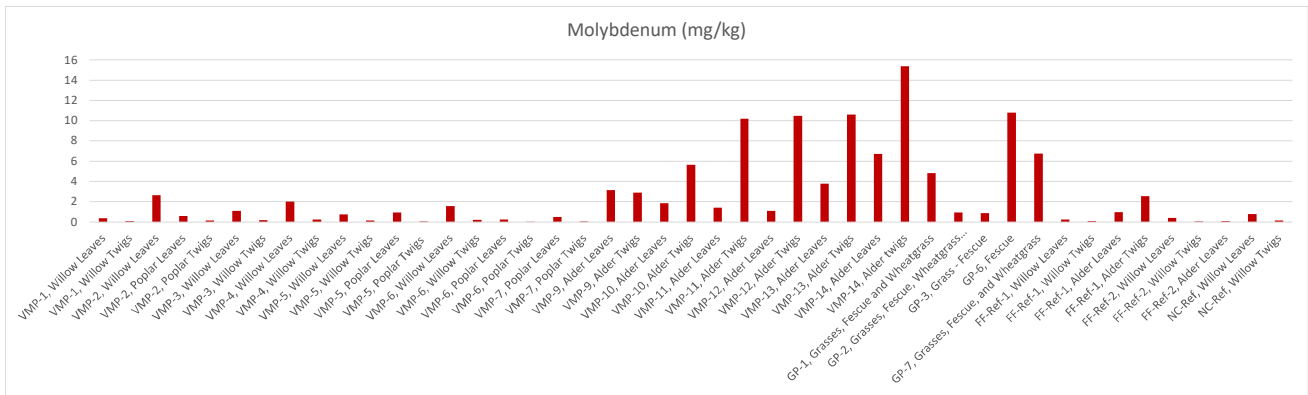
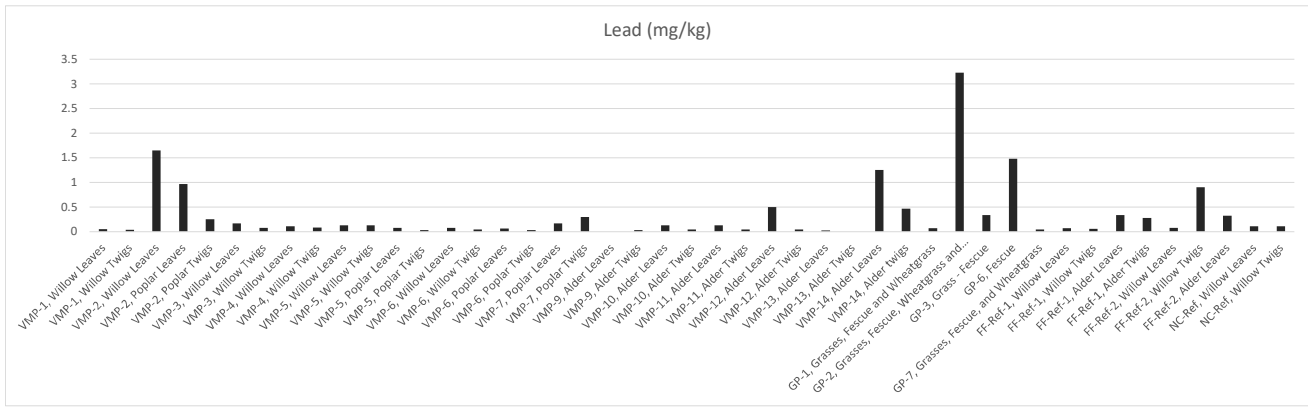
- **Table D-1, The Average Concentration (mg/kg) of Each Element per Tissue Type**
- **Figure D-1, Concentrations of COPCs in all Foliar Samples, 2020**
- **Figure D-2, Concentrations of COPCs in Willow and Alder Tissues at the Exposed and Reference Sites**
- **Figure D-3, Concentrations of COPCs in Willow and Alder Twigs at the Reference Sites, 2013 and 2020**
- **Certificate of Analysis, ALS**

TABLE D-1 APPENDIX D THE AVERAGE CONCENTRATION OF EACH ELEMENT PER TISSUE TYPE

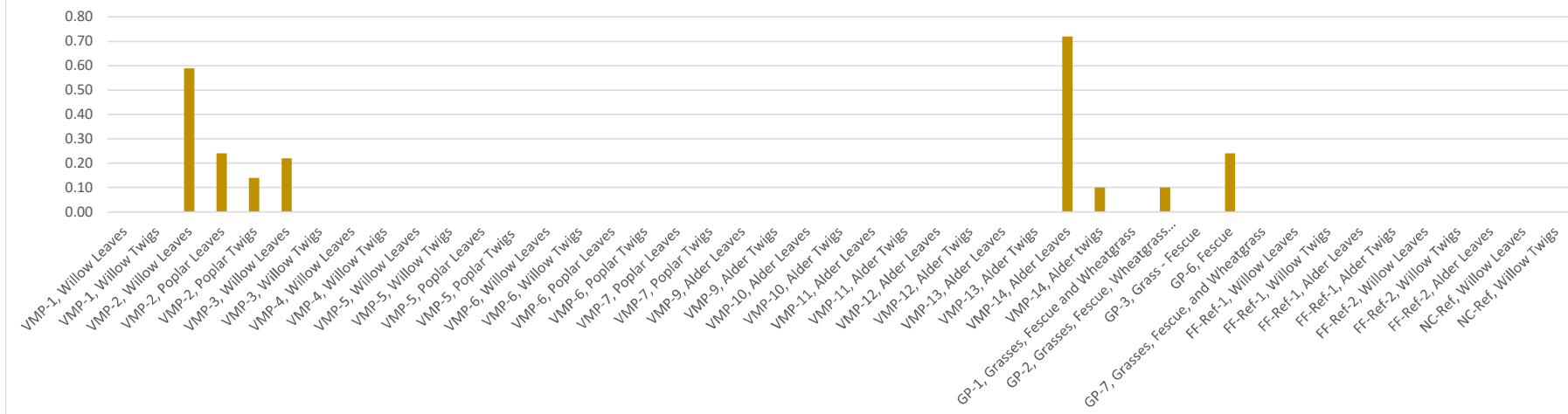
Tissue Type	Alder Leaves (N=8)			Alder Twigs (N=7)			Grasses (N=5)			Poplar Leaves (N=4)			Poplar Twigs (N=4)			Willow Leaves (N=9)			Willow Twigs (N=8)		
	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max
moisture (%)	64.4	56.0	71.0	66.9	60.6	70.7	62.3	55.8	67.3	64.6	62.0	66.8	63.2	53.9	71.8	69.1	61.5	78.7	70.0	64.6	79.0
aluminum	18.3	3.5	64.9	6.3	2.1	9.7	24.1	6.0	48.2	24.4	2.1	88.9	19.7	2.2	65.2	38.1	3.0	218.0	18.6	2.8	47.2
antimony	0.041	0.041	0.041		not detected		0.031	0.031	0.031	0.012	0.012	0.012	0.041	0.041	0.041	0.033	0.013	0.052	0.023	0.014	0.036
arsenic	0.092	0.038	0.24	0.04	0.031	0.051	0.0956	0.022	0.319	0.1195	0.047	0.187	0.1095	0.044	0.18	0.111	0.035	0.404	0.049	0.021	0.085
barium	8.2	2.8	17.0	11.8	4.8	21.6	7.2	4.2	12.2	13.6	7.0	19.2	20.3	10.3	33.8	8.1	1.5	16.0	7.2	2.3	13.6
beryllium		not detected			not detected			not detected			not detected			not detected			not detected			not detected	
bismuth		not detected			not detected		0.044	0.044	0.044		not detected			not detected			not detected			not detected	
boron	6.9	2.3	20.7	9.2	3.7	17.6	4.3	2.1	10.3	43.9	18.1	81.1	27.9	23.4	33.5	15.9	8.4	22.6	13.0	9.1	16.3
cadmium	0.052	0.013	0.147	0.048	0.024	0.130	0.503	0.017	1.300	13.53	3.25	34.40	7.70	1.94	16.90	15.18	4.02	71.00	9.11	3.24	34.00
calcium	8006	1330	10700	6770	5020	10400	3514	1750	7640	18050	16900	20400	12690	8160	16400	12878	7720	18600	5246	3130	6700
cesium	0.5113	0.0155	1.2100	0.3661	0.1010	0.8760	0.1351	0.0082	0.4970	0.0486	0.0220	0.0832	0.0354	0.0152	0.0496	0.1366	0.0108	0.3500	0.0774	0.0050	0.1620
chromium	0.283	0.080	0.750	0.062	0.053	0.072	0.124	0.066	0.310	0.145	0.145	0.145	0.128	0.075	0.230	0.209	0.075	0.418	0.214	0.075	0.690
cobalt	0.240	0.025	0.814	0.172	0.022	0.356	0.281	0.027	0.961	1.146	0.508	2.580	0.186	0.084	0.295	0.725	0.083	2.000	0.219	0.026	0.637
copper	5.22	2.79	7.04	5.77	3.82	8.27	3.15	1.95	4.82	4.72	3.58	6.78	7.54	6.36	9.07	6.59	3.37	10.10	8.07	4.30	11.30
iron	59.2	27.8	144.0	38.1	28.0	55.8	57.0	24.1	96.4	51.0	27.9	112.0	45.2	19.8	114.0	99.1	40.2	398.0	31.3	18.5	55.8
lead	0.385	0.025	1.250	0.151	0.029	0.464	1.032	0.042	3.230	0.319	0.060	0.968	0.154	0.034	0.295	0.271	0.049	1.650	0.181	0.035	0.903
lithium		not detected			not detected			not detected			not detected			not detected			not detected			not detected	
magnesium	1471	508	1940	1220	992	1760	1050	661	1870	1913	1800	2030	1453	1360	1530	2161	1540	3740	957	766	1120
manganese	70.2	30.9	168.0	49.2	29.3	65.6	36.2	16.2	60.2	81.0	61.4	119.0	18.3	12.0	29.3	89.5	49.8	176.0	25.4	12.6	37.7
mercury		not detected			not detected			not detected			not detected			not detected			not detected			not detected	
molybdenum	2.39	0.07	6.72	8.26	2.55	15.40	4.83	0.88	10.80	0.56	0.23	0.93	0.07	0.05	0.15	1.10	0.23	2.64	0.14	0.06	0.24
nickel	0.79	0.41	1.26	0.49	0.38	0.68	0.93	0.66	1.41	1.17	0.72	1.71	1.04	0.61	1.48	1.80	1.01	2.47	0.79	0.48	1.22
phosphorus	2400	1380	3110	2044	1670	2550	1873	787	2800	2260	1910	2620	1753	1610	1900	2611	1630	4360	1973	1480	2760
potassium	7533	3920	12800	6654	4840	8740	11528	8440	13800	12975	12000	14300	10045	7760	13100	16522	11400	21700	10188	8040	13800
rubidium	22.44	4.01	50.80	16.73	9.46	41.60	12.72	3.84	32.90	10.65	4.54	15.80	11.97	4.28	16.80	23.70	1.98	85.30	19.48	2.11	57.50
selenium	0.058	0.058	0.058	0.108	0.108	0.108	0.473	0.157	0.820	15.193	1.490	36.600	4.824	0.613	11.000	2.709	0.146	7.990	1.042	0.072	2.670
sodium		not detected			not detected		61	61	61		not detected		158	158	158		not detected		82	82	82
strontium	20.1	3.6	28.1	25.2	20.5	31.8	9.3	4.5	16.6	51.3	35.2	69.3	47.9	33.5	61.7	39.5	21.0	63.4	23.7	14.1	31.2
tellurium		not detected			not detected			not detected			not detected			not detected			not detected			not detected	
thallium	0.005	0.005	0.005	0.00365	0.0025	0.0048	0.0467	0.0467	0.0467		not detected			not detected		0.0022	0.0022	0.0022	0.0051	0.0051	0.0051
tin		not detected			not detected		0.49	0.49	0.49		not detected		0.3	0.3	0.3		not detected		0.63	0.63	0.63
uranium	0.0075	0.0026	0.0123	0.0021	0.0021	0.0021	0.0084	0.0056	0.0111	0.0088	0.0059	0.0116	0.0031	0.0028	0.0032	0.0092	0.0035	0.0172	0.0032	0.0025	0.0038
vanadium	0.72	0.72	0.72	0.1	0.1	0.1	0.17	0.1	0.24	0.24	0.24	0.24	0.14	0.14	0.14	0.405	0.22	0.59		not detected	
zinc	39.2	25.1	77.5	32.2	24.6	45.7	57.0	12.8	182.0	428.8	228.0	742.0	143.3	103.0	192.0	285.6	126.0	556.0	148.2	93.7	190.0
zirconium	0.41	0.41	0.41	0.25	0.25	0.25	0.87	0.87	0.87		not detected		0.31	0.31	0.31	0.24	0.24	0.24	0.515	0.26	1.18

FIGURE D-1 CONCENTRATIONS OF COPCS IN ALL FOLIAR SAMPLES, 2020





Vanadium (mg/kg)



Zinc (mg/kg)

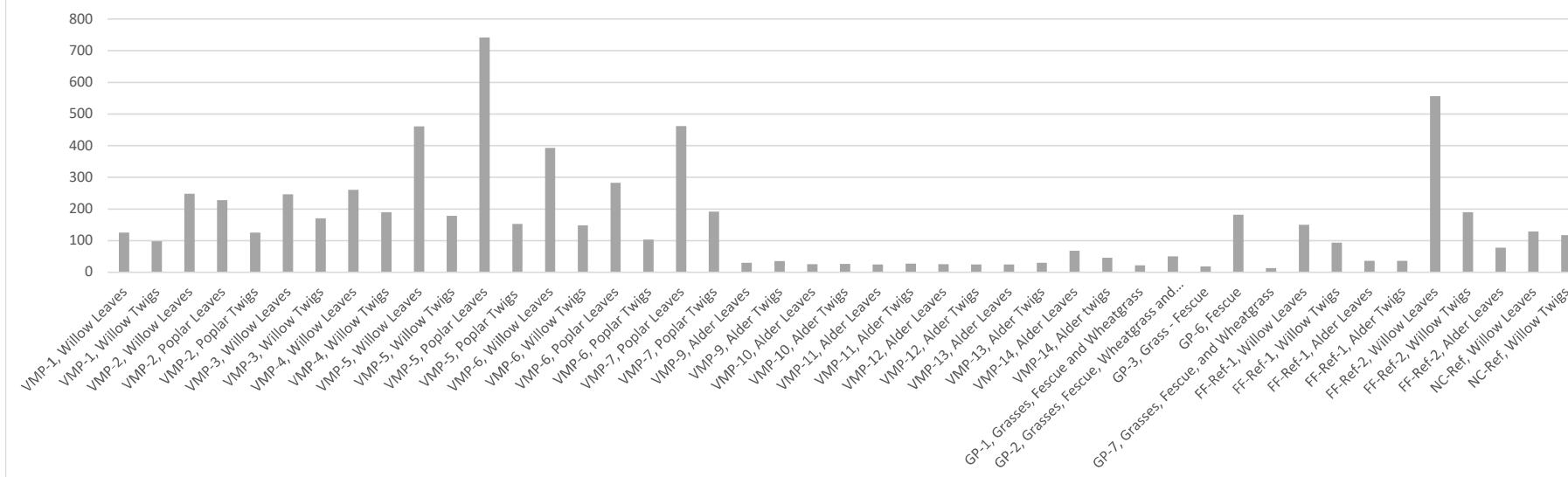


FIGURE D-2 CONCENTRATIONS OF COPCS IN WILLOW AND ALDER TISSUES AT THE EXPOSED AND REFERENCE SITES, 2020

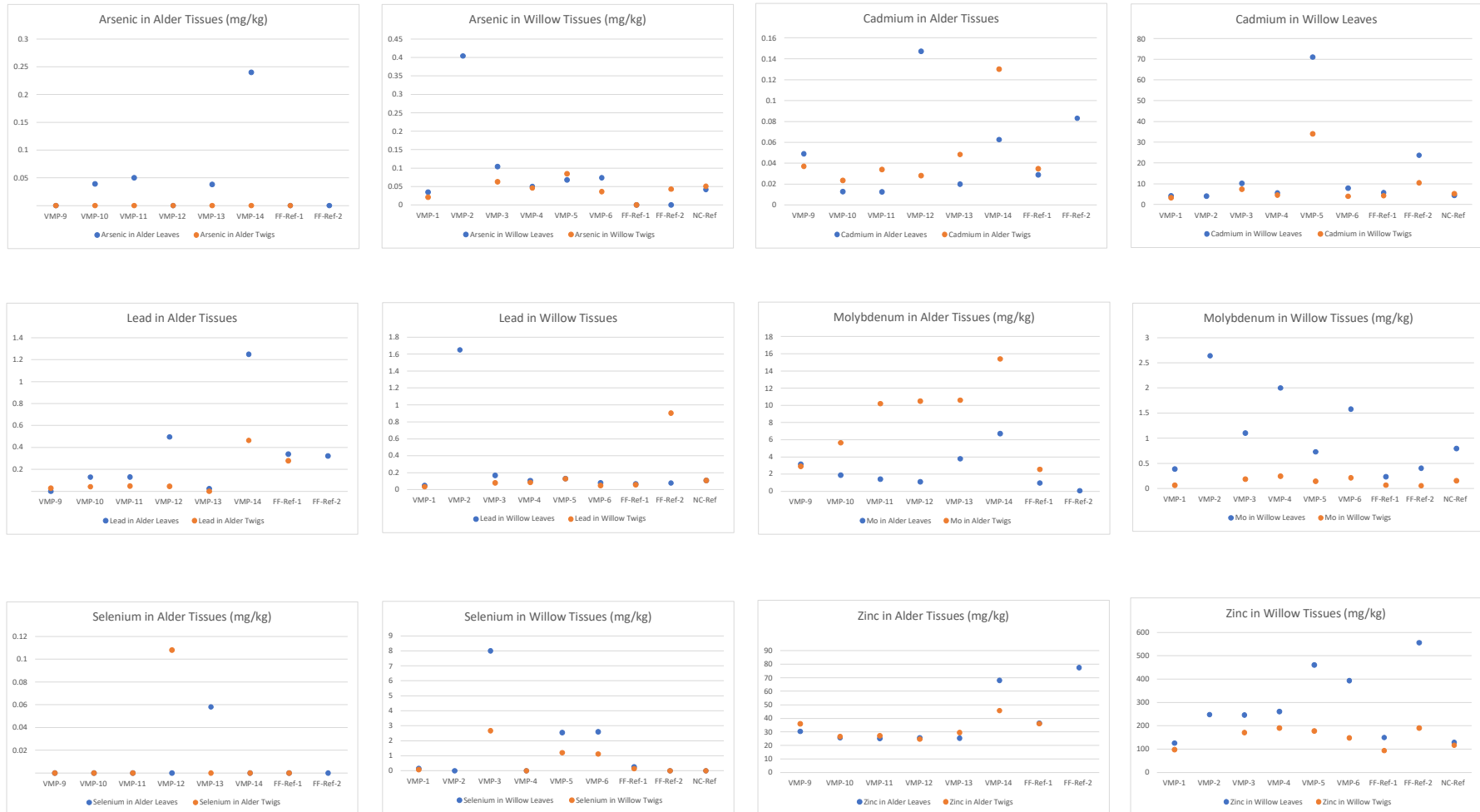
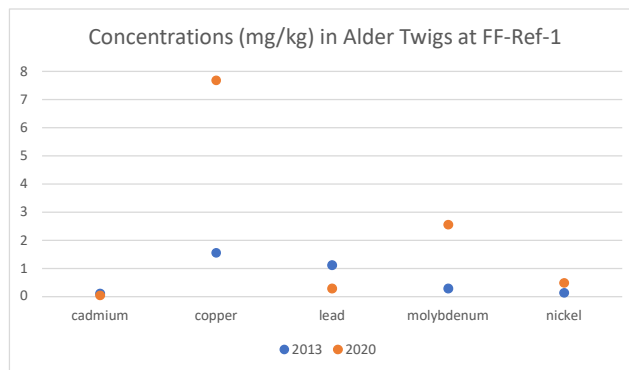
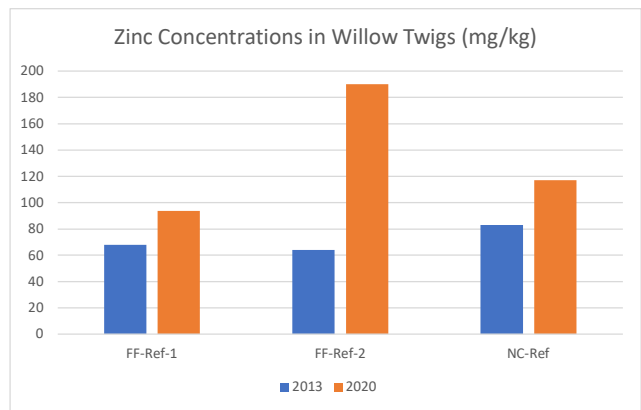
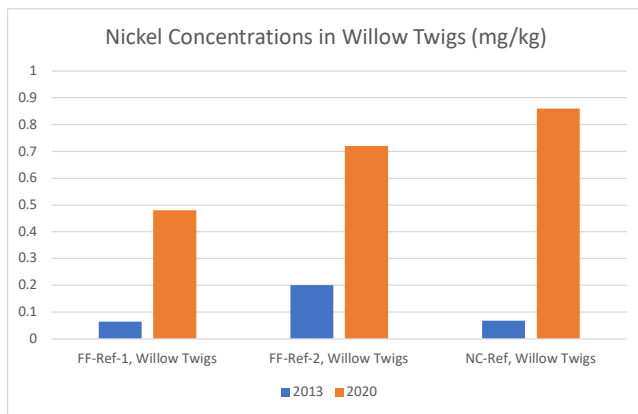
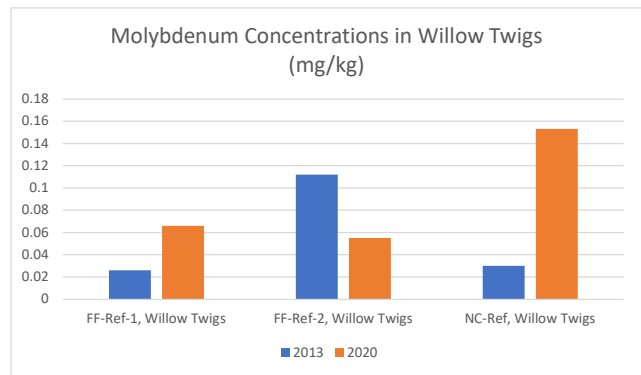
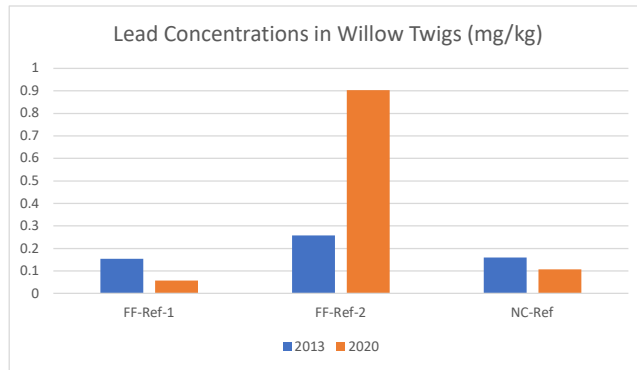
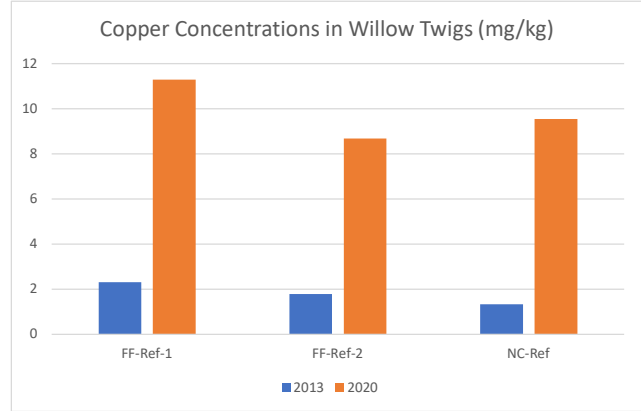
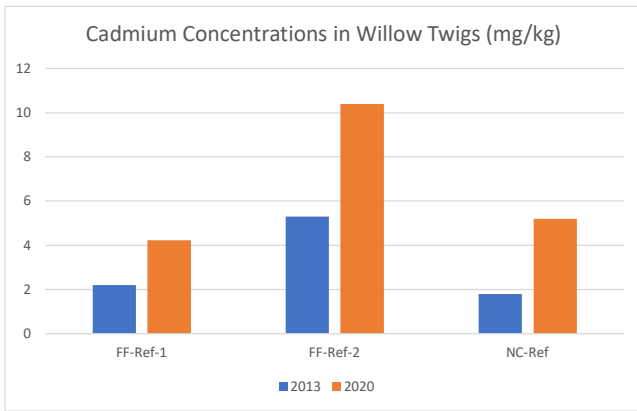


FIGURE D-3 CONCENTRATIONS OF COPCs IN WILLOW AND ALDER TWIGS AT THE REFERENCE SITES, 2013 AND 2020





CERTIFICATE OF ANALYSIS

Work Order : **WR2000560**
Client : **Teck Metals Limited**
Contact : Michelle Unger
Address : 601 Knighton Road
Kimberley BC Canada V1A 3E1
Telephone : 250 427 8404
Project : Sa Dena Hes
PO : 9971
C-O-C number :
Sampler : Bonnie Burns
Site : Sa Dena Hes
Quote number : Q62635
No. of samples received : 45
No. of samples analysed : 45

Page : 1 of 23
Laboratory : Whitehorse - Environmental
Account Manager : Can Dang
Address : #12 151 Industrial Road
Whitehorse YT Canada Y1A 2V3
Telephone : +1 867 668 6689
Date Samples Received : 28-Jul-2020 15:20
Date Analysis Commenced : 13-Aug-2020
Issue Date : 10-Sep-2020 07:43

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Kinny Wu	Lab Analyst	Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia
Salimah Khimani	Lab Assistant	Metals, Burnaby, British Columbia
Shaneel Dayal	Analyst	Metals, Burnaby, British Columbia
Woochan Song	Lab Assistant	Metals, Burnaby, British Columbia



General Comments

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

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

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

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

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

<i>Unit</i>	<i>Description</i>
%	percent
mg/kg	milligrams per kilogram

<: less than.

>: greater than.

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

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

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

Analytical results in reports identified as "Preliminary Report" are considered authorized for use.

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLA	Detection Limit adjusted for required dilution.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).



Analytical Results

Sub-Matrix: Tissue
 (Matrix: Biota)

Client sample ID

					VMP-1, Willow Leaves	VMP-1, Willow Twigs	VMP-2, Willow Leaves	VMP-2, Poplar Leaves	VMP-2, Poplar Twigs
Client sampling date / time					24-Jul-2020	24-Jul-2020	24-Jul-2020	24-Jul-2020	24-Jul-2020
Analyte	CAS Number	Method	LOR	Unit	WR2000560-026	WR2000560-027	WR2000560-028	WR2000560-029	WR2000560-030
					Result	Result	Result	Result	Result
Physical Tests									
moisture	----	E144	0.50	%	66.7	67.6	61.5	62.0	----
moisture	----	E144-H	2.0	%	----	----	----	----	53.9
Metals									
aluminum	7429-90-5	E440	2.0	mg/kg	7.9	4.4	218	88.9	----
aluminum	7429-90-5	E472	5.0	mg/kg	----	----	----	----	65.2
antimony	7440-36-0	E472	0.010	mg/kg	----	----	----	----	0.041
antimony	7440-36-0	E440	0.010	mg/kg	<0.010	<0.010	0.052	0.012	----
arsenic	7440-38-2	E440	0.020	mg/kg	0.035	0.021	0.404	0.187	----
arsenic	7440-38-2	E472	0.030	mg/kg	----	----	----	----	0.180
barium	7440-39-3	E472	0.050	mg/kg	----	----	----	----	33.8
barium	7440-39-3	E440	0.050	mg/kg	3.10	4.35	16.0	18.5	----
beryllium	7440-41-7	E472	0.010	mg/kg	----	----	----	----	<0.010
beryllium	7440-41-7	E440	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	----
bismuth	7440-69-9	E472	0.010	mg/kg	----	----	----	----	<0.010
bismuth	7440-69-9	E440	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	----
boron	7440-42-8	E472	1.0	mg/kg	----	----	----	----	23.4
boron	7440-42-8	E440	1.0	mg/kg	11.6	11.7	13.2	21.4	----
cadmium	7440-43-9	E440	0.0050	mg/kg	4.11	3.24	4.02	3.25	----
cadmium	7440-43-9	E472	0.010	mg/kg	----	----	----	----	1.94
calcium	7440-70-2	E472	20	mg/kg	----	----	----	----	16400
calcium	7440-70-2	E440	20	mg/kg	8080	4650	12200	16900	----
cesium	7440-46-2	E472	0.0050	mg/kg	----	----	----	----	0.0152
cesium	7440-46-2	E440	0.0050	mg/kg	0.112	0.0834	0.0377	0.0220	----
chromium	7440-47-3	E440	0.050	mg/kg	<0.050	0.096	0.418	0.145	----
chromium	7440-47-3	E472	0.20	mg/kg	----	----	----	----	0.23
cobalt	7440-48-4	E472	0.020	mg/kg	----	----	----	----	0.295
cobalt	7440-48-4	E440	0.020	mg/kg	1.12	0.397	2.00	2.58	----
copper	7440-50-8	E440	0.10	mg/kg	3.37	4.30	5.10	3.62	----
copper	7440-50-8	E472	0.20	mg/kg	----	----	----	----	6.36
iron	7439-89-6	E440	3.0	mg/kg	47.3	18.8	398	112	----
iron	7439-89-6	E472	5.0	mg/kg	----	----	----	----	114



Analytical Results

Sub-Matrix: Tissue
 (Matrix: Biota)

Client sample ID

					VMP-1, Willow Leaves	VMP-1, Willow Twigs	VMP-2, Willow Leaves	VMP-2, Poplar Leaves	VMP-2, Poplar Twigs
Client sampling date / time					24-Jul-2020	24-Jul-2020	24-Jul-2020	24-Jul-2020	24-Jul-2020
Analyte	CAS Number	Method	LOR	Unit	WR2000560-026	WR2000560-027	WR2000560-028	WR2000560-029	WR2000560-030
					Result	Result	Result	Result	Result
Metals									
lead	7439-92-1	E440	0.020	mg/kg	0.049	0.035	1.65	0.968	----
lead	7439-92-1	E472	0.050	mg/kg	----	----	----	----	0.254
lithium	7439-93-2	E472	0.50	mg/kg	----	----	----	----	<0.50
lithium	7439-93-2	E440	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	----
magnesium	7439-95-4	E472	2.0	mg/kg	----	----	----	----	1530
magnesium	7439-95-4	E440	2.0	mg/kg	1590	968	2270	1940	----
manganese	7439-96-5	E472	0.050	mg/kg	----	----	----	----	29.3
manganese	7439-96-5	E440	0.050	mg/kg	74.5	26.8	156	119	----
mercury	7439-97-6	E511	0.0050	mg/kg	----	----	----	----	<0.0050
mercury	7439-97-6	E510	0.0050	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	----
molybdenum	7439-98-7	E440	0.020	mg/kg	0.387	0.064	2.64	0.603	----
molybdenum	7439-98-7	E472	0.040	mg/kg	----	----	----	----	0.145
nickel	7440-02-0	E472	0.20	mg/kg	----	----	----	----	1.48
nickel	7440-02-0	E440	0.20	mg/kg	1.01	0.62	2.12	1.71	----
phosphorus	7723-14-0	E472	10	mg/kg	----	----	----	----	1890
phosphorus	7723-14-0	E440	10	mg/kg	1630	1480	1970	1910	----
potassium	7440-09-7	E472	20	mg/kg	----	----	----	----	9220
potassium	7440-09-7	E440	20	mg/kg	17300	10900	11400	12200	----
rubidium	7440-17-7	E472	0.050	mg/kg	----	----	----	----	4.28
rubidium	7440-17-7	E440	0.050	mg/kg	8.30	9.06	1.98	4.54	----
selenium	7782-49-2	E440	0.050	mg/kg	0.146	0.072	<0.050	<0.050	----
selenium	7782-49-2	E472	0.10	mg/kg	----	----	----	----	<0.10
sodium	7440-23-5	E472	20	mg/kg	----	----	----	----	158
sodium	7440-23-5	E440	20	mg/kg	<20	<20	<20	<20	----
strontium	7440-24-6	E440	0.050	mg/kg	27.5	24.3	43.0	54.1	----
strontium	7440-24-6	E472	0.10	mg/kg	----	----	----	----	61.2
tellurium	13494-80-9	E472	0.020	mg/kg	----	----	----	----	<0.020
tellurium	13494-80-9	E440	0.020	mg/kg	<0.020	<0.020	<0.020	<0.020	----
thallium	7440-28-0	E472	0.0020	mg/kg	----	----	----	----	<0.0020
thallium	7440-28-0	E440	0.0020	mg/kg	<0.0020	<0.0020	<0.0020	<0.0020	----
tin	7440-31-5	E472	0.10	mg/kg	----	----	----	----	0.30
tin	7440-31-5	E440	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	----



Analytical Results

Sub-Matrix: Tissue (Matrix: Biota)					Client sample ID	VMP-1, Willow Leaves	VMP-1, Willow Twigs	VMP-2, Willow Leaves	VMP-2, Poplar Leaves	VMP-2, Poplar Twigs
Client sampling date / time					24-Jul-2020	24-Jul-2020	24-Jul-2020	24-Jul-2020	24-Jul-2020	
Analyte	CAS Number	Method	LOR	Unit	WR2000560-026	WR2000560-027	WR2000560-028	WR2000560-029	WR2000560-030	
					Result	Result	Result	Result	Result	
Metals										
uranium	7440-61-1	E472	0.0020	mg/kg	----	----	----	----	0.0032	
uranium	7440-61-1	E440	0.0020	mg/kg	<0.0020	<0.0020	0.0172	0.0059	----	
vanadium	7440-62-2	E472	0.10	mg/kg	----	----	----	----	0.14	
vanadium	7440-62-2	E440	0.10	mg/kg	<0.10	<0.10	0.59	0.24	----	
zinc	7440-66-6	E440	0.50	mg/kg	126	97.8	248	228	----	
zinc	7440-66-6	E472	1.0	mg/kg	----	----	----	----	125	
zirconium	7440-67-7	E472	0.20	mg/kg	----	----	----	----	0.31	
zirconium	7440-67-7	E440	0.20	mg/kg	<0.20	<0.20	0.24	<0.20	----	

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



Analytical Results

Sub-Matrix: Tissue

Client sample ID

(Matrix: Biota)

					VMP-3, Willow Leaves	VMP-3, Willow Twigs	VMP-4, Willow Leaves	VMP-4, Willow Twigs	VMP-5, Willow Leaves
Client sampling date / time					24-Jul-2020	24-Jul-2020	25-Jul-2020	25-Jul-2020	26-Jul-2020
Analyte	CAS Number	Method	LOR	Unit	WR2000560-031	WR2000560-032	WR2000560-033	WR2000560-034	WR2000560-035
					Result	Result	Result	Result	Result
Physical Tests									
moisture	----	E144	0.50	%	64.9	66.4	67.1	64.6	67.3
Metals									
aluminum	7429-90-5	E440	2.0	mg/kg	62.4	47.2	22.1	29.9	3.5
antimony	7440-36-0	E440	0.010	mg/kg	0.032	0.036	0.013	0.018	<0.010
arsenic	7440-38-2	E440	0.020	mg/kg	0.104	0.063	0.050	0.046	0.068
barium	7440-39-3	E440	0.050	mg/kg	14.8	13.6	9.90	11.1	8.49
beryllium	7440-41-7	E440	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
bismuth	7440-69-9	E440	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
boron	7440-42-8	E440	1.0	mg/kg	20.0	15.7	21.9	15.5	22.6
cadmium	7440-43-9	E440	0.0050	mg/kg	10.2	7.34	5.62	4.54	71.0
calcium	7440-70-2	E440	20	mg/kg	13000	6700	11300	6050	15200
cesium	7440-46-2	E440	0.0050	mg/kg	0.0108	0.0050	0.0202	0.0116	0.144
chromium	7440-47-3	E440	0.050	mg/kg	0.133	0.115	0.075	0.136	<0.050
cobalt	7440-48-4	E440	0.020	mg/kg	0.852	0.337	1.04	0.637	0.247
copper	7440-50-8	E440	0.10	mg/kg	5.19	6.40	5.45	8.51	9.38
iron	7439-89-6	E440	3.0	mg/kg	126	55.8	58.5	46.4	49.4
lead	7439-92-1	E440	0.020	mg/kg	0.168	0.079	0.107	0.085	0.129
lithium	7439-93-2	E440	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
magnesium	7439-95-4	E440	2.0	mg/kg	2280	1120	1940	1040	1860
manganese	7439-96-5	E440	0.050	mg/kg	79.2	21.5	82.6	30.9	60.5
mercury	7439-97-6	E510	0.0050	mg/kg	<0.0050	<0.0063 ^{DLA}	<0.0050	<0.0050	<0.0050
molybdenum	7439-98-7	E440	0.020	mg/kg	1.10	0.187	2.00	0.244	0.729
nickel	7440-02-0	E440	0.20	mg/kg	2.08	1.22	1.69	1.07	2.47
phosphorus	7723-14-0	E440	10	mg/kg	2630	1760	2590	1900	2650
potassium	7440-09-7	E440	20	mg/kg	16300	8150	15800	8510	11900
rubidium	7440-17-7	E440	0.050	mg/kg	2.51	2.11	3.71	2.80	18.4
selenium	7782-49-2	E440	0.050	mg/kg	7.99	2.67	<0.050	<0.050	2.55
sodium	7440-23-5	E440	20	mg/kg	<20	<20	<20	<20	<20
strontium	7440-24-6	E440	0.050	mg/kg	42.2	28.2	41.9	28.7	46.6
tellurium	13494-80-9	E440	0.020	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020
thallium	7440-28-0	E440	0.0020	mg/kg	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
tin	7440-31-5	E440	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10



Analytical Results

Sub-Matrix: Tissue (Matrix: Biota)					Client sample ID	VMP-3, Willow Leaves	VMP-3, Willow Twigs	VMP-4, Willow Leaves	VMP-4, Willow Twigs	VMP-5, Willow Leaves
Client sampling date / time					24-Jul-2020	24-Jul-2020	25-Jul-2020	25-Jul-2020	26-Jul-2020	
Analyte	CAS Number	Method	LOR	Unit	WR2000560-031	WR2000560-032	WR2000560-033	WR2000560-034	WR2000560-035	
					Result	Result	Result	Result	Result	
Metals										
uranium	7440-61-1	E440	0.0020	mg/kg	0.0087	0.0025	<0.0020	<0.0020	0.0073	
vanadium	7440-62-2	E440	0.10	mg/kg	0.22	<0.10	<0.10	<0.10	<0.10	
zinc	7440-66-6	E440	0.50	mg/kg	246	171	261	190	461	
zirconium	7440-67-7	E440	0.20	mg/kg	<0.20	0.32	<0.20	0.26	<0.20	

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



Analytical Results

Sub-Matrix: Tissue

Client sample ID

(Matrix: Biota)

					VMP-5, Willow Twigs	VMP-5, Poplar Leaves	VMP-5, Poplar Twigs	VMP-6, Willow Leaves	VMP-6, Willow Twigs
Client sampling date / time					26-Jul-2020	24-Jul-2020	24-Jul-2020	24-Jul-2020	24-Jul-2020
Analyte	CAS Number	Method	LOR	Unit	WR2000560-036	WR2000560-037	WR2000560-038	WR2000560-039	WR2000560-040
					Result	Result	Result	Result	Result
Physical Tests									
moisture	----	E144	0.50	%	71.2	66.8	66.0	69.2	65.4
Metals									
aluminum	7429-90-5	E440	2.0	mg/kg	2.8	2.1	2.2	19.5	5.7
antimony	7440-36-0	E440	0.010	mg/kg	<0.010	<0.010	<0.010	0.035	0.014
arsenic	7440-38-2	E440	0.020	mg/kg	0.085	0.101	0.071	0.074	0.036
barium	7440-39-3	E440	0.050	mg/kg	7.71	9.86	12.2	7.89	6.88
beryllium	7440-41-7	E440	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
bismuth	7440-69-9	E440	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
boron	7440-42-8	E440	1.0	mg/kg	13.2	81.1	33.5	11.6	12.8
cadmium	7440-43-9	E440	0.0050	mg/kg	34.0	34.4	16.9	7.86	3.94
calcium	7440-70-2	E440	20	mg/kg	6330	17500	8160	13500	5310
cesium	7440-46-2	E440	0.0050	mg/kg	0.0742	0.0521	0.0312	0.198	0.112
chromium	7440-47-3	E440	0.050	mg/kg	0.075	<0.050	0.078	<0.050	<0.050
cobalt	7440-48-4	E440	0.020	mg/kg	0.039	0.508	0.084	0.692	0.189
copper	7440-50-8	E440	0.10	mg/kg	9.07	6.78	9.07	5.60	6.77
iron	7439-89-6	E440	3.0	mg/kg	18.5	35.5	19.8	75.9	31.1
lead	7439-92-1	E440	0.020	mg/kg	0.128	0.076	0.034	0.079	0.048
lithium	7439-93-2	E440	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
magnesium	7439-95-4	E440	2.0	mg/kg	871	2030	1410	1870	933
manganese	7439-96-5	E440	0.050	mg/kg	15.4	72.8	12.0	57.8	12.6
mercury	7439-97-6	E510	0.0050	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
molybdenum	7439-98-7	E440	0.020	mg/kg	0.141	0.926	0.051	1.58	0.213
nickel	7440-02-0	E440	0.20	mg/kg	0.80	1.29	1.05	1.10	0.58
phosphorus	7723-14-0	E440	10	mg/kg	1670	2460	1610	3100	1860
potassium	7440-09-7	E440	20	mg/kg	10300	14300	13100	17300	8040
rubidium	7440-17-7	E440	0.050	mg/kg	15.6	15.8	16.8	18.1	15.2
selenium	7782-49-2	E440	0.050	mg/kg	1.21	1.49	0.613	2.60	1.12
sodium	7440-23-5	E440	20	mg/kg	<20	<20	<20	<20	<20
strontium	7440-24-6	E440	0.050	mg/kg	25.9	46.4	35.3	39.0	21.7
tellurium	13494-80-9	E440	0.020	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020
thallium	7440-28-0	E440	0.0020	mg/kg	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
tin	7440-31-5	E440	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10



Analytical Results

Sub-Matrix: Tissue
 (Matrix: Biota)

					Client sample ID	VMP-5, Willow Twigs	VMP-5, Poplar Leaves	VMP-5, Poplar Twigs	VMP-6, Willow Leaves	VMP-6, Willow Twigs
					Client sampling date / time	26-Jul-2020	24-Jul-2020	24-Jul-2020	24-Jul-2020	24-Jul-2020
Analyte	CAS Number	Method	LOR	Unit	WR2000560-036	WR2000560-037	WR2000560-038	WR2000560-039	WR2000560-040	
					Result	Result	Result	Result	Result	
Metals										
uranium	7440-61-1	E440	0.0020	mg/kg	<0.0020	0.0116	0.0032	0.0035	<0.0020	
vanadium	7440-62-2	E440	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10	
zinc	7440-66-6	E440	0.50	mg/kg	178	742	153	393	148	
zirconium	7440-67-7	E440	0.20	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20	

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



Analytical Results

Sub-Matrix: Tissue
 (Matrix: Biota)

Client sample ID

					VMP-6, Poplar Leaves	VMP-6, Poplar Twigs	VMP-7, Poplar Leaves	VMP-7, Poplar Twigs	VMP-9, Alder Leaves
Client sampling date / time					24-Jul-2020	24-Jul-2020	26-Jul-2020	26-Jul-2020	25-Jul-2020
Analyte	CAS Number	Method	LOR	Unit	WR2000560-041	WR2000560-042	WR2000560-043	WR2000560-044	WR2000560-045
					Result	Result	Result	Result	Result
Physical Tests									
moisture	----	E144	0.50	%	64.1	71.8	65.6	61.0	63.8
Metals									
aluminum	7429-90-5	E440	2.0	mg/kg	3.8	5.5	2.8	5.8	4.9
antimony	7440-36-0	E440	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
arsenic	7440-38-2	E440	0.020	mg/kg	0.047	0.044	0.143	0.143	<0.020
barium	7440-39-3	E440	0.050	mg/kg	7.01	10.3	19.2	25.0	17.0
beryllium	7440-41-7	E440	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
bismuth	7440-69-9	E440	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
boron	7440-42-8	E440	1.0	mg/kg	18.1	25.2	55.1	29.4	10.0
cadmium	7440-43-9	E440	0.0050	mg/kg	6.16	4.60	10.3	7.34	0.0490
calcium	7440-70-2	E440	20	mg/kg	17400	11100	20400	15100	5410
cesium	7440-46-2	E440	0.0050	mg/kg	0.0369	0.0496	0.0832	0.0455	0.0910
chromium	7440-47-3	E440	0.050	mg/kg	<0.050	<0.050	<0.050	0.075	<0.050
cobalt	7440-48-4	E440	0.020	mg/kg	0.762	0.190	0.735	0.173	0.070
copper	7440-50-8	E440	0.10	mg/kg	3.58	7.09	4.90	7.64	4.79
iron	7439-89-6	E440	3.0	mg/kg	28.4	26.7	27.9	20.2	32.2
lead	7439-92-1	E440	0.020	mg/kg	0.060	0.034	0.170	0.295	<0.020
lithium	7439-93-2	E440	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
magnesium	7439-95-4	E440	2.0	mg/kg	1800	1510	1880	1360	743
manganese	7439-96-5	E440	0.050	mg/kg	61.4	14.3	70.6	17.7	32.7
mercury	7439-97-6	E510	0.0050	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
molybdenum	7439-98-7	E440	0.020	mg/kg	0.234	0.045	0.479	0.056	3.16
nickel	7440-02-0	E440	0.20	mg/kg	0.72	1.00	0.95	0.61	0.41
phosphorus	7723-14-0	E440	10	mg/kg	2050	1900	2620	1610	1480
potassium	7440-09-7	E440	20	mg/kg	12000	10100	13400	7760	3920
rubidium	7440-17-7	E440	0.050	mg/kg	8.07	13.0	14.2	13.8	6.61
selenium	7782-49-2	E440	0.050	mg/kg	7.49	2.86	36.6	11.0	<0.050
sodium	7440-23-5	E440	20	mg/kg	<20	<20	<20	<20	<20
strontium	7440-24-6	E440	0.050	mg/kg	35.2	33.5	69.3	61.7	19.4
tellurium	13494-80-9	E440	0.020	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020
thallium	7440-28-0	E440	0.0020	mg/kg	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
tin	7440-31-5	E440	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10



Analytical Results

Sub-Matrix: Tissue
 (Matrix: Biota)

					<i>Client sample ID</i>				
					VMP-6, Poplar Leaves	VMP-6, Poplar Twigs	VMP-7, Poplar Leaves	VMP-7, Poplar Twigs	VMP-9, Alder Leaves
<i>Client sampling date / time</i>					24-Jul-2020	24-Jul-2020	26-Jul-2020	26-Jul-2020	25-Jul-2020
<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	WR2000560-041	WR2000560-042	WR2000560-043	WR2000560-044	WR2000560-045
					Result	Result	Result	Result	Result
Metals									
uranium	7440-61-1	E440	0.0020	mg/kg	0.0090	0.0028	<0.0020	<0.0020	<0.0020
vanadium	7440-62-2	E440	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
zinc	7440-66-6	E440	0.50	mg/kg	283	103	462	192	30.3
zirconium	7440-67-7	E440	0.20	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20

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



Analytical Results

Sub-Matrix: Tissue

Client sample ID

(Matrix: Biota)

					VMP-9, Alder Twigs	VMP-10, Alder Leaves	VMP-10, Alder Twigs	VMP-11, Alder Leaves	VMP-11, Alder Twigs
Client sampling date / time					25-Jul-2020	26-Jul-2020	26-Jul-2020	26-Jul-2020	26-Jul-2020
Analyte	CAS Number	Method	LOR	Unit	WR2000560-046	WR2000560-047	WR2000560-048	WR2000560-049	WR2000560-050
					Result	Result	Result	Result	Result
Physical Tests									
moisture	----	E144	0.50	%	60.6	60.7	68.7	64.8	68.9
Metals									
aluminum	7429-90-5	E440	2.0	mg/kg	5.8	24.2	7.0	31.4	9.2
antimony	7440-36-0	E440	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
arsenic	7440-38-2	E440	0.020	mg/kg	0.042	0.039	<0.020	0.050	<0.020
barium	7440-39-3	E440	0.050	mg/kg	16.9	8.51	11.1	5.92	9.01
beryllium	7440-41-7	E440	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
bismuth	7440-69-9	E440	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
boron	7440-42-8	E440	1.0	mg/kg	10.2	2.3	3.7	2.9	4.7
cadmium	7440-43-9	E440	0.0050	mg/kg	0.0371	0.0128	0.0235	0.0125	0.0341
calcium	7440-70-2	E440	20	mg/kg	10400	10400	5630	8690	5700
cesium	7440-46-2	E440	0.0050	mg/kg	0.101	0.385	0.314	0.530	0.408
chromium	7440-47-3	E440	0.050	mg/kg	<0.050	0.080	0.061	0.112	<0.050
cobalt	7440-48-4	E440	0.020	mg/kg	0.173	0.465	0.151	0.240	0.101
copper	7440-50-8	E440	0.10	mg/kg	4.47	6.14	6.74	4.24	5.50
iron	7439-89-6	E440	3.0	mg/kg	39.5	61.3	42.2	63.3	37.3
lead	7439-92-1	E440	0.020	mg/kg	0.029	0.130	0.042	0.131	0.048
lithium	7439-93-2	E440	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
magnesium	7439-95-4	E440	2.0	mg/kg	1760	1940	992	1610	1070
manganese	7439-96-5	E440	0.050	mg/kg	64.1	67.7	46.5	56.5	38.9
mercury	7439-97-6	E510	0.0050	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
molybdenum	7439-98-7	E440	0.020	mg/kg	2.90	1.87	5.65	1.42	10.2
nickel	7440-02-0	E440	0.20	mg/kg	0.45	0.72	0.43	0.67	0.38
phosphorus	7723-14-0	E440	10	mg/kg	2550	2570	1670	2690	1950
potassium	7440-09-7	E440	20	mg/kg	6260	5040	4840	6570	6730
rubidium	7440-17-7	E440	0.050	mg/kg	9.55	14.2	11.3	23.2	19.4
selenium	7782-49-2	E440	0.050	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050
sodium	7440-23-5	E440	20	mg/kg	<20	<20	<20	<20	<20
strontium	7440-24-6	E440	0.050	mg/kg	24.6	27.6	24.1	21.6	22.2
tellurium	13494-80-9	E440	0.020	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020
thallium	7440-28-0	E440	0.0020	mg/kg	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
tin	7440-31-5	E440	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10



Analytical Results

Sub-Matrix: Tissue

(Matrix: Biota)

					<i>Client sample ID</i>				
					VMP-9, Alder Twigs	VMP-10, Alder Leaves	VMP-10, Alder Twigs	VMP-11, Alder Leaves	VMP-11, Alder Twigs
<i>Client sampling date / time</i>					25-Jul-2020	26-Jul-2020	26-Jul-2020	26-Jul-2020	26-Jul-2020
<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	WR2000560-046	WR2000560-047	WR2000560-048	WR2000560-049	WR2000560-050
					Result	Result	Result	Result	Result
Metals									
uranium	7440-61-1	E440	0.0020	mg/kg	<0.0020	<0.0020	<0.0020	0.0026	<0.0020
vanadium	7440-62-2	E440	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
zinc	7440-66-6	E440	0.50	mg/kg	35.9	25.6	26.5	25.1	27.1
zirconium	7440-67-7	E440	0.20	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20

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



Analytical Results

Sub-Matrix: Tissue

Client sample ID

(Matrix: Biota)

					VMP-12, Alder Leaves	VMP-12, Alder Twigs	VMP-13, Alder Leaves	VMP-13, Alder Twigs	VMP-14, Alder Leaves
Client sampling date / time					24-Jul-2020	24-Jul-2020	24-Jul-2020	24-Jul-2020	24-Jul-2020
Analyte	CAS Number	Method	LOR	Unit	WR2000560-051	WR2000560-052	WR2000560-053	WR2000560-054	WR2000560-055
					Result	Result	Result	Result	Result
Physical Tests									
moisture	----	E144	0.50	%	56.0	62.7	63.9	69.0	65.2
Metals									
aluminum	7429-90-5	E440	2.0	mg/kg	7.2	7.1	4.7	2.1	64.9
antimony	7440-36-0	E440	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	0.041
arsenic	7440-38-2	E440	0.020	mg/kg	<0.020	0.036	0.038	0.031	0.240
barium	7440-39-3	E440	0.050	mg/kg	5.54	9.04	12.1	21.6	6.66
beryllium	7440-41-7	E440	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
bismuth	7440-69-9	E440	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
boron	7440-42-8	E440	1.0	mg/kg	2.6	11.9	4.2	6.4	20.7
cadmium	7440-43-9	E440	0.0050	mg/kg	0.147	0.0281	0.0199	0.0484	0.0626
calcium	7440-70-2	E440	20	mg/kg	1330	5020	8880	6700	9420
cesium	7440-46-2	E440	0.0050	mg/kg	0.0155	0.115	0.207	0.175	0.782
chromium	7440-47-3	E440	0.050	mg/kg	<0.050	<0.050	<0.050	<0.050	0.191
cobalt	7440-48-4	E440	0.020	mg/kg	0.025	0.356	0.814	0.320	0.200
copper	7440-50-8	E440	0.10	mg/kg	2.79	3.94	3.24	3.82	7.04
iron	7439-89-6	E440	3.0	mg/kg	27.8	31.6	41.5	28.0	144
lead	7439-92-1	E440	0.020	mg/kg	0.495	0.046	0.025	<0.020	1.25
lithium	7439-93-2	E440	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
magnesium	7439-95-4	E440	2.0	mg/kg	508	1200	1940	1280	1800
manganese	7439-96-5	E440	0.050	mg/kg	30.9	48.8	100	65.6	39.5
mercury	7439-97-6	E510	0.0050	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
molybdenum	7439-98-7	E440	0.020	mg/kg	1.11	10.5	3.79	10.6	6.72
nickel	7440-02-0	E440	0.20	mg/kg	0.59	0.41	0.87	0.58	1.26
phosphorus	7723-14-0	E440	10	mg/kg	1380	1830	3110	1970	2650
potassium	7440-09-7	E440	20	mg/kg	10100	6400	6830	6920	7250
rubidium	7440-17-7	E440	0.050	mg/kg	4.01	11.0	12.0	9.46	20.6
selenium	7782-49-2	E440	0.050	mg/kg	<0.050	0.108	0.058	<0.050	<0.050
sodium	7440-23-5	E440	20	mg/kg	<20	<20	<20	<20	<20
strontium	7440-24-6	E440	0.050	mg/kg	3.57	20.5	24.8	31.1	18.6
tellurium	13494-80-9	E440	0.020	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020
thallium	7440-28-0	E440	0.0020	mg/kg	<0.0020	<0.0020	<0.0020	0.0025	<0.0020
tin	7440-31-5	E440	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10



Analytical Results

Sub-Matrix: Tissue

(Matrix: Biota)

					<i>Client sample ID</i>				
					VMP-12, Alder Leaves	VMP-12, Alder Twigs	VMP-13, Alder Leaves	VMP-13, Alder Twigs	VMP-14, Alder Leaves
<i>Client sampling date / time</i>					24-Jul-2020	24-Jul-2020	24-Jul-2020	24-Jul-2020	24-Jul-2020
<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	WR2000560-051	WR2000560-052	WR2000560-053	WR2000560-054	WR2000560-055
					Result	Result	Result	Result	Result
Metals									
uranium	7440-61-1	E440	0.0020	mg/kg	<0.0020	<0.0020	<0.0020	<0.0020	0.0123
vanadium	7440-62-2	E440	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	0.72
zinc	7440-66-6	E440	0.50	mg/kg	25.6	24.6	25.3	29.5	68.0
zirconium	7440-67-7	E440	0.20	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20

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



Analytical Results

Sub-Matrix: Tissue
 (Matrix: Biota)

Client sample ID

					VMP-14, Alder twigs	GP-1, Grasses, Fescue and Wheatgrass	GP-2, Grasses, Fescue, Wheatgrass and Alpine Bluegrass	GP-3, Grass - Fescue	GP-6, Fescue
Client sampling date / time					26-Jul-2020	25-Jul-2020	25-Jul-2020	25-Jul-2020	27-Jul-2020
Analyte	CAS Number	Method	LOR	Unit	WR2000560-056	WR2000560-057	WR2000560-058	WR2000560-059	WR2000560-060
					Result	Result	Result	Result	Result
Physical Tests									
moisture	----	E144	0.50	%	70.7	63.1	67.3	63.6	----
moisture	----	E144-H	2.0	%	----	----	----	----	55.8
Metals									
aluminum	7429-90-5	E440	2.0	mg/kg	9.7	17.3	36.5	12.4	----
aluminum	7429-90-5	E472	5.0	mg/kg	----	----	----	----	48.2
antimony	7440-36-0	E472	0.010	mg/kg	----	----	----	----	0.031
antimony	7440-36-0	E440	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	----
arsenic	7440-38-2	E440	0.020	mg/kg	0.051	0.056	0.058	0.023	----
arsenic	7440-38-2	E472	0.030	mg/kg	----	----	----	----	0.319
barium	7440-39-3	E472	0.050	mg/kg	----	----	----	----	8.75
barium	7440-39-3	E440	0.050	mg/kg	10.4	4.21	5.19	5.87	----
beryllium	7440-41-7	E472	0.010	mg/kg	----	----	----	----	<0.010
beryllium	7440-41-7	E440	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	----
bismuth	7440-69-9	E472	0.010	mg/kg	----	----	----	----	0.044
bismuth	7440-69-9	E440	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	----
boron	7440-42-8	E472	1.0	mg/kg	----	----	----	----	3.2
boron	7440-42-8	E440	1.0	mg/kg	17.6	10.3	2.9	2.8	----
cadmium	7440-43-9	E440	0.0050	mg/kg	0.130	0.0166	1.00	0.168	----
cadmium	7440-43-9	E472	0.010	mg/kg	----	----	----	----	1.30
calcium	7440-70-2	E472	20	mg/kg	----	----	----	----	3960
calcium	7440-70-2	E440	20	mg/kg	6280	7640	2250	1970	----
cesium	7440-46-2	E472	0.0050	mg/kg	----	----	----	----	0.497
cesium	7440-46-2	E440	0.0050	mg/kg	0.574	0.136	0.0222	0.0121	----
chromium	7440-47-3	E440	0.050	mg/kg	0.053	0.066	0.086	0.082	----
chromium	7440-47-3	E472	0.20	mg/kg	----	----	----	----	0.31
cobalt	7440-48-4	E472	0.020	mg/kg	----	----	----	----	0.081
cobalt	7440-48-4	E440	0.020	mg/kg	0.078	0.961	0.054	0.027	----
copper	7440-50-8	E440	0.10	mg/kg	8.27	3.11	4.82	2.86	----
copper	7440-50-8	E472	0.20	mg/kg	----	----	----	----	3.01



Analytical Results

Sub-Matrix: Tissue
 (Matrix: Biota)

Client sample ID

					VMP-14, Alder twigs	GP-1, Grasses, Fescue and Wheatgrass	GP-2, Grasses, Fescue, Wheatgrass and Alpine Bluegrass	GP-3, Grass - Fescue	GP-6, Fescue
Client sampling date / time					26-Jul-2020	25-Jul-2020	25-Jul-2020	25-Jul-2020	27-Jul-2020
Analyte	CAS Number	Method	LOR	Unit	WR2000560-056	WR2000560-057	WR2000560-058	WR2000560-059	WR2000560-060
					Result	Result	Result	Result	Result
Metals									
iron	7439-89-6	E440	3.0	mg/kg	55.8	50.7	78.4	35.6	----
iron	7439-89-6	E472	5.0	mg/kg	----	----	----	----	96.4
lead	7439-92-1	E440	0.020	mg/kg	0.464	0.072	3.23	0.334	----
lead	7439-92-1	E472	0.050	mg/kg	----	----	----	----	1.48
lithium	7439-93-2	E472	0.50	mg/kg	----	----	----	----	<0.50
lithium	7439-93-2	E440	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	----
magnesium	7439-95-4	E472	2.0	mg/kg	----	----	----	----	1200
magnesium	7439-95-4	E440	2.0	mg/kg	1220	1870	742	661	----
manganese	7439-96-5	E472	0.050	mg/kg	----	----	----	----	39.7
manganese	7439-96-5	E440	0.050	mg/kg	29.3	60.2	32.9	32.2	----
mercury	7439-97-6	E511	0.0050	mg/kg	----	----	----	----	<0.0050
mercury	7439-97-6	E510	0.0050	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	----
molybdenum	7439-98-7	E440	0.020	mg/kg	15.4	4.83	0.921	0.877	----
molybdenum	7439-98-7	E472	0.040	mg/kg	----	----	----	----	10.8
nickel	7440-02-0	E472	0.20	mg/kg	----	----	----	----	1.41
nickel	7440-02-0	E440	0.20	mg/kg	0.68	0.66	0.71	0.93	----
phosphorus	7723-14-0	E472	10	mg/kg	----	----	----	----	787
phosphorus	7723-14-0	E440	10	mg/kg	2020	2800	2120	1660	----
potassium	7440-09-7	E472	20	mg/kg	----	----	----	----	10900
potassium	7440-09-7	E440	20	mg/kg	6690	8440	13800	13300	----
rubidium	7440-17-7	E472	0.050	mg/kg	----	----	----	----	32.9
rubidium	7440-17-7	E440	0.050	mg/kg	14.8	15.4	6.63	3.84	----
selenium	7782-49-2	E440	0.050	mg/kg	<0.050	0.157	0.565	<0.050	----
selenium	7782-49-2	E472	0.10	mg/kg	----	----	----	----	0.82
sodium	7440-23-5	E472	20	mg/kg	----	----	----	----	61
sodium	7440-23-5	E440	20	mg/kg	<20	<20	<20	<20	----
strontium	7440-24-6	E440	0.050	mg/kg	22.0	16.6	4.49	5.46	----
strontium	7440-24-6	E472	0.10	mg/kg	----	----	----	----	14.8
tellurium	13494-80-9	E472	0.020	mg/kg	----	----	----	----	<0.020



Analytical Results

Sub-Matrix: Tissue
 (Matrix: Biota)

Client sample ID

					VMP-14, Alder twigs	GP-1, Grasses, Fescue and Wheatgrass	GP-2, Grasses, Fescue, Wheatgrass and Alpine Bluegrass	GP-3, Grass - Fescue	GP-6, Fescue
Client sampling date / time					26-Jul-2020	25-Jul-2020	25-Jul-2020	25-Jul-2020	27-Jul-2020
Analyte	CAS Number	Method	LOR	Unit	WR2000560-056	WR2000560-057	WR2000560-058	WR2000560-059	WR2000560-060
					Result	Result	Result	Result	Result
Metals									
tellurium	13494-80-9	E440	0.020	mg/kg	<0.020	<0.020	<0.020	<0.020	----
thallium	7440-28-0	E472	0.0020	mg/kg	----	----	----	----	0.0467
thallium	7440-28-0	E440	0.0020	mg/kg	0.0048	<0.0020	<0.0020	<0.0020	----
tin	7440-31-5	E472	0.10	mg/kg	----	----	----	----	0.49
tin	7440-31-5	E440	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	----
uranium	7440-61-1	E472	0.0020	mg/kg	----	----	----	----	0.0111
uranium	7440-61-1	E440	0.0020	mg/kg	0.0021	<0.0020	0.0056	<0.0020	----
vanadium	7440-62-2	E472	0.10	mg/kg	----	----	----	----	0.24
vanadium	7440-62-2	E440	0.10	mg/kg	0.10	<0.10	0.10	<0.10	----
zinc	7440-66-6	E440	0.50	mg/kg	45.7	21.5	50.4	18.3	----
zinc	7440-66-6	E472	1.0	mg/kg	----	----	----	----	182
zirconium	7440-67-7	E472	0.20	mg/kg	----	----	----	----	0.87
zirconium	7440-67-7	E440	0.20	mg/kg	<0.20	<0.20	<0.20	<0.20	----

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



Analytical Results

Sub-Matrix: Tissue
 (Matrix: Biota)

Client sample ID

					GP-7, Grasses, Fescue, and Wheatgrass	FF-Ref-1, Willow Leaves	FF-Ref-1, Willow Twigs	FF-Ref-1, Alder Leaves	FF-Ref-1, Alder Twigs
Client sampling date / time					25-Jul-2020	27-Jul-2020	27-Jul-2020	27-Jul-2020	27-Jul-2020
Analyte	CAS Number	Method	LOR	Unit	WR2000560-061	WR2000560-062	WR2000560-063	WR2000560-064	WR2000560-065
					Result	Result	Result	Result	Result
Physical Tests									
moisture	----	E144	0.50	%	61.5	72.8	77.0	70.0	68.0
Metals									
aluminum	7429-90-5	E440	2.0	mg/kg	6.0	3.1	3.2	3.5	3.1
antimony	7440-36-0	E440	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
arsenic	7440-38-2	E440	0.020	mg/kg	0.022	<0.020	<0.020	<0.020	<0.020
barium	7440-39-3	E440	0.050	mg/kg	12.2	1.52	2.33	2.81	4.83
beryllium	7440-41-7	E440	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
bismuth	7440-69-9	E440	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
boron	7440-42-8	E440	1.0	mg/kg	2.1	8.4	9.1	6.6	9.8
cadmium	7440-43-9	E440	0.0050	mg/kg	0.0309	5.69	4.23	0.0289	0.0348
calcium	7440-70-2	E440	20	mg/kg	1750	7720	3130	10700	7660
cesium	7440-46-2	E440	0.0050	mg/kg	0.0082	0.0363	0.0211	0.870	0.876
chromium	7440-47-3	E440	0.050	mg/kg	0.076	<0.050	<0.050	<0.050	0.072
cobalt	7440-48-4	E440	0.020	mg/kg	<0.020	0.316	0.098	0.050	0.022
copper	7440-50-8	E440	0.10	mg/kg	1.95	10.1	11.3	7.03	7.68
iron	7439-89-6	E440	3.0	mg/kg	24.1	40.2	20.2	35.3	32.3
lead	7439-92-1	E440	0.020	mg/kg	0.042	0.067	0.058	0.339	0.278
lithium	7439-93-2	E440	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
magnesium	7439-95-4	E440	2.0	mg/kg	775	1540	766	1560	1020
manganese	7439-96-5	E440	0.050	mg/kg	16.2	49.8	30.5	66.0	51.0
mercury	7439-97-6	E510	0.0050	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
molybdenum	7439-98-7	E440	0.020	mg/kg	6.74	0.234	0.066	0.971	2.55
nickel	7440-02-0	E440	0.20	mg/kg	<0.20	1.57	0.48	0.60	0.48
phosphorus	7723-14-0	E440	10	mg/kg	2000	2080	1860	2570	2320
potassium	7440-09-7	E440	20	mg/kg	11200	19000	13800	12800	8740
rubidium	7440-17-7	E440	0.050	mg/kg	4.84	20.5	16.2	48.1	41.6
selenium	7782-49-2	E440	0.050	mg/kg	0.348	0.261	0.137	<0.050	<0.050
sodium	7440-23-5	E440	20	mg/kg	<20	<20	<20	<20	<20
strontium	7440-24-6	E440	0.050	mg/kg	5.17	21.0	15.8	28.1	31.8
tellurium	13494-80-9	E440	0.020	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020
thallium	7440-28-0	E440	0.0020	mg/kg	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020



Analytical Results

Sub-Matrix: Tissue
 (Matrix: Biota)

Client sample ID

					GP-7, Grasses, Fescue, and Wheatgrass	FF-Ref-1, Willow Leaves	FF-Ref-1, Willow Twigs	FF-Ref-1, Alder Leaves	FF-Ref-1, Alder Twigs
Client sampling date / time					25-Jul-2020	27-Jul-2020	27-Jul-2020	27-Jul-2020	27-Jul-2020
Analyte	CAS Number	Method	LOR	Unit	WR2000560-061	WR2000560-062	WR2000560-063	WR2000560-064	WR2000560-065
					Result	Result	Result	Result	Result
Metals									
tin	7440-31-5	E440	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
uranium	7440-61-1	E440	0.0020	mg/kg	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
vanadium	7440-62-2	E440	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
zinc	7440-66-6	E440	0.50	mg/kg	12.8	150	93.7	36.4	36.0
zirconium	7440-67-7	E440	0.20	mg/kg	<0.20	<0.20	<0.20	<0.20	0.25

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



Analytical Results

Sub-Matrix: Tissue

Client sample ID

(Matrix: Biota)

					FF-Ref-2, Willow Leaves	FF-Ref-2, Willow Twigs	FF-Ref-2, Alder Leaves	NC-Ref, Willow Leaves	NC-Ref, Willow Twigs
Client sampling date / time					27-Jul-2020	27-Jul-2020	27-Jul-2020	27-Jul-2020	27-Jul-2020
Analyte	CAS Number	Method	LOR	Unit	WR2000560-066	WR2000560-067	WR2000560-068	WR2000560-069	WR2000560-070
					Result	Result	Result	Result	Result
Physical Tests									
moisture	---	E144	0.50	%	78.7	79.0	71.0	73.4	---
moisture	---	E144-H	2.0	%	---	---	---	---	69.0
Metals									
aluminum	7429-90-5	E440	2.0	mg/kg	3.0	36.7	5.3	3.3	---
aluminum	7429-90-5	E472	5.0	mg/kg	---	---	---	---	<5.0
antimony	7440-36-0	E472	0.010	mg/kg	---	---	---	---	<0.010
antimony	7440-36-0	E440	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	---
arsenic	7440-38-2	E440	0.020	mg/kg	<0.020	0.043	<0.020	0.042	---
arsenic	7440-38-2	E472	0.030	mg/kg	---	---	---	---	0.051
barium	7440-39-3	E472	0.050	mg/kg	---	---	---	---	3.62
barium	7440-39-3	E440	0.050	mg/kg	7.60	7.70	7.37	3.31	---
beryllium	7440-41-7	E472	0.010	mg/kg	---	---	---	---	<0.010
beryllium	7440-41-7	E440	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	---
bismuth	7440-69-9	E472	0.010	mg/kg	---	---	---	---	<0.010
bismuth	7440-69-9	E440	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	---
boron	7440-42-8	E472	1.0	mg/kg	---	---	---	---	16.3
boron	7440-42-8	E440	1.0	mg/kg	15.7	9.5	5.6	17.7	---
cadmium	7440-43-9	E440	0.0050	mg/kg	23.7	10.4	0.0831	4.45	---
cadmium	7440-43-9	E472	0.010	mg/kg	---	---	---	---	5.20
calcium	7440-70-2	E472	20	mg/kg	---	---	---	---	5860
calcium	7440-70-2	E440	20	mg/kg	16300	3940	9220	18600	---
cesium	7440-46-2	E472	0.0050	mg/kg	---	---	---	---	0.162
cesium	7440-46-2	E440	0.0050	mg/kg	0.320	0.150	1.21	0.350	---
chromium	7440-47-3	E440	0.050	mg/kg	<0.050	0.171	0.750	<0.050	---
chromium	7440-47-3	E472	0.20	mg/kg	---	---	---	---	0.69
cobalt	7440-48-4	E472	0.020	mg/kg	---	---	---	---	0.026
cobalt	7440-48-4	E440	0.020	mg/kg	0.172	0.029	0.053	0.083	---
copper	7440-50-8	E440	0.10	mg/kg	9.23	8.69	6.46	5.88	---
copper	7440-50-8	E472	0.20	mg/kg	---	---	---	---	9.54
iron	7439-89-6	E440	3.0	mg/kg	51.2	33.4	68.1	45.8	---
iron	7439-89-6	E472	5.0	mg/kg	---	---	---	---	25.8
lead	7439-92-1	E440	0.020	mg/kg	0.078	0.903	0.322	0.108	---



Analytical Results

Sub-Matrix: Tissue
 (Matrix: Biota)

Client sample ID

					FF-Ref-2, Willow Leaves	FF-Ref-2, Willow Twigs	FF-Ref-2, Alder Leaves	NC-Ref, Willow Leaves	NC-Ref, Willow Twigs
Client sampling date / time					27-Jul-2020	27-Jul-2020	27-Jul-2020	27-Jul-2020	27-Jul-2020
Analyte	CAS Number	Method	LOR	Unit	WR2000560-066	WR2000560-067	WR2000560-068	WR2000560-069	WR2000560-070
					Result	Result	Result	Result	Result
Metals									
lead	7439-92-1	E472	0.050	mg/kg	----	----	----	----	0.108
lithium	7439-93-2	E472	0.50	mg/kg	----	----	----	----	<0.50
lithium	7439-93-2	E440	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	----
magnesium	7439-95-4	E472	2.0	mg/kg	----	----	----	----	934
magnesium	7439-95-4	E440	2.0	mg/kg	3740	1020	1670	2360	----
manganese	7439-96-5	E472	0.050	mg/kg	----	----	----	----	27.8
manganese	7439-96-5	E440	0.050	mg/kg	176	37.7	168	69.1	----
mercury	7439-97-6	E511	0.0050	mg/kg	----	----	----	----	<0.0050
mercury	7439-97-6	E510	0.0050	mg/kg	<0.0050	<0.0057	<0.0050	<0.0050	----
molybdenum	7439-98-7	E440	0.020	mg/kg	0.403	0.055	0.071	0.795	----
molybdenum	7439-98-7	E472	0.040	mg/kg	----	----	----	----	0.153
nickel	7440-02-0	E472	0.20	mg/kg	----	----	----	----	0.86
nickel	7440-02-0	E440	0.20	mg/kg	2.38	0.72	1.21	<0.20	----
phosphorus	7723-14-0	E472	10	mg/kg	----	----	----	----	2490
phosphorus	7723-14-0	E440	10	mg/kg	4360	2760	2750	2490	----
potassium	7440-09-7	E472	20	mg/kg	----	----	----	----	10200
potassium	7440-09-7	E440	20	mg/kg	21700	11600	7750	18000	----
rubidium	7440-17-7	E472	0.050	mg/kg	----	----	----	----	37.4
rubidium	7440-17-7	E440	0.050	mg/kg	85.3	57.5	50.8	54.5	----
selenium	7782-49-2	E440	0.050	mg/kg	<0.050	<0.050	<0.050	<0.050	----
selenium	7782-49-2	E472	0.10	mg/kg	----	----	----	----	<0.10
sodium	7440-23-5	E472	20	mg/kg	----	----	----	----	82
sodium	7440-23-5	E440	20	mg/kg	<20	<20	<20	<20	----
strontium	7440-24-6	E440	0.050	mg/kg	30.8	14.1	16.9	63.4	----
strontium	7440-24-6	E472	0.10	mg/kg	----	----	----	----	31.2
tellurium	13494-80-9	E472	0.020	mg/kg	----	----	----	----	<0.020
tellurium	13494-80-9	E440	0.020	mg/kg	<0.020	<0.020	<0.020	<0.020	----
thallium	7440-28-0	E472	0.0020	mg/kg	----	----	----	----	<0.0020
thallium	7440-28-0	E440	0.0020	mg/kg	0.0022	0.0051	0.0050	<0.0020	----
tin	7440-31-5	E472	0.10	mg/kg	----	----	----	----	0.63
tin	7440-31-5	E440	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	----
uranium	7440-61-1	E472	0.0020	mg/kg	----	----	----	----	<0.0020



Analytical Results

Sub-Matrix: Tissue

(Matrix: Biota)

					Client sample ID	FF-Ref-2, Willow Leaves	FF-Ref-2, Willow Twigs	FF-Ref-2, Alder Leaves	NC-Ref, Willow Leaves	NC-Ref, Willow Twigs
					Client sampling date / time	27-Jul-2020	27-Jul-2020	27-Jul-2020	27-Jul-2020	27-Jul-2020
Analyte	CAS Number	Method	LOR	Unit	WR2000560-066	WR2000560-067	WR2000560-068	WR2000560-069	WR2000560-070	
					Result	Result	Result	Result	Result	
Metals										
uranium	7440-61-1	E440	0.0020	mg/kg	<0.0020	0.0038	<0.0020	<0.0020	----	
vanadium	7440-62-2	E472	0.10	mg/kg	----	----	----	----	<0.10	
vanadium	7440-62-2	E440	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	----	
zinc	7440-66-6	E440	0.50	mg/kg	556	190	77.5	129	----	
zinc	7440-66-6	E472	1.0	mg/kg	----	----	----	----	117	
zirconium	7440-67-7	E472	0.20	mg/kg	----	----	----	----	1.18	
zirconium	7440-67-7	E440	0.20	mg/kg	<0.20	0.30	0.41 ^{DLM}	<0.20	----	

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: WR2000560	Page	: 1 of 21
Client	: Teck Metals Limited	Laboratory	: Whitehorse - Environmental
Contact	: Michelle Unger	Account Manager	: Can Dang
Address	: 601 Knighton Road Kimberley BC Canada V1A 3E1	Address	: #12 151 Industrial Road Whitehorse, Yukon Canada Y1A 2V3
Telephone	: 250 427 8404	Telephone	: +1 867 668 6689
Project	: Sa Dena Hes	Date Samples Received	: 28-Jul-2020 15:20
PO	: 9971	Issue Date	: 10-Sep-2020 08:11
C-O-C number	:		
Sampler	: Bonnie Burns		
Site	: Sa Dena Hes		
Quote number	: Q62635		
No. of samples received	: 45		
No. of samples analysed	: 45		

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

Key

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

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

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- Reference Material (RM) Sample outliers occur - please see the following pages for full details.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Biota**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Duplicate (DUP) RPDs								
Metals	WR2000560-070	NC-Ref, Willow Twigs	chromium	7440-47-3	E472	0.49 % ^{DUP-H, J}	Diff <2x LOR	Low Level DUP DQO exceeded (difference > 2 LOR).
Metals	WR2000560-070	NC-Ref, Willow Twigs	nickel	7440-02-0	E472	0.63 % ^{DUP-H}	Diff <2x LOR	Low Level DUP DQO exceeded (difference > 2 LOR).

Result Qualifiers

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.
J	Duplicate results and limits are expressed in terms of absolute difference.

Reference Material (RM) Sample								
Metals	QC-MRG2-7618000 3	----	manganese	7439-96-5	E440	133 % ^{MES}	70.0-130%	Recovery greater than upper control limit
Metals	QC-MRG2-7389500 3	----	lead	7439-92-1	E472	131 % ^{MES}	70.0-130%	Recovery greater than upper control limit

Result Qualifiers

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



Analysis Holding Time Compliance

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

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

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 15:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 15:00 is used for calculation purposes.

Matrix: **Biota** 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	
Metals : Mercury in Biota by CVAAS (DRY units, Micro)										
LDPE bag GP-6, Fescue	E511	27-Jul-2020	26-Aug-2020	365 days	29 days	✓	02-Sep-2020	335 days	6 days	✓
Metals : Mercury in Biota by CVAAS (DRY units, Micro)										
LDPE bag NC-Ref, Willow Twigs	E511	27-Jul-2020	26-Aug-2020	365 days	29 days	✓	02-Sep-2020	335 days	6 days	✓
Metals : Mercury in Biota by CVAAS (DRY units, Micro)										
LDPE bag VMP-2, Poplar Twigs	E511	24-Jul-2020	26-Aug-2020	365 days	32 days	✓	02-Sep-2020	332 days	6 days	✓
Metals : Mercury in Biota by CVAAS (DRY units, Routine)										
LDPE bag FF-Ref-1, Alder Leaves	E510	27-Jul-2020	21-Aug-2020	365 days	24 days	✓	21-Aug-2020	340 days	0 days	✓
Metals : Mercury in Biota by CVAAS (DRY units, Routine)										
LDPE bag FF-Ref-1, Alder Twigs	E510	27-Jul-2020	21-Aug-2020	365 days	24 days	✓	21-Aug-2020	340 days	0 days	✓
Metals : Mercury in Biota by CVAAS (DRY units, Routine)										
LDPE bag VMP-10, Alder Leaves	E510	26-Jul-2020	21-Aug-2020	365 days	25 days	✓	21-Aug-2020	339 days	0 days	✓
Metals : Mercury in Biota by CVAAS (DRY units, Routine)										
LDPE bag VMP-10, Alder Twigs	E510	26-Jul-2020	21-Aug-2020	365 days	25 days	✓	21-Aug-2020	339 days	0 days	✓



Matrix: **Biota** 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		
Metals : Mercury in Biota by CVAAS (DRY units, Routine)											
LDPE bag VMP-11, Alder Leaves	E510	26-Jul-2020	21-Aug-2020	365 days	25 days	✔	21-Aug-2020	339 days	0 days	✔	
Metals : Mercury in Biota by CVAAS (DRY units, Routine)											
LDPE bag VMP-11, Alder Twigs	E510	26-Jul-2020	21-Aug-2020	365 days	25 days	✔	21-Aug-2020	339 days	0 days	✔	
Metals : Mercury in Biota by CVAAS (DRY units, Routine)											
LDPE bag VMP-5, Willow Leaves	E510	26-Jul-2020	21-Aug-2020	365 days	25 days	✔	21-Aug-2020	339 days	0 days	✔	
Metals : Mercury in Biota by CVAAS (DRY units, Routine)											
LDPE bag GP-1, Grasses, Fescue and Wheatgrass	E510	25-Jul-2020	21-Aug-2020	365 days	26 days	✔	21-Aug-2020	338 days	0 days	✔	
Metals : Mercury in Biota by CVAAS (DRY units, Routine)											
LDPE bag VMP-4, Willow Leaves	E510	25-Jul-2020	21-Aug-2020	365 days	26 days	✔	21-Aug-2020	338 days	0 days	✔	
Metals : Mercury in Biota by CVAAS (DRY units, Routine)											
LDPE bag VMP-4, Willow Twigs	E510	25-Jul-2020	21-Aug-2020	365 days	26 days	✔	21-Aug-2020	338 days	0 days	✔	
Metals : Mercury in Biota by CVAAS (DRY units, Routine)											
LDPE bag VMP-9, Alder Leaves	E510	25-Jul-2020	21-Aug-2020	365 days	26 days	✔	21-Aug-2020	338 days	0 days	✔	
Metals : Mercury in Biota by CVAAS (DRY units, Routine)											
LDPE bag VMP-9, Alder Twigs	E510	25-Jul-2020	21-Aug-2020	365 days	26 days	✔	21-Aug-2020	338 days	0 days	✔	
Metals : Mercury in Biota by CVAAS (DRY units, Routine)											
LDPE bag FF-Ref-2, Alder Leaves	E510	27-Jul-2020	24-Aug-2020	365 days	27 days	✔	24-Aug-2020	337 days	0 days	✔	



Matrix: **Biota** 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		
Metals : Mercury in Biota by CVAAS (DRY units, Routine)											
LDPE bag FF-Ref-2, Willow Leaves	E510	27-Jul-2020	24-Aug-2020	365 days	27 days	✔	24-Aug-2020	337 days	0 days	✔	
Metals : Mercury in Biota by CVAAS (DRY units, Routine)											
LDPE bag FF-Ref-2, Willow Twigs	E510	27-Jul-2020	24-Aug-2020	365 days	27 days	✔	24-Aug-2020	337 days	0 days	✔	
Metals : Mercury in Biota by CVAAS (DRY units, Routine)											
LDPE bag NC-Ref, Willow Leaves	E510	27-Jul-2020	24-Aug-2020	365 days	27 days	✔	24-Aug-2020	337 days	0 days	✔	
Metals : Mercury in Biota by CVAAS (DRY units, Routine)											
LDPE bag VMP-1, Willow Leaves	E510	24-Jul-2020	21-Aug-2020	365 days	27 days	✔	21-Aug-2020	337 days	0 days	✔	
Metals : Mercury in Biota by CVAAS (DRY units, Routine)											
LDPE bag VMP-1, Willow Twigs	E510	24-Jul-2020	21-Aug-2020	365 days	27 days	✔	21-Aug-2020	337 days	0 days	✔	
Metals : Mercury in Biota by CVAAS (DRY units, Routine)											
LDPE bag VMP-12, Alder Twigs	E510	24-Jul-2020	21-Aug-2020	365 days	27 days	✔	21-Aug-2020	337 days	0 days	✔	
Metals : Mercury in Biota by CVAAS (DRY units, Routine)											
LDPE bag VMP-13, Alder Leaves	E510	24-Jul-2020	21-Aug-2020	365 days	27 days	✔	21-Aug-2020	337 days	0 days	✔	
Metals : Mercury in Biota by CVAAS (DRY units, Routine)											
LDPE bag VMP-2, Poplar Leaves	E510	24-Jul-2020	21-Aug-2020	365 days	27 days	✔	21-Aug-2020	337 days	0 days	✔	
Metals : Mercury in Biota by CVAAS (DRY units, Routine)											
LDPE bag VMP-2, Willow Leaves	E510	24-Jul-2020	21-Aug-2020	365 days	27 days	✔	21-Aug-2020	337 days	0 days	✔	



Matrix: **Biota** 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		
Metals : Mercury in Biota by CVAAS (DRY units, Routine)											
LDPE bag VMP-3, Willow Leaves	E510	24-Jul-2020	21-Aug-2020	365 days	27 days	✓	21-Aug-2020	337 days	0 days	✓	
Metals : Mercury in Biota by CVAAS (DRY units, Routine)											
LDPE bag VMP-3, Willow Twigs	E510	24-Jul-2020	21-Aug-2020	365 days	27 days	✓	21-Aug-2020	337 days	0 days	✓	
Metals : Mercury in Biota by CVAAS (DRY units, Routine)											
LDPE bag FF-Ref-1, Willow Leaves	E510	27-Jul-2020	25-Aug-2020	365 days	28 days	✓	26-Aug-2020	336 days	0 days	✓	
Metals : Mercury in Biota by CVAAS (DRY units, Routine)											
LDPE bag FF-Ref-1, Willow Twigs	E510	27-Jul-2020	25-Aug-2020	365 days	28 days	✓	26-Aug-2020	336 days	0 days	✓	
Metals : Mercury in Biota by CVAAS (DRY units, Routine)											
LDPE bag VMP-7, Poplar Leaves	E510	26-Jul-2020	24-Aug-2020	365 days	28 days	✓	24-Aug-2020	336 days	0 days	✓	
Metals : Mercury in Biota by CVAAS (DRY units, Routine)											
LDPE bag VMP-7, Poplar Twigs	E510	26-Jul-2020	24-Aug-2020	365 days	28 days	✓	24-Aug-2020	336 days	0 days	✓	
Metals : Mercury in Biota by CVAAS (DRY units, Routine)											
LDPE bag VMP-14, Alder twigs	E510	26-Jul-2020	25-Aug-2020	365 days	29 days	✓	26-Aug-2020	335 days	0 days	✓	
Metals : Mercury in Biota by CVAAS (DRY units, Routine)											
LDPE bag VMP-5, Willow Twigs	E510	26-Jul-2020	25-Aug-2020	365 days	29 days	✓	26-Aug-2020	335 days	0 days	✓	
Metals : Mercury in Biota by CVAAS (DRY units, Routine)											
LDPE bag GP-2, Grasses, Fescue, Wheatgrass and Alpine Bluegrass	E510	25-Jul-2020	25-Aug-2020	365 days	30 days	✓	26-Aug-2020	334 days	0 days	✓	



Matrix: **Biota** 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	
Metals : Mercury in Biota by CVAAS (DRY units, Routine)										
LDPE bag GP-3, Grass - Fescue	E510	25-Jul-2020	25-Aug-2020	365 days	30 days	✔	26-Aug-2020	334 days	0 days	✔
Metals : Mercury in Biota by CVAAS (DRY units, Routine)										
LDPE bag GP-7, Grasses, Fescue, and Wheatgrass	E510	25-Jul-2020	25-Aug-2020	365 days	30 days	✔	26-Aug-2020	334 days	0 days	✔
Metals : Mercury in Biota by CVAAS (DRY units, Routine)										
LDPE bag VMP-6, Poplar Leaves	E510	24-Jul-2020	24-Aug-2020	365 days	30 days	✔	24-Aug-2020	334 days	0 days	✔
Metals : Mercury in Biota by CVAAS (DRY units, Routine)										
LDPE bag VMP-6, Poplar Twigs	E510	24-Jul-2020	24-Aug-2020	365 days	30 days	✔	24-Aug-2020	334 days	0 days	✔
Metals : Mercury in Biota by CVAAS (DRY units, Routine)										
LDPE bag VMP-6, Willow Leaves	E510	24-Jul-2020	24-Aug-2020	365 days	30 days	✔	24-Aug-2020	334 days	0 days	✔
Metals : Mercury in Biota by CVAAS (DRY units, Routine)										
LDPE bag VMP-6, Willow Twigs	E510	24-Jul-2020	24-Aug-2020	365 days	30 days	✔	24-Aug-2020	334 days	0 days	✔
Metals : Mercury in Biota by CVAAS (DRY units, Routine)										
LDPE bag VMP-12, Alder Leaves	E510	24-Jul-2020	25-Aug-2020	365 days	31 days	✔	26-Aug-2020	333 days	0 days	✔
Metals : Mercury in Biota by CVAAS (DRY units, Routine)										
LDPE bag VMP-13, Alder Twigs	E510	24-Jul-2020	25-Aug-2020	365 days	31 days	✔	26-Aug-2020	333 days	0 days	✔
Metals : Mercury in Biota by CVAAS (DRY units, Routine)										
LDPE bag VMP-14, Alder Leaves	E510	24-Jul-2020	25-Aug-2020	365 days	31 days	✔	26-Aug-2020	333 days	0 days	✔



Matrix: **Biota** 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		
Metals : Mercury in Biota by CVAAS (DRY units, Routine)											
LDPE bag VMP-5, Poplar Leaves	E510	24-Jul-2020	25-Aug-2020	365 days	31 days	✓	26-Aug-2020	333 days	0 days	✓	
Metals : Mercury in Biota by CVAAS (DRY units, Routine)											
LDPE bag VMP-5, Poplar Twigs	E510	24-Jul-2020	25-Aug-2020	365 days	31 days	✓	26-Aug-2020	333 days	0 days	✓	
Metals : Metals in Biota by CRC ICPMS (DRY units, Micro)											
LDPE bag GP-6, Fescue	E472	27-Jul-2020	26-Aug-2020	730 days	29 days	✓	27-Aug-2020	700 days	0 days	✓	
Metals : Metals in Biota by CRC ICPMS (DRY units, Micro)											
LDPE bag NC-Ref, Willow Twigs	E472	27-Jul-2020	26-Aug-2020	730 days	29 days	✓	27-Aug-2020	700 days	0 days	✓	
Metals : Metals in Biota by CRC ICPMS (DRY units, Micro)											
LDPE bag VMP-2, Poplar Twigs	E472	24-Jul-2020	26-Aug-2020	730 days	32 days	✓	27-Aug-2020	697 days	0 days	✓	
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)											
LDPE bag FF-Ref-1, Alder Leaves	E440	27-Jul-2020	21-Aug-2020	730 days	24 days	✓	21-Aug-2020	705 days	0 days	✓	
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)											
LDPE bag FF-Ref-1, Alder Twigs	E440	27-Jul-2020	21-Aug-2020	730 days	24 days	✓	21-Aug-2020	705 days	0 days	✓	
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)											
LDPE bag VMP-10, Alder Leaves	E440	26-Jul-2020	21-Aug-2020	730 days	25 days	✓	21-Aug-2020	704 days	0 days	✓	
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)											
LDPE bag VMP-10, Alder Twigs	E440	26-Jul-2020	21-Aug-2020	730 days	25 days	✓	21-Aug-2020	704 days	0 days	✓	



Matrix: **Biota** 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	
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)										
LDPE bag VMP-11, Alder Leaves	E440	26-Jul-2020	21-Aug-2020	730 days	25 days	✔	21-Aug-2020	704 days	0 days	✔
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)										
LDPE bag VMP-11, Alder Twigs	E440	26-Jul-2020	21-Aug-2020	730 days	25 days	✔	21-Aug-2020	704 days	0 days	✔
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)										
LDPE bag VMP-5, Willow Leaves	E440	26-Jul-2020	21-Aug-2020	730 days	25 days	✔	21-Aug-2020	704 days	0 days	✔
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)										
LDPE bag GP-1, Grasses, Fescue and Wheatgrass	E440	25-Jul-2020	21-Aug-2020	730 days	26 days	✔	21-Aug-2020	703 days	0 days	✔
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)										
LDPE bag VMP-4, Willow Leaves	E440	25-Jul-2020	21-Aug-2020	730 days	26 days	✔	21-Aug-2020	703 days	0 days	✔
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)										
LDPE bag VMP-4, Willow Twigs	E440	25-Jul-2020	21-Aug-2020	730 days	26 days	✔	21-Aug-2020	703 days	0 days	✔
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)										
LDPE bag VMP-9, Alder Leaves	E440	25-Jul-2020	21-Aug-2020	730 days	26 days	✔	21-Aug-2020	703 days	0 days	✔
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)										
LDPE bag VMP-9, Alder Twigs	E440	25-Jul-2020	21-Aug-2020	730 days	26 days	✔	21-Aug-2020	703 days	0 days	✔
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)										
LDPE bag FF-Ref-2, Alder Leaves	E440	27-Jul-2020	24-Aug-2020	730 days	27 days	✔	24-Aug-2020	702 days	0 days	✔



Matrix: **Biota** 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		
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)											
LDPE bag FF-Ref-2, Willow Leaves	E440	27-Jul-2020	24-Aug-2020	730 days	27 days	✔	24-Aug-2020	702 days	0 days	✔	
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)											
LDPE bag FF-Ref-2, Willow Twigs	E440	27-Jul-2020	24-Aug-2020	730 days	27 days	✔	24-Aug-2020	702 days	0 days	✔	
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)											
LDPE bag NC-Ref, Willow Leaves	E440	27-Jul-2020	24-Aug-2020	730 days	27 days	✔	24-Aug-2020	702 days	0 days	✔	
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)											
LDPE bag VMP-1, Willow Leaves	E440	24-Jul-2020	21-Aug-2020	730 days	27 days	✔	21-Aug-2020	702 days	0 days	✔	
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)											
LDPE bag VMP-1, Willow Twigs	E440	24-Jul-2020	21-Aug-2020	730 days	27 days	✔	21-Aug-2020	702 days	0 days	✔	
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)											
LDPE bag VMP-12, Alder Twigs	E440	24-Jul-2020	21-Aug-2020	730 days	27 days	✔	21-Aug-2020	702 days	0 days	✔	
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)											
LDPE bag VMP-13, Alder Leaves	E440	24-Jul-2020	21-Aug-2020	730 days	27 days	✔	21-Aug-2020	702 days	0 days	✔	
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)											
LDPE bag VMP-2, Poplar Leaves	E440	24-Jul-2020	21-Aug-2020	730 days	27 days	✔	21-Aug-2020	702 days	0 days	✔	
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)											
LDPE bag VMP-2, Willow Leaves	E440	24-Jul-2020	21-Aug-2020	730 days	27 days	✔	21-Aug-2020	702 days	0 days	✔	



Matrix: **Biota** 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		
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)											
LDPE bag VMP-3, Willow Leaves	E440	24-Jul-2020	21-Aug-2020	730 days	27 days	✓	21-Aug-2020	702 days	0 days	✓	
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)											
LDPE bag VMP-3, Willow Twigs	E440	24-Jul-2020	21-Aug-2020	730 days	27 days	✓	21-Aug-2020	702 days	0 days	✓	
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)											
LDPE bag FF-Ref-1, Willow Leaves	E440	27-Jul-2020	25-Aug-2020	730 days	28 days	✓	26-Aug-2020	701 days	0 days	✓	
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)											
LDPE bag FF-Ref-1, Willow Twigs	E440	27-Jul-2020	25-Aug-2020	730 days	28 days	✓	26-Aug-2020	701 days	0 days	✓	
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)											
LDPE bag VMP-7, Poplar Leaves	E440	26-Jul-2020	24-Aug-2020	730 days	28 days	✓	24-Aug-2020	701 days	0 days	✓	
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)											
LDPE bag VMP-7, Poplar Twigs	E440	26-Jul-2020	24-Aug-2020	730 days	28 days	✓	24-Aug-2020	701 days	0 days	✓	
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)											
LDPE bag VMP-14, Alder twigs	E440	26-Jul-2020	25-Aug-2020	730 days	29 days	✓	26-Aug-2020	700 days	0 days	✓	
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)											
LDPE bag VMP-5, Willow Twigs	E440	26-Jul-2020	25-Aug-2020	730 days	29 days	✓	26-Aug-2020	700 days	0 days	✓	
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)											
LDPE bag GP-2, Grasses, Fescue, Wheatgrass and Alpine Bluegrass	E440	25-Jul-2020	25-Aug-2020	730 days	30 days	✓	26-Aug-2020	699 days	0 days	✓	



Matrix: **Biota** 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	
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)										
LDPE bag GP-3, Grass - Fescue	E440	25-Jul-2020	25-Aug-2020	730 days	30 days	✔	26-Aug-2020	699 days	0 days	✔
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)										
LDPE bag GP-7, Grasses, Fescue, and Wheatgrass	E440	25-Jul-2020	25-Aug-2020	730 days	30 days	✔	26-Aug-2020	699 days	0 days	✔
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)										
LDPE bag VMP-6, Poplar Leaves	E440	24-Jul-2020	24-Aug-2020	730 days	30 days	✔	24-Aug-2020	699 days	0 days	✔
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)										
LDPE bag VMP-6, Poplar Twigs	E440	24-Jul-2020	24-Aug-2020	730 days	30 days	✔	24-Aug-2020	699 days	0 days	✔
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)										
LDPE bag VMP-6, Willow Leaves	E440	24-Jul-2020	24-Aug-2020	730 days	30 days	✔	24-Aug-2020	699 days	0 days	✔
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)										
LDPE bag VMP-6, Willow Twigs	E440	24-Jul-2020	24-Aug-2020	730 days	30 days	✔	24-Aug-2020	699 days	0 days	✔
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)										
LDPE bag VMP-12, Alder Leaves	E440	24-Jul-2020	25-Aug-2020	730 days	31 days	✔	26-Aug-2020	698 days	0 days	✔
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)										
LDPE bag VMP-13, Alder Twigs	E440	24-Jul-2020	25-Aug-2020	730 days	31 days	✔	26-Aug-2020	698 days	0 days	✔
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)										
LDPE bag VMP-14, Alder Leaves	E440	24-Jul-2020	25-Aug-2020	730 days	31 days	✔	26-Aug-2020	698 days	0 days	✔



Matrix: **Biota** 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		
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)											
LDPE bag VMP-5, Poplar Leaves	E440	24-Jul-2020	25-Aug-2020	730 days	31 days	✔	26-Aug-2020	698 days	0 days	✔	
Metals : Metals in Biota by CRC ICPMS (DRY units, Routine)											
LDPE bag VMP-5, Poplar Twigs	E440	24-Jul-2020	25-Aug-2020	730 days	31 days	✔	26-Aug-2020	698 days	0 days	✔	
Physical Tests : Moisture Content by Gravimetry (Low Mass Samples)											
LDPE bag GP-6, Fescue	E144-H	27-Jul-2020	----	----	----		19-Aug-2020	----	----		
Physical Tests : Moisture Content by Gravimetry (Low Mass Samples)											
LDPE bag NC-Ref, Willow Twigs	E144-H	27-Jul-2020	----	----	----		19-Aug-2020	----	----		
Physical Tests : Moisture Content by Gravimetry (Low Mass Samples)											
LDPE bag VMP-2, Poplar Twigs	E144-H	24-Jul-2020	----	----	----		19-Aug-2020	----	----		
Physical Tests : Moisture Content by Gravimetry											
LDPE bag FF-Ref-1, Alder Leaves	E144	27-Jul-2020	----	----	----		13-Aug-2020	----	----		
Physical Tests : Moisture Content by Gravimetry											
LDPE bag FF-Ref-1, Alder Twigs	E144	27-Jul-2020	----	----	----		13-Aug-2020	----	----		
Physical Tests : Moisture Content by Gravimetry											
LDPE bag FF-Ref-1, Willow Leaves	E144	27-Jul-2020	----	----	----		13-Aug-2020	----	----		
Physical Tests : Moisture Content by Gravimetry											
LDPE bag FF-Ref-1, Willow Twigs	E144	27-Jul-2020	----	----	----		13-Aug-2020	----	----		



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag FF-Ref-2, Alder Leaves	E144	27-Jul-2020	----	----	----		17-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag FF-Ref-2, Willow Leaves	E144	27-Jul-2020	----	----	----		17-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag FF-Ref-2, Willow Twigs	E144	27-Jul-2020	----	----	----		17-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag GP-1, Grasses, Fescue and Wheatgrass	E144	25-Jul-2020	----	----	----		13-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag GP-2, Grasses, Fescue, Wheatgrass and Alpine Bluegrass	E144	25-Jul-2020	----	----	----		13-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag GP-3, Grass - Fescue	E144	25-Jul-2020	----	----	----		13-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag GP-7, Grasses, Fescue, and Wheatgrass	E144	25-Jul-2020	----	----	----		13-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag NC-Ref, Willow Leaves	E144	27-Jul-2020	----	----	----		17-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag VMP-1, Willow Leaves	E144	24-Jul-2020	----	----	----		13-Aug-2020	----	----	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag VMP-1, Willow Twigs	E144	24-Jul-2020	----	----	----		13-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag VMP-10, Alder Leaves	E144	26-Jul-2020	----	----	----		13-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag VMP-10, Alder Twigs	E144	26-Jul-2020	----	----	----		13-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag VMP-11, Alder Leaves	E144	26-Jul-2020	----	----	----		13-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag VMP-11, Alder Twigs	E144	26-Jul-2020	----	----	----		13-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag VMP-12, Alder Leaves	E144	24-Jul-2020	----	----	----		13-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag VMP-12, Alder Twigs	E144	24-Jul-2020	----	----	----		13-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag VMP-13, Alder Leaves	E144	24-Jul-2020	----	----	----		13-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag VMP-13, Alder Twigs	E144	24-Jul-2020	----	----	----		13-Aug-2020	----	----	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag VMP-14, Alder Leaves	E144	24-Jul-2020	----	----	----		13-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag VMP-14, Alder twigs	E144	26-Jul-2020	----	----	----		13-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag VMP-2, Poplar Leaves	E144	24-Jul-2020	----	----	----		13-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag VMP-2, Willow Leaves	E144	24-Jul-2020	----	----	----		13-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag VMP-3, Willow Leaves	E144	24-Jul-2020	----	----	----		13-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag VMP-3, Willow Twigs	E144	24-Jul-2020	----	----	----		13-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag VMP-4, Willow Leaves	E144	25-Jul-2020	----	----	----		13-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag VMP-4, Willow Twigs	E144	25-Jul-2020	----	----	----		13-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag VMP-5, Poplar Leaves	E144	24-Jul-2020	----	----	----		13-Aug-2020	----	----	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag VMP-5, Poplar Twigs	E144	24-Jul-2020	----	----	----		13-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag VMP-5, Willow Leaves	E144	26-Jul-2020	----	----	----		13-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag VMP-5, Willow Twigs	E144	26-Jul-2020	----	----	----		13-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag VMP-6, Poplar Leaves	E144	24-Jul-2020	----	----	----		13-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag VMP-6, Poplar Twigs	E144	24-Jul-2020	----	----	----		13-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag VMP-6, Willow Leaves	E144	24-Jul-2020	----	----	----		13-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag VMP-6, Willow Twigs	E144	24-Jul-2020	----	----	----		13-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag VMP-7, Poplar Leaves	E144	26-Jul-2020	----	----	----		13-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag VMP-7, Poplar Twigs	E144	26-Jul-2020	----	----	----		13-Aug-2020	----	----	



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

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag VMP-9, Alder Leaves	E144	25-Jul-2020	----	----	----		13-Aug-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag VMP-9, Alder Twigs	E144	25-Jul-2020	----	----	----		13-Aug-2020	----	----	

Legend & Qualifier Definitions

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



Quality Control Parameter Frequency Compliance

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

Matrix: **Biota**

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Mercury in Biota by CVAAS (DRY units, Micro)	E511	73895	1	3	33.3	5.0	✔
Mercury in Biota by CVAAS (DRY units, Routine)	E510	76181	3	45	6.6	5.0	✔
Metals in Biota by CRC ICPMS (DRY units, Micro)	E472	73896	1	3	33.3	5.0	✔
Metals in Biota by CRC ICPMS (DRY units, Routine)	E440	76180	3	45	6.6	5.0	✔
Moisture Content by Gravimetry	E144	71671	3	42	7.1	5.0	✔
Moisture Content by Gravimetry (Low Mass Samples)	E144-H	73889	1	3	33.3	5.0	✔
Laboratory Control Samples (LCS)							
Mercury in Biota by CVAAS (DRY units, Micro)	E511	73895	2	3	66.6	10.0	✔
Mercury in Biota by CVAAS (DRY units, Routine)	E510	76181	6	45	13.3	10.0	✔
Metals in Biota by CRC ICPMS (DRY units, Micro)	E472	73896	2	3	66.6	10.0	✔
Metals in Biota by CRC ICPMS (DRY units, Routine)	E440	76180	6	45	13.3	10.0	✔
Moisture Content by Gravimetry	E144	71671	3	42	7.1	5.0	✔
Moisture Content by Gravimetry (Low Mass Samples)	E144-H	73889	1	3	33.3	5.0	✔
Method Blanks (MB)							
Mercury in Biota by CVAAS (DRY units, Micro)	E511	73895	1	3	33.3	5.0	✔
Mercury in Biota by CVAAS (DRY units, Routine)	E510	76181	3	45	6.6	5.0	✔
Metals in Biota by CRC ICPMS (DRY units, Micro)	E472	73896	1	3	33.3	5.0	✔
Metals in Biota by CRC ICPMS (DRY units, Routine)	E440	76180	3	45	6.6	5.0	✔
Moisture Content by Gravimetry	E144	71671	3	42	7.1	5.0	✔
Moisture Content by Gravimetry (Low Mass Samples)	E144-H	73889	1	3	33.3	5.0	✔



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Moisture Content by Gravimetry	E144 Vancouver - Environmental	Biota	Puget Sound Water Quality Authority/CCME PHC in Soil - Tier 1	Moisture is measured gravimetrically by drying the sample at 105°C. Moisture content is calculated as the weight loss (due to water) divided by the wet weight of the sample, expressed as a percentage.
Moisture Content by Gravimetry (Low Mass Samples)	E144-H Vancouver - Environmental	Biota	Puget Sound Water Quality Authority/BC MOE Lab Manual	Moisture is measured gravimetrically by drying the sample at <60°C for a minimum of 3 days to constant weight. Moisture content is calculated as the weight loss (due to water) divided by the wet weight of soil, expressed as a percentage.
Metals in Biota by CRC ICPMS (DRY units, Routine)	E440 Vancouver - Environmental	Biota	EPA 200.3/6020B	Tissue samples are homogenized and sub-sampled prior to hotblock digestion with HNO ₃ , HCl, and H ₂ O ₂ . Analysis is by Collision/Reaction Cell ICPMS. Method Limitation: This method employs a strong acid/peroxide digestion, and is intended to provide a conservative estimate of bio-available metals. Near complete recoveries are achieved for most toxicologically important metals, but elements associated with recalcitrant minerals may be only partially recovered.
Metals in Biota by CRC ICPMS (DRY units, Micro)	E472 Vancouver - Environmental	Biota	EPA 200.3/6020B (mod)	Tissue samples are homogenized and sub-sampled prior to hotblock digestion with HNO ₃ , HCl, and H ₂ O ₂ . Analysis is by Collision/Reaction Cell ICPMS. Method Limitation: This method employs a strong acid/peroxide digestion, and is intended to provide a conservative estimate of bio-available metals. Near complete recoveries are achieved for most toxicologically important metals, but elements associated with recalcitrant minerals may be only partially recovered.
Mercury in Biota by CVAAS (DRY units, Routine)	E510 Vancouver - Environmental	Biota	EPA 200.3/1631 Appendix (mod)	Samples are homogenized and sub-sampled prior to hotblock digestion with HNO ₃ , HCl, and H ₂ O ₂ . Analysis is by CVAAS.
Mercury in Biota by CVAAS (DRY units, Micro)	E511 Vancouver - Environmental	Biota	EPA 200.3/1631E (mod)	Samples are homogenized and sub-sampled prior to hotblock digestion with nitric acid, hydrochloric acid, and hydrogen peroxide. Analysis is by CVAAS.
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Metals and Mercury Biota Digestion	EP440 Vancouver - Environmental	Biota	EPA 200.3	This method uses a heated strong acid digestion with HNO ₃ , HCl, and H ₂ O ₂ and is intended to provide a conservative estimate of bio-available metals.
Metals and Mercury Biota Digestion (Micro)	EP472 Vancouver - Environmental	Biota	EPA 200.3	This method, designed for small sample amounts, uses a heated strong acid digestion with HNO ₃ , HCl, and H ₂ O ₂ and is intended to provide a conservative estimate of bio-available metals.

QUALITY CONTROL REPORT

Work Order	: WR2000560	Page	: 1 of 21
Client	: Teck Metals Limited	Laboratory	: Whitehorse - Environmental
Contact	: Michelle Unger	Account Manager	: Can Dang
Address	: 601 Knighton Road Kimberley BC Canada V1A 3E1	Address	: #12 151 Industrial Road Whitehorse, Yukon Canada Y1A 2V3
Telephone	: 250 427 8404	Telephone	: +1 867 668 6689
Project	: Sa Dena Hes	Date Samples Received	: 28-Jul-2020 15:20
PO	: 9971	Date Analysis Commenced	: 13-Aug-2020
C-O-C number	:	Issue Date	: 10-Sep-2020 07:45
Sampler	: Bonnie Burns		
Site	: Sa Dena Hes		
Quote number	: Q62635		
No. of samples received	: 45		
No. of samples analysed	: 45		

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
Kinny Wu	Lab Analyst	Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia
Salimah Khimani	Lab Assistant	Metals, Burnaby, British Columbia
Shaneel Dayal	Analyst	Metals, Burnaby, British Columbia
Woochan Song	Lab Assistant	Metals, Burnaby, British Columbia

Page : 2 of 21
Work Order : WR2000560
Client : Teck Metals Limited
Project : Sa Dena Hes



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: Biota					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: 71671)												
WR2000560-026	VMP-1, Willow Leaves	moisture	----	E144	0.50	%	66.7	63.3	5.20%	20%	----	
Physical Tests (QC Lot: 71674)												
WR2000560-046	VMP-9, Alder Twigs	moisture	----	E144	0.50	%	60.6	60.5	0.165%	20%	----	
Physical Tests (QC Lot: 72950)												
WR2000560-069	NC-Ref, Willow Leaves	moisture	----	E144	0.50	%	73.4	72.7	1.03%	20%	----	
Physical Tests (QC Lot: 73889)												
WR2000560-070	NC-Ref, Willow Twigs	moisture	----	E144-H	2.0	%	69.0	70.2	1.68%	20%	----	
Metals (QC Lot: 73895)												
WR2000560-070	NC-Ref, Willow Twigs	mercury	7439-97-6	E511	0.0050	mg/kg	<0.0050	<0.0050	0	Diff <2x LOR	----	
Metals (QC Lot: 73896)												
WR2000560-070	NC-Ref, Willow Twigs	aluminum	7429-90-5	E472	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----	
		antimony	7440-36-0	E472	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----	
		arsenic	7440-38-2	E472	0.030	mg/kg	0.051	0.047	0.004	Diff <2x LOR	----	
		barium	7440-39-3	E472	0.050	mg/kg	3.62	3.55	2.03%	40%	----	
		beryllium	7440-41-7	E472	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----	
		bismuth	7440-69-9	E472	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----	
		boron	7440-42-8	E472	1.0	mg/kg	16.3	16.4	0.920%	40%	----	
		cadmium	7440-43-9	E472	0.010	mg/kg	5.20	5.02	3.39%	40%	----	
		calcium	7440-70-2	E472	20	mg/kg	5860	5300	9.93%	60%	----	
		cesium	7440-46-2	E472	0.0050	mg/kg	0.162	0.165	2.02%	40%	----	
		chromium	7440-47-3	E472	0.20	mg/kg	0.69	# <0.20	0.49	Diff <2x LOR	DUP-H,J	
		cobalt	7440-48-4	E472	0.020	mg/kg	0.026	<0.020	0.006	Diff <2x LOR	----	
		copper	7440-50-8	E472	0.20	mg/kg	9.54	8.99	5.98%	40%	----	
		iron	7439-89-6	E472	5.0	mg/kg	25.8	23.4	2.4	Diff <2x LOR	----	
		lead	7439-92-1	E472	0.050	mg/kg	0.108	0.111	0.003	Diff <2x LOR	----	
		lithium	7439-93-2	E472	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	----	
		magnesium	7439-95-4	E472	2.0	mg/kg	934	919	1.63%	40%	----	
		manganese	7439-96-5	E472	0.050	mg/kg	27.8	27.5	1.09%	40%	----	
		molybdenum	7439-98-7	E472	0.040	mg/kg	0.153	0.143	0.010	Diff <2x LOR	----	
		nickel	7440-02-0	E472	0.20	mg/kg	0.86	# 0.22	0.63	Diff <2x LOR	DUP-H	
		phosphorus	7723-14-0	E472	10	mg/kg	2490	2420	2.85%	40%	----	
		potassium	7440-09-7	E472	20	mg/kg	10200	10700	4.72%	40%	----	



Sub-Matrix: Biota

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
Metals (QC Lot: 73896) - continued											
WR2000560-070	NC-Ref, Willow Twigs	rubidium	7440-17-7	E472	0.050	mg/kg	37.4	38.3	2.37%	40%	----
		selenium	7782-49-2	E472	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		sodium	7440-23-5	E472	20	mg/kg	82	80	2	Diff <2x LOR	----
		strontium	7440-24-6	E472	0.10	mg/kg	31.2	31.0	0.837%	60%	----
		tellurium	13494-80-9	E472	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		thallium	7440-28-0	E472	0.0020	mg/kg	<0.0020	<0.0020	0	Diff <2x LOR	----
		tin	7440-31-5	E472	0.10	mg/kg	0.63	0.57	10.2%	40%	----
		uranium	7440-61-1	E472	0.0020	mg/kg	<0.0020	<0.0020	0	Diff <2x LOR	----
		vanadium	7440-62-2	E472	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		zinc	7440-66-6	E472	1.0	mg/kg	117	112	4.80%	40%	----
zirconium	7440-67-7	E472	0.20	mg/kg	1.18	1.20	1.70%	40%	----		
Metals (QC Lot: 74368)											
WR2000560-031	VMP-3, Willow Leaves	aluminum	7429-90-5	E440	2.0	mg/kg	62.4	62.0	0.626%	40%	----
		antimony	7440-36-0	E440	0.010	mg/kg	0.032	0.046	0.013	Diff <2x LOR	----
		arsenic	7440-38-2	E440	0.020	mg/kg	0.104	0.092	0.012	Diff <2x LOR	----
		barium	7440-39-3	E440	0.050	mg/kg	14.8	14.0	5.72%	40%	----
		beryllium	7440-41-7	E440	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		bismuth	7440-69-9	E440	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		boron	7440-42-8	E440	1.0	mg/kg	20.0	19.4	3.15%	40%	----
		cadmium	7440-43-9	E440	0.0050	mg/kg	10.2	10.2	0.475%	40%	----
		calcium	7440-70-2	E440	20	mg/kg	13000	12900	0.678%	60%	----
		cesium	7440-46-2	E440	0.0050	mg/kg	0.0108	0.0114	0.0005	Diff <2x LOR	----
		chromium	7440-47-3	E440	0.050	mg/kg	0.133	0.123	0.010	Diff <2x LOR	----
		cobalt	7440-48-4	E440	0.020	mg/kg	0.852	0.883	3.62%	40%	----
		copper	7440-50-8	E440	0.10	mg/kg	5.19	5.41	4.11%	40%	----
		iron	7439-89-6	E440	3.0	mg/kg	126	130	2.81%	40%	----
		lead	7439-92-1	E440	0.020	mg/kg	0.168	0.124	29.8%	40%	----
		lithium	7439-93-2	E440	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	----
		magnesium	7439-95-4	E440	2.0	mg/kg	2280	2380	4.45%	40%	----
		manganese	7439-96-5	E440	0.050	mg/kg	79.2	82.7	4.31%	40%	----
		molybdenum	7439-98-7	E440	0.020	mg/kg	1.10	1.10	0.0989%	40%	----
		nickel	7440-02-0	E440	0.20	mg/kg	2.08	2.20	5.60%	40%	----
phosphorus	7723-14-0	E440	10	mg/kg	2630	2730	3.49%	40%	----		
potassium	7440-09-7	E440	20	mg/kg	16300	16800	2.67%	40%	----		
rubidium	7440-17-7	E440	0.050	mg/kg	2.51	2.62	4.07%	40%	----		
selenium	7782-49-2	E440	0.050	mg/kg	7.99	8.37	4.59%	40%	----		



Sub-Matrix: Biota					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
Metals (QC Lot: 74368) - continued											
WR2000560-031	VMP-3, Willow Leaves	sodium	7440-23-5	E440	20	mg/kg	<20	<20	0	Diff <2x LOR	----
		strontium	7440-24-6	E440	0.050	mg/kg	42.2	42.1	0.202%	60%	----
		tellurium	13494-80-9	E440	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		thallium	7440-28-0	E440	0.0020	mg/kg	<0.0020	<0.0020	0	Diff <2x LOR	----
		tin	7440-31-5	E440	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		uranium	7440-61-1	E440	0.0020	mg/kg	0.0087	0.0088	0.0001	Diff <2x LOR	----
		vanadium	7440-62-2	E440	0.10	mg/kg	0.22	0.22	0.005	Diff <2x LOR	----
		zinc	7440-66-6	E440	0.50	mg/kg	246	254	3.08%	40%	----
		zirconium	7440-67-7	E440	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	----
Metals (QC Lot: 74369)											
WR2000560-031	VMP-3, Willow Leaves	mercury	7439-97-6	E510	0.0050	mg/kg	<0.0050	<0.0050	0	Diff <2x LOR	----
Metals (QC Lot: 74962)											
VA20B2105-001	Anonymous	aluminum	7429-90-5	E440	2.0	mg/kg	34.5	34.5	0.207%	40%	----
		antimony	7440-36-0	E440	0.010	mg/kg	0.012	0.012	0.0005	Diff <2x LOR	----
		arsenic	7440-38-2	E440	0.020	mg/kg	0.312	0.304	2.70%	40%	----
		barium	7440-39-3	E440	0.050	mg/kg	25.1	25.2	0.172%	40%	----
		beryllium	7440-41-7	E440	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		bismuth	7440-69-9	E440	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		boron	7440-42-8	E440	1.0	mg/kg	57.7	57.5	0.372%	40%	----
		cadmium	7440-43-9	E440	0.0050	mg/kg	1.16	1.14	1.78%	40%	----
		calcium	7440-70-2	E440	20	mg/kg	17500	17100	2.40%	60%	----
		cesium	7440-46-2	E440	0.0050	mg/kg	<0.0050	<0.0050	0	Diff <2x LOR	----
		chromium	7440-47-3	E440	0.050	mg/kg	0.087	0.106	0.019	Diff <2x LOR	----
		cobalt	7440-48-4	E440	0.020	mg/kg	2.20	2.21	0.866%	40%	----
		copper	7440-50-8	E440	0.10	mg/kg	3.75	3.72	0.616%	40%	----
		iron	7439-89-6	E440	3.0	mg/kg	90.0	89.9	0.0638%	40%	----
		lead	7439-92-1	E440	0.020	mg/kg	0.056	0.056	0.0004	Diff <2x LOR	----
		lithium	7439-93-2	E440	0.50	mg/kg	1.13	1.10	0.03	Diff <2x LOR	----
		magnesium	7439-95-4	E440	2.0	mg/kg	5740	5730	0.238%	40%	----
		manganese	7439-96-5	E440	0.050	mg/kg	72.5	70.4	2.89%	40%	----
		molybdenum	7439-98-7	E440	0.020	mg/kg	0.266	0.254	4.58%	40%	----
		nickel	7440-02-0	E440	0.20	mg/kg	0.55	0.57	0.02	Diff <2x LOR	----
		phosphorus	7723-14-0	E440	10	mg/kg	2160	2110	2.29%	40%	----
potassium	7440-09-7	E440	20	mg/kg	18000	17600	2.20%	40%	----		
rubidium	7440-17-7	E440	0.050	mg/kg	0.669	0.656	1.96%	40%	----		
selenium	7782-49-2	E440	0.050	mg/kg	0.104	0.104	0.0001	Diff <2x LOR	----		



Sub-Matrix: Biota					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
Metals (QC Lot: 74962) - continued											
VA20B2105-001	Anonymous	sodium	7440-23-5	E440	20	mg/kg	31	31	0.2	Diff <2x LOR	----
		strontium	7440-24-6	E440	0.050	mg/kg	141	139	1.25%	60%	----
		tellurium	13494-80-9	E440	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		thallium	7440-28-0	E440	0.0020	mg/kg	<0.0020	<0.0020	0	Diff <2x LOR	----
		tin	7440-31-5	E440	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		uranium	7440-61-1	E440	0.0020	mg/kg	0.0316	0.0308	2.57%	40%	----
		vanadium	7440-62-2	E440	0.10	mg/kg	0.10	0.11	0.004	Diff <2x LOR	----
		zinc	7440-66-6	E440	0.50	mg/kg	174	173	0.526%	40%	----
		zirconium	7440-67-7	E440	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	----
Metals (QC Lot: 74963)											
VA20B2105-001	Anonymous	mercury	7439-97-6	E510	0.0050	mg/kg	0.0079	0.0080	0.0002	Diff <2x LOR	----
Metals (QC Lot: 76180)											
WR2000560-037	VMP-5, Poplar Leaves	aluminum	7429-90-5	E440	2.0	mg/kg	2.1	2.3	0.2	Diff <2x LOR	----
		antimony	7440-36-0	E440	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		arsenic	7440-38-2	E440	0.020	mg/kg	0.101	0.106	4.92%	40%	----
		barium	7440-39-3	E440	0.050	mg/kg	9.86	9.85	0.100%	40%	----
		beryllium	7440-41-7	E440	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		bismuth	7440-69-9	E440	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		boron	7440-42-8	E440	1.0	mg/kg	81.1	80.3	0.910%	40%	----
		cadmium	7440-43-9	E440	0.0050	mg/kg	34.4	34.1	0.998%	40%	----
		calcium	7440-70-2	E440	20	mg/kg	17500	17000	2.62%	60%	----
		cesium	7440-46-2	E440	0.0050	mg/kg	0.0521	0.0528	1.36%	40%	----
		chromium	7440-47-3	E440	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		cobalt	7440-48-4	E440	0.020	mg/kg	0.508	0.518	1.99%	40%	----
		copper	7440-50-8	E440	0.10	mg/kg	6.78	6.68	1.36%	40%	----
		iron	7439-89-6	E440	3.0	mg/kg	35.5	39.1	9.83%	40%	----
		lead	7439-92-1	E440	0.020	mg/kg	0.076	0.082	0.006	Diff <2x LOR	----
		lithium	7439-93-2	E440	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	----
		magnesium	7439-95-4	E440	2.0	mg/kg	2030	2030	0.258%	40%	----
		manganese	7439-96-5	E440	0.050	mg/kg	72.8	72.4	0.642%	40%	----
		molybdenum	7439-98-7	E440	0.020	mg/kg	0.926	0.916	1.16%	40%	----
		nickel	7440-02-0	E440	0.20	mg/kg	1.29	1.26	2.28%	40%	----
		phosphorus	7723-14-0	E440	10	mg/kg	2460	2420	1.51%	40%	----
		potassium	7440-09-7	E440	20	mg/kg	14300	14200	1.12%	40%	----
		rubidium	7440-17-7	E440	0.050	mg/kg	15.8	15.8	0.00592%	40%	----
		selenium	7782-49-2	E440	0.050	mg/kg	1.49	1.48	0.405%	40%	----



Sub-Matrix: Biota					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
Metals (QC Lot: 76180) - continued											
WR2000560-037	VMP-5, Poplar Leaves	sodium	7440-23-5	E440	20	mg/kg	<20	<20	0	Diff <2x LOR	----
		strontium	7440-24-6	E440	0.050	mg/kg	46.4	47.5	2.29%	60%	----
		tellurium	13494-80-9	E440	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		thallium	7440-28-0	E440	0.0020	mg/kg	<0.0020	<0.0020	0	Diff <2x LOR	----
		tin	7440-31-5	E440	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		uranium	7440-61-1	E440	0.0020	mg/kg	0.0116	0.0109	6.12%	40%	----
		vanadium	7440-62-2	E440	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		zinc	7440-66-6	E440	0.50	mg/kg	742	728	2.02%	40%	----
		zirconium	7440-67-7	E440	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	----
Metals (QC Lot: 76181)											
WR2000560-037	VMP-5, Poplar Leaves	mercury	7439-97-6	E510	0.0050	mg/kg	<0.0050	<0.0050	0	Diff <2x LOR	----

Qualifiers

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.
J	Duplicate results and limits are expressed in terms of absolute difference.



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: Biota

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 71671)						
moisture	----	E144	0.5	%	<0.50	----
Physical Tests (QCLot: 71674)						
moisture	----	E144	0.5	%	<0.50	----
Physical Tests (QCLot: 72950)						
moisture	----	E144	0.5	%	<0.50	----
Physical Tests (QCLot: 73889)						
moisture	----	E144-H	2	%	<2.0	----
Metals (QCLot: 73895)						
mercury	7439-97-6	E511	0.005	mg/kg	<0.0050	----
Metals (QCLot: 73896)						
aluminum	7429-90-5	E472	5	mg/kg	<5.0	----
antimony	7440-36-0	E472	0.01	mg/kg	<0.010	----
arsenic	7440-38-2	E472	0.03	mg/kg	<0.030	----
barium	7440-39-3	E472	0.05	mg/kg	<0.050	----
beryllium	7440-41-7	E472	0.01	mg/kg	<0.010	----
bismuth	7440-69-9	E472	0.01	mg/kg	<0.010	----
boron	7440-42-8	E472	1	mg/kg	<1.0	----
cadmium	7440-43-9	E472	0.01	mg/kg	<0.010	----
calcium	7440-70-2	E472	20	mg/kg	<20	----
cesium	7440-46-2	E472	0.005	mg/kg	<0.0050	----
chromium	7440-47-3	E472	0.2	mg/kg	<0.20	----
cobalt	7440-48-4	E472	0.02	mg/kg	<0.020	----
copper	7440-50-8	E472	0.2	mg/kg	<0.20	----
iron	7439-89-6	E472	5	mg/kg	<5.0	----
lead	7439-92-1	E472	0.05	mg/kg	<0.050	----
lithium	7439-93-2	E472	0.5	mg/kg	<0.50	----
magnesium	7439-95-4	E472	2	mg/kg	<2.0	----
manganese	7439-96-5	E472	0.05	mg/kg	<0.050	----
molybdenum	7439-98-7	E472	0.04	mg/kg	<0.040	----
nickel	7440-02-0	E472	0.2	mg/kg	<0.20	----
phosphorus	7723-14-0	E472	10	mg/kg	<10	----
potassium	7440-09-7	E472	20	mg/kg	<20	----
rubidium	7440-17-7	E472	0.05	mg/kg	<0.050	----



Sub-Matrix: Biota

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Metals (QCLot: 73896) - continued						
selenium	7782-49-2	E472	0.1	mg/kg	<0.10	----
sodium	7440-23-5	E472	20	mg/kg	<20	----
strontium	7440-24-6	E472	0.1	mg/kg	<0.10	----
tellurium	13494-80-9	E472	0.02	mg/kg	<0.020	----
thallium	7440-28-0	E472	0.002	mg/kg	<0.0020	----
tin	7440-31-5	E472	0.1	mg/kg	<0.10	----
uranium	7440-61-1	E472	0.002	mg/kg	<0.0020	----
vanadium	7440-62-2	E472	0.1	mg/kg	<0.10	----
zinc	7440-66-6	E472	1	mg/kg	<1.0	----
zirconium	7440-67-7	E472	0.2	mg/kg	<0.20	----
Metals (QCLot: 74368)						
aluminum	7429-90-5	E440	2	mg/kg	<2.0	----
antimony	7440-36-0	E440	0.01	mg/kg	<0.010	----
arsenic	7440-38-2	E440	0.02	mg/kg	<0.020	----
barium	7440-39-3	E440	0.05	mg/kg	<0.050	----
beryllium	7440-41-7	E440	0.01	mg/kg	<0.010	----
bismuth	7440-69-9	E440	0.01	mg/kg	<0.010	----
boron	7440-42-8	E440	1	mg/kg	<1.0	----
cadmium	7440-43-9	E440	0.005	mg/kg	<0.0050	----
calcium	7440-70-2	E440	20	mg/kg	<20	----
cesium	7440-46-2	E440	0.005	mg/kg	<0.0050	----
chromium	7440-47-3	E440	0.05	mg/kg	<0.050	----
cobalt	7440-48-4	E440	0.02	mg/kg	<0.020	----
copper	7440-50-8	E440	0.1	mg/kg	<0.10	----
iron	7439-89-6	E440	3	mg/kg	<3.0	----
lead	7439-92-1	E440	0.02	mg/kg	<0.020	----
lithium	7439-93-2	E440	0.5	mg/kg	<0.50	----
magnesium	7439-95-4	E440	2	mg/kg	<2.0	----
manganese	7439-96-5	E440	0.05	mg/kg	<0.050	----
molybdenum	7439-98-7	E440	0.02	mg/kg	<0.020	----
nickel	7440-02-0	E440	0.2	mg/kg	<0.20	----
phosphorus	7723-14-0	E440	10	mg/kg	<10	----
potassium	7440-09-7	E440	20	mg/kg	<20	----
rubidium	7440-17-7	E440	0.05	mg/kg	<0.050	----
selenium	7782-49-2	E440	0.05	mg/kg	<0.050	----
sodium	7440-23-5	E440	20	mg/kg	<20	----



Sub-Matrix: Biota

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Metals (QCLot: 74368) - continued						
strontium	7440-24-6	E440	0.05	mg/kg	<0.050	----
tellurium	13494-80-9	E440	0.02	mg/kg	<0.020	----
thallium	7440-28-0	E440	0.002	mg/kg	<0.0020	----
tin	7440-31-5	E440	0.1	mg/kg	<0.10	----
uranium	7440-61-1	E440	0.002	mg/kg	<0.0020	----
vanadium	7440-62-2	E440	0.1	mg/kg	<0.10	----
zinc	7440-66-6	E440	0.5	mg/kg	<0.50	----
zirconium	7440-67-7	E440	0.2	mg/kg	<0.20	----
Metals (QCLot: 74369)						
mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----
Metals (QCLot: 74962)						
aluminum	7429-90-5	E440	2	mg/kg	<2.0	----
antimony	7440-36-0	E440	0.01	mg/kg	<0.010	----
arsenic	7440-38-2	E440	0.02	mg/kg	<0.020	----
barium	7440-39-3	E440	0.05	mg/kg	<0.050	----
beryllium	7440-41-7	E440	0.01	mg/kg	<0.010	----
bismuth	7440-69-9	E440	0.01	mg/kg	<0.010	----
boron	7440-42-8	E440	1	mg/kg	<1.0	----
cadmium	7440-43-9	E440	0.005	mg/kg	<0.0050	----
calcium	7440-70-2	E440	20	mg/kg	<20	----
cesium	7440-46-2	E440	0.005	mg/kg	<0.0050	----
chromium	7440-47-3	E440	0.05	mg/kg	<0.050	----
cobalt	7440-48-4	E440	0.02	mg/kg	<0.020	----
copper	7440-50-8	E440	0.1	mg/kg	<0.10	----
iron	7439-89-6	E440	3	mg/kg	<3.0	----
lead	7439-92-1	E440	0.02	mg/kg	<0.020	----
lithium	7439-93-2	E440	0.5	mg/kg	<0.50	----
magnesium	7439-95-4	E440	2	mg/kg	<2.0	----
manganese	7439-96-5	E440	0.05	mg/kg	<0.050	----
molybdenum	7439-98-7	E440	0.02	mg/kg	<0.020	----
nickel	7440-02-0	E440	0.2	mg/kg	<0.20	----
phosphorus	7723-14-0	E440	10	mg/kg	<10	----
potassium	7440-09-7	E440	20	mg/kg	<20	----
rubidium	7440-17-7	E440	0.05	mg/kg	<0.050	----
selenium	7782-49-2	E440	0.05	mg/kg	<0.050	----
sodium	7440-23-5	E440	20	mg/kg	<20	----



Sub-Matrix: Biota

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Metals (QCLot: 74962) - continued						
strontium	7440-24-6	E440	0.05	mg/kg	<0.050	----
tellurium	13494-80-9	E440	0.02	mg/kg	<0.020	----
thallium	7440-28-0	E440	0.002	mg/kg	<0.0020	----
tin	7440-31-5	E440	0.1	mg/kg	<0.10	----
uranium	7440-61-1	E440	0.002	mg/kg	<0.0020	----
vanadium	7440-62-2	E440	0.1	mg/kg	<0.10	----
zinc	7440-66-6	E440	0.5	mg/kg	<0.50	----
zirconium	7440-67-7	E440	0.2	mg/kg	<0.20	----
Metals (QCLot: 74963)						
mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----
Metals (QCLot: 76180)						
aluminum	7429-90-5	E440	2	mg/kg	<2.0	----
antimony	7440-36-0	E440	0.01	mg/kg	<0.010	----
arsenic	7440-38-2	E440	0.02	mg/kg	<0.020	----
barium	7440-39-3	E440	0.05	mg/kg	<0.050	----
beryllium	7440-41-7	E440	0.01	mg/kg	<0.010	----
bismuth	7440-69-9	E440	0.01	mg/kg	<0.010	----
boron	7440-42-8	E440	1	mg/kg	<1.0	----
cadmium	7440-43-9	E440	0.005	mg/kg	<0.0050	----
calcium	7440-70-2	E440	20	mg/kg	<20	----
cesium	7440-46-2	E440	0.005	mg/kg	<0.0050	----
chromium	7440-47-3	E440	0.05	mg/kg	<0.050	----
cobalt	7440-48-4	E440	0.02	mg/kg	<0.020	----
copper	7440-50-8	E440	0.1	mg/kg	<0.10	----
iron	7439-89-6	E440	3	mg/kg	<3.0	----
lead	7439-92-1	E440	0.02	mg/kg	<0.020	----
lithium	7439-93-2	E440	0.5	mg/kg	<0.50	----
magnesium	7439-95-4	E440	2	mg/kg	<2.0	----
manganese	7439-96-5	E440	0.05	mg/kg	<0.050	----
molybdenum	7439-98-7	E440	0.02	mg/kg	<0.020	----
nickel	7440-02-0	E440	0.2	mg/kg	<0.20	----
phosphorus	7723-14-0	E440	10	mg/kg	<10	----
potassium	7440-09-7	E440	20	mg/kg	<20	----
rubidium	7440-17-7	E440	0.05	mg/kg	<0.050	----
selenium	7782-49-2	E440	0.05	mg/kg	<0.050	----
sodium	7440-23-5	E440	20	mg/kg	<20	----



Sub-Matrix: **Biota**

<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	<i>Result</i>	<i>Qualifier</i>
Metals (QCLot: 76180) - continued						
strontium	7440-24-6	E440	0.05	mg/kg	<0.050	----
tellurium	13494-80-9	E440	0.02	mg/kg	<0.020	----
thallium	7440-28-0	E440	0.002	mg/kg	<0.0020	----
tin	7440-31-5	E440	0.1	mg/kg	<0.10	----
uranium	7440-61-1	E440	0.002	mg/kg	<0.0020	----
vanadium	7440-62-2	E440	0.1	mg/kg	<0.10	----
zinc	7440-66-6	E440	0.5	mg/kg	<0.50	----
zirconium	7440-67-7	E440	0.2	mg/kg	<0.20	----
Metals (QCLot: 76181)						
mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----



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.

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	
Physical Tests (QCLot: 71671)									
moisture	---	E144	0.5	%	50 %	100	90.0	110	---
Physical Tests (QCLot: 71674)									
moisture	---	E144	0.5	%	50 %	100	90.0	110	---
Physical Tests (QCLot: 72950)									
moisture	---	E144	0.5	%	50 %	101	90.0	110	---
Physical Tests (QCLot: 73889)									
moisture	---	E144-H	2	%	100 %	100	90.0	110	---
Metals (QCLot: 73895)									
mercury	7439-97-6	E511	0.005	mg/kg	0.02 mg/kg	98.2	80.0	120	---
Metals (QCLot: 73896)									
aluminum	7429-90-5	E472	5	mg/kg	20 mg/kg	120	80.0	120	---
antimony	7440-36-0	E472	0.01	mg/kg	10 mg/kg	104	80.0	120	---
arsenic	7440-38-2	E472	0.03	mg/kg	10 mg/kg	103	80.0	120	---
barium	7440-39-3	E472	0.05	mg/kg	2.5 mg/kg	109	80.0	120	---
beryllium	7440-41-7	E472	0.01	mg/kg	1 mg/kg	106	80.0	120	---
bismuth	7440-69-9	E472	0.01	mg/kg	10 mg/kg	104	80.0	120	---
boron	7440-42-8	E472	1	mg/kg	10 mg/kg	105	80.0	120	---
cadmium	7440-43-9	E472	0.01	mg/kg	1 mg/kg	101	80.0	120	---
calcium	7440-70-2	E472	20	mg/kg	500 mg/kg	106	80.0	120	---
cesium	7440-46-2	E472	0.005	mg/kg	0.5 mg/kg	111	80.0	120	---
chromium	7440-47-3	E472	0.2	mg/kg	2.5 mg/kg	111	80.0	120	---
cobalt	7440-48-4	E472	0.02	mg/kg	2.5 mg/kg	111	80.0	120	---
copper	7440-50-8	E472	0.2	mg/kg	2.5 mg/kg	106	80.0	120	---
iron	7439-89-6	E472	5	mg/kg	10 mg/kg	106	80.0	120	---
lead	7439-92-1	E472	0.05	mg/kg	5 mg/kg	104	80.0	120	---
lithium	7439-93-2	E472	0.5	mg/kg	2.5 mg/kg	112	80.0	120	---
magnesium	7439-95-4	E472	2	mg/kg	500 mg/kg	108	80.0	120	---
manganese	7439-96-5	E472	0.05	mg/kg	2.5 mg/kg	111	80.0	120	---
molybdenum	7439-98-7	E472	0.04	mg/kg	2.5 mg/kg	108	80.0	120	---
nickel	7440-02-0	E472	0.2	mg/kg	5 mg/kg	107	80.0	120	---
phosphorus	7723-14-0	E472	10	mg/kg	100 mg/kg	112	80.0	120	---
potassium	7440-09-7	E472	20	mg/kg	500 mg/kg	115	80.0	120	---
rubidium	7440-17-7	E472	0.05	mg/kg	1 mg/kg	112	80.0	120	---



Sub-Matrix: Biota

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Metals (QCLot: 73896) - continued									
selenium	7782-49-2	E472	0.1	mg/kg	10 mg/kg	97.1	80.0	120	----
sodium	7440-23-5	E472	20	mg/kg	500 mg/kg	112	80.0	120	----
strontium	7440-24-6	E472	0.1	mg/kg	2.5 mg/kg	113	80.0	120	----
tellurium	13494-80-9	E472	0.02	mg/kg	1 mg/kg	96.7	80.0	120	----
thallium	7440-28-0	E472	0.002	mg/kg	10 mg/kg	103	80.0	120	----
tin	7440-31-5	E472	0.1	mg/kg	5 mg/kg	106	80.0	120	----
uranium	7440-61-1	E472	0.002	mg/kg	0.05 mg/kg	110	80.0	120	----
vanadium	7440-62-2	E472	0.1	mg/kg	5 mg/kg	115	80.0	120	----
zinc	7440-66-6	E472	1	mg/kg	5 mg/kg	101	80.0	120	----
zirconium	7440-67-7	E472	0.2	mg/kg	1 mg/kg	107	80.0	120	----
Metals (QCLot: 74368)									
aluminum	7429-90-5	E440	2	mg/kg	20 mg/kg	108	80.0	120	----
antimony	7440-36-0	E440	0.01	mg/kg	10 mg/kg	105	80.0	120	----
arsenic	7440-38-2	E440	0.02	mg/kg	10 mg/kg	104	80.0	120	----
barium	7440-39-3	E440	0.05	mg/kg	2.5 mg/kg	108	80.0	120	----
beryllium	7440-41-7	E440	0.01	mg/kg	1 mg/kg	104	80.0	120	----
bismuth	7440-69-9	E440	0.01	mg/kg	10 mg/kg	99.4	80.0	120	----
boron	7440-42-8	E440	1	mg/kg	10 mg/kg	103	80.0	120	----
cadmium	7440-43-9	E440	0.005	mg/kg	1 mg/kg	102	80.0	120	----
calcium	7440-70-2	E440	20	mg/kg	500 mg/kg	104	80.0	120	----
cesium	7440-46-2	E440	0.005	mg/kg	0.5 mg/kg	105	80.0	120	----
chromium	7440-47-3	E440	0.05	mg/kg	2.5 mg/kg	107	80.0	120	----
cobalt	7440-48-4	E440	0.02	mg/kg	2.5 mg/kg	104	80.0	120	----
copper	7440-50-8	E440	0.1	mg/kg	2.5 mg/kg	105	80.0	120	----
iron	7439-89-6	E440	3	mg/kg	10 mg/kg	113	80.0	120	----
lead	7439-92-1	E440	0.02	mg/kg	5 mg/kg	104	80.0	120	----
lithium	7439-93-2	E440	0.5	mg/kg	2.5 mg/kg	106	80.0	120	----
magnesium	7439-95-4	E440	2	mg/kg	500 mg/kg	104	80.0	120	----
manganese	7439-96-5	E440	0.05	mg/kg	2.5 mg/kg	107	80.0	120	----
molybdenum	7439-98-7	E440	0.02	mg/kg	2.5 mg/kg	109	80.0	120	----
nickel	7440-02-0	E440	0.2	mg/kg	5 mg/kg	104	80.0	120	----
phosphorus	7723-14-0	E440	10	mg/kg	100 mg/kg	111	80.0	120	----
potassium	7440-09-7	E440	20	mg/kg	500 mg/kg	111	80.0	120	----
rubidium	7440-17-7	E440	0.05	mg/kg	1 mg/kg	105	80.0	120	----
selenium	7782-49-2	E440	0.05	mg/kg	10 mg/kg	108	80.0	120	----
sodium	7440-23-5	E440	20	mg/kg	500 mg/kg	106	80.0	120	----
strontium	7440-24-6	E440	0.05	mg/kg	2.5 mg/kg	108	80.0	120	----



Sub-Matrix: Biota

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Metals (QCLot: 74368) - continued									
tellurium	13494-80-9	E440	0.02	mg/kg	1 mg/kg	107	80.0	120	----
thallium	7440-28-0	E440	0.002	mg/kg	10 mg/kg	98.8	80.0	120	----
tin	7440-31-5	E440	0.1	mg/kg	5 mg/kg	102	80.0	120	----
uranium	7440-61-1	E440	0.002	mg/kg	0.05 mg/kg	109	80.0	120	----
vanadium	7440-62-2	E440	0.1	mg/kg	5 mg/kg	108	80.0	120	----
zinc	7440-66-6	E440	0.5	mg/kg	5 mg/kg	101	80.0	120	----
zirconium	7440-67-7	E440	0.2	mg/kg	1 mg/kg	102	80.0	120	----
Metals (QCLot: 74369)									
mercury	7439-97-6	E510	0.005	mg/kg	0.02 mg/kg	101	80.0	120	----
Metals (QCLot: 74962)									
aluminum	7429-90-5	E440	2	mg/kg	20 mg/kg	105	80.0	120	----
antimony	7440-36-0	E440	0.01	mg/kg	10 mg/kg	105	80.0	120	----
arsenic	7440-38-2	E440	0.02	mg/kg	10 mg/kg	103	80.0	120	----
barium	7440-39-3	E440	0.05	mg/kg	2.5 mg/kg	106	80.0	120	----
beryllium	7440-41-7	E440	0.01	mg/kg	1 mg/kg	102	80.0	120	----
bismuth	7440-69-9	E440	0.01	mg/kg	10 mg/kg	104	80.0	120	----
boron	7440-42-8	E440	1	mg/kg	10 mg/kg	103	80.0	120	----
cadmium	7440-43-9	E440	0.005	mg/kg	1 mg/kg	99.9	80.0	120	----
calcium	7440-70-2	E440	20	mg/kg	500 mg/kg	103	80.0	120	----
cesium	7440-46-2	E440	0.005	mg/kg	0.5 mg/kg	103	80.0	120	----
chromium	7440-47-3	E440	0.05	mg/kg	2.5 mg/kg	106	80.0	120	----
cobalt	7440-48-4	E440	0.02	mg/kg	2.5 mg/kg	105	80.0	120	----
copper	7440-50-8	E440	0.1	mg/kg	2.5 mg/kg	103	80.0	120	----
iron	7439-89-6	E440	3	mg/kg	10 mg/kg	109	80.0	120	----
lead	7439-92-1	E440	0.02	mg/kg	5 mg/kg	104	80.0	120	----
lithium	7439-93-2	E440	0.5	mg/kg	2.5 mg/kg	104	80.0	120	----
magnesium	7439-95-4	E440	2	mg/kg	500 mg/kg	108	80.0	120	----
manganese	7439-96-5	E440	0.05	mg/kg	2.5 mg/kg	105	80.0	120	----
molybdenum	7439-98-7	E440	0.02	mg/kg	2.5 mg/kg	103	80.0	120	----
nickel	7440-02-0	E440	0.2	mg/kg	5 mg/kg	104	80.0	120	----
phosphorus	7723-14-0	E440	10	mg/kg	100 mg/kg	115	80.0	120	----
potassium	7440-09-7	E440	20	mg/kg	500 mg/kg	109	80.0	120	----
rubidium	7440-17-7	E440	0.05	mg/kg	1 mg/kg	106	80.0	120	----
selenium	7782-49-2	E440	0.05	mg/kg	10 mg/kg	107	80.0	120	----
sodium	7440-23-5	E440	20	mg/kg	500 mg/kg	110	80.0	120	----
strontium	7440-24-6	E440	0.05	mg/kg	2.5 mg/kg	105	80.0	120	----
tellurium	13494-80-9	E440	0.02	mg/kg	1 mg/kg	99.0	80.0	120	----



Sub-Matrix: Biota

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Metals (QCLot: 74962) - continued									
thallium	7440-28-0	E440	0.002	mg/kg	10 mg/kg	104	80.0	120	----
tin	7440-31-5	E440	0.1	mg/kg	5 mg/kg	102	80.0	120	----
uranium	7440-61-1	E440	0.002	mg/kg	0.05 mg/kg	102	80.0	120	----
vanadium	7440-62-2	E440	0.1	mg/kg	5 mg/kg	107	80.0	120	----
zinc	7440-66-6	E440	0.5	mg/kg	5 mg/kg	101	80.0	120	----
zirconium	7440-67-7	E440	0.2	mg/kg	1 mg/kg	103	80.0	120	----
Metals (QCLot: 74963)									
mercury	7439-97-6	E510	0.005	mg/kg	0.02 mg/kg	102	80.0	120	----
Metals (QCLot: 76180)									
aluminum	7429-90-5	E440	2	mg/kg	20 mg/kg	110	80.0	120	----
antimony	7440-36-0	E440	0.01	mg/kg	10 mg/kg	107	80.0	120	----
arsenic	7440-38-2	E440	0.02	mg/kg	10 mg/kg	104	80.0	120	----
barium	7440-39-3	E440	0.05	mg/kg	2.5 mg/kg	108	80.0	120	----
beryllium	7440-41-7	E440	0.01	mg/kg	1 mg/kg	106	80.0	120	----
bismuth	7440-69-9	E440	0.01	mg/kg	10 mg/kg	105	80.0	120	----
boron	7440-42-8	E440	1	mg/kg	10 mg/kg	99.2	80.0	120	----
cadmium	7440-43-9	E440	0.005	mg/kg	1 mg/kg	104	80.0	120	----
calcium	7440-70-2	E440	20	mg/kg	500 mg/kg	107	80.0	120	----
cesium	7440-46-2	E440	0.005	mg/kg	0.5 mg/kg	106	80.0	120	----
chromium	7440-47-3	E440	0.05	mg/kg	2.5 mg/kg	106	80.0	120	----
cobalt	7440-48-4	E440	0.02	mg/kg	2.5 mg/kg	106	80.0	120	----
copper	7440-50-8	E440	0.1	mg/kg	2.5 mg/kg	105	80.0	120	----
iron	7439-89-6	E440	3	mg/kg	10 mg/kg	112	80.0	120	----
lead	7439-92-1	E440	0.02	mg/kg	5 mg/kg	107	80.0	120	----
lithium	7439-93-2	E440	0.5	mg/kg	2.5 mg/kg	105	80.0	120	----
magnesium	7439-95-4	E440	2	mg/kg	500 mg/kg	110	80.0	120	----
manganese	7439-96-5	E440	0.05	mg/kg	2.5 mg/kg	109	80.0	120	----
molybdenum	7439-98-7	E440	0.02	mg/kg	2.5 mg/kg	106	80.0	120	----
nickel	7440-02-0	E440	0.2	mg/kg	5 mg/kg	106	80.0	120	----
phosphorus	7723-14-0	E440	10	mg/kg	100 mg/kg	109	80.0	120	----
potassium	7440-09-7	E440	20	mg/kg	500 mg/kg	109	80.0	120	----
rubidium	7440-17-7	E440	0.05	mg/kg	1 mg/kg	106	80.0	120	----
selenium	7782-49-2	E440	0.05	mg/kg	10 mg/kg	109	80.0	120	----
sodium	7440-23-5	E440	20	mg/kg	500 mg/kg	109	80.0	120	----
strontium	7440-24-6	E440	0.05	mg/kg	2.5 mg/kg	110	80.0	120	----
tellurium	13494-80-9	E440	0.02	mg/kg	1 mg/kg	107	80.0	120	----
thallium	7440-28-0	E440	0.002	mg/kg	10 mg/kg	103	80.0	120	----



Sub-Matrix: **Biota**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Metals (QCLot: 76180) - continued									
tin	7440-31-5	E440	0.1	mg/kg	5 mg/kg	105	80.0	120	----
uranium	7440-61-1	E440	0.002	mg/kg	0.05 mg/kg	104	80.0	120	----
vanadium	7440-62-2	E440	0.1	mg/kg	5 mg/kg	110	80.0	120	----
zinc	7440-66-6	E440	0.5	mg/kg	5 mg/kg	104	80.0	120	----
zirconium	7440-67-7	E440	0.2	mg/kg	1 mg/kg	102	80.0	120	----
Metals (QCLot: 76181)									
mercury	7439-97-6	E510	0.005	mg/kg	0.02 mg/kg	104	80.0	120	----



Reference Material (RM) Report

A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix: **Biota**

Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Reference Material (RM) Report				
					RM Target Concentration	Recovery (%) RM	Recovery Limits (%)		Qualifier
							Low	High	
Metals (QCLot: 73895)									
QC-73895-003	RM	mercury	7439-97-6	E511	0.322 mg/kg	119	70.0	130	----
Metals (QCLot: 73896)									
QC-73896-003	RM	aluminum	7429-90-5	E472	1280 mg/kg	119	70.0	130	----
QC-73896-003	RM	arsenic	7440-38-2	E472	6.87 mg/kg	102	70.0	130	----
QC-73896-003	RM	barium	7440-39-3	E472	4.4 mg/kg	108	70.0	130	----
QC-73896-003	RM	boron	7440-42-8	E472	9.24 mg/kg	108	70.0	130	----
QC-73896-003	RM	cadmium	7440-43-9	E472	0.299 mg/kg	101	70.0	130	----
QC-73896-003	RM	calcium	7440-70-2	E472	2360 mg/kg	107	70.0	130	----
QC-73896-003	RM	cesium	7440-46-2	E472	0.078 mg/kg	99.8	70.0	130	----
QC-73896-003	RM	chromium	7440-47-3	E472	1.58 mg/kg	109	70.0	130	----
QC-73896-003	RM	cobalt	7440-48-4	E472	0.25 mg/kg	107	70.0	130	----
QC-73896-003	RM	copper	7440-50-8	E472	15.7 mg/kg	107	70.0	130	----
QC-73896-003	RM	iron	7439-89-6	E472	318 mg/kg	106	70.0	130	----
QC-73896-003	RM	lead	7439-92-1	E472	0.231 mg/kg	# 131	70.0	130	MES
QC-73896-003	RM	lithium	7439-93-2	E472	1.21 mg/kg	107	50.0	150	----
QC-73896-003	RM	magnesium	7439-95-4	E472	910 mg/kg	106	70.0	130	----
QC-73896-003	RM	manganese	7439-96-5	E472	3.17 mg/kg	99.0	70.0	130	----
QC-73896-003	RM	molybdenum	7439-98-7	E472	0.29 mg/kg	102	70.0	130	----
QC-73896-003	RM	nickel	7440-02-0	E472	1.34 mg/kg	94.3	70.0	130	----
QC-73896-003	RM	phosphorus	7723-14-0	E472	8000 mg/kg	106	70.0	130	----
QC-73896-003	RM	potassium	7440-09-7	E472	12840 mg/kg	109	70.0	130	----
QC-73896-003	RM	rubidium	7440-17-7	E472	5.59 mg/kg	107	70.0	130	----
QC-73896-003	RM	selenium	7782-49-2	E472	3.45 mg/kg	106	70.0	130	----
QC-73896-003	RM	sodium	7440-23-5	E472	14000 mg/kg	107	70.0	130	----
QC-73896-003	RM	strontium	7440-24-6	E472	10.1 mg/kg	96.9	70.0	130	----
QC-73896-003	RM	thallium	7440-28-0	E472	0.0093 mg/kg	99.7	70.0	130	----
QC-73896-003	RM	uranium	7440-61-1	E472	0.0481 mg/kg	102	70.0	130	----
QC-73896-003	RM	vanadium	7440-62-2	E472	1.48 mg/kg	109	70.0	130	----
QC-73896-003	RM	zinc	7440-66-6	E472	46.2 mg/kg	111	70.0	130	----



Sub-Matrix: Biota

Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Reference Material (RM) Report				
					RM Target Concentration	Recovery (%) RM	Recovery Limits (%)		Qualifier
							Low	High	
Metals (QCLot: 74368)									
QC-74368-003	RM	aluminum	7429-90-5	E440	1280 mg/kg	110	70.0	130	----
QC-74368-003	RM	arsenic	7440-38-2	E440	6.87 mg/kg	95.0	70.0	130	----
QC-74368-003	RM	barium	7440-39-3	E440	4.4 mg/kg	105	70.0	130	----
QC-74368-003	RM	boron	7440-42-8	E440	9.24 mg/kg	92.8	70.0	130	----
QC-74368-003	RM	cadmium	7440-43-9	E440	0.299 mg/kg	91.9	70.0	130	----
QC-74368-003	RM	calcium	7440-70-2	E440	2360 mg/kg	101	70.0	130	----
QC-74368-003	RM	cesium	7440-46-2	E440	0.078 mg/kg	95.1	70.0	130	----
QC-74368-003	RM	chromium	7440-47-3	E440	1.58 mg/kg	106	70.0	130	----
QC-74368-003	RM	cobalt	7440-48-4	E440	0.25 mg/kg	99.2	70.0	130	----
QC-74368-003	RM	copper	7440-50-8	E440	15.7 mg/kg	96.6	70.0	130	----
QC-74368-003	RM	iron	7439-89-6	E440	318 mg/kg	105	70.0	130	----
QC-74368-003	RM	lead	7439-92-1	E440	0.231 mg/kg	119	70.0	130	----
QC-74368-003	RM	lithium	7439-93-2	E440	1.21 mg/kg	92.7	50.0	150	----
QC-74368-003	RM	magnesium	7439-95-4	E440	910 mg/kg	96.6	70.0	130	----
QC-74368-003	RM	manganese	7439-96-5	E440	3.17 mg/kg	93.9	70.0	130	----
QC-74368-003	RM	molybdenum	7439-98-7	E440	0.29 mg/kg	97.5	70.0	130	----
QC-74368-003	RM	nickel	7440-02-0	E440	1.34 mg/kg	98.7	70.0	130	----
QC-74368-003	RM	phosphorus	7723-14-0	E440	8000 mg/kg	96.0	70.0	130	----
QC-74368-003	RM	potassium	7440-09-7	E440	12840 mg/kg	98.3	70.0	130	----
QC-74368-003	RM	rubidium	7440-17-7	E440	5.59 mg/kg	99.1	70.0	130	----
QC-74368-003	RM	selenium	7782-49-2	E440	3.45 mg/kg	105	70.0	130	----
QC-74368-003	RM	sodium	7440-23-5	E440	14000 mg/kg	99.6	70.0	130	----
QC-74368-003	RM	strontium	7440-24-6	E440	10.1 mg/kg	93.9	70.0	130	----
QC-74368-003	RM	thallium	7440-28-0	E440	0.0093 mg/kg	87.8	70.0	130	----
QC-74368-003	RM	uranium	7440-61-1	E440	0.0481 mg/kg	108	70.0	130	----
QC-74368-003	RM	vanadium	7440-62-2	E440	1.48 mg/kg	104	70.0	130	----
QC-74368-003	RM	zinc	7440-66-6	E440	46.2 mg/kg	109	70.0	130	----
Metals (QCLot: 74369)									
QC-74369-003	RM	mercury	7439-97-6	E510	0.322 mg/kg	108	70.0	130	----
Metals (QCLot: 74962)									
QC-74962-003	RM	aluminum	7429-90-5	E440	1280 mg/kg	103	70.0	130	----
QC-74962-003	RM	arsenic	7440-38-2	E440	6.87 mg/kg	94.5	70.0	130	----



Sub-Matrix: Biota

Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Reference Material (RM) Report				
					RM Target Concentration	Recovery (%) RM	Recovery Limits (%)		Qualifier
							Low	High	
Metals (QCLot: 74962) - continued									
QC-74962-003	RM	barium	7440-39-3	E440	4.4 mg/kg	103	70.0	130	----
QC-74962-003	RM	boron	7440-42-8	E440	9.24 mg/kg	88.1	70.0	130	----
QC-74962-003	RM	cadmium	7440-43-9	E440	0.299 mg/kg	97.0	70.0	130	----
QC-74962-003	RM	calcium	7440-70-2	E440	2360 mg/kg	101	70.0	130	----
QC-74962-003	RM	cesium	7440-46-2	E440	0.078 mg/kg	93.7	70.0	130	----
QC-74962-003	RM	chromium	7440-47-3	E440	1.58 mg/kg	104	70.0	130	----
QC-74962-003	RM	cobalt	7440-48-4	E440	0.25 mg/kg	99.8	70.0	130	----
QC-74962-003	RM	copper	7440-50-8	E440	15.7 mg/kg	96.3	70.0	130	----
QC-74962-003	RM	iron	7439-89-6	E440	318 mg/kg	105	70.0	130	----
QC-74962-003	RM	lead	7439-92-1	E440	0.231 mg/kg	110	70.0	130	----
QC-74962-003	RM	lithium	7439-93-2	E440	1.21 mg/kg	93.1	50.0	150	----
QC-74962-003	RM	magnesium	7439-95-4	E440	910 mg/kg	97.0	70.0	130	----
QC-74962-003	RM	manganese	7439-96-5	E440	3.17 mg/kg	93.4	70.0	130	----
QC-74962-003	RM	molybdenum	7439-98-7	E440	0.29 mg/kg	93.2	70.0	130	----
QC-74962-003	RM	nickel	7440-02-0	E440	1.34 mg/kg	90.7	70.0	130	----
QC-74962-003	RM	phosphorus	7723-14-0	E440	8000 mg/kg	97.4	70.0	130	----
QC-74962-003	RM	potassium	7440-09-7	E440	12840 mg/kg	98.0	70.0	130	----
QC-74962-003	RM	rubidium	7440-17-7	E440	5.59 mg/kg	101	70.0	130	----
QC-74962-003	RM	selenium	7782-49-2	E440	3.45 mg/kg	105	70.0	130	----
QC-74962-003	RM	sodium	7440-23-5	E440	14000 mg/kg	103	70.0	130	----
QC-74962-003	RM	strontium	7440-24-6	E440	10.1 mg/kg	91.6	70.0	130	----
QC-74962-003	RM	thallium	7440-28-0	E440	0.0093 mg/kg	103	70.0	130	----
QC-74962-003	RM	uranium	7440-61-1	E440	0.0481 mg/kg	95.4	70.0	130	----
QC-74962-003	RM	vanadium	7440-62-2	E440	1.48 mg/kg	101	70.0	130	----
QC-74962-003	RM	zinc	7440-66-6	E440	46.2 mg/kg	108	70.0	130	----
Metals (QCLot: 74963)									
QC-74963-003	RM	mercury	7439-97-6	E510	0.322 mg/kg	112	70.0	130	----
Metals (QCLot: 76180)									
QC-76180-003	RM	aluminum	7429-90-5	E440	1280 mg/kg	111	70.0	130	----
QC-76180-003	RM	arsenic	7440-38-2	E440	6.87 mg/kg	95.5	70.0	130	----
QC-76180-003	RM	barium	7440-39-3	E440	4.4 mg/kg	110	70.0	130	----
QC-76180-003	RM	boron	7440-42-8	E440	9.24 mg/kg	94.6	70.0	130	----



Sub-Matrix: Biota

Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Reference Material (RM) Report				
					RM Target Concentration	Recovery (%) RM	Recovery Limits (%)		Qualifier
							Low	High	
Metals (QCLot: 76180) - continued									
QC-76180-003	RM	cadmium	7440-43-9	E440	0.299 mg/kg	106	70.0	130	----
QC-76180-003	RM	calcium	7440-70-2	E440	2360 mg/kg	103	70.0	130	----
QC-76180-003	RM	cesium	7440-46-2	E440	0.078 mg/kg	92.1	70.0	130	----
QC-76180-003	RM	chromium	7440-47-3	E440	1.58 mg/kg	114	70.0	130	----
QC-76180-003	RM	cobalt	7440-48-4	E440	0.25 mg/kg	102	70.0	130	----
QC-76180-003	RM	copper	7440-50-8	E440	15.7 mg/kg	97.8	70.0	130	----
QC-76180-003	RM	iron	7439-89-6	E440	318 mg/kg	107	70.0	130	----
QC-76180-003	RM	lead	7439-92-1	E440	0.231 mg/kg	111	70.0	130	----
QC-76180-003	RM	lithium	7439-93-2	E440	1.21 mg/kg	93.1	50.0	150	----
QC-76180-003	RM	magnesium	7439-95-4	E440	910 mg/kg	96.4	70.0	130	----
QC-76180-003	RM	manganese	7439-96-5	E440	3.17 mg/kg	# 133	70.0	130	MES
QC-76180-003	RM	molybdenum	7439-98-7	E440	0.29 mg/kg	95.8	70.0	130	----
QC-76180-003	RM	nickel	7440-02-0	E440	1.34 mg/kg	93.1	70.0	130	----
QC-76180-003	RM	phosphorus	7723-14-0	E440	8000 mg/kg	93.0	70.0	130	----
QC-76180-003	RM	potassium	7440-09-7	E440	12840 mg/kg	100	70.0	130	----
QC-76180-003	RM	rubidium	7440-17-7	E440	5.59 mg/kg	103	70.0	130	----
QC-76180-003	RM	selenium	7782-49-2	E440	3.45 mg/kg	105	70.0	130	----
QC-76180-003	RM	sodium	7440-23-5	E440	14000 mg/kg	99.0	70.0	130	----
QC-76180-003	RM	strontium	7440-24-6	E440	10.1 mg/kg	95.5	70.0	130	----
QC-76180-003	RM	thallium	7440-28-0	E440	0.0093 mg/kg	85.7	70.0	130	----
QC-76180-003	RM	uranium	7440-61-1	E440	0.0481 mg/kg	101	70.0	130	----
QC-76180-003	RM	vanadium	7440-62-2	E440	1.48 mg/kg	102	70.0	130	----
QC-76180-003	RM	zinc	7440-66-6	E440	46.2 mg/kg	103	70.0	130	----
Metals (QCLot: 76181)									
QC-76181-003	RM	mercury	7439-97-6	E510	0.322 mg/kg	110	70.0	130	----

Qualifiers

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



Chain of Custody / Analytical Request Form
 Canada Toll Free: 1 800 668 9878
 www.alsglobal.com

COC # _____

Page 1 of 6

Report To				Report Format / Distribution				Service Requested (Rush for routine analysis subject to availability)											
Company: Teck Resources Ltd				<input checked="" type="checkbox"/> Standard <input type="checkbox"/> Other				<input checked="" type="radio"/> Regular (Standard Turnaround Times - Business Days)											
Contact: Michelle Unger				<input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> Excel <input checked="" type="checkbox"/> Digital <input type="checkbox"/> Fax				<input type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT											
Address:				Email 1: bonnieburns@northwestel.net				<input type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT											
Phone: 250-427-8422 Fax:				Email 2:				<input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT											
Invoice To Same as Report? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				Client / Project Information				Analysis Request											
Hardcopy of Invoice with Report? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				Job #:				Please indicate below Filtered, Preserved or both (F, P, F/)											
Company:				PO / AFE: Teck PO 9971															
Contact:				LSD:															
Address:				Quote #: Q62635															
Phone: Fax:				ALS Heather Mckenzie															
Lab Work Order # (lab use only)				Sampler: Bonnie Burns															
Sample #	Sample Identification (This description will appear on the report)	Date (dd-mm-yy)	Time (hh:mm)	Sample Type	Total Nitrogen	pH	Metals, CCME	Particle Size Analysis	C:N ratio	Plant Available nutrients	TOC	total organic matter	moisture	Number of					
VMP-1		24-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2					
VMP-2		24-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2					
VMP-3		24-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2					
VMP-4		25-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2					
VMP-5		26-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2					
VMP-6		24-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2					
VMP-7		26-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2					
VMP-8		26-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2					
VMP-9		25-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2					
VMP-10		26-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2					
VMP-11		26-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2					
VMP-12		24-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2					
VMP-13		24-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2					
Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details																			
DO NOT RINSE THE TISSUE SAMPLES. WE WANT THE ANALYSIS TO INCLUDE THE DUST ON THE LEAVES ETC AS WELL AS INCLUDING THE UPTAKE OF METALS IN THE PLANTS.																			
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.																			
By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.																			
Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.																			
SHIPMENT RELEASE (client use)				SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)											
Released by:	Date (dd-mm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ?									
Bonnie Burns	15-Jul-19			July 28/20	15:20	10/9°C	HA	7/25	1:10 pm										

Environmental Division
 Whitehorse
 Work Order Reference
WR2000560



Telephone: +1 867 668 6669

7c



Report To			Report Format / Distribution			Service Requested (Rush for routine analysis subject to availability)									
Company:			<input checked="" type="checkbox"/> Standard <input type="checkbox"/> Other			<input checked="" type="radio"/> Regular (Standard Turnaround Times - Business Days)									
Contact:			<input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> Excel <input checked="" type="checkbox"/> Digital <input type="checkbox"/> Fax			<input type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT									
Address:			Email 1: bonnieburns@northwestel.net			<input type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT									
Phone:			Email 2:			<input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT									
Fax:			Email 3:			Analysis Request									
Invoice To Same as Report? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			Client / Project Information			Please indicate below Filtered, Preserved or both (F, P, F/P)									
Hardcopy of Invoice with Report? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			Job #:												
Company:			PO / AFE:												
Contact:			LSD:												
Address:			Quote #:												
Phone:			ALS Contact: Heather Mackenzie												
Fax:			Sampler: Bonnie Burns												
Lab Work Order # (lab use only)															
Sample #	Sample Identification (This description will appear on the report)	Date (dd-mm-yy)	Time (hh:mm)	Sample Type	Total Nitrogen	pH	Metals, CCME	Particle Size Analysis	C:N ratio	Plant Available nutrients	TOC	total organic matter	moisture	Number of Containers	
VMP-14		24-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2	
GP-1		25-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2	
GP-2		25-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2	
GP-3		25-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2	
GP-5		27-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2	
GP-6		26-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2	
GP-7		26-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2	
FF-Ref-1		25-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2	
FF-Ref-2		25-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2	
NC-Ref		25-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2	
DUP-1				Soil	X	X	X	X	X	X	X	X	X	2	
DUP-2				Soil	X	X	X	X	X	X	X	X	X	2	
Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details															
DO NOT RINSE THE TISSUE SAMPLES. WE WANT THE ANALYSIS TO INCLUDE THE DUST ON THE LEAVES ETC AS WELL AS INCLUDING THE UPTAKE OF METALS IN THE PLANTS.															
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.															
By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.															
Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.															
SHIPMENT RELEASE (client use)					SHIPMENT RECEPTION (lab use only)					SHIPMENT VERIFICATION (lab use only)					
Released by:	Date (dd-mm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ?	If Yes add SIF				
Bonnie Burns						°C									



Report To			Report Format / Distribution				Service Requested (Rush for routine analysis subject to availability)																																																																																																	
Company: Teck Resources Let			<input checked="" type="checkbox"/> Standard <input type="checkbox"/> Other				<input checked="" type="radio"/> Regular (Standard Turnaround Times - Business Days)																																																																																																	
Contact: Michelle Unger			<input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> Excel <input checked="" type="checkbox"/> Digital <input type="checkbox"/> Fax				<input type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT																																																																																																	
Address:			Email 1: bonnieburns@northwestel.net				<input type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT																																																																																																	
Phone:			Email 2:				<input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT																																																																																																	
Fax:			Email 3:				Analysis Request																																																																																																	
Invoice To Same as Report? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			Client / Project Information				Please indicate below Filtered, Preserved or both (F, P, F/P)																																																																																																	
Hardcopy of invoice with Report? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			Job #: SDH Veg Survey				<table border="1"> <tr> <th rowspan="7">Metals in Tissue</th> <th rowspan="7">Number of Containers</th> <th colspan="12"></th> </tr> <tr> <th colspan="12"></th> </tr> <tr> <th colspan="12"></th> </tr> <tr> <th colspan="12"></th> </tr> <tr> <th colspan="12"></th> </tr> <tr> <th colspan="12"></th> </tr> <tr> <th colspan="12"></th> </tr> </table>												Metals in Tissue	Number of Containers																																																																																				
Metals in Tissue	Number of Containers																																																																																																							
Company:			PO / A/E:																																																																																																					
Contact:			LSD:																																																																																																					
Address:			Quote #:																																																																																																					
Phone:																																																																																																								
Fax:																																																																																																								
Lab Work Order # (lab use only)			ALS Contact: Heather Mackenzie		Sampler: Bonnie Burns																																																																																																			
Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Metals in Tissue	Number of Containers																																																																																																		
	FF-Ref-1, Alder leaves	27-Jul-20			X	1																																																																																																		
	FF-Ref-1, Alder twigs	27-Jul-20			X	1																																																																																																		
	FF-Ref-2, Willow leaves	27-Jul-20			X	1																																																																																																		
	FF-Ref-2, Willow twigs	27-Jul-20			X	1																																																																																																		
	FF-Ref-2, Alder leaves	27-Jul-20			X	1																																																																																																		
	NC-Ref, Willow leaves	27-Jul-20			X	1																																																																																																		
	NC-Ref, Willow twigs	27-Jul-20			X	1																																																																																																		
Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details																																																																																																								
DO NOT RINSE THE TISSUE SAMPLES. WE WANT THE ANALYSIS TO INCLUDE THE DUST ON THE LEAVES ETC AS WELL AS INCLUDING THE UPTAKE OF METALS IN THE PLANTS.																																																																																																								
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.																																																																																																								
By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.																																																																																																								
Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.																																																																																																								
SHIPMENT RELEASE (client use)				SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)																																																																																																
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF																																																																																														
Bonnie Burns						°C																																																																																																		

APPENDIX E

SOIL DATA, 2020

- **Table E-1, Concentrations of Metals (mg/kg) in Soils Compared to YCS Standards**
- **Table E-2, RPD Values for the Duplicate Soil Samples**
- **Figure E-1, Concentrations of COPCs in Soils with CSR Standards, 2020**
- **Certificate of Analysis, ALS**

TABLE E-1 CONCENTRATIONS OF METALS IN SOILS COMPARED TO YCS STANDARDS, 2020

	Site	Date Sampled	% Moisture	pH (1:2 soil:water)	Antimony (Sb)	Arsenic (As)	Barium (Ba)	Beryllium (Be)	Cadmium (Cd)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Lead (Pb)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Selenium (Se)	Silver (Ag)	Thallium (Tl)	Tin (Sn)	Uranium (U)	Vanadium (V)	Zinc (Zn)
Exposed Tree/Shrub Plots	VMP-01	24-Jul-2020	9.82	8.18	2.32	38.3	106	0.74	0.491	27.2	15.7	29.3	29.8	0.0219	2.73	40.5	0.35	0.17	<0.10	<1.0	0.843	28.6	142
	VMP-02	24-Jul-2020	8.17	8.51	2.83	28.4	118	0.58	1.30	32.8	10.4	30.5	59.3	0.0204	3.95	41.1	0.94	0.25	<0.20	2.1	0.775	31.0	218
	VMP-03	24-Jul-2020	13.9	8.36	2.21	15.7	126	0.47	1.17	28.0	9.05	25.2	34.2	0.0286	3.20	33.4	0.65	0.29	<0.15	<1.0	0.926	38.5	157
	VMP-04	25-Jul-2020	9.60	8.39	1.94	20.5	115	0.68	0.872	25.2	12.4	25.5	46.3	0.0222	2.16	33.6	0.25	0.19	<0.15	<1.0	0.783	31.6	156
	VMP-05	26-Jul-2020	18.2	7.42	1.63	15.0	107	0.52	2.29	29.9	9.01	23.2	94.1	0.0297	1.80	29.0	1.22	0.30	<0.15	<1.0	1.74	33.6	256
	VMP-06	24-Jul-2020	10.5	8.25	1.98	18.7	122	0.47	1.01	26.3	9.13	20.9	30.2	0.0164	3.23	32.9	0.50	0.21	<0.15	<1.0	1.01	35.1	155
	VMP-07	26-Jul-2020	12.3	8.38	1.83	15.2	112	0.46	0.860	23.2	9.84	25.7	49.1	0.0877	2.22	31.0	0.55	0.22	0.111	<1.0	0.746	32.9	159
	VMP-08	26-Jul-2020	15.0	7.90	11.9	63.7	204	0.59	4.33	32.8	9.42	55.5	58.9	0.0453	27.8	70.2	1.91	0.82	0.377	<1.0	2.87	149	455
	VMP-09	25-Jul-2020	8.36	7.99	2.57	18.8	81.5	0.41	1.01	22.2	7.53	24.2	22.0	0.0170	3.50	30.0	0.71	0.23	0.110	<1.0	0.904	39.0	160
	VMP-10	26-Jul-2020	11.8	8.38	2.15	19.8	121	0.60	0.899	27.5	12.4	28.2	35.1	0.0225	3.00	37.1	0.33	0.22	<0.15	<1.0	0.836	36.7	157
	VMP-11	26-Jul-2020	11.1	8.35	2.17	22.2	127	0.63	0.945	25.6	12.2	28.2	37.9	0.0259	3.02	35.7	0.36	0.28	<0.15	<1.0	0.917	38.9	163
	VMP-12	24-Jul-2020	12.1	8.47	1.93	27.7	102	0.53	0.885	24.1	10.9	23.9	46.2	0.0182	2.15	32.1	0.28	0.20	<0.15	<1.0	0.712	27.0	143
	VMP-13	24-Jul-2020	9.71	8.46	2.44	40.8	105	0.51	0.585	16.4	14.6	27.3	24.5	0.0139	2.12	35.2	0.34	0.18	<0.10	<1.0	0.864	25.5	122
	VMP-14	24-Jul-2020	8.93	8.22	10.2	61.3	133	0.65	5.74	34.0	10.9	54.4	282	0.0288	16.2	56.9	1.49	0.87	<0.40	<1.0	2.84	156	681
Exposed Grass Plots	GP-1	25-Jul-2020	8.47	8.37	2.06	18.4	105	0.57	1.02	33.6	12.9	26.2	83.8	0.0175	3.48	39.6	0.35	0.22	<0.15	<1.0	0.878	33.8	232
	GP-2	25-Jul-2020	6.71	8.37	2.00	19.3	92.1	0.56	1.50	25.7	11.6	26.6	87.2	0.0175	2.71	34.6	0.38	0.29	<0.15	<1.0	0.795	33.0	283
	GP-3	25-Jul-2020	7.86	8.54	2.43	21.6	108	0.57	1.11	36.0	11.6	28.5	50.0	0.0213	3.80	39.8	0.50	0.27	<0.15	<1.0	0.961	45.4	175
	GP-5	27-Jul-2020	11.8	7.99	5.56	47.1	112	3.41	215	56.3	58.1	33.6	859	0.0279	7.76	54.1	22.9	13.0	<5.0	3.4	2.56	52.7	47400
	GP-6	26-Jul-2020	7.70	8.28	8.71	126	114	1.61	60.6	62.2	21.7	34.4	531	0.0133	10.3	63.9	10.8	11.8	<2.5	<1.0	2.83	72.9	12300
	GP-7	26-Jul-2020	7.32	8.52	2.52	22.2	99.7	0.46	1.24	54.7	9.23	26.0	53.9	0.0148	6.49	49.9	0.42	0.28	<0.15	<1.0	1.05	35.9	201
	Reference Sites	FF-REF-1	27-Jul-2020	32.4	6.59	1.21	25.4	62.2	0.72	2.16	34.8	17.5	61.7	177	0.0197	0.52	34.0	<0.20	0.77	<0.10	<1.0	0.352	22.3
FF-REF-2		27-Jul-2020	51.3	5.77	1.65	20.3	94.3	0.62	5.45	23.0	10.8	26.5	145	0.0338	1.72	25.7	0.30	0.51	<0.20	<1.0	1.25	25.9	490
NC-REF		27-Jul-2020	63.4	7.47	1.98	26.4	81.3	1.29	10.6	39.5	8.02	80.4	1120	0.0598	1.06	19.8	1.09	1.22	<0.50	<1.0	3.30	23.8	675
YCS Standards	Agricultural Park				20	50	750	4	70	300	40	150	1000	100	5	150	2	20	2	5		200	450
	Residential				20	50	500	4	70	300	50	150	1000	100	10	100	3	20	--	50		200	450
					20	50	500	4	70	300	50	150	1000	100	10	100	3	20	--	50		200	450
value	Exceedance of Agricultural Standard Only																						
value	Exceedance of all Standards																						

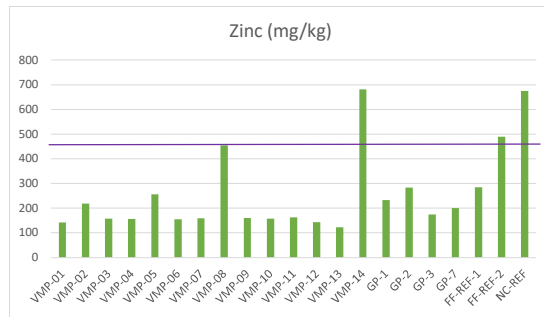
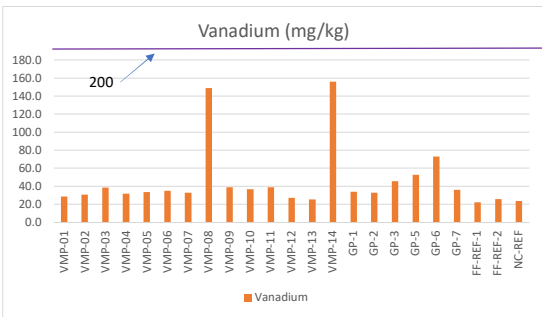
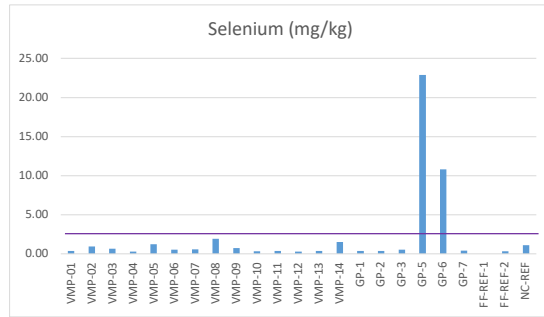
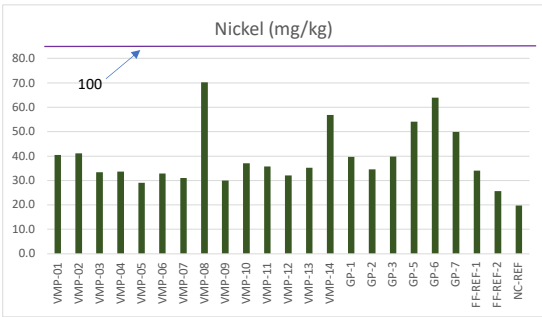
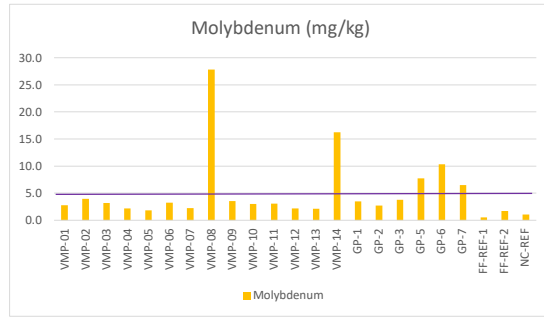
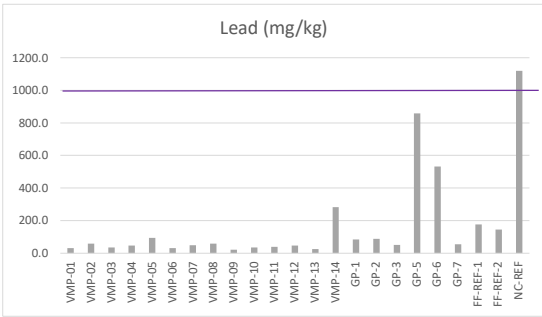
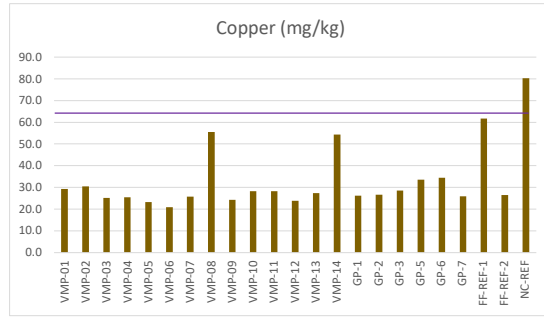
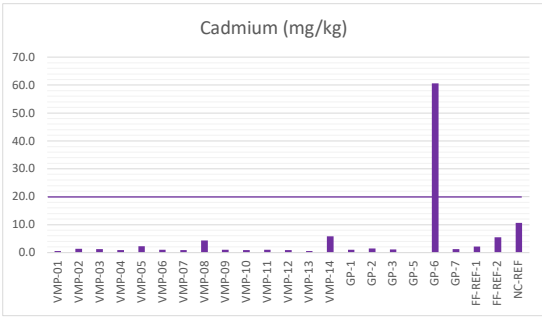
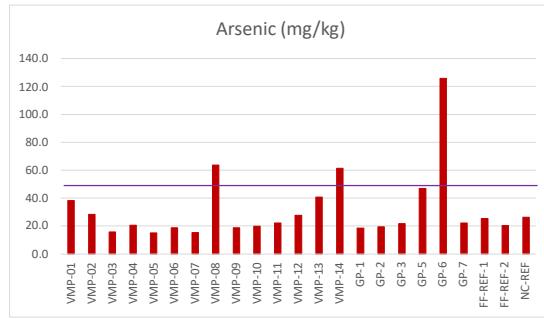
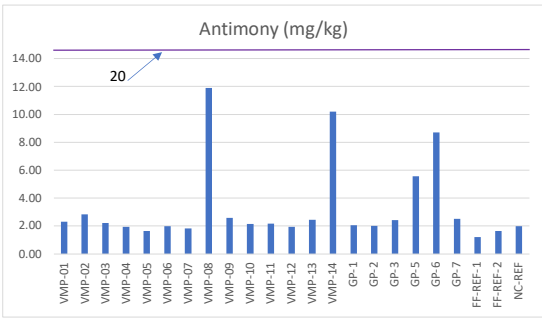
TABLE E-2 RPD VALUES FOR THE DUPLICATE SOILS SAMPLES, JULY 2020

PARAMETER	UNITS	VMP-04	DUP-1	RPD%	VMP-07	DUP-2	RPD%
Physical Tests							
% Moisture	%	9.60	9.81	2.2	12.3	14.8	18.5
pH (1:2 soil:water)	pH	8.39	8.38	0.1	8.38	8.24	1.7
Particle Size							
% Gravel (>2mm)	%	29.1	32.7	11.7	25.9	23.9	8.0
% Sand (2.0mm - 0.063mm)	%	42.1	38.7	8.4	42.5	43.0	1.2
% Silt (0.063mm - 4um)	%	19.9	19.5	2.0	24.1	25.3	4.9
% Clay (<4um)	%	8.8	9.1	3.4	7.5	7.8	3.9
Texture	-	Sandy loam	Sandy loam		Sandy loam	Sandy loam	
Leachable Anions & Nutrients							
Total Kjeldahl Nitrogen	%	0.073	0.086	16.4	0.057	0.072	23.3
Total Available Nitrogen	mg/kg	<2.2	<2.2	ND	<2.2	<2.2	ND
Organic / Inorganic Carbon							
Inorganic Carbon	%	0.464	0.506	8.7	0.253	0.271	6.9
Inorganic Carbon (as CaCO3 Equi)	%	3.87	4.21	8.4	2.11	2.26	6.9
C:N Ratio	-	12.4:1	12.1:1	ND	17.1:1	12.4:1	ND
Organic Matter	%	0.76	0.92	19	1.23	1.08	13.0
Total Carbon by Combustion	%	0.90	1.04	14.4	0.97	0.90	7.5
Total Organic Carbon	%	0.44	0.53	18.6	0.714	0.624	13.5
Plant Available Nutrients							
Available Ammonium-N	mg/kg	<1.0	1.1	ND	<1.0	1.5	ND
Available Nitrate-N	mg/kg	<1.0	<1.0	ND	<1.0	<1.0	ND
Nitrate+Nitrite-N	mg/kg	<2.0	<2.0	ND	<2.0	<2.0	ND
Nitrate-N	mg/kg	<2.0	<2.0	ND	<2.0	<2.0	ND
Nitrite-N	mg/kg	<1.0	<1.0	ND	<1.0	<1.0	ND
Available Phosphate-P	mg/kg	<2.0	<2.0	ND	<2.0	<2.0	ND
Available Potassium	mg/kg	40	41	2.5	39	47	18.6
Available Sulfate-S	mg/kg	<3.0	<3.0	ND	<3.0	<3.0	ND
Metals							
Antimony (Sb)	mg/kg	1.94	1.84	5.3	1.83	1.90	3.8
Arsenic (As)	mg/kg	20.5	20.9	1.9	15.2	14.6	4.0
Barium (Ba)	mg/kg	115	116	0.9	112	126	11.8
Beryllium (Be)	mg/kg	0.68	0.64	6.1	0.46	0.47	2.2
Cadmium (Cd)	mg/kg	0.872	0.803	8.2	0.860	0.871	1.3
Chromium (Cr)	mg/kg	25.2	29.6	16.1	23.2	29.0	22.2
Cobalt (Co)	mg/kg	12.4	12.9	4	9.84	9.37	4.9
Copper (Cu)	mg/kg	25.5	28.2	10.1	25.7	25.5	0.8
Lead (Pb)	mg/kg	46.3	52.2	12	49.1	48.5	1.2
Mercury (Hg)	mg/kg	0.0222	0.0218	1.8	0.0877	0.0320	93.1
Molybdenum (Mo)	mg/kg	2.16	2.01	7.2	2.22	2.69	19.1
Nickel (Ni)	mg/kg	33.6	36.4	8	31.0	33.2	6.9
Selenium (Se)	mg/kg	0.25	0.24	4.1	0.55	0.58	5.3
Silver (Ag)	mg/kg	0.19	0.26	31.1	0.22	0.25	12.8
Thallium (Tl)	mg/kg	<0.15	<0.15	ND	0.111	<0.15	ND
Tin (Sn)	mg/kg	<1.0	<1.0	ND	<1.0	<1.0	ND
Uranium (U)	mg/kg	0.783	0.696	11.8	0.746	0.785	5.1
Vanadium (V)	mg/kg	31.6	31.0	1.9	32.9	34.9	5.9
Zinc (Zn)	mg/kg	156	157	0.6	159	150	5.8

ND = not detected therefore RPD could not be calculated.

RPD values greater than 30% are highlighted.

FIGURE E-1 CONCENTRATIONS OF COPCs IN SOIL WITH CSR STANDARDS, 2020





TECK METALS LTD.
ATTN: Michelle Unger
601 Knightton Road
KIMBERLEY BC V1A 3E1

Date Received: 05-AUG-20
Report Date: 18-AUG-20 15:51 (MT)
Version: FINAL

Client Phone: 250-427-8404

Certificate of Analysis

Lab Work Order #: L2484904
Project P.O. #: TEK PO 9971
Job Reference:
C of C Numbers:
Legal Site Desc:

Can Dang
Senior Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L2484904-1 SOIL 24-JUL-20 12:00 VMP-01	L2484904-2 SOIL 24-JUL-20 12:00 VMP-02	L2484904-3 SOIL 24-JUL-20 12:00 VMP-03	L2484904-4 SOIL 25-JUL-20 12:00 VMP-04	L2484904-5 SOIL 26-JUL-20 12:00 VMP-05
Grouping	Analyte					
SOIL						
Physical Tests	% Moisture (%)	9.82	8.17	13.9	9.60	18.2
	pH (1:2 soil:water) (pH)	8.18	8.51	8.36	8.39	7.42
Particle Size	% Gravel (>2mm) (%)	43.6	25.0	22.6	29.1	22.7
	% Sand (2.0mm - 0.063mm) (%)	35.5	47.2	42.4	42.1	42.0
	% Silt (0.063mm - 4um) (%)	15.2	19.4	25.8	19.9	28.5
	% Clay (<4um) (%)	5.6	8.4	9.1	8.8	6.8
	Texture	Sandy loam	Sandy loam	Sandy loam	Sandy loam	Sandy loam
Leachable Anions & Nutrients	Total Kjeldahl Nitrogen (%)	0.101	0.078	0.081	0.073	0.177
	Total Available Nitrogen (mg/kg)	<2.2	<2.2	<2.2	<2.2	<2.2
Organic / Inorganic Carbon	Inorganic Carbon (%)	0.513	0.485	0.413	0.464	0.157
	Inorganic Carbon (as CaCO3 Equivalent) (%)	4.27	4.04	3.44	3.87	1.31
	C:N Ratio	11.8:1	10.6:1	11.2:1	12.4:1	16.1:1
	Organic Matter (%)	1.17	0.58	0.85	0.76	4.64
	Total Carbon by Combustion (%)	1.19	0.82	0.91	0.90	2.85
	Total Organic Carbon (%)	0.68	0.34	0.49	0.44	2.69
Plant Available Nutrients	Available Ammonium-N (mg/kg)	<1.0	<1.0	<1.0	<1.0	1.5
	Available Nitrate-N (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Nitrate+Nitrite-N (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Nitrate-N (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Nitrite-N (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Available Phosphate-P (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Available Potassium (mg/kg)	38	37	44	40	63
	Available Sulfate-S (mg/kg)	<3.0	<3.0	9.7	<3.0	66.1
Metals	Antimony (Sb) (mg/kg)	2.32	2.83	2.21	1.94	1.63
	Arsenic (As) (mg/kg)	38.3	28.4	15.7	20.5	15.0
	Barium (Ba) (mg/kg)	106	118	126	115	107
	Beryllium (Be) (mg/kg)	0.74	0.58	0.47	0.68	0.52
	Cadmium (Cd) (mg/kg)	0.491	1.30	1.17	0.872	2.29
	Chromium (Cr) (mg/kg)	27.2	32.8	28.0	25.2	29.9
	Cobalt (Co) (mg/kg)	15.7	10.4	9.05	12.4	9.01
	Copper (Cu) (mg/kg)	29.3	30.5	25.2	25.5	23.2
	Lead (Pb) (mg/kg)	29.8	59.3	34.2	46.3	94.1
	Mercury (Hg) (mg/kg)	0.0219	0.0204	0.0286	0.0222	0.0297
	Molybdenum (Mo) (mg/kg)	2.73	3.95	3.20	2.16	1.80
	Nickel (Ni) (mg/kg)	40.5	41.1	33.4	33.6	29.0

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID	L2484904-6 SOIL 24-JUL-20 12:00 VMP-06	L2484904-7 SOIL 26-JUL-20 12:00 VMP-07	L2484904-8 SOIL 26-JUL-20 12:00 VMP-08	L2484904-9 SOIL 25-JUL-20 12:00 VMP-09	L2484904-10 SOIL 26-JUL-20 12:00 VMP-10	
Grouping	Analyte					
SOIL						
Physical Tests	% Moisture (%)	10.5	12.3	15.0	8.36	11.8
	pH (1:2 soil:water) (pH)	8.25	8.38	7.90	7.99	8.38
Particle Size	% Gravel (>2mm) (%)	25.1	25.9	33.0	24.5	29.1
	% Sand (2.0mm - 0.063mm) (%)	48.6	42.5	34.8	59.0	43.3
	% Silt (0.063mm - 4um) (%)	19.9	24.1	22.6	13.7	19.2
	% Clay (<4um) (%)	6.4	7.5	9.6	2.8	8.5
	Texture	Sandy loam	Sandy loam	Sandy loam	Loamy sand	Sandy loam
Leachable Anions & Nutrients	Total Kjeldahl Nitrogen (%)	0.073	0.057	0.108	0.082	0.083
	Total Available Nitrogen (mg/kg)	<2.2	<2.2	<2.2	<2.2	<2.2
Organic / Inorganic Carbon	Inorganic Carbon (%)	0.211	0.253	0.099	0.222	0.449
	Inorganic Carbon (as CaCO3 Equivalent) (%)	1.76	2.11	0.82	1.85	3.74
	C:N Ratio	10:1	17.1:1	8.8:1	14.5:1	10.7:1
	Organic Matter (%)	0.89	1.23	1.47	1.67	0.76
	Total Carbon by Combustion (%)	0.73	0.97	0.95	1.19	0.89
	Total Organic Carbon (%)	0.517	0.714	0.851	0.968	0.44
Plant Available Nutrients	Available Ammonium-N (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Available Nitrate-N (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Nitrate+Nitrite-N (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Nitrate-N (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Nitrite-N (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Available Phosphate-P (mg/kg)	<2.0	<2.0	3.2	8.0	<2.0
	Available Potassium (mg/kg)	27	39	36	33	40
	Available Sulfate-S (mg/kg)	4.1	<3.0	38.0	<3.0	8.2
Metals	Antimony (Sb) (mg/kg)	1.98	1.83	11.9	2.57	2.15
	Arsenic (As) (mg/kg)	18.7	15.2	63.7	18.8	19.8
	Barium (Ba) (mg/kg)	122	112	204	81.5	121
	Beryllium (Be) (mg/kg)	0.47	0.46	0.59	0.41	0.60
	Cadmium (Cd) (mg/kg)	1.01	0.860	4.33	1.01	0.899
	Chromium (Cr) (mg/kg)	26.3	23.2	32.8	22.2	27.5
	Cobalt (Co) (mg/kg)	9.13	9.84	9.42	7.53	12.4
	Copper (Cu) (mg/kg)	20.9	25.7	55.5	24.2	28.2
	Lead (Pb) (mg/kg)	30.2	49.1	58.9	22.0	35.1
	Mercury (Hg) (mg/kg)	0.0164	0.0877	0.0453	0.0170	0.0225
	Molybdenum (Mo) (mg/kg)	3.23	2.22	27.8	3.50	3.00
	Nickel (Ni) (mg/kg)	32.9	31.0	70.2	30.0	37.1

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID	L2484904-11 SOIL 26-JUL-20 12:00 VMP-11	L2484904-12 SOIL 24-JUL-20 12:00 VMP-12	L2484904-13 SOIL 24-JUL-20 12:00 VMP-13	L2484904-14 SOIL 24-JUL-20 12:00 VMP-14	L2484904-15 SOIL 25-JUL-20 12:00 GP-1	
Grouping	Analyte					
SOIL						
Physical Tests	% Moisture (%)	11.1	12.1	9.71	8.93	8.47
	pH (1:2 soil:water) (pH)	8.35	8.47	8.46	8.22	8.37
Particle Size	% Gravel (>2mm) (%)	28.0	30.3	43.8	34.1	32.4
	% Sand (2.0mm - 0.063mm) (%)	37.6	44.4	39.4	39.9	46.9
	% Silt (0.063mm - 4um) (%)	22.4	18.1	11.4	18.1	15.2
	% Clay (<4um) (%)	12.0	7.1	5.3	8.0	5.5
	Texture	Sandy loam	Sandy loam	Sandy loam	Sandy loam	Sandy loam
Leachable Anions & Nutrients	Total Kjeldahl Nitrogen (%)	0.079	0.075	0.095	0.068	0.070
	Total Available Nitrogen (mg/kg)	<2.2	<2.2	<2.2	<2.2	<2.2
Organic / Inorganic Carbon	Inorganic Carbon (%)	0.389	0.616	0.750	0.204	0.752
	Inorganic Carbon (as CaCO3 Equivalent) (%)	3.24	5.13	6.25	1.70	6.26
	C:N Ratio	9.4:1	12.2:1	12.7:1	10.3:1	14.1:1
	Organic Matter (%)	0.61	0.51	0.78	0.86	0.41
	Total Carbon by Combustion (%)	0.74	0.91	1.20	0.70	0.99
	Total Organic Carbon (%)	0.35	0.30	0.45	0.498	0.24
Plant Available Nutrients	Available Ammonium-N (mg/kg)	<1.0	<1.0	<1.0	1.0	<1.0
	Available Nitrate-N (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Nitrate+Nitrite-N (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Nitrate-N (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Nitrite-N (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Available Phosphate-P (mg/kg)	<2.0	<2.0	<2.0	2.5	<2.0
	Available Potassium (mg/kg)	40	36	33	41	36
	Available Sulfate-S (mg/kg)	17.9	15.9	<3.0	13.3	<3.0
Metals	Antimony (Sb) (mg/kg)	2.17	1.93	2.44	10.2	2.06
	Arsenic (As) (mg/kg)	22.2	27.7	40.8	61.3	18.4
	Barium (Ba) (mg/kg)	127	102	105	133	105
	Beryllium (Be) (mg/kg)	0.63	0.53	0.51	0.65	0.57
	Cadmium (Cd) (mg/kg)	0.945	0.885	0.585	5.74	1.02
	Chromium (Cr) (mg/kg)	25.6	24.1	16.4	34.0	33.6
	Cobalt (Co) (mg/kg)	12.2	10.9	14.6	10.9	12.9
	Copper (Cu) (mg/kg)	28.2	23.9	27.3	54.4	26.2
	Lead (Pb) (mg/kg)	37.9	46.2	24.5	282	83.8
	Mercury (Hg) (mg/kg)	0.0259	0.0182	0.0139	0.0288	0.0175
	Molybdenum (Mo) (mg/kg)	3.02	2.15	2.12	16.2	3.48
	Nickel (Ni) (mg/kg)	35.7	32.1	35.2	56.9	39.6

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L2484904-16 SOIL 25-JUL-20 12:00 GP-2	L2484904-17 SOIL 25-JUL-20 12:00 GP-3	L2484904-18 SOIL 27-JUL-20 12:00 GP-5	L2484904-19 SOIL 26-JUL-20 12:00 GP-6	L2484904-20 SOIL 26-JUL-20 12:00 GP-7
Grouping	Analyte					
SOIL						
Physical Tests	% Moisture (%)	6.71	7.86	11.8	7.70	7.32
	pH (1:2 soil:water) (pH)	8.37	8.54	7.99	8.28	8.52
Particle Size	% Gravel (>2mm) (%)	35.2	35.5	35.2	38.0	29.3
	% Sand (2.0mm - 0.063mm) (%)	45.4	42.1	40.2	38.0	57.3
	% Silt (0.063mm - 4um) (%)	14.2	15.6	18.4	17.3	10.1
	% Clay (<4um) (%)	5.2	6.7	6.2	6.7	3.3
	Texture	Sandy loam	Sandy loam	Sandy loam	Sandy loam	Loamy sand
Leachable Anions & Nutrients	Total Kjeldahl Nitrogen (%)	0.067	0.075	0.039	0.061	0.054
	Total Available Nitrogen (mg/kg)	<2.2	<2.2	<2.2	<2.2	<2.2
Organic / Inorganic Carbon	Inorganic Carbon (%)	0.749	0.544	1.21	1.31	0.722
	Inorganic Carbon (as CaCO3 Equivalent) (%)	6.24	4.53	10.1	10.9	6.01
	C:N Ratio	14.7:1	10.4:1	46:1	34.1:1	19.8:1
	Organic Matter (%)	0.40	0.41	1.03	1.36	0.58
	Total Carbon by Combustion (%)	0.98	0.78	1.81	2.10	1.06
	Total Organic Carbon (%)	0.23	0.24	0.60	0.79	0.34
Plant Available Nutrients	Available Ammonium-N (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Available Nitrate-N (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Nitrate+Nitrite-N (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Nitrate-N (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Nitrite-N (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Available Phosphate-P (mg/kg)	<2.0	<2.0	<2.0	<2.0	2.5
	Available Potassium (mg/kg)	28	28	199	97	39
	Available Sulfate-S (mg/kg)	25.7	<3.0	19.0	36.6	<3.0
Metals	Antimony (Sb) (mg/kg)	2.00	2.43	5.56	8.71	2.52
	Arsenic (As) (mg/kg)	19.3	21.6	47.1	126	22.2
	Barium (Ba) (mg/kg)	92.1	108	112	114	99.7
	Beryllium (Be) (mg/kg)	0.56	0.57	3.41	1.61	0.46
	Cadmium (Cd) (mg/kg)	1.50	1.11	215	60.6	1.24
	Chromium (Cr) (mg/kg)	25.7	36.0	56.3	62.2	54.7
	Cobalt (Co) (mg/kg)	11.6	11.6	58.1	21.7	9.23
	Copper (Cu) (mg/kg)	26.6	28.5	33.6	34.4	26.0
	Lead (Pb) (mg/kg)	87.2	50.0	859 ^{DLHC}	531 ^{DLHC}	53.9
	Mercury (Hg) (mg/kg)	0.0175	0.0213	0.0279	0.0133	0.0148
	Molybdenum (Mo) (mg/kg)	2.71	3.80	7.76	10.3	6.49
	Nickel (Ni) (mg/kg)	34.6	39.8	54.1	63.9	49.9

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID	L2484904-21 SOIL 25-JUL-20 12:00 FF-REF-1	L2484904-22 SOIL 25-JUL-20 12:00 FF-REF-2	L2484904-23 SOIL 25-JUL-20 12:00 NC-REF	L2484904-24 SOIL 24-JUL-20 DUP-1	L2484904-25 SOIL 24-JUL-20 DUP-2	
Grouping	Analyte					
SOIL						
Physical Tests	% Moisture (%)	32.4	51.3	63.4	9.81	14.8
	pH (1:2 soil:water) (pH)	6.59	5.77	7.47	8.38	8.24
Particle Size	% Gravel (>2mm) (%)	26.8	15.5	<1.0	32.7	23.9
	% Sand (2.0mm - 0.063mm) (%)	30.1	29.5	20.0	38.7	43.0
	% Silt (0.063mm - 4um) (%)	30.3	48.2	74.2	19.5	25.3
	% Clay (<4um) (%)	12.8	6.8	5.6	9.1	7.8
	Texture	Loam ^{DLHC}	Silt loam ^{DLM}	Silt loam ^{DLM}	Sandy loam	Sandy loam
Leachable Anions & Nutrients	Total Kjeldahl Nitrogen (%)	0.204	0.495	0.87	0.086	0.072
	Total Available Nitrogen (mg/kg)	5.7	6.2	16.3	<2.2	<2.2
Organic / Inorganic Carbon	Inorganic Carbon (%)	0.233	0.161	0.331	0.506	0.271
	Inorganic Carbon (as CaCO3 Equivalent) (%)	1.94	1.34	2.75	4.21	2.26
	C:N Ratio	21.4:1	21.4:1	15.9:1	12.1:1	12.4:1
	Organic Matter (%)	7.13	18.0	23.2	0.92	1.08
	Total Carbon by Combustion (%)	4.37	10.6	13.8	1.04	0.90
	Total Organic Carbon (%)	4.14	10.4	13.5	0.53	0.624
Plant Available Nutrients	Available Ammonium-N (mg/kg)	2.6	6.2 ^{DLM}	9.4 ^{DLM}	1.1	1.5
	Available Nitrate-N (mg/kg)	2.8	<1.0	6.8 ^{DLM}	<1.0	<1.0
	Nitrate+Nitrite-N (mg/kg)	3.1	<2.0	6.9 ^{DLM}	<2.0	<2.0
	Nitrate-N (mg/kg)	3.1	<2.0	5.2 ^{DLM}	<2.0	<2.0
	Nitrite-N (mg/kg)	<1.0	<1.0	1.67 ^{DLM}	<1.0	<1.0
	Available Phosphate-P (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Available Potassium (mg/kg)	38	40	63	41	47
	Available Sulfate-S (mg/kg)	<3.0	4.3	<8.0 ^{DLM}	<3.0	<3.0
Metals	Antimony (Sb) (mg/kg)	1.21	1.65	1.98	1.84	1.90
	Arsenic (As) (mg/kg)	25.4	20.3	26.4	20.9	14.6
	Barium (Ba) (mg/kg)	62.2	94.3	81.3	116	126
	Beryllium (Be) (mg/kg)	0.72	0.62	1.29	0.64	0.47
	Cadmium (Cd) (mg/kg)	2.16	5.45	10.6	0.803	0.871
	Chromium (Cr) (mg/kg)	34.8	23.0	39.5	29.6	29.0
	Cobalt (Co) (mg/kg)	17.5	10.8	8.02	12.9	9.37
	Copper (Cu) (mg/kg)	61.7	26.5	80.4	28.2	25.5
	Lead (Pb) (mg/kg)	177	145	1120 ^{DLHC}	52.2	48.5
	Mercury (Hg) (mg/kg)	0.0197	0.0338	0.0598	0.0218	0.0320
	Molybdenum (Mo) (mg/kg)	0.52	1.72	1.06	2.01	2.69
	Nickel (Ni) (mg/kg)	34.0	25.7	19.8	36.4	33.2

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2484904-1	L2484904-2	L2484904-3	L2484904-4	L2484904-5
		Description	SOIL	SOIL	SOIL	SOIL	SOIL
		Sampled Date	24-JUL-20	24-JUL-20	24-JUL-20	25-JUL-20	26-JUL-20
		Sampled Time	12:00	12:00	12:00	12:00	12:00
		Client ID	VMP-01	VMP-02	VMP-03	VMP-04	VMP-05
Grouping	Analyte						
SOIL							
Metals	Selenium (Se) (mg/kg)		0.35	0.94	0.65	0.25	1.22
	Silver (Ag) (mg/kg)		0.17	0.25	0.29	0.19	0.30
	Thallium (Tl) (mg/kg)		<0.10 ^{DLM}	<0.20 ^{DLM}	<0.15 ^{DLM}	<0.15 ^{DLM}	<0.15 ^{DLM}
	Tin (Sn) (mg/kg)		<1.0	2.1	<1.0	<1.0	<1.0
	Uranium (U) (mg/kg)		0.843	0.775	0.926	0.783	1.74
	Vanadium (V) (mg/kg)		28.6	31.0	38.5	31.6	33.6
	Zinc (Zn) (mg/kg)		142	218	157	156	256

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2484904-6	L2484904-7	L2484904-8	L2484904-9	L2484904-10
		Description	SOIL	SOIL	SOIL	SOIL	SOIL
		Sampled Date	24-JUL-20	26-JUL-20	26-JUL-20	25-JUL-20	26-JUL-20
		Sampled Time	12:00	12:00	12:00	12:00	12:00
		Client ID	VMP-06	VMP-07	VMP-08	VMP-09	VMP-10
Grouping	Analyte						
SOIL							
Metals	Selenium (Se) (mg/kg)		0.50	0.55	1.91	0.71	0.33
	Silver (Ag) (mg/kg)		0.21	0.22	0.82	0.23	0.22
	Thallium (Tl) (mg/kg)		<0.15 ^{DLM}	0.111	0.377	0.110	<0.15 ^{DLM}
	Tin (Sn) (mg/kg)		<1.0	<1.0	<1.0	<1.0	<1.0
	Uranium (U) (mg/kg)		1.01	0.746	2.87	0.904	0.836
	Vanadium (V) (mg/kg)		35.1	32.9	149	39.0	36.7
	Zinc (Zn) (mg/kg)		155	159	455	160	157

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2484904-11	L2484904-12	L2484904-13	L2484904-14	L2484904-15
		Description	SOIL	SOIL	SOIL	SOIL	SOIL
		Sampled Date	26-JUL-20	24-JUL-20	24-JUL-20	24-JUL-20	25-JUL-20
		Sampled Time	12:00	12:00	12:00	12:00	12:00
		Client ID	VMP-11	VMP-12	VMP-13	VMP-14	GP-1
Grouping	Analyte						
SOIL							
Metals	Selenium (Se) (mg/kg)		0.36	0.28	0.34	1.49	0.35
	Silver (Ag) (mg/kg)		0.28	0.20	0.18	0.87	0.22
	Thallium (Tl) (mg/kg)		<0.15 ^{DLM}	<0.15 ^{DLM}	<0.10 ^{DLM}	<0.40 ^{DLM}	<0.15 ^{DLM}
	Tin (Sn) (mg/kg)		<1.0	<1.0	<1.0	<1.0	<1.0
	Uranium (U) (mg/kg)		0.917	0.712	0.864	2.84	0.878
	Vanadium (V) (mg/kg)		38.9	27.0	25.5	156	33.8
	Zinc (Zn) (mg/kg)		163	143	122	681 ^{DLHC}	232

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2484904-16	L2484904-17	L2484904-18	L2484904-19	L2484904-20
		Description	SOIL	SOIL	SOIL	SOIL	SOIL
		Sampled Date	25-JUL-20	25-JUL-20	27-JUL-20	26-JUL-20	26-JUL-20
		Sampled Time	12:00	12:00	12:00	12:00	12:00
		Client ID	GP-2	GP-3	GP-5	GP-6	GP-7
Grouping	Analyte						
SOIL							
Metals	Selenium (Se) (mg/kg)		0.38	0.50	22.9	10.8	0.42
	Silver (Ag) (mg/kg)		0.29	0.27	13.0	11.8	0.28
	Thallium (Tl) (mg/kg)		<0.15 ^{DLM}	<0.15 ^{DLM}	<5.0 ^{DLM}	<2.5 ^{DLM}	<0.15 ^{DLM}
	Tin (Sn) (mg/kg)		<1.0	<1.0	3.4	<1.0	<1.0
	Uranium (U) (mg/kg)		0.795	0.961	2.56	2.83	1.05
	Vanadium (V) (mg/kg)		33.0	45.4	52.7	72.9	35.9
	Zinc (Zn) (mg/kg)		283	175	47400 ^{DLHC}	12300 ^{DLHC}	201

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2484904-21	L2484904-22	L2484904-23	L2484904-24	L2484904-25
		Description	SOIL	SOIL	SOIL	SOIL	SOIL
		Sampled Date	25-JUL-20	25-JUL-20	25-JUL-20	24-JUL-20	24-JUL-20
		Sampled Time	12:00	12:00	12:00		
		Client ID	FF-REF-1	FF-REF-2	NC-REF	DUP-1	DUP-2
Grouping	Analyte						
SOIL							
Metals	Selenium (Se) (mg/kg)		<0.20	0.30	1.09	0.24	0.58
	Silver (Ag) (mg/kg)		0.77	0.51	1.22	0.26	0.25
	Thallium (Tl) (mg/kg)		<0.10 ^{DLM}	<0.20 ^{DLM}	<0.50 ^{DLM}	<0.15 ^{DLM}	<0.15 ^{DLM}
	Tin (Sn) (mg/kg)		<1.0	<1.0	<1.0	<1.0	<1.0
	Uranium (U) (mg/kg)		0.352	1.25	3.30	0.696	0.785
	Vanadium (V) (mg/kg)		22.3	25.9	23.8	31.0	34.9
	Zinc (Zn) (mg/kg)		285	490 ^{DLHC}	675 ^{DLHC}	157	150

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

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Antimony (Sb)	DUP-H	L2484904-21, -22, -23, -24, -25, -4

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
C-TIC-PCT-SK	Soil	Total Inorganic Carbon in Soil	CSSS (2008) P216-217
		A known quantity of acetic acid is consumed by reaction with carbonates in the soil. The pH of the resulting solution is measured and compared against a standard curve relating pH to weight of carbonate.	
C-TOC-CALC-SK	Soil	Total Organic Carbon Calculation	CSSS (2008) 21.2
		Total Organic Carbon (TOC) is calculated by the difference between total carbon (TC) and total inorganic carbon. (TIC)	
C-TOT-LECO-SK	Soil	Total Carbon by combustion method	CSSS (2008) 21.2
		The sample is ignited in a combustion analyzer where carbon in the reduced CO ₂ gas is determined using a thermal conductivity detector.	
ETL-C:N-RATIO-SK	Soil	Carbon:Nitrogen Ratio - Calculation	Calculation
ETL-N-TOT-AVAIL-SK	Soil	Available Ammonium-N - Calculation	Soil Methods of Analysis (1993) CSSS
HG-200.2-CVAA-SK	Soil	Mercury in Soil by CVAAS	EPA 200.2/1631E (mod)
		Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAAS.	
IC-CACO3-CALC-SK	Soil	Inorganic Carbon as CaCO ₃ Equivalent	Calculation
MET-200.2-CCMS-SK	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020A (mod)
		Soil/sediment is dried, disaggregated, and sieved (2 mm). Strong Acid Leachable Metals in the <2mm fraction are solubilized by heated digestion with nitric and hydrochloric acids. Instrumental analysis is by Collision / Reaction Cell ICPMS.	
		Limitations: This method is intended to liberate environmentally available metals. Silicate minerals are not solubilized. Some metals may be only partially recovered (matrix dependent), including Al, Ba, Be, Cr, S, Sr, Ti, V, W, and Zr. Elemental Sulfur may be poorly recovered by this method. Volatile forms of sulfur (e.g. sulfide, H ₂ S) may be excluded if lost during sampling, storage, or digestion.	
MOIST-SK	Soil	Moisture Content	CCME PHC in Soil - Tier 1 (mod)
		The weighed portion of soil is placed in a 105°C oven overnight. The dried soil is allowed to cooled to room temperature, weighed and the % moisture is calculated.	
N-TOTKJ-COL-SK	Soil	Total Kjeldahl Nitrogen	CSSS (2008) 22.2.3
		The soil is digested with sulfuric acid in the presence of CuSO ₄ and K ₂ SO ₄ catalysts. Ammonia in the soil extract is determined colorimetrically at 660 nm.	
N2/N3-AVAIL-KCL-SK	Soil	Nitrate, Nitrite & Nitrate+Nitrite-N(KCL	CSSS (2008) 6.2-6.3
		Plant available nitrate and nitrite are extracted from the sample with 2N KCl. Nitrate and Nitrite in the filtered extract are determined colorimetrically by Technicon auto-analyzer or flow injection analyzer at 520 nm.	
NH4-AVAIL-SK	Soil	Available Ammonium-N	CSSS Carter 6.2 / Comm Soil Sci 19(6)
		Ammonium (NH ₄ -N) is extracted from the soil using 2 N KCl. Ammonium in the extract is mixed with hypochlorite and salicylate to form indophenol blue, which is determined colorimetrically by auto analysis at 660 nm.	
NO3-AVAIL-SK	Soil	Available Nitrate-N	Alberta Ag / APHA 4500 NO3F
		Available Nitrate and Nitrite are extracted from the soil using a dilute calcium chloride solution. Nitrate is quantitatively reduced to nitrite by passing of the sample through a copperized cadmium column. The nitrite (reduced nitrate plus original nitrite) is then determined by diazotizing with sulfanilamide followed by coupling with N-(1-naphthyl) ethylenediamine dihydrochloride. The resulting water soluble dye has a magenta color which is measured at colorimetrically at 520nm.	
OM-CALC-SK	Soil	Organic Matter Calculation	SPAC
		Soil organic matter is calculated by using the Van Bemmelen Factor to convert from Total Organic Carbon (TOC)	
		For use with C-TC,TOC,TIC-SK	

Reference Information

PH-1:2-SK	Soil	pH (1:2 Soil:Water Extraction)	AB Ag (1988) p.7
1 part dry soil and 2 parts de-ionized water (by volume) is mixed. The slurry is allowed to stand with occasional stirring for 30 - 60 minutes. After equilibration, pH of the slurry is measured using a pH meter.			
PO4/K-AVAIL-SK	Soil	Plant Available Phosphorus and Potassium	Comm. Soil Sci. Plant Anal, 25 (5&6)
Plant available phosphorus and potassium are extracted from the soil using Modified Kelowna solution. Phosphorous in the soil extract is determined colorimetrically at 880 nm, while potassium is determined by flame emission at 770 nm.			
PSA-PIPET+GRAVEL-SK	Soil	Particle size - Sieve and Pipette	SSIR-51 METHOD 3.2.1
Particle size distribution is determined by a combination of techniques. Dry sieving is performed for coarse particles, wet sieving for sand particles and the pipette sedimentation method for clay particles.			
SO4-AVAIL-SK	Soil	Available Sulfate-S	REC METH SOIL ANAL - AB. AG(1988)
Plant available sulfate in the soil is extracted using a weak calcium chloride solution. Sulfate in the extract is determined by ICP-OES. This extraction may also produce organic sulfur in the extracts when organic soils are analyzed.			

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

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

Laboratory Definition Code	Laboratory Location
SK	ALS ENVIRONMENTAL - SASKATOON, SASKATCHEWAN, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

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

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

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

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

mg/L - milligrams per litre.

< - Less than.

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

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

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

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

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



L2484904-COFC

Chain Canada Toll Free: 1 800 668 8689
www.alsglobal.com

COC # _____

Page 1 of 6



Environmental Division
Whitehorse
Work Order Reference
WR2000560



Telephone : +1 867 668 8689

Report To		Report Format / Distribution		Service Requested (Rush for routine analysis subject to availability)											
Company: Teck Resources Ltd		<input checked="" type="checkbox"/> Standard <input type="checkbox"/> Other		<input checked="" type="radio"/> Regular (Standard Turnaround Times - Business Days)											
Contact: Michelle Unger		<input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> Excel <input checked="" type="checkbox"/> Digital <input type="checkbox"/> Fax		<input type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT											
Address:		Email 1: bonnieburns@northwestel.net		<input type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT											
Phone: 250-427-8422 Fax:		Email 2:		<input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT											
Invoice To Same as Report? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Email 3: michelle.unger@teck.com		Analysis Request											
Hardcopy of Invoice with Report? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Client / Project Information		Please indicate below Filtered, Preserved or both (F, P, F)											
Company:		Job #:		Total Nitrogen	pH	Metals, CCME	Particle Size Analysis	C:N ratio	Plant Available nutrients	TOC	Total organic matter	moisture	Number of		
Contact:		PO / AFE: Teck PO 8971													
Address:		LSD:													
Phone: Fax:		Quote #: Q62635													
Lab Work Order # (lab use only)		ALS Heather Mackenzie		Sampler: Bonnie Burns											
Sample	Sample Identification (This description will appear on the report)	Date (dd-mm-yy)	Time (hh:mm)	Sample Type											
VMP-1		24-Jul-20		Soil	X	X	X	X	X	X	X	X	2		
VMP-2		24-Jul-20		Soil	X	X	X	X	X	X	X	X	2		
VMP-3		24-Jul-20		Soil	X	X	X	X	X	X	X	X	2		
VMP-4		25-Jul-20		Soil	X	X	X	X	X	X	X	X	2		
VMP-5		26-Jul-20		Soil	X	X	X	X	X	X	X	X	2		
VMP-6		24-Jul-20		Soil	X	X	X	X	X	X	X	X	2		
VMP-7		26-Jul-20		Soil	X	X	X	X	X	X	X	X	2		
VMP-8		25-Jul-20		Soil	X	X	X	X	X	X	X	X	2		
VMP-9		26-Jul-20		Soil	X	X	X	X	X	X	X	X	2		
VMP-10		26-Jul-20		Soil	X	X	X	X	X	X	X	X	2		
VMP-11		26-Jul-20		Soil	X	X	X	X	X	X	X	X	2		
VMP-12		24-Jul-20		Soil	X	X	X	X	X	X	X	X	2		
VMP-13		24-Jul-20		Soil	X	X	X	X	X	X	X	X	2		
Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1.- Natural, etc) / Hazardous Details															
DO NOT RINSE THE TISSUE SAMPLES. WE WANT THE ANALYSIS TO INCLUDE THE DUST ON THE LEAVES ETC AS WELL AS INCLUDING THE UPTAKE OF METALS IN THE PLANTS.															
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.															
By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.															
Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.															
SHIPMENT RELEASE (client use)				SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)							
Released by:	Date (dd-mm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations:					
Bonnie Burns	15-Jul-19			July 28/20	15:20	10/9 °C	HA	7/25	1:10 pm	Yes / No ? If Yes add SIF					

GENF 20.00 Front

7c



L2484904-COFC

COC #



www.alsglobal.com

Page 2 of 6

Report To			Report Format / Distribution			Service Requested (Rush for routine analysis subject to availability)												
Company:			<input checked="" type="checkbox"/> Standard <input type="checkbox"/> Other			<input checked="" type="radio"/> Regular (Standard Turnaround Times - Business Days)												
Contact:			<input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> Excel <input checked="" type="checkbox"/> Digital <input type="checkbox"/> Fax			<input type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT												
Address:			Email 1: bonnieburns@northwestel.net			<input type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT												
Phone:			Email 2:			<input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT												
Fax:			Email 3:			Analysis Request												
Invoice To Same as Report? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			Client / Project Information			Please indicate below Filtered, Preserved or both (F, P, F/P)												
Hardcopy of Invoice with Report? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			Job #:															
Company:			PO / AFE:															
Contact:			LSD:															
Address:			Quote #:															
Phone:			ALS Contact: Heather Mackenzie			Sampler: Bonnie Burns												
Lab Work Order # (lab use only)																		
Sample #	Sample Identification (This description will appear on the report)		Date (dd-mm-yy)	Time (hh:mm)	Sample Type	Total Nitrogen	pH	Metals, CCME	Particle Size Analysis	C:N ratio	Plant Available nutrients	TOC	total organic matter	moisture	Number of Containers			
VMP-14			24-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2			
GP-1			25-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2			
GP-2			25-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2			
GP-3			25-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2			
GP-5			27-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2			
GP-6			26-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2			
GP-7			26-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2			
FF-Ref-1			25-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2			
FF-Ref-2			25-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2			
NC-Ref			25-Jul-20		Soil	X	X	X	X	X	X	X	X	X	2			
DUP-1					Soil	X	X	X	X	X	X	X	X	X	2			
DUP-2					Soil	X	X	X	X	X	X	X	X	X	2			
Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details																		
DO NOT RINSE THE TISSUE SAMPLES. WE WANT THE ANALYSIS TO INCLUDE THE DUST ON THE LEAVES ETC AS WELL AS INCLUDING THE UPTAKE OF METALS IN THE PLANTS.																		
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.																		
By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.																		
Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.																		
SHIPMENT, RELEASE (client use)				SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)										
Released by:	Date (dd-mm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF								
Bonnie Burns						°C												

APPENDIX F

INVASIVE SPECIES, 2020

Km on Access Rd	Side of Road		Species	Abundance Category	Stem Count	Photos (Y or N)	Comments
	West	East					
0						N	At the Robert Campbell Highway
0.3	√	√	melialba	7	F	N	
0.4		√	melialba	1	A	N	
0.5	√		melialba	3	C	N	
0.8		√	creptect	3	C	N	
0.9		√	melialba	3	B	N	on roadside but near stream so removed
1	√	√	creptect	4	D	N	100 m
1.2	√	√	creptect	2	B	N	
1.8	√		creptect	4	C	N	200 m
1.9		√	creptect	2	B	N	
2.7	√	√	creptect	2	C	N	50 m
3.3	√		creptect	7	D	N	500 m
3.3	√		hierpilo	4	D	N	500 m
3.4		√	hierpilo	3	C	N	
3.9	√	√	creptect	7	F	N	300 m
4.1		√	creptect	3	B	N	
4.7	√	√	creptect	4	D	N	300 m
4.7	√		hierpilo	2	B	N	
5	√	√	hierpilo	4	D	N	100 m
5.4	√	√	hierpilo	4	C	N	100 m
6.1	√		creptect	2	B	N	2 individual plants
6.8	√		creptect	4	D	N	100 m
7.5	√		creptect	4	E	N	300 m
7.8		√	creptect	4	E	N	600 m
8.8	√	√	creptect	2	C	N	100 m
9.1		√	creptect	3	C	N	
9.2	√	√	creptect	3	C	N	
9.8	√	√	creptect	4	E	N	300 m
10.6	√	√	creptect	4	E	N	700 m
11.3	√	√	creptect	4	E	N	500 m
12	√	√	creptect	4	E	N	400 m
13.2	√	√	creptect	7	E	N	800 m but sporadic
14	√	√	hierpilo	7	F	N	600 m but not thick
14.4	√	√	hierpilo	7	F	Y	400 m, very thick, Photo #
14.4	√	√	creptect	4	F	N	1 km
14.7		√	hierpilo	2	B	N	
15.1		√	hierpilo	2	B	N	1 small patch
15.2	√		creptect	2	B	N	1 small patch
15.3	√		creptect	2	B	N	1 small patch
15.7		√	creptect	7	F	N	for 1.3 km
15.7		√	hierpilo	2	B	N	
15.9		√	creptect	4	C	N	80 m
16.6		√	creptect	4	B	N	200 m
17.3		√	creptect	2	B	N	<50 m
18.2	√	√	creptect	4	E	N	300 m
18.6	√		hierpilo	2	B	N	
18.8	√	√	creptect	4	D	N	300 m
19.3	√	√	creptect	2	B	N	100 m
19.6	√		creptect	2	B	N	100 m
19.8	√	√	creptect	2	B	N	100 m
20.4	√	√	creptect	7	E	N	300 m
21.8	√	√	creptect	4	B	N	100 m
21.9	√		creptect	2	B	N	
23.9							Gate at the SDH site

Legend: leucvulg = *Leucanthemum vulgare* (oxeye daisy) creptect = *Crepis tectorum* (narrowleaf hawksbeard)
melialba = *Melilotus alba* (White sweetclover) hierpilo = *Hieracium piloselloides*
1 = rare individual, a single occurrence, 2 = a few sparsely occurring individuals, 3 = a single patch or clump of species
4 = several sparsely occurring individuals, 7 = continuous occurrence of a species with a few gaps in the distribution
A = 1, B = 6 - 25, C = 26 - 50, D = 51 - 150, E = 151 - 500, F = 500+