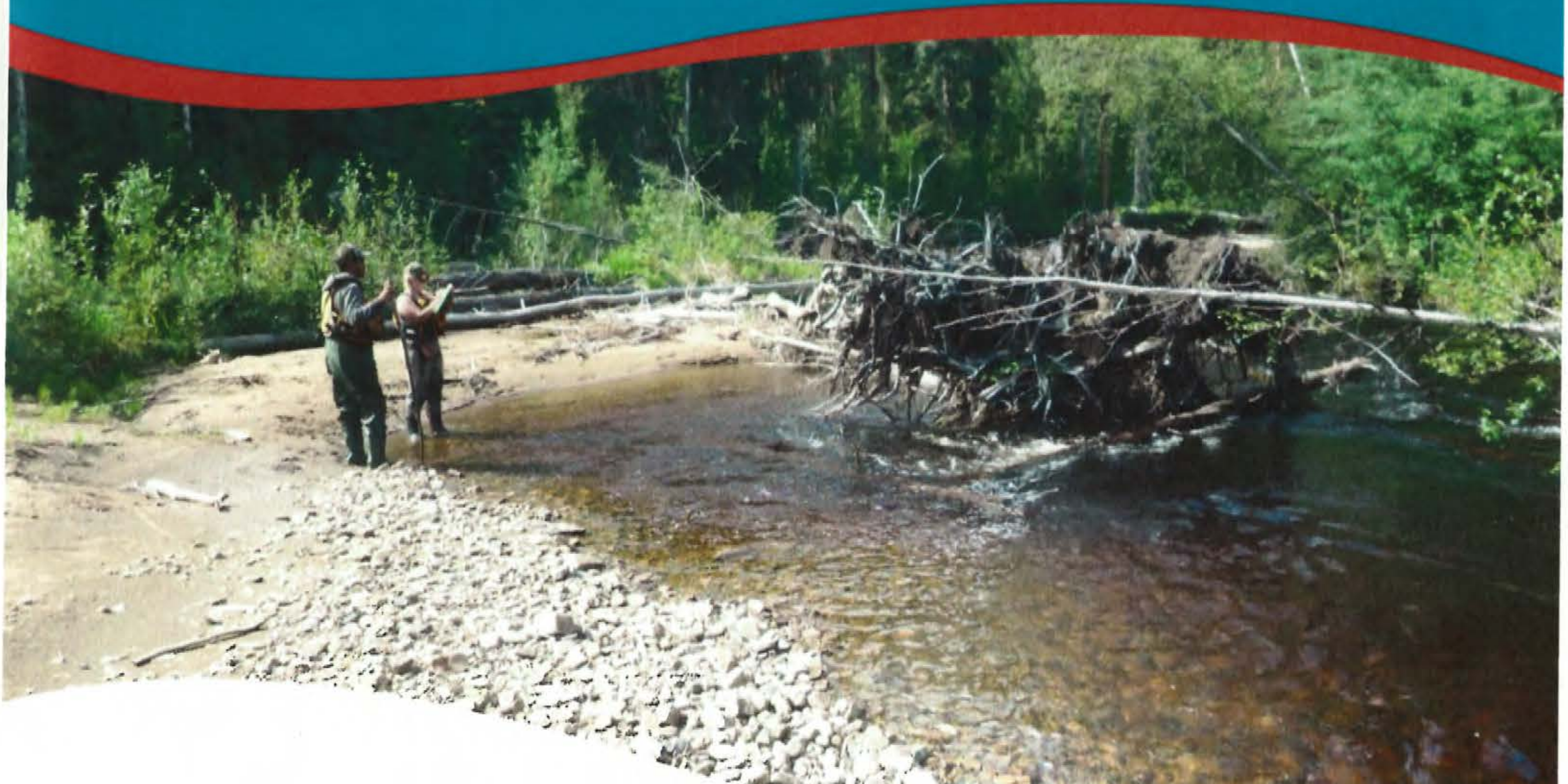
APPENDIX 14-A

Fisheries and Aquatic Resource Baseline Update 2016

Coffee Gold Mine:
Fisheries & Aquatic Resource Baseline Update - 2016



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March 2017

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REVISION SUMMARY

Version No.	Date	Revision Notes	Revision Authors
1.0	24 March 2016	Original Version	
1.1	30 May 2016 / 22 June 2016	Updated with 2016 Metals Analyses Data, eDNA and addressing of comments from Hemmera. Reviewed for consistency	Ben Snow Pat Tobler
1.2	October 31, 2016	Updated with 2016 field results	Pat Tobler Ben Schonewille Lyndsay Doetzel Ben Snow
1.3	March 12, 2017	Updated to address First Nation reviewer comments and include additional lab data.	Pat Tobler Lyndsay Doetzel

EXECUTIVE SUMMARY

Fisheries and aquatic baseline studies for the proposed Coffee Gold Project were conducted from 2013 to 2016; some additional data was collected for other projects prior to 2013. Baseline studies undertaken to date have included the compilation of existing information, fish habitat assessments, sampling for fish (summer, fall and winter), environmental DNA (eDNA), benthic invertebrates, periphyton and stream sediments.

The study area includes a 332 km^2 area around the Mine (Mine study area; including portions of the Yukon River, Coffee, Latte, Halfway, Independence and YT-24 creeks) and a 125 km long corridor along the Northern Access Route (NAR study area; which crosses the Yukon and Stewart rivers as well as several smaller watersheds).

A total of 14 species of fish can be found within the streams adjacent to or downstream of the Project infrastructure including two species of salmon and 12 species of resident freshwater fish species. The majority of these species are found only in the Yukon and Stewart rivers with three of these species documented in the small/medium sized streams downstream of proposed mine. These species include slimy sculpin (*Cottus cognatus*), Arctic grayling (*Thymallus arcticus*), and juvenile Chinook salmon *(Oncorhynchus tshawytscha*). These three species were also the most common species encountered along the NAR. Baseline studies have not found Chinook spawning within the study areas; however, chum salmon (*Oncorhynchus keta*) spawning has been confirmed in groundwater fed side channels of the Yukon River in the study area, and in similar habitats in the Stewart River downstream of the NAR study area. Among the tributary creeks, the highest species diversity and abundance of fish have been documented in Coffee and Independence creeks, which are the two largest creeks in the Mine study area.

Coffee, Independence (and occasionally Halfway) creeks are used by juvenile Chinook as non-natal rearing habitat, and Coffee Creek provides confirmed overwintering habitat for this species. Arctic grayling use the creeks in the Mine study area primarily for summer rearing; eDNA data from March 2016 confirmed Arctic grayling overwintering in Coffee Creek and the Yukon River but not in any other streams within the Mine study area. It is common for Arctic grayling to use different streams for important life history periods such as spawning, summer rearing and overwintering. Moderate densities of Arctic grayling have been documented in the lower reaches of Latte Creek during the summer months; however, overwintering habitat for fish within this stream appears poor and eDNA samples collected in this creek in March 2016 tested negative for both Arctic grayling and juvenile Chinook salmon. Slimy sculpin are year round residents in Coffee Creek, the lower portion of Independence Creeks and the Yukon River.

The headwater streams within the Mine footprint are small, steep, have poor habitat and with are located significant distances from documented fish bearing locations. Lower down in the watersheds, these streams eventually provide fish habitat or flow into areas that are used by fish. Along the NAR, fish presence is typically associated with the larger streams that are crossed with likelihood of fish presence decreasing with distance from mainstem habitat.

Benthic invertebrate sampling indicated that mean total abundance was variable throughout the Mine study area, with the highest abundance in Independence Creek, followed by YT-24, Coffee, Latte and Halfway creeks. Primary production (as indicated through periphyton sampling) was very low for all sampling stations, which is typical of northern, nutrient poor aquatic habitats. Chlorophyll-a concentrations were lowest in samples collected farthest upstream in each of the watersheds, and increased in downstream locations, as stream flows and nutrient inputs increased.

Baseline tissue metal concentrations within the Mine study area were analyzed in fish (Arctic grayling, slimy sculpin and juvenile Chinook salmon) and benthic invertebrate tissues, as well as in sediment samples collected from the creeks in the Mine study area. Concentrations of estimated methylmercury in all slimy sculpin, Arctic grayling and juvenile Chinook salmon tissues exceeded the CCME residue guidelines for the protection of wildlife consumers of aquatic biota (CCME 2000a). Baseline concentrations of selenium in slimy sculpin exceeded the United States Environmental Protection Agency guideline for whole-body selenium (EPA 2015) at a small number of samples from Coffee and Independence creeks, and samples from Arctic grayling and slimy sculpin from all areas exceeded the BC guideline for selenium.

Analysis of baseline benthic invertebrate tissue metals concentrations conducted in March and August 2016 indicated that estimated methylmercury concentrations in all benthic invertebrate tissue samples (54% of total mercury) did not exceeded the CCME guideline set for the protection of piscivorous wildlife (0.033 µg/g ww; CCME 2000a) at any sample stations in the Project area; the highest concentration was found in the sample collected from Coffee Creek (CF2.7) in March 2016 (0.0226 µg/g ww). Uranium concentrations in benthic invertebrate tissues were higher in samples collected in March when compared with August data; this correlated to when uranium concentrations in water are at their annual peak during late winter low flows, resulting in increased proportions of groundwater contributions to surface water.

Analyses of sediment baseline metals concentrations collected throughout the Mine study area indicate that arsenic and chromium are consistently present at concentrations that exceed the CCME interim Freshwater Sediment Quality Guidelines (CCME 2000b). Concentrations of copper, cadmium and mercury were found to exceed the applicable guidelines in only a small number of samples, all of which were located in the Coffee Creek watershed.

ACKNOWLEDGEMENTS

[name redacted] managed this project on behalf of the Goldcorp Inc. and [name redacted] managed the earlier portion of the project on behalf of Kaminak. [name redacted] (Goldcorp) provided GIS data used in this report. [name redacted] from Goldcorp provided exceptional logistical support to ensure our field crews could complete the work in an efficient and effective matter. [name redacted] of Laberge Environmental Services provided value insight and knowledge of streams within the Local study area.

EDI would like to highlight the exceptional assistance provided by Goldcorp's Environmental Monitors. [name redacted] provided navigation, local insight and field assistance for the road accessible portions of fieldwork. [name redacted] provided local insight and assistance for components that were based from the mine.

AUTHORSHIP

This report was prepared by EDI Environmental Dynamics Inc. Staff who contributed to this project include:

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[name redacted][name redacted] .... Section Author

[name redacted] .... Section Author

[name redacted] .... Section Author

[name redacted]redacted] .... GIS Mapping and Database Management

[name redacted] of Hemmera Envirochem Inc. produced the eDNA report included in Appendix A and led the eDNA sampling component of the field program.

Members of the EDI field crew for the 2016 fieldwork included the following EDI personnel: [name redacted [name redacted]

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1 INTRODUCTION

1.1 PROJECT DETAILS

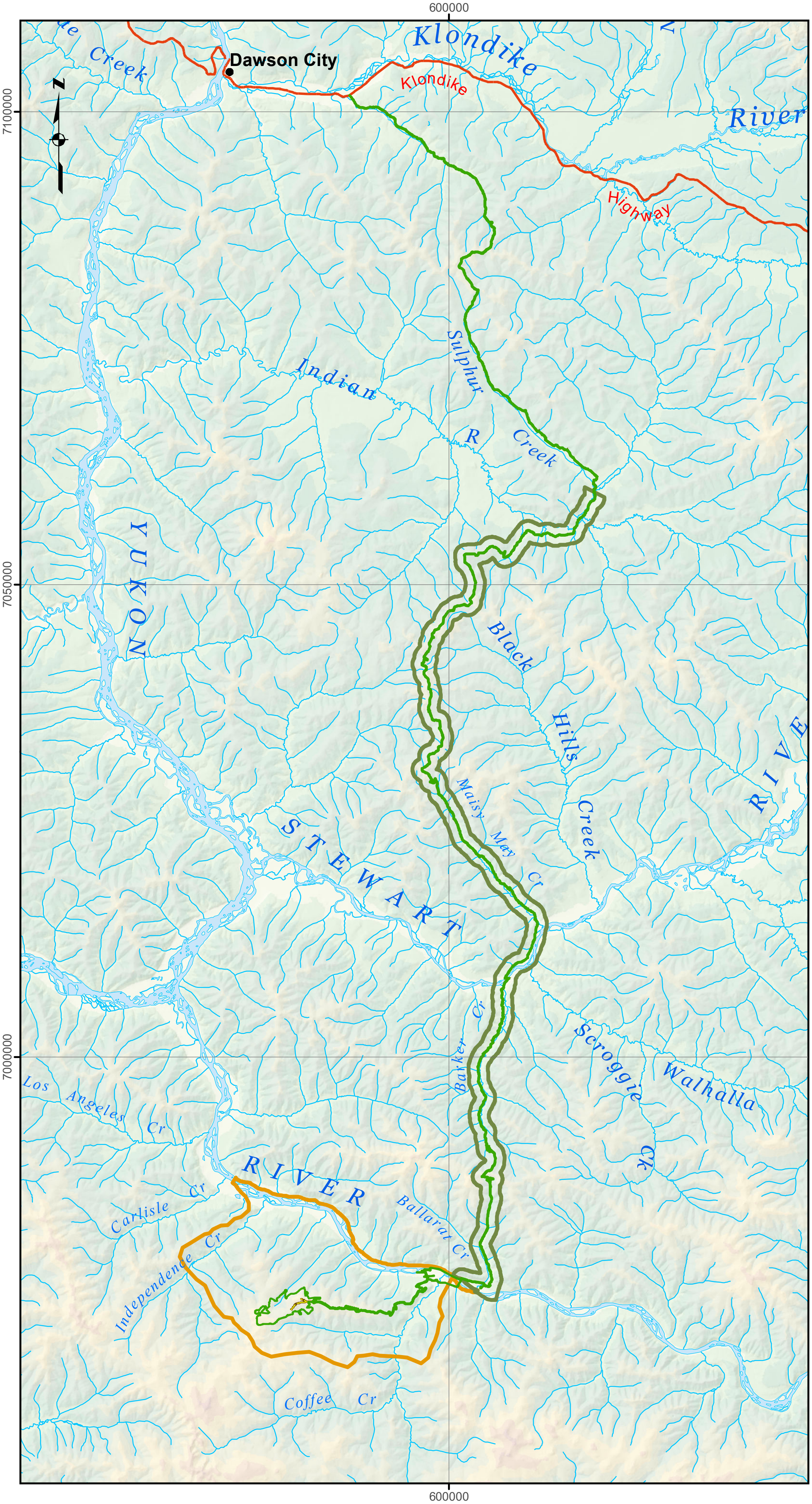
The Coffee Gold Project (Coffee Project; the Project) is a proposed gold mine in west-central Yukon, located 130 km south of Dawson City. Gold was initially discovered at Coffee Creek in 2010, and exploration activities have been ongoing since then. Baseline environmental studies began in 2010 and were expanded in the following years in anticipation of future regulatory requirements.

The proposed Project will consist of an open pit gold mine and heap leach facility. The projected mine life is ten years with an 18 month construction period. The feasibility study proposes four open pits mined by conventional shovel and truck methods. The mine and associated activities will generally be located on a relatively high elevation ridge top, and will not extend into the lower elevations where the larger streams are located. The mine footprint does include the upper part of some headwater watershed (including Halfway Creek, YT-24 and unnamed tributaries to Latte Creek). Most prominently, the main proposed Waste Rock Storage Facility (WRSF) will be positioned in the upper Halfway Creek watershed.

The Project will be accessed by road from Dawson City via a 214 km single-lane, gravel road with pull outs. The initial part of this route, from the highway to Sulphur Creek utilizes a government-maintained gravel road. Beyond Sulphur Creek, the Northern Access Route (NAR) mainly follows existing placer mine roads which will be upgraded to provide all season access to supply vehicles. Approximately 30 km of new road will be constructed (Figure 1). Electricity will be generated onsite by diesel-powered generators. The majority of mine staff will access the site by air.

The Coffee Project is located on Crown land within the Traditional Territory of the Tr'ondëk Hwëch'in and the asserted traditional territory of the White River First Nation. A portion of Goldcorp's claim block is located in the Traditional Territory of the Selkirk First Nation and the proposed road also overlaps with the Traditional Territory of the First Nation of the Na-cho Nyak Dun.

The proposed Project will require an Executive Committee Screening from the Yukon Environmental and Socio-economic Assessment Board (YESAB), a Type A Water Licence issued by the Yukon Water Board and a Quartz Mining License issued by the Yukon Government, among other permits and licences.



Legend

● Settlement/Community

Highway

Government-Maintained Gravel Road Along Proposed Route

Proposed Route

🟩 Project Footprint (as of March 10, 2017)

Aquatic Local Study Areas

🟧 Mine Study

🟩 NAR Study

FIGURE: 1

Overview of the Coffee Project study area

Data Sources
1:250,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Model and 1:250,000 National Topographic Database (NTDB) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

Disclaimer
This document is not an official land survey and the spatial data presented is subject to change. Project data displayed is site specific.

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Map Reference Scale: 1:600,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

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1.2 PURPOSE AND SCOPE OF REPORT

This report provides an update to the Coffee Project fish and aquatic resource baseline for the mine. Palmer Environmental Consulting Group collected baseline data around the mine in 2014 and 2015 (PECG 2017) and along the access road in 2015 (PECG 2016). EDI collected additional baseline data in 2016 around the mine and NAR. This report synthesizes the 2016 results with all previous fish and aquatic resource data collected in the study areas from 2000 to 2015 and includes the Mine study area (Figure 2) and the Northern Access Road (NAR) study area (Figure 3). This report is intended to support the effects assessment for the Project and the preparation of the YESAB Project Proposal. This report includes:

- A summary of data collection methods and existing knowledge (prior to 2016) for fish and aquatic resources within the study areas including fish and fish habitat, benthic invertebrates, periphyton and stream sediments;
- Methods and results for 2016 Mine study area field studies include:
    - winter fish and fish habitat sampling including environmental DNA;
    - benthic invertebrate tissue sampling, March and August for metals;
    - whole-body fish tissue sampling for metals, March, July and August;
    - chlorophyll-a sampling in August;
    - fish and fish habitat investigations (July and August);
    - stream gradient modelling and analysis for small streams within the Project footprint, and;
    - spawning surveys for Chinook salmon.
- Methods and results for 2016 NAR study area field studies include:
    - fish and fish habitat investigations at stream crossings along the NAR;
    - fish sampling and fish habitat characterization at proposed barge landings;
    - fish and fish habitat investigations at back channel of Stewart River;
    - spawning surveys for chum salmon in the Yukon and Stewart rivers.
- A synthesis of the results from all fish and aquatic resources studies to date, and an updated discussion on fish use of streams within the study areas with an emphasis on the stream in the Mine study area.

1.3 INFORMATION SOURCES

Available information sources for fish and aquatic resources within the study areas include scientific studies conducted between 2000 and 2016 (Table 1), as well as Traditional Knowledge. Preliminary fisheries and aquatic assessments associated with the Coffee Project were conducted in 2013 (ACG 2014), and were followed by two years of fish and aquatic baseline data collection for the Project in 2014 and 2015 by Palmer Environmental Consulting Group (PECG 2017) and data collection by EDI Environmental Dynamics in 2016 (this report).

Additional data that is not associated with either Project was collected on Coffee Creek in 2010, 2001 and 2000 (Laberge and White Mountain 2010; Laberge and White Mountain 2002; White Mountain 2001). Traditional Knowledge was also incorporated and was sourced from a database of such information compiled by the Kaminak Gold Corporation.

Table 1. Summary of available information sources for aquatic resources in the study areas.

Year	Data Summary	Agency	Report References
2016	Winter: fish and fish habitat assessments, environmental DNA (eDNA) sampling for Arctic grayling and Chinook salmon and benthic invertebrate sampling for analysis of baseline metal levels. Summer/fall: salmon spawning surveys, stream assessments along NAR, fish sampling/habitat assessments around mine, chlorophyll-a sampling, metals analysis of invertebrates and fish tissue.	EDI Environmental Dynamics (EDI)	This report
2014, 2015	Fish and aquatic resources baseline report for the Coffee Project, including data on fish and fish habitat, benthic invertebrates, periphyton and stream sediments. Includes fish tissue sampling data and salmon spawning surveys.	Palmer Environmental Consulting Group (PECG)	PECG 2017
2015	Fish and aquatic resources baseline report for the mine access route (NAR) focusing on collection of fish and habitat data at proposed stream crossings.	Palmer Environmental Consulting Group (PECG)	PECG 2016
2013	Preliminary fish and fish habitat assessment for the Coffee Project baseline, including surveys of fish abundance, distribution and size/weight data. Salmon spawning surveys were conducted on lower Independence Creek, and the Yukon River.	Access Consulting Group (ACG)	ACG 2014
2010	Fish and fish habitat assessments and benthic invertebrate sampling in lower Coffee Creek.	Laberge Environmental Services and White Mountain Consulting	Laberge and White Mountain 2012
2001	Fish and fish habitat assessments and benthic invertebrate sampling in lower Coffee Creek; a salmon spawning survey was conducted on lower Coffee Creek and the Yukon River.	Laberge Environmental Services and White Mountain Consulting	Laberge and White Mountain 2002
2000	Fish and fish habitat assessments in lower Coffee Creek; a salmon spawning survey was conducted on lower Coffee Creek and the Yukon River.	White Mountain Environmental Consulting	White Mountain Environmental Consulting 2001

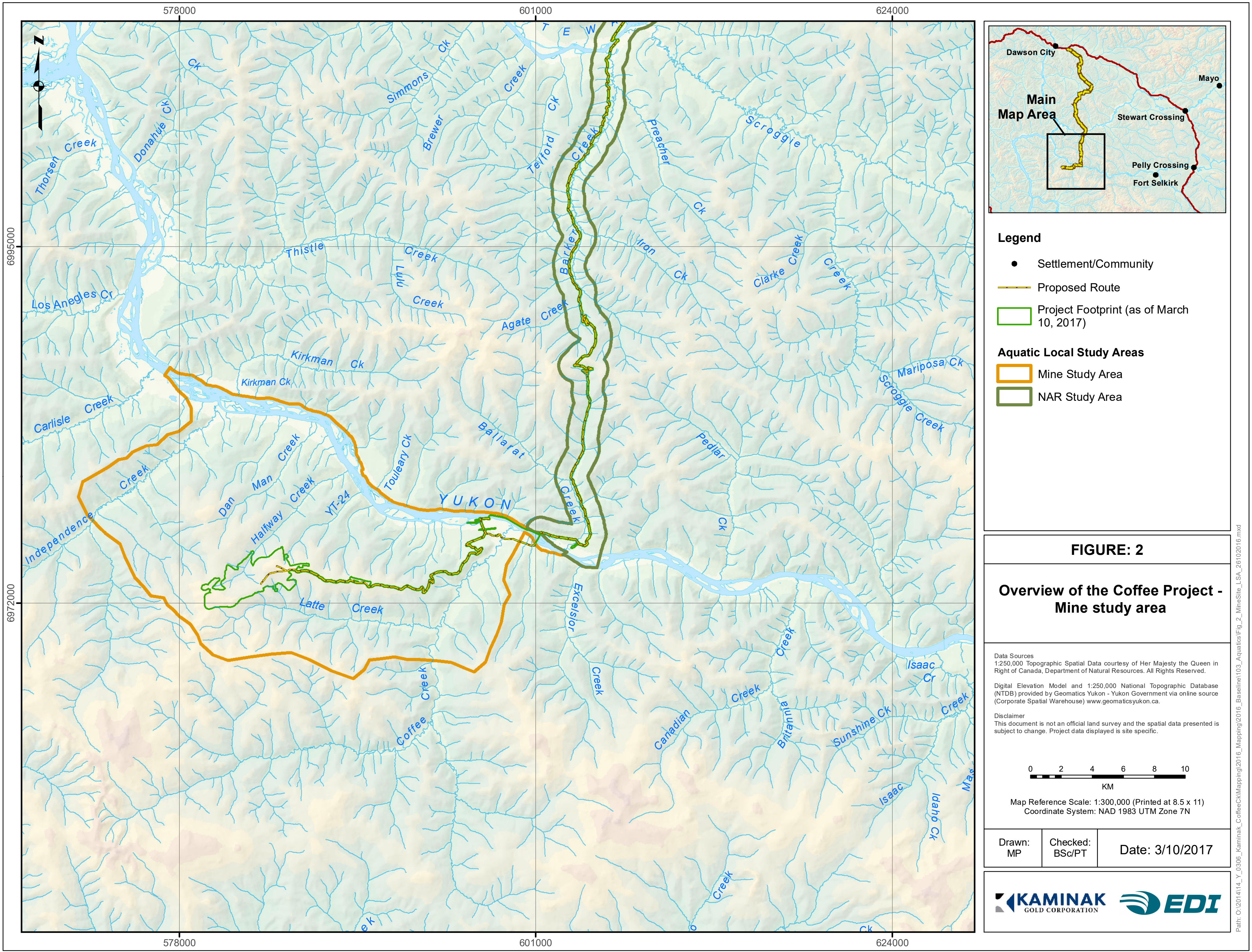

FIGURE: 2

Overview of the Coffee Project - Mine study area

Data Sources
1:250,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Model and 1:250,000 National Topographic Database (NTDB) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

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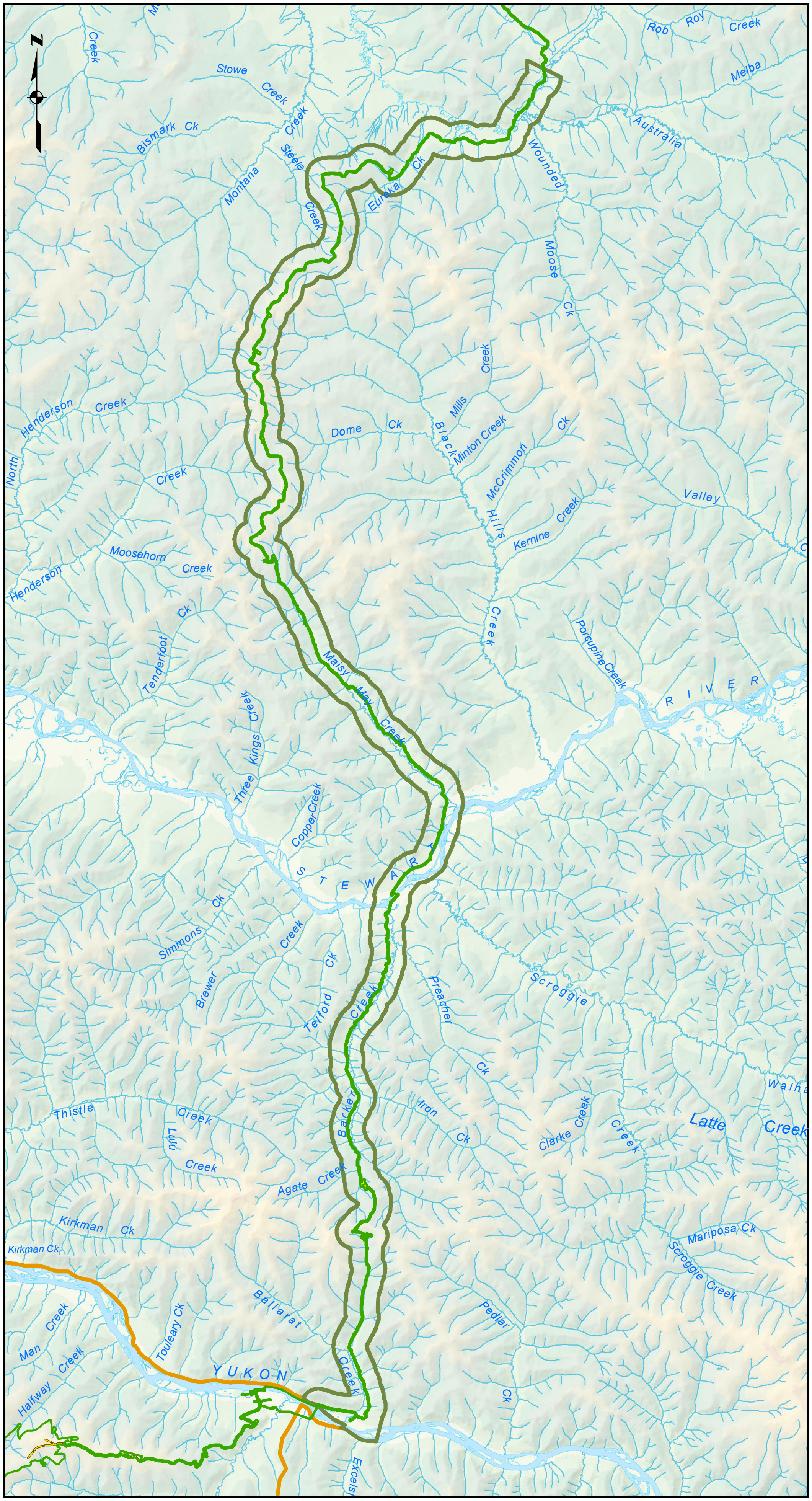

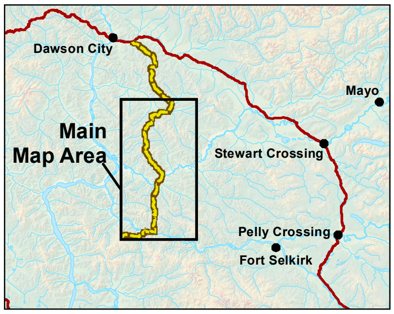

Legend

●	Settlement/Community
—	Government-Maintained Gravel Road Along Proposed Route
—	Proposed Route
🟩	Project Footprint (as of March 10, 2017)

Aquatic Local Study Areas

🟧	Mine Study Area
🟩	NAR Study Area

FIGURE: 3

Overview of the Coffee Project - Northern Access Road (NAR) study area

Data Sources
1:250,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Model and 1:250,000 National Topographic Database (NTDB) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

Disclaimer
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1.4 WATERSHED SUMMARY AND FISH SPECIES OVERVIEW

The Mine study area includes 32 km of the Yukon River as well as five smaller watersheds, all of which are tributaries of the Yukon River and generally flow in a northerly direction (Figure 2). These include:

- Coffee Creek watershed to the east;
- Latte Creek watershed to the south, which flows into Coffee Creek;
- Independence Creek watershed to the west, including the Kona Tributary; and,
- Halfway Creek and YT-24 watersheds to the north.

The NAR study area includes portions of the Yukon and Stewart Rivers and several smaller watersheds including (Figure 3):

- Indian River;
- Maisy May Creek;
- Barker Creek; and
- Ballarat Creek.

There are headwater tributaries of Latte Creek, Halfway Creek and YT-24 Creek which lie in close proximity to, or overlap with, with the planned Mine footprint (Figure 2). One tributary to Independence Creek, the 'Kona Tributary', is also near the planned Project footprint. In addition to these watersheds, two watersheds outside of the study area were sampled during 2014 to 2016 studies (Los Angeles and Isaac creeks; reference streams). Within the study areas, the Yukon and Stewart rivers provide overwintering, migration and rearing habitat for many fish species. Chum salmon spawning activity has been previously documented in the Yukon River in the study area (ACG 2014; PECG 2017) and in the Stewart River downstream of the NAR study area (Rivest Pers. Comm. 2016). In contrast, the smaller watersheds within the study areas support simpler fish communities, which include Chinook salmon (*Oncorhynchus tshawytscha*), Arctic grayling (*Thymallus arcticus*), and slimy sculpin (*Cottus cognatus*). Further information on relevant life history of key species found in the study areas (slimy sculpin, Chinook salmon, chum salmon [*Oncorhynchus keta*], and Arctic grayling) is described in the following sections.

Slimy sculpin are a small fish species commonly found in streams and lakes throughout the Yukon. This species is widespread and common in a variety of habitats although it is most common in streams with moderate to swift currents and coarse gravel/cobble substrate (McPhail 2007, McPhail and Lindsey 1970). Slimy sculpin diets include a wide variety of invertebrate prey items with chironomid larvae being a primary item taken; larger individuals may also feed upon the eggs of other fish species (McPhail 2007). They are bottom-oriented species and are known to have relatively small home ranges; they do not conduct any substantial migrations for any part of their life history (i.e. spawning, rearing, and feeding) and exhibit a high degree of site fidelity (Gray et al. 2004). For this reason, the presence of slimy sculpin in Yukon watersheds is a good indicator of suitable overwintering habitat for other fish species. This species can also be a useful indicator species for bioaccumulation of metals at intermediate trophic levels in aquatic ecosystems, as they consume various benthic invertebrate species and are themselves prey items for larger fish species.

Chinook salmon are an anadromous fish species and the largest salmon species in the Yukon. This species is known to be an important fish for First Nations and recreational fishers in the Yukon River. As indicated by Traditional Knowledge (TH 2012), the Yukon River in the vicinity of Coffee Creek has long been an important salmon fishing location for First Nations. There is general acknowledgement that the Chinook salmon returns in the Yukon River are not as strong as historical.

In the Yukon River watershed, Chinook spawn from late July to late August in clear, fast flowing streams and rivers, where large and clean cobble substrates are present. Eggs are deposited in stream gravels and hatch in late fall or early winter as alevins. Chinook alevins remain in the gravels through the duration of the winter, and live off stored energy reserves during this time before emerging as fry in late spring (May/June). Juvenile Chinook salmon rear in freshwater streams for up to one year after emerging from the stream gravels. Juvenile Chinook salmon are known to migrate many kilometers as juveniles in order to find high quality rearing habitat; this can include use of both natal and non-natal streams. Juvenile Chinook salmon generally leave rearing habitats in the early spring in the year after emergence, spend 3 to 5 years in the ocean, and return to spawn in the Yukon River watershed as 4 to 6 year olds.

Chum salmon spawning has been documented in the Yukon River mainstem slough and side channel habitats from the White River to Tatchun Creek (near Carmacks) and appear to use similar habitats in the Stewart River. Chum salmon also migrate through the study areas of the Yukon and Stewart rivers to reach spawning areas further upstream. In the Yukon River watershed, chum spawning occurs from September to November and is almost exclusively associated with areas of upwelling groundwater discharge. As with Chinook salmon, the eggs hatch as alevins during the winter and remain in the gravel until emergence during the spring (May/June). However, unlike Chinook, chum fry head directly downstream to the ocean and do not reside in freshwater for any considerable period of time. Chum salmon from the Yukon River watershed typically spend 3 to 4 years in the ocean before returning as adults to spawn.

Arctic grayling are an important recreational fish species in the Yukon River watershed, and are also a traditional food source for local First Nations. This species can be found in a wide variety of habitats ranging from large lakes to small headwater streams. A common life history strategy involves seasonal migrations between overwintering, spawning and summer rearing habitats with the largest individuals often being found the furthest upstream during the summer months (McPhail 2007). As such, this species is typically the most widespread in terms of distribution in Yukon watersheds. Spawning occurs during the spring shortly after ice-out and takes place in flowing water over substrates dominated by gravels. Small juveniles are typically found along the margins of the spawning streams although sub-adults and adults are often found in streams which do not provide spawning habitat. Food items taken by grayling include a wide variety of aquatic and terrestrial insects and they may also feed upon small fish and/or eggs (McPhail 2007, McPhail and Lindsey 1970).

1.5 BASELINE SAMPLING STATION CONCORDANCE

Aquatic sampling stations established during the 2014/2015 baseline studies (within the Mine study area) were given the form "AQ##", where the hashtags represented a numerical station designation. An alternate set of sample station codes were developed as a component of the Coffee Project water quality baseline data collection program; these were used during recent aquatics sampling programs as sampling was conducted in areas not visited as part of the 2014/2015 program. Going forward, EDI has developed the following station designation codes that allow for easy determination of station location, and allow for the addition of new stations, if and where needed:

1. Each station ID designation begins with a two or three letter code for each stream in the Mine study area. Three letter codes are used for unnamed tributaries to named streams; LCC therefore corresponds to Latte Creek Tributary C.
2. Following the stream letter code is a numeric designation that represents the straight line distance (kilometres) of a sampling station from its major confluence.
3. For stations in the Yukon River, the same naming convention was used although distances were measured in a straight line from the Coffee Creek confluence. A 'U' was used to indicate a station upstream of Coffee Creek and a 'D' for stations downstream. To assist in rectifying previous sampling stations with the new system, a table of concordance is shown below (Table 2).
4. Discrete sampling locations within the same station are designated as sites (e.g. station CF2.3 sediment sampling sites 1, 2 and 3).

Table 2. Concordance table of Coffee Project fisheries and aquatic field sampling station identifiers.

Stream	2014/2015 Aquatic Baseline Station Name (PECG 2017)	Water Quality and Hydrology Station (Lorax 2016)	2016 Station Name (this report)
Coffee Creek		CC4.5	CF2.7
Coffee Creek	AQ00		CF3.9
Coffee Creek	AQ01		CF5.7
Coffee Creek	AQ02		CF8.0
Coffee Creek		CC0.5	CF8.3
Latte Creek	AQ03	CC3.5	LC0.5[1]
Latte Creek	AQ04		LC2.7
Latte Creek		CC1.5	LC9.7
Latte Creek	AQ04.5		LC9.9
Latte Creek	AQ05		LC10.4
Latte Creek	AQ06		LC11.8
Latte Creek		CC6.0	LC13.5
Latte Creek, Tributary C		CC1.0	LCC0.1
Halfway Creek	AQ20		HF0.0
Halfway Creek		HC5.0	HF0.2
Halfway Creek		HC2.5	HF6.3
Halfway Creek	AQ21		HF9.3
YT-24	AQ30		YT0.0
YT-24		ML1.0	YT0.2
YT-24	AQ31		YT5.0
Independence Creek	AQ10	IC4.5	ID1.9
Independence Creek	AQ11		ID6.7
Kona Tributary	AQ12		KT0.1
Kona Tributary	AQ13		KT5.2
Yukon River		YUK2.0	YRU2.2
Yukon River		YUK5.0	YRD21.7
Isaac Creek	AQREF1		IS0.1
Los Angeles Creek	AQREF2		LaC4.8

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[1] While this site was labeled LC0.5, the actual distance of this site from the mouth of Latte Creek is ~50 m.

2 METHODS

2.1 TRADITIONAL KNOWLEDGE AND EXISTING INFORMATION SOURCES

Traditional Knowledge (TK) and current land use data provide information on fish species that are known to use the study areas and speak to fish species of interest to First Nations and local Yukon residents. This includes TK information shared by the Tr'ondëk Hwëch'in and White River First Nations, as well as a local trapping concession holder (Bates et. al. 2014, TH 2012, DRPC 2013; Interview 14, Pers. Comm. 2016). Prior to the initiation of the aquatic baseline studies for the Coffee Project, aquatic assessments in/near the Mine study area were conducted in Coffee Creek and the Yukon River in 2000 (White Mountain 2001), 2001 (Laberge and White Mountain 2002) and 2010 (Laberge and White Mountain 2012). The Fisheries and Oceans Canada Fisheries Information Summary System (FISS; DFO 2016) contains general data on fish presence in the Yukon River, including data records prior to the Coffee Project baseline studies.

Fish and fish habitat data were also collected just upstream of the mouth of Coffee Creek in July 2000 and 2001 and August 2010. Data collection included in-situ water quality parameters, stream discharge and velocity measurements, and general habitat attributes (e.g., channel width, substrate composition, cover, and stream morphology). Surface water quality samples were collected and analysed for metals concentrations, total dissolved solids (TDS) and total suspended solids (TSS). Benthic invertebrate sampling was conducted at the site at the mouth of Coffee Creek in 2001 and 2010 and fish sampling was conducted in all three sampling years (2000, 2001 and 2010). Sampling methods included minnow trapping in all years and, backpack electrofishing (2010 and 2001), gill netting (2001) and beach seining (2000 and 2001). Aerial surveys to attempt to locate Chinook salmon spawning were conducted in Coffee Creek 2000 and 2001.

2.2 SAMPLING AREAS AND RATIONALE

Aquatic resources sampling included fish sampling, habitat assessment (summer and overwintering), sediment and periphyton sampling, benthic invertebrate community composition via CABIN methods, and fish and benthic invertebrate tissue analysis for total metals. These activities were carried out in a number of streams in the Mine study area:

- Latte, Halfway and YT-24 creeks directly drain the Mine Site, and are those that are predicted to be most affected by project activities. These streams are considered 'near' to project activities.
- Latte Creek flows into Coffee Creek. Therefore, while Coffee Creek is downstream of the Project area, the reaches that are downstream of the Latte confluence are considered 'far' from Project activities.
- Independence, Los Angeles, and Coffee Creek upstream of the Latte Creek confluence were studies as part of the baseline program to act as 'reference' sites.

2.3 2013 TO 2015 BASELINE STUDIES

2.3.1 MINE AREA

The preliminary baseline studies for the Coffee Project began in 2013. Fish and fish habitat assessments were conducted at 10 stations (Figure 4), including Independence, Halfway and Coffee creeks. Fish habitat data collection included in-situ water quality measurements, stream discharge measurements and general observations of fish habitat suitability. Fish sampling was conducted using minnow traps. Aerial surveys to attempt to document spawning salmon were conducted in July, August, September and October 2013, and included the south bank of the Yukon River and the lower portions of Independence Creek (in July only; ACG 2014). Surveys focused on likely chum salmon spawning habitats in the Yukon River (i.e. side channel areas and sloughs), and included the portion of the river extending from approximately 500 m downstream of the confluence of Ballarat Creek to approximately 1 km downstream of the confluence of Independence Creek (ACG 2014).

More in depth aquatic baseline studies for the Coffee Project were completed in 2014 and 2015. The 2014 and 2015 baseline field sampling program included sampling at 18 fish community sampling stations, 17 fish habitat stations, and 12 benthic invertebrate, periphyton and sediment stations (PECG 2017; Figure 4). Sampling was conducted by Palmer Environmental Consulting Group (PECG) in August and October, 2014, and in March, June, July, and September, 2015. Winter sampling in March 2015 focused on documenting under-ice water flow in Latte and Coffee Creeks; however, no fish sampling was conducted.

Fish habitat was characterized by PECG at each fish sampling station in the study area. Data collected included in situ water quality parameters and an assessment of habitat quality and quantity based on general habitat attributes (e.g., channel width, gradient, substrate composition, cover, and stream morphology). Various station-specific fish sampling methods included backpack electrofishing, minnow trapping, fyke net trapping, and angling. In addition to summer fish habitat surveys, winter fish habitat surveys as well as salmon and Arctic grayling spawning surveys were completed. Fish samples were obtained from watersheds in the Mine study area and reference areas to analyze fish age, diet, and tissue metal concentrations[2].

Sediment samples were collected by PECG at stations throughout the Mine study area and were analyzed for nutrients, pH and metal concentrations. Periphyton sampling included analysis for chlorophyll-a and periphyton cell density. Benthic invertebrate field sampling was completed using the Canadian Aquatic Biomonitoring Network (CABIN) protocols (NWRI 2008), and were analyzed using the Reference Condition Approach (RCA).

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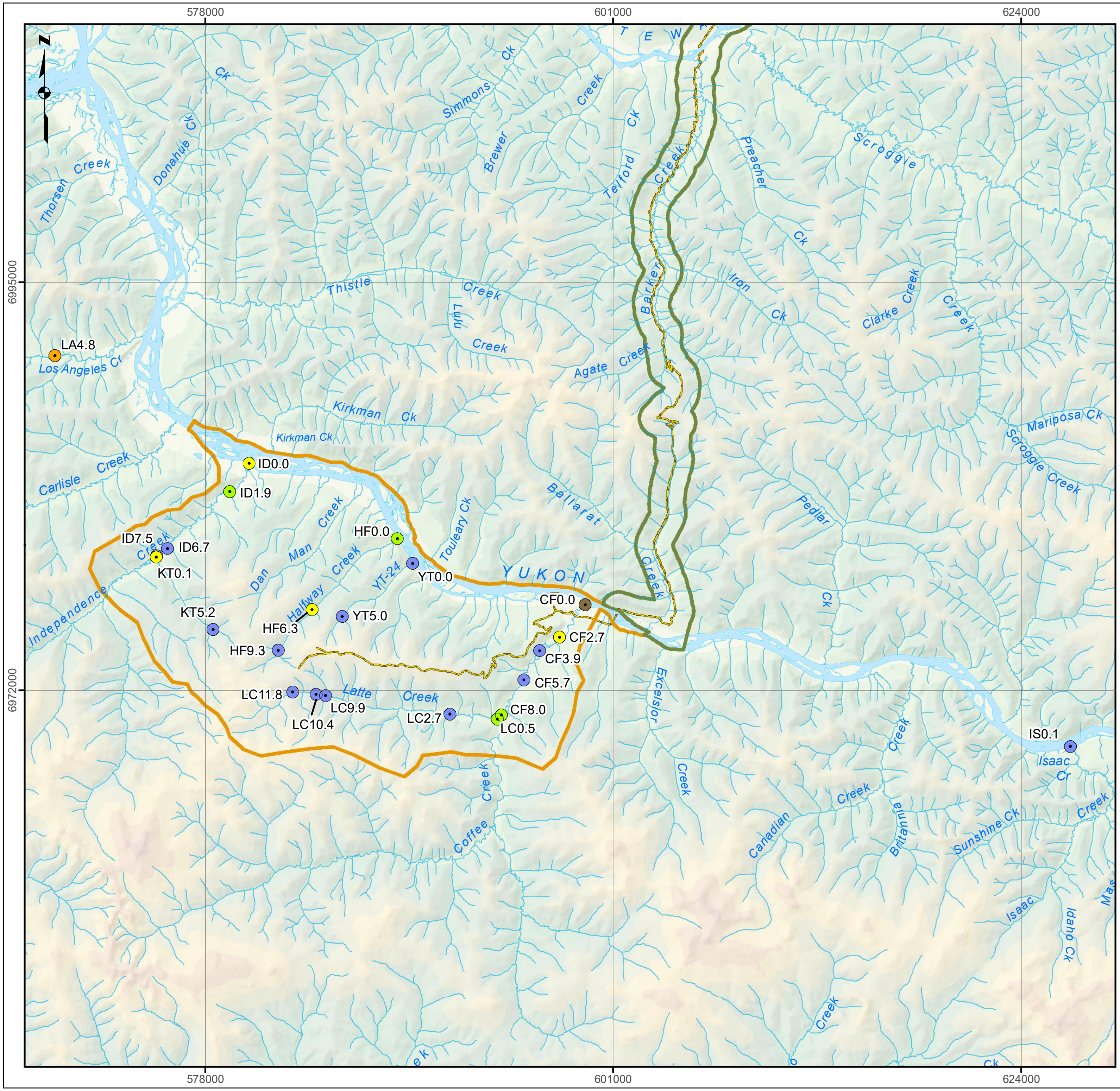
[2] Metal analysis for fish was performed on whole slimy sculpin (except for head) and pieces of muscle tissue from the dorso-lateral area from Arctic grayling.

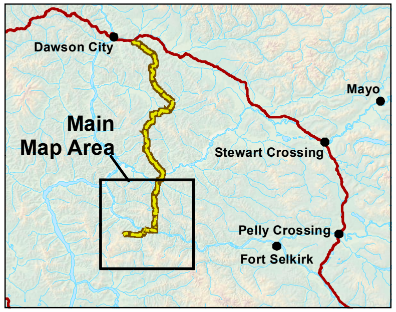
2.3.2 NORTHERN ACCESS ROUTE

In 2015, PECG completed stream assessments at 66 potential watercourse crossings along the Northern Access Route (PECG 2016). Streams were assessed for fish habitat, existence of downstream barriers to fish passage, and in some cases were sampled for fish. Since the completion of the work, a portion of the NAR has been realigned to avoid the Black Hills Creek watershed.

Included in the 66 watercourse crossings were the proposed barge crossings of Yukon and Stewart rivers. In these locations Chinook spawning surveys were completed and a general characterization of habitat was completed at the proposed barge landings.

Additional investigation was completed at a side/back channel of the Stewart River where the proposed road footprint will encroach on the high water mark. A description of the habitat, minnow trapping and water quality data was collected.





Legend

● Settlement/Community

Proposed Route

Aquatic LSA Sampling Sites (Year)

● 2015

● 2014 and 2015

● 2013, 2014 and 2015

● 2013

● 2000, 2001 and 2010

Aquatic Local Study Areas

☐ Mine Study Area

☐ NAR Study Area

FIGURE: 4

Fisheries and aquatic sampling stations in the Coffee Project LSA - 2000 to 2015

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2.4 2016 BASELINE STUDIES

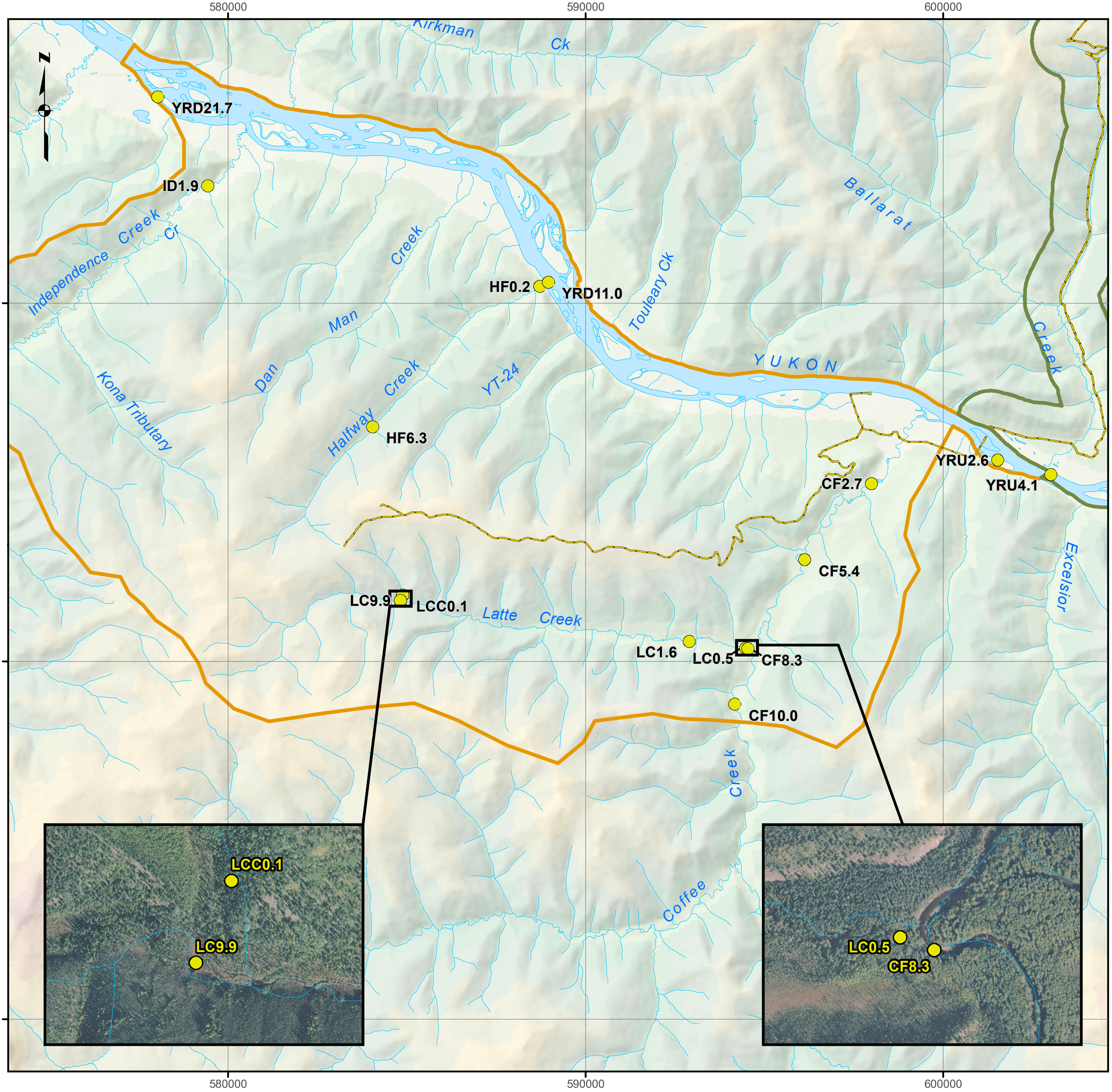
Baseline fish and aquatic resource studies conducted 2016 included fish and fish habitat assessments, sampling for environmental DNA (eDNA), winter fish habitat assessments, chlorophyll-a sampling, and fish and benthic invertebrate tissue sampling to assess baseline metal concentrations. A stream gradient modelling exercise was conducted to assess stream gradients in headwater tributaries of creeks in the vicinity of the Mine footprint. The methods for each of these components are summarized in the following subsections.

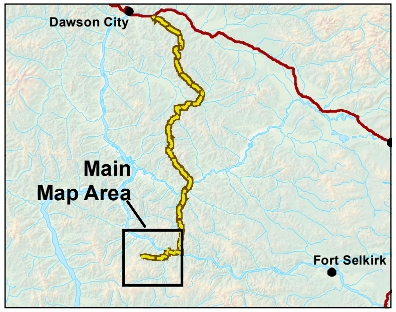
2.4.1 ENVIRONMENTAL DNA SAMPLING

The eDNA sampling conducted during March 2016 involved the collection of both water and sediment samples with the goal of supplementing conventional fish sampling results for Coffee, Latte, Halfway and Independence creek watersheds. Water-based eDNA samples provide an indication of winter habitat utilization whereas the sediment samples can potentially provide a longer term indication of habitat use. This is particularly important given that portions of the watersheds that were sampled may only contain the target species for some portions of the year. The eDNA field sampling effort was conducted for the Coffee Gold Project on March 1 and 2, 2016 and included 14 stations sampled for water and 12 stations sampled for sediment (Table 3; Figure 5). Detailed methods of the eDNA component of this project are described in APPENDIX A.

Table 3. Summary of eDNA sampling stations at the Coffee Gold Project, March 2016.

Station Name	Stream	UTM Co-ordinates (Zone 7)		Samples Collected	
		Easting	Northing	Water	Sediment
CF2.7	Coffee Creek	597998	6974963	✓	✓
CF5.4	Coffee Creek	596129	6972840	✓	✓
CF8.3	Coffee Creek	594533	6910347	✓	✓
CF10.0	Coffee Creek	594174	6968807	✓	✓
LC0.5	Latte Creek	594470	6970371	✓	✓
LC1.6	Latte Creek	592896	6970557	✓	✓
LC9.9	Latte Creek	584815	6971704	✓	✓
LCC1.0	Latte Creek Tributary	584835	6971857	✓	✓
ID1.9	Independence Creek	579439	6982199	✓	✓
HF0.2	Halfway Creek	588716	6980472	✓	
HF6.3	Halfway Creek	584040	6976554	✓	✓
YRD11.0	Yukon River	588957	6980596	✓	
YRD23.0	Yukon River	578042	6985775	✓	✓
YRU4.1	Yukon River	603003	6995219	✓	
YRU2.6	Yukon River	601522	6975623		✓
CF990	NA – distilled water control			✓	





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● Settlement/Community

● eDNA Sampling Site

Proposed Route

Aquatic Local Study Areas

▭ Mine Study Area

▭ NAR Study Area

FIGURE: 5

eDNA sampling stations in the Mine study area

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2.4.2 WINTER FISH HABITAT ASSESSMENT/SAMPLING

Winter fish habitat assessments and fish sampling were conducted from March 3 to 5, 2016 at seven stations (Table 4; Figure 6). Aerial video was also collected for Halfway, Coffee and Latte creeks on March 5, to provide additional data on winter fish habitat conditions in these streams. At stations where the stream channel was ice covered, an ice chisel (spud) was used to penetrate through the ice to allow for the assessment of under ice fish habitat conditions and fish sampling.

Table 4. Summary fish habitat assessment and fish sampling stations in the Coffee Project Mine study area, March 2016.

Station Name	Stream	UTM Co-ordinates (Zone 7)		Fish Sampling	
		Easting	Northing	Minnow Trapping	Underwater Camera
CF2.7	Coffee Creek	597994	6975001	✓	✓
CF8.3	Coffee Creek	594500	6970382	✓	✓
CF0.5	Coffee Creek	599243	6976704	✓	✓
CF10.0	Coffee Creek	594171	6968811	✓	✓
LC1.6	Latte Creek	592896	6970560	✓	
ID1.9	Independence Creek	579414	6983296	✓	✓
HF6.3	Halfway Creek	584040	6976554	✓	

Qualitative fish habitat data collection included station photos, descriptions of stream channel morphology and notes on observed under ice water flow and the presence of observed woody debris. Quantitative fish habitat data collection included measurements of ice thickness, water depth and the collection of in-situ water quality parameters (temperature, pH, dissolved oxygen and specific conductivity). In-situ water quality data was collected in the near vicinity of fish sampling sites, to provide context to fish capture and observation data.

Fish sampling included under ice minnow trapping and the use of an underwater video camera to attempt to visually document the presence of fish at sampling stations. At stations with numerous suitable locations to sample for fish, multiple minnow traps were set at various sites within the station in order to increase sampling effort at accessible micro-habitats (e.g. ice covered pools). At each station, 0.25 inch mesh (0.6 cm), gee-type minnow traps were baited with Yukon River salmon roe and were deployed in stream margin, slow water habitats. Traps were set to soak overnight, with soak times ranging from 17 to 25 hours. Under ice video was collected in pools at all minnow trapping stations except for LC1.6 and HF6.3, where a lack of suitable pool habitat prevented investigation with the camera. Observations were completed using one of two Aqua-Vu high definition underwater cameras (models AV 760c and AV Micro Plus with DVR). Both cameras were suspended below the ice to allow for easy rotation and movement in the water column. The duration of viewing ranged from 10 to 30 minutes, depending on the observed conditions at each station. The AV Micro Plus camera was used to record video data, while the AV 760c camera was used to view the video data in real-time via a small attached display screen. Field staff watched the video data in real-time for the presence of fish, and recorded data was reviewed again in the office to ensure that all objects of interest were identified.

All captured fish were identified to species and measured. Fork lengths were measured for species with forked tails; total lengths were measured for fish with non-forked tails (i.e. sculpin). Incidental mortalities and those fish that were retained were also weighed.

High definition aerial video of Halfway, Coffee and Latte creeks was collected from a helicopter, which was flown at a low and slow speed over the creeks. Video data was collected with the goal of documenting any indications of winter groundwater flow (open water, ice free leads), as well as aufeis formation and general ice coverage extent. The surveyed portions of the creeks included:

- The entire channel of Halfway Creek from the confluence of the Yukon River upstream to its headwaters, including Tributary B;
- YT-24 Creek from to confluence with the Yukon River upstream to its headwaters;
- Coffee Creek from the confluence with the Yukon River, upstream to station CF10.0; and,
- Latte Creek Tributary C.

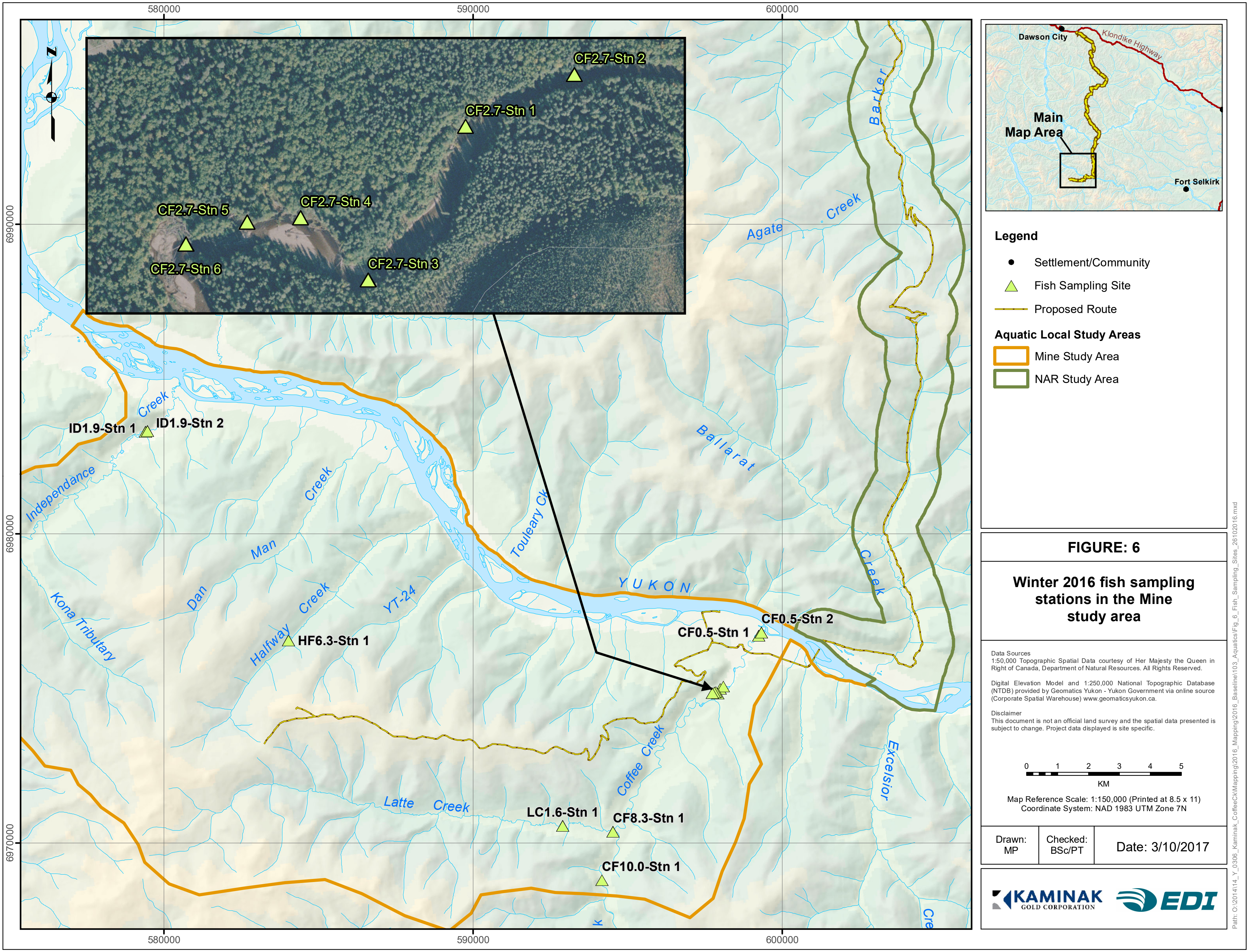

FIGURE: 6

Winter 2016 fish sampling stations in the Mine study area

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2.4.3 SUMMER FISH AND FISH HABITAT ASSESSMENTS (MINE)

Fish and fish habitat investigations were conducted in streams within the Coffee Project Mine study area in July and August 2016 to provide additional insight into fish presence and distribution. Sampled streams included Halfway and YT-24 as well as two small tributaries to the Latte Creek (Tributaries B and C; Table 5). Fish sampling was also completed in Latte, Coffee and Independence Creek to gain more information on fish use of the area and obtain additional tissue samples. Most sampling stations that were established and sampled during 2014 to 2015 summer baseline studies were revisited and sampled for fish, new sites were also established (Figure 7).

Fish habitat was characterized at representative locations in each stream using the methods described in the Resources Inventory Standards Committee (RISC) the Fish and Fish Habitat Inventory: Site Card Field Guide for the British Columbia government (BC MOE 2008). At each location where site cards were used to assess fish habitat (Table 5), a minimum of 100 m linear metres of stream channel was surveyed. At additional locations where fish sampling was conducted, fish habitat was characterized with detailed field including information on water depths, relative instream cover and channel morphology and bed material.

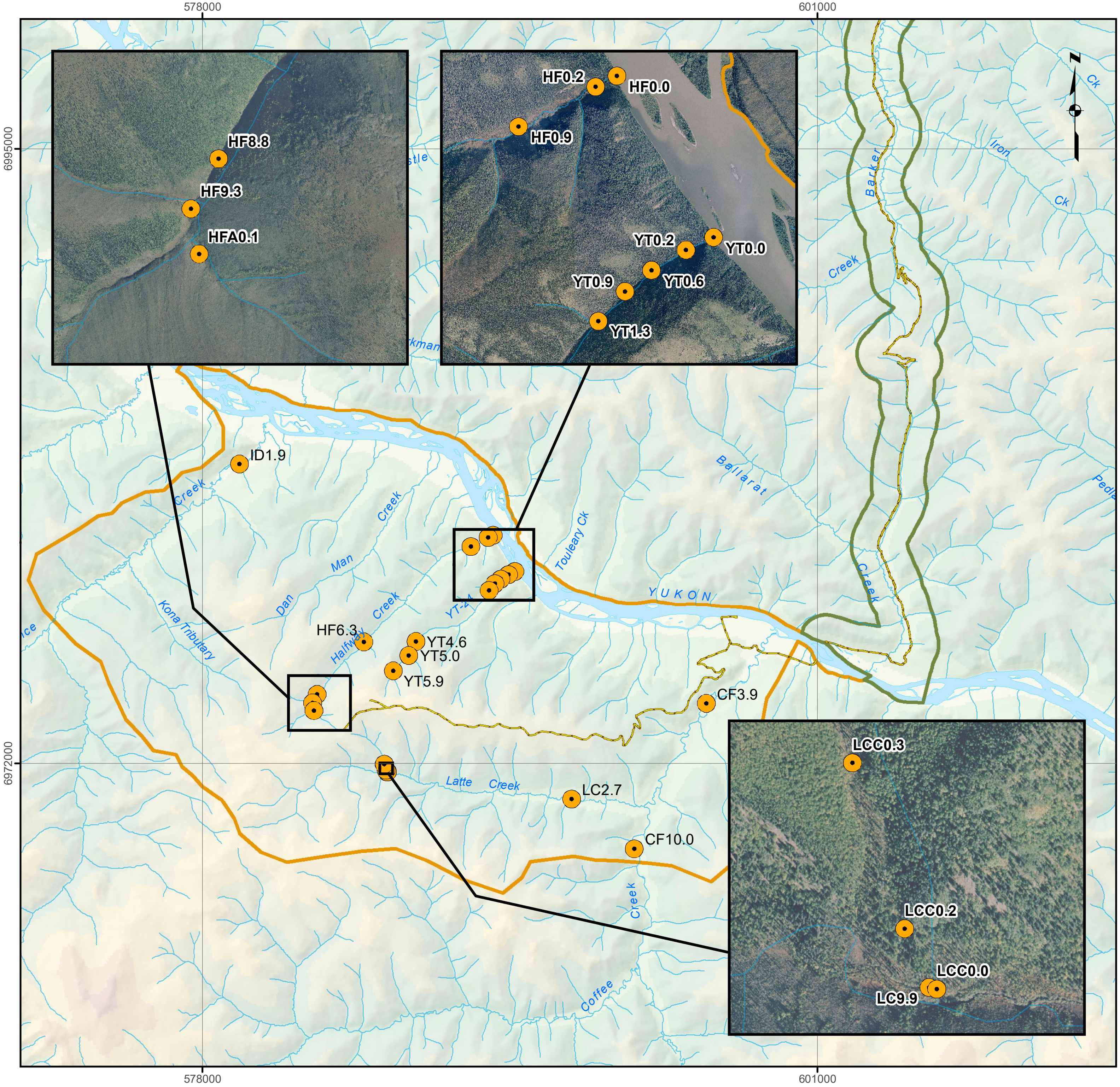
Electrofishing was the primary fish sampling method used to assess the presence of fish in Halfway and YT-24 Creek and Latte Creek Tributary C (Table 5). Latte Creek Tributary B was dry and was not sampled. Electrofishing was conducted using a Smith Root LR-24 electrofisher set at 60 or 70 Hz with a voltage setting ranging from 350 to 600 volts, depending on the in-situ specific conductivity at each site (i.e. higher volts were used at stations with lower conductivity). Electrofishing sampling effort ranged from 105 to 2,084 seconds with the goal of sampling at least 100 m of linear stream channel.

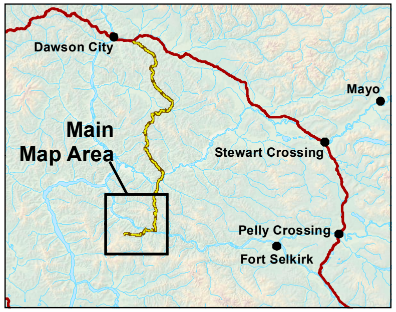
Minnow traps were deployed to increase fish sampling efforts at stations where water depths were sufficiently deep and stream velocities were not excessive. At each station, 0.25 inch mesh (0.6 cm), gee-type minnow traps were baited with Yukon River salmon roe and were deployed along stream margin, slow water habitats. Trap set depths were recorded and traps were set to soak overnight, with soak times ranging from 13.8 to 29.8 hours. At stations with numerous suitable locations to sample for fish, multiple minnow traps were set at various sites within the station in order to increase sampling effort. At all fish sampling stations, in-situ water quality parameters (temperature, dissolved oxygen, specific conductivity and pH) and photos were collected.

Table 5. Fish and fish habitat assessment stations in the Mine study area, July and August 2016.

Watercourse Name	Station Name	Fish Habitat Assessment Type	Fish Sampling Type
Coffee Creek	CF3.9	-	EF, AG
Coffee Creek	CF10.0	-	EF, AG
Independence Creek	ID1.9	-	EF, AG
Latte Creek	LC2.7	-	EF
Latte Creek	LC9.9	-	MT
Latte Creek Tributary C	LCC0.0	Site Card	EF, MT
Latte Creek Tributary C	LCC0.2	Site Card	EF, MT
Latte Creek Tributary C	LCC0.3	Field Notes	EF
Latte Creek Tributary B	LCB0.0	Field Notes	Site dry, not sampled
Halfway Creek	HF0.0	Field Notes	EF
Halfway Creek	HF0.2	Site Card	EF, MT
Halfway Creek	HF0.9	Field Notes	EF
Halfway Creek	HF6.3	Field Notes	EF
Halfway Creek	HF8.8	Site Card	EF
Halfway Creek	HF9.3	Field Notes	EF
YT-24 Creek	YT0.0	Field Notes	EF
YT-24 Creek	YT0.2	Site Card	EF, MT
YT-24 Creek	YT0.6	Field Notes	EF
YT-24 Creek	YT0.9	Field Notes	EF
YT-24 Creek	YT1.3	Field Notes	EF
YT-24 Creek	YT4.6	Site Card	EF
YT-24 Creek	YT5.0	Field Notes	EF
YT-24 Creek	YT5.9	Field Notes	EF

EF = Electrofishing, MT = Minnow Trapping, AG = Angling





Legend

- ● Settlement/Community
- ● 2016 Fish Sampling Sites
- Proposed Route

Aquatic Local Study Areas

- ▭ Mine Study Area
- ▭ NAR Study Area

FIGURE: 7

Summer 2016 fish and fish habitat assessment locations in the Mine study area

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Aerial imagery courtesy of Kaminak Gold Corporation.

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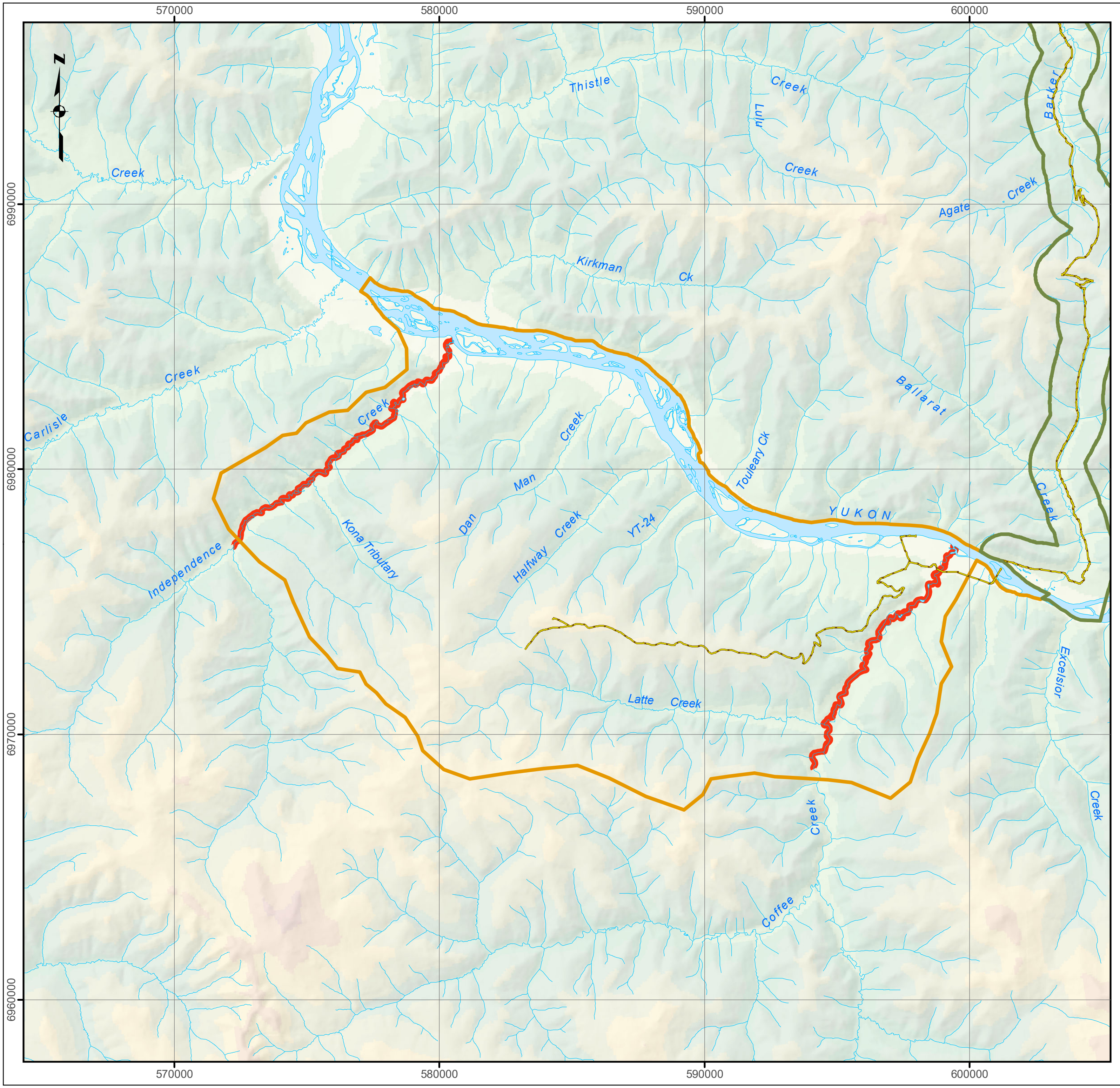
2.4.4 CHINOOK SALMON SPAWNING SURVEYS

Chinook spawning surveys were completed in areas where Traditional Knowledge indicated past presence and where habitat appeared to be suitable for Chinook spawning (Coffee and Independence Creek). Aerial surveys were completed by helicopter on Coffee Creek on August 18th, 2016 between 11:05 and 11:35 hrs and on Independence Creek on August 20th, 2016 between 13:27 and 14:11 hrs. Both streams were surveyed from the Yukon River upstream to a point where the stream was thought to be too small for adult Chinook (Independence was surveyed for 16 km and Coffee for 13 km; Figure 8). Observers were located in the front and backseats and the pilot positioned them over the river, flying sideways with the best possible vantage point at approximately 40-45 m above ground level. Surveys were completed in an upstream manner, from the mouth towards its headwaters. Observers wore polarized glasses to reduce glare. Weather was sunny and light conditions were considered very good. Tannins in both streams reduced the visibility in very deep pools, but the river could be seen to a depth of ~1m.



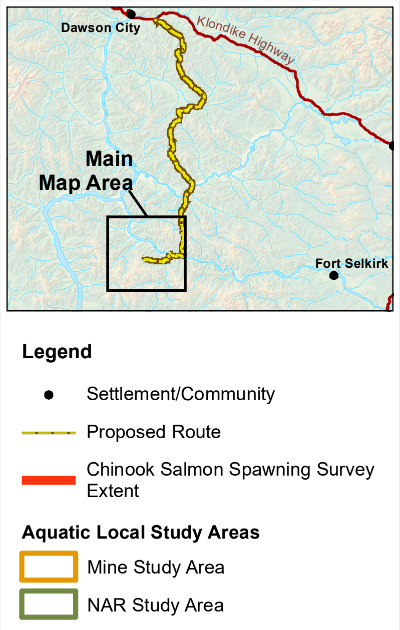


FIGURE: 8

August 2016 Chinook salmon spawning survey extent in the Mine study area

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Survey flight tracks (Chinook salmon spawning survey extent) were recorded by EDI Environmental Dynamics Inc. on August 18 and 20, 2016.

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2.4.5 FISH TISSUE METALS ANALYSIS

Fish tissues for metals analysis were collected and analyzed by PECG in 2014 and 2015 and by EDI in 2016 (Table 6). Before the 2016 sampling it was determined that uranium is a contaminant of concern in the Project area; concentrations of uranium in water are predicted to increase and in some cases exceed the CCME guideline for the protection of freshwater aquatic life. Uranium is stored preferentially in mineralized tissues, including bone. Therefore, previous years sampling which focussed on muscle tissues are believed to have underestimated the uranium concentration in tissues. Fish tissue sampling in 2016 was conducted using whole body samples (Table 6). Aging structures could not be collected from samples collected for analysis of the whole body samples to avoid sample contamination. However age/length relationships were developed by PECG (2017) and these relationships can be used together with length data collected in 2016 to estimate age.

Fish were collected for tissue sampling during winter and summer fish and fish habitat assessments, from March 3 and 4, and August 20-23, 2016. Sampling attempted to capture 10 of each slimy sculpin and Arctic grayling from each sampling location; juvenile Chinook salmon were only retained when incidental mortalities of individuals occurred during sampling. All captured fish were identified to species and measured. Fork lengths were measured for species with forked tails; total lengths were measured for fish with non-forked tails (i.e. sculpin). Incidental mortalities and those fish that were retained were also weighed. Retained individuals from both species were rinsed with creek water from each station to remove any sediment or organics debris, and were preserved on-site via freezing. The target tissue size for total metals and percent moisture analyses was 5.0 g, however the lab indicated they would be able to work with as little as 2.0 grams if necessary. Individual retained fish of the same species from the same sample site with weights of less than one gram were pooled together to achieve a minimum target sample mass of one gram. Whole body samples were sent for analysis to Maxxam Analytics in Burnaby, B.C.

Maxxam conducted analyzed tissue samples for both percent moisture and metals concentrations. For percent moisture the lab collected a subsample from the homogenized tissue samples. The subsamples were placed on a tared pan and weighed on a two decimal point balance. The samples were then placed in a forced-air oven at 105 ± 5°C to dry, generally overnight. The samples were dried to a constant weight (removed and allow to cool, weigh sample, return to oven for 30 minutes, remove and cool, reweigh, repeat as needed), and the final weight recorded. The percent moisture was then calculated.

Maxxam analytics analyzed metal concentrations in fish tissue samples by first weighing and then digesting samples using a mixture of hydrogen peroxide and hydrochloric acid at 95°C for two hours. Samples were then filtered and analyzed using inductively coupled plasma mass spectrometry (ICP/MS). There were 31 total metals analyzed with detection limits as presented in Table 7.

Table 6. Fish collected for baseline tissue metal analysis in the Coffee Project area.

Watershed	SSID - old	SSID new	Sample Date	Species	Sample Type	Samples Collected
Coffee	CCM	CF0.5	Winter 2016	CH	whole body	3 juvenile Chinook salmon
Coffee	CC4.5	CF2.7	Winter 2016	CCG	whole body	5 slimy sculpin
Coffee	CC4.5	CF2.7	Winter 2016	CH	whole body	3 juvenile Chinook salmon
Coffee	--	CF3.9	Summer 2016	CCG	whole body	10 slimy sculpin
Coffee	AQ00	CF3.9	Summer 2015	GR	muscle	2 Arctic grayling
Coffee	AQ02	CF8.0	Summer 2014	CCG	whole body minus head	9 slimy sculpin
Coffee	AQ02	CF8.0	Summer 2015	CCG	whole body minus head	3 slimy sculpin
Coffee	AQ02	CF8.0	Summer 2015	GR	muscle	6 Arctic grayling
Coffee	CC0.5	CF8.0	Winter 2016	CCG	whole body	1 slimy sculpin
Coffee	CC997	CF10.0	Winter 2016	CCG	whole body	1 slimy sculpin
Coffee	--	CF10.0	Summer 2016	CCG	whole body	10 slimy sculpin
Coffee	--	CF10.0	Summer 2016	GR	whole body	7 Arctic grayling
Halfway	--	HF0.2	Summer 2016	CH	whole body	12 juvenile Chinook salmon
Halfway	--	HF0.2	Summer 2016	GR	whole body	1 Arctic grayling
Independence	AQ10	ID1.9	Summer 2014	CCG	whole body minus head	8 slimy sculpin
Independence	AQ10	ID1.9	Summer 2015	CCG	whole body minus head	1 slimy sculpin
Independence	--	ID1.9	Summer 2016	CCG	whole body	10 slimy sculpin
Independence	AQ11	ID6.7	Summer 2014	GR	muscle	1 Arctic grayling
Independence	AQ11	ID6.7	Summer 2015	GR	muscle	7 Arctic grayling
Isaac	AQREF1	IS0.1	Summer 2014	CCG	whole body minus head	9 slimy sculpin
Isaac	AQREF1	IS0.1	Summer 2015	CCG	whole body minus head	3 slimy sculpin
Los Angeles	AQREF2	LaC4.8	Summer 2015	CCG	whole body minus head	1 slimy sculpin
Los Angeles	AQREF2	LaC4.8	Summer 2015	GR	muscle	1 Arctic grayling
Los Angeles	AQREF2	LaC4.8	Summer 2015	GR	muscle	1 Arctic grayling
Los Angeles	--	LaC4.8	Summer 2016	GR	whole body	3 Arctic grayling
Latte	AQ03	LC0.5	Summer 2014	CCG	whole body minus head	1 slimy sculpin
Latte	AQ03	LC0.5	Summer 2015	CCG	whole body minus head	2 slimy sculpin
Latte	AQ04	LC2.7	Summer 2015	GR	muscle	2 Arctic grayling
Latte	--	LC2.7	Winter 2016	GR	whole body	5 Arctic grayling
Latte	AQ04	LC2.7	Summer 2016	GR	muscle	6 Arctic grayling

Table 7. Tissue metals and detection limits (Maxxam Analytics) for tissue analysis.

Metal	Detection Limit
Total Aluminum (Al)	0.2
Total Antimony (Sb)	0.001
Total Arsenic (As)	0.005
Total Barium (Ba)	0.01
Total Beryllium (Be)	0.002
Total Bismuth (Bi)	0.02
Total Boron (B)	0.4
Total Cadmium (Cd)	0.002
Total Calcium (Ca)	2
Total Chromium (Cr)	0.01
Total Cobalt (Co)	0.004
Total Copper (Cu)	0.01
Total Iron (Fe)	1
Total Lead (Pb)	0.002
Total Magnesium (Mg)	2
Total Manganese (Mn)	0.02
Total Mercury (Hg)	0.002
Total Molybdenum (Mo)	0.01
Total Nickel (Ni)	0.01
Total Phosphorus (P)	2
Total Potassium (K)	2
Total Selenium (Se)	0.01
Total Silver (Ag)	0.004
Total Sodium (Na)	2
Total Strontium (Sr)	0.01
Total Thallium (Tl)	0.0004
Total Tin (Sn)	0.02
Total Titanium (Ti)	0.05
Total Uranium (U)	0.0004
Total Vanadium (V)	0.02
Total Zinc (Zn)	0.04

2.4.6 BENTHIC INVERTEBRATE SAMPLING FOR TISSUE METALS ANALYSIS

Benthic invertebrate sampling for tissue metals analysis in the Mine study area and reference sites was conducted on March 3 and 4, and August 20 to 23, 2016 (Figure 9). The goal of this sampling was to collect benthic invertebrate samples of sufficient mass to allow for analysis of metals concentrations in benthic invertebrate tissues; sampling was not intended to assess benthic invertebrate abundance or distribution. Prior to March 2016, no metals analysis had been conducted on benthic invertebrate tissues; however, benthic invertebrate samples had been collected and submitted for taxonomic analysis to assess community composition and overall benthic invertebrate abundance/diversity (PECG 2017).

Tissue metals concentrations assist with the comprehensive understanding of station-specific metal bioaccumulation between sediments, benthic invertebrates and fish populations. Benthic invertebrate sampling was conducted via kick netting, and focused on riffle habitats (Table 8) which had the following characteristics:

- For winter sampling: sufficient area of riffle habitat that could be cleared of ice, or was ice free, at the time of sampling;
- Sufficient amount of stream flow to allow for dislodged benthic invertebrates to be washed into the kick net; and,
- Sufficient stream bed material to be easily agitated by kicking.

At each of the stations sampled, kick netting was conducted using a 250 micron mesh with a detachable collection cup. The final samples were all composites made of three or more net kicks. The opening of the net faced upstream and the bottom of the net was rested on the stream bed; the field sampler walked backward while moving in a zig-zag motion upstream through the sampling area. Benthic invertebrates were dislodged from the stream bed by vigorous kicking for a period of 20 to 40 minutes; the amount of sampling effort at each site was proportional to the available area of suitable habitat. In-situ water quality parameters including water temperature, pH, specific conductivity and dissolved oxygen concentration were collected at each sample site. More than one replicate was collected when benthic invertebrate abundance allowed (Table 8).

All collected sample material from each site was washed from the collection cup using stream water from each site. Samples were placed in large, clean Ziploc bags and all washings were retained. At the completion of each day's sampling, collected sample material was sorted and invertebrates were separated from stream sediments and organic debris. All observed macroscopic invertebrates were removed from each sample and were then preserved by freezing. All samples were weighed, and individually packaged in sterile, labelled WhirlPak containers, and were kept frozen until they were delivered under chain of custody (COC) documentation to Maxxam Analytical for analyses including percent moisture and total metals concentrations in benthic invertebrate tissues. The target tissue size for total metals and percent moisture analyses was 5.0 g, however the lab indicated they would be able to work with as little as 2.0 grams if necessary.

Maxxam conducted analyzed tissue samples for both percent moisture and metals concentrations. For percent moisture the lab collected a subsample from the homogenized tissue samples. The subsamples were placed on a tared pan and weighed on a two decimal point balance. The samples were then placed in a forced-air oven at 105 ± 5°C to dry, generally overnight. The samples were dried to a constant weight (removed and allow to cool, weigh sample, return to oven for 30 minutes, remove and cool, reweigh, repeat as needed), and the final weight recorded. The percent moisture was then calculated.

Maxxam analytics analyzed metal concentrations in fish tissue samples by first weighing and then digesting samples using a mixture of hydrogen peroxide and hydrochloric acid at 95°C for two hours. Samples were then filtered and analyzed using inductively coupled plasma mass spectrometry (ICP/MS). There were 31 total metals analyzed with detection limits as presented in Table 7.

Table 8. Summary of 2016 benthic invertebrate sampling in the Mine study area.

Station Name/Site Name	Stream	Sampling Date	Number of replicates collected	Sample weight (g) [1]
CF2.7	Coffee Creek	4/5 March 2016	6	1.3, 3.4, 2.5, 2.2, 1.3, 2.0
ID4.5	Independence Creek	04-Mar-16	1	0.6
LC2.7	Latte Creek	21-Aug-16	1	2.6
LC9.9	Latte Creek	21-Aug-16	1	2.4
CF3.9	Coffee Creek	21-Aug-16	1	3.5
CF10.0	Coffee Creek	21-Aug-16	1	3.5
HF0.2	Halfway Creek	23-Aug-16	2	2.5, 2.7
HF6.3	Halfway Creek	20-Aug-16	1	2.6
YT0.2	YT-24 Creek	23-Aug-16	1	2.8
YT5.0	YT-24 Creek	21-Aug-16	1	2.1
ID1.9	Independence Creek	20-Aug-16	1	2.5
LaC4.8	Los Angeles Creek	20-Aug-16	2	2.2, 2.9

[1] Sample weights less than 2.0 g were analysed by the lab, but detection limits were raised, as necessary, see Maxxam COA, Appendix E, for detailed detection limits.

2.4.7 CHLOROPHYLL–A

Chlorophyll-a sampling was conducted in late summer when communities were expected to have reached maximum density and diversity. Sampling sites were selected with an attempt to standardize, where possible, water depth, velocity, gradient, substrate, and sunlight exposure (Figure 9; Table 9).

Six rocks were randomly selected and sampled at each chlorophyll-a sample site using a 10 cm (4”) diameter template and scrub brush. Each rock represented one replicate, resulting in a total of six replicates collected per site. Algae scrubbed from within the template area were washed into a 500 mL laboratory-supplied bottle; sample volume from each rock was approximately 50 mL. Each replicate was then filtered through a 0.45 µm filter within 12 hours of sample collection. The sample filters were separately preserved, as recommended by the analytical laboratory performing the analysis, and labelled with the site name, date, and area sampled. Sample filters were kept frozen and dark until they were transferred to the laboratory under chain of custody documentation.

Samples were sent to Maxxam Analytics in Burnaby, BC where they were filtered, ground, and extracted using 90% acetone and analyzed on a spectrophotometer. Results were presented as mass/area (µg/cm^2 or mg/cm^2) as the lab was provided with the known volume sampled per area of substrate sampled at each site.

Upon receipt of data results from the laboratory, summary statistics for each site including minimum, maximum and mean values were calculated from the six replicates collected at each site. Mean values from each site were used to perform a between site comparison.

Table 9. Summary of 2016 chlorophyll-a sampling in the Mine study area.

Station Name/Site Name	Stream	Sampling Date
LC9.9	Latte Creek	21-Aug-16
LC2.7	Latte Creek	21-Aug-16
CF3.9	Coffee Creek	21-Aug-16
CF10.0	Coffee Creek	21-Aug-16
HF0.2	Halfway Creek	23-Aug-16
HF6.3	Halfway Creek	20-Aug-16
YT0.2	YT-24 Creek	23-Aug-16
YT5.0	YT-24 Creek	21-Aug-16
ID1.9	Independence Creek	20-Aug-16
LaC4.8	Los Angeles Creek	20-Aug-16

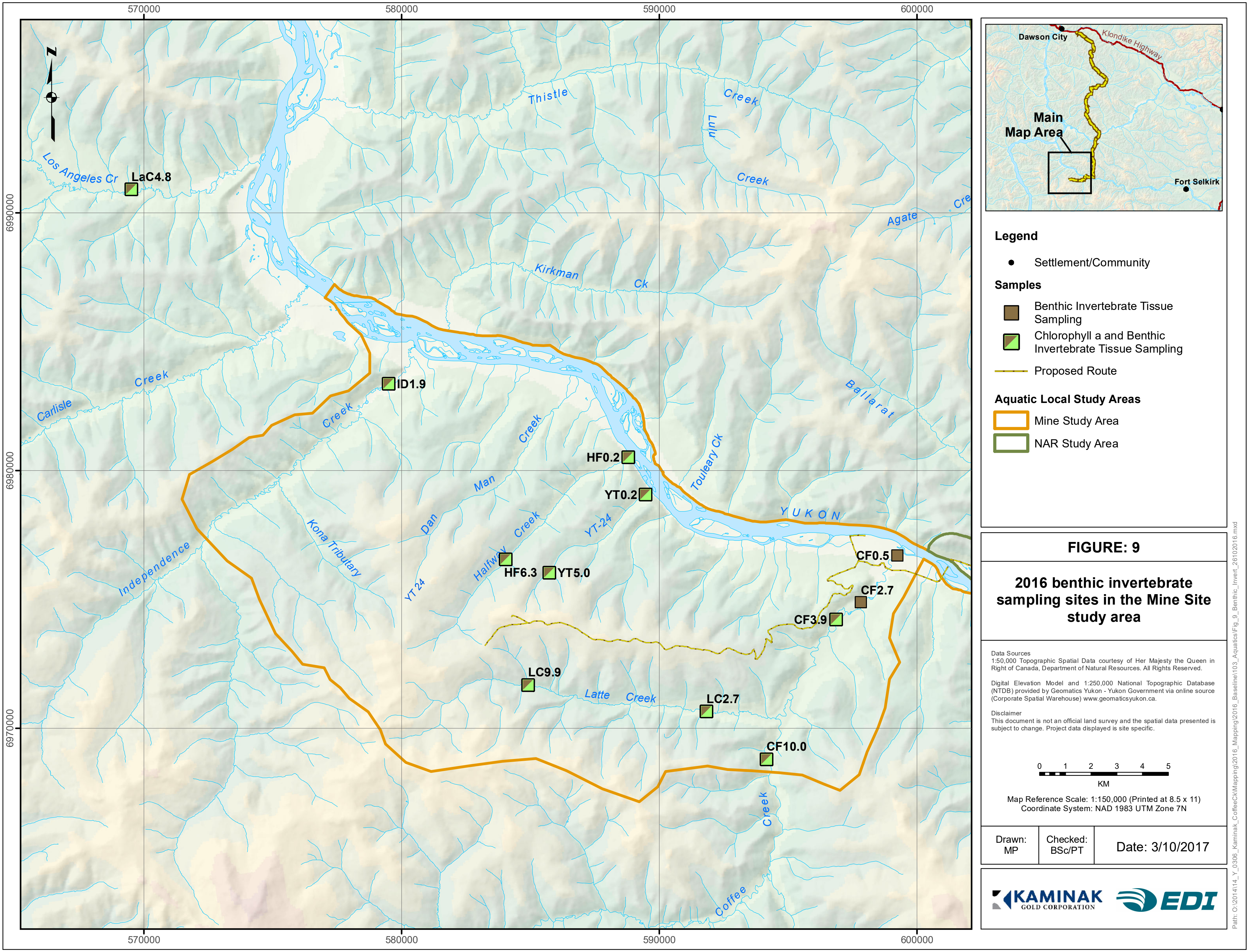

FIGURE: 9

2016 benthic invertebrate sampling sites in the Mine Site study area

Data Sources
1:50,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Model and 1:250,000 National Topographic Database (NTDB) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

Disclaimer
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Map Reference Scale: 1:150,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn: MP	Checked: BSc/PT	Date: 3/10/2017

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EDI

Path: O:\2014\14_Y_0306_Kaminak_CoffeeCk\Mapping\2016_Mapping\2016_Baseline\103_Aquatics\Fig_9_Benthic_Invert_26102016.mxd

2.4.8 STREAM GRADIENT MODELLING

Modelling of stream gradients was completed to provide additional context to the fish bearing potential of focal streams in the vicinity of the Project infrastructure, particularly those streams that intersect the proposed mine infrastructure. Although stream gradient alone cannot be used to indicate whether streams are fish bearing, analysis of stream gradient properties can be a useful tool in determining the likelihood of fish presence (BC MOF 1998).

The stream gradient modelling involved the use of LIDAR imagery (2 m resolution digital elevation model) with stream gradients measured at 100 m intervals along the streams of interest. A watercourse layer was produced digitally using the LIDAR imagery and provided to EDI for the purposes of this modelling. Stream gradient measurement data points where then color coded according to the stream gradient ranges, with hotter colors (reds) indicating steep gradients and cooler colors (greens) indicating shallow gradients (stream gradients found in Table 10).

2.4.9 NORTHERN ACCESS ROUTE

Fish and fish habitat assessments were completed along the NAR in 2016. Many crossings that were assessed in 2015 were revisited in order to collect additional information and where applicable, update the fish bearing status of each crossing. At each crossing, an assessment of channel characteristics was made to determine if the drainage should be considered a stream. A stream was defined as having flow on a perennial or seasonal basis having a continuous channel bed that was scoured by water and contains deposits of alluvium[3]. If it was determined to be a stream, a Fish Habitat Site Card (BC MOE 2008) was completed and investigations were made to determine if the stream was fish bearing, potentially fish bearing or non-fish bearing. Investigations included fish sampling (electrofishing and/or minnow trapping), assessment of habitat quality and evaluation of downstream barriers to fish passage and closely followed methods outlined in BC MOF (1998).

2.4.9.1 Barge Landing Investigations

Proposed barge landings on the Stewart and Yukon rivers were visited and sampled for fish during 2016. Visual observations were made to describe the fish habitat present in these areas. Fish sampling was conducted primarily using beach seining with minnow trapping also conducted at the proposed north Yukon River barge landing site. In some cases, the beach seining sites were located upstream or downstream of the proposed landing sites due to the presence of vertical banks which were not conducive to fish sampling. A total of six beach seining hauls were completed at proposed barge landing sites (three hauls on

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[3] This definition is consistent with Forest Practices Code of British Columbia (1998); no such definition of stream in the Yukon could be found. A key consideration is that fish species found in Yukon would not use habitats that do not meet this definition of stream (unless it is a lake or open water wetland).

the Yukon River and three on the Stewart River) and minnow traps were set at two stations on the Yukon River (Figure 10).

The beach seine used was 10 m in length, 2 m deep and constructed of 5 mm mesh. Information collected for each beach seine haul included in-situ water quality, water clarity and seine haul dimensions (length, width, depth). Minnow traps were baited with Yukon River origin salmon roe and left to sit for approximately 24 hours. All fish captured were identified to species and subsample of 10 individuals per species measured to fork length.

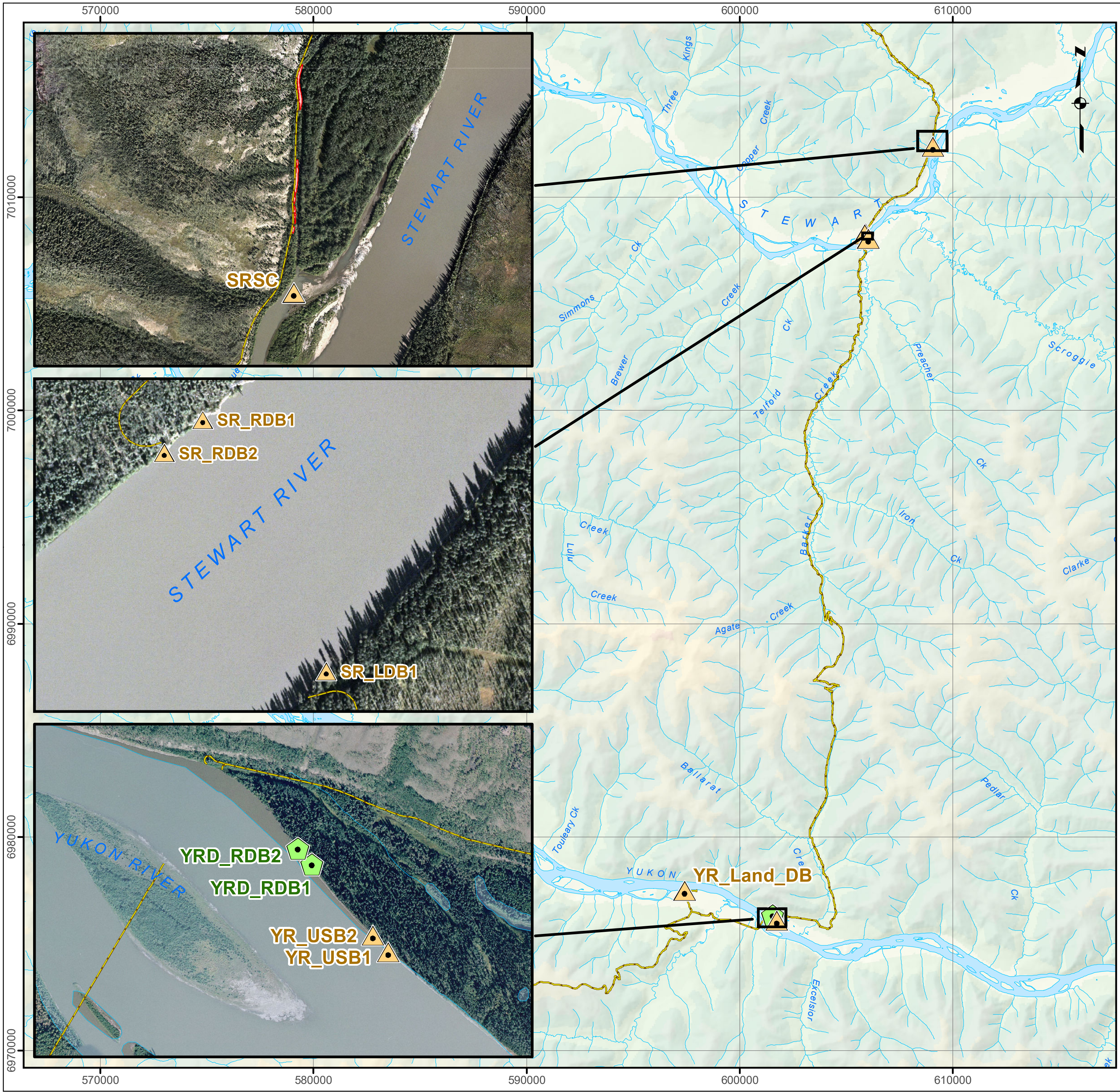
2.4.9.2 Stewart River Back Channel Investigations

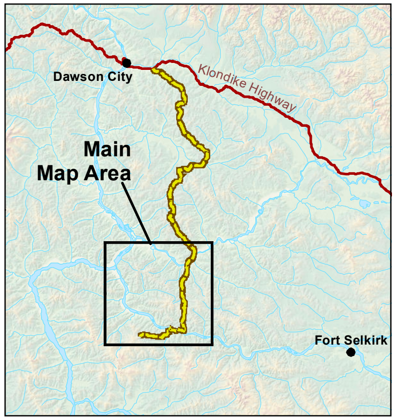
A back channel on the Stewart River which will be encroached upon by the Northern Access Route was visited on two occasions during 2016: July 14 and October 25. During the July visit, the area downstream of the back channel (Figure 10) was sampled for fish using a beach seine and in-situ water quality parameters were collected. During the October visit, the back channel was visited to collect water quality parameters and determine the potential for fish overwintering.

2.4.9.3 Chum Salmon Spawning Surveys

Aerial surveys were completed by helicopter on the Yukon and Stewart rivers on October 24 and 25, 2016. The Yukon River was surveyed from Britannia Creek (21 km upstream of Coffee Creek) downstream to Dan Man Creek, a river distance of approximately 35 km (Figure 11). The Stewart River was surveyed from 6 km upstream of Maisy May Creek, downstream below the proposed barge landings near Barker Creek to a point 8 kilometers downstream of Brewer Creek for a total river distance of approximately 26 km (Figure 11).

Observers were located in the front and backseats and the pilot positioned them over the river, flying sideways with the best possible vantage point at approximately 40-45 m above ground level. Surveys were completed in an upstream manner with both observers wearing polarized glasses to reduce glare. Air temperatures during the survey were relatively cold (-20°C) which resulted in freezing conditions on both rivers, particularly the Stewart River where the ice conditions limited the ability to see spawning chum. All open water areas within river channel were surveyed, although an emphasis was placed on side channel habitats where groundwater discharge areas were present (known preferred spawning areas for chum salmon on large Yukon rivers).





Legend

- ● Settlement/Community
- ━ Highway
- ━ Proposed Route
- 🟥 Encroachment Areas - Stewart River Back Channel

Fish Sampling Type

- ▲ Beach Seine
- ⬠ Minnow Trap

FIGURE: 10

Fish sampling sites for proposed barge landings

Data Sources
1:50,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Model and 1:50,000 National Topographic Database (NTDB) provided by Geomatics Yukon - www.geomaticsyukon.ca.

Aerial imagery courtesy of Kaminak gold Corporation.

Survey data collected by Environmental Dynamics Inc. (EDI). 2016. Locations obtained using Garmin GPS technology.

Disclaimer
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KM

Map Reference Scale: 1:250,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

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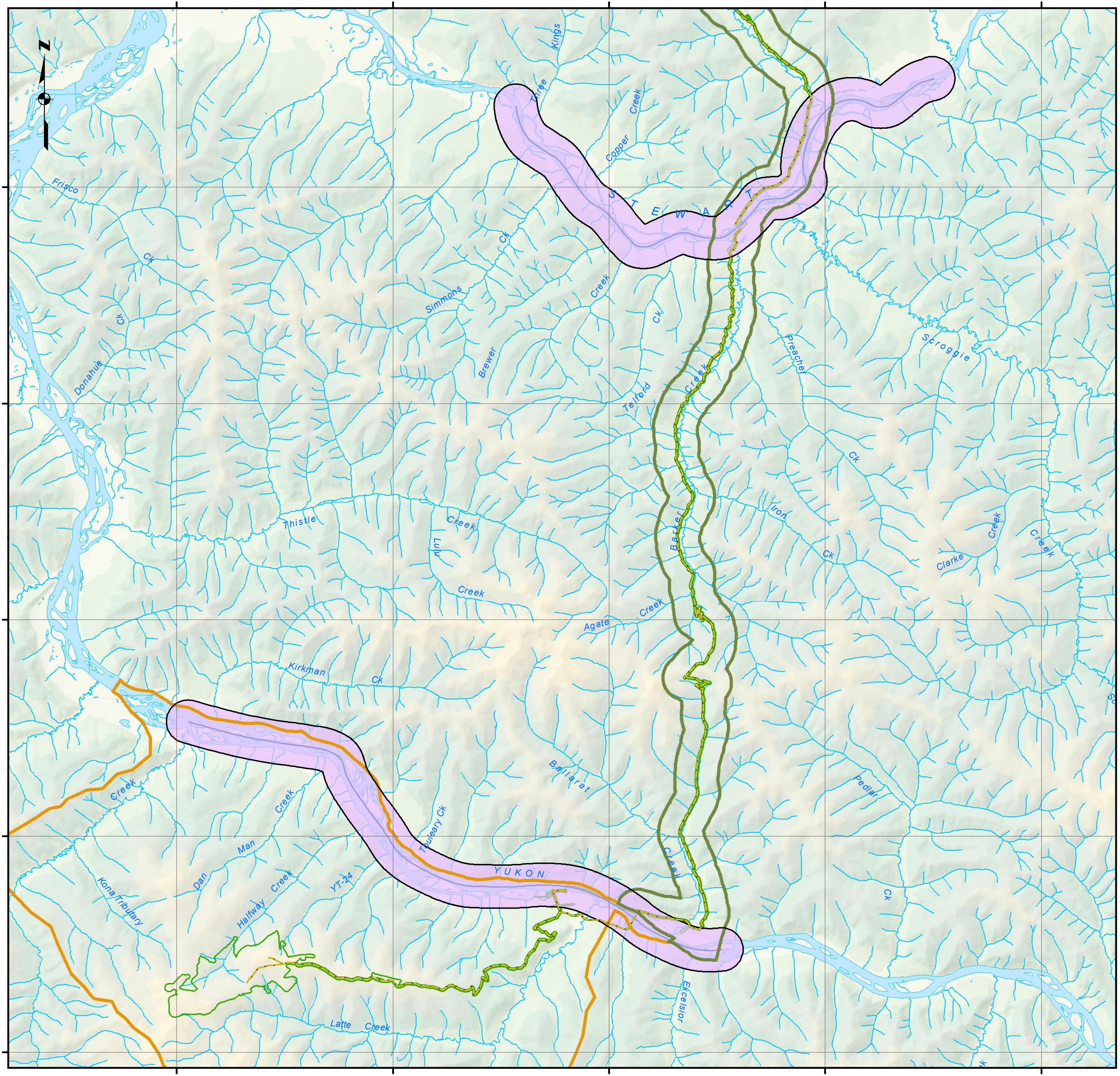

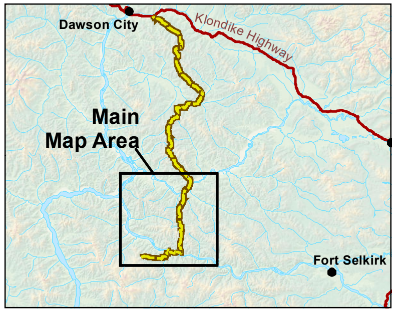

Legend

- ● Settlement/Community
- Proposed Route
- Chum Spawning Survey Extent (Stewart and Yukon Rivers)
- Project Footprint

Aquatic Local Study Areas

- Mine Study Area
- NAR Study Area

FIGURE: 11

October 2016 chum slamon spawning survey extent in the NAR study area

Data Sources
1:250,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Model and 1:250,000 National Topographic Database (NTDB) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

Survey flight tracks (Chinook salmon spawning survey extent) were recorded by EDI Environmental Dynamics Inc. on August 18 and 20, 2016.

Disclaimer
This document is not an official land survey and the spatial data presented is subject to change. Project data displayed is site specific.

0 1 2 3 4 5
KM

Map Reference Scale: 1:200,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

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3 RESULTS – MINE STUDY AREA

The results from all fish and aquatic resource data collected in the Mine study area are synthesized in the following sections. Where results are detailed by date and are not otherwise referenced, the following reference sources apply:

- This report (2016 data);
- PECG 2017 (2014 and 2015 data);
- PECG 2016 (2015 NAR specific data);
- ACG 2014 (2013 data);
- Laberge and White Mountain 2010 and 2002 (2012 and 2001 data, respectively);
- White Mountain (2000 data); and,
- Traditional Knowledge.

3.1 BIOPHYSICAL CHARACTERISTICS OF STREAMS (OVERVIEW)

The biophysical characteristics of the creeks in the Mine study area that were measured from 2014 and 2016 are summarized in Table 10. Other than recent mining exploration for the Project, the watersheds associated with the Mine study area have not been subject to development and as such the streams/watersheds are in an unaltered state. Fish habitat quality varies between and within watersheds, with the most complex and high quality habitat being located in Coffee and Independence creeks. These low gradient streams have moderate size (mean channel widths range of 12 to 25 m; Table 10) with riffle-pool morphologies and primarily a gravel dominated bed. Deep pools (>1 m) are also found in Coffee and Independence creeks. Latte, Halfway and YT-24 creeks have substantially smaller channel widths, no deep pools (>1 m) and higher gradients, especially at sampling stations further upstream in the watersheds. Additional information on biophysical characteristics on streams around the Mine can be found in PECG (2017), APPENDIX B and in sections 3.4 and 5 of this report.

Table 10. Summary of biophysical characteristics of small watersheds associated with Coffee Project, data from PECG 2017 and from 2016 field studies.

Stream Name (Sampling Station)	Mean Channel Width (m)	Mean Channel Gradient (%)	Deep Pools (>1m)	Substrate Type		Total Stream Cover
				Dominant	Subdominant	
Yukon River	~500	0	Y	-	-	-
Coffee Creek (CF3.9)	14.90	1	Y	gravels	cobbles / fines	Moderate
Coffee Creek (CF5.9)	22.08	2	Y	gravel	cobble	Moderate
Coffee Creek (CF8.0)	18.43	2	Y	gravel	cobble	Abundant
Coffee Creek (CF10.0)	24.55	2.5	Y	cobble	gravel	Moderate
Latte Creek (LC2.7)	5.86	2	N	cobble	gravel	Moderate
Latte Creek (LC9.9)	2.83	3	N	boulder	cobble	Moderate
Latte Creek (LC10.4)	3.81	7	N	cobble	boulder	Moderate
Latte Creek (LC11.8)	4.00	11	N	boulder	cobble	Abundant
Latte Creek, Tributary C (LCC0.2)	1.01	13.5	N	fines	gravel	Moderate
Independence Creek (ID1.9)	12.21	2	Y	gravel	cobble	Abundant
Independence Creek (ID6.7)	23.23	2	Y	gravel	cobble	Moderate
Kona Creek Tributary (KT0.1)	3.05	1	N	gravel	fines	Abundant
Kona Tributary (KT5.2)	2.23	8	N	boulder	cobble	Abundant
Halfway Creek (HF0.0)	4.03	2	N	cobble	gravel	Moderate
Halfway Creek (HF0.2)	4.80	2.3	N	cobble	gravel	Moderate
Halfway Creek (HF8.8)	2.60	10.5	N	boulder	cobble	Trace
Halfway Creek (HF9.3)	2.47	10	N	boulder	cobble	Moderate
YT-24 Creek (YT0.0)	4.20	8	N	cobble	boulder	Moderate
YT-24 Creek (YT0.2)	4.08	4	N	cobble	gravel	Moderate
YT-24 Creek (YT4.6)	2.83	9	N	cobble	boulder	Trace
YT-24 Creek (YT5.0)	1.87	11	N	boulder	cobble	Moderate

3.2 WINTER ICE COVERAGE EXTENT

Aerial video of Coffee, Latte, YT-24, Halfway and Latte Tributary C creeks that was collected in March 2016 showed that that majority of these watercourses were generally completely ice covered at the time of the overflights. Coffee Creek was the only creek where open water was observed. Varying amounts of aufeis formation (evidenced by snow free ice cover, and blue or brown tinged ice cover) were observed in all creeks, particularly in the lower reaches of YT-24 and Halfway creeks. Ice coverage extent is detailed for each stream in the following sections.

3.2.1 COFFEE CREEK

The aerial video collected on Coffee Creek included the full length of the creek within the Mine study area; this included filming the creek from the confluence with the Yukon River to a linear distance of approximately 11 km upstream. Small, discontinuous areas of open water were observed in several areas in the lower 5 km of the creek (linear distance). This included a number of open water areas in the vicinity of the confluence with the Yukon River, as well as station CF2.7 (Photo 1), where several minnow traps were set in these areas of open water. A narrow area of open water was observed approximately 5 km upstream of the confluence with the Yukon River (Photo 2). Several small and discontinuous areas of 'overflow' or aufeis were observed in Coffee Creek, most notably in two straight and partially confined sections of the creek located approximately 4 km and 6.5 km (Photo 3) upstream of the Yukon River confluence. A small area of open water was also observed in the vicinity of sampling station CF10.0. The remainder of the surface of Coffee Creek was fully ice covered, including all areas upstream of the Latte Creek confluence.

Photo 1. Aerial view of site Coffee Creek sampling station CF2.7, showing winter open water leads; March 15, 2016. Photo blur due to motion of helicopter.

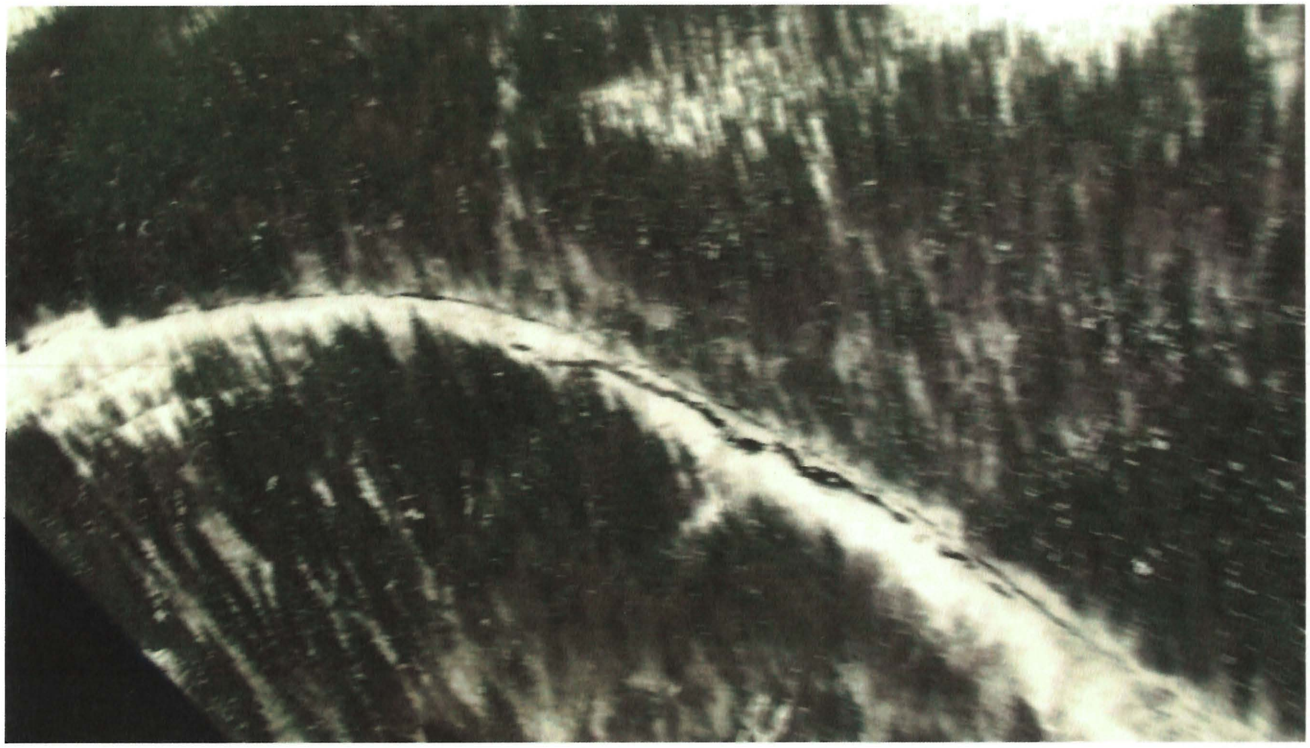


Photo 2. Aerial view of winter open water lead on Coffee Creek approximately 5 km upstream from the Yukon River confluence; March 15, 2016. Photo blur due to motion of helicopter.

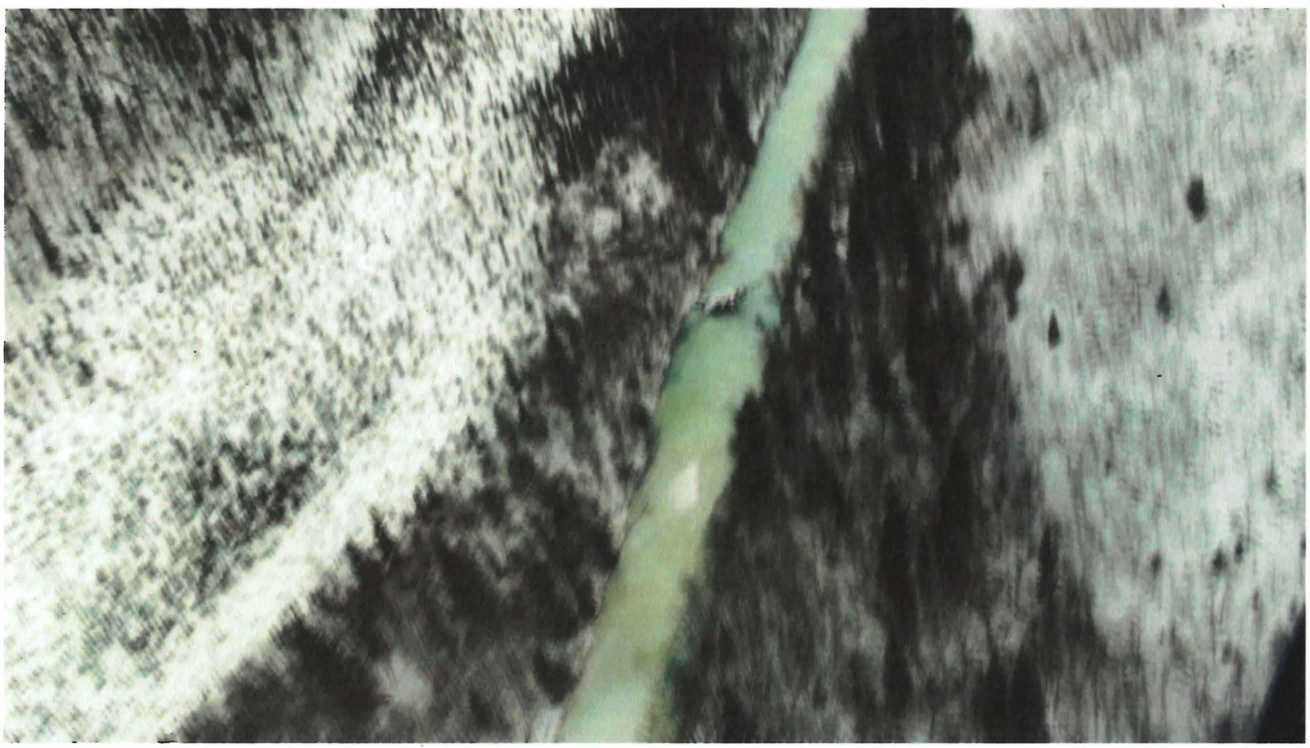


Photo 3. Aerial view of aufeis on Coffee Creek, approximately 5 km upstream of the confluence with the Yukon River.

3.2.2 LATTE CREEK

The aerial video collected on Latte Creek included filming from the confluence with the Coffee Creek to the confluence with Latte Creek Tributary C. No open water areas were observed, and the channel was fully ice covered. Discontinuous aufeis was observed throughout the creek (Photo 4).

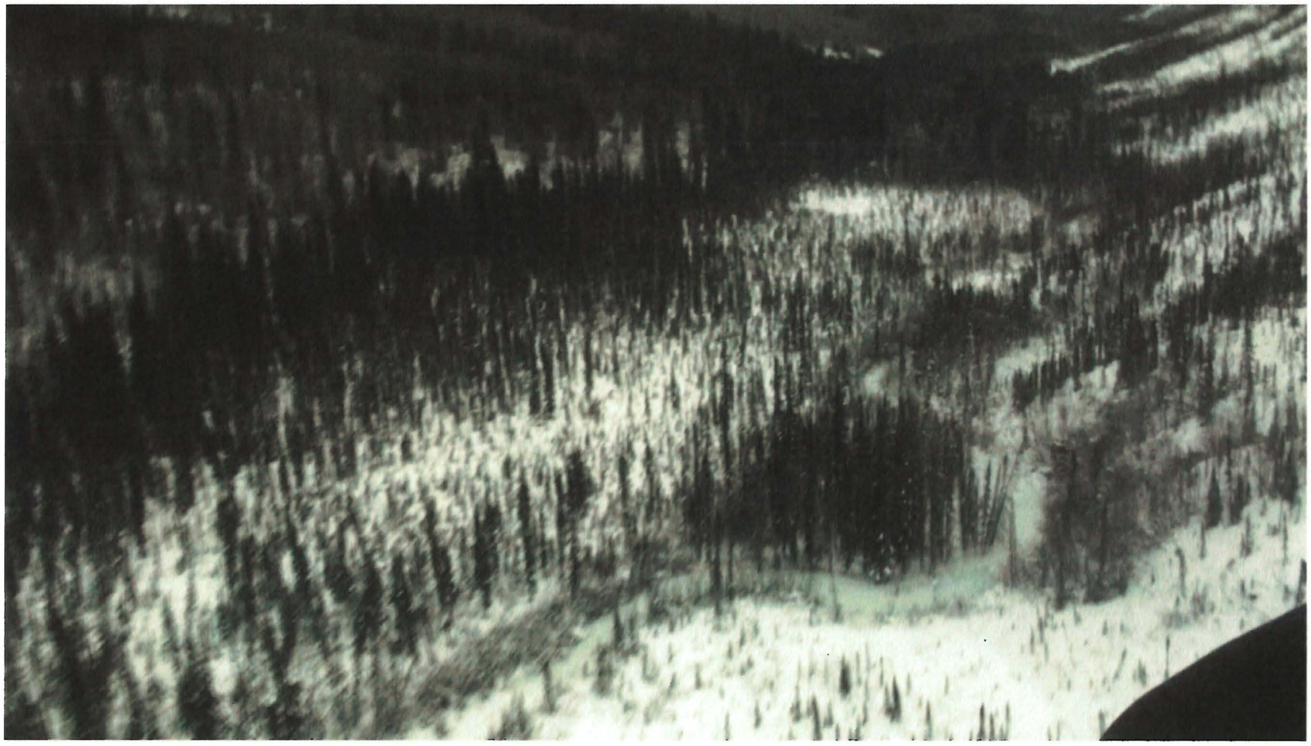


Photo 4. Aerial view of aufeis on Latte Creek.

3.2.3 LATTE CREEK TRIBUTARY C

The aerial video collected on Latte Creek Tributary C included filming from the confluence with the Latte Creek to the headwaters of the tributary. No open water areas were observed, and the small channel width was fully ice covered. A small area of 'overflow' or aufeis was observed approximately 600 m upstream of the confluence with Latte Creek (Photo 5).

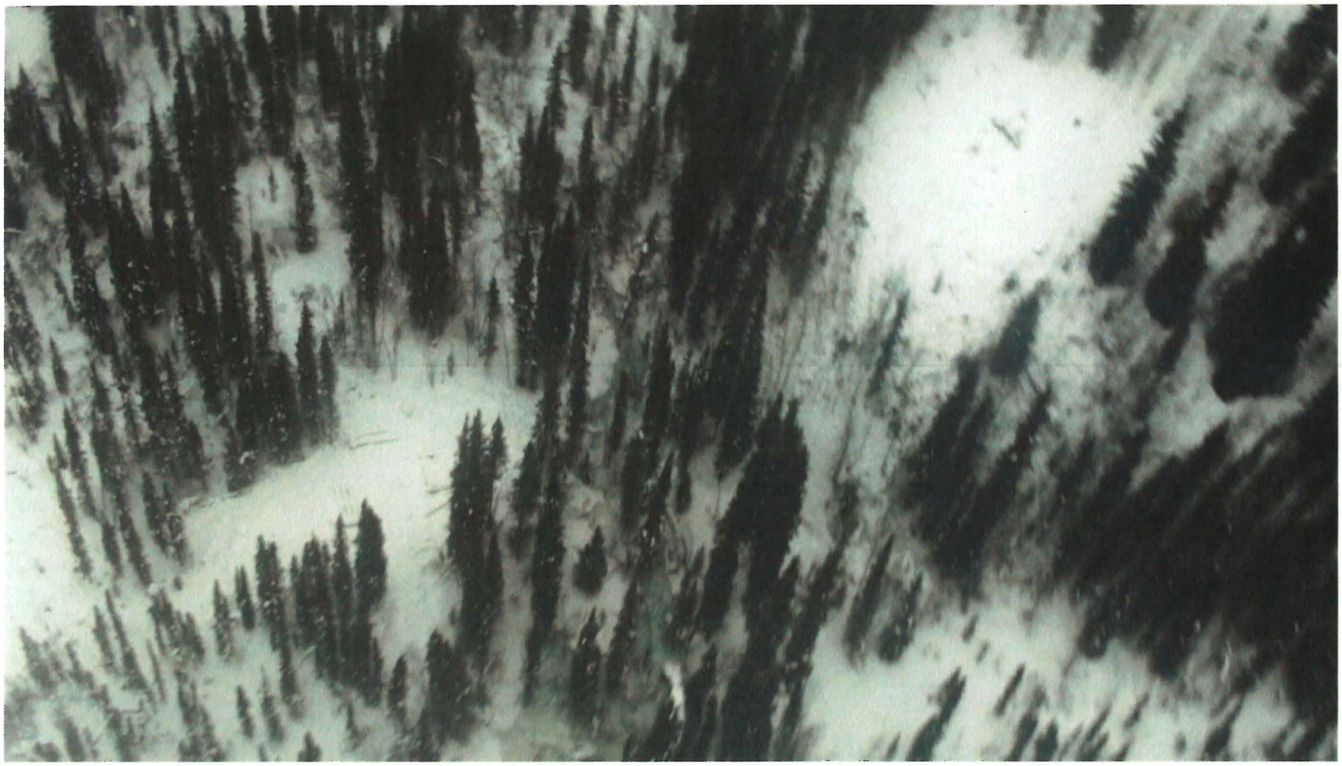


Photo 5. **Aerial view of aufeis area on Latte Creek Tributary C, approximately 600 m upstream of the Latte Creek confluence; March 15, 2016.**

3.2.4 YT-24 CREEK

The aerial video collected on YT-24 Creek included filming from the confluence with the Yukon River to the headwaters of the creek. Much of the lower 3 km of the creek channel is heavily forested along the stream banks, and the creek channel was difficult to observe from the air in this portion of the creek. No open water areas were observed, and the small channel width was fully ice covered. A substantial area of aufeis was observed approximately 3 km upstream of the confluence with the Yukon River (Photo 6), and it appeared that the area of aufeis extended beyond the banks of the creek channel.

Photo 6. Aerial view of aufeis formation on YT-24 Creek, approximately 3 km upstream of the Yukon River confluence; March 15, 2016.

3.2.5 HALFWAY CREEK

The aerial video collected on Halfway Creek included filming from the confluence with the Yukon River to the headwaters of the creek. No open water areas were observed, and the channel was fully ice covered. Discontinuous aufeis was observed throughout the Halfway Creek mainstem (Photo 7), but was not observed in smaller first order tributaries.

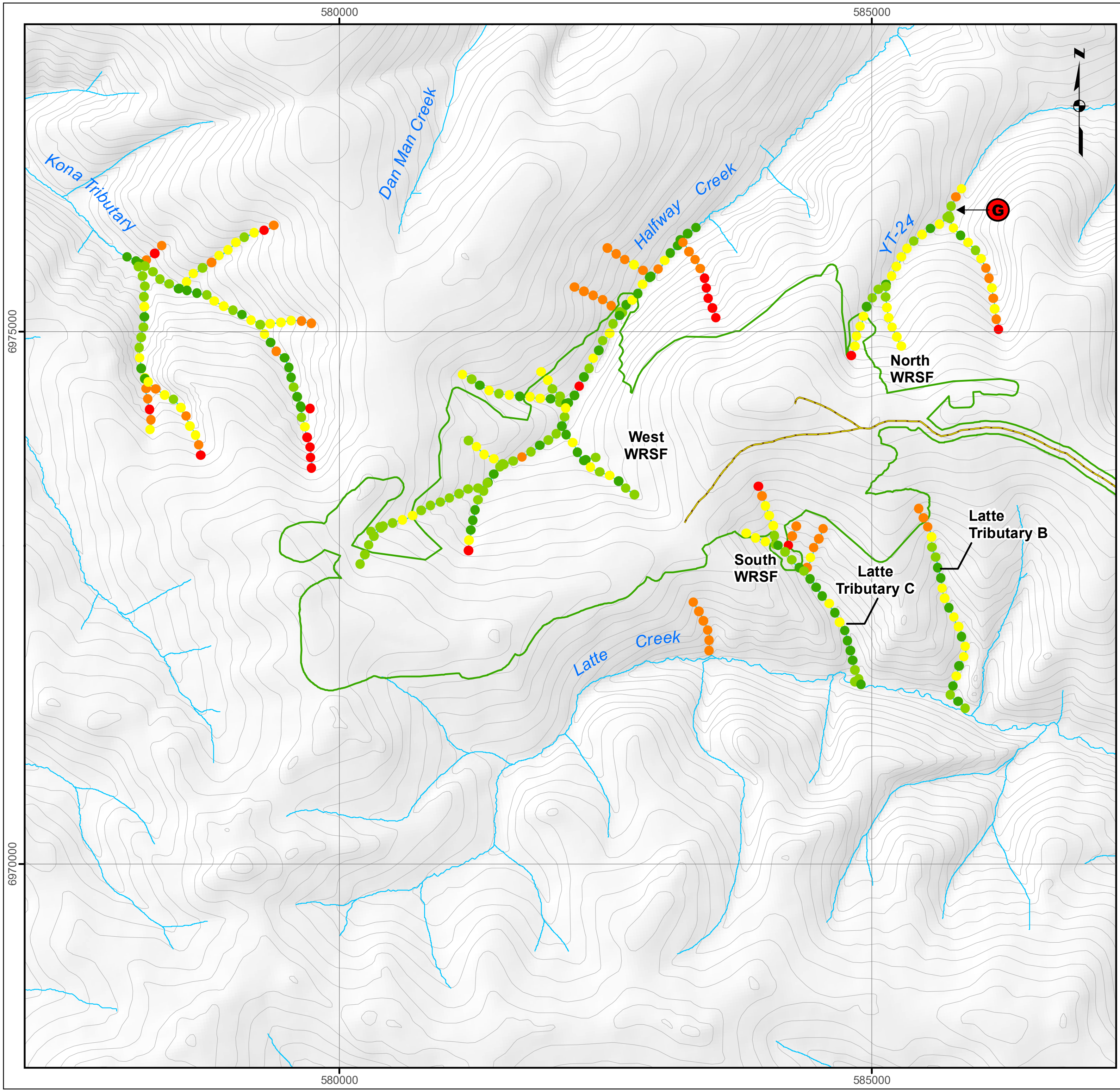
Photo 7. **Aerial view of aufeis formation on Halfway Creek, approximately 2 km upstream of the confluence with the Yukon River; March 15, 2016.**

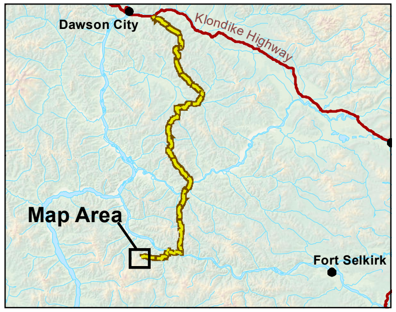
3.3 STREAM GRADIENT MODELLING

The 2016 modelling of gradients in the small streams in the vicinity of the Project infrastructure indicates that portions of these streams have gradients that can be prohibitive to fish migration and use. Considering stream gradients independently of other variables, the British Columbia Fish Stream Identification Guidebook (BC MOF 1998) indicates that stream gradients greater than 20% for 100 m or greater can be considered barriers to all fish species.

Due to identified interactions with the Mine footprint, the primary focal streams for the gradient modelling included Latte Creek tributaries B and C and the upper portion of the YT-24 and Halfway Creek watersheds (Figure 12). On Latte Creek Tributary C, modelled stream gradients are commonly within the range of 8 to 16% and higher in the watershed there are sections with gradients in excess of 17% and some gradients over 20%.

The stream gradient modelling indicates that upper Halfway Creek has a number of high gradient sections which likely preclude fish presence in this portion of the watershed. The upper portion of YT-24 Creek has a relatively steep gradient, almost exclusively in excess of 12%. A field verified gradient barrier of 30% has also been documented by PECG (2017) near an area where the modelled gradient data shows an area of greater than 20%.





Legend

G	Field Documented Fish Passage Barrier (Gradient)
—	Proposed Route
☐	Project Footprint (as of March 10, 2017)

Stream Gradients in the Coffee Property (100 m intervals)

●	up to 8% Stream Gradient
●	8% – 12% Stream Gradient
●	12% – 16% Stream Gradient
●	16% – 19% Stream Gradient
●	20%+ Stream Gradient

FIGURE: 12

Gradients of focal streams within the Coffee Property as derived by LiDAR imagery

Data Sources
1:50,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Model and 1:250,000 National Topographic Database (NTDB) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

Stream gradients were developed by EDI using a watercourse layer that was produced digitally by Kaminak using LiDAR imagery. EDI does not gaurantee any accuracy of the data.

Disclaimer
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0 0.5 1 1.5 2
KM

Map Reference Scale: 1:50,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

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3.4 FISH DISTRIBUTION

Chinook salmon (juvenile), Arctic grayling, slimy sculpin and chum salmon have been captured or documented in Mine study area sampling stations during sampling conducted in 2000, 2001, 2010, 2013, 2014, 2015 and 2016 (Table 11; APPENDIX C). More detailed information is described for each stream in the following subsections.

Table 11. Summary of fish species documented in the Mine study area during baseline studies.

Station	Location	Years Sampled	Documented Fish Species	Season of Fish Capture or Observation
-	Yukon River	2016	Refer to Table 12	n/a
CF0.5	Coffee Creek near Yukon River	2000, 2001, 2010, 2016 –winter only	CH, CCG, GR	Summer and Winter
CF2.7	Coffee Creek below Latte Creek	2013, 2016 – winter only	CH, CCG	Summer and Winter
CF3.9	Coffee Creek below Latte Creek	2014, 2015, 2016	CH, CCG, GR	Summer
CF5.7	Coffee Creek below Latte Creek	2014, 2015	CH, GR	Summer
CF8.0	Coffee Creek below Latte Creek	2016	CCG	Winter
CF8.3	Coffee Creek near Latte Creek	2013, 2014, 2015	CH, CCG, GR	Summer
CF10.0	Coffee Creek above Latte Creek	2016	CCG, GR	Summer and Winter
LaC4.8	Los Angeles Creek	2015, 2016	CH, GR, RW[1]	Summer
LC0.5	Latte Creek near Coffee Creek	2013, 2014, 2015, 2016 – winter only	CCG, GR[2]	Summer
LC1.6	Lower Latte Creek	2016 – winter only	No fish captured	-
LC2.7	Lower Latte Creek	2014, 2015, 2016	GR	Summer
LC9.9	Upper Latte Creek	2015, 2016	GR[1]	Summer
LC10.4	Upper Latte Creek	2014	No fish captured	-
LC11.8	Upper Latte Creek	2014, 2015	No fish captured	-
LCC0.0	Latte Creek tributary C	2016	No fish captured	-
LCC0.2	Latte Creek tributary C	2016	No fish captured	-
LCC0.3	Latte Creek tributary C	2016	No fish captured	-
HF0.0	Lower Halfway Creek	2014, 2015	GR	Summer
HF0.2	Lower Halfway Creek	2013, 2016	CH, GR	Summer
HF0.9	Lower Halfway Creek	2016	No fish captured	-
HF6.3	Upper Halfway Creek	2013, 2016	No fish captured	-
HF8.8	Upper Halfway Creek	2016	No fish captured	-
HF9.3	Upper Halfway Creek	2014, 2015	No fish captured	-
HFA0.1	Trib to Halfway	2016	No fish captured	-

Station	Location	Years Sampled	Documented Fish Species	Season of Fish Capture or Observation
YT0.0	Lower YT-24 Creek at mouth	2014, 2015, 2016	CCG[3]	Summer
YT0.2	Lower YT-24 Creek	2016	No fish captured	-
YT0.6	Lower YT-24 Creek	2016	No fish captured	-
YT0.9	Lower YT-24 Creek	2016	No fish captured	-
YT1.3	Lower YT-24 Creek	2016	No fish captured	-
YT4.6	Upper YT-24 Creek	2016	No fish captured	-
YT5.0	Upper YT-24 Creek	2014, 2015	No fish captured	-
ID0.0	Independence Creek at Yukon R.	2013	CCG	Summer
ID1.9	Lower Independence Creek	2013, 2014, 2015, 2016	CH, CCG, GR	Summer
ID6.7	Upper Independence Creek	2014, 2015	CH, CCG	Summer
IC7.5	Upper Independence Creek	2013	CH	Summer
KT0.1	Lower Kona Tributary	2014, 2015	GR	Summer
KT5.2	Upper Kona Tributary	2014, 2015	No fish captured	-
IS0.1	Isaac Creek	2014, 2015	GR, CH, CCG, BB, LSU, AL	Summer

Fish species codes: CM =Adult chum salmon, CH = Chinook salmon (juvenile), CCG = slimy sculpin, GR = Arctic grayling, AL = Arctic Lamprey, LSU = longnose sucker, BB = burbot, RW = round whitefish.

[1] Round whitefish were added to the fish species at this site during fish tissue sampling during 2016.

[2] Arctic grayling were observed but not captured at this site.

[3] Slimy sculpin were captured in the lower 50 m of the creek, which was back flooded by the Yukon River at the time of sampling.

3.4.1 YUKON RIVER

Traditional Knowledge (TK) and Current Land Use information provides information on fish species that can be found in the Yukon River and speaks to fish species of interest to First Nations and local Yukon residents. TK identifies whitefish (various species), burbot (*Lota lota*), northern pike (*Esox Lucius*), Arctic grayling and Chinook and chum salmon in the Yukon River within the study areas (Bates et. al. 2014, TH 2012, DRPC 2013; Interview 14, Pers. Comm. 2016). This species assemblage is supported by fish sampling during 2016 and is supplemented by the information in the Yukon FISS database of fish species that have been documented in the Yukon River and could potentially be present in the study areas (Table 12).

Table 12. Documented Yukon River fish species that may potentially occur in the study areas (data from DFO 2016).

Category	Common Name[1]	Scientific Name
Salmon species	Chinook salmon *	*Oncorhynchus tshawytscha*
	chum salmon *	*Oncorhynchus keta*
Freshwater fish species	Arctic grayling *	*Thymallus arcticus*
	broad whitefish	*Coregonus nasus*
	lake whitefish	*Coregonus clupeaformis*
	burbot *	*Lota lota*
	inconnu	*Stenodus leucichthys*
	northern pike *	*Esox lucius*
	least cisco	*Coregonus sardinella*
	longnose sucker *	*Catostomus catostomus*
	lake chub *	*Couesius plumbeus*
	slimy sculpin *	*Cottus cognatus*
	round whitefish	*Prosopium cylindraceum*
	Arctic lamprey	*Lethenteron camtschaticum*

[1] Species denoted with an '*' were documented in the Yukon River during 2016 sampling associated with barge landing assessments or spawning assessments. Refer to Section 4.2 for additional information.

Aerial surveys to attempt to document Chinook salmon spawning in the Yukon River within the study areas in July and August 2013 (ACG 2014) and July 2015 (PECG 2017) did not document any spawning activity. Aerial surveys to attempt to document chum spawning salmon in the Yukon River were conducted in September and October 2013 (ACG 2014), 2014 (PECG 2017) and 2016 (this report). Spawning was documented in groundwater fed side channels in both 2013 and 2016. Additional details are provided in Section 4.2.1.

3.4.2 COFFEE CREEK

Juvenile Chinook salmon, Arctic grayling, and slimy sculpin have been documented in Coffee Creek throughout the Mine study area. Juvenile Chinook salmon were captured downstream of the confluence with Latte Creek via minnow trapping (in 2000, 2001, 2010, 2014, 2015 and winter 2016) and electrofishing (2001 and 2010; Table 13). Arctic grayling were captured via angling, electrofishing, beach seining and to a lesser extent, via fyke netting. Upstream of the Latte Creek confluence, sampling during 2016 documented both slimy sculpin and Arctic grayling. Slimy sculpin were captured throughout Coffee Creek via electrofishing, minnow trapping and beach seining. Tr'ondëk Hwëch'in TK indicates that Chinook salmon used to spawn up Coffee Creek (TH 2012); however, recent aerial surveys to attempt to locate Chinook salmon spawning in Coffee Creek in 2000 (sampling month not specified), July 2001, August 2014, July 2015, August 2015 and August 2016 did not report any evidence of spawning. An aerial for chum salmon spawning in October 2014 also did not report any observed spawning activity for this species in Coffee Creek.

Table 13. Baseline fish sampling and capture data in Coffee Creek from 2014 to 2016, ordered by sampling site from downstream to upstream-most site (open water season only).

Sampling Site	Sample Date	Sampling Methods	Total Sampling Effort	Fish Captured
CF3.9	Aug 2014	Minnow Trapping	243.3 trap hours	Chinook salmon (122 juveniles), Slimy sculpin (3)
CF3.9	Aug 2014	Electrofishing	1,457 seconds	Slimy sculpin (24), Chinook salmon (10 juveniles)
CF3.9	Aug 2014	Angling	2 hours	Arctic grayling (1)
CF3.9	Aug 2014	Fyke Net	53.8 trap hours	Arctic grayling (6), Chinook salmon (3 juveniles)
CF3.9	Oct 2014	Minnow Trapping	126.3 trap hours	Chinook salmon (25 juveniles), Slimy sculpin (1)
CF3.9	June 2015	Angling	3.8 hours	Arctic grayling (6)
CF3.9	June 2015	Minnow Trapping	121.25 trap hours	Slimy sculpin (3)
CF3.9	July 2015	Angling	2.5 hours	Arctic grayling (12)
CF3.9	July 2015	Minnow Trapping	132.9 trap hours	Chinook salmon (8 juveniles)
CF3.9	July 2015	Fyke Net	23.1 trap hours	Chinook salmon (1 juvenile)
CF3.9	July 2016	Electrofishing	5,324 seconds	Chinook salmon (3 juveniles), Slimy sculpin (144)
CF3.9	July 2016	Angling	1.3 hours	None
CF5.7	Aug 2014	Minnow Trapping	237.5 trap hours	Chinook salmon (72 juveniles) Slimy sculpin (1)
CF5.7	Oct 2014	Minnow Trapping	125 trap hours	Chinook salmon (30 juveniles) Slimy sculpin (2)
CF5.7	June 2015	Angling	3 hours	Arctic grayling (2)
CF5.7	June 2015	Minnow Trapping	112.5 trap hours	Slimy sculpin (2)
CF5.7	July 2015	Angling	1.5 hours	Arctic grayling (7)
CF5.7	July 2015	Minnow Trapping	99.6 trap hours	Chinook salmon (2 juveniles), Slimy sculpin (1)
CF5.7	July 2015	Fyke Net	26 trap hours	None
CF8.0	Aug, 2014	Minnow Trapping	271.7 trap hours	Chinook salmon (62 juveniles), Slimy sculpin (4)
CF8.0	Oct 2014	Minnow Trapping	125 trap hours	Chinook salmon (16 juveniles), Slimy sculpin (3)
CF8.0	July 2015	Minnow Trapping	123.8 trap hours	Arctic grayling (1), Chinook salmon (14 juveniles), Slimy sculpin (4)
CF8.0	July 2015	Fyke Net	23.92 trap hours	None
CF8.0	Aug 2014	Fyke Net	46.6 trap hours	Arctic grayling (3) Slimy sculpin (3)
CF8.0	Aug, 2014	Electrofishing	1,118 seconds	Slimy sculpin (31)
CF8.0	July 2015	Electrofishing	942 seconds	Slimy sculpin (6)
CF8.0	July 2015	Fyke Net	23.9 trap hours	None
CF8.0	July 2015	Angling	3.8 hours	Arctic grayling (20)
CF10.0	July 2016	Electrofishing	4,616	Arctic grayling (9), Slimy sculpin (34)
CF10.0	July 2016	Angling	0.5 hours	Arctic grayling (3)

3.4.3 LATTE CREEK

In Latte Creek, Arctic grayling and slimy sculpin were documented in 2014, 2015 and 2016 (grayling only; Table 14). Slimy sculpin were captured only at the most downstream station (LC0.5), near the confluence with Coffee Creek (within 50 m). Further upstream, Arctic grayling were captured in moderate numbers at station LC2.7, with an approximate population estimate of 6 Arctic grayling/100 m^2 in 2014, and 10 Arctic grayling/100 m^2 in 2015 (±2 grayling, 90% confidence intervals for both years; PECG 2017). No fish were captured upstream of station LC2.7 (including at stations LC9.9, LC10.4 and LC11.8); however, one adult Arctic grayling was observed at station LC9.9 during the summer of 2015. None were captured or observed during 2016.

Table 14. Baseline fish sampling and capture data in Latte Creek from 2013 to 2016, ordered by sampling site from downstream to upstream-most site (open water period only).

Sampling Site	Sample Date	Sampling Methods	Total Sampling Effort	Fish Captured
LC0.5	July 2015	Minnow Trapping	240 trap hours	Slimy sculpin (1)
LC0.5	June 2015	Electrofishing	1,839 seconds	Arctic grayling (5) Slimy sculpin (3)
LC0.5	July 2015	Electrofishing	1,309 seconds	Arctic grayling (1) Slimy sculpin (1)
LC0.5	Sept 2015	Electrofishing	1,100 seconds	Arctic grayling (1) Slimy sculpin (1)
LC0.5	Oct 2014	Fyke Netting	25.8 trap hours	Slimy sculpin (7) Arctic grayling (1)
LC0.5	Sept 2015	Minnow Trapping	110.4 trap hours	None
LC2.7	Aug 2014	Minnow Trapping	118.4 trap hours	None
LC2.7	Aug 2014	Electrofishing	2,898 seconds	Arctic grayling (20)
LC2.7	June 2015	Electrofishing	1,278 seconds	Arctic grayling (11)
LC2.7	July 2015	Electrofishing	3,151 seconds	Arctic grayling (39)
LC2.7	July 2016	Electrofishing	3,108 seconds	Arctic grayling (7)
LC9.9	June 2015	Electrofishing	870 seconds	None
LC9.9	July 2015	Electrofishing	854 seconds	None
LC9.9	July 2016	Minnow Trapping	216 trap hours	None
LC10.4	Aug 2014	Minnow Trapping	58 trap hours	No fish captured
LC11.8	Aug 2014	Minnow Trapping	55 trap hours	No fish captured
LC11.8	June 2015	Electrofishing	768 seconds	No fish captured
LC11.8	July 2015	Electrofishing	835 seconds	No fish captured

3.4.4 LATTE CREEK TRIBUTARY B

Latte Creek Tributary B was visited in July 2016. This tributary was dewatered at its confluence with Latte Creek at the time of the field visit and had no potential to support fish of any kind. Small areas of discontinuous pooled water were present in the lower 100 m of the watercourse, potentially from recent precipitation. Considerable amounts of terrestrial vegetation were present in this seasonal drainage and alluvial bed material was discontinuous (Photo 8). Further upstream the dry drainage narrowed and two hard barriers were documented with drops of 0.5 and 0.6 m, respectively. Gradients of 16 and 21% were measured in this portion of the watercourse. This is not a stream, rather a seasonal seepage area.

Photo 8. Latte Creek Tributary B lacking continuous channel and alluvial material.

3.4.5 LATTE CREEK TRIBUTARY C

This small tributary was not sampled for fish previous to 2016. Minnow trapping and electrofishing was completed in the lower 300 m of the stream in July 2016, no fish were captured (Table 15).

The lower 15 m of this stream is influenced by back flooding from Latte Creek (Photo 9). A 1 m high cascade over organics is present 15 m upstream of the mouth (Photo 10). Between this drop and 100 m from the mouth the channel is often poorly defined with a discontinuous alluvial bed (Photo 11). Upstream of the first 100 m, channel banks and alluvial bed material re-establish; however, the channel is narrow (~0.6 m channel width) with maximum residual pool depths of 0.13 m and numerous (non-permanent) drops over organic material up to 0.65 m (Photo 12). The average stream gradient of Tributary C between 100 m and

200 m from the confluence with Latte Creek was 13.5%. Moving upstream in the watershed gradients increase and the channel becomes narrower.

Table 15. Baseline fish sampling and capture data in Latte Creek Tributary C, ordered by sampling site from downstream to upstream-most site.

Sampling Site	Sample Date	Sampling Methods	Total Sampling Effort	Fish Captured
LCC0.0	July 2016	Minnow Trapping	69.5 trap hours	None
LCC0.0	July 2016	Electrofishing	105 seconds	None
LCC0.2	July 2016	Minnow Trapping	57.1 trap hours	None
LCC0.2	July 2016	Electrofishing	509 seconds	None
LCC0.3	July 2016	Electrofishing	114 seconds	None

Photo 9. Downstream view of lower 15 m of Latte Tributary C. Note Latte Creek in the background and cascade at the lower portion of the photo.

Photo 10. One metre high cascade located 15 m upstream from the mouth of the stream.

Photo 11. Poorly defined channel in the lower 100 m of the Latte Creek Tributary C.

Photo 12. Upstream view of Latte Creek Tributary C in in the section 100-300 m upstream of the mouth.

3.4.6 HALFWAY CREEK

Halfway Creek has been sampled from 2013 to 2016 via a combination of minnow trapping and electrofishing (Table 16). Sampling near the confluence with the Yukon (HF0.0) resulted in the capture of one Arctic grayling in 2014 and 2015 and twenty slimy sculpin in 2016 (sculpin were captured in an area backwatered by the Yukon River). In the lower part of Halfway Creek, upstream of the mouth (HF0.2), no fish were captured in July 2016 or four sampling events in 2013, but twenty juvenile Chinook salmon and one Arctic grayling were captured in August 2016 in the lower 350 m of the stream. No fish were captured from 350-800 m of the mouth during the same sampling event.

Upstream of station HF0.2, the stream gradient of Halfway Creek begins to increase, the stream channel narrows and a number of small drops are present, including a 1.05 m drop over a large log jam at station HF0.9 (Photo 13). The water drops onto a log before dropping to the streambed, the plunge pool at the bottom of the drop has a depth of 0.4 m. This obstruction exceeds the jumping ability of adult Arctic grayling and juvenile Chinook salmon (Parker 2000). Electrofishing conducted in July 2016 immediately downstream and upstream of this drop did not capture any fish.

In the middle reaches of Halfway Creek (HF6.3) the stream channel gradient increases to an average of 10%, the channel narrows to approximately 2 m and residual pool depths are 0.17 m or less. Fish habitat is limited by fast flow and lack of deep pool habitat. Similar gradients and habitat extend up to stations HF8.8 and HF9.3. A field verified channel gradient of 21.3% over a distance of 100 m was documented in July

2016 in the headwaters of Halfway Creek at station HFA0.1. Fish sampling at station HF6.3, HF8.8, HF9.3 and HFA0.1 has included 3,205 seconds of electrofishing and 228 minnow trap hours (Table 16, not including winter sampling) and no fish have been captured at any of these sites.

Table 16. Baseline fish sampling and capture data in Halfway Creek from 2013 to 2016, ordered by sampling site from downstream to upstream-most site (open water season only).

Sampling Site	Sample Date	Sampling Methods	Total Sampling Effort	Fish Captured
HF0.0	August 2014	Electrofishing	653 seconds	1 Arctic grayling
HF0.0	June and July 2015	Electrofishing	1,421 seconds	1 Arctic grayling
HF0.0	August 2016	Electrofishing	97 seconds	20 slimy sculpin (in area backwatered by Yukon River)
HF0.2	July, August, September, October 2013	Minnow Trapping	185.2 trap hours	None
HF0.2	July 2016	Electrofishing	829 seconds	None
HF0.2	July 2016	Minnow Trapping	128.3 trap hours	None
HF0.2	August 2016	Electrofishing	2,084 seconds (600 m lineal length)	20 juvenile Chinook salmon, 1 Arctic grayling (all fish captured in the lower 350 m of stream)
HF0.9	July 2016	Electrofishing	287 seconds (210 of which upstream of falls)	None
HF6.3	July, August, September, October 2013	Minnow Trapping	175.9 trap hours	None
HF6.3	July 2016	Electrofishing	211 seconds	None
HF6.3	August 2016	Electrofishing	1,107 seconds	None
HF8.8	July 2016	Electrofishing	201 seconds	None
HF9.3	August 2014	Minnow Trapping	52.2 trap hours	None
HF9.3	June and July 2015	Electrofishing	1,741 seconds	None
HFA0.1	July 2016	Electrofishing	156 seconds	None

Photo 13. Field crew member standing downstream of a 1.05 m drop on Halfway Creek at station HF0.9, July 2016.

3.4.7 YT-24

Slimy sculpin are the only fish species that have been captured in YT-24 Creek. Five slimy sculpin were captured within 50 m of the Yukon River in 2015, which was back-flooded into the creek at the time of sampling (at station YT0.0; Table 17). In August 2016, twenty slimy sculpin were captured at this same sampling station; back-flooding by the Yukon River was also occurring during this sampling event. No fish were captured at the mouth of YT-24 in August 2014 or July 2016.

Upstream of the stream mouth, no fish have been captured by electrofishing and minnow trapping conducted in the lower reaches of the YT-24 (YT0.2, YT0.6, YT0.9 and YT1.3). Similarly, no fish were captured in the upper portion of YT-24 (YT4.6 and YT5.0) in any of the sampling conducted in 2014, 2015 or 2016 (Table 17).

A number of small drops in the stream channel are present a short distance upstream of the confluence with the Yukon River, including a 0.75 drop over a log jam approximately 100 m upstream of the mouth of the creek (Photo 14), a 0.7 m drop approximately 600 m upstream of the creek mouth as well as additional smaller drops. These drops are not permanent features, but likely limit the extent of fish use in the watershed.

In the upper reaches of YT-24 Creek (YT4.6), the average stream gradient increases to 9%, there is minimal instream cover and residual pool depths are 0.18 m on average. Fish habitat quality is poor. Electrofishing at this location in July 2016, and at stations YT5.0 in 2014, 2015 and August 2016 did not capture any fish. A barrier to fish passage (30% gradient over 7.4 m) was documented upstream of station YT5.0 by PECG

(2017; Figure 12). This barrier prevents access for all fish to the portion of YT-24 near the mine infrastructure.

Table 17. **Baseline fish sampling and capture data in YT-24 from 2014 to 2016, ordered by sampling site from downstream to upstream-most site.**

Sampling Site	Sample Date	Sampling Methods	Total Sampling Effort	Fish Captured
YT0.0	August 2014, June and July 2015, July 2016	Electrofishing	1,918 seconds	25 slimy sculpin
YT0.2	July and August 2016	Electrofishing	2,172 seconds	None
YT0.2	July 2016	Minnow Trapping	125.8 trap hours	None
YT0.6	July 2016	Electrofishing	259 seconds	None
YT0.9	July 2016	Electrofishing	276 seconds	None
YT1.3	July 2016	Electrofishing	209 seconds	None
YT4.6	July 2016	Electrofishing	331 seconds	None
YT5.0	August 2014	Minnow Trapping	48.8 trap hours	None
YT5.0	June and July 2015, August 2016	Electrofishing	2,306 seconds	None
YT5.9	July 2016	Electrofishing	171 seconds	None

Photo 14. **View of a 0.75 m drop in YT-24 Creek approximately 100 m upstream of the Yukon River, July 2016.**

3.4.8 INDEPENDENCE CREEK, INCLUDING THE KONA TRIBUTARY

Arctic grayling, juvenile Chinook salmon, and slimy sculpin were captured in the mainstem of Independence Creek in 2014 and 2015. Juvenile Chinook salmon were present in low numbers throughout Independence Creek, with the highest numbers closer to the confluence with the Yukon River (Table 18). Slimy sculpin were captured in the downstream sampling station (ID1.9), but not upstream at the ID6.7 sampling station. Arctic grayling were found throughout Independence Creek. In 2014, an Arctic grayling population estimate of 3 Arctic grayling/100 m^2 (±2, 90% CI) was documented at station ID6.7 using multiple-pass electrofishing depletion sampling (PECG 2017).

Two stations were sampled in the Kona Tributary of Independence Creek in 2014 and 2015; one near its confluence with the mainstem of Independence Creek (KT0.1) and one in the upper headwaters of the Kona Tributary (KT5.2). Fish sampling results have documented Arctic grayling at the lower sampling site in the Kona Tributary; however, they were present in low numbers.

Chinook salmon aerial spawning surveys in Independence Creek (July 2013, August 2014, July 2015, August 2015 and August 2016) did not document any spawning activity. Similarly, an aerial spawning survey of Independence Creek in October 2014 did report any chum salmon spawning activity.

Table 18. Baseline fish sampling and capture data in Independence Creek and Kona Tributary 2014 to 2016, ordered by sampling site from downstream to upstream-most site (open water season only).

Sampling Site	Sample Date	Sampling Methods	Total Sampling Effort	Fish Captured
ID1.9	Aug-14	Minnow Trapping	249.2 trap hours	10 Chinook salmon
ID1.9	Aug-14	Electrofishing	1,939 seconds	3 Arctic grayling, 9 slimy sculpin, and 1 Chinook salmon
ID1.9	Oct-14	Minnow Trapping	125 trap hours	6 Chinook salmon
ID1.9	Jun-15	Minnow Trapping	127.9 trap hours	1 Chinook salmon
ID1.9	Jul-15	Minnow Trapping	311.6 trap hours	10 Chinook salmon
ID1.9	Sep-15	Minnow Trapping	382.5 trap hours	1 slimy sculpin and 4 Chinook salmon
ID1.9	May-15	Electrofishing	4,034 seconds	7 slimy sculpin
ID1.9	July 2016	Electrofishing	5,325 seconds	31 slimy sculpin
ID1.9	July 2016	Angling	58 minutes	None
ID6.7	Aug-14	Minnow Trapping	247.5 trap hours	1 Chinook salmon
ID6.7	Aug-14	Electrofishing	1,295 seconds	5 Arctic grayling
ID6.7	Oct-14	Minnow Trapping	103.4 trap hours	None
ID6.7	Jul-15	Minnow Trapping	118.8 trap hours	None
ID6.7	Jul-15	Angling	5.5 hours	8 Arctic grayling
KT0.1	Aug-14	Minnow Trapping	45 trap hours	None
KT0.1	Aug-14	Electrofishing	591 seconds	None
KT0.1	Jun-15	Electrofishing	690 seconds	3 Arctic grayling
KT0.1	Jul-15	Electrofishing	627 seconds	None
KT5.2	Aug-14	Minnow Trapping	47 trap hours	None
KT5.2	Jun-15	Electrofishing	773 seconds	None
KT5.2	Jul-15	Electrofishing	559 seconds	None

3.5 FISH OVERWINTERING

The March 2015 winter fish habitat assessments was completed at six stations in Latte and Coffee creeks and included collection of under-ice video. The March 2016 winter fish habitat and overwintering assessment was completed at 13 stations including Coffee, Latte, Independence, Halfway and YT-24 creeks and included under ice video and fish sampling.

In 2015, ice covered all stations with ice thickness ranging from of 15 to 57 cm. Flowing water was only found at Coffee Creek in 2015 with depths ranging from 37 to 82 cm. In March 2016, all stations on Coffee Creek were covered by 5 to 10 cm of ice (Table 19), with the exception of an ice free glide at station CF2.3 (station 5). Flowing water was present at most samplings stations in 2016, and water depths at sampling stations varied from 22 to 135 cm. Water was deepest at sampling stations in the mainstem of Coffee Creek and was shallower at sampling stations in Latte and Halfway creeks.

Fish sampling in March 2016 was generally conducted in glide or pool habitats, where there was sufficient water depth to set minnow traps. Water temperature was near freezing (range of 0.5 of -0.1 °C) at all sampling stations; in-situ pH ranged from slightly acidic to slightly basic (6.21 to 7.65) and specific conductivity ranged from 242.8 to 402.1 µS/cm.

Dissolved oxygen concentrations differed considerably between sampling stations. In March 2015, dissolved oxygen in Coffee Creek was 10.3 to 13.95 mg/L, at stations CF8.0 and CF5.7, respectively. At sampling stations in Latte Creek, Halfway Creek and the upstream portions of Coffee Creek (CF2.7, CF8.3 and CF10.0) dissolved oxygen concentrations were relatively high, and ranged from 8.84 mg/L to 12.59 mg/L (March 2016; Table 19). In contrast, dissolved oxygen concentrations ranged from 5.85 mg/L to 7.82 mg/L in the downstream most sites in Coffee Creek and Independence creeks (station CF0.5 and ID1.9; March 2016).

In the vicinity of sampling station CF2.7 on Coffee Creek, two small side channels were observed to be free of ice during the March 2016 field investigations. Based upon the lack of ice cover in these channels and the slightly warmer water (up to 0.5°C; Photo 15), these areas are probable groundwater discharge areas. Such areas are often important for overwintering fish and this was confirmed by the capture of juvenile Chinook either within the channels or in the mainstem of Coffee Creek near the outlet of the channels.

Table 19. Summary of winter fish habitat information collected at the Coffee Project, March 2016.

Stream Name	Station Name	Sampling Site Number	Habitat Type	Water Depth (cm)	Ice Thickness (cm)[1]	In-Situ Water Quality			
						Temperature (°C)	Dissolved Oxygen (mg/L)	pH	Specific Conductivity (µS/cm)
Coffee Creek	CF0.5	1	Pool	35	5-10	0.3	5.85	6.81	271.2
Coffee Creek	CF0.5	2	Pool	54	10	0.2	7.35	6.92	269.2
Coffee Creek	CF2.7	1	Glide	25	5	0.1	8.96	6.44	294.7
Coffee Creek	CF2.7	2	Glide	26	5	0	12.29	6.75	291.7
Coffee Creek	CF2.7	3	Not observable due to ice cover	135	5-10	0	11.54	6.88	283.2
Coffee Creek	CF2.7	4	Glide/Pool	45	<5	0.2	9.12	6.21	292.4
Coffee Creek	CF2.7	5	Glide	22	0	0.5	9.16	6.57	285.4
Coffee Creek	CF2.7	6	Pool	126	<5	0.1	8.84	6.79	306.9
Coffee Creek	CF8.3	1	Glide/Pool	80	<5	0	10.84	7.11	401.2
Coffee Creek	CF10.0	1	Pool	41	<5	0	12.59	7.37	374.1
Latte Creek	LC1.6	1	Not observable due to ice cover	26	10	-0.1	8.74	7.24	259.5
Latte Creek	LC 9.9	1	Not observable due to ice cover	-	-	0.0	9.88	6.99	482.1
Latte Creek Trib C	LCC0.1	1	Not observable due to ice cover	-	-	0.0	9.45	8.03	929.0
YT-24	YT0.2	1	Not observable due to ice cover	Frozen to bed, no water found.					
Kona Trib	KT0.1	1	Not observable due to ice cover	Frozen to bed, no water found.					
Halfway Creek	HF6.3	1	Pool	34	5-10	0	11.36	7.65	336.9
Independence Creek	ID1.9	1	Pool	67	5	0	6.55	6.83	242.8
Independence Creek	ID1.9	2	Pool	35	5-10	0.1	7.82	6.77	245.6

[1] Ice thickness varied throughout the areas sampled; however, minnow traps were placed in areas where the ice was thin and easy to clear.

Photo 15. View of probable groundwater fed side channel in Coffee Creek (station CF2.7).

3.5.1 MINNOW TRAPPING AND UNDERWATER VIDEO COLLECTION

Minnow trapping effort and fish capture data from the March 2016 field sampling is shown in Table 20; detailed station specific fish sampling data is included in APPENDIX B. A total of 39 minnow traps were set for a cumulative total of 838.15 hours of minnow trapping effort. A total of 53 fish were captured including 47 juvenile Chinook and 6 slimy sculpin (Table 20; Photo 16). All fish were captured at sampling stations in Coffee Creek with the highest number of fish captured at stations CF0.5 and CF2.7. Slimy sculpin were captured at all four sampling stations in Coffee Creek, although the catch per unit effort (CPUE) was relatively low across all stations (average = 0.22 fish/24 minnow trapping hours by sampling station). Juvenile Chinook were only captured at stations CF0.5 and CF2.7, with CPUE which ranged from a low of 4.80 fish/24 minnow trapping hours to a high of 17.06 fish/24 minnow trapping hours at station CF0.5.

Photo 16. Juvenile Chinook salmon captured in Coffee Creek (station CF2.7) during early March 2016.

Lengths and weights of captured fish are summarized in Table 21; due to the relatively small samples size of captured fish, length and weight data from all stations were grouped together. Only fish that were retained for metals tissue analysis were weighed; this included incidental mortalities of juvenile Chinook and all slimy sculpin. Captured slimy sculpin had fork lengths ranging from 66 to 85 mm, while juvenile Chinook salmon had fork lengths ranging from 60 to 90 mm (Table 21). The mean fork length of both species was 75 mm. Juvenile Chinook weighed between 3.2 and 5.1 grams; the range of slimy sculpin weights was greater (2.3 to 7.1 grams). Mean weights were 4.7 grams for slimy sculpin and 3.9 grams for juvenile Chinook salmon.

Fish observations from underwater video data collected in 2016 are summarized in Table 22. Underwater visibility was very good (5 to 10 m or greater) at all stations where investigations were conducted in 2016; information on the condition of under ice visibility was not recorded in 2015. A total of 150 minutes of underwater video were recorded in 2016 and only a single fish was observed on the collected video data (at station CF0.5, site 1). This species of this fish could not be discerned from the collected video data. A total of 30 minutes of underwater video were recorded in March 2015; no fish were observed in any of the video data collected in 2015.

Table 20. Summary of minnow trapping effort and fish capture data from the Mine study area in March 2016.

Stream Name	Station Name	Sampling Site Number	Number of Minnow Traps Set	Total Set Time (Hours)	Number of Fish Captured		Catch-per-unit-effort (Number of fish per 24 minnow trap hrs)	
					Slimy Sculpin	Juvenile Chinook	Slimy Sculpin	Juvenile Chinook
Coffee Creek	CF0.5	1	3	59.75	0	17	0.00	6.83
		2	3	61.00	0	1	0.00	0.39
	CF2.7	1	4	99.32	2	5	0.48	1.21
		2	2	49.00	1	0	0.49	0.00
		3	2	48.33	1	15	0.50	7.45
		4	4	91.67	0	2	0.00	0.52
		5	3	68.00	0	7	0.00	2.47
		6	2	44.83	0	0	0.00	0.00
	CF8.3	1	3	66.50	1	0	0.36	0.00
	CF10.0	1	3	64.00	1	0	0.38	0.00
Latte Creek	LC1.6	1	2	40.67	0	0	0.00	0.00
Halfway Creek	HF6.3	1	2	38.83	0	0	0.00	0.00
Independence Creek	ID1.9	1	3	53.25	0	0	0.00	0.00
		2	3	53.00	0	0	0.00	0.00
TOTALS			**39**	**838.15**	**6**	**47**	-	-

Table 21. Summary of lengths and weights of fish captured via minnow trapping in the Mine study area in March 2016.

Species	Number Measured	Number Weighed[1]	Fork Lengths (mm)			Weights (grams)		
			Minimum	Maximum	Mean	Minimum	Maximum	Mean
Slimy Sculpin	5	5	66	85	75	2.3	7.1	4.7
Juvenile Chinook	41	6	60	90	75	3.2	5.1	3.9

[1] Only captured fish that were retained for metals analyses were weighed.

Table 22. Summary of underwater video data collected in the Mine study area in March 2016.

Stream Name	Station Name	Sampling Site Number	Duration of Video (minutes)	Number and Species of Observed Fish
Coffee Creek	CF0.5	1	15	1 fish observed, species unidentified
Coffee Creek	CF0.5	2	10	None
Coffee Creek	CF2.7	1	15	None
Coffee Creek	CF2.7	3	30	None; habitat appears to be of high quality
Coffee Creek	CF2.7	4	15	None
Coffee Creek	CF2.7	6	20	None
Coffee Creek	CF3.3	1	10	None
Coffee Creek	CF10.0	1	10	None
Independence Creek	ID1.9	1	10	None

3.6 PERIPHYTON

Mean chlorophyll-a and ash-free dry mass (AFDM) measured in 2014 and 2015 were very low for all stations[4], which is typical of northern, nutrient poor aquatic habitats (PECG 2017). There was little variation among the stations and there was no relationship between chlorophyll-a and ash-free periphyton mass; differences in chlorophyll-a content may have been due to varying light conditions, nutrient availability, and periphyton taxonomy, which results in different proportions of photosynthetic:non-photosynthetic organisms that comprise periphyton (Barbour et al. 1999). Given that the 2014 and 2015 samples missed laboratory holding times, combined with the low nutrient status of these streams, the results may have underestimated the chlorophyll-a concentrations. Therefore, all streams within the Project area as well as reference sites were re-sampled for chlorophyll-a concentration in August 2016. The 2016 data indicated higher concentrations of chlorophyll-a throughout the sampling locations when compared with 2014 and 2015 data. Chlorophyll-a was lowest in samples collected farthest upstream in each of the watersheds, and increased in downstream locations. This trend existed in Latte Creek, with values of 0.13 mg/cm^2 at the upstream sampling location (LC9.9), and 0.26 mg/cm^2 closer to the confluence (LC2.7), in Coffee Creek (0.57 and 0.88 mg/cm^2) at the upstream and downstream sites, respectively, and in YT-24 (0.61 and 0.76 mg/cm^2) and Halfway creeks (0.30 and 0.69 mg/cm^2) as well (APPENDIX D).

Community composition included blue-green algae (cyanophyta), which comprised approximately 80% of the overall community composition and was the most dominant algal group in the study area; diatoms were the second most dominant group, followed by small percentages of green algae (chlorophyte; PECG 2017). Blue-green algae tended to dominate at higher elevation stations within the Mine study area, whereas higher proportions of diatoms were present further downstream, at lower elevations. The large diatom *Didymosphenia geminata* was confirmed at station ID1.9 in Independence Creek in 2014; this species has become increasingly prolific in British Columbia and Yukon in recent years, and is commonly referred to as 'rock snot' (YISC 2014).

3.7 BENTHIC INVERTEBRATE COMMUNITIES

Benthic invertebrate sampling in 2001 was conducted using a 300 μm mesh surber sampler and did not follow the standardized Canadian Aquatic Biomonitoring Network (CABIN) protocols used in later sampling in 2010, 2014 and 2015. The CABIN protocols provide a standardized method to sample benthic invertebrate communities (NWRI 2008), and allows for robust data analysis by leveraging a large, nation-wide database of invertebrate community data. As such, the data described in this section are from the 2010, 2014 and 2015 studies only. The benthic invertebrate sampling conducted in March and August 2016 focused on collecting samples for metals analysis only, and was not analyzed for benthic invertebrate abundance and diversity (APPENDIX E).

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[4] Hold times for chlorophyll-a sample analysis were exceeded for a number of stations during the 2014/2015 baselines studies (PECG 2016).

Sampling in 2010 at the mouth of Coffee Creek showed the highest abundance of benthic invertebrate in all three sampling years (2010, 2014 and 2015) with a total abundance of 9,500 individuals per kick-net. In 2014 and 2015, mean total abundance of benthic invertebrates ranged from 247 to 3,885 individuals per kick-net in the watersheds in the Mine study area. Independence Creek had the highest total abundance followed by YT-24, Coffee Creek, Latte Creek and then Halfway Creek. Total abundance generally increased in an upstream direction within watersheds.

Ephemeroptera-Plecoptera-Trichoptera (EPT) abundances within the study area demonstrated similar patterns to overall abundance. Some stations had high between-year variability, such as at ID1.9 in lower Independence Creek (PECG 2017).

Dipterans were the most dominant benthic invertebrate group in the Mine study area, making up approximately 50% of the overall community composition. The second and third most dominant groups were the mayflies (*Ephemeroptera*) and stoneflies (*Plecoptera*), which contributed approximately 26% and 21% to the overall community composition, respectively. Small percentages of ringed worms (Annelids), and caddisflies (*Trichoptera*) were also present at the majority of stations. In Coffee and Independence creeks, EPT organisms typically dominated stations higher in the watershed; dipteran species dominated further downstream (PECG 2017).

3.8 METAL CONCENTRATIONS IN THE AQUATIC ECOSYSTEM

3.8.1 METAL CONCENTRATIONS IN FISH TISSUE

Fish tissue metal concentrations were analyzed from a total of twenty-four Arctic grayling and seventeen slimy sculpin captured in Coffee, Latte and Independence creeks in 2014 and 2015 (PECG 2017); muscle tissues were collected from Arctic grayling, and full body samples were collected from sculpin. In March 2016, additional tissue samples were collected and analyzed for metal concentrations from seven slimy sculpin and six juvenile Chinook salmon that were captured in Coffee Creek. All fish collected in 2016 were analysed as whole body samples in order to fully investigate uranium concentrations in fish tissues; uranium is stored preferentially in mineralized tissues such as bones. In July additional samples were collected from Coffee, Latte, Independent and Los Angeles creeks, and finally in August 2016 there were 12 juvenile Chinook salmon and one Arctic grayling from Halfway Creek were collected for analysis (Table 6; APPENDIX E). Currently, established tissue concentration guidelines exist for total mercury (CFIA 2011) and methylmercury (CCME 2000a). There are no federal guidelines for tissue concentrations of selenium, however, the EPA has developed guidelines for both tissue and whole body samples (8.5 µg/g dw for whole body and 11.3 µg/g dw for fish tissue, EPA 2015), and British Columbia has developed a muscle tissue and whole body guideline (both set at 4 µg/g dw, BC MOE 2014). Additionally, uranium concentrations in fish tissues were reviewed as uranium can be naturally elevated in some streams in the Mine study area (especially during low flows).

3.8.1.1 Arctic Grayling

Mercury is stored in muscle tissue, generally in the form of methylmercury, and therefore the muscle tissue samples generally had a slightly higher mercury and methylmercury concentrations that the whole body samples; however, the difference was small (Table 23). Baseline total mercury concentrations in all sampled Arctic grayling, including tissue and whole body samples, did not exceed the Canadian Food and Inspection Agency (CFIA) guideline (0.5 µg/g ww; CFIA 2011; Figure 13). In contrast, estimated methylmercury concentrations (95% of total mercury concentrations, Jewett et. al. 2003) in nearly all Arctic grayling sampled in Coffee, Latte, Independence and Los Angeles Creek exceeded the Canadian Council for the Ministers of the Environment (CCME) guideline for the protection of piscivorous wildlife (0.033 µg/g ww; CCME 2000a). Mean concentrations were lowest in Halfway (the only grayling captured in Halfway Creek had a methylmercury concentration below the guideline), Los Angeles, and Independence creeks, while higher methylmercury concentrations were noted in Coffee and Latte creeks (Table 23; Figure 14).

Selenium concentrations in Arctic grayling muscle tissue did not exceed the EPA's interim guideline for fish muscle tissue (11.3 µg/g dw; EPA 2015). The lowest selenium concentrations were found in Arctic grayling muscle tissues collected in Latte Creek, just upstream of the confluence with Coffee Creek. In 2016 whole body selenium concentrations were collected in Coffee Creek at CF10.0, in Latte Creek at LC2.7, in Halfway Creek at HF0.2 (only one grayling) and in Los Angeles Creek at LaC4.8. Mean dry weight concentrations were similar across all sampling sites, ranging from 5.1 µg/g dw at Latte Creek (LC2.7) to a high of 6.5 µg/g dw at Coffee Creek (CF10.0) (Table 23; Figure 15). Nearly all samples from all sites, with the exception of five Arctic grayling from Latte Creek exceeded the BC tissue and whole body guidelines for selenium (which are both set at 4 µg/g dw, BC MOE 2014).

Uranium concentrations in Arctic grayling muscle tissues collected in 2014 and 2015 from all watersheds ranged from less than 0.001 µg/g ww in Latte, Los Angeles, Coffee and Independence creeks to a high of 0.014 µg/g ww in Halfway Creek (Table 23; Figure 16). Whole body uranium concentrations were collected in 2016 from Coffee Creek at CF10.0, in Latte Creek at LC2.7, in Halfway Creek at HF0.2 (only one grayling) and in Los Angeles Creek at LaC4.8. All whole body grayling samples had higher uranium concentrations than muscle tissue samples collected in 2014 and 2015. However, there was no discernable trend was observed in uranium concentrations in Arctic grayling tissues among different sites. The highest mean whole body uranium concentration was at LC2.7, 0.034 µg/g ww, and the lowest at LaC4.8, with a concentration of 0.034 µg/g ww; only one whole body Arctic grayling sample was collected from Halfway Creek, and the concentration was 0.011 µg/g ww. With the exception of Coffee Creek, Arctic grayling generally only populate streams in the LSA during the summer months, when uranium concentrations in the water are lowest; this use of the habitat likely allows the grayling to maintain low tissue concentrations of uranium.

Table 23. Descriptive statistics for Arctic grayling tissue metals concentrations (whole body and muscle tissue samples presented separately).

Creek	Sampling Site	N	Statistic	Mercury (µg/g ww)	MeHg Estimate [1] (µg/g ww)	Selenium (µg/g ww)	Selenium [2] (µg/g dw)	Uranium (µg/g ww)
Muscle Tissue Only Samples								
Coffee	CF3.9	2	Minimum	0.050	0.047	1.180	5.540	0.003
			Mean	0.070	0.066	1.235	5.841	0.003
			Maximum	0.090	0.085	1.290	6.143	0.003
	CF8.0	6	Minimum	0.039	0.037	1.310	5.771	0.001
			Mean	0.062	0.059	1.587	7.329	0.001
			Maximum	0.092	0.086	1.790	8.443	0.002
Latte	LC2.7	8	Minimum	0.071	0.067	0.480	2.172	0.001
			Mean	0.110	0.103	0.836	4.041	0.002
			Maximum	0.132	0.124	1.080	5.320	0.002
Independence	IC6.7	8	Minimum	0.036	0.034	1.230	5.168	0.001
			Mean	0.052	0.049	1.569	7.427	0.001
			Maximum	0.086	0.081	2.070	10.098	0.003
Los Angeles	LaC4.8	2	Minimum	0.065	0.061	0.900	4.230	<0.001
			Mean	0.067	0.063	1.295	5.887	<0.001
			Maximum	0.068	0.064	1.690	7.545	<0.001
Whole Body Samples								
Coffee	CF10.0	7	Minimum	0.022	0.021	1.130	4.346	0.014
			Mean	0.044	0.041	1.554	6.511	0.028
			Maximum	0.069	0.065	3.000	13.043	0.051
Latte	LC2.7	5	Minimum	0.043	0.040	0.929	3.871	0.017
			Mean	0.074	0.070	1.246	5.093	0.034
			Maximum	0.109	0.102	1.730	6.920	0.046
Halfway	HF0.2	1	Minimum	0.033	0.031	1.320	6.000	0.011
			Mean	-	-	-	-	-
			Maximum	-	-	-	-	-
Los Angeles	LaC4.8	3	Minimum	0.033	0.031	1.300	5.909	0.008
			Mean	0.044	0.041	1.438	6.307	0.019
			Maximum	0.062	0.058	1.610	6.708	0.046

1. For Arctic grayling, methylmercury was estimated as 94% of total mercury, as per Jewett et al 2003.
2. Selenium is presented as dry weight (dw) in addition to wet weight (ww) to compare with the EPA guidelines, which were calculated as dry weight.

3.8.1.2 Slimy Sculpin

Slimy sculpin samples for metals analysis were collected only from Coffee Creek, the mouth of Latte Creek (LC0.5), Independence Creek, and Los Angeles Creek (only one sample). Mean total mercury concentrations were lowest in upstream Coffee Creek at CF10.0, with a concentration of 0.055 µg/g ww, and highest in fish sampled at the mouth of Latte Creek, where the mean concentration was 0.154 µg/g ww (Table 24). The CFIA guideline for total mercury does not apply to slimy sculpin because they are not a human food source; however, mercury concentrations from all sculpin samples were below the guideline (Figure 13). The estimated concentrations of methylmercury (81% of total mercury, Jewett et al 2003) exceeded the CCME guideline set for the protection of piscivorous wildlife (0.033 µg/g ww; CCME 2000a) in all creeks where sculpin were sampled including Coffee, Latte (at the mouth), Independence and Los Angeles creeks (Table 24; Figure 14). The lowest concentrations were found in slimy sculpin collected from Independence Creek, while the highest concentrations were found in sculpin collected in the Coffee Creek watershed, including from the mouth of Latte Creek.

Selenium concentrations in slimy sculpin tissue samples varied widely across the LSA, and even within Coffee Creek. Mean selenium concentration in samples collected from Coffee Creek at CF3.9 and CF10.0 and the single sample from Los Angeles Creek exceeded the EPA whole body fish tissue concentration guideline (8.5 µg/g dw; EPA 2015; Table 24). Concentrations were lower (and less variable) in sculpin collected from Coffee Creek at CF2.3 and CF8.0, as well as Latte and Independence creeks (Figure 15).

Uranium concentrations were higher in slimy sculpin tissues, compared with Arctic grayling and juvenile Chinook salmon, due to their high site fidelity and overwintering habits (water quality data indicates that the highest water uranium concentrations are seen in later winter (Lorax 2016). Concentrations of uranium were considerably higher in the Coffee Creek watershed when compared with other stations in the study area. The lowest concentrations were noted in slimy sculpin tissues collected from Isaac and Los Angeles creeks (mean concentrations of 0.015 and 0.011 µg/g ww, respectively) (Table 24; Figure 16).

Table 24. Descriptive statistics for slimy sculpin tissue metals concentrations.

Creek	Sampling Site	N	Statistic	Mercury (µg/g ww)	MeHg Estimate [1] (µg/g ww)	Selenium (µg/g ww)	Selenium [2] (µg/g dw)	Uranium (µg/g ww)
Coffee	CF2.3	5	Minimum	0.077	0.062	1.070	4.374	0.052
			Mean	0.117	0.095	1.418	6.507	0.091
			Maximum	0.168	0.136	1.950	10.263	0.124
	CF3.9	10	Minimum	0.059	0.047	1.620	7.043	0.032
			Mean	0.087	0.071	2.645	15.165	0.069
			Maximum	0.130	0.105	3.460	38.444	0.131
	CF8.0	13	Minimum	0.058	0.047	0.950	3.378	0.021
			Mean	0.125	0.102	1.508	5.881	0.057
			Maximum	0.248	0.201	2.740	10.111	0.146
	CF10.0	11	Minimum	0.038	0.031	2.130	8.680	0.062
			Mean	0.055	0.045	2.675	15.533	0.088
			Maximum	0.097	0.079	3.740	21.429	0.167
Latte	LC0.5	3	Minimum	0.047	0.038	1.150	4.123	0.029
			Mean	0.154	0.125	1.417	5.080	0.101
			Maximum	0.213	0.173	1.880	6.741	0.175
Independence	IC1.9	19	Minimum	0.041	0.033	0.900	2.866	0.008
			Mean	0.071	0.058	1.734	7.309	0.029
			Maximum	0.110	0.089	2.760	12.545	0.052
Los Angeles [3]	LaC4.8	1	Minimum	0.084	0.068	2.740	9.514	0.011
			Mean	-	-	-	-	-
			Maximum	0.084	0.068	2.740	9.514	0.011

1. For slimy sculpin, methylmercury was estimated as 81% of total mercury, as per Jewett et al 2003.
2. Selenium is presented as dry weight (dw) in addition to wet weight (ww) to compare with the EPA guidelines, which were calculated as dry weight.
3. Only one sample was collected from Los Angeles Creek

3.8.1.3 Juvenile Chinook Salmon

Juvenile Chinook salmon samples for total metal analysis were collected from Coffee Creek at CF0.5 and CF2.3, and from Halfway Creek at HF0.2. Mean total mercury concentrations in juvenile Chinook salmon were lowest in Halfway Creek at HF0.2, and slightly higher in Coffee Creek at CF0.5 and at CF2.3, with mean concentrations of 0.025, 0.050 and 0.076 µg/g ww, respectively (Table 25). The CFIA guideline for total mercury does not apply to juvenile Chinook salmon because they are not a human food source at the juvenile life stage; however mercury concentrations form all Chinook samples were below the guideline (Figure 13). There are no currently available studies that estimate the percentage of methylmercury relative to total mercury for juvenile Chinook salmon tissue; for the purpose of this report a conservative estimate of 94% of total mercury concentration was used. This percentage is based on the estimated methylmercury concentration for Arctic grayling tissue (Jewett et al 2003), as well as the fact that juvenile Chinook salmon are at a similar or lower trophic level than Arctic grayling and thus could be expected to bio-accumulate methylmercury at comparable rates. Estimated methylmercury concentrations in all juvenile Chinook salmon tissue samples (94% of total mercury) from Coffee Creek exceeded the CCME guideline set for the protection of piscivorous wildlife (0.033 µg/g ww; CCME 2000a). All samples from Halfway Creek had estimate methylmercury concentrations below the CCME guideline (Table 25; Figure 14).

Selenium concentrations in juvenile Chinook salmon muscle tissue in Coffee Creek did not exceed the EPA guideline for muscle tissue (11.3 µg/g dw; EPA 2015) at any sampled stations (Table 25; Figure 15). Only one same from Halfway Creek exceeded the BC selenium tissue guideline (4.0 µg/g dw, BC MOE 2012).

Uranium concentrations in juvenile Chinook salmon tissues ranged from 0.005 µg/g ww in a sample collected from Halfway Creek to 0.0604 µg/g ww, in a sample from Coffee Creek. Concentrations in Coffee Creek were highest at stations further upstream in the watershed (Table 25; Figure 16).

Table 25. Descriptive statistics for Chinook salmon tissue metals concentrations.

Creek	Sampling Site	N	Statistic	Mercury (µg/g ww)	MeHg Estimate [1] (µg/g ww)	Selenium (µg/g ww)	Selenium [2] (µg/g dw)	Uranium (µg/g ww)
Coffee	CF0.5	3	Minimum	0.039	0.037	0.502	2.191	0.012
			Mean	0.050	0.047	0.533	2.391	0.014
			Maximum	0.071	0.067	0.594	2.700	0.017
	CF2.3	3	Minimum	0.058	0.055	0.498	1.302	0.013
			Mean	0.076	0.071	0.534	2.182	0.033
			Maximum	0.100	0.094	0.570	2.767	0.060
Halfway	HF0.2	12	Minimum	0.021	0.020	0.403	2.096	0.005
			Mean	0.025	0.024	0.592	2.997	0.018
			Maximum	0.029	0.028	0.676	4.714	0.037

1. For slimy sculpin, methylmercury was estimated as 81% of total mercury, as per Jewett et al 2003.
2. Selenium is presented as dry weight (dw) in addition to wet weight (ww) to compare with the EPA guidelines, which were calculated as dry weight.

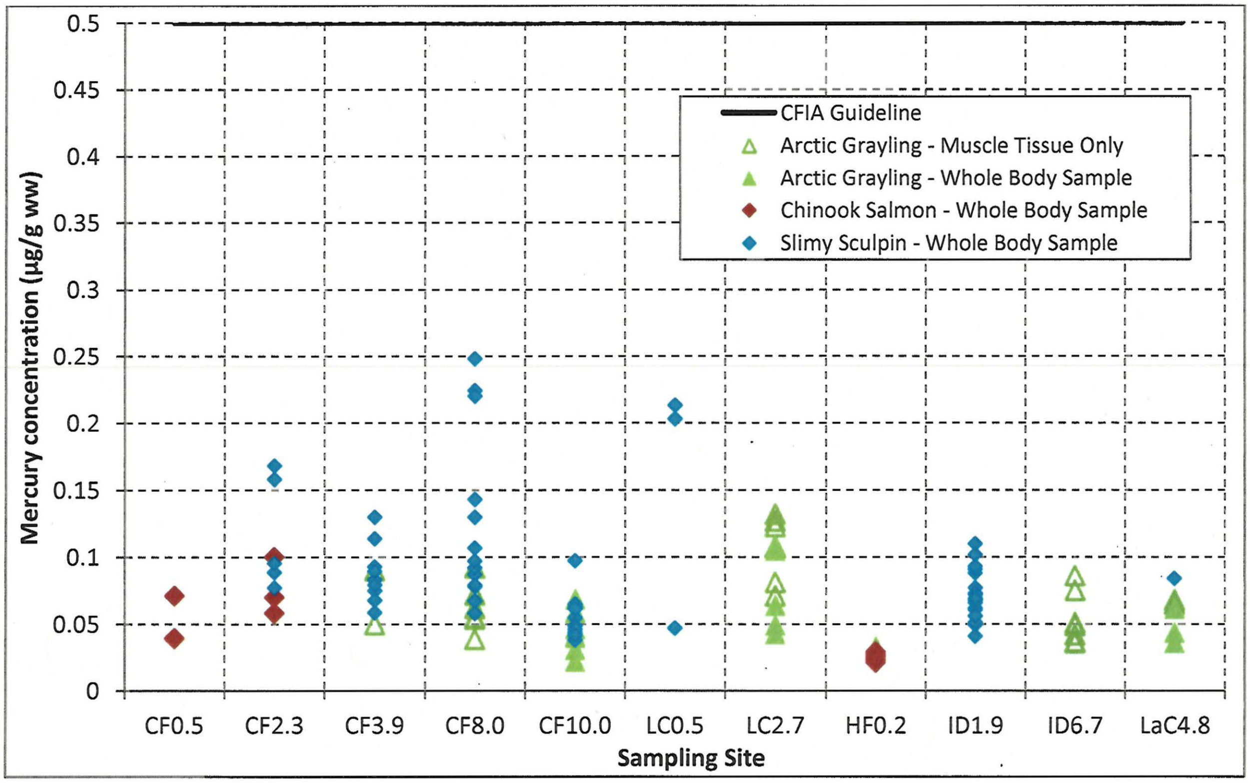


Figure 13. Total mercury concentrations in fish sampled throughout the Coffee Project area.

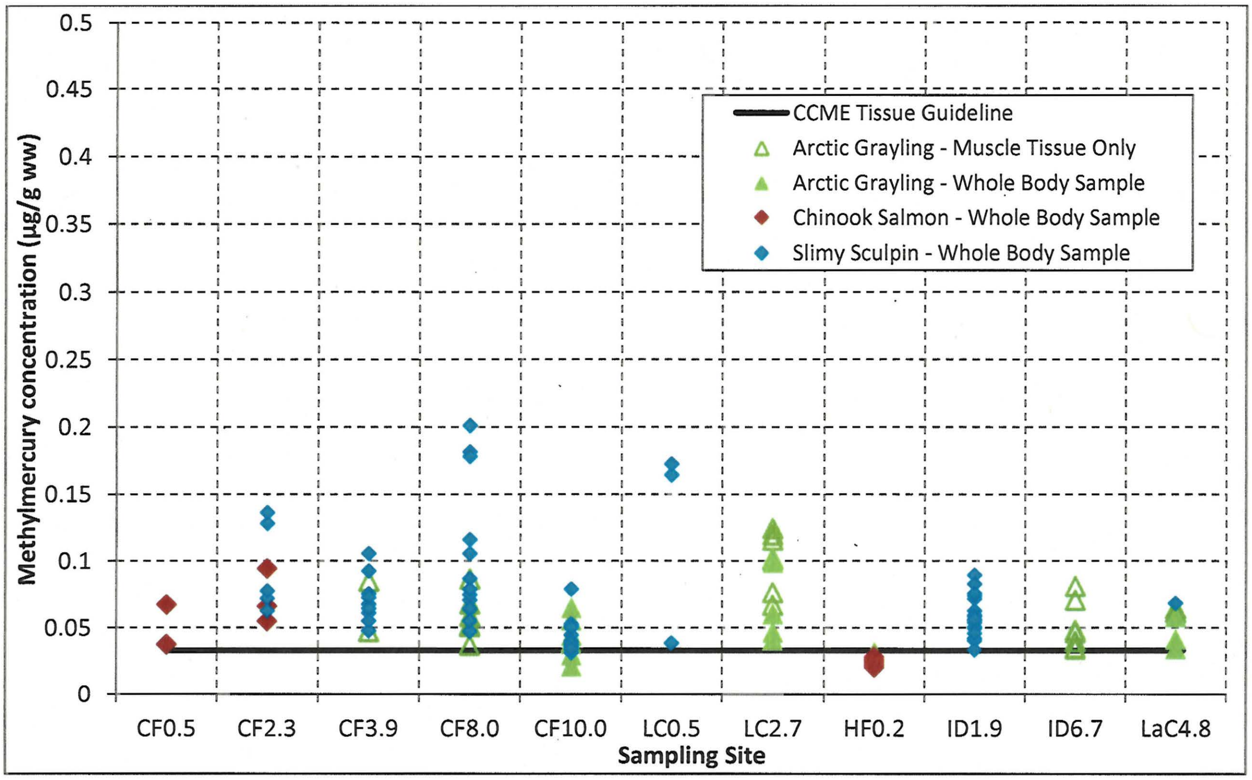


Figure 14. Estimated methylmercury concentrations in fish sampled throughout the Coffee Project area.

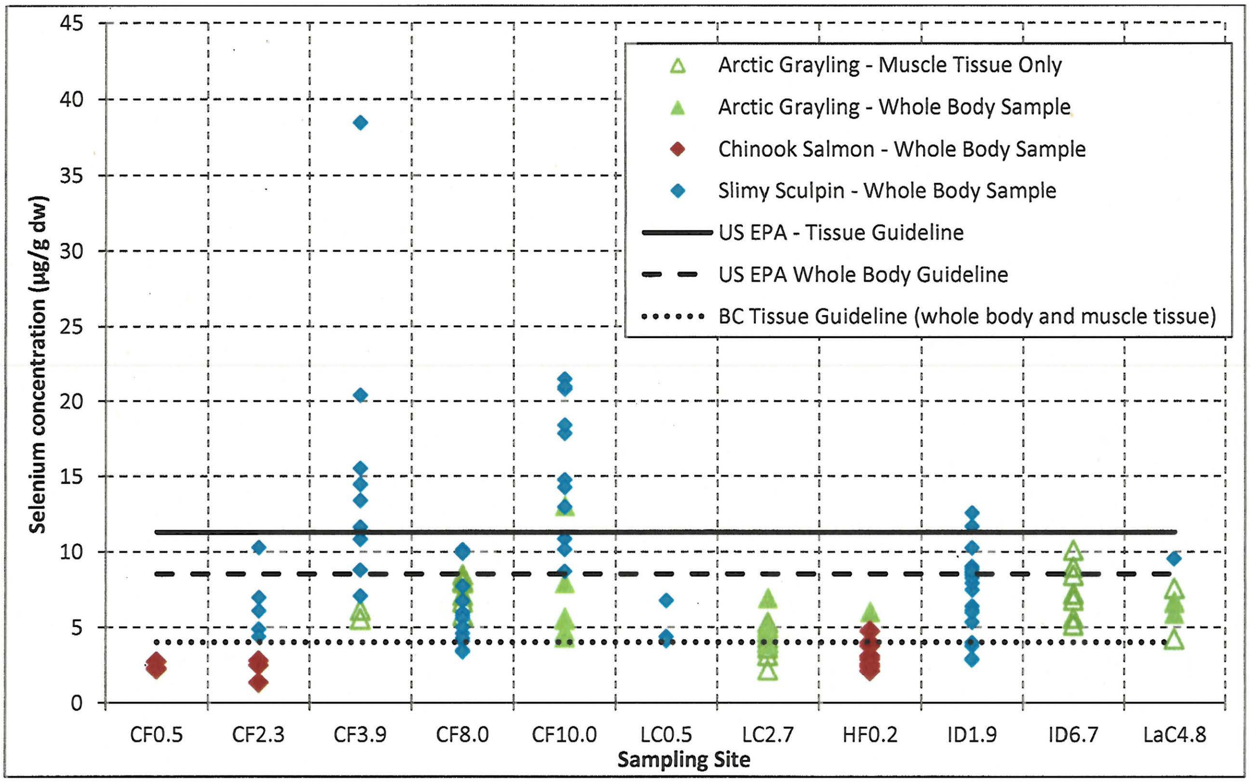


Figure 15. Selenium concentrations in fish sampled throughout the Coffee Project area.

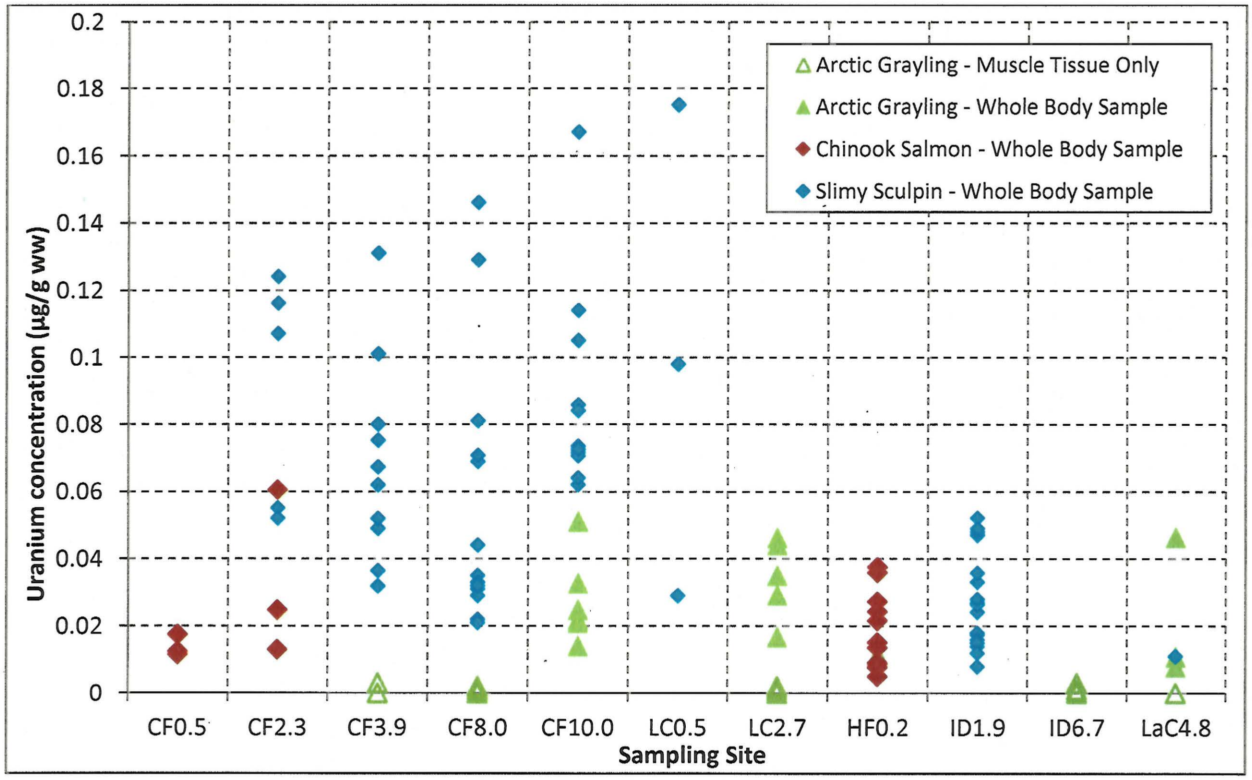


Figure 16. Uranium concentrations in fish sampled throughout the Coffee Project area.

3.8.2 METAL CONCENTRATIONS IN BENTHIC INVERTEBRATES

Benthic invertebrate samples were collected in March and August 2016. March samples were collected at two stations in Coffee Creek and one station in Independence Creek, and August samples were collected from Coffee, Latte, Halfway, YT-24, Independence and Los Angeles creeks. All samples were analyzed for tissue metal concentrations; detailed analysis results are included in APPENDIX E. Benthic invertebrate tissue metal concentration guidelines exist for methylmercury (CCME 2000a). Additionally, uranium concentrations were reviewed as uranium can be naturally elevated in some streams in the LSA. The CFIA total metal tissue guideline does not apply to benthic invertebrates as they are not consumed by humans.

There are no currently available studies that estimate the percentage of methylmercury relative to total mercury for benthic invertebrate tissues; for the purpose of this report a conservative estimate of 54% of total mercury concentration was used. This percentage is based on the fact that different species of invertebrates occupy different trophic levels and accumulate methylmercury at different rates (e.g. range of 22% to 85% of total mercury concentration; Tremblay and Lucotte 1997) as well as the fact that methylmercury concentrations were not collected for all sampled benthic invertebrate taxa described in Tremblay and Lucotte (1997).

Estimated methylmercury concentrations in all benthic invertebrate tissue samples (54% of total mercury) did not exceeded the CCME guideline set for the protection of piscivorous wildlife (0.033 µg/g ww; CCME 2000a) at any sample stations in the Project area; the highest concentration was found in the sample collected from Coffee Creek (CF2.7) in March (0.0226 µg/g ww).

Uranium concentrations in benthic invertebrate tissues were highest in samples collected in March; uranium concentrations in water are at their annual peak during late winter low flows, resulting in increased proportions of groundwater contributions to surface water (Lorax 201.) Uranium concentrations in benthic invertebrate tissues collected from Coffee Creek in March 2016 ranged from 6.97 to 18.1 µg/g ww, and in Independence Creek was 1.26 µg/g ww. The lowest concentrations from August 2016 samples were found in benthic invertebrate tissues collected from YT-24 and Los Angeles creeks, and the highest concentrations were in benthic invertebrate concentrations from Halfway Creek, at HF0.2 (5.76 µg/g ww; Figure 17).

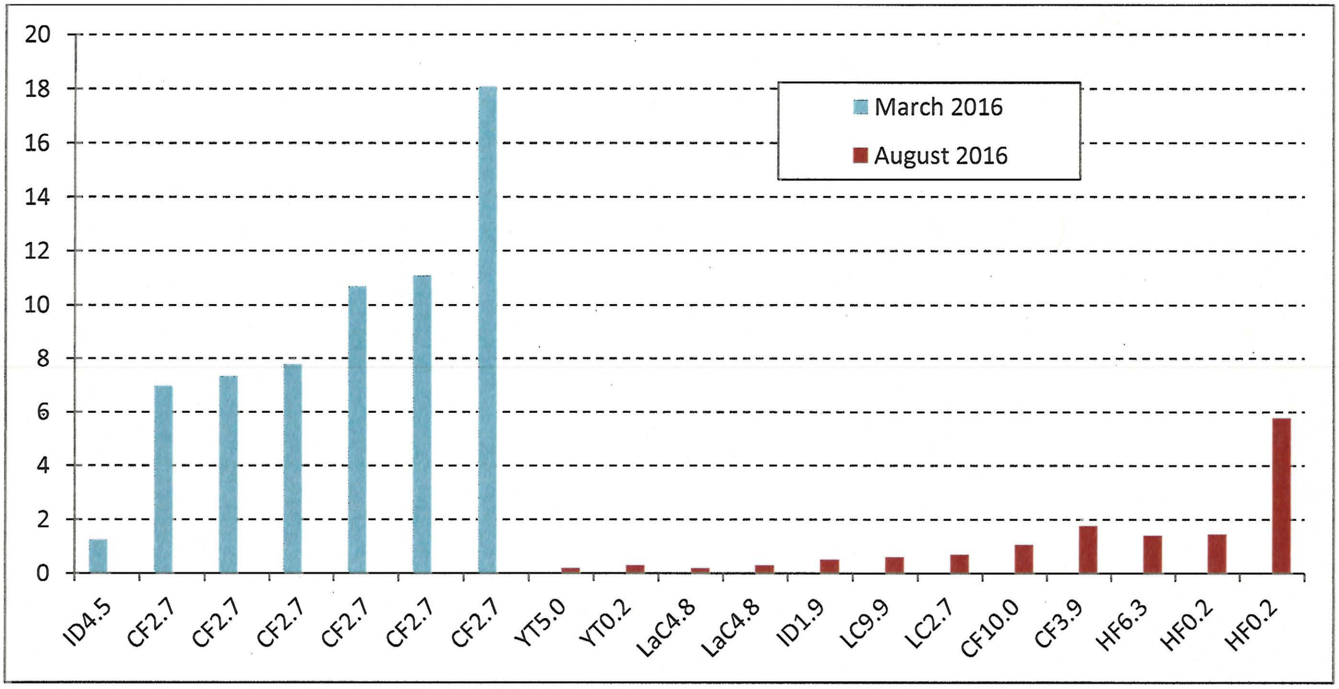


Figure 17. Uranium concentrations in benthic invertebrate tissues collected in March and August 2016.

3.8.3 METAL CONCENTRATIONS IN SEDIMENT

Analyses of baseline metals concentrations in stream sediments collected in the study area in 2014 and 2015 (PECG 2017) indicate that arsenic and chromium are consistently present at concentrations that exceed the CCME interim Freshwater Sediment Quality Guidelines (CCME 2000b). Concentrations of copper, cadmium and mercury were found to exceed the applicable guidelines in only a small number of samples, all located in the Coffee Creek watershed.

Baseline sediment samples collected by PECG in 2014 and 2015 from Coffee Creek and Latte Creek were found to have the highest concentrations of a number of metals. Concentrations from samples collected in 2014 and 2015 exceeded the CCME interim Freshwater Sediment Quality Guidelines for chromium (Coffee Creek CF3.9 and Latte Creek LC2.7), copper (Coffee Creek CF8.0), cadmium (Coffee and Latte creeks, CF8.0 and LC9.9), and mercury (Latte Creek LC2.7).

Analysis of metals concentrations in sediment samples from, Halfway Creek, YT-24 and Independence Creek and the Kona Tributary all indicate that the arsenic concentrations were elevated over the CCME interim Freshwater Sediment Quality Guideline in all samples collected in 2014 and 2015 (CCME 2000b). Additionally, chromium concentrations exceeded the CCME interim Freshwater Sediment Quality Guideline in samples collected from the Kona Tributary, upstream Independence Creek (ID6.7).

3.9 ENVIRONMENTAL DNA SAMPLING

Environmental DNA samples filtered from water collected in March 2016 tested positive for both Arctic grayling and Chinook salmon DNA markers at several sample sites (Table 26). In contrast, all stream sediment eDNA samples tested negative for except for a single replicate at site CF2.3. However, some thawing of stream sediment samples had occurred during transit to the lab and lab staff indicated that the relatively coarse sediment particle sizes present at sample sites may reduce eDNA residence time (as compared to finer sediment; Carim pers. comm. 2016). As such, eDNA results from sediment samples may be considered inconclusive, and are not discussed further in this section. All results discussed in the following paragraphs pertain to eDNA detected in filtered water samples; detailed eDNA collection data and analytical results from both sediment and water samples are included in APPENDIX A. The eDNA persistence time in the aquatic environment is estimated to range from 7 to 25 days (Hobbs et. al. 2015). The station and species specific eDNA persistence may vary for Chinook salmon in the study area; however, none of the DNA collected in March 2016 could have come from adult salmon (which migrate through the Yukon River to spawn in July and August). As such, all positive Chinook salmon eDNA detections from March 2016 are representative of DNA from juvenile Chinook salmon.

Arctic grayling eDNA was detected at three stations in Coffee Creek (CF2.7, CF8.3 and CF10.0; Table 26). Samples collected in the Yukon River also tested positive for Arctic grayling eDNA, with positive detections at all Yukon River sample collection stations (YRD23.0, YRD11.0 and YRD4.1). No Arctic grayling eDNA was detected in Latte Creek Tributary C, or in Latte, Halfway or Independence creeks.

Juvenile Chinook salmon eDNA was detected at all sampled stations in Coffee Creek (CF2.7, CF5.4, CF8.3 and CF10.0; Table 26). No juvenile Chinook salmon eDNA was detected at any other sampled locations in the study area, including the Yukon River.

Table 26. Summary of eDNA detection results in the Mine study area, March 2016.

Station Name[1]	Sample Replicate	Arctic Grayling eDNA Detected (Yes/No)	Chinook Salmon eDNA Detected (Yes/No)
CF2.7	A	No	**Yes**
CF2.7	B	**Yes**	**Yes**
CF2.7	C	No	**Yes**
CF5.4	A	No	**Yes**
CF5.4	B	No	**Yes**
CF5.4	C	No	**Yes**
LC0.5	A	No	No
LC0.5	B	No	No
LC0.5	C	No	No
CF8.3	A	**Yes**	**Yes**
CF8.3	B	No	**Yes**
CF8.3	C	**Yes**	**Yes**
CF10.0	A	**Yes**	**Yes**
CF10.0	B	**Yes**	**Yes**
CF10.0	C	**Yes**	**Yes**

Station Name[1]	**Sample Replicate**	**Arctic Grayling eDNA Detected (Yes/No)**	**Chinook Salmon eDNA Detected (Yes/No)**
LC1.6	A	No	No
LC1.6	B	No	No
LC1.6	C	No	No
LCC0.1	A	No	No
LCC0.1	B	No	No
LCC0.1	C	No	No
LC9.9	A	No	No
LC9.9	B	No	No
LC9.9	C	No	No
ID1.9	A	No	No
ID1.9	B	No	No
ID1.9	C	No	No
HF0.2	A	No	No
HF0.2	B	No	No
HF0.2	C	No	No
YRD11.0	A	No	No
YRD11.0	B	**Yes**	No
YRD11.0	C	**Yes**	No
HF6.3	A	No	No
HF6.3	B	No	No
HF6.3	C	No	No
YRD23.0	A	**Yes**	No
YRD23.0	B	**Yes**	No
YRD23.0	C	**Yes**	No
YRU4.1	A	**Yes**	No
YRU4.1	B	**Yes**	No
YRU4.1	C	**Yes**	No
Control (Deionized Water)	Control	No	No

[1] Station names converted to system outlined in Section 1.5

4 RESULTS – NORTHERN ACCESS ROUTE

A total of 14 species of fish can be found within the streams that are intersected by the NAR including two species of salmon and 12 species of resident freshwater fish species (Table 12). The majority of these species are found only in the Yukon and Stewart rivers. The NAR intersects the upper portion of the Indian River watershed, in a location that is a considerable distance upstream from documented Chinook presence; however, a number of freshwater species are expected to be present (PECG 2017). The other primary watersheds intersected by the NAR (Maisy May, Barker, Ballarat) are smaller in size with the most diverse habitat (e.g. overwintering potential) near the mouths of these watersheds. Placer mining activity is prominent along the NAR (north of the Yukon River) and many stream channels and associated fish habitat has been changed by past activity.

4.1 STREAM CROSSINGS

Fish had been previously documented in the larger streams which the NAR intersects. PECG (2016) captured Arctic grayling at two sites in Maisy May Creek and burbot, slimy sculpin and juvenile Chinook salmon near the mouth of Maisy May (Crossing 91). Fish had been also previously documented in some of the larger streams along the route including the Stewart, Yukon and Indian rivers as well as Ballarat and Coffee creeks.

In 2016, 53 proposed crossings were visited; fish sampling was completed where stream channels were present with an emphasis on streams that did not have previously documented fish presence. Fish were captured in the Indian River (slimy sculpin) and in the upper Barker watershed (Arctic grayling at Crossing 208). Many of the smaller streams had poor habitat quality and/or downstream obstructions (e.g. high gradients[5]) to fish habitat (APPENDIX B and APPENDIX F).

Several of the smaller drainages assessed did not have stream characteristics such as a continuous channel bed where water has scoured a channel or deposited mineral alluvium within the channel. Any drainage that did not meet the criteria of a stream and did not have any fish habitat was referred to a Non-Classified Drainage (NCD).

Of the 56 drainages along the NAR (not including the Yukon and Stewart rivers), 16 were determined to be fish bearing or assumed fish bearing, 19 were determined to be non-fish bearing due to poor habitat and/or the presence of downstream barriers and 21 were determined to be NCD's (Figure 18 to Figure 20). Table 27 outlines all the streams assessed and provides rationale for each designation.

---

[5] Based on information from BC MOF (1998) stream grades of >20% were used to identify gradient barriers; this would be considered a very conservative for the fish species found in the study area (i.e. species that are known to navigate steep gradients in small streams in BC, e.g. bull trout and rainbow trout are not present).

Table 27. Summary of fish and fish habitat assessment work for road crossing associated with the NAR.

Crossing Number	Stream Name[1]	Avg. Channel Width (m)	Avg. Stream Gradient (%)	Fish Bearing Status[2]	Rationale for Fish Bearing Status
47	Sulphur Creek	n/a	n/a	FB	Not assessed in 2016 due to access restrictions. Considered fish bearing by PECG (2016). Round whitefish and Arctic grayling documented by DFO (2016). Large enough to provide overwintering habitat.
50	Indian River	~15 m	1	FB	Slimy sculpin captured at this site. Arctic grayling also documented in Indian River (PECG 2016).
51	unnamed (Indian River Trib 1)	-	5.0	NCD	Flow through moss, bog. No defined channel banks or alluvial substrate.
52	unnamed (Indian River Trib 2)	0.52	5.0	NFB	Poor habitat near road, spread out and underground flow downstream of road prevents access. No fish captured via electrofishing and minnow trapping.
53	unnamed (Indian River Trib 3)	-	-	NCD	Flow spread out through vegetation, lacks continuous defined channel banks or alluvial substrate.
54	unnamed (Indian River Trib 4)	-	-	NCD	Drainage dry, alluvial substrate only present immediately downstream of culvert.
54.5	unnamed (Eureka Trib)	0.55	23.0	NFB	Drainage is dry upstream of culvert and has an average gradient of 23% downstream, which precludes fish usage.
55	Eureka Creek	~30[a]	2[a]	PFB	Not assessed in 2016 due to active placer mining in area. Sampled by PECG (2016), no fish captured but potential exists given stream size and proximity to the Indian River.
57	unnamed tributary to Maisy May	-	-	NCD	Ditch water collects and flows across the road, no channel or defined banks.
58	unnamed tributary to Maisy May	-	-	NCD	No visible channel, as assessed by PECG (2016).
59	unnamed tributary to Maisy May	-	-	NCD	No visible channel, as assessed by PECG (2016).
60	unnamed tributary of Maisy May	n/a	30	NFB	Channel results from road/ditching drainage, no water at time of survey. Likely only flows during rain/melt events. Steep gradient and poor habitat would preclude fish use. Road planned to be moved away (upslope) from this area.
61	unnamed tributary of Maisy May	-	-	NCD	No stream bed/alluvial bed material downstream of the road. Road planned to be moved away from this area.

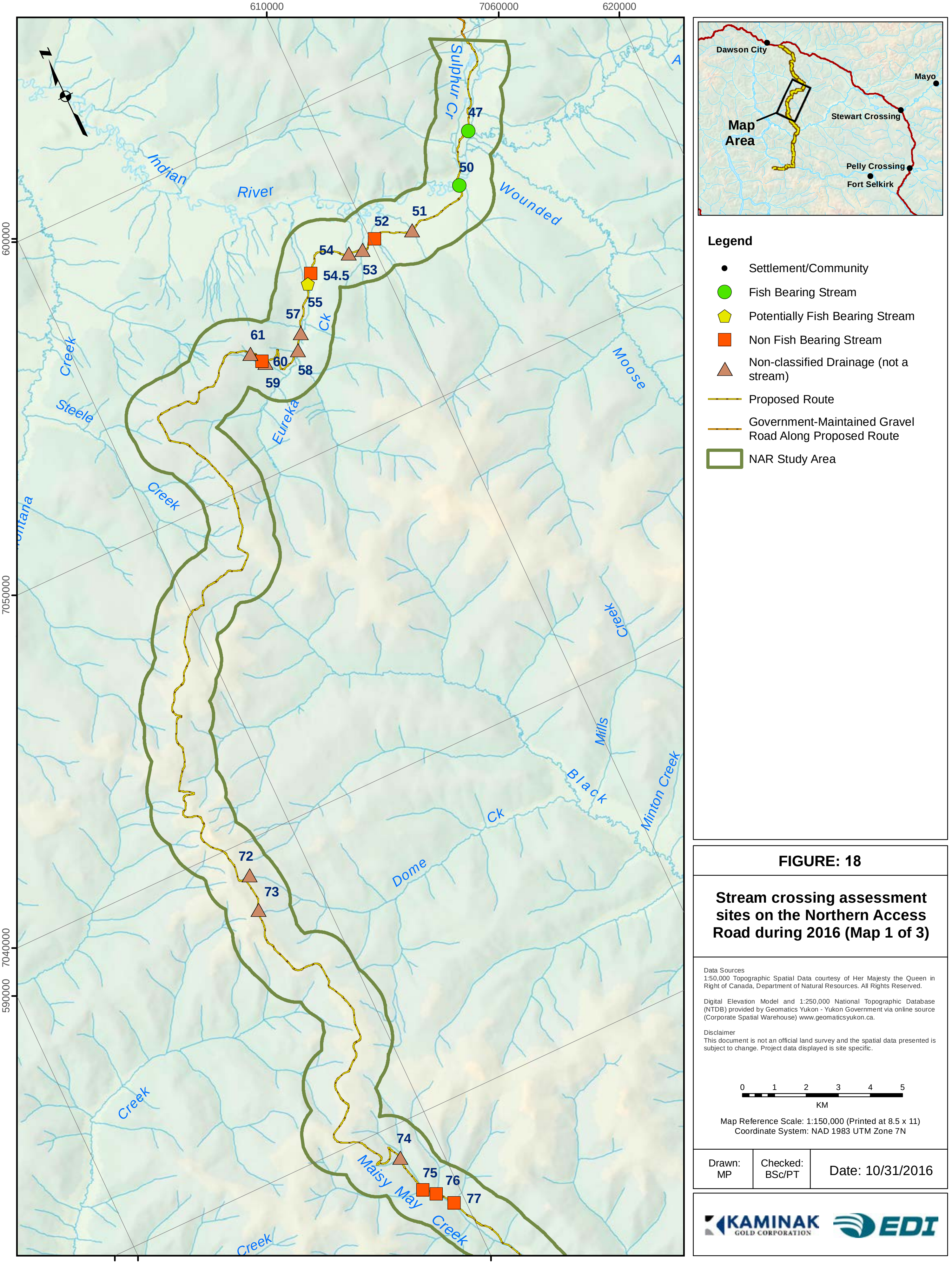
Crossing Number	**Stream Name[1]**	**Avg. Channel Width (m)**	**Avg. Stream Gradient (%)**	**Fish Bearing Status[2]**	**Rationale for Fish Bearing Status**
72	unnamed tributary of Maisy May Creek	-	-	NCD	Flow over moss and organics, no alluvial bed material or defined streambanks.
73	unnamed tributary of Maisy May	-	-	NCD	No stream channel evident on either side of road, just seepage from ditch.
74	unnamed (Upper Maisy May Trib)	-	-	NCD	Flow only near road, no defined stream channel upstream or downstream of road, and no alluvial bed materials.
75	unnamed (Maisy May Trib 1)	1.73	6.0	NFB	High gradient downstream of road prevents fish access. Electrofished, no fish captured.
76	unnamed (Maisy May Trib 2)	2.35	5.5	NFB	High gradient downstream of road prevents fish access. Electrofished, no fish captured.
77	unnamed (Maisy May Trib 3)	1.73	4.0	NFB	Some fish potential downstream of road; however, channel on approach to culvert is steep and would not pass fish. NFC during electrofishing.
MMTT-1	Maisy May Tailings Trib 1	-	-	NCD	Spread out flow through vegetation for 40 m upstream of the road. Shallow ponded water upstream. Minnow trapped, no fish captured.
MMTT-2	Maisy May Tailings Trib 2	3.94	1.8	PFB	Shallow flow in wide stream channel, possibly an old channel of Maisy May. Habitat could be used seasonally during high flows.
MMTT-3	Maisy May Tailings Trib 3	-	-	NCD	No flow, no signs of scouring or defined channel. Appears to be only wetted during super high flows in Maisy May, where the stream flows over road into this area. Suggestion to block off flow permanently to prevent fish from entering and possibly getting stranded during flood events.
MMTT-4	Maisy May Tailings Trib 4	-	-	NCD	No stream scouring or channel on Maisy May side of road, small groundwater channel starts 80 m east of crossing and flows south (away from road) into MMTT-5. It also appears that during times of flood in Maisy May, water flows over road at this location. Suggest building up the road to block off flow permanently to prevent flow through old placer mined area.
MMTT-5	Maisy May Tailings Trib 5	1.71	0.5	NFB	Shallow stream, poor fish habitat, flows through vegetation immediately upstream of road. Electrofished, no fish captured.
81	unnamed (Maisy May	3.6[a]	1[a]	FB	Arctic grayling captured by PECG (2016). Minnow traps set in 2016, no fish captured.

Crossing Number	Stream Name[1]	Avg. Channel Width (m)	Avg. Stream Gradient (%)	Fish Bearing Status[2]	Rationale for Fish Bearing Status
	Trib 4)				
83	unnamed (Lower Maisy May Trib 1)	0.67	8.5	NFB	Poor habitat quality, small channel with many obstructions. Electrofished, no fish captured.
84	unnamed (Lower Maisy May Trib 2)	-	-	NCD	No alluvial substrate or defined, continuous channel banks. Seepage flow only.
85	Unnamed Tributary of Maisy May Creek	-	-	NCD	No alluvial substrate or defined, continuous channel banks.
91	Maisy May Creek	4.00	2.5	FB	Burbot, Arctic grayling, Chinook salmon (juveniles) and slimy sculpin captured in Maisy May Creek by PECG (2016) and others.
97	unnamed (North Stewart Trib)	0.49	9.3	NFB	Too steep/shallow, lack of nearby spawning habitat, no fish captured by electrofishing or minnow trapping, multiple obstructions to fish passage.
100	Barker Creek	~10[a]	2[a]	FB	Good quality fish habitat, Arctic grayling captured upstream (Crossing 208).
101	unnamed (Lower Barker Trib 1)	3.38	12.0	NCD	Channel bed and banks are not continuous, no fish captured during electrofishing
102	unnamed (Lower Barker Trib 2)	2.12	13.0	NCD	Channel bed/banks not continuous for >100m, poorly defined.
103	unnamed (Lower Barker Trib 3)	2.43	9.5	NFB	Poor habitat and obstructions downstream, no fish captured via electrofishing.
104	unnamed (Lower Barker Trib 4)	3.74	8.0	NFB	Poor habitat and obstructions downstream, no fish captured via electrofishing.
110	unnamed tributary of Barker Creek	0.81[a]	3[a]	NFB	3 m falls 55 m downstream crossing, no overwintering habitat upstream of falls. No fish captured by electrofishing.
111	unnamed (Mid Barker Camp)	4.40	6.0	PFB	No fish captured during electrofishing; however, habitat exists and Arctic grayling have been captured upstream (Agate Creek).
112	unnamed (Mid Barker Tailings 1)	1.30		NFB	Small, poorly defined and shallow stream with downstream obstructions to fish passage.

Crossing Number	Stream Name[1]	Avg. Channel Width (m)	Avg. Stream Gradient (%)	Fish Bearing Status[2]	Rationale for Fish Bearing Status
113	unnamed (Mid Barker Tailings 2)	5.00	2.3	PFB	No fish captured during electrofishing; however, habitat exists.
114	unnamed tributary of Barker Creek	n/a	n/a	NFB	Discontinuous and poorly defined upstream of road, more defined downstream, but goes subsurface occasionally. Gradient barrier downstream of the crossing (24% for over 100 m), no fish captured via electrofishing.
115	unnamed tributary of Barker Creek	n/a	n/a	NFB	Small, poorly defined and shallow stream. Not enough water to sample.
210	unnamed (Upper Barker Trib 1)	2.23	3.0	PFB	Moderate rearing habitat, no fish captured during electrofishing but usage for summer rearing (i.e. Arctic grayling) cannot be ruled out.
209	unnamed (Upper Barker Trib 3)	3.80	4.5	PFB	Moderate rearing habitat, no fish captured during electrofishing but usage for summer rearing (i.e. Arctic grayling) cannot be ruled out.
208	Agate Creek (Upper Barker)	2.35	4.0	FB	Arctic grayling captured.
207	unnamed (Upper Barker Trib 4)	1.23	17.0	NFB	Too steep/shallow, cascades to 0.9 m, no spawning/overwintering nearby. No fish captured during electrofishing.
206	unnamed (Ballarat Headwaters)	-	-	NCD	Water flow through willow and moss, no defined stream channel. No fish captured during electrofishing
205	unnamed (Upper Ballarat)	0.97	11.5	NFB	Barrier located downstream of this site on Ballarat Creek, also habitat poor overall. No fish captured during electrofishing
204	unnamed tributary to Ballarat Creek	-	-	NCD	No drainage found in this location.
203	unnamed (Upper Ballarat Trib)	0.44	10.7	NFB	Low habitat quality, very small channel, poor habitat, very cold water temps. No fish captured during electrofishing.
202	unnamed tributary to Ballarat Creek	-	-	NCD	Small backwatered area at confluence of Ballarat Creek only, otherwise flow through organics with no defined channel.
201	Ballarat Creek (Mid Ballarat)	3.60	2.8	PFB	Moderate overwintering and rearing habitat quality, no hard barriers identified/confirmed downstream. No fish captured via electrofishing.
118	unnamed	11[a]	5[a]	PFB	Substantial stream, no barriers to fish passage.

Crossing Number	Stream Name[1]	Avg. Channel Width (m)	Avg. Stream Gradient (%)	Fish Bearing Status[2]	Rationale for Fish Bearing Status
	(Lower Ballarat Trib 1)				
119	unnamed (Lower Ballarat Trib 2)	n/a	n/a	NFB	No water, steep boulder dominated channel with gradient barrier downstream of road.
200	Ballarat Creek (Ballarat Proper)			FB	Juvenile Chinook salmon documented nearby by WMEC (2001).
WRC-1	unnamed (Winter Road Creek)	0.76	2.8	PFB	Moderate rearing habitat quality, no hard barriers identified and relatively few obstructions downstream.
WRC-2	unnamed tributary to Yukon River	-	-	NCD	Trickle of water through vegetation, no defined stream channel or alluvial bed material.
125	Coffee Creek	21.83	1.5	FB	Fish captured during previous sampling by PECG (2017) and this report (mine sampling). Chinook salmon (juveniles), slimy sculpin and Arctic grayling documented.

[1] Names in brackets are consistent with OnSite Crossing ID (project engineers). 2 Where FB = Fish Bearing, NFB = Non-Fish Bearing, PFB = Potentially Fish Bearing and NCD = Non-Classified Drainage. [a] data from PECG (2016)



Legend

- ● Settlement/Community
- 🟢 Fish Bearing Stream
- ⬠ Potentially Fish Bearing Stream
- 🟧 Non Fish Bearing Stream
- ▲ Non-classified Drainage (not a stream)
- Proposed Route
- Government-Maintained Gravel Road Along Proposed Route
- ▭ NAR Study Area

FIGURE: 18

Stream crossing assessment sites on the Northern Access Road during 2016 (Map 1 of 3)

Data Sources
1:50,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Model and 1:250,000 National Topographic Database (NTDB) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

Disclaimer
This document is not an official land survey and the spatial data presented is subject to change. Project data displayed is site specific.

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KM

Map Reference Scale: 1:150,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn: MP	Checked: BSc/PT	Date: 10/31/2016

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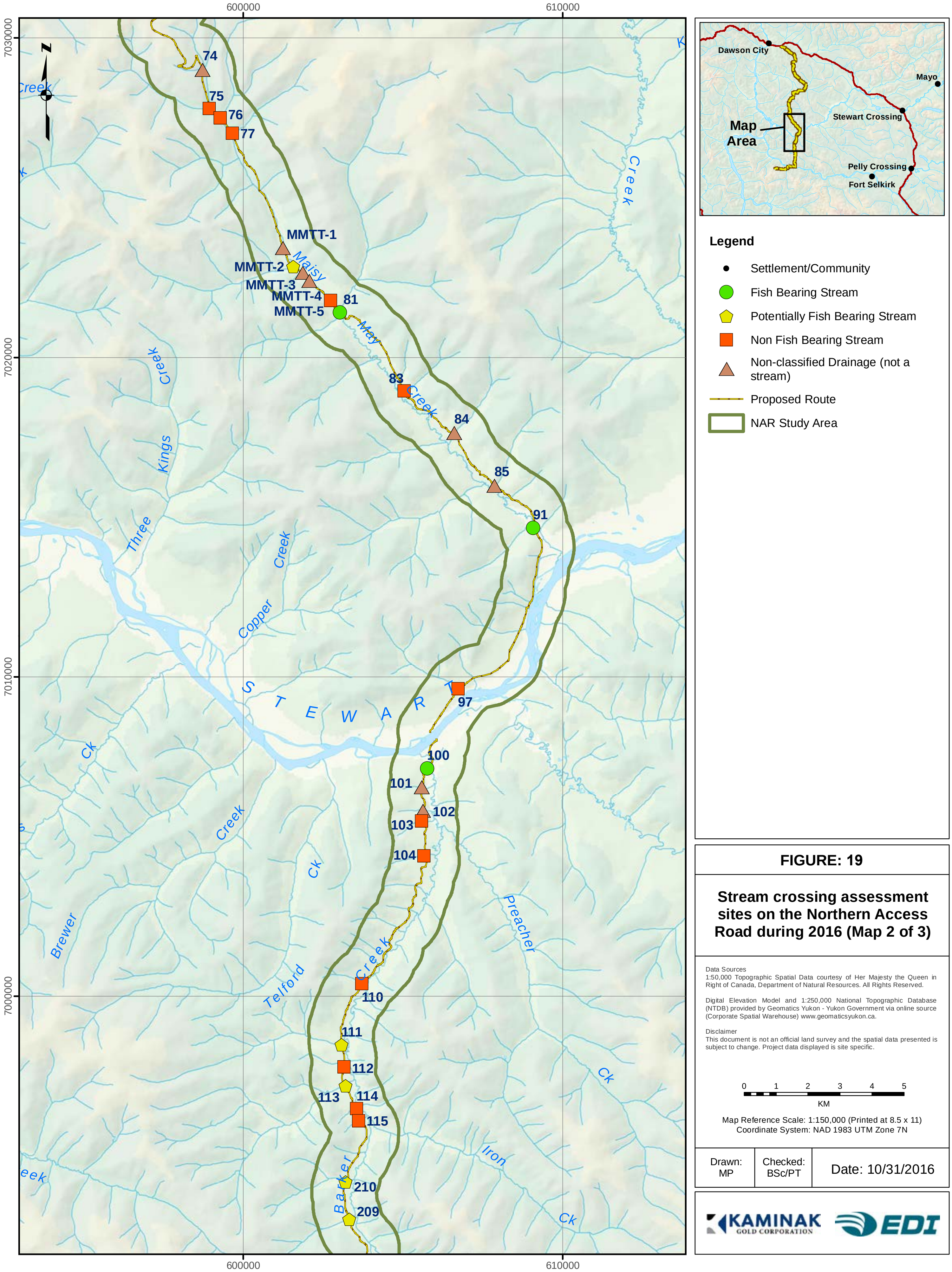

FIGURE: 19

Stream crossing assessment sites on the Northern Access Road during 2016 (Map 2 of 3)

Data Sources
1:50,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Model and 1:250,000 National Topographic Database (NTDB) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

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KM

Map Reference Scale: 1:150,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn: MP	Checked: BSc/PT	Date: 10/31/2016

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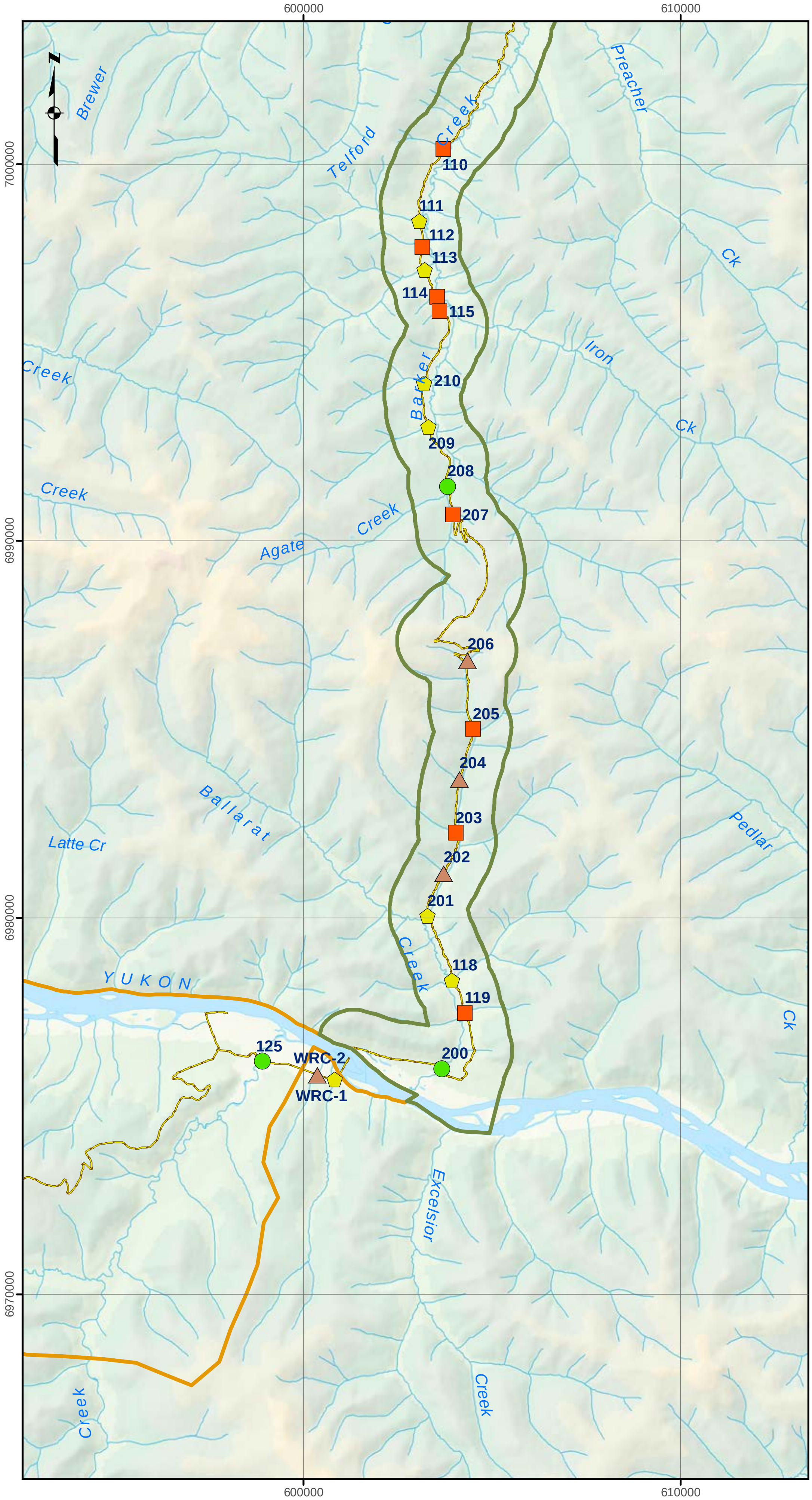

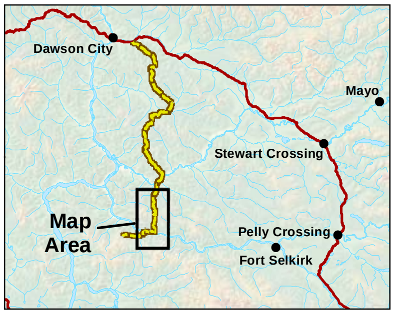

Legend

- ● Settlement/Community
- 🟢 Fish Bearing Stream
- ⬟ Potentially Fish Bearing Stream
- 🟥 Non Fish Bearing Stream
- ▲ Non-classified Drainage (not a stream)
- ― Proposed Route

Aquatic Local Study Areas

- ▭ Mine Study Area
- ▭ NAR Study Area

FIGURE: 20

Stream crossing assessment sites on the Northern Access Road during 2016 (Map 3 of 3)

Data Sources
1:50,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Model and 1:250,000 National Topographic Database (NTDB) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

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0 1 2 3 4 5
KM

Map Reference Scale: 1:150,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn: MP	Checked: BSc/PT	Date: 10/31/2016

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4.2 BARGE LANDINGS – YUKON AND STEWART RIVERS

Past work at the barge landings on the Yukon and Stewart rivers indicates that the sites are located in areas that have typical streambank habitat associated with these large rivers. No sampling was completed in 2015; however, it was speculated that these areas would provide migration and rearing habitat for the various species of fish in these rivers. Sampling was conducted in both the Yukon and Stewart rivers in 2016 to provide information on fish species presence within the vicinity of the proposed barge landings.

A total of eight species were captured during 2016 sampling (Table 28) with similar fish species being captured in both the Yukon and Stewart rivers. Northern pike and round whitefish were captured in the Yukon and Stewart rivers only, respectively.

Juvenile Chinook salmon were the most frequently captured species and were captured in three beach seine hauls on the Yukon River where they accounted for nearly 80% of the fish captured (Figure 21). Slimy sculpin and longnose sucker were also captured in all three seine hauls although the number of individuals captured was relatively low. In the Stewart River, juvenile Chinook and longnose sucker were the most common species captured with only the latter captured in all three seine hauls.

Table 28. Summary of fish species captured in the Yukon and Stewart rivers during 2016 as associated with the proposed barge landing locations.

Species	Fish Captured	
	Yukon River	Stewart River
Chinook salmon	✓	✓
Arctic grayling	✓	✓
burbot	✓	✓
northern pike	✓	
longnose sucker	✓	✓
lake chub	✓	✓
slimy sculpin	✓	✓
round whitefish		✓
lake/round whitefish[6]		✓

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[6] These species are not discernable at the juvenile life stage without genetic testing.

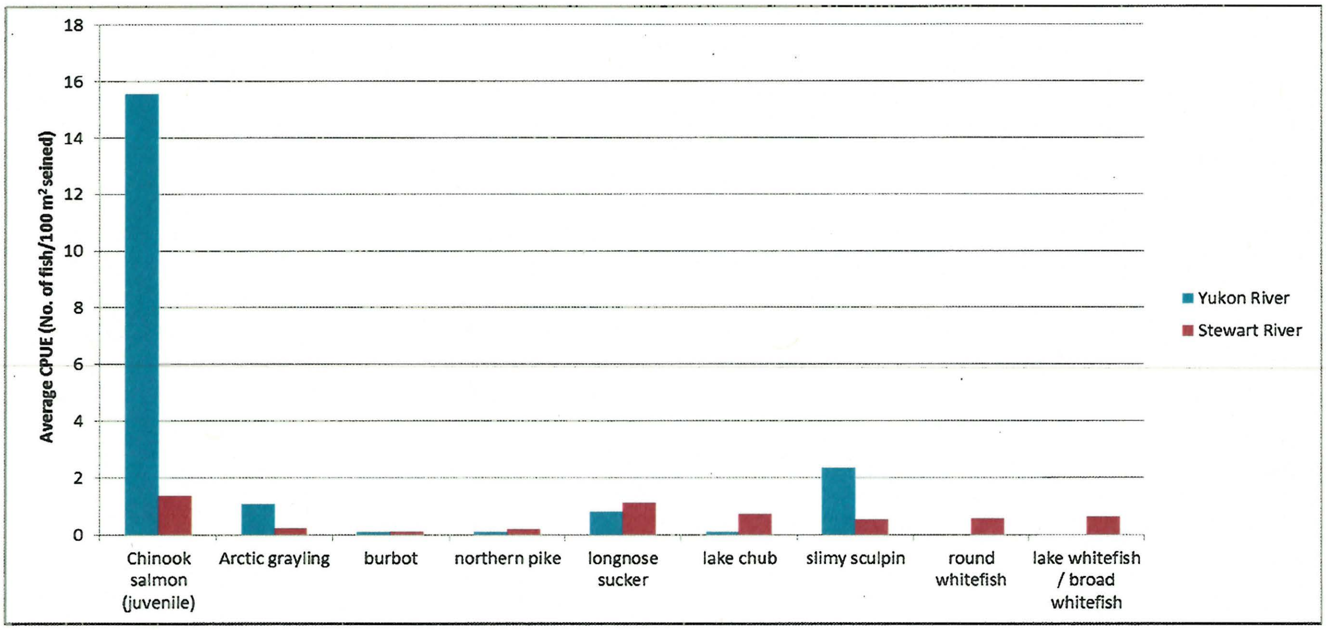

Figure 21. **Catch-per-unit-effort (CPUE) of fish captured by beach seining in the vicinity of the proposed barge landings on the Yukon and Stewart rivers.**

4.2.1 CHUM SPAWNING SURVEYS

Spawning chum salmon were observed in the Yukon River in September and October 2013 (Figure 22). An unverified salmon species was documented spawning within the study area in October 2014; the timing of the observation indicates that the observed spawning salmon were chum (PECG 2016). During the October 2016 spawning survey, spawning chum were found in six locations within the Yukon River with a total of 263 chum observed (Table 29, Figure 22). The Stewart River was mostly frozen over at the time of the survey; however, three spawning chum were observed in one location near the downstream end of the survey extent (Table 29, Figure 22). All areas were shallow and gravel and cobble bed material. On both rivers, the ice conditions and unseasonably cold temperatures likely reduced the number of spawning sites observed. On the Yukon River a number of the spawning areas located during 2013 were frozen over during the October 2016 survey and thus could not be surveyed.

All documented chum salmon spawning areas in the LSA occur in small, clear water side channels of the Yukon River (Photo 17, Photo 18) and the Stewart River (Photo 19). This suggests that chum salmon spawn preferentially in these clear water locations, rather than the more turbid mainstem or larger secondary side channels of the these large rivers. In addition, the upstream inlet of the spawning channels appears to be disconnected from the flow of the mainstem Yukon River during the fall chum salmon spawning period (i.e. fall months; Photo 10). As such, the naturally turbid river water would be prevented from flowing into this channel during the fall, while chum salmon are spawning/incubating in these areas.

Table 29. Summary of spawning chum salmon observed on the Yukon and Stewart rivers during October 2016.

Stream	Site	Number of Chum Salmon Observed
Yukon River	YR1	50
	YR2	63
	YR3	39
	YR4	42
	YR5	37
	YR6	32
Stewart River	SR1	3

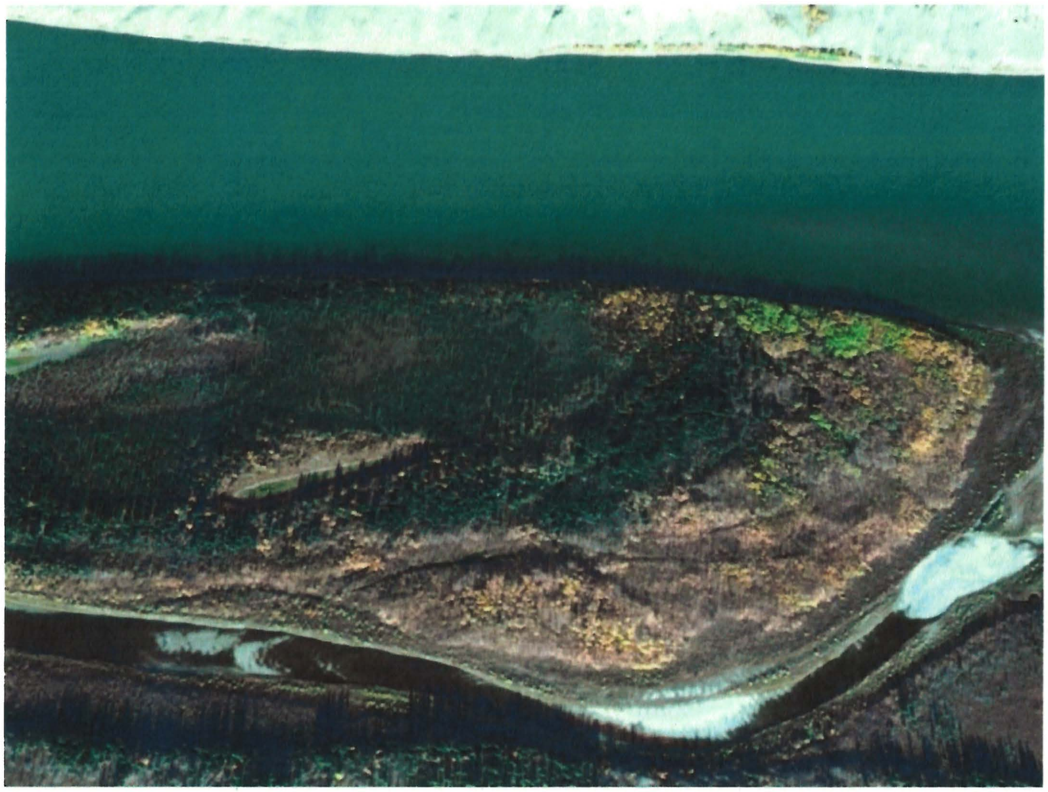

Photo 17. Aerial image showing a clear water side channel where chum salmon spawning has been observed in the study area, the more turbid water above is the mainstem of the Yukon River (from Google Earth image date September 19, 2010).

Photo 18. Ground photo of spawning chum salmon in a clear water side channel of the Yukon River during the October 2016 survey (site YR5 shown).

Photo 19. Aerial image showing a clear water side channel on where chum salmon spawning was observed (red circle) in clear water side channel of the Stewart River (from Google Earth image date: September 19, 2010).

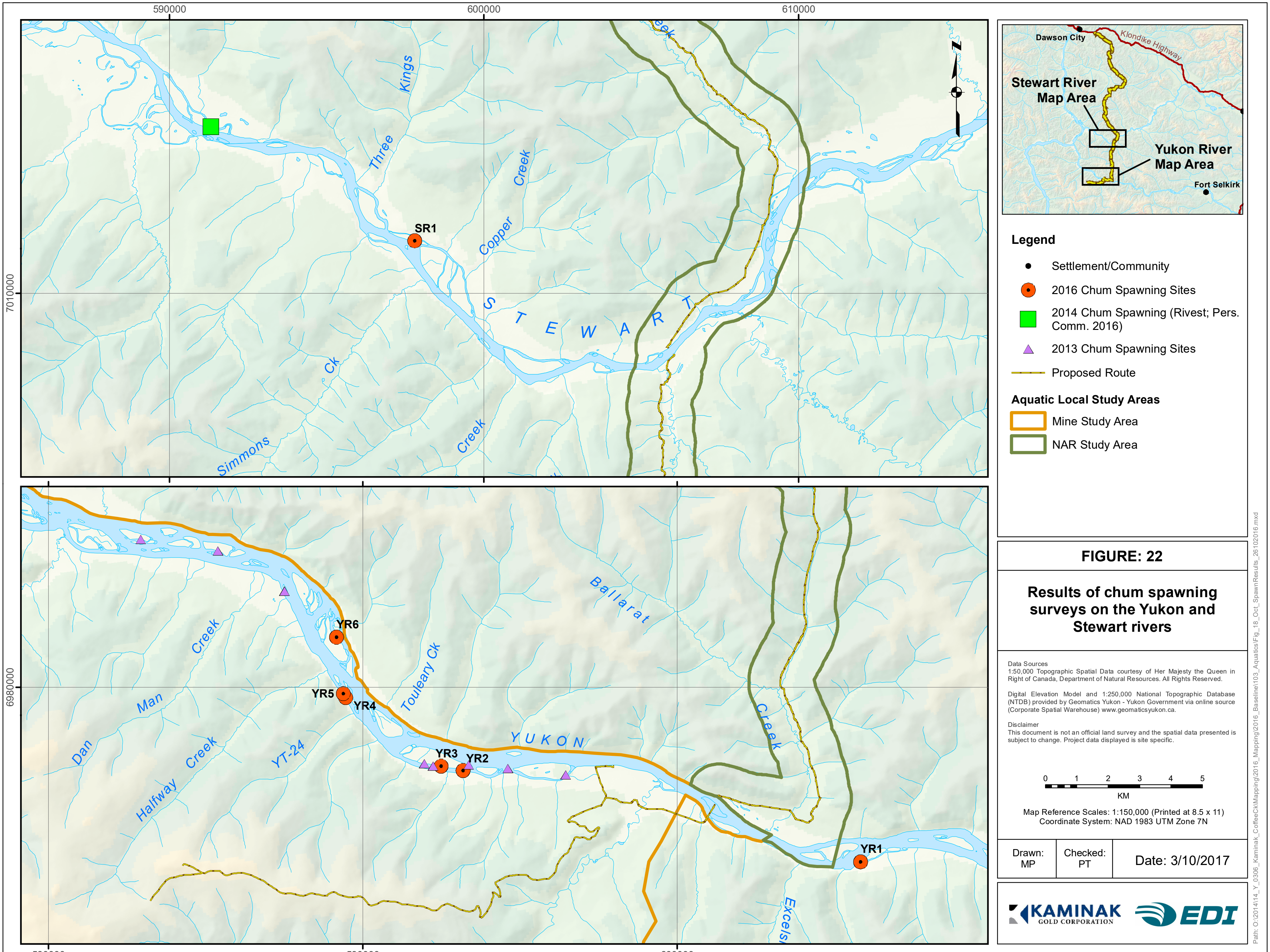

FIGURE: 22

Results of chum spawning surveys on the Yukon and Stewart rivers

Data Sources
1:50,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Model and 1:250,000 National Topographic Database (NTDB) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

Disclaimer
This document is not an official land survey and the spatial data presented is subject to change. Project data displayed is site specific.

0 1 2 3 4 5
KM

Map Reference Scales: 1:150,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn: MP	Checked: PT	Date: 3/10/2017

KAMINAK GOLD CORPORATION

EDI

Path: O:\2014\14_Y_0306_Kaminak_CoffeeCk\Mapping\2016_Mapping\2016_Baseline\103_Aquatics\Fig_18_Oct_SpawnResults_26102016.mxd

4.3 STEWART RIVER BACK CHANNEL

Previous investigations indicated this channel had limited fish habitat during low flows in the Stewart River (PECG 2016). No fish were captured via minnow trapping (September 2015) in the vicinity of the area that will be encroached upon and dissolved oxygen levels were relatively low (5.19 mg/L; PECG 2016). Given its connection with the Stewart River, it is considered fish bearing and is likely most valuable as refuge habitat when water levels in the Stewart River are high.

During July 2016, fish sampling downstream of the area that will be encroached by the NAR (where the channel is deeper and wider), resulted in the capture of lake chub, northern pike, round whitefish and lake whitefish. During the late October visit, the back channel in the vicinity of the encroachment areas was found to be frozen to bed with no water under the ice (Photo 20, Photo 21). The crew investigated the upstream extent of this channel to determine if it receives flow from the upstream end and found that there was more terrestrial vegetation (i.e. willows) towards the upper end of the channel; however, it appears likely that flow does occasionally enter the channel during high flows in the Stewart River.

In the vicinity of the encroachment areas, this channel appears to be only wetted during high flows in the Stewart River and is most likely used as refuge habitat by species utilize the area downstream (i.e. lake chub, northern pike and perhaps whitefish). The channel bottom is made of fines and organics. No critical habitats will be affected by the encroachment on the edge of this channel.

Photo 20. **Downstream view of Stewart River back channel in the vicinity of an encroachment area (right side of photo).**

Photo 21. **Upstream view of Stewart River back channel in the vicinity of an encroachment area (left side of photo).**

5 DISCUSSION

The fish habitat in the study area comprises large river and smaller stream habitat. The Yukon and Stewart rivers provide important overwintering habitat and migration corridors within the region, while tributary streams, depending on their size, provide a variety of rearing habitat and overwintering capabilities. Tributaries that provide overwintering habitat (i.e. Coffee, lower Independence and Maisy May creeks) have more diverse fish assemblages, while smaller tributaries with no overwintering habitat provide some summer rearing habitat for migratory fish (e.g. grayling). Most tributary streams in the area are nutrient-poor and have cool water temperatures, which limit their overall productivity. Many smaller streams in headwater areas have moderate gradients and poor habitats (i.e. limited pool depth) that are not typically used by the species present in the region. Many of the streams along the NAR have been subject to placer mining activities which have resulted in change of stream and riparian morphology. The following sections use all available information to discuss the fish and fish habitat values in each stream with an emphasis on the Mine study area.

5.1 YUKON RIVER

The Yukon River flows within the Mine and NAR study areas and all of the streams near the Mine infrastructure are tributaries of this stream. The river has a relatively diverse assemblage of fish species with numerous species likely to occur within the vicinity of Coffee Creek including both Chinook and chum salmon. Near the study area, adult Chinook use the river as a migration route to spawning areas further upstream. Juvenile Chinook use the main channel of the river during the downstream migration from rearing areas to the ocean. Juveniles may also rear in the main channel during the summer; however, this is not considered ideal rearing habitat for these fish which prefer clear water smaller streams with woody debris and other forms of in-stream cover. The lack of detected Chinook salmon eDNA in river Yukon River water collected in March 2016 provides an indication that Chinook do not overwinter in the Yukon River.

Adult chum have been observed spawning in side channel areas of the Yukon River within the study area in 2013, 2014 and 2016 (Figure 22). These spawners belong to the 'mainstem Yukon River' stock, which spawn in side channels/sloughs of the Yukon River between the White River and the Tatchun Creek area near Carmacks. During 2014, this stock constituted 49% of the Canadian border passage of fall chum salmon (JTC 2015); however, only a small portion of these individuals likely spawn in the portion of the Yukon River within the study area. These chum that spawn within the study area use clear water side channel habitat that appear disconnected from the flow of the mainstem of the Yukon River during fall and winter months. Based on known chum salmon habitat preferences, these channels are likely fed by groundwater throughout the incubation period.

No chum spawning has been documented in close proximity to the barge and winter road landings (Photo 22); the closest location is in a side channel 1.8 km downstream of south barge landing. While the southern winter road landing is located in a side channel, this side channel appears to be frequently fed by river flow rather than groundwater (Photo 22, all documented spawning locations were in clear water locations on this imagery), no spawning has been observed in this side channel.

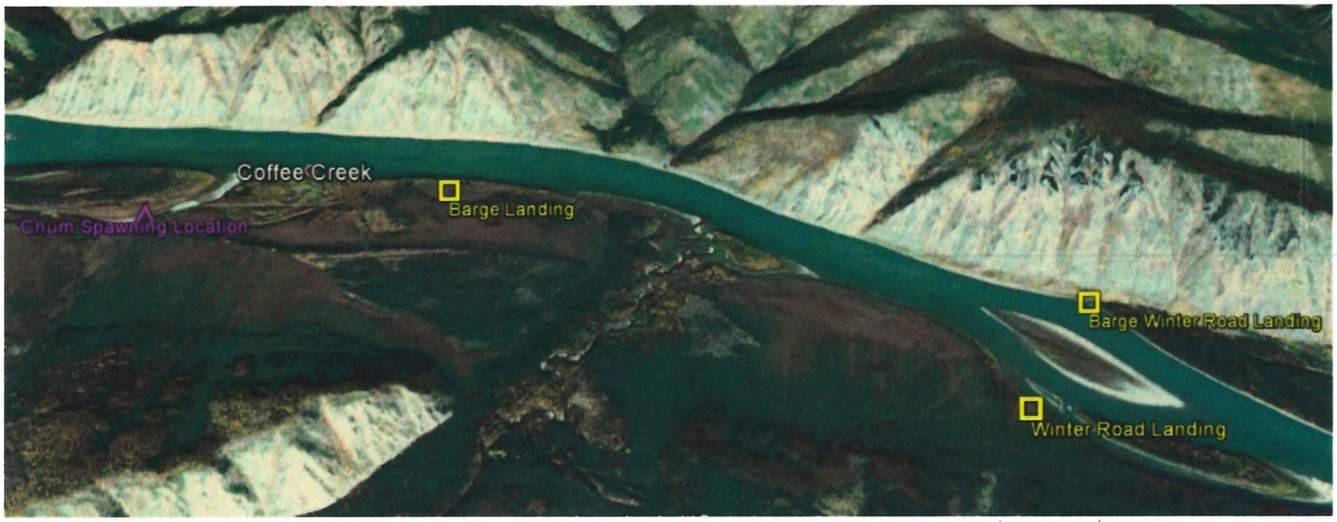

Photo 22. **Google earth imagery (Sept 19, 2010) of the Stewart River near the locations of barge and winter road landings.**

In addition to salmon, the mainstem Yukon River also provides habitat for a wide range of species including Arctic grayling, a valued recreational fish species in the Yukon and species of interest for the Coffee Project due to their presence in the small streams directly downstream of the Project infrastructure. The river likely does not provide spawning habitat for this species; however, it does provides suitable overwintering conditions. The detection of Arctic grayling eDNA in river water samples collected at several locations in the Yukon River provides evidence of Arctic grayling overwintering in the portion of the river within the study area. Arctic grayling often make considerable migrations between spawning, rearing and overwintering locations with smaller streams (such as Coffee, Latte and Independence creeks) used primarily for summer rearing.

Northern pike, burbot and whitefish are also present in the Yukon River. Low numbers of burbot (one fish) and pike (one fish) were captured associated with the barge landing sampling; whitefish were not captured. Northern pike are likely more common in back channel areas where flow velocities and turbidity is low (based on habitat preference and knowledge of them being visual feeders as outlined by McPhail, 2007). Burbot are associated with deep main channels of northern rivers and are found in areas where clear streams enter turbid rivers (McPhail, 2007). Whitefish likely seek out clearer water habitat (moderate size rivers) during the spring/summer when the Yukon River is turbid. All of these species likely use the Yukon River for overwintering purposes when turbidity is low and other overwintering locations are limited.

5.2 STEWART RIVER

The Stewart River provides very similar habitat to the Yukon River; it is also a migration corridor for Chinook and chum salmon that are known to spawn upstream of the NAR. Chum spawning has been documented in clear groundwater fed side channels downstream (~10 km [in 2016] and ~18 km [Rivest Pers. Comm. 2016]) of the barge landings. While spawning survey conditions were not ideal in 2016, there is no similar side channel habitat in the vicinity of the barge crossings (as viewed from the 2016 survey and Project Lidar (Photo 23).

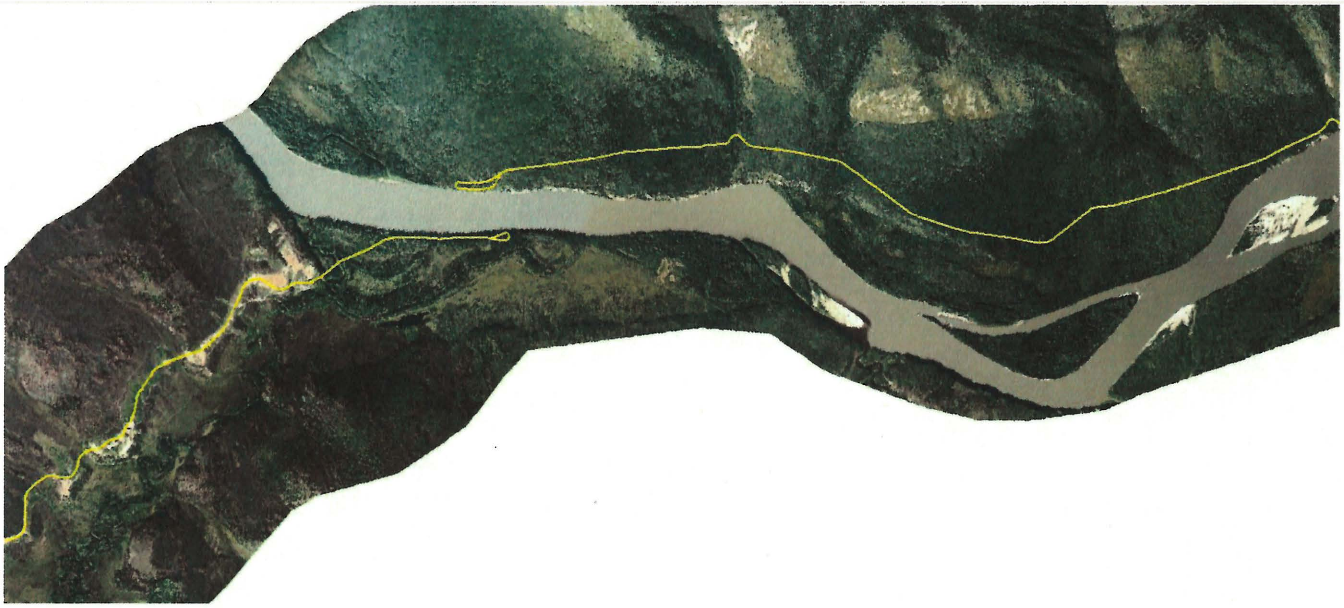

Photo 23. Lidar imagery of the Stewart River near the locations of barge landings (yellow line = NAR).

The Stewart River back channel that will be encroached upon during road construction provides marginal fish habitat that is most likely to be used as refuge habitat during high water events in the Stewart River.

Northern pike, burbot and whitefish are also likely to occur in the Stewart River and utilize similar habitats as the Yukon River (refer to Section 5.1).

5.3 COFFEE CREEK

Aside from the Yukon River, Coffee Creek has the largest catchment in the Mine study area with a total area of approximately 49,000 ha. Three fish species have been documented in the portion of Coffee Creek within the study area, including Chinook salmon (juveniles), Arctic grayling and slimy sculpin.

During the open water season, juvenile Chinook salmon have been captured at sites from the confluence of Coffee Creek and the Yukon River upstream to the Latte Creek confluence, a linear distance of approximately 8.3 km. These juveniles are presumed to be non-natal and likely originated from spawning areas in the Yukon River watershed upstream of Coffee Creek. This hypothesis is supported by recent spawning surveys and the lack of capture of juvenile Chinook during late June (2015) sampling efforts. The use of small streams for non-natal rearing by juvenile Chinook has been well documented in the Yukon by other researchers including Beacham et al. (1989) and Moodie et al. (2000). This life history strategy allows for juvenile Chinook to access areas which provide productive rearing habitats and may also be associated with predation avoidance (Moodie et al. 2000).

Overwintering habitat was confirmed in the lower 10.0 km of Coffee Creek in early March 2016, as indicated by the capture of slimy sculpin (at stations CF2.7, CF8.3 and CF10.0) and juvenile Chinook (stations CF0.5 and CF2.7) and the detection of juvenile Chinook salmon eDNA water samples collected from all sampling sites. Open water was observed in several side channels in this portion of Coffee Creek, which is often indicative of groundwater discharge in winter. Groundwater discharge influences the presence of juvenile Chinook during the winter months as these areas typically have slightly warmer water temperatures and provide security in terms of sufficient water flows during the winter months. Traditional Knowledge (TH 2012) indicates that Chinook salmon used to spawn up Coffee Creek; however, spawning Chinook were not documented in Coffee Creek during surveys in 2000, 2001, 2014, 2015 or 2016.

Arctic grayling use Coffee Creek for summer rearing and feeding habitat and there is evidence of use for overwintering. PECG (2017) documented Arctic grayling in Coffee Creek from the Yukon River upstream to the Latte Creek confluence in the summer months (a linear distance of approximately 8.3 km). Despite favourable underwater viewing conditions and presence of pool habitat in the lower portions of Coffee Creek no Arctic grayling have been observed or captured during the winter in Coffee Creek. However, positive detection of eDNA of this species in winter at sites in lower (CF2.7) and upper Coffee Creek (CF8.3 and CF10.0) indicate that grayling do overwinter in the stream.

It appears unlikely that Coffee Creek is used by Arctic grayling for spawning. Juvenile grayling (including young-of-the-year) are typically associated with stream margins and would be effectively captured by electrofishing if they were present in the stream. A total of 15 Arctic grayling were captured in Coffee Creek during 2014 and 2015 (PECG 2017) and ranged in size from 134 to 357 mm; YOY were not captured and the majority of individuals captured were over 200 mm in length. The Arctic grayling captured in upper Coffee Creek by PECG (2013) were also consistent with the sampling lower in the watershed; the 12 individuals captured in this area ranged in length from 173 to 238 mm.

Slimy sculpin have been documented in Coffee Creek upstream to the CF10.0 sampling station and likely occur further upstream in the watershed. Given that this species is non-migratory; their presence supports the conclusion that Coffee Creek provides suitable overwintering conditions for fish. In March 2016, slimy sculpin were captured at sampling stations where open water leads were present (CF2.7 and CF10.0) as well as stations where the channel had full ice coverage (CF8.3), indicating that this species overwinters in both habitat types.

Baseline benthic invertebrate tissue metal concentrations in samples collected from Coffee Creek indicates that concentrations of total mercury and methylmercury (calculated) are below the relevant guidelines. In contrast, calculated baseline Arctic grayling, slimy sculpin and juvenile Chinook salmon tissue methylmercury concentrations exceeded the CCME tissue residue guidelines for the protection of wildlife consumers of aquatic biota (CCME 2000a). Baseline tissue concentrations of selenium in benthic invertebrates, Arctic grayling and juvenile Chinook tissue samples were below the EPA aquatic life ambient water quality criterion for selenium. A small number of sampled slimy sculpin had selenium tissue concentrations above the draft EPA guideline. Selenium concentrations in some Arctic grayling and many slimy sculpin exceeded the BC selenium standard. Uranium concentrations in both invertebrates and slimy sculpin tissue were higher in samples collected from Coffee Creek in March when compared to those collected in August, which is reflective of the baseline uranium concentrations in the creek water, which were highest during low flow conditions experience in late winter (Lorax Environmental 2016).

5.3.1 LATTE CREEK

Latte Creek flows into Coffee Creek approximately 8.3 km upstream from the Yukon River. Latte Creek has a catchment area of approximately 7,000 ha (Lorax Pers. Comm. 2016) and a portion of the headwaters of the drainage are located within the footprint of the Project infrastructure. Two species of fish have been documented in Latte Creek to date including slimy sculpin and Arctic grayling. Slimy sculpin were captured only in the very lower portion of the Latte Creek watershed (LC0.5), in close proximity to Coffee Creek.

Arctic grayling have been captured or observed in Latte Creek from the mouth of the creek upstream to station LC9.9, a linear distance of nearly 10 km. A total of 57 Arctic grayling were captured in the stream during 2014 and 2015 (PECG 2017) and ranged in length from 128 to 355 mm with a mean length of 260 mm. Multiple pass electrofishing was used to estimate the density of Arctic grayling at station LC2.7 and documented a moderate density of individuals (6/100 m^2 during 2014 and 10/100 m^2 in 2015; ± 2, 90% confidence interval in both years; PECG 2017). The lack of YOY captured in the stream indicates that the stream is not used for spawning. PECG (2017) conducted spawning surveys in Latte Creek during mid-June 2015 and did not observe any spawning behaviour nor did they capture any fish that were actively spawning.

Fish overwintering in Latte Creek appears to be unlikely, as determined by observations of the stream during early March 2016. The stream was completely ice covered with no open water leads and had minimal water flow under the ice. Water quality parameters (temperature and dissolved oxygen) were suitable for fish overwintering; however, the limited water depth and lack of deeper pools likely do not provide suitable conditions for overwintering. All eDNA samples collected from water in Latte Creek in March 2016 tested negative for both Arctic grayling and juvenile Chinook salmon DNA. The absence of slimy sculpin in all but the very lower portion of the watershed (adjacent to documented overwintering habitat in Coffee Creek) also supports this conclusion that fish overwintering in Latte Creek is unlikely. Due to the non-migratory nature of this species, their absence is often a good indicator that overwintering habitat is lacking.

Baseline fish tissue concentrations of methylmercury in Latte Creek exceeded the CCME tissue guideline in Arctic grayling and slimy sculpin samples. Uranium concentrations in all fish tissues were among the lowest in the Mine LSA. Baseline benthic invertebrate tissue metal concentrations in samples collected from Latte Creek indicate that concentrations of total mercury and methylmercury (calculated) were below the relevant guidelines; however, it was noted that concentrations of total and methylmercury were higher at LC9.9 when compared to LC2.7, located closer to the confluence with Coffee Creek.

5.3.1.1 Latte Creek Tributary C

The Latte Creek Tributary C is a small stream (2nd order, 1:50,000) that flows into Latte Creek approximately 10 km upstream from Coffee Creek. The catchment area of this stream is relatively small (344 ha; Lorax Pers. Comm. 2016) and the upper portion of this watershed overlaps with mine infrastructure (e.g. proposed pits).

The stream has a moderate to high gradients, has a poorly defined channel near the mouth and has numerous obstructions to fish passage (described in Section 3.4.5). The only species/life stage that use Latte Creek near the confluence of this stream is sub-adult and adult Arctic grayling. With the exception of the lower 15 m that is influenced by flows in Latte Creek, the poor habitat (small and poorly defined channel, lack of deep pools, high gradient, and numerous obstructions) in this stream is not suitable to this species/life stage.

5.4 HALFWAY CREEK

Halfway Creek is a tributary of the Yukon River and has a catchment area of 2,704 ha (Lorax Pers. Comm. 2016). The total length of the mainstem of this stream is approximately 11 km and a portion of its headwaters are located within the footprint of the proposed WRSF.

The capture of a single Arctic grayling in 2014, 2015 and 2016 and a small number of slimy sculpin in August 2016 at station HF0.0 indicates that the area at/near the confluence with the Yukon River is used by low densities of fish. Previous sampling in July, August, September and October 2013 and in July 2016 ~200 m upstream of the mouth (HF0.2) did not result in the capture any fish; however, one Arctic grayling and 20 juvenile Chinook salmon were captured at this station in August 2016.

Winter fish sampling was conducted during March 2016 at station HF6.3 and no fish were captured. Due to the extensive ice coverage of the stream and minimal water flow/depths under the ice, winter fish sampling could not be completed in the lower portion of the stream; however, the overwintering potential appears to be low. A sufficient amount of water was present in the stream to allow for the collection of eDNA samples from two sites on Halfway Creek (HF6.3 and HF0.2); both sites tested negative for both Arctic grayling and juvenile Chinook salmon.

Based on the fish sampling results from 2013 to 2016 and the fish habitat data collected in the lower, middle and upper reaches of Halfway Creek, fish presence in low numbers is confirmed in the lower 350 m of Halfway Creek. Fish presence is also possible in the lower 900 m that are accessible to fish from the Yukon River. While the barrier 900 m upstream of the mouth is not permanent, there are other obstructions to fish accessing the middle reaches of Halfway Creek (HF6.3), and fish habitat in this area is generally poor due to moderate gradients (~10%) and lack of pools.

In Yukon, headwater streams with moderate gradients (in the range of 10% or higher) are often absent of fish. A study in the Peel River watershed indicated that Arctic Grayling were predicted to be found in only the larger, lower reaches of 3rd order streams, with probabilities in upstream sections declining rapidly to nil (Barker et al. 2011). Barker et al. (2011) indicated that their predictive model reflected observed patterns of grayling presence; with most grayling found in larger, lower-elevation streams with large amounts of surrounding vegetation, often overhanging the stream. They also indicated "Predicted probability of Arctic Grayling presence was near nil in 1st and 2nd order streams and very low in most 3rd order streams, but approached one in most 4th order streams". While this study was in a different area of the Yukon, the results are consistent with the observations of fish distribution in streams adjacent to the Coffee Mine site (e.g. Halfway is a 3rd order, Lower Latte is a 4th order stream and YT-24 is a 2nd order stream). This is also consistent with the habitat modelling completed with the Yukon Placer Secretariat (2010) which indicated low suitability habitat in Halfway Creek above HF6.3.

Baseline fish tissue concentrations of methylmercury in Halfway Creek were below the CCME tissue guideline in Arctic grayling and juvenile Chinook salmon tissue samples; methylmercury concentrations in samples from Halfway Creek were among the lowest in the Mine LSA. Uranium concentrations in all fish tissues ranged from 0.005 to 0.037 µg/g ww, which was average for the Mine LSA. Baseline benthic invertebrate tissue metal concentrations in samples collected from Halfway Creek indicate that concentrations of total mercury and methylmercury (calculated) were below relevant guidelines and uranium concentrations in benthic invertebrate tissues collect both at upstream and downstream sampling locations in Halfway Creek were among the highest of all sites in the Mine LSA sampled in August 2016.

5.5 YT-24

YT-24 Creek is a tributary of the Yukon River and has a catchment area of 1,183 ha (Lorax Pers. Comm. 2016). The total length of the mainstem of YT-24 Creek is approximately 7 km and a portion of its catchment will overlap with the proposed mine footprint. Open water season fish sampling in the stream includes sampling at the confluence of the Yukon River (YT0.0), as well as several stations in the lower reaches of the creek (YT0.2, YT0.6, YT0.9 and YT1.3) and three stations in the upper reaches of the creek (YT4.6, YT5.0 and YT5.9).

Slimy sculpin are the only fish species to have been captured in YT-24; they were found in the lower 50 m of the stream in 2015 and at the confluence with the Yukon River in August 2016 (station YT0.0); however, the Yukon River had back flooded this portion of the stream at the time of sampling in 2015 (PECG 2017) and 2016.

Winter fish sampling and eDNA sampling collection was attempted near the mouth during March 2016; however, no flowing water was located. These findings suggest that overwintering habitat in the stream is absent.

Based on the fish sampling results from 2014 to 2016 and the fish habitat data collected in the lower and upper reaches of YT-24 Creek, fish use occurs at the confluence of YT-24 with the Yukon River and appears limited in any areas further upstream. Multiple drops in the stream channel of 0.7 m or more impede fish access in the first few hundred meters of the creek and appear to cumulatively present a barrier to fish passage. An additional barrier to fish passage (30% gradient over 7.4 m) further precludes fish presence in the area of YT-24 Creek that is in the vicinity of mine infrastructure.

No fish tissue samples were collected from YT-24, however benthic invertebrate tissue samples that were analyzed to metals concentrations indicate that concentrations of total and methylmercury and uranium were all among the lowest of the benthic invertebrate tissue concentrations analyzed throughout the Mine LSA.

5.6 INDEPENDENCE CREEK

With a catchment area of approximately 22,000 ha (Lorax Pers. Comm. 2016), Independence Creek has the second largest catchment area in the Mine study area. The fish community composition in this stream is very similar to that of Coffee Creek with three species documented including: juvenile Chinook salmon, Arctic grayling and slimy sculpin.

All three fish species have been documented to a linear distance of 6.7 km upstream from the Yukon River confluence with Independence Creek. The CPUE of juvenile Chinook in Independence Creek was generally lower than that of Coffee Creek, particularly during 2014 when capture rates were less than 1 fish per trap day as compared to 5 to 12 fish per trap day in Coffee Creek (PECG 2017). Chinook salmon spawning has not been documented in Independence Creek and, similar to Coffee Creek, it is likely that juvenile Chinook use the stream as non-natal rearing and potentially overwintering habitat.

Arctic grayling in Independence Creek were found in low densities and multiple pass electrofishing at station ID6.7 during 2014 resulted in an estimate of 3 individuals per 100 m^2 with a 90% confidence interval of ±2 fish (PECG 2017). The catch of Arctic grayling in the stream was dominated by sub-adult and adult individuals, although a single YOY was captured at station ID1.9 which indicates that some spawning occurred in the stream. Environmental DNA samples from water collected at a site near the confluence of Independence Creek with the Yukon River (ID1.9) tested negative for both Arctic grayling and juvenile Chinook salmon DNA.

The capture of slimy sculpin in Independence Creek provides an indication that overwintering habitat may be present in the stream. Winter fish sampling during March 2016 did not capture any fish in six minnow traps set at station ID1.9; however, conditions appeared to be suitable for fish overwintering at the time of sampling as indicated by areas of open water and considerable under ice water flow. The winter fish sampling data, combined with the eDNA results, suggest that while overwintering is probable in the creek, it does not appear be as extensive as in Coffee Creek.

Baseline benthic invertebrate tissue metal concentrations in samples collected from Independence Creek indicate that tissue concentrations of total mercury, methylmercury and selenium were all below the relevant guideline levels. In contrast, baseline fish tissue metal concentrations of methylmercury exceeded the CCME guideline for Arctic grayling and slimy sculpin. Baseline tissue concentrations of selenium exceeded the BC and EPA whole-body guideline in two sampled slimy sculpin. Tissue uranium concentrations in benthic invertebrates and fish were low, compared with benthic invertebrate tissues analyzed from other streams in the Mine site LSA.

5.6.1 KONA TRIBUTARY

The Kona Tributary flows into Independence Creek 7.5 km upstream from the Yukon River and has a catchment area of 1,833 ha (Lorax Pers. Comm. 2016). The upper portion of the watershed is located in proximity to the Project footprint, but is not impacted by it as it is separate by a ridge. Fish sampling occurred at two stations including: KT0.1 in the lower portion of the watershed near Independence Creek and KT5.2 in the upper portion of the watershed. No fish were captured at the upper station and low numbers of adult Arctic grayling were captured and observed at the lower station.

Stream gradient modelling of the upper portion of the watershed near the Project footprint indicates the presence of numerous sections of the stream with moderate to high gradients and therefore fish potential is low in this portion. Winter fish sampling was not attempted in this stream as a suitable location for sampling could not be located and the stream appeared to be frozen to bed.

6 SUMMARY

The fisheries and aquatic resource data collected in the Coffee Gold Project study area provide a comprehensive understanding of the aquatic environment. The following conclusions can be made from the results of this data collection.

- The presence of fish has been confirmed in the larger creeks downstream/near the Mine footprint including Coffee, Latte and Independence creeks. Latte and Coffee Creeks are used by Arctic grayling for summer rearing/feeding purposes. Coffee Creek provides year round rearing habitat for juvenile Chinook salmon and Arctic grayling

- Smaller streams including Halfway Creek, YT-24 Creek and the Kona Tributary have confirmed fish presence only in the very lower reaches (at the mouth only for YT-24). The headwater portions of YT-24 and Halfway Creek and, including the location of the proposed mine facilities, are characterized by moderate stream gradients and poor habitat and are a considerable distance from documented fish habitat (i.e. fish presence).

- Overwintering of fish in the creeks with the Mine study area appears to be unlikely outside of the Yukon River, Coffee and Independence creeks.

- Periphyton sampling indicates that streams have very low primary productivity, which is common of low nutrient, northern watercourses.

- Baseline metals analysis of Arctic grayling, slimy sculpin and juvenile Chinook salmon tissues indicate that the estimated concentrations of methylmercury exceeded CCME tissue guidelines for the protection of aquatic like for all three fish species (Jewett et al. 2003; inferred for juvenile Chinook salmon). Baseline tissue concentrations of selenium were generally below the interim guideline values (EPA 2015), but often exceeded the BC guideline for selenium in sampled fish.

- Baseline uranium concentrations in Coffee Creek invertebrates were higher in the winter compared with the summer which is consistent with the uranium concentrations in the water quality data from the Mine study area.

- Baseline metals analysis of sediment samples throughout the Mine study area indicate that arsenic and chromium are consistently present at concentrations that exceed the CCME interim Freshwater Sediment Quality Guidelines.

- Chum spawning has been documented in groundwater fed side channels of the Yukon and Stewart Rivers. No such areas have been documented in close proximity (i.e. within one kilometre) of the proposed barge or winter road landings.

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APPENDIX A. ENVIRONMENTAL DNA

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HEMMERA

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May 9, 2016
File: 1930-001.01

Environmental Dynamics Inc.
2195 2nd Avenue
Whitehorse, YT Y1A 3T8

Attn: Ben Schonewille, Fish & Wildlife Biologist

Dear Ben,

Re: Kaminak Coffee Gold Environmental DNA Assessment of Winter Use by Arctic Grayling and Chinook Salmon

Environmental Dynamics Inc. (EDI), on behalf of Kaminak, is interested in characterizing baseline environmental conditions for Arctic grayling (*Thymallus Arcticus)* and Chinook Salmon (*Oncorhynchus tshawytscha*) at the Kaminak Coffee Gold Project site (the "Project") near Dawson City, Yukon.

The information presented in this report summarizes results of field-based inventory and assessment (completed in March 2016) to characterize winter use of selected lotic systems by these target taxa. Data collected by EDI field staff during these studies is submitted separately.

We are pleased to provide EDI and Kaminak with this final report and hope the information compiled and described is of benefit to both EDI and Kaminak as the Project advances.

Regards,

[signature redacted]

Jared Hobbs, M.Sc., R.P.Bio.
Senior Biologist
[phone number redacted]

[email redacted]

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1.0 INTRODUCTION

As living organisms complete their life processes their genetic material, or DNA, is shed exogenously into the surrounding environment. For aquatic and semi-aquatic species environmental DNA (eDNA) can be collected in water samples, filtered to capture eDNA, and effectively assayed to detect the presence of aquatic and semi-aquatic species without direct observation (Farrington and Lance 2014). This method is referred to as eDNA (analysis) and provides a promising and emerging method for more cost-effective, less invasive and more efficient survey of aquatic species living in natural lotic and lentic systems (Biggs et al. 2014; Herder et al. 2015). The reliable detection of aquatic vertebrate species using eDNA, from a variety of freshwater systems, has been confirmed as an effective survey method for tested species (Waits and Paetkau 2005, Ficetola et al. 2008, Goldberg et al. 2011, Thomsen et al. 2012). Analysis of eDNA is currently being applied to a diverse suite of species in a variety of freshwater habitats including both lotic and lentic systems (Goldberg et al. 2011).

Water and/or sediment samples from habitats potentially inhabited by the species in question, are collected for subsequent analysis of the environmental sample(s) to detect the presence of DNA from the target taxa. Testing for the presence of a species' DNA is completed *ex situ* (in a laboratory) using quantitative polymerase chain reaction (qPCR) methods. qPCR methods enzymatically increase the abundance of a specific sequence of DNA from target taxa in a solution. Next, the DNA sequence for the target taxa is targeted using 'primers' (short fragments of DNA that bind to the target sequence). The PCR process repeatedly subjects the sample to alternating heat (to denature, or separate, the double helix) followed by cooling to copy the original DNA in the sample. This process is repeated many times (e.g. 30-40 cycles) resulting in an exponential increase in copy number of the DNA from the target taxa. Each process, including all cycles, is referred to as a run; samples are typically run between three to eight times, for each sample collected, to arrive at a binary conclusion regarding presence or absence of DNA from the target taxa (Hobbs et al 2015). Samples from each site are then considered collectively to derive a determination of positive or negative at the site level (**see Methods**). The use of a qPCR assay requires development of a set of species-specific primers that target a small section of the genome; primer specificity is key to this process (Farrington and Lance 2014). The primer for Arctic grayling was developed independently, prior to this study, at the National Genomics Center for Wildlife and Fish Conservation in Missoula Montana (by Carim et al 2016); the assay used in this study, for Chinook salmon, was developed by Dr. C. Goldberg, Dr. M.B. Laramie and Dr. D.S Pilliod (Laramie et al. 2015).

The objective of this study was to assess winter season presence of Arctic grayling (*Thymallus Arcticus*) and Chinook salmon (*Oncorhynchus tshawytscha*) (hereafter referred to as Chinook) within lotic reaches associated with the Kaminak Coffee proposed mine site (the Project).The eDNA methods used in this assessment have been confirmed to be effective for both Arctic grayling (Veldhoen et al 2013) and Chinook (Hobbs and Kanary 2016 *in press*) in Yukon. In this study eDNA methods were used to supplement existing information derived from conventional fish survey methods previously applied within Coffee Creek, Latte Creek, Independence Creek, Halfway Creek and the Yukon River. In total, 14 sites were assessed in these five systems, using eDNA methods, to better determine winter use of these reaches by both Arctic grayling and Chinook in February 2016.

2.0 METHODS

2.1 FIELD SAMPLE COLLECTION

2.1.1 Water Sample Collection

Water sample collection followed protocols developed through direct collaboration with Dr. Caren Goldberg and summarized by Hobbs et al (2015). These methods have been successfully applied by Hemmera Envirochem Inc. (Hemmera), in 24 eDNA field studies (at the time of writing of this report), for fourteen species in BC and Yukon. These methods have also been accepted by the BC Ministry of Environment as an approved Resource Inventory Standards Committee (RISC) guidance document (Hobbs et al. 2015). The same methods have been applied and accepted by the Yukon Conservation Center and the Yukon Department of Environment in a previous study (Hobbs and Goldberg 2016). These accepted standards provide detailed guidance regarding appropriate collection and interpretation of qPCR results, for eDNA practitioners engaged in surface water sampling and eDNA qPCR analysis methods. These standards are intended for (and applicable to) use for all freshwater eDNA studies utilizing surface water collection.

Sample collection methods involved the collection of triplicate 1 litre (L) water samples at each sampling location (replication determined on a site-by-site basis as required by study and site-specific limitations). During sample collection, bottles were labelled using a permanent marker with the site and sample ID, (gazetted) location name, Universal Transverse Mercator (UTM) coordinates, collection time and the initials of the field personnel responsible for sample collection. Biologists avoided entering the water during sampling, particularly upstream of the sample collection site, to prevent contamination of the sample water from boots, clothing or other equipment.

For all sites where ice >30 cm thick covered the sample location (e.g., on the Yukon River) an ice auger (Stihl BT 130 with a 10-inch diameter blade) was used to penetrate the ice. For sites where ice cover was relatively less thick an ice spud (chisel) was used as decontamination of the ice spud was more practical. At each site, biologists augured (n=3) or chiseled (n=11) two holes. The downstream hole was used as a rinse hole for sample bottles and other equipment; the upstream hole was used for sample collection. The biologists observed a five-minute wait time before sampling at sites where the ice auger was used to minimize risk of cross-site contamination as the auger could not be thoroughly cleaned between each use.

During sample collection biologists wore clean nitrile gloves and triple rinsed the sample bottles with site water before collection of samples at each site. Each sample bottle was filled with water from the surface immediately beneath the ice layer of the water feature (at smaller features) or in the upwelling water (at all three Yukon River collection locations). Immediately following sample collection, a YSI® brand water quality meter was used to measure water chemistry data at each location. Field biologists recorded location UTM coordinates, water quality data and site photographs at each sample site location. Water chemistry parameters collected in the field were as follows:

- Temperature (°C)
- pH
- Conductivity (µS/cm)
- Dissolved oxygen (mg/L)

During sample collection biologists placed sample bottles in the cabin of the helicopter to prevent sample freezing as ambient conditions encountered during collection were sub-zero. Genetic material in the water sample was not permitted to freeze prior to off-site filtration and preservation.

2.1.2 Sediment Sample Collection

Sediment sample collection methods involved the collection of triplicate sediment samples at 12 of 14 selected water sample sites (as feasible according to site conditions). The biologists used an ice-spud to move rocks and expose the sediment at the bottom of each sample site. Sediment was then scooped from the bottom of the waterbody using a 4-inch ladle sieve which allowed water to drain out. Approximately 25 – 35 mL of sediment was placed into separately labelled 50 mL falcon tubes for laboratory analysis. All sediment sampling instruments were sterilized and rinsed between sites and water sampling was always completed prior to sediment sampling to avoid introducing disturbed sediment into water samples. In the field sediment was stored in the cargo area of the helicopter to permit freezing before being placed in a cooler, packed with dry ice, for transport (in a frozen state) to the laboratory.

2.2 POST-COLLECTION SAMPLE PROCESSING

2.2.1 Water Sample Processing

Water was collected at each site and processed following standard eDNA surface water sample collection protocols (Hobbs et al 2015). Samples were processed within 12 hours of collection[1] in the same order as collected. Samples were poured into a 250 mL sterile polypropylene filter funnel with a 0.45 µm pore-diameter cellulose nitrate membrane. The sample was filtered through the membrane using a Gast High-Capacity Vacuum Pump (Gauge/Reg; 1.1 cfm/25.5"Hg-60psi/115V) to create a vacuum. Upon completion of filtration, the filter was removed using clean nitrile gloves and sterilized forceps[2]. The membrane was placed in a 2.5”x3.5” coin envelope with two approximately 15 ml of self-indicating silica beads as a desiccant. Envelopes were labelled and placed inside labelled whirl-pak storage bags for shipping.

---

[1] Processing is recommended within 24 hours of collection to limit degradation of DNA (Caren Goldberg, *pers. comm.*)

[2] Forceps were sterilized by immersing, for 30 seconds, in a 50% bleach/water solution and rinsing in a 100% distilled water solution for >1 minute.

One control sample, using distilled water, was processed using the same filtration procedure. This served as a contamination test of both the filtration and laboratory analysis processes as required by provincial protocol (Hobbs *et al.* 2015). Preserved membranes were shipped to the National Genomics Center for Wildlife and Fish Conservation for subsequent DNA extraction and analysis; distilled water samples were not identified to the lab prior to analysis.

2.2.2 Sediment Sample Processing

Sediment samples were stored in Falcon tubes and shipped in a cooler with ~4 kg of dry ice during transport to the lab. Falcon tubes were shipped to the National Genomics Center for Wildlife and Fish Conservation for subsequent extraction and analysis.

2.3 LABORATORY ANALYSIS

All laboratory testing, including sediment and water samples, were tested at the National Genomics Center for Wildlife and Fish Conservation (a part of the U.S. Forest Service Rocky Mountain Research Station) in Missoula, MT, USA.

2.3.1 Primer Details

Tissue samples from ten Arctic grayling were collected from the study area, as well as ten tissue samples from two conspecific fish species; slimy sculpin (*Cottus cognatus*) and round whitefish (*Prosopium cylindraceum*). The primer used (in this study) for Arctic grayling had not been previously tested on Yukon populations of Arctic grayling. Efficacy of the Arctic grayling primer was confirmed through laboratory testing of the primer, in Montana, using the pure grayling DNA tissue samples collected in Yukon and provided to the lab (by Yukon Government and EDI) for this purpose. The grayling primer was also tested to ensure exclusion of both sculpin and whitefish as these conspecifics have been confirmed to occur sympatrically within the Project study area.

The primer used to test for Chinook is published (Laramie et al 2015) and has been tested and confirmed effective with a 94% detection rate in Yukon (Hobbs and Kanary 2016 *in prep*). For further confirmation Chinook tissue was collected from the study area (Coffee Creek) and sequenced at the National Genomics Center for Wildlife and Fish Conservation laboratory and proved to be an exact match to the eDNA marker (primer) developed by Laramie et al (2015) (C. Kellie *pers. comm*. 2016).

2.3.2 Water Samples

Preserved sample filters were processed in a laboratory dedicated to the analysis of low-quantity DNA sources using a Qiashredder/DNeasy protocol (Goldberg *et al.* 2011). Each filter was extracted and subsequently run in triplicate using a species-specific qPCR assay that included positive and negative controls in each plate, as well as an internal exogenous internal positive control reagents to screen for PCR inhibition. When PCR inhibition was detected, samples were run through a One-Step PCR Inhibitor Removal kit column (Zymo Research) and reanalyzed. When triplicate wells did not test consistently (i.e., one or two tested positive), the sample was reanalyzed to confirm the result.

2.3.3 Sediment Samples

Environmental DNA from sediment samples was extracted using a Mobio PowerSoil® DNA isolation kit to isolate microbial genomic DNA. Cell lysis is achieved by mechanical and chemical methods and total genomic DNA is captured on a silica membrane in a centrifuge. DNA is washed and extracted from the membrane and then used for PCR analysis as described for water samples (**Section 2.3.2**).

3.0 RESULTS

Forty-two surface water samples were collected from 14 sample locations, at 14 spatially distinct aquatic features (sites) between March 1 and March 3, 2016. Concomitant collection of sediment was also completed for 11 of the water collection sites (as feasible); sediment was also collected at a single additional site in the Yukon River at which water was not collected (Site ID: YR998A1). Sampling conditions at all sites were excellent with cold water temperatures and no precipitation or meltwater in the stream for several months preceding or during sample collection

All collected surface water and sediment samples were analyzed, using qPCR methods (as described in Section 2.3) for the presence of eDNA from both Arctic grayling and Chinook. Results are described below.

3.1 WATER SAMPLES

The distilled water control sample yielded a negative result, evidence that appropriate rigour was observed during processing. This result confirms the efficacy of controls used to prevent contamination during all phases of surface water sample-collection, filtration, transport, and qPCR laboratory analysis.

Arctic grayling: The presence of Arctic grayling had previously been confirmed, using traditional methods, at three of the 14 sample sites (21%). The targeted DNA sequence for the species was recovered at six (43%) of the sites sampled including all three of the previously confirmed sites (i.e., a 100% detection rate when compared to known sites). The remaining three sites that tested positive for the presence of eDNA for Arctic grayling suggest winter use, by Arctic grayling, of stream reaches where winter use was previously unknown.

Six of the remaining eight sites that tested negative for winter use by Arctic grayling had been previously surveyed and no evidence of winter use by Arctic grayling had been documented. Negative eDNA results at these six sites serve to further corroborate this conclusion. The final two sites had not been previously surveyed to assess winter use by Arctic grayling; eDNA results from this study suggest these sites are not currently being used by Arctic grayling as winter habitat (**Table 1 and Figure 1**).

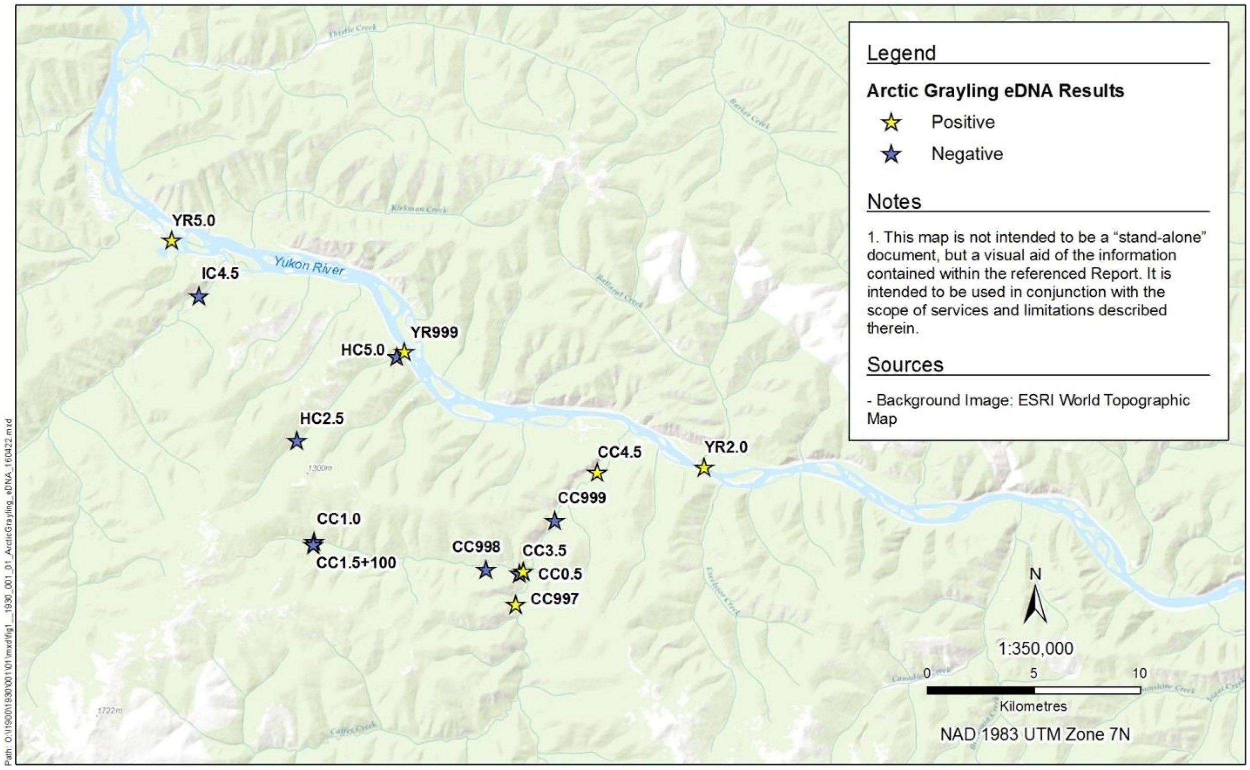

Figure 1 qPCR results for Arctic grayling

Table 1 Results of qPCR Analysis summarized by site and denoting previous confirmation of either Chinook or Arctic grayling.

Site	Grayling winter use previosly confirmed	Grayling detected - filter	Grayling detected - sediment	Chinook winter use previosly confirmed	Chinook detected - filter	Chinook detected - sediment
CC0.5	Unknown	Yes	No	Yes	Yes	No
CC1.0	No	No	No	No	No	No
CC1.5+100	No	No	No	No	No	No
CC3.5	No	No	No	No	No	No
CC4.5	Unknown	No	No	Yes	Yes	Yes
CC997	Unknown	Yes	No	Unknown	Yes	No
CC998	No	No	No	No	No	No
CC999	Unknown	No	No	Yes	Yes	No
HC2.5	No	No	No	No	No	No
HC5.0	No	No	N/A	No	No	N/A
IC4.5	Unknown	No	No	Unknown	No	No
YR2.0	Yes	Yes	N/A	Yes	No	N/A
YR5.0	Yes	Yes	No	Yes	No	No
YR998A3	N/A	N/A	No	Yes	N/A	No
YR999	Yes	No	N/A	Yes	No	N/A

Chinook: The presence of juvenile Chinook had been previously confirmed at six of the 14 sample sites, however, the targeted DNA sequence for the species was recovered at only three (50%) of the six known extant (based on data collected in the summer) Chinook sites sampled in February 2016; Chinook DNA was not recovered from any of the three sites in the Yukon River. These three Yukon River sites are known to be used by adult or juvenile Chinook in summer however no data exists for winter use. eDNA results suggest juvenile Chinook are not using these sites (including habitat immediately upstream) during the winter of 2016.

Overwinter use, by juvenile Chinook was unknown at the remaining eight sites; one of these sites tested positive for Chinook salmon DNA during qPCR analysis suggesting this site is also being used as overwintering or year round rearing habitat by Chinook. The remaining seven sites, including Latte Creek, Halfway Creek and Independence Creek each tested negative for Chinook during qPCR analysis (**Table 1** and **Figure 2**).

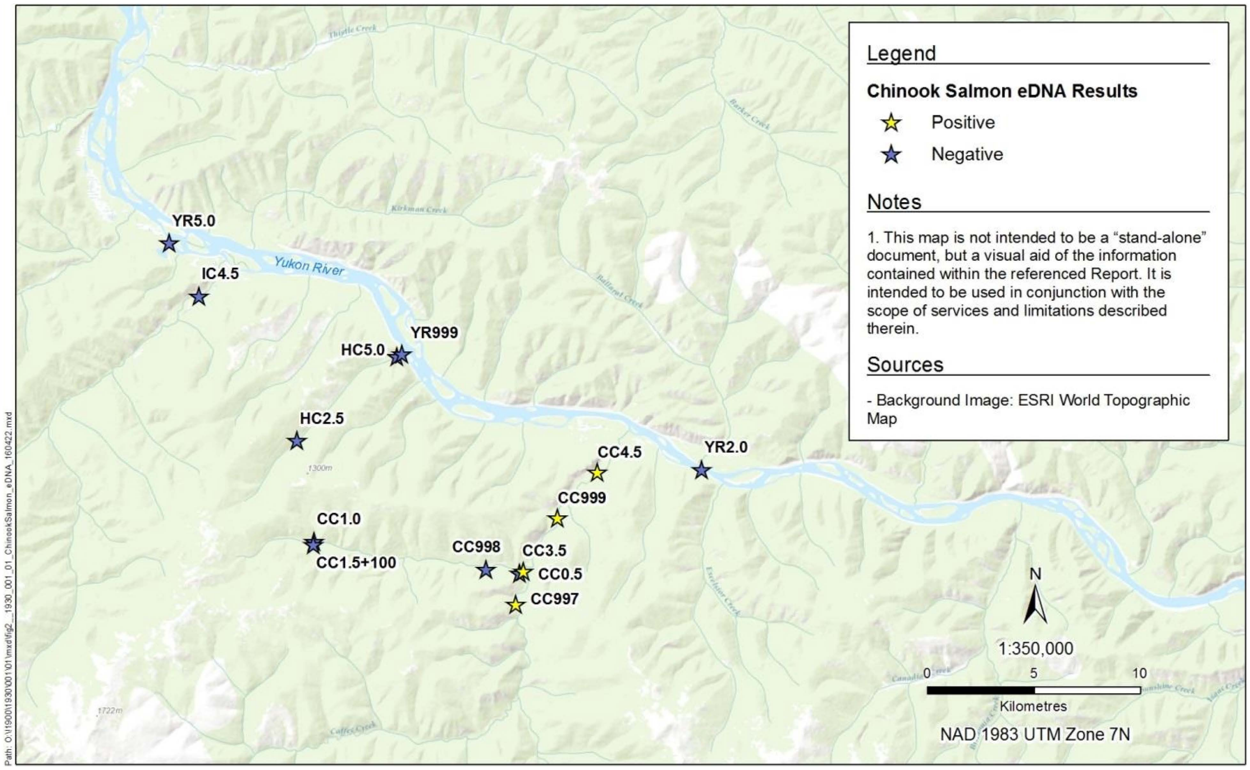

Figure 2 qPCR results for Chinook.

3.2 SEDIMENT SAMPLES

Sediment was collected at 12 sites during surface water sample collection. Only one sediment sample tested positive for the presence of Chinook eDNA during qPCR analysis and no samples tested positive for Arctic grayling eDNA.

4.0 DISCUSSION

Results from the study confirm earlier findings by Veldhoen et al (2014) and by Hobbs and Kanary (2016); eDNA provides a useful, powerful and cost-effective means to establish presence of use of aquatic habitats by both Chinook and Arctic grayling in the Yukon. This study represents the first Canadian, and perhaps global, application of eDNA in near Arctic aquatic ecosystems in winter conditions. There are no published studies to inform degradation rates of eDNA in the stream temperatures (0.5°C) encountered during field collection in this study. There are also no published studies regarding degradation rates in ice-bound lotic systems. As temperature and incidental ambient ultra-violet (UV) exposure are both positively correlated with degradation of eDNA this study provides valuable insight regarding eDNA degradation rates, flushing time and transport distances encountered during these relatively extreme environmental sampling conditions.

Detection of Arctic grayling DNA at 100% of known extant winter areas (n=3) provides further confirmation of methodological efficacy. Detection of Arctic grayling DNA at an additional three sites where previous studies, using conventional techniques, have failed to detect Arctic grayling in winter conditions also demonstrates the applicability and usefulness of eDNA methods. Despite the inherent sensitivity of qPCR methods Arctic grayling eDNA was not detected at eight sites; this suggests that the species was not using these habitats during or in the weeks or months preceding sample collection in February 2016.

Detection of Chinook DNA at three of six sites (50%) where juvenile Chinook have been documented in the spring/summer/fall seasons is corroborative with detection rates from an independent previous eDNA assessment conducted on Chinook in Yukon in 2015 (Hobbs and Kanary 2016). In addition, tests conducted by the lab in Montana confirms the efficacy of the primer used, for Chinook, in this study (*"Chinook tissues that we sequenced from Coffee Creek were an exact match for the eDNA marker developed by Laramie et al."* email from K. Carim, April 7, 2016). eDNA from Chinook was detected at all four sites in Coffee Creek; this indicates that this creek provides winter habitat for juvenile Chinook. Despite the inherent sensitivity of qPCR methods Chinook eDNA was not detected at any of the water samples collected from three sites in the Yukon River in the winter. This observation is more challenging to explain and suggests that juvenile Chinook are absent from proximal reaches in Yukon River during winter. This conclusion merits further investigation.

Finally, sediment sampling was conducted in this study to obviate the need for summer sampling, as eDNA persistence times are known to exceed eDNA persistence times in water. If successful, sediment sampling would have allowed inference of summer use of aquatic systems, by target taxa, at any time of year. By comparison, water sampling only allows inference of use, by target taxa, within a short period (7-21 days) preceding sampling. The negative results from sediment sampling at 11 of 12 sites, including sites that appear to be used during winter by either or both juvenile Chinook or Arctic grayling, demonstrate that further research is required regarding appropriate field sampling, sample storage, sample shipping and eDNA extraction.

The most plausible explanation for the low detection rate associated with sediment samples may be best attributed to sample preservation methods (i.e., samples were subjected to repeated thawing and refreezing during shipment likely causing DNA to denature). A second plausible explanation may be attributed to insufficient sample volume and / or availability of sediment with higher organic content during sampling. During sample collection, at most sites, the streambed was frozen; access to deeper, more organic sediment layers was challenging. As a result, sediment samples collected in this study were largely comprised of course sedimentary material collected from the upper surface layer of the streambed. Flushing would likely have removed DNA from this surface layer (K. Carim pers com: email dated April 7, 2016). Unfortunately, there are few published papers that have attempted and / or described sediment sampling techniques (Turner et al 2015) so this aspect of the project was considered experimental. Concomitant sampling of sediment and water in the winter, if successful, would have theoretically provided information regarding year round habitat use by Chinook and Arctic grayling within the study area. Recognizing the inconclusive comparative utility of results derived from collection of sediment sample and water samples at the same sites future water sampling is recommended, at the 14 sites in this study, during the 2016 summer field season to better understand year-round use of these habitats by both focal fish taxa.

5.0 CLOSURE

This Work was performed in accordance with the contract between Hemmera Envirochem Inc. ("Hemmera") and EDI. ("Client"). This Report has been prepared by Hemmera, based on fieldwork conducted by Hemmera, for sole benefit and use by Kaminak and EDI. In performing this Work, Hemmera has relied in good faith on information provided by others, and has assumed that the information provided by those individuals is both complete and accurate. This Work was performed to current industry standard practice for similar environmental work, within the relevant jurisdiction and same locale. The findings presented herein should be considered within the context of the scope of work and project terms of reference; further, the findings are time sensitive and are considered valid only at the time the Report was produced. The conclusions and recommendations contained in this Report are based upon the applicable guidelines, regulations, and legislation existing at the time the Report was produced; any changes in the regulatory regime may alter the conclusions and/or recommendations.

We have appreciated the opportunity of working with you on this project and trust that this report is satisfactory to your requirements. Please feel free to contact the undersigned regarding any questions or further information that you may require.

Report prepared by:
Hemmera Envirochem Inc.

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APPENDIX B. 2016 PHYSICAL STREAM ATTRIBUTES AND FISH SAMPLING DATA

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Table B1. 2016 physical stream attribute and fish sampling data.

Crossing	Station/Pass	Data Row	Stream Name	Sample Date	Avg Channel Width (m)	Avg Wet Width (m)	Avg. Residual Pool Depth (m)	Avg. Bankfull Depth (m)	Avg Stream Gradient (%)	Cover - Total	Cover - Dominant	Cover - Subdominant				Substrate		Water Temp (°C)	pH	SPC (µg/cm)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Turbidity
		1	Coffee Creek	4-Mar-16														0.3	6.81	271.2	5.85		
		2	Coffee Creek	4-Mar-16														0.3	6.81	271.2	5.85		
		3	Coffee Creek	4-Mar-16														0.3	6.81	271.2	5.85		
		4	Coffee Creek	4-Mar-16														0.2	7.35	269.2	7.35		
		5	Coffee Creek	4-Mar-16														0.2	7.35	269.2	7.35		
		6	Coffee Creek	4-Mar-16														0.2	7.35	269.2	7.35		
		7	Coffee Creek	3-Mar-16														0	7.37	374.1	12.59		
		8	Coffee Creek	3-Mar-16														0.1	7.37	374.1	12.35		
		9	Coffee Creek	3-Mar-16														0.1	7.37	374.1	11.93		
	1	10	Coffee Creek	10-Jul-16														8	7.62	90.3		101.6	T - Turbid
	2	11	Coffee Creek	10-Jul-16														8	7.62	90.3		101.6	T - Turbid
		12	Coffee Creek	10-Jul-16	24.55	16.39	0.50	1.45	2.5	moderate		B - Boulder	U - Undercut Banks	OV - Overhanging Veg		C - Cobble	G - Gravel	8	7.62				M - Moderate
	1	13	Coffee Creek	10-Jul-16														4.9	7.32	88.2		94.4	T - Turbid
	2	14	Coffee Creek	10-Jul-16														4.9	7.32	88.2		94.4	T - Turbid
	3	15	Coffee Creek	10-Jul-16														4.9	7.32	88.2		94.4	T - Turbid
	1	16	Coffee Creek	10-Jul-16														4.9	7.32	88.2		94.4	T - Turbid
	2	17	Coffee Creek	10-Jul-16														4.9	7.32	88.2		94.4	T - Turbid
	3	18	Coffee Creek	10-Jul-16														4.9	7.32	88.2		94.4	T - Turbid
	1	19	Coffee Creek	10-Jul-16														4.9	7.32	88.2		94.4	T - Turbid
	2	20	Coffee Creek	10-Jul-16														4.9	7.32	88.2		94.4	T - Turbid
	3	21	Coffee Creek	10-Jul-16														4.9	7.32	88.2		94.4	T - Turbid
		22	Coffee Creek	3-Mar-16														0.1	6.44	294.7	8.96		
		23	Coffee Creek	3-Mar-16														0.1	6.44	294.7	8.91		
		24	Coffee Creek	3-Mar-16														0.1	6.44	294.7	8.8		
		25	Coffee Creek	3-Mar-16														0.2	6.44	294.7	9.56		
		26	Coffee Creek	3-Mar-16														0	6.75	291.7	12.29		
		27	Coffee Creek	3-Mar-16														0	6.75	291.7	10.74		
		28	Coffee Creek	3-Mar-16														0	6.88	283.2	11.54		
		29	Coffee Creek	3-Mar-16														0	6.88	283.2	12.42		
		30	Coffee Creek	4-Mar-16														0.2	6.21	292.4	9.12		
		31	Coffee Creek	4-Mar-16														0.2	6.21	292.4	9.12		
		32	Coffee Creek	4-Mar-16														0.2	6.21	292.4	9.12		
		33	Coffee Creek	4-Mar-16														0.2	6.21	292.4	9.12		
		34	Coffee Creek	4-Mar-16														0.5	6.57	285.4	9.16		
		35	Coffee Creek	4-Mar-16														0.5	6.57	285.4	9.16		
		36	Coffee Creek	4-Mar-16														0.5	6.57	285.4	9.16		
		37	Coffee Creek	4-Mar-16														0.1	6.79	306.9	8.84		
		38	Coffee Creek	4-Mar-16														0.1	6.79	306.9	8.84		
		39	Coffee Creek	11-Jul-16																			
		40	Coffee Creek	11-Jul-16																			
	1	41	Coffee Creek	11-Jul-16														5.8	7.36	91.3	12.23		M - Moderate
	2	42	Coffee Creek	11-Jul-16														5.8	7.36	91.3	12.23		M - Moderate

Crossing	Station/Pass	Data Row	Stream Name	Sample Date	Avg Channel Width (m)	Avg Wet Width (m)	Avg. Residual Pool Depth (m)	Avg. Bankfull Depth (m)	Avg Stream Gradient (%)	Cover - Total	Cover - Dominant	Cover - Subdominant				Substrate		Water Temp (°C)	pH	SPC (µg/cm)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Turbidity
	3	43	Coffee Creek	11-Jul-16														5.8	7.36	91.3	12.23		M - Moderate
	1	44	Coffee Creek	11-Jul-16														5.8	7.36	91.3	12.23		M - Moderate
	2	45	Coffee Creek	11-Jul-16														5.8	7.36	91.3	12.23		M - Moderate
	3	46	Coffee Creek	11-Jul-16														5.8	7.36	91.3	12.23		M - Moderate
	4	47	Coffee Creek	11-Jul-16																			
	1	48	Coffee Creek	11-Jul-16														5.8	7.36	91.3	12.23		M - Moderate
	2	49	Coffee Creek	11-Jul-16														5.8	7.36	91.3	12.23		M - Moderate
	3	50	Coffee Creek	11-Jul-16														5.8	7.36	91.3	12.23		M - Moderate
		51	Coffee Creek	3-Mar-16														0	7.11	401.2	11.17		
		52	Coffee Creek	3-Mar-16														0	7.11	401.2	10.84		
		53	Coffee Creek	3-Mar-16														0	7.11	401.2	11.32		
		54	Halfway Creek	8-Jul-16	4.80	4.27	0.14	0.70	2.3	moderate	U - Undercut Banks	LWD - Large Woody Debris				C - Cobble	G - Gravel	7.2	4.97	138	9.76		C - Clear
		55	Halfway Creek	23-Aug-16														4	8.28	174			L - Light
		56	Halfway Creek	9-Jul-16														4.4	5.55	142	11.02		C - Clear
		57	Halfway Creek	3-Mar-16														0	7.65	336.9	11.36		
		58	Halfway Creek	3-Mar-16														0	7.65	336.9	11.36		
		59	Halfway Creek	9-Jul-16														5.8	6.23	98	10.05		
		60	Halfway Creek	20-Aug-16														2.5	8.58	131			L - Light
		61	Halfway Creek	9-Jul-16	2.60	2.12	No pools	0.43	10.5	trace	U - Undercut Banks	SWD - Small Woody Debris				B - Boulder	C - Cobble	2.9	4.84	55	10.63		C - Clear
		62	Unnamed Tributary to Halfway Creek	9-Jul-16					21.3	moderate								4.1	5.71	79	10.67		C - Clear
		63	Independence Creek	4-Mar-16														0	6.83	242.8	6.55		
		64	Independence Creek	4-Mar-16														0	6.83	242.8	6.55		
		65	Independence Creek	4-Mar-16														0	6.83	242.8	6.55		
		66	Independence Creek	4-Mar-16														0.1	6.77	245.6	7.82		
		67	Independence Creek	4-Mar-16														0.1	6.77	245.6	7.82		
		68	Independence Creek	4-Mar-16														0.1	6.77	245.6	7.82		
		69	Independence Creek	12-Jul-16														6.5	7.49	83.4	11.26		L - Light
		70	Independence Creek	12-Jul-16														6.5	7.49	83.4	11.26		L - Light
		71	Independence Creek	12-Jul-16														6.5	7.49	83.4	11.26		L - Light
	1	72	Independence Creek	12-Jul-16														6.5	7.49	83.4	11.26		L - Light
	2	73	Independence Creek	12-Jul-16														6.5	7.49	83.4	11.26		L - Light
	3	74	Independence Creek	12-Jul-16														6.5	7.49	83.4	11.26		L - Light
	1	75	Independence Creek	12-Jul-16														6.5	7.49	83.4	11.26		L - Light
	2	76	Independence Creek	12-Jul-16														6.5	7.49	83.4	11.26		L - Light
	3	77	Independence Creek	12-Jul-16														6.5	7.49	83.4	11.26		L - Light
	1	78	Independence Creek	12-Jul-16														6.5	7.49	83.4	11.26		L - Light
	2	79	Independence Creek	12-Jul-16														6.5	7.49	83.4	11.26		L - Light
	3	80	Independence Creek	12-Jul-16														6.5	7.49	83.4	11.26		L - Light
50		81	Indian River	20-Aug-16																			T - Turbid

Crossing	Station/Pass	Data Row	Stream Name	Sample Date	Avg Channel Width (m)	Avg Wet Width (m)	Avg. Residual Pool Depth (m)	Avg. Bankfull Depth (m)	Avg Stream Gradient (%)	Cover - Total	Cover - Dominant	Cover - Subdominant				Substrate		Water Temp (°C)	pH	SPC (µg/cm)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Turbidity
		82	Los Angeles Creek	13-Jul-16												G - Gravel	F - Fines	7.1				84.2	T - Turbid
		83	Los Angeles Creek	13-Jul-16												G - Gravel	F - Fines	7.1				84.2	T - Turbid
		84	Los Angeles Creek	13-Jul-16												G - Gravel	F - Fines	7.1				84.2	T - Turbid
		85	Los Angeles Creek	13-Jul-16												G - Gravel	F - Fines	7.1				84.2	T - Turbid
		86	Los Angeles Creek	13-Jul-16												G - Gravel	F - Fines	7.1				84.2	T - Turbid
	1	87	Los Angeles Creek	13-Jul-16														7.1	7.82	223		84.2	T - Turbid
	2	88	Los Angeles Creek	13-Jul-16														7.1	7.82	223		84.2	T - Turbid
	3	89	Los Angeles Creek	13-Jul-16														7.1	7.82	223		84.2	T - Turbid
	4	90	Los Angeles Creek	13-Jul-16														7.1	7.82	223		84.2	T - Turbid
	5	91	Los Angeles Creek	13-Jul-16														7.1	7.82	223		84.2	T - Turbid
	6	92	Los Angeles Creek	13-Jul-16														7.1	7.82	223		84.2	T - Turbid
		93	Los Angeles Creek	13-Jul-16														7.1	7.82	223		84.2	T - Turbid
		94	Los Angeles Creek	13-Jul-16														7.1	7.82	223		84.2	T - Turbid
		95	Latte Creek	3-Mar-16														-0.1	7.24	259.5	8.74		
		96	Latte Creek	3-Mar-16														-0.1	7.24	259.5	8.74		
	1	97	Latte Creek	9-Jul-16														4.5	7.66	128.1	11.23		M - Moderate
	2	98	Latte Creek	9-Jul-16														4.5	7.66	128.1	11.23		M - Moderate
	3	99	Latte Creek	9-Jul-16														4.5	7.66	128.1	11.23		M - Moderate
	1	100	Latte Creek	9-Jul-16														4.5	7.66	128.1	11.23		M - Moderate
	2	101	Latte Creek	9-Jul-16														4.5	7.66	128.1	11.23		M - Moderate
	3	102	Latte Creek	9-Jul-16														4.5	7.66	128.1	11.23		M - Moderate
	1	103	Latte Creek	9-Jul-16														4.5	7.66	128.1	11.23		M - Moderate
	2	104	Latte Creek	9-Jul-16														4.5	7.66	128.1	11.23		M - Moderate
	3	105	Latte Creek	9-Jul-16														4.5	7.66	128.1	11.23		M - Moderate
	1	106	Latte Creek	8-Jul-16														5.2	6.81	95.2	11.37		C - Clear
	2	107	Latte Creek	8-Jul-16														5.2	6.81	95.2	11.37		C - Clear
	3	108	Latte Creek	8-Jul-16														5.2	6.81	95.2	11.37		C - Clear
		109	Latte Creek Tributary C	10-Jul-16														2.6	5.93	695	11.41		C - Clear
		110	Latte Creek Tributary C	10-Jul-16														3.3	7.41	704	11.03		C - Clear
		111	Latte Creek Tributary C	10-Jul-16														2.6	5.93	695	11.41		C - Clear
		112	Latte Creek Tributary C	10-Jul-16														2.1	6.7	695	11.49		C - Clear
		113	Latte Creek Tributary C	10-Jul-16														2.1	6.92	695	11.5		C - Clear
		114	Latte Creek Tributary C	10-Jul-16														2	6.85	695	11.54		C - Clear
		115	Latte Creek Tributary C	10-Jul-16														2.7	7.42	694	11.33		C - Clear
		116	Latte Creek Tributary C	10-Jul-16														2	7.26	696	11.49		C - Clear
		117	Latte Creek Tributary C	10-Jul-16					15.0									1.9	7.19	696	11.51		C - Clear
		118	Latte Creek Tributary C	10-Jul-16					15.0														
		119	Latte Creek Tributary C	11-Jul-16	1.01	0.88	0.11	0.35	13.5	moderate	U - Undercut Banks	SWD - Small Woody Debris				F - Fines	C - Cobble	1.9	6.93	696	11.54		C - Clear
		120	Latte Creek Tributary C	11-Jul-16														1.47	7.19	696	11.34		C - Clear
		121	Latte Creek Tributary C	11-Jul-16																			

Crossing	Station/Pass	Data Row	Stream Name	Sample Date	Avg Channel Width (m)	Avg Wet Width (m)	Avg. Residual Pool Depth (m)	Avg. Bankfull Depth (m)	Avg Stream Gradient (%)	Cover - Total	Cover - Dominant	Cover - Subdominant				Substrate		Water Temp (°C)	pH	SPC (µg/cm)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Turbidity
91		122	Unnamed Tributary of Maisy May Creek	22-Aug-16	4.00				2.5	trace	B - Boulder												T - Turbid
MMTT-1		123	Unnamed Tributary of Maisy May Creek	21-Aug-16														11	7.99	654	15.16		
MMTT-2		124	Unnamed Tributary of Maisy May Creek	21-Aug-16	3.94	2.60	0.06	0.47	1.8	trace	IV - Instream Veg					G - Gravel	C - Cobble	10.4	7.69	518	11.13		C - Clear
MMTT-3		125	Unnamed Tributary of Maisy May Creek	21-Aug-16																			
MMTT-4		126	Unnamed Tributary of Maisy May Creek	21-Aug-16																			
MMTT-5		127	Unnamed Tributary of Maisy May Creek	21-Aug-16	1.71	1.52	0.10	0.43	0.5	trace	B - Boulder	SWD - Small Woody Debris	OV - Overhanging Veg			G - Gravel	C - Cobble	8.3	8.12	682.4	12.97		
		128	Stewart River	14-Jul-16																			
		129	Stewart River	14-Jul-16												C - Cobble	F - Fines	18.3			8.53		T - Turbid
		130	Stewart River	14-Jul-16												C - Cobble	G - gravel	18.3			8.52		T - Turbid
		131	Stewart River	14-Jul-16												F - fines		17.2			7.98		T - Turbid
	1	132	Stewart River Side Channel	14-Jul-16												F - Fines		17.2	7.9	351.4	7.98		T - Turbid
	1	133	Stewart River Side Channel	14-Jul-16												F - Fines		17.2	7.9	351.4	7.98		T - Turbid
	1	134	Stewart River Side Channel	14-Jul-16												F - Fines		17.2	7.9	351.4	7.98		T - Turbid
	2	135	Stewart River Side Channel	14-Jul-16												F - Fines		17.9	8.09	345.8	8.04		T - Turbid
	2	136	Stewart River Side Channel	14-Jul-16												F - Fines		17.9	8.09	345.8	8.04		T - Turbid
	2	137	Stewart River Side Channel	14-Jul-16												F - Fines		17.9	8.09	345.8	8.04		T - Turbid
		138	Yukon River	8-Jul-16												G - Gravel	C - Cobble						T - Turbid
		139	Yukon River	8-Jul-16												G - Gravel		18.3	8.2	217	8.14		T - Turbid
		140	Yukon River	8-Jul-16												C - Cobble		18.3	8.2	217	8.14		T - Turbid
	1	141	Yukon River	8-Jul-16														18.3	8.21	216.5	7.97		T - Turbid
	1	142	Yukon River	8-Jul-16														18.3	8.22	216.1	8.11		T - Turbid
WRC-2		143	Unnamed Tributary to Yukon River	13-Jul-16																			
WRC-1		144	Unnamed Tributary to Yukon River	13-Jul-16	0.76	1.09	0.38	0.51	2.8	moderate	U - Undercut Banks	SWD - Small Woody Debris	LWD - Large Woody Debris			G - Gravel	C - Cobble	4.4	5.89	333	11.07		C - Clear
		145	Unnamed Tributary to Yukon River	13-Jul-16														4.3	4.74	333	11.17		C - Clear
		146	YT24	23-Aug-16																			
		147	YT24 Creek	10-Jul-16	4.08	2.77	0.26	0.73	4.0	moderate	U - Undercut Banks	SWD - Small Woody Debris	LWD - Large Woody Debris			C - Cobble	G - Gravel	4	5.86	121	11.23		C - Clear
		148	YT24	23-Aug-16														4.2	8.08	124			L - Light
		149	YT24 Creek	10-Jul-16					6.0	moderate								4	5.39	115	11.24		C - Clear
		150	YT24 Creek	10-Jul-16														4.4	6.28	101	11.15		C - Clear
		151	YT24 Creek	10-Jul-16														6.1	6.64	96	10.5		C - Clear
		152	YT24 Creek	10-Jul-16	2.83	2.43	0.18	0.71	9.0	trace	U - Undercut Banks	B - Boulder				C - Cobble	B - Boulder	4.8	6.27	108	10.45		C - Clear
		153	YT24	21-Aug-16														2	8.49	60			L - Light
		154	YT24 Creek	11-Jul-16														2.4	4.13	22	10.78		C - Clear
51		155	Unnamed Tributary to	20-Aug-16					5.0														

Crossing	Station/Pass	Data Row	Stream Name	Sample Date	Avg Channel Width (m)	Avg Wet Width (m)	Avg. Residual Pool Depth (m)	Avg. Bankfull Depth (m)	Avg Stream Gradient (%)	Cover - Total	Cover - Dominant	Cover - Subdominant				Substrate		Water Temp (°C)	pH	SPC (µg/cm)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Turbidity
			Indian River																				
52		156	Unnamed Tributary to Indian River	20-Aug-16	0.52	0.75	0.18	0.33	5.0	moderate	OV - Overhanging Veg	U - Undercut Banks						3.2	7.87	226	13.2		M - Moderate
53		157	Unnamed Tributary to Indian River	20-Aug-16														5.8	7.92	1006	11.9		
54		158	Unnamed Tributary to Indian River	20-Aug-16																			
54.5		159	Unnamed Tributary to Eureka Creek	20-Aug-16	0.55	0.55		0.07	23.0									6.5	7.19	86.5	11.14		M - Moderate
55		160	Eureka Creek	20-Aug-16														7.9	71	487.1	6.67		T - Turbid
57		161	Unnamed Tributary to Maisy May	20-Aug-16																			
58		162	Unnamed Tributary to Maisy May	Not visited in 2016																			
59		163	Unnamed Tributary to Maisy May	Not visited in 2016																			
60		164	Unnamed Tributary of Maisy May Creek	20-Aug-16					30.0														
61		165	Unnamed Tributary of Maisy May Creek	20-Aug-16																			
72		166	Unnamed Tributary of Maisy May Creek	22-Aug-16																			
73		167	Unnamed Tributary of Maisy May Creek	22-Aug-16																			
74		168	Unnamed Tributary of Maisy May Creek	22-Aug-16																			
75		169	Unnamed Tributary of Maisy May Creek	22-Aug-16	1.73	1.28	0.21	0.38	6.0	moderate	OV - Overhanging Veg	SWD - Small Woody Debris				G - Gravel	F - Fines	4.9	7.84	356.7	12.49		L - Light
76		170	Unnamed Tributary of Maisy May Creek	22-Aug-16	2.35	1.43	0.16	0.67	5.5	trace		SWD - Small Woody Debris	B - Boulder	U - Undercut Banks	DP - Deep Pools	G - Gravel	C - Cobble	5.9	7.89	287	12.14		M - Moderate
77		171	Unnamed Tributary of Maisy May Creek	22-Aug-16	1.73	1.74	0.25	0.38	4.0	moderate	U - Undercut Banks	DP - Deep Pools				G - Gravel	F - Fines	4.3	7.68	138	12.87		C - Clear
80		172	Unnamed Tributary of Maisy May Creek	22-Aug-16																			
80.5		173	Unnamed Tributary of Maisy May Creek	22-Aug-16																			
81		174	Unnamed Tributary of Maisy May Creek	21-Aug-16														2.7	7.92	287.2	15.88		
83		175	Unnamed Tributary of Maisy May Creek	21-Aug-16	0.67	0.41	0.13	0.50	8.5	moderate	U - Undercut Banks					F - Fines	G - Gravel	6.1	8.23	505			
84		176	Unnamed Tributary of Maisy May Creek	21-Aug-16														6.4	7.06	662	1.2		
85		177	Unnamed Tributary of Maisy May Creek	21-Aug-16																			
97	1	178	Unnamed Tributary of Stewart River	14-Jul-16												G - Gravel	F - Fines	6.4	7.84	420.2	9.16		C - Clear
97	1	179	Unnamed Tributary of Stewart River	14-Jul-16												G - Gravel	F - Fines	6.4	7.84	420.2	9.16		C - Clear
97	1	180	Unnamed Tributary of Stewart River	14-Jul-16												G - Gravel	F - Fines	6.4	7.84	420.2	9.16		C - Clear
97	2	181	Unnamed Tributary of Stewart River	14-Jul-16												G - Gravel	F - Fines	6.8	7.85	409.8	10.27		C - Clear
97	2	182	Unnamed Tributary of Stewart River	14-Jul-16												G - Gravel	F - Fines	6.8	7.85	409.8	10.27		C - Clear
97	2	183	Unnamed Tributary of	14-Jul-16												G - Gravel	F - Fines	6.8	7.85	409.8	10.27		C - Clear

Crossing	Station/Pass	Data Row	Stream Name	Sample Date	Avg Channel Width (m)	Avg Wet Width (m)	Avg. Residual Pool Depth (m)	Avg. Bankfull Depth (m)	Avg Stream Gradient (%)	Cover - Total	Cover - Dominant	Cover - Subdominant				Substrate		Water Temp (°C)	pH	SPC (µg/cm)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Turbidity
			Stewart River																				
97	3	184	Unnamed Tributary of Stewart River	14-Jul-16												F - Fines		6.9	7.97	402.4	10.23		C - Clear
97	3	185	Unnamed Tributary of Stewart River	14-Jul-16												F - Fines		6.9	7.97	402.4	10.23		C - Clear
97	3	186	Unnamed Tributary of Stewart River	14-Jul-16												F - Fines		6.9	7.97	402.4	10.23		C - Clear
97		187	Unnamed Tributary of Stewart River	14-Jul-16														6.9	7.97	402.4	10.23		C - Clear
97		188	Unnamed Tributary of Stewart River	14-Jul-16	0.49	0.46	0.17	0.24	9.3	abundant	DP - Deep Pools	SWD - Small Woody Debris	U - Undercut Banks	OV - Overhanging Veg		F - Fines	G - Gravel	6.8	7.85	409.8	10.23		C - Clear
101		189	Unnamed trib of Barker Creek	22-Aug-16	3.38	0.90	0.08	0.10	12.0	abundant	OV - Overhanging Veg	SWD - Small Woody Debris	U - Undercut Banks	IV - Instream Veg		F - Fines	G - Gravel	8.4	8.25	130			M - Moderate
102		190	Unnamed trib of Barker Creek	22-Aug-16	2.12	1.02	0.13	0.20	13.0	abundant	OV - Overhanging Veg	SWD - Small Woody Debris	LWD - Large Woody Debris	U - Undercut Banks	IV - Instream Veg	F - Fines	G - Gravel	7.1	8.01	177			M - Moderate
103		191	Unnamed trib of Barker Creek	22-Aug-16	2.43	0.58	0.20	0.20	9.5	abundant	OV - Overhanging Veg	SWD - Small Woody Debris	LWD - Large Woody Debris	IV - Instream Veg		F - Fines	G - Gravel	5	8.29	203			M - Moderate
104		192	Unnamed trib of Barker Creek	22-Aug-16	3.74	0.62	0.18	0.37	8.0	moderate	OV - Overhanging Veg	LWD - Large Woody Debris	U - Undercut Banks	IV - Instream Veg		F - Fines	G - Gravel	4.2	8.42	550			L - Light
110		193	Unnamed trib of Barker Creek	22-Aug-16																			
111		194	Unnamed trib of Barker Creek	22-Aug-16	4.40	3.10	0.17	0.20	6.0	trace						C - Cobble	F - Fines	3.8	8.32	271			L - Light
112		195	Unnamed Tributary to Barker Creek	11-Jul-16	1.30	1.00		0.07		trace	IV - Instream Veg					G - Gravel	F - Fines	16.1	7.41	644	8.08		C - Clear
113		196	Unnamed trib of Barker Creek	22-Aug-16	5.00	2.94	0.14	0.30	2.3	trace						G - Gravel	F - Fines	5.3	8.24	460			L - Light
114		197	Unnamed trib of Barker Creek	22-Aug-16																			
115		198	Unnamed trib of Barker Creek	22-Aug-16																			
118		199	Unnamed Tributary to Ballarat Creek	13-Jul-16																			T - Turbid
119		200	Unnamed Tributary to Ballarat Creek	13-Jul-16																			
125		201	Coffee Creek	13-Jul-16	21.83	19.83	Flooding, unsafe to access	Flooding, unsafe to access	1.5	trace	LWD - Large Woody Debris	SWD - Small Woody Debris				Flooding, unsafe to access	Flooding, unsafe to access	5.2	5.08	65	10.82		T - Turbid
200		202	Ballarat Creek	Not visited in 2016																			
201		203	Ballarat Creek	13-Jul-16	3.60	3.12	0.38	0.69	2.8	abundant	SWD - Small Woody Debris	LWD - Large Woody Debris	U - Undercut Banks	DP - Deep Pools		G - Gravel	F - Fines	4.3	6.51	332	10.7		C - Clear
202		204	Unnamed Tributary to Ballarat Creek	13-Jul-16																			
203		205	Unnamed Tributary of Ballarat Creek	12-Jul-16	0.44	0.48	0.23	0.34	10.7	abundant	U - Undercut Banks	SWD - Small Woody Debris	OV - Overhanging Veg			F - Fines	G - Gravel	1.48	5.89	482	11.54		C - Clear
204		206	Unnamed Tributary to Ballarat Creek	13-Jul-16																			
205		207	Unnamed Tributary of Ballarat Creek	12-Jul-16	0.97	0.58	0.15	0.44	11.5	abundant	U - Undercut Banks	SWD - Small Woody Debris	OV - Overhanging Veg			F - Fines	C - Cobble	2.2	4.6	345	11.14		C - Clear
206		208	Unnamed Tributary to Ballarat Creek	12-Jul-16																			

Crossing	Station/Pass	Data Row	Stream Name	Sample Date	Avg Channel Width (m)	Avg Wet Width (m)	Avg. Residual Pool Depth (m)	Avg. Bankfull Depth (m)	Avg Stream Gradient (%)	Cover - Total	Cover - Dominant	Cover - Subdominant				Substrate		Water Temp (°C)	pH	SPC (µg/cm)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Turbidity
207		209	Unnamed trib of Barker Creek	19-Aug-16	1.23	0.50	0.12	0.10	17.0	moderate	OV - Overhanging Veg	SWD - Small Woody Debris	IV - Instream Veg			F - Fines	G - Gravel	4.2	8.4	124			L - Light
208		210	Unnamed branch of Barker Creek	19-Aug-16	2.35	2.28	0.28	0.40	4.0	moderate	U - Undercut Banks	SWD - Small Woody Debris	OV - Overhanging Veg			C - Cobble	G - Gravel	4.5	8.32	225			L - Light
209		211	Unnamed trib of Barker Creek	19-Aug-16	3.80	0.80	0.55	0.50	4.5	abundant	U - Undercut Banks	SWD - Small Woody Debris	DP - Deep Pools	OV - Overhanging Veg		C - Cobble	F - Fines	4.1	8.3	228			L - Light
210		212	Unnamed trib of Barker Creek	19-Aug-16	2.23	0.80	0.42	0.40	3.0	abundant	U - Undercut Banks	SWD - Small Woody Debris	LWD - Large Woody Debris	DP - Deep Pools	OV - Overhanging Veg	F - Fines	G - Gravel	4	8.52	459			L - Light
Maisy May at Airstrip		213	Maisy May Creek	21-Aug-16																			

[1] Cover: B- boulder, DP – deep pool, IV –instream vegetation, LWD – large woody debris, OV – overhanging vegetation, SWD – small woody debris, U – undercut bank.

[2] Substrate: B – boulder, C- cobble, F – fines, G – gravel.

Table B2. 2016 physical stream attribute and fish sampling data (continued).

Site Name	Crossing	Station	Pass	Data Row	Overwinter Habitat Description[1]	Spawning Habitat Description[1]	Rearing Habitat Description[1]	Fish Bearing Status[1]	Sampling Method	Angling Effort (mins)	EF Effort (seconds)	EF Section Length (m)	EF Section Width (m)	BS - Haul Length (m)	BS - Haul Width (m)	BS - Haul Depth (m)	MT depth (m)	MT total time (hours)	No Fish Captured [2]	GR	CH (juv)	CCG	LSU	BB	LKC	NP	RW	LW/ BW
CF0.5				1					MT - Minnow Trapping								35	19.9			7							
CF0.5				2					MT - Minnow Trapping								65	19.9			7							
CF0.5				3					MT - Minnow Trapping								67	19.9			3							
CF0.5				4					MT - Minnow Trapping								54	20.3			1							
CF0.5				5					MT - Minnow Trapping								50	20.3	NFC									
CF0.5				6					MT - Minnow Trapping								110	20.3	NFC									
CF10.0		1		7					AG - Angling	75										8								
CF10.0		2		8					AG - Angling	30										3								
CF10.0				9					MT - Minnow Trapping								41	45.3	NFC									
CF10.0				10					MT - Minnow Trapping								42	45.3	NFC									
CF10.0				11					MT - Minnow Trapping								26	45.3				1						
CF10.0-1			1	12					EF - Electrofishing		732	20	5.0									10						
CF10.0-1			2	13					EF - Electrofishing		559	20	5.0									7						
CF10.0-1			3	14					EF - Electrofishing		707	20	5.0									2						
CF10.0-2			1	15					EF - Electrofishing		468	20	5.0							7		3						
CF10.0-2			2	16					EF - Electrofishing		574	20	5.0									2						
CF10.0-2			3	17					EF - Electrofishing		415	20	5.0									1						
CF10.0-3			1	18					EF - Electrofishing		427	20	5.0							1		2						
CF10.0-3			2	19					EF - Electrofishing		344	20	5.0							1		6						
CF10.0-3			3	20					EF - Electrofishing		390	20	5.0									1						
CF2.7				21					MT - Minnow Trapping								25	25			2	1						
CF2.7				22					MT - Minnow Trapping								35	25				1						
CF2.7				23					MT - Minnow Trapping								55	25	NFC		2							
CF2.7				24					MT - Minnow Trapping								25	25	NFC		1							
CF2.7				25					MT - Minnow Trapping								26	24.6	NFC									
CF2.7				26					MT - Minnow Trapping								21	24.6				1						
CF2.7				27					MT - Minnow Trapping								135	24.2	NFC									
CF2.7				28					MT - Minnow Trapping								108	24.2			15	1						
CF2.7				29					MT - Minnow Trapping								45	22.9	NFC									
CF2.7				30					MT - Minnow Trapping								80	22.9			2							
CF2.7				31					MT - Minnow Trapping								55	22.9	NFC									
CF2.7				32					MT - Minnow Trapping								35	22.9	NFC									
CF2.7				33					MT - Minnow Trapping								22	22.7			6							
CF2.7				34					MT - Minnow Trapping								20	22.7	NFC									
CF2.7				35					MT - Minnow Trapping								20	22.7			1							
CF2.7				36					MT - Minnow Trapping								126	22.4	NFC									
CF2.7				37					MT - Minnow Trapping								41	22.4	NFC									
CF3.9		1		38					AG - Angling	55									NFC									
CF3.9		2		39					AG - Angling	20									NFC									
CF3.9-1			1	40					EF - Electrofishing		476	20.75	5.8									15						
CF3.9-1			2	41					EF - Electrofishing		293	20.75	5.8									7						
CF3.9-1			3	42					EF - Electrofishing		313	20.75	5.8									6						
CF3.9-2			1	43					EF - Electrofishing		853	28	8.9								1	19						
CF3.9-2			2	44					EF - Electrofishing		443	28	8.9								2	13						
CF3.9-2			3	45					EF - Electrofishing		476	28	8.9									6						
CF3.9-2			4	46					EF - Electrofishing		355	28	8.9									6						
CF3.9-3			1	47					EF - Electrofishing		1125	33.75	6.9									41						
CF3.9-3			2	48					EF - Electrofishing		762	33.75	6.9									21						
CF3.9-3			3	49					EF - Electrofishing		570	33.75	6.9									10						
CF8.3				50					MT - Minnow Trapping								21	22.2	NFC									

Site Name	Crossing	Station	Pass	Data Row	Overwinter Habitat Description[1]	Spawning Habitat Description[1]	Rearing Habitat Description[1]	Fish Bearing Status[1]	Sampling Method	Angling Effort (mins)	EF Effort (seconds)	EF Section Length (m)	EF Section Width (m)	BS - Haul Length (m)	BS - Haul Width (m)	BS - Haul Depth (m)	MT depth (m)	MT total time (hours)	No Fish Captured [2]	GR	CH (juv)	CCG	LSU	BB	LKC	NP	RW	LW/ BW
CF8.3				51					MT - Minnow Trapping								80	22.2	NFC									
CF8.3				52					MT - Minnow Trapping								39	22.1				1						
HF0.2				53	Low	Low	Low		EF - Electrofishing		829								NFC									
HF0.2		1		54	Low	Low	Low		MT - Minnow Trapping									14.3	NFC									
HF0.2		1		55	Low	Low	Low		MT - Minnow Trapping									14.3	NFC									
HF0.2		1		56	Low	Low	Low		MT - Minnow Trapping									14.3	NFC									
HF0.2		2		57	Low	Low	Low		MT - Minnow Trapping									14.3	NFC									
HF0.2		2		58	Low	Low	Low		MT - Minnow Trapping									14.3	NFC									
HF0.2		2		59	Low	Low	Low		MT - Minnow Trapping									14.3	NFC									
HF0.2		3		60	Low	Low	Low		MT - Minnow Trapping									14.3	NFC									
HF0.2		3		61	Low	Low	Low		MT - Minnow Trapping									14.3	NFC									
HF0.2		3		62	Low	Low	Low		MT - Minnow Trapping									14.3	NFC									
HF0.2				63	Low	Low	Low		EF - Electrofishing		84								NFC									
HF0.2				64	Low	Low	Low		EF - Electrofishing		2084									1	20							
HF0.9				65					EF - Electrofishing		287								NFC									
HF6.3				66					EF - Electrofishing		211								NFC									
HF6.3				67					EF - Electrofishing		1107								NFC									
HF6.3				68					MT - Minnow Trapping								34	19.5	NFC									
HF6.3				69					MT - Minnow Trapping								26	19.5	NFC									
HF8.8				70	Low	None	Low		EF - Electrofishing		201								NFC									
HFA0.1				71					EF - Electrofishing		156								NFC									
ID1.9				72					EF - Electrofishing		256											7						
ID1.9				73					EF - Electrofishing		3778								NFC									
ID1.9				74					AG - Angling	58									NFC									
ID1.9				75					MT - Minnow Trapping								67	17.8	NFC									
ID1.9				76					MT - Minnow Trapping								42	17.8	NFC									
ID1.9				77					MT - Minnow Trapping								56	17.8	NFC									
ID1.9				78					MT - Minnow Trapping								35	17.7	NFC									
ID1.9				79					MT - Minnow Trapping								35	17.7	NFC									
ID1.9				80					MT - Minnow Trapping								40	17.7	NFC									
ID1.9-1			1	81					EF - Electrofishing		694	25.9	8.5									11						
ID1.9-1			2	82					EF - Electrofishing		705	25.9	8.5									4						
ID1.9-1			3	83					EF - Electrofishing		638	25.9	8.5									3						
ID1.9-2			1	84					EF - Electrofishing		448	20	7.2									3						
ID1.9-2			2	85					EF - Electrofishing		435	20	7.2						NFC									
ID1.9-2			3	86					EF - Electrofishing		440	20	7.2									1						
ID1.9-3			1	87					EF - Electrofishing		627	20.5	5.7									1						
ID1.9-3			2	88					EF - Electrofishing		641	20.5	5.7									1						
ID1.9-3			3	89					EF - Electrofishing		441	20.5	5.7						NFC									
LA-1				90					BS - Beach Seining					20	2	0.2			NFC									
LA-2				91					BS - Beach Seining					30	5	1.2			NFC									
LA-3				92					BS - Beach Seining					50	3.5	0.8				2								
LA-4				93					BS - Beach Seining					30	4	0.7				1							1	
LA-5				94					BS - Beach Seining					40	6	1.3			NFC									
LaC4.8		1		95					EF - Electrofishing		279	15	4.0						NFC									
LaC4.8		1		96					EF - Electrofishing		279	15	4.0						NFC									
LaC4.8		1		97					EF - Electrofishing		310	25	3.0						NFC									
LaC4.8		1		98					EF - Electrofishing		57								NFC									
LaC4.8		1		99					EF - Electrofishing		224	15	3.0						NFC									
LaC4.8		1		100					EF - Electrofishing		160	4	5.0						NFC									
LaC4.8				101					BS - Beach Seining											2								
LaC4.8				102					AG - Angling	60										1								

Site Name	Crossing	Station	Pass	Data Row	Overwinter Habitat Description[1]	Spawning Habitat Description[1]	Rearing Habitat Description[1]	Fish Bearing Status[1]	Sampling Method	Angling Effort (mins)	EF Effort (seconds)	EF Section Length (m)	EF Section Width (m)	BS - Haul Length (m)	BS - Haul Width (m)	BS - Haul Depth (m)	MT depth (m)	MT total time (hours)	No Fish Captured [2]	GR	CH (juv)	CCG	LSU	BB	LKC	NP	RW	LW/ BW
LC1.6				103					MT - Minnow Trapping								26	20.4	NFC									
LC1.6				104					MT - Minnow Trapping								36	20.4	NFC									
LC2.7-1			1	105					EF - Electrofishing		489	35	4.1						NFC									
LC2.7-1			2	106					EF - Electrofishing		661	35	4.1						NFC									
LC2.7-1			3	107					EF - Electrofishing		442	35	4.1						NFC									
LC2.7-2			1	108					EF - Electrofishing		214	13	5.5							1								
LC2.7-2			2	109					EF - Electrofishing		328	13	5.5						NFC									
LC2.7-2			3	110					EF - Electrofishing		216	13	5.5							1								
LC2.7-3			1	111					EF - Electrofishing		199	30	5.7							2								
LC2.7-3			2	112					EF - Electrofishing		304	30	5.7						NFC									
LC2.7-3			3	113					EF - Electrofishing		255	30	5.7							3								
LC9.9		1		114					MT - Minnow Trapping								0.35	24	NFC									
LC9.9		1		115					MT - Minnow Trapping								0.4	24	NFC									
LC9.9		1		116					MT - Minnow Trapping								0.4	24	NFC									
LC9.9		2		117					MT - Minnow Trapping								0.3	24	NFC									
LC9.9		2		118					MT - Minnow Trapping								0.35	24	NFC									
LC9.9		2		119					MT - Minnow Trapping								0.35	24	NFC									
LC9.9		3		120					MT - Minnow Trapping								0.5	24	NFC									
LC9.9		3		121					MT - Minnow Trapping								0.45	24	NFC									
LC9.9		3		122					MT - Minnow Trapping								0.55	24	NFC									
LCC0.0				123					MT - Minnow Trapping									14	NFC									
LCC0.0				124					MT - Minnow Trapping									13.8	NFC									
LCC0.0				125					MT - Minnow Trapping									13.9	NFC									
LCC0.0				126					MT - Minnow Trapping									13.8	NFC									
LCC0.0				127					MT - Minnow Trapping									14	NFC									
LCC0.2				128					MT - Minnow Trapping									14.1	NFC									
LCC0.2				129					MT - Minnow Trapping									14.1	NFC									
LCC0.2				130					MT - Minnow Trapping									14.2	NFC									
LCC0.2				131					MT - Minnow Trapping									14.8	NFC									
LCC0.2				132	Nil	None	Low		EF - Electrofishing		509								NFC									
LCC0.3				133					EF - Electrofishing		1145								NFC									
LLC0.0				134					EF - Electrofishing		105								NFC									
SR_LDB_1				135					BS - Beach Seining					85	7	1.5				6	18	12	4		10		1	
SR_RDB_1				136					BS - Beach Seining					38	8	1.2							2					
SR_RDB_2				137					BS - Beach Seining					55	8	1.1					11	1	14	2				
SRSC				138					BS - Beach Seining					30	8	0.5									3	2	5	6
SRSC		1		139					MT - Minnow Trapping									5.4	NFC									
SRSC		1		140					MT - Minnow Trapping									5.4	NFC									
SRSC		1		141					MT - Minnow Trapping									5.4	NFC									
SRSC		2		142					MT - Minnow Trapping									5.4	NFC									
SRSC		2		143					MT - Minnow Trapping									5.4	NFC									
SRSC		2		144					MT - Minnow Trapping									5.4				1						
YR Land LDB				145					BS - Beach Seining					71	4	1.2				3	62	6	1	1	1	1		
YR US Barge1				146					BS - Beach Seining					45	2	1.2				2	20	4	1					
YR US Barge2				147					BS - Beach Seining					65	3	1.2					5	1	2					
YRD_RDB1		1		148					MT - Minnow Trapping								0.5	23.08333333	NFC									
YRD_RDB1		1		149					MT - Minnow Trapping								0.2	23.08333333	NFC									
YRD_RDB1		1		150					MT - Minnow Trapping								0.5	23.08333333	NFC									
YRD_RDB2		1		151					MT - Minnow Trapping								0.5	22.83333333	NFC									
YRD_RDB2		1		152					MT - Minnow Trapping								0.25	22.83333333					1					

Site Name	Crossing	Station	Pass	Data Row	Overwinter Habitat Description[1]	Spawning Habitat Description[1]	Rearing Habitat Description[1]	Fish Bearing Status[1]	Sampling Method	Angling Effort (mins)	EF Effort (seconds)	EF Section Length (m)	EF Section Width (m)	BS - Haul Length (m)	BS - Haul Width (m)	BS - Haul Depth (m)	MT depth (m)	MT total time (hours)	No Fish Captured[2]	GR	CH (juv)	CCG	LSU	BB	LKC	NP	RW	LW/ BW
YRD_RDB2		1		153					MT - Minnow Trapping								0.6	22.83333333	NFC									
YT0.0				154					EF - Electrofishing		97											20						
YT0.2				155	Nil	Nil	Low		EF - Electrofishing		835								NFC									
YT0.2		1		156	Nil	Nil	Low		MT - Minnow Trapping									14	NFC									
YT0.2		1		157	Nil	Nil	Low		MT - Minnow Trapping									14	NFC									
YT0.2		2		158	Nil	Nil	Low		MT - Minnow Trapping									13.9	NFC									
YT0.2		2		159	Nil	Nil	Low		MT - Minnow Trapping									13.9	NFC									
YT0.2		3		160	Nil	Nil	Low		MT - Minnow Trapping									13.9	NFC									
YT0.2		3		161	Nil	Nil	Low		MT - Minnow Trapping									13.9	NFC									
YT0.2		3		162	Nil	Nil	Low		MT - Minnow Trapping		735							13.9	NFC									
YT0.2		4		163	Nil	Nil	Low		MT - Minnow Trapping									14.1	NFC									
YT0.2		4		164	Nil	Nil	Low		MT - Minnow Trapping									14.1	NFC									
YT0.2				165	Nil	Nil	Low		EF - Electrofishing		1337								NFC									
YT0.6				166					EF - Electrofishing		259								NFC									
YT0.9				167					EF - Electrofishing		276								NFC									
YT1.3				168					EF - Electrofishing		209								NFC									
YT4.6				169	Nil	Nil	Low		EF - Electrofishing		331								NFC									
YT5.0				170					EF - Electrofishing		803								NFC									
YT5.9				171					EF - Electrofishing		171								NFC									
	52			172	None	Non	Poor to fair	NFB - Non-fish bearing	MT - Minnow Trapping									8.2	NFC									
	52			173	None	Non	Poor to fair	NFB - Non-fish bearing	MT - Minnow Trapping									8.2	NFC									
	52			174	None	Non	Poor to fair	NFB - Non-fish bearing	EF - Electrofishing		495								NFC									
	75			175	Poor	Poor	Fair	NFB - Non-fish bearing	EF - Electrofishing		295								NFC									
	76			176	Poor	Poor	Poor	NFB - Non-fish bearing	EF - Electrofishing		124								NFC									
	77			177	Poor	Poor	Moderate	NFB - Non-fish bearing	EF - Electrofishing		265								NFC									
	81			178					MT - Minnow Trapping									22.3	NFC									
	81			179			Moderate	FB - Fish Bearing	MT - Minnow Trapping									22.3	NFC									
	84			180			Moderate	FB - Fish Bearing	EF - Electrofishing		231								NFC									
	97	1		181				NFB - Non-fish bearing	MT - Minnow Trapping									5.7	NFC									
	97	1		182				NFB - Non-fish bearing	MT - Minnow Trapping									5.7	NFC									
	97	1		183				NFB - Non-fish bearing	MT - Minnow Trapping									5.7	NFC									
	97	2		184				NFB - Non-fish bearing	MT - Minnow Trapping									5.4	NFC									
	97	2		185				NFB - Non-fish bearing	MT - Minnow Trapping									5.4	NFC									
	97	2		186				NFB - Non-fish bearing	MT - Minnow Trapping									5.4	NFC									
	97	3		187				NFB - Non-fish bearing	MT - Minnow Trapping									5.4	NFC									
	97	3		188				NFB - Non-fish bearing	MT - Minnow Trapping									5.4	NFC									
	97	3		189				NFB - Non-fish bearing	MT - Minnow Trapping									5.4	NFC									
	97			190				NFB - Non-fish bearing	EF - Electrofishing		420								NFC									
	101			191	None	None	None	NCD - Non-classified drainage	EF - Electrofishing		164																	
	102			192	NA	NA	NA	NCD - Non-classified drainage	EF - Electrofishing		146								NFC									
	103			193	None	Low	Low	NFB - Non-fish bearing	EF - Electrofishing		283								NFC									
	104			194	None	None	Low	NFB - Non-fish bearing	EF - Electrofishing		288								NFC									
	110			195				NFB - Non-fish bearing	EF - Electrofishing		133								NFC									
	111			196	None	Low	Moderate	PFB - Potentially fish bearing	EF - Electrofishing		303								NFC									
	112			197	None	None	None	NFB - Non-fish bearing	EF - Electrofishing		304								NFC									
	113			198	None	Low	Low	PFB - Potentially fish bearing	EF - Electrofishing		330								NFC									
	114			199				NFB - Non-fish bearing	EF - Electrofishing		203								NFC									
	201			200	Moderate	Low	Moderate	PFB - Potentially fish bearing	EF - Electrofishing		338								NFC									

Site Name	Crossing	Station	Pass	Data Row	Overwinter Habitat Description[1]	Spawning Habitat Description[1]	Rearing Habitat Description[1]	Fish Bearing Status[1]	Sampling Method	Angling Effort (mins)	EF Effort (seconds)	EF Section Length (m)	EF Section Width (m)	BS - Haul Length (m)	BS - Haul Width (m)	BS - Haul Depth (m)	MT depth (m)	MT total time (hours)	No Fish Captured [2]	GR	CH (juv)	CCG	LSU	BB	LKC	NP	RW	LW/ BW
	203			201	None	None	None	NFB - Non-fish bearing	EF - Electrofishing		160								NFC									
	205			202	None	Low	Moderate	NFB - Non-fish bearing	EF - Electrofishing		231								NFC									
	207			203	None	None	Low	NFB - Non-fish bearing	EF - Electrofishing		316								NFC									
	208			204	None	Low	Moderate	FB - Fish Bearing	EF - Electrofishing		573									1								
	209			205	None	None	Moderate	PFB - Potentially fish bearing	EF - Electrofishing		571								NFC									
	210			206	None	None	Moderate	PFB - Potentially fish bearing	EF - Electrofishing		601								NFC									
	Indian River Mainstem			207				FB - Fish Bearing	MT - Minnow Trapping									8.7	NFC									
	Indian River Mainstem			208				FB - Fish Bearing	MT - Minnow Trapping									8.7	NFC									
	Indian River Mainstem			209				FB - Fish Bearing	MT - Minnow Trapping									8.7				1						
	Tailings Trib 1			210				NCD - Non-classified drainage	MT - Minnow Trapping									22.2	NFC									
	Tailings Trib 1			211				NCD - Non-classified drainage	MT - Minnow Trapping									22.2	NFC									
	Tailings Trib 1			212				NCD - Non-classified drainage	MT - Minnow Trapping									22.2	NFC									
	Tailings Trib 2			213	Poor	Poor	Poor	PFB - Potentially fish bearing	EF - Electrofishing		382								NFC									
	Tailings Trib 2			214	Poor	Poor	Poor	PFB - Potentially fish bearing	MT - Minnow Trapping									22.2	NFC									
	Tailings Trib 2			215	Poor	Poor	Poor	PFB - Potentially fish bearing	MT - Minnow Trapping									22.2	NFC									
	Tailings Trib 5			216	None	None	Poor to fair	NFB - Non-fish bearing	EF - Electrofishing		516								NFC									
	YRUB_Winter Road Crossing			217	Moderate	Low	Moderate	PFB - Potentially fish bearing	EF - Electrofishing		276								NFC									
	YRUB_Winter Road Crossing			218					EF - Electrofishing		838								NFC									
		Maisy May at Airstrip		219					MT - Minnow Trapping									22.3	NFC									
		Maisy May at Airstrip		220					MT - Minnow Trapping									22.3	NFC									

[1] Summary information only, for additional information refer to Section 3.4 (fish distribution and abundance) and Section 4.1 (stream crossings) for additional information and rationale.

[2] Fish species codes: GR – Arctic grayling, CH – Chinook salmon (juvenile), CCG – slimy sculpin, LSU – longnose sucker, BB – burbot, LKC – lake chub, NP – northern pike, RW – round whitefish, LW/BW – lake whitefish/broad whitefish.

APPENDIX C. 2016 FISH CAPTURE DATA

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Table C1. 2016 fish capture data.

Site Name	Stream Name	Sample Date	Capture Method	Species	Length (mm)	Weight (g)	Release Condition
IC1.9-1-1	Independence Creek	12-Jul-16	EF - electrofishing	slimy sculpin	81	6.5	retained
IC1.9-1-1	Independence Creek	12-Jul-16	EF - electrofishing	slimy sculpin	68	3.4	retained
IC1.9-1-1	Independence Creek	12-Jul-16	EF - electrofishing	slimy sculpin	75	4.6	retained
IC1.9-1-1	Independence Creek	12-Jul-16	EF - electrofishing	slimy sculpin	65	3.5	retained
IC1.9-1-1	Independence Creek	12-Jul-16	EF - electrofishing	slimy sculpin	54	1.6	released
IC1.9-1-1	Independence Creek	12-Jul-16	EF - electrofishing	slimy sculpin	56	2.2	released
IC1.9-1-1	Independence Creek	12-Jul-16	EF - electrofishing	slimy sculpin	59	2.5	released
IC1.9-1-1	Independence Creek	12-Jul-16	EF - electrofishing	slimy sculpin	56	2.4	released
IC1.9-1-1	Independence Creek	12-Jul-16	EF - electrofishing	slimy sculpin	57	2.1	released
IC1.9-1-1	Independence Creek	12-Jul-16	EF - electrofishing	slimy sculpin	60	2.9	released
IC1.9-1-1	Independence Creek	12-Jul-16	EF - electrofishing	slimy sculpin	57	1.8	released
IC1.9-1-2	Independence Creek	12-Jul-16	EF - electrofishing	slimy sculpin			released
IC1.9-1-2	Independence Creek	12-Jul-16	EF - electrofishing	slimy sculpin			released
IC1.9-1-2	Independence Creek	12-Jul-16	EF - electrofishing	slimy sculpin			released
IC1.9-1-2	Independence Creek	12-Jul-16	EF - electrofishing	slimy sculpin			released
IC1.9-1-3	Independence Creek	12-Jul-16	EF - electrofishing	slimy sculpin			released
IC1.9-1-3	Independence Creek	12-Jul-16	EF - electrofishing	slimy sculpin			released
IC1.9-1-3	Independence Creek	12-Jul-16	EF - electrofishing	slimy sculpin			released
IC1.9-2-1	Independence Creek	12-Jul-16	EF - electrofishing	slimy sculpin	52	1.7	retained
IC1.9-2-1	Independence Creek	12-Jul-16	EF - electrofishing	slimy sculpin	57	2.4	retained
IC1.9-2-1	Independence Creek	12-Jul-16	EF - electrofishing	slimy sculpin	60	2.2	retained
IC1.9-2-3	Independence Creek	12-Jul-16	EF - electrofishing	slimy sculpin	52	1.4	retained
IC1.9-3-1	Independence Creek	12-Jul-16	EF - electrofishing	slimy sculpin	45	1	retained
IC1.9-3-2	Independence Creek	12-Jul-16	EF - electrofishing	slimy sculpin	64	2.6	retained
CF0.5	Coffee Creek	5-Mar-16	MT - minnow trapping	Chinook salmon	84	5.1	retained
CF0.5	Coffee Creek	5-Mar-16	MT - minnow trapping	Chinook salmon	75	3.9	retained
CF0.5	Coffee Creek	5-Mar-16	MT - minnow trapping	Chinook salmon	72	3.2	retained
CF0.5	Coffee Creek	5-Mar-16	MT - minnow trapping	Chinook salmon	60		released
CF0.5	Coffee Creek	5-Mar-16	MT - minnow trapping	Chinook salmon	65		released
CF0.5	Coffee Creek	5-Mar-16	MT - minnow trapping	Chinook salmon	77		released
CF0.5	Coffee Creek	5-Mar-16	MT - minnow trapping	Chinook salmon	73		released
CF0.5	Coffee Creek	5-Mar-16	MT - minnow trapping	Chinook salmon	71		released
CF0.5	Coffee Creek	5-Mar-16	MT - minnow trapping	Chinook salmon	72		released

Site Name	Stream Name	Sample Date	Capture Method	Species	Length (mm)	Weight (g)	Release Condition
CF0.5	Coffee Creek	5-Mar-16	MT - minnow trapping	Chinook salmon	70		released
CF0.5	Coffee Creek	5-Mar-16	MT - minnow trapping	Chinook salmon	71		released
CF0.5	Coffee Creek	5-Mar-16	MT - minnow trapping	Chinook salmon	64		released
CF0.5	Coffee Creek	5-Mar-16	MT - minnow trapping	Chinook salmon	72		released
CF0.5	Coffee Creek	5-Mar-16	MT - minnow trapping	Chinook salmon	70		released
CF0.5	Coffee Creek	5-Mar-16	MT - minnow trapping	Chinook salmon	76		released
CF0.5	Coffee Creek	5-Mar-16	MT - minnow trapping	Chinook salmon	72		released
CF0.5	Coffee Creek	5-Mar-16	MT - minnow trapping	Chinook salmon	78		released
CF10.0	Coffee Creek	4-Mar-16	MT - minnow trapping	slimy sculpin	69	2.6	retained
CF10.0	Coffee Creek	10-Jul-16	AG - angling	Arctic grayling			escape
CF10.0	Coffee Creek	10-Jul-16	AG - angling	Arctic grayling			escape
CF10.0	Coffee Creek	10-Jul-16	AG - angling	Arctic grayling			escape
CF10.0	Coffee Creek	10-Jul-16	AG - angling	Arctic grayling			escape
CF10.0	Coffee Creek	10-Jul-16	AG - angling	Arctic grayling			escape
CF10.0	Coffee Creek	10-Jul-16	AG - angling	Arctic grayling			escape
CF10.0	Coffee Creek	10-Jul-16	AG - angling	Arctic grayling			escape
CF10.0	Coffee Creek	10-Jul-16	AG - angling	Arctic grayling	190	67.6	retained
CF10.0	Coffee Creek	10-Jul-16	AG - angling	Arctic grayling	280	197.6	retained
CF10.0	Coffee Creek	10-Jul-16	AG - angling	Arctic grayling	245	148.7	retained
CF10.0	Coffee Creek	10-Jul-16	AG - angling	Arctic grayling	330	378.5	retained
CF10.0-1-1	Coffee Creek	10-Jul-16	EF - electrofishing	slimy sculpin	76	4	retained
CF10.0-1-1	Coffee Creek	10-Jul-16	EF - electrofishing	slimy sculpin	79	4.6	retained
CF10.0-1-1	Coffee Creek	10-Jul-16	EF - electrofishing	slimy sculpin	50	1.3	retained
CF10.0-1-1	Coffee Creek	10-Jul-16	EF - electrofishing	slimy sculpin	71	3.2	retained
CF10.0-1-1	Coffee Creek	10-Jul-16	EF - electrofishing	slimy sculpin	74	3.6	retained
CF10.0-1-1	Coffee Creek	10-Jul-16	EF - electrofishing	slimy sculpin	54	1.5	retained
CF10.0-1-1	Coffee Creek	10-Jul-16	EF - electrofishing	slimy sculpin	53	1.2	retained
CF10.0-1-1	Coffee Creek	10-Jul-16	EF - electrofishing	slimy sculpin	54	1.6	retained
CF10.0-1-1	Coffee Creek	10-Jul-16	EF - electrofishing	slimy sculpin	55	1.5	retained
CF10.0-1-1	Coffee Creek	10-Jul-16	EF - electrofishing	slimy sculpin	55	1.6	retained
CF10.0-1-2	Coffee Creek	10-Jul-16	EF - electrofishing	slimy sculpin	56	1.7	released
CF10.0-1-2	Coffee Creek	10-Jul-16	EF - electrofishing	slimy sculpin	71	3.4	released
CF10.0-1-2	Coffee Creek	10-Jul-16	EF - electrofishing	slimy sculpin	50	1.1	released
CF10.0-1-2	Coffee Creek	10-Jul-16	EF - electrofishing	slimy sculpin	57	1.5	released

Site Name	Stream Name	Sample Date	Capture Method	Species	Length (mm)	Weight (g)	Release Condition
CF10.0-1-2	Coffee Creek	10-Jul-16	EF - electrofishing	slimy sculpin	57	1.4	released
CF10.0-1-2	Coffee Creek	10-Jul-16	EF - electrofishing	slimy sculpin	50	1.1	released
CF10.0-1-2	Coffee Creek	10-Jul-16	EF - electrofishing	slimy sculpin	52	1.4	released
CF10.0-1-3	Coffee Creek	10-Jul-16	EF - electrofishing	slimy sculpin	75	3.6	released
CF10.0-1-3	Coffee Creek	10-Jul-16	EF - electrofishing	slimy sculpin	32	0.4	released
CF10.0-2-1	Coffee Creek	10-Jul-16	EF - electrofishing	Arctic grayling	225	122.9	retained
CF10.0-2-1	Coffee Creek	10-Jul-16	EF - electrofishing	Arctic grayling	50	1	released
CF10.0-2-1	Coffee Creek	10-Jul-16	EF - electrofishing	Arctic grayling	55	1.2	released
CF10.0-2-1	Coffee Creek	10-Jul-16	EF - electrofishing	Arctic grayling	59	1.6	released
CF10.0-2-1	Coffee Creek	10-Jul-16	EF - electrofishing	Arctic grayling	60	1.9	released
CF10.0-2-1	Coffee Creek	10-Jul-16	EF - electrofishing	Arctic grayling	46	1	released
CF10.0-2-1	Coffee Creek	10-Jul-16	EF - electrofishing	Arctic grayling	51	1.3	released
CF10.0-2-1	Coffee Creek	10-Jul-16	EF - electrofishing	slimy sculpin	53	1.3	released
CF10.0-2-1	Coffee Creek	10-Jul-16	EF - electrofishing	slimy sculpin	31	0.4	released
CF10.0-2-1	Coffee Creek	10-Jul-16	EF - electrofishing	slimy sculpin	32	0.4	released
CF10.0-2-2	Coffee Creek	10-Jul-16	EF - electrofishing	slimy sculpin	30	0.4	released
CF10.0-2-2	Coffee Creek	10-Jul-16	EF - electrofishing	slimy sculpin	29	0.2	released
CF10.0-2-3	Coffee Creek	10-Jul-16	EF - electrofishing	slimy sculpin	32	0.4	released
CF10.0-3-1	Coffee Creek	10-Jul-16	EF - electrofishing	Arctic grayling	245	174.3	retained
CF10.0-3-1	Coffee Creek	10-Jul-16	EF - electrofishing	slimy sculpin	55	1.8	released
CF10.0-3-1	Coffee Creek	10-Jul-16	EF - electrofishing	slimy sculpin	54	1.4	released
CF10.0-3-2	Coffee Creek	10-Jul-16	EF - electrofishing	Arctic grayling	164	53	retained
CF10.0-3-2	Coffee Creek	10-Jul-16	EF - electrofishing	slimy sculpin	55	1.5	released
CF10.0-3-2	Coffee Creek	10-Jul-16	EF - electrofishing	slimy sculpin	56	1.7	released
CF10.0-3-3	Coffee Creek	10-Jul-16	EF - electrofishing	slimy sculpin	51	1.2	released
CF2.7	Coffee Creek	4-Mar-16	MT - minnow trapping	slimy sculpin	85	7.1	retained
CF2.7	Coffee Creek	4-Mar-16	MT - minnow trapping	slimy sculpin	70	4.2	retained
CF2.7	Coffee Creek	4-Mar-16	MT - minnow trapping	slimy sculpin	84	7.1	retained
CF2.7	Coffee Creek	4-Mar-16	MT - minnow trapping	slimy sculpin		6.5	retained
CF2.7	Coffee Creek	4-Mar-16	MT - minnow trapping	Chinook salmon	75	3.8	retained
CF2.7	Coffee Creek	4-Mar-16	MT - minnow trapping	Chinook salmon	81	3.8	retained
CF2.7	Coffee Creek	4-Mar-16	MT - minnow trapping	Chinook salmon	70	3.5	retained
CF2.7	Coffee Creek	4-Mar-16	MT - minnow trapping	Chinook salmon	80		released
CF2.7	Coffee Creek	4-Mar-16	MT - minnow trapping	Chinook salmon	84		released

Site Name	Stream Name	Sample Date	Capture Method	Species	Length (mm)	Weight (g)	Release Condition
CF2.7	Coffee Creek	4-Mar-16	MT - minnow trapping	Chinook salmon	80		released
CF2.7	Coffee Creek	4-Mar-16	MT - minnow trapping	Chinook salmon	80		released
CF2.7	Coffee Creek	4-Mar-16	MT - minnow trapping	Chinook salmon	78		released
CF2.7	Coffee Creek	4-Mar-16	MT - minnow trapping	Chinook salmon	85		released
CF2.7	Coffee Creek	4-Mar-16	MT - minnow trapping	Chinook salmon	75		released
CF2.7	Coffee Creek	4-Mar-16	MT - minnow trapping	Chinook salmon	75		released
CF2.7	Coffee Creek	4-Mar-16	MT - minnow trapping	Chinook salmon	73		released
CF2.7	Coffee Creek	4-Mar-16	MT - minnow trapping	Chinook salmon	80		released
CF2.7	Coffee Creek	4-Mar-16	MT - minnow trapping	Chinook salmon	70		released
CF2.7	Coffee Creek	4-Mar-16	MT - minnow trapping	Chinook salmon	76		released
CF2.7	Coffee Creek	4-Mar-16	MT - minnow trapping	Chinook salmon			released
CF2.7	Coffee Creek	4-Mar-16	MT - minnow trapping	Chinook salmon			released
CF2.7	Coffee Creek	4-Mar-16	MT - minnow trapping	Chinook salmon			released
CF2.7	Coffee Creek	4-Mar-16	MT - minnow trapping	Chinook salmon			released
CF2.7	Coffee Creek	4-Mar-16	MT - minnow trapping	Chinook salmon			released
CF2.7	Coffee Creek	5-Mar-16	MT - minnow trapping	slimy sculpin		0.4	retained
CF2.7	Coffee Creek	5-Mar-16	MT - minnow trapping	slimy sculpin		0.3	retained
CF2.7	Coffee Creek	5-Mar-16	MT - minnow trapping	slimy sculpin		0.9	retained
CF2.7	Coffee Creek	5-Mar-16	MT - minnow trapping	slimy sculpin		<0.1	retained
CF2.7	Coffee Creek	5-Mar-16	MT - minnow trapping	Chinook salmon	90		released
CF2.7	Coffee Creek	5-Mar-16	MT - minnow trapping	Chinook salmon	76		released
CF2.7	Coffee Creek	5-Mar-16	MT - minnow trapping	Chinook salmon	76		released
CF2.7	Coffee Creek	5-Mar-16	MT - minnow trapping	Chinook salmon	78		released
CF2.7	Coffee Creek	5-Mar-16	MT - minnow trapping	Chinook salmon	76		released
CF2.7	Coffee Creek	5-Mar-16	MT - minnow trapping	Chinook salmon	79		released
CF2.7	Coffee Creek	5-Mar-16	MT - minnow trapping	Chinook salmon	83		released
CF2.7	Coffee Creek	5-Mar-16	MT - minnow trapping	Chinook salmon	76		released
CF2.7	Coffee Creek	5-Mar-16	MT - minnow trapping	Chinook salmon			released
CF3.9-1-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	78	4.4	released
CF3.9-1-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	64	2.8	released
CF3.9-1-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	56	2.3	released
CF3.9-1-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	54	1.5	released
CF3.9-1-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	32	0.7	released
CF3.9-1-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	45	1.2	released

Site Name	Stream Name	Sample Date	Capture Method	Species	Length (mm)	Weight (g)	Release Condition
CF3.9-1-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	53	1.8	released
CF3.9-1-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	55	1.8	released
CF3.9-1-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	55	1.7	released
CF3.9-1-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	50	1.3	released
CF3.9-1-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-1-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-1-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-1-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-1-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-1-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-1-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-1-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-1-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-1-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-1-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-1-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-1-3	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-1-3	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-1-3	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-1-3	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-1-3	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-1-3	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-1	Coffee Creek	11-Jul-16	EF - electrofishing	Chinook salmon	58	2.2	released
CF3.9-2-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	48	0.8	released
CF3.9-2-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	44	0.8	released
CF3.9-2-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	25	0.2	released
CF3.9-2-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	46	0.8	released
CF3.9-2-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	41	0.5	released
CF3.9-2-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	45	1	released
CF3.9-2-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	43	0.7	released
CF3.9-2-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	41	0.7	released
CF3.9-2-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	40	0.6	released
CF3.9-2-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	25	0.3	released
CF3.9-2-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released

Site Name	Stream Name	Sample Date	Capture Method	Species	Length (mm)	Weight (g)	Release Condition
CF3.9-2-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-2	Coffee Creek	11-Jul-16	EF - electrofishing	Arctic grayling	160		released
CF3.9-2-2	Coffee Creek	11-Jul-16	EF - electrofishing	Chinook salmon	62	3.1	released
CF3.9-2-2	Coffee Creek	11-Jul-16	EF - electrofishing	Chinook salmon	56	2.3	released
CF3.9-2-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-3	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-3	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-3	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-3	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-3	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-3	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-4	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-4	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-4	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-4	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released

Site Name	Stream Name	Sample Date	Capture Method	Species	Length (mm)	Weight (g)	Release Condition
CF3.9-2-4	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-2-4	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	66	3	retained
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	67	3.6	retained
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	84	5.8	retained
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	67	2.9	retained
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	67	2.7	retained
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	50	1.1	retained
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	50	1.2	retained
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	58	1.9	retained
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	55	1.5	retained
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	46	0.8	retained
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	50	1.2	released
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	51	1.4	released
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	55	1.6	released
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	52	1.2	released
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	50	1.1	released
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	51	1.4	released
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	51	1.3	released
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	43	0.8	released
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	50	1.2	released
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	51	1.4	released
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	50	1.6	released
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	50	1.1	released
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	50	1.1	released
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	50	1.3	released
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	45	1.1	released
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin	42	1	released
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released

Site Name	Stream Name	Sample Date	Capture Method	Species	Length (mm)	Weight (g)	Release Condition
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-1	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-2	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-3	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-3	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-3	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-3	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released

Site Name	Stream Name	Sample Date	Capture Method	Species	Length (mm)	Weight (g)	Release Condition
CF3.9-3-3	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-3	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-3	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-3	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-3	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF3.9-3-3	Coffee Creek	11-Jul-16	EF - electrofishing	slimy sculpin			released
CF8.3	Coffee Creek	4-Mar-16	MT - minnow trapping	slimy sculpin	66	2.3	retained
HF0.2	Halfway Creek	23-Aug-16	EF - electrofishing	Chinook salmon	69		retained
HF0.2	Halfway Creek	23-Aug-16	EF - electrofishing	Chinook salmon	77		retained
HF0.2	Halfway Creek	23-Aug-16	EF - electrofishing	Chinook salmon	70		retained
HF0.2	Halfway Creek	23-Aug-16	EF - electrofishing	Chinook salmon	82		retained
HF0.2	Halfway Creek	23-Aug-16	EF - electrofishing	Chinook salmon	73		retained
HF0.2	Halfway Creek	23-Aug-16	EF - electrofishing	Chinook salmon	69		retained
HF0.2	Halfway Creek	23-Aug-16	EF - electrofishing	Chinook salmon	70		retained
HF0.2	Halfway Creek	23-Aug-16	EF - electrofishing	Chinook salmon	72		retained
HF0.2	Halfway Creek	23-Aug-16	EF - electrofishing	Chinook salmon	71		retained
HF0.2	Halfway Creek	23-Aug-16	EF - electrofishing	Chinook salmon	77		retained
HF0.2	Halfway Creek	23-Aug-16	EF - electrofishing	Chinook salmon	76		retained
HF0.2	Halfway Creek	23-Aug-16	EF - electrofishing	Arctic grayling	123		retained
HF0.2	Halfway Creek	23-Aug-16	EF - electrofishing	Chinook salmon	78		released
HF0.2	Halfway Creek	23-Aug-16	EF - electrofishing	Chinook salmon	78		released
HF0.2	Halfway Creek	23-Aug-16	EF - electrofishing	Chinook salmon	75		released
HF0.2	Halfway Creek	23-Aug-16	EF - electrofishing	Chinook salmon	74		released
HF0.2	Halfway Creek	23-Aug-16	EF - electrofishing	Chinook salmon	70		released
HF0.2	Halfway Creek	23-Aug-16	EF - electrofishing	Chinook salmon	68		released
HF0.2	Halfway Creek	23-Aug-16	EF - electrofishing	Chinook salmon	73		released
HF0.2	Halfway Creek	23-Aug-16	EF - electrofishing	Chinook salmon	75		released
HF0.2	Halfway Creek	23-Aug-16	EF - electrofishing	Chinook salmon	76		released
Indian River Mainstem	Indian River Crossing	20-Aug-16	MT - minnow trapping	slimy sculpin	50		released
LC2.7-2-1	Latte Creek	9-Jul-16	EF - electrofishing	Arctic grayling			escape
LC2.7-2-3	Latte Creek	9-Jul-16	EF - electrofishing	Arctic grayling			escape
LC2.7-3-1	Latte Creek	9-Jul-16	EF - electrofishing	Arctic grayling	267	199.6	retained
LC2.7-3-1	Latte Creek	9-Jul-16	EF - electrofishing	Arctic grayling	284	276.9	retained

Site Name	Stream Name	Sample Date	Capture Method	Species	Length (mm)	Weight (g)	Release Condition
LC2.7-3-3	Latte Creek	9-Jul-16	EF - electrofishing	Arctic grayling	247	180.2	retained
LC2.7-3-3	Latte Creek	9-Jul-16	EF - electrofishing	Arctic grayling	235	157.9	retained
LC2.7-3-3	Latte Creek	9-Jul-16	EF - electrofishing	Arctic grayling	168		retained
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	slimy sculpin	55		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	slimy sculpin	59		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	slimy sculpin	52		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	slimy sculpin	46		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	slimy sculpin	44		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	slimy sculpin	50		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	slimy sculpin	57		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	slimy sculpin	51		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	slimy sculpin	38		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	slimy sculpin	24		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	slimy sculpin	33		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	slimy sculpin	41		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	Chinook salmon	70		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	Chinook salmon	75		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	Chinook salmon	64		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	Chinook salmon	74		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	Chinook salmon	76		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	Chinook salmon	63		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	Chinook salmon	69		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	Chinook salmon	73		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	Chinook salmon	65		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	Chinook salmon	62		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	Chinook salmon	70		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	Chinook salmon	72		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	Chinook salmon	68		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	Chinook salmon	67		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	Chinook salmon	74		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	Chinook salmon	63		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	Chinook salmon	66		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	Chinook salmon	59		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	Arctic grayling	135		released

Site Name	Stream Name	Sample Date	Capture Method	Species	Length (mm)	Weight (g)	Release Condition
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	Arctic grayling	145		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	Arctic grayling	125		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	Arctic grayling	110		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	Arctic grayling	105		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	Arctic grayling	58		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	lake chub	95		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	lake chub	85		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	lake chub	85		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	lake chub	85		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	lake chub	83		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	lake chub	87		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	lake chub	90		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	lake chub	80		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	lake chub	22		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	lake chub	75		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	longnose sucker	140		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	longnose sucker	150		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	longnose sucker	150		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	longnose sucker	105		released
SR_LDB_1	Stewart River	14-Jul-16	BS - beach seining	round whitefish	45		released
SR_RDB_1	Stewart River	14-Jul-16	BS - beach seining	longnose sucker	280		released
SR_RDB_1	Stewart River	14-Jul-16	BS - beach seining	longnose sucker	175		released
SR_RDB_2	Stewart River	14-Jul-16	BS - beach seining	burbot	320		released
SR_RDB_2	Stewart River	14-Jul-16	BS - beach seining	burbot	180		released
SR_RDB_2	Stewart River	14-Jul-16	BS - beach seining	slimy sculpin	70		released
SR_RDB_2	Stewart River	14-Jul-16	BS - beach seining	slimy sculpin	55		released
SR_RDB_2	Stewart River	14-Jul-16	BS - beach seining	slimy sculpin	50		released
SR_RDB_2	Stewart River	14-Jul-16	BS - beach seining	slimy sculpin	55		released
SR_RDB_2	Stewart River	14-Jul-16	BS - beach seining	slimy sculpin	53		released
SR_RDB_2	Stewart River	14-Jul-16	BS - beach seining	slimy sculpin	50		released
SR_RDB_2	Stewart River	14-Jul-16	BS - beach seining	slimy sculpin	54		released
SR_RDB_2	Stewart River	14-Jul-16	BS - beach seining	slimy sculpin	45		released
SR_RDB_2	Stewart River	14-Jul-16	BS - beach seining	slimy sculpin	45		released
SR_RDB_2	Stewart River	14-Jul-16	BS - beach seining	slimy sculpin	50		released

Site Name	Stream Name	Sample Date	Capture Method	Species	Length (mm)	Weight (g)	Release Condition
SR_RDB_2	Stewart River	14-Jul-16	BS - beach seining	slimy sculpin	51		released
SR_RDB_2	Stewart River	14-Jul-16	BS - beach seining	Chinook salmon	75		released
SR_RDB_2	Stewart River	14-Jul-16	BS - beach seining	longnose sucker	275		released
SR_RDB_2	Stewart River	14-Jul-16	BS - beach seining	longnose sucker	220		released
SR_RDB_2	Stewart River	14-Jul-16	BS - beach seining	longnose sucker	200		released
SR_RDB_2	Stewart River	14-Jul-16	BS - beach seining	longnose sucker	190		released
SR_RDB_2	Stewart River	14-Jul-16	BS - beach seining	longnose sucker	180		released
SR_RDB_2	Stewart River	14-Jul-16	BS - beach seining	longnose sucker	90		released
SR_RDB_2	Stewart River	14-Jul-16	BS - beach seining	longnose sucker	130		released
SR_RDB_2	Stewart River	14-Jul-16	BS - beach seining	longnose sucker	130		released
SR_RDB_2	Stewart River	14-Jul-16	BS - beach seining	longnose sucker	120		released
SR_RDB_2	Stewart River	14-Jul-16	BS - beach seining	longnose sucker	110		released
SR_RDB_2	Stewart River	14-Jul-16	BS - beach seining	longnose sucker	80		released
SR_RDB_2	Stewart River	14-Jul-16	BS - beach seining	longnose sucker	110		released
SR_RDB_2	Stewart River	14-Jul-16	BS - beach seining	longnose sucker	100		released
SR_RDB_2	Stewart River	14-Jul-16	BS - beach seining	longnose sucker	160		released
SRSC	Stewart River	14-Jul-16	BS - beach seining	lake chub	23		released
SRSC	Stewart River	14-Jul-16	BS - beach seining	lake chub	22		released
SRSC	Stewart River	14-Jul-16	BS - beach seining	northern pike	62		released
SRSC	Stewart River	14-Jul-16	BS - beach seining	northern pike	110		released
SRSC	Stewart River	14-Jul-16	BS - beach seining	round whitefish	45		released
SRSC	Stewart River	14-Jul-16	BS - beach seining	round whitefish	45		released
SRSC	Stewart River	14-Jul-16	BS - beach seining	round whitefish	45		released
SRSC	Stewart River	14-Jul-16	BS - beach seining	round whitefish	46		released
SRSC	Stewart River	14-Jul-16	BS - beach seining	lake/broad whitefish	130		released
SRSC	Stewart River	14-Jul-16	BS - beach seining	lake/broad whitefish	85		released
SRSC	Stewart River	14-Jul-16	BS - beach seining	lake/broad whitefish	70		released
SRSC	Stewart River	14-Jul-16	BS - beach seining	lake/broad whitefish	45		released
SRSC	Stewart River	14-Jul-16	BS - beach seining	lake/broad whitefish	58		released
SRSC	Stewart River	14-Jul-16	BS - beach seining	lake chub			released
SRSC	Stewart River	14-Jul-16	BS - beach seining	lake chub			released
SRSC	Stewart River	14-Jul-16	BS - beach seining	lake chub			released
SRSC	Stewart River	14-Jul-16	BS - beach seining	round whitefish			released
SRSC	Stewart River	14-Jul-16	BS - beach seining	round whitefish			released

Site Name	Stream Name	Sample Date	Capture Method	Species	Length (mm)	Weight (g)	Release Condition
SRSC	Stewart River	14-Jul-16	BS - beach seining	round whitefish			released
SRSC	Stewart River	14-Jul-16	BS - beach seining	round whitefish			released
SRSC	Stewart River	14-Jul-16	BS - beach seining	round whitefish			released
SRSC	Stewart River	14-Jul-16	BS - beach seining	round whitefish			released
SRSC	Stewart River	14-Jul-16	BS - beach seining	round whitefish			released
SRSC	Stewart River	14-Jul-16	BS - beach seining	round whitefish			released
SRSC	Stewart River	14-Jul-16	BS - beach seining	round whitefish			released
SRSC	Stewart River	14-Jul-16	BS - beach seining	round whitefish			released
SRSC	Stewart River	14-Jul-16	BS - beach seining	round whitefish			released
SRSC	Stewart River	14-Jul-16	BS - beach seining	round whitefish			released
SRSC	Stewart River	14-Jul-16	BS - beach seining	round whitefish			released
SRSC	Stewart River	14-Jul-16	BS - beach seining	round whitefish			released
SRSC	Stewart River	14-Jul-16	BS - beach seining	round whitefish			released
SRSC	Stewart River	14-Jul-16	BS - beach seining	round whitefish			released
SRSC	Stewart River	14-Jul-16	BS - beach seining	lake/broad whitefish			released
SRSC	Stewart River	14-Jul-16	BS - beach seining	lake/broad whitefish			released
SRSC	Stewart River	14-Jul-16	BS - beach seining	lake/broad whitefish			released
SRSC	Stewart River	14-Jul-16	BS - beach seining	lake/broad whitefish			released
SRSC	Stewart River	14-Jul-16	BS - beach seining	lake/broad whitefish			released
SRSC	Stewart River	14-Jul-16	BS - beach seining	lake/broad whitefish			released
SRSC	Stewart River	14-Jul-16	BS - beach seining	lake/broad whitefish			released
SRSC	Stewart River	14-Jul-16	BS - beach seining	lake/broad whitefish			released
SRSC	Stewart River	14-Jul-16	BS - beach seining	lake/broad whitefish			released
SRSC	Stewart River	14-Jul-16	BS - beach seining	lake/broad whitefish			released
SRSC	Stewart River	14-Jul-16	BS - beach seining	lake/broad whitefish			released
SRSC	Stewart River	14-Jul-16	BS - beach seining	lake/broad whitefish			released
SRSC	Stewart River	14-Jul-16	BS - beach seining	lake/broad whitefish			released
SRSC	Stewart River Side Channel	14-Jul-16	MT - minnow trapping	slimy sculpin	57		released
YR Land LDB	Yukon River	8-Jul-16	BS - beach seining	burbot			released
YR Land LDB	Yukon River	8-Jul-16	BS - beach seining	slimy sculpin			released
YR Land LDB	Yukon River	8-Jul-16	BS - beach seining	slimy sculpin			released
YR Land LDB	Yukon River	8-Jul-16	BS - beach seining	slimy sculpin			released
YR Land LDB	Yukon River	8-Jul-16	BS - beach seining	slimy sculpin			released

Site Name	Stream Name	Sample Date	Capture Method	Species	Length (mm)	Weight (g)	Release Condition
YR Land LDB	Yukon River	8-Jul-16	BS - beach seining	slimy sculpin			released
YR Land LDB	Yukon River	8-Jul-16	BS - beach seining	slimy sculpin			released
YR Land LDB	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon			released
YR Land LDB	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon			released
YR Land LDB	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon			released
YR Land LDB	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon			released
YR Land LDB	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon			released
YR Land LDB	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon			released
YR Land LDB	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon			released
YR Land LDB	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon			released
YR Land LDB	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon			released
YR Land LDB	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon			released
YR Land LDB	Yukon River	8-Jul-16	BS - beach seining	Arctic grayling			released
YR Land LDB	Yukon River	8-Jul-16	BS - beach seining	Arctic grayling			released
YR Land LDB	Yukon River	8-Jul-16	BS - beach seining	Arctic grayling			released
YR Land LDB	Yukon River	8-Jul-16	BS - beach seining	lake chub			released
YR Land LDB	Yukon River	8-Jul-16	BS - beach seining	longnose sucker			released
YR Land LDB	Yukon River	8-Jul-16	BS - beach seining	northern pike			released
YR US Barge1	Yukon River	8-Jul-16	BS - beach seining	slimy sculpin	52		released
YR US Barge1	Yukon River	8-Jul-16	BS - beach seining	slimy sculpin	56		released
YR US Barge1	Yukon River	8-Jul-16	BS - beach seining	slimy sculpin	55		released
YR US Barge1	Yukon River	8-Jul-16	BS - beach seining	slimy sculpin			released
YR US Barge1	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon	68	3.8	released
YR US Barge1	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon	67	3.5	released
YR US Barge1	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon	64	3.2	released
YR US Barge1	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon	68	3.6	released
YR US Barge1	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon	75	5.2	released
YR US Barge1	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon	68	4	released
YR US Barge1	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon	70	4.1	released
YR US Barge1	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon	68	3.7	released
YR US Barge1	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon	64	3.3	released
YR US Barge1	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon	65	3.8	released
YR US Barge1	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon	66	3.8	released
YR US Barge1	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon			released

Site Name	Stream Name	Sample Date	Capture Method	Species	Length (mm)	Weight (g)	Release Condition
YR US Barge1	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon			released
YR US Barge1	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon			released
YR US Barge1	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon			released
YR US Barge1	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon			released
YR US Barge1	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon			released
YR US Barge1	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon			released
YR US Barge1	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon			released
YR US Barge1	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon			released
YR US Barge1	Yukon River	8-Jul-16	BS - beach seining	Arctic grayling	119	15.6	released
YR US Barge1	Yukon River	8-Jul-16	BS - beach seining	longnose sucker	108	12.5	released
YR US Barge2	Yukon River	8-Jul-16	BS - beach seining	slimy sculpin	70		released
YR US Barge2	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon	69	3.8	released
YR US Barge2	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon	65	2.9	released
YR US Barge2	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon	69	3.9	released
YR US Barge2	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon	58	2.2	released
YR US Barge2	Yukon River	8-Jul-16	BS - beach seining	Chinook salmon	64	2	released
YR US Barge2	Yukon River	8-Jul-16	BS - beach seining	longnose sucker	100	10	released
YR US Barge2	Yukon River	8-Jul-16	BS - beach seining	longnose sucker	62	2.3	released
YRD_RDB2	Yukon River	8-Jul-16	MT - minnow trapping	longnose sucker	83		released

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APPENDIX D. 2016 PERIPHYTON DATA

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Table D1. 2016 periphyton data.

Site	Rep Number	Watercourse	Sample Date	Area Sampled (cm²)	chl a (µg/cm²)
YT0.2	YT0.2-CHLA-1	YT-24 Creek	23-Aug-16	81	0.67
YT0.2	YT0.2-CHLA-2	YT-24 Creek	23-Aug-16	81	0.23
YT0.2	YT0.2-CHLA-3	YT-24 Creek	23-Aug-16	81	0.61
YT0.2	YT0.2-CHLA-4	YT-24 Creek	23-Aug-16	81	1.04
YT0.2	YT0.2-CHLA-5	YT-24 Creek	23-Aug-16	81	0.84
YT0.2	YT0.2-CHLA-6	YT-24 Creek	23-Aug-16	81	1.17
YT0.2	YT0.2 - Mean	YT-24 Creek	23-Aug-16	81	0.76
HF0.2	HF0.2-CHLA-1	Halfway Creek	23-Aug-16	81	0.44
HF0.2	HF0.2-CHLA-2	Halfway Creek	23-Aug-16	81	0.61
HF0.2	HF0.2-CHLA-3	Halfway Creek	23-Aug-16	81	0.75
HF0.2	HF0.2-CHLA-4	Halfway Creek	23-Aug-16	81	0.39
HF0.2	HF0.2-CHLA-5	Halfway Creek	23-Aug-16	81	0.58
HF0.2	HF0.2-CHLA-6	Halfway Creek	23-Aug-16	81	1.40
HF0.2	HF0.2-Mean	Halfway Creek	23-Aug-16	81	0.69
ID1.9	ICD1.9-CHLA-1	Independence Creek	20-Aug-16	81	0.48
ID1.9	ID1.9-CHLA-2	Independence Creek	20-Aug-16	81	0.36
ID1.9	ID1.9-CHLA-3	Independence Creek	20-Aug-16	81	0.11
ID1.9	ID1.9-CHLA-4	Independence Creek	20-Aug-16	81	0.29
ID1.9	ID1.9-CHLA-5	Independence Creek	20-Aug-16	81	0.93
ID1.9	ID1.9-CHLA-6	Independence Creek	20-Aug-16	81	0.38
ID1.9	ID1.9-Mean	Independence Creek	20-Aug-16	81	0.43
YT5.0	YT5.0-CHLA-1	YT-24 Creek	21-Aug-16	81	0.19
YT5.0	YT5.0-CHLA-2	YT-24 Creek	21-Aug-16	81	0.50
YT5.0	YT5.0-CHLA-3	YT-24 Creek	21-Aug-16	81	0.42
YT5.0	YT5.0-CHLA-4	YT-24 Creek	21-Aug-16	81	1.81
YT5.0	YT5.0-CHLA-5	YT-24 Creek	21-Aug-16	81	0.33
YT5.0	YT5.0-CHLA-6	YT-24 Creek	21-Aug-16	81	0.42
YT5.0	YT5.0-Mean	YT-24 Creek	21-Aug-16	81	0.61

Site	Rep Number	Watercourse	Sample Date	Area Sampled (cm²)	chl a (µg/cm²)
LC9.9	LC9.9-CHLA-1	Latte Creek	21-Aug-16	81	0.14
LC9.9	LC9.9-CHLA-2	Latte Creek	21-Aug-16	81	0.20
LC9.9	LC9.9-CHLA-3	Latte Creek	21-Aug-16	81	0.14
LC9.9	LC9.9-CHLA-4	Latte Creek	21-Aug-16	81	0.14
LC9.9	LC9.9-CHLA-5	Latte Creek	21-Aug-16	81	0.10
LC9.9	LC9.9-CHLA-6	Latte Creek	21-Aug-16	81	0.10
LC9.9	LC9.9-Mean	Latte Creek	21-Aug-16	81	0.13
LaC4.8	LaC4.8-CHLA-1	Los Angeles Creek	20-Aug-16	81	1.06
LaC4.8	LaC4.8-CHLA-2	Los Angeles Creek	20-Aug-16	81	0.73
LaC4.8	LaC4.8-CHLA-3	Los Angeles Creek	20-Aug-16	81	0.81
LaC4.8	LaC4.8-CHLA-4	Los Angeles Creek	20-Aug-16	81	1.08
LaC4.8	LaC4.8-CHLA-5	Los Angeles Creek	20-Aug-16	81	0.27
LaC4.8	LaC4.8-CHLA-6	Los Angeles Creek	20-Aug-16	81	0.47
LaC4.8	LaC4.8-Mean	Los Angeles Creek	20-Aug-16	81	0.74
HF6.3	HF6.3-CHLA-1	Halfway Creek	20-Aug-16	81	0.19
HF6.3	HF6.3-CHLA-2	Halfway Creek	20-Aug-16	81	0.12
HF6.3	HF6.3-CHLA-3	Halfway Creek	20-Aug-16	81	0.13
HF6.3	HF6.3-CHLA-4	Halfway Creek	20-Aug-16	81	0.64
HF6.3	HF6.3-CHLA-5	Halfway Creek	20-Aug-16	81	0.52
HF6.3	HF6.3-CHLA-6	Halfway Creek	20-Aug-16	81	0.18
HF6.3	HC6.3 - Mean	Halfway Creek	20-Aug-16	81	0.30
CF10.0	CF10.0-CHLA-1	Coffee Creek	21-Aug-16	81	0.07
CF10.0	CF10.0-CHLA-2	Coffee Creek	21-Aug-16	81	0.21
CF10.0	CF10.0-CHLA-3	Coffee Creek	21-Aug-16	81	0.48
CF10.0	CF10.0-CHLA-4	Coffee Creek	21-Aug-16	81	0.64
CF10.0	CF10.0-CHLA-5	Coffee Creek	21-Aug-16	81	0.66
CF10.0	CF10.0-CHLA-6	Coffee Creek	21-Aug-16	81	1.35
CF10.0	CF10.0 - Mean	Coffee Creek	21-Aug-16	81	0.57
LC2.7	LC2.7-CHLA-1	Latte Creek	21-Aug-16	81	0.21

Site	Rep Number	Watercourse	Sample Date	Area Sampled (cm²)	chl a (µg/cm²)
LC2.7	LC2.7-CHLA-2	Latte Creek	21-Aug-16	81	0.11
LC2.7	LC2.7-CHLA-3	Latte Creek	21-Aug-16	81	0.19
LC2.7	LC2.7-CHLA-4	Latte Creek	21-Aug-16	81	0.45
LC2.7	LC2.7-CHLA-5	Latte Creek	21-Aug-16	81	0.24
LC2.7	LC2.7-CHLA-6	Latte Creek	21-Aug-16	81	0.39
LC2.7	LC2.7 - Mean	Latte Creek	21-Aug-16	81	0.26
CF3.9	CF3.9-CHLA-1	Coffee Creek	21-Aug-16	81	1.07
CF3.9	CF3.9-CHLA-2	Coffee Creek	21-Aug-16	81	1.30
CF3.9	CF3.9-CHLA-3	Coffee Creek	21-Aug-16	81	0.77
CF3.9	CF3.9-CHLA-4	Coffee Creek	21-Aug-16	81	0.65
CF3.9	CF3.9-CHLA-5	Coffee Creek	21-Aug-16	81	0.68
CF3.9	CF3.9-CHLA-6	Coffee Creek	21-Aug-16	81	0.79
CF3.9	CC3.9 - Mean	Coffee Creek	21-Aug-16	81	0.88

Your Project #: 14Y0306:102
Site Location: COFFEE CREEK

Attention:LYNDSAY DOETZEL
EDI ENVIRONMENTAL DYNAMICS INC.
2195 2nd Avenue
WHITEHORSE, YT
CANADA Y1A 3T8

Your C.O.C. #: 08426768, 08426769, 08426771, 08426772, 08426773, 08426774

Report Date: 2016/09/02
Report #: R2252940
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B673220
Received: 2016/08/25, 14:15

Sample Matrix: Water
Samples Received: 60

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Chlorophyll A (surface)(sin)	30	N/A	2016/08/30	BBY6SOP-00002	SM 22 10200 H m
Chlorophyll A (surface)(sin)	30	N/A	2016/09/01	BBY6SOP-00002	SM 22 10200 H m

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Maxxam
REPORT AUTOMATION ENGINE
02 Sep 2016 16:08:34 -07:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Graham Rudkin, Project Manager, Environmental
Email: GRudkin@maxxam.ca
Phone# (604)638-5926 Ext:5926
==
This report has been generated and distributed using a secure automated process.
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total Cover Pages : 1

Maxxam Job #: B673220
Report Date: 2016/09/02

EDI ENVIRONMENTAL DYNAMICS INC.
Client Project #: 14Y0306:102
Site Location: COFFEE CREEK
Sampler Initials: JT

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		PJ3292	PJ3293	PJ3294		PJ3295	PJ3296		
Sampling Date		2016/08/23 12:00	2016/08/23 12:00	2016/08/23 12:00		2016/08/23 12:00	2016/08/23 12:00		
COC Number		08426768	08426768	08426768		08426768	08426768		
	UNITS	**YT 0.2-CHLA-1**	**YT 0.2-CHLA-2**	**YT 0.2-CHLA-3**	**RDL**	**YT 0.2-CHLA-4**	**YT 0.2-CHLA-5**	**RDL**	**QC Batch**
Parameter									
Chlorophyll a	ug/cm2	0.669	0.228	0.610	0.030	1.04 (1)	0.836 (1)	0.060	8381929

RDL = Reportable Detection Limit
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam ID		PJ3297		PJ3298	PJ3299		PJ3300		
Sampling Date		2016/08/23 12:00		2016/08/23 13:00	2016/08/23 13:00		2016/08/23 13:00		
COC Number		08426768		08426768	08426768		08426768		
	UNITS	**YT 0.2-CHLA-6**	**RDL**	**HF 0.2-CHLA-1**	**HF 0.2-CHLA-2**	**RDL**	**HF 0.2-CHLA-3**	**RDL**	**QC Batch**
Parameter									
Chlorophyll a	ug/cm2	1.17 (1)	0.060	0.437	0.606	0.030	0.752 (1)	0.060	8381929

RDL = Reportable Detection Limit
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam ID		PJ3301		PJ3313		PJ3314		PJ3315		
Sampling Date		2016/08/23 13:00		2016/08/23 13:00		2016/08/23 13:00		2016/08/20 12:00		
COC Number		08426768		08426769		08426769		08426769		
	UNITS	**HF 0.2-CHLA-4**	**QC Batch**	**HF 0.2-CHLA-5**	**RDL**	**HF 0.2-CHLA-6**	**RDL**	**IC 1.9-CHLA-1**	**RDL**	**QC Batch**
Parameter										
Chlorophyll a	ug/cm2	0.393	8381929	0.576	0.030	1.40 (1)	0.15	0.483	0.030	8381932

RDL = Reportable Detection Limit
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam ID		PJ3316	PJ3317	PJ3318		PJ3319		PJ3320		
Sampling Date		2016/08/20 12:00	2016/08/20 12:00	2016/08/20 12:00		2016/08/20 12:00		2016/08/20 12:00		
COC Number		08426769	08426769	08426769		08426769		08426769		
	UNITS	**IC 1.9-CHLA-2**	**IC 1.9-CHLA-3**	**IC 1.9-CHLA-4**	**RDL**	**IC 1.9-CHLA-5**	**RDL**	**IC 1.9-CHLA-6**	**RDL**	**QC Batch**
Parameter										
Chlorophyll a	ug/cm2	0.363	0.105	0.291	0.030	0.932 (1)	0.060	0.381	0.030	8381932

RDL = Reportable Detection Limit
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam Job #: B673220
Report Date: 2016/09/02

EDI ENVIRONMENTAL DYNAMICS INC.
Client Project #: 14Y0306:102
Site Location: COFFEE CREEK
Sampler Initials: JT

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		PJ3321	PJ3322	PJ3331		PJ3332		PJ3333		
Sampling Date		2016/08/21 12:00	2016/08/21 12:00	2016/08/21 12:00		2016/08/21 12:00		2016/08/21 12:00		
COC Number		08426769	08426769	08426771		08426771		08426771		
	UNITS	**YT 5.0-CHLA-1**	**YT 5.0-CHLA-2**	**YT 5.0-CHLA-3**	**RDL**	**YT 5.0-CHLA-4**	**RDL**	**YT 5.0-CHLA-5**	**RDL**	**QC Batch**
Parameter										
Chlorophyll a	ug/cm2	0.190	0.497	0.423	0.030	1.81 (1)	0.15	0.331	0.030	8381932

RDL = Reportable Detection Limit
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam ID		PJ3334	PJ3335	PJ3336	PJ3337	PJ3338	PJ3339		
Sampling Date		2016/08/21 12:00	2016/08/21 13:00	2016/08/21 13:00	2016/08/21 13:00	2016/08/21 13:00	2016/08/21 13:00		
COC Number		08426771	08426771	08426771	08426771	08426771	08426771		
	UNITS	**YT 5.0-CHLA-6**	**LC 9.9-CHLA-1**	**LC 9.9-CHLA-2**	**LC 9.9-CHLA-3**	**LC 9.9-CHLA-4**	**LC 9.9-CHLA-5**	**RDL**	**QC Batch**
Parameter									
Chlorophyll a	ug/cm2	0.417	0.136	0.202	0.139	0.140	0.097	0.030	8381932

RDL = Reportable Detection Limit

Maxxam ID		PJ3340			PJ3354	PJ3355	PJ3356	PJ3357		
Sampling Date		2016/08/21 13:00			2016/08/20 12:00	2016/08/20 12:00	2016/08/20 12:00	2016/08/20 12:00		
COC Number		08426771			08426772	08426772	08426772	08426772		
	UNITS	**LC 9.9-CHLA-6**	**RDL**	**QC Batch**	**LA 4.8-CHLA-1**	**LA 4.8-CHLA-2**	**LA 4.8-CHLA-3**	**LA 4.8-CHLA-4**	**RDL**	**QC Batch**
Parameter										
Chlorophyll a	ug/cm2	0.095	0.030	8381932	1.06 (1)	0.728 (1)	0.808 (1)	1.08 (1)	0.060	8384179

RDL = Reportable Detection Limit
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam ID		PJ3358	PJ3359	PJ3360	PJ3361	PJ3362	PJ3363		
Sampling Date		2016/08/20 12:00	2016/08/20 12:00	2016/08/20 13:00	2016/08/20 13:00	2016/08/20 13:00	2016/08/20 13:00		
COC Number		08426772	08426772	08426772	08426772	08426772	08426772		
	UNITS	**LA 4.8-CHLA-5**	**LA 4.8-CHLA-6**	**HF 6.3-CHLA-1**	**HF 6.3-CHLA-2**	**HF 6.3-CHLA-3**	**HF 6.3-CHLA-4**	**RDL**	**QC Batch**
Parameter									
Chlorophyll a	ug/cm2	0.267	0.474	0.192	0.118	0.133	0.638	0.030	8384179

RDL = Reportable Detection Limit

Maxxam Job #: B673220
Report Date: 2016/09/02

EDI ENVIRONMENTAL DYNAMICS INC.
Client Project #: 14Y0306:102
Site Location: COFFEE CREEK
Sampler Initials: JT

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		PJ3370	PJ3371	PJ3372	PJ3373	PJ3374		
Sampling Date		2016/08/20 13:00	2016/08/20 13:00	2016/08/21 14:00	2016/08/21 14:00	2016/08/21 14:00		
COC Number		08426773	08426773	08426773	08426773	08426773		
	UNITS	**HF 6.3-CHLA-5**	**HF 6.3-CHLA-6**	**CF 10.0-CHLA-1**	**CF 10.0-CHLA-2**	**CF 10.0-CHLA-3**	**RDL**	**QC Batch**
Parameter								
Chlorophyll a	ug/cm2	0.524	0.182	0.072	0.213	0.476	0.030	8384179

RDL = Reportable Detection Limit

Maxxam ID		PJ3375	PJ3376		PJ3377		PJ3378	PJ3379		
Sampling Date		2016/08/21 14:00	2016/08/21 14:00		2016/08/21 14:00		2016/08/21 15:00	2016/08/21 15:00		
COC Number		08426773	08426773		08426773		08426773	08426773		
	UNITS	**CF 10.0-CHLA-4**	**CF 10.0-CHLA-5**	**RDL**	**CF 10.0-CHLA-6**	**RDL**	**LC 2.7-CHLA-1**	**LC 2.7-CHLA-2**	**RDL**	**QC Batch**
Parameter										
Chlorophyll a	ug/cm2	0.637	0.663	0.030	1.35 (1)	0.060	0.205	0.107	0.030	8384179

RDL = Reportable Detection Limit
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam ID		PJ3381	PJ3382	PJ3383	PJ3384		PJ3385		
Sampling Date		2016/08/21 15:00	2016/08/21 15:00	2016/08/21 15:00	2016/08/21 15:00		2016/08/21 16:00		
COC Number		08426774	08426774	08426774	08426774		08426774		
	UNITS	**LC 2.7-CHLA-3**	**LC 2.7-CHLA-4**	**LC 2.7-CHLA-5**	**LC 2.7-CHLA-6**	**RDL**	**CF 3.9-CHLA-1**	**RDL**	**QC Batch**
Parameter									
Chlorophyll a	ug/cm2	0.191	0.452	0.240	0.390	0.030	1.07 (1)	0.060	8384182

RDL = Reportable Detection Limit
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam ID		PJ3386	PJ3387		PJ3388		PJ3389	PJ3390		
Sampling Date		2016/08/21 16:00	2016/08/21 16:00		2016/08/21 16:00		2016/08/21 16:00	2016/08/21 16:00		
COC Number		08426774	08426774		08426774		08426774	08426774		
	UNITS	**CF 3.9-CHLA-2**	**CF 3.9-CHLA-3**	**RDL**	**CF 3.9-CHLA-4**	**RDL**	**CF 3.9-CHLA-5**	**CF 3.9-CHLA-6**	**RDL**	**QC Batch**
Parameter										
Chlorophyll a	ug/cm2	1.30 (1)	0.772 (1)	0.060	0.647	0.030	0.678 (1)	0.785 (1)	0.060	8384182

RDL = Reportable Detection Limit
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

GENERAL COMMENTS

Results relate only to the items tested.

Maxxam Job #: B673220
Report Date: 2016/09/02

QUALITY ASSURANCE REPORT

EDI ENVIRONMENTAL DYNAMICS INC.
Client Project #: 14Y0306:102

Site Location: COFFEE CREEK
Sampler Initials: JT

			Spiked Blank		Method Blank	
QC Batch	**Parameter**	**Date**	**% Recovery**	**QC Limits**	**Value**	**UNITS**
8381929	Chlorophyll a	2016/08/30	104	80 - 120	<0.030	ug/cm2
8381932	Chlorophyll a	2016/08/30	111	80 - 120	<0.030	ug/cm2
8384179	Chlorophyll a	2016/09/01	107	80 - 120	<0.030	ug/cm2
8384182	Chlorophyll a	2016/09/01	110	80 - 120	<0.030	ug/cm2

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

[signature redacted]

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam
A Bureau Veritas Group Company

Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5. Toll Free (800) 665-8566

CHAIN OF CUSTODY RECORD

COC 08426768

BBY FCD-00077/05
Page 1 of 6

Invoice Information		Report Information (if differs from invoice)		Project Information (where applicable)	
Company Name:	EDI Environmental Dynamics Inc.	Company Name:	EDI	Quotation #:	B60053
Contact Name:	Shannon Jenner	Contact Name:	Lyndsay Doetzel	P.O. #/ AFE#:	
Address:	2195 2nd Avenue	Address:	same as invoice	Project #:	14Y0306:102
	Whitehorse, YT PC: Y1A 3T8		PC:	Site Location:	Coffee Creek
Phone:	867-393-4882	Phone:	867-393-4882	Site #:	
Email:	[email redacted]	Email:	[email redacted]	Sampled By:	J. Taylor / J. Duncan

Turnaround Time (TAT) Required
☒ Regular TAT 5 days (Most analyses)
PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Rush TAT (Surcharges will be applied)
☐ Same Day ☐ 2 Days
☐ 1 Day ☐ 3 Days
Date Required:
Rush Confirmation #:

Regulatory Criteria
☐ BC CSR Soil ☐ BC CSR Water
☐ CCME (Specify) ☐ Other (Specify)
☐ Drinking Water ☐ BC Water Quality

Special Instructions
☐ Return Cooler
☐ Ship Sample Bottles (Please Specify)

Analysis Requested
- BTEX/VPH ☐ MTBE ☐ VOC/VPH ☐
- EPH ☐ TEH ☐
- PAH ☐ LEPH/HEPH ☐
- CCME-PHC BTEX/ F1 ☐ F2 - F4 ☐
- Dissolved Metals Filtered? ☐ Preserved? ☐
- Dissolved Mercury Filtered? ☐ Preserved? ☐
- Total Metals Field Preserved? ☐
- Total Mercury Field Preserved? ☐
- Chloride ☐ Fluoride ☐ Sulphate ☐
- TSS ☐ TDS ☐ BOD ☐ COD ☐
- pH ☐ Conductivity ☐ Alkalinity ☐
- Nitrite ☐ Nitrate ☐ Ammonia ☐
- chlorophyll a
- # OF CONTAINERS SUBMITTED
- HOLD - DO NOT ANALYZE

LABORATORY USE ONLY

CUSTODY SEAL Y / [✓ N]		COOLER TEMPERATURES
Present	Intact	
1A		3 2 2
		1 1

COOLING MEDIA PRESENT [✓ Y] / N

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

	Sample Identification	Lab Identification	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	chlorophyll a	# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE	COMMENTS
1	YTO.2-chla-1		2016/08/23	12:00		✓			in same z'plock YTO.2
2	YTO.2-chla-2		2016/08/23			✓			
3	YTO.2-chla-3		2016/08/23			✓			
4	YT-0.2-chla-4		2016/08/23			✓			
5	YT-0.2-chla-5		2016/08/23			✓			
6	YT-0.2-chla-6		2016/08/23	↓		✓			
7	HF0.2-chla-1		2016/08/23	13:00		✓			same z'plock HF0.2
8	HF0.2-chla-2		2016/08/23			✓			
9	HF0.2-chla-3		2016/08/23			✓			
10	HF0.2-chla-4		2016/08/23	↓		✓			

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)
[signature redacted]	2016/08/25	14:00	[signature redacted]	2016/08/26	13:50

B673220_COC

Maxxam
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Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5. Toll Free (800) 665-8566

CHAIN OF CUSTODY RECORD

COC 08426769

BBY FCD-00077/05
Page 2 of 6

Invoice Information		Report Information (if differs from invoice)		Project Information (wh		round Time (TAT) Required
Company Name:	EDI Environmental Dynamics Inc.	Company Name:	EDI	Quotation #:	B60053	☒ Regular TAT 5 days (Most analyses)
Contact Name:	Shannon Jenner	Contact Name:	Lyndsay Doetzel	P.O. #/ AFE#:		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address:	2195 2nd Avenue	Address:	same as invoice	Project #:	14Y0306:102	Rush TAT (Surcharges will be applied)
	Whitehorse, YT PC: Y1A 3T8		PC:	Site Location:	Coffee Creek	☐ Same Day ☐ 2 Days
Phone:	867-393-4882	Phone:	867-393-4882	Site #:		☐ 1 Day ☐ 3 Days
Email:	[redacted]	Email:	[redacted]	Sampled By:	J. Taylor / J. Duncan	Date Required:

Rush Confirmation #:

Regulatory Criteria		Special Instructions
☐ BC CSR Soil	☐ BC CSR Water	☐ Return Cooler
☐ CCME (Specify)	☐ Other (Specify)	☐ Ship Sample Bottles (Please Specify)
☐ Drinking Water	☐ BC Water Quality	

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Analysis Requested

	Sample Identification	Lab Identification	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	BTEX/VPH ☐ MTBE ☐ VOC/VPH ☐	EPH ☐ TEH ☐	PAH ☐ LEPH/HEPH ☐	CCME-PHC BTEX/F1 ☐ F2 - F4 ☐	Dissolved Metals Filtered? ☐ Preserved? ☐	Dissolved Mercury Filtered? ☐ Preserved? ☐	Total Metals Field Preserved? ☐	Total Mercury Field Preserved? ☐	Chloride ☐ Fluoride ☐ Sulphate ☐	TSS ☐ TDS ☐ BOD ☐ COD ☐	pH ☐ Conductivity ☐ Alkalinity ☐	Nitrite ☐ Nitrate ☐ Ammonia ☐	chlorophyll a					# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE	COMMENTS
1	HF$^{0.2}$-chla-5		2016/08/23	13:00														✓							ziplock label read HFO.2
2	HFO.2-chla-6		2016/08/23	13:00														✓							
3	IC1.9-chla-1		2016/08/20	12:00														✓							Same ziplock IC1.9
4	IC1.9-chla-2		2016/08/20															✓							
5	IC1.9-chla 3		2016/08/20															✓							
6	IC1.9-chla 4		2016/08/20															✓							
7	IC1.9-chla-5		2016/08/20															✓							
8	IC1.9-chla-6		2016/08/20	↓														✓							
9	YT5.0-chla-1		2016/08/21	12:00														✓							↓
10	YT5.0-chla-2		2016/08/21	12:00														✓							

LABORATORY USE ONLY

CUSTODY SEAL Y / [✓ N]		COOLER TEMPERATURES
Present	Intact	
NA		3 2 2
		1 1

COOLING MEDIA PRESENT [✓ Y] / N

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)
[redacted]	2016/08/25	14:00	[redacted]	2016/08/26	13:50

B673220_COC

Maxxam
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Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5. Toll Free (800) 665-8566

CHAIN OF CUSTODY RECORD

COC: 08426771

BBY FCD-00077/05
Page 3 of 6

Invoice Information		Report Information (if differs from invoice)		Project Information (wher	
Company Name:	EDI Environmental Dynamics Inc.	Company Name:	EDI	Quotation #:	B60053
Contact Name:	Shannon Jenner	Contact Name:	Lyndsay Doetzel	P.O. #/ AFE#:	
Address:	2195 2nd Avenue	Address:	same as invoice	Project #:	14Y0306:102
	Whitehorse, YT PC: Y1A 3T8		PC:	Site Location:	Coffee Creek
Phone:	867-393-4882	Phone:	867-393-4882	Site #:	
Email:	[email redacted]	Email:	[email redacted]	Sampled By:	J. Taylor / J. Duncan

und Time (TAT) Required

☒ Regular TAT 5 days (Most analyses)

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Rush TAT (Surcharges will be applied)
☐ Same Day ☐ 2 Days
☐ 1 Day ☐ 3 Days

Date Required:

Rush Confirmation #:

Regulatory Criteria

☐ BC CSR Soil ☐ BC CSR Water
☐ CCME (Specify) ☐ Other (Specify)
☐ Drinking Water ☐ BC Water Quality

Special Instructions

☐ Return Cooler
☐ Ship Sample Bottles (Please Specify)

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

LABORATORY USE ONLY

CUSTODY SEAL Y / [✓ N]		COOLER TEMPERATURES
Present	Intact	
NA		322
		1 1

COOLING MEDIA PRESENT [✓ Y] / N

Analysis Requested

	Sample Identification	Lab Identification	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	BTEX/VPH ☐ MTBE ☐ VOC/VPH ☐	EPH ☐ TEH ☐	PAH ☐ LEPH/HEPH ☐	CCME-PHC BTEX/F1 ☐ F2-F4 ☐	Dissolved Metals Filtered? ☐ Preserved? ☐	Dissolved Mercury Filtered? ☐ Preserved? ☐	Total Metals Field Preserved? ☐	Total Mercury Field Preserved? ☐	Chloride ☐ Fluoride ☐ Sulphate ☐	TSS ☐ TDS ☐ BOD ☐ COD ☐	pH ☐ Conductivity ☐ Alkalinity ☐	Nitrite ☐ Nitrate ☐ Ammonia ☐	chlorophyll a				# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE	COMMENTS
1	YT5.0-chla-3		2016/08/21	12:00														✓						same ziplock YT5.0
2	YT5.0-chla-4		2016/08/21															✓						
3	YT5.0-chla-5		2016/08/21															✓						
4	YT5.0-chla-6		2016/08/21	↓														✓						
5	LC9.9-chla-1		2016/08/21	13:00														✓						Same ziplock LC9.9
6	LC9.9-chla-2		2016/08/21															✓						
7	LC9.9-chla-3		2016/08/21															✓						
8	LC9.9-chla-4		2016/08/21															✓						
9	LC9.9-chla-5		2016/08/21	↓														✓						
10	LC9.9-chla-6		2016/08/21															✓						

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)
[signature redacted]	2016/08/25	14:00	[signature redacted]	2016/08/26	13:50

B673220_COC

Maxxam
A Bureau Veritas Group Company

Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5. Toll Free (800) 665-8566

CHAIN OF CUSTODY RECORD

COC #: 08426772

BBY FCD-00077/05
Page 4 of 6

Invoice Information		Report Information (if differs from invoice)		Project Information (where		Turnaround Time (TAT) Required
Company Name:	EDI Environmental Dynamics Inc.	Company Name:	EDI	Quotation #:	B60053	☒ Regular TAT 5 days (Most analyses)
Contact Name:	Shannon Jenner	Contact Name:	Lyndsay Doetzel	P.O. #/ AFE#:		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address:	2195 2nd Avenue	Address:	same as invoice	Project #:	14Y0306:102	Rush TAT (Surcharges will be applied)
	Whitehorse, YT PC: Y1A 3T8		PC:	Site Location:	Coffee Creek	☐ Same Day ☐ 2 Days
Phone:	867-393-4882	Phone:	867-393-4882	Site #:		☐ 1 Day ☐ 3 Days
Email:	[redacted]	Email:	[redacted]	Sampled By:	J. Taylor / J. Duncan	Date Required:
						Rush Confirmation #:

Regulatory Criteria

☐ BC CSR Soil ☐ BC CSR Water
☐ CCME (Specify) ☐ Other (Specify)
☐ Drinking Water ☐ BC Water Quality

Special Instructions

☐ Return Cooler
☐ Ship Sample Bottles (Please Specify)

LABORATORY USE ONLY

CUSTODY SEAL Y [✓ N]		COOLER TEMPERATURES
Present	Intact	
NA		322

COOLING MEDIA PRESENT [✓ Y] / N

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Analysis Requested

	Sample Identification	Lab Identification	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	BTEX/VPH ☐ MTBE ☐ VOC/VPH ☐	EPH ☐ TEH ☐	PAH ☐ LEPH/HEPH ☐	CCME-PHC BTEX/ F1 ☐ F2 - F4 ☐	Dissolved Metals Filtered? ☐ Preserved? ☐	Dissolved Mercury Filtered? ☐ Preserved? ☐	Total Metals Field Preserved? ☐	Total Mercury Field Preserved? ☐	Chloride ☐ Fluoride ☐ Sulphate ☐	TSS ☐ TDS ☐ BOD ☐ COD ☐	pH ☐ Conductivity ☐ Alkalinity ☐	Nitrite ☐ Nitrate ☐ Ammonia ☐	chlorophyll a				# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE	COMMENTS
1	LA 4.8-chla-1		2016/08/20	12:00														✓						Same ziplock LA 4.8
2	LA4.8-chla-2		2016/08/20															✓						
3	LA4.8-chla-3		2016/08/20															✓						
4	LA 4.8-chla-4		2016/08/20															✓						
5	LA4.8-chla-5		2016/08/20															✓						
6	LA4.8-chla-6		2016/08/20															✓						
7	HF6.3-chla-1		2016/08/20	13:00														✓						Same ziplock HF6.3
8	HF6.3-chla-2		2016/08/20															✓						
9	HF 6.3-chla-3		2016/08/20															✓						
10	HF6.3 chla-4		2016/08/20															✓						

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)
[redacted]	2016/08/25	14:00	[redacted]	2016/08/26	13:50

B673220_COC

Maxxam
A Bureau Veritas Group Company

CHAIN OF CUSTODY RECORD

Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5. Toll Free (800) 665-8566

COC # 08426773

BBY FCD-00077/05
Page 5 of 6

Invoice Information

Company Name: EDI Environmental Dynamics Inc.
Contact Name: Shannon Jenner
Address: 2195 2nd Avenue
Whitehorse, YT PC: Y1A 3T8
Phone: 867-393-4882
Email: [email redacted]

Report Information (if differs from invoice)

Company Name: EDI
Contact Name: Lyndsay Doetzel
Address: same as invoice
PC:
Phone: 867-393-4882
Email: [email redacted]

Project Information (where ...

Quotation #: B60053
P.O. #/ AFE#:
Project #: 14Y0306:102
Site Location: Coffee Creek
Site #:
Sampled By: J. Taylor / J. Duncan

...nd Time (TAT) Required

☒ Regular TAT 5 days (Most analyses)

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Rush TAT (Surcharges will be applied)
☐ Same Day ☐ 2 Days
☐ 1 Day ☐ 3 Days

Date Required:
Rush Confirmation #:

Regulatory Criteria

☐ BC CSR Soil ☐ BC CSR Water
☐ CCME (Specify) ☐ Other (Specify)
☐ Drinking Water ☐ BC Water Quality

Special Instructions

☐ Return Cooler
☐ Ship Sample Bottles (Please Specify)

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Analysis Requested

- BTEX/VPH ☐ MTBE ☐ VOC/VPH ☐
- EPH ☐ TEH ☐
- PAH ☐ LEPH/HEPH ☐
- CCME-PHC BTEX/ F1 ☐ F2 - F4 ☐
- Dissolved Metals Filtered? ☐ Preserved? ☐
- Dissolved Mercury Filtered? ☐ Preserved? ☐
- Total Metals Field Preserved? ☐
- Total Mercury Field Preserved? ☐
- Chloride ☐ Fluoride ☐ Sulphate ☐
- TSS ☐ TDS ☐ BOD ☐ COD ☐
- pH ☐ Conductivity ☐ Alkalinity ☐
- Nitrite ☐ Nitrate ☐ Ammonia ☐
- chlorophyll a

LABORATORY USE ONLY

CUSTODY SEAL Y / [✓ N]		COOLER TEMPERATURES
Present	Intact	
NA		3 2 2
		1 1

COOLING MEDIA PRESENT [✓ Y] / N

	Sample Identification	Lab Identification	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	chlorophyll a	# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE	COMMENTS
1	HF6.3-chla-5		2016/08/20	13:00		✓			same ziplock HF6.3
2	HF6.3-chla-6		2016/08/20	13:00		✓			
3	CF10.0-chla-1		2016/08/21	14:00		✓			same ziplock CF10.0
4	CF10.0-chla-2		2016/08/21			✓			
5	CF10.0-chla-3		2016/08/21			✓			
6	CF10.0-chla-4		2016/08/21			✓			
7	CF10.0-chla-5		2016/08/21			✓			
8	CF10.0-chla-6		2016/08/21	↓		✓			
9	LC2.7-chla-1		2016/08/21	15:00		✓			↓ see order
10	LC2.7-chla-2		2016/08/21	15:00		✓			

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)
[signature redacted]	2016/08/25	14:00	[signature redacted]	2016/08/26	13:50

B673220_COC

Maxxam
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Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5. Toll Free (800) 665-8566

CHAIN OF CUSTODY RECORD

COC 08426774

BBY FCD-00077/05
Page 6 of 6

Invoice Information		Report Information (if differs from invoice)		Project Information (where applicable)	
Company Name:	EDI Environmental Dynamics Inc.	Company Name:	EDI	Quotation #:	B60053
Contact Name:	Shannon Jenner	Contact Name:	Lyndsay Doetzel	P.O. #/ AFE#:	
Address:	2195 2nd Avenue	Address:	same as invoice	Project #:	14Y0306:102
	Whitehorse, YT PC: Y1A 3T8		PC:	Site Location:	Coffee Creek
Phone:	867-393-4882	Phone:	867-393-4882	Site #:	
Email:	[email redacted]	Email:	[email redacted]	Sampled By:	J. Taylor / J. Duncan

Turnaround Time (TAT) Required

☒ Regular TAT 5 days (Most analyses)

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Rush TAT (Surcharges will be applied)

☐ Same Day ☐ 2 Days
☐ 1 Day ☐ 3 Days

Date Required:

Rush Confirmation #:

Regulatory Criteria

☐ BC CSR Soil ☐ BC CSR Water
☐ CCME (Specify) ☐ Other (Specify)
☐ Drinking Water ☐ BC Water Quality

Special Instructions

☐ Return Cooler
☐ Ship Sample Bottles (Please Specify)

LABORATORY USE ONLY

CUSTODY SEAL Y / [✓ N]

Present	Intact	COOLER TEMPERATURES
NA		322 11

COOLING MEDIA PRESENT [✓ Y] / N

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Analysis Requested

	Sample Identification	Lab Identification	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	BTEX/VPH ☐ MTBE ☐ VOC/VPH ☐	EPH ☐ TEH ☐	PAH ☐ LEPH/HEPH ☐	CCME-PHC BTEX/ F1 ☐ F2 - F4 ☐	Dissolved Metals Filtered? ☐ Preserved? ☐	Dissolved Mercury Filtered? ☐ Preserved? ☐	Total Metals Field Preserved? ☐	Total Mercury Field Preserved? ☐	Chloride ☐ Fluoride ☐ Sulphate ☐	TSS ☐ TDS ☐ BOD ☐ COD ☐	pH ☐ Conductivity ☐ Alkalinity ☐	Nitrite ☐ Nitrate ☐ Ammonia ☐	chlorophyll a					# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE	COMMENTS
1	LC2.7-chla-3		2016/08/21	15:00														✓							
2	LC2.7-chla-4		2016/08/21	↓														✓							1
3	LC2.7-chla-5		2016/08/21															✓							1
4	LC2.7-chla-6		2016/08/21	↓														✓							1
5	CF3.9-chla-1		2016/08/21	16:00														✓							1
6	CF3.9-chla-2		2016/08/21	↓														✓							0
7	CF3.9-chla-3		2016/08/21															✓							
8	CF3.9-chla-4		2016/08/21															✓							
9	CF3.9-chla-5		2016/08/21															✓							
10	CF3.9-chla-6		2016/08/21	↓														✓							

Sample 2x ?oct LC2.7

Same 2x ?oct CF3.9

RECEIVED IN WHITEHORSE
BY: Suyano @ 14:15
2016-08-25
TEMP:

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)
[signature redacted]	2016/08/25	14:00	[signature redacted]	2016/08/26	13:50

B673220_COC

APPENDIX E. 2014, 2015 and 2016 FISH AND BENTHIC INVERTEBRATE TISSUE METALS DATA

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Table E1. Benthic invertebrate and fish tissue metals data; 2014 - 2016.

Sample ID	Watercourse	SSID - old	SSID new	Species[1]	Date	Length (mm)	Weight (g)	Age	Sample Type	Moisture (%)	Units	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese
CF 10.0-B1-1	Coffee	--	CF10.0	BI	20-Aug-16	-	3.5	-	whole body	83	mg/kg ww	687	0.0718	0.855	15.2	0.0197	<0.020	<0.40	0.425	821	0.92	0.749	4.11	1210	0.293	414	75.3
CF 3.9-B1-1	Coffee	--	CF3.9	BI	20-Aug-16	-	3.5	-	whole body	86	mg/kg ww	1880	0.0805	1.98	37.4	0.0497	<0.020	<0.40	0.259	1130	2.05	1.83	3.98	3980	0.692	1070	142
CC4.5-BI-1	Coffee	--	CF2.7	BI	4-Mar-16	-	1.3	-	whole body	71	µg/g ww	3820	0.14	5.54	112	0.116	<0.10	<2.0	0.135	1450	10.5	4.16	7.26	9420	5.29	2350	317
CC4.5-BI-2	Coffee	--	CF2.7	BI	4-Mar-16	-	3.4	-	whole body	70	µg/g ww	3840	0.0995	4.03	139	0.119	<0.040	<0.80	0.158	1710	6.78	3.67	7.44	9050	1.54	2380	285
CC4.5-BI-3	Coffee	--	CF2.7	BI	5-Mar-16	-	2.5	-	whole body	81	µg/g ww	3370	0.0696	3.84	100	0.101	<0.040	<0.80	0.142	1540	5.69	3.73	6.48	8510	1.17	2280	265
CC4.5-BI-4	Coffee	--	CF2.7	BI	5-Mar-16	-	2.2	-	whole body	73	µg/g ww	3420	0.0907	3.52	112	0.104	<0.060	<1.2	0.197	1900	6.56	3.57	6.78	8670	1.56	2370	290
CC4.5-BI-5	Coffee	--	CF2.7	BI	5-Mar-16	-	1.3	-	whole body	78	µg/g ww	2240	0.065	3.78	74.8	0.097	<0.20	<4.0	0.144	2110	2.88	2.11	5.97	5270	0.967	1240	171
CC4.5-BI-6	Coffee	--	CF2.7	BI	5-Mar-16	-	2.0	-	whole body	72	µg/g ww	3730	0.126	5.12	172	0.126	<0.060	<1.2	0.237	2320	5.32	4.15	8.05	10300	5.12	2510	473
CCM-BI-1	Coffee	--	CF0.5	BI	5-Mar-16	-	2.0	-	whole body	80	µg/g ww	2000	0.116	3.06	107	0.0868	<0.060	<1.2	0.23	2460	3.68	2.25	7.61	5550	4.13	1510	231
HF 0.2-B1-1	Halfway	--	HF0.2	BI	23-Aug-16	-	2.5	-	whole body	90	mg/kg ww	423	0.0918	0.902	6.58	0.019	<0.020	<0.40	0.0955	534	1.12	0.386	3.01	698	0.187	339	31.1
HF 0.2-B1-2	Halfway	--	HF0.2	BI	23-Aug-16	-	2.7	-	whole body	88	mg/kg ww	222	0.0887	0.596	9.15	0.02	<0.020	<0.40	0.104	855	0.495	0.336	3.4	457	0.151	254	44.7
HF 6.3-B1-1	Halfway	--	HF6.3	BI	20-Aug-16	-	2.6	-	whole body	88	mg/kg ww	384	0.0923	0.805	5.91	0.0163	<0.020	<0.40	0.131	380	0.653	0.273	2.03	523	0.161	242	29.8
IC 1.9-B1-1	Independence	--	ID1.9	BI	20-Aug-16	-	2.5	-	whole body	88	mg/kg ww	1270	0.0657	1.57	18.1	0.0431	<0.020	<0.40	0.187	573	2.47	1.14	3.2	2330	0.697	791	87.3
IC4.5-BI-1	Independence	--	ID4.5	BI	4-Mar-16	-	0.6	-	whole body	67	µg/g ww	1780	0.036	2.5	42.5	0.055	<0.24	<4.8	0.171	1890	3.62	1.99	6.32	4340	0.924	1340	159
LAC 4.8-B1-1	Los Angeles	--	LaC4.8	BI	20-Aug-16	-	2.2	-	whole body	89	mg/kg ww	223	0.0538	0.478	8.59	0.0153	<0.020	0.43	0.0836	414	2.2	0.478	3.07	675	0.181	392	67
LAC 4.8-B1-2	Los Angeles	--	LaC4.8	BI	20-Aug-16	-	2.9	-	whole body	92	mg/kg ww	535	0.0632	1.88	20.9	0.0441	<0.020	0.4	0.135	796	1.82	1.17	3.85	1920	0.505	444	126
LC 2.7-B1-1	Latte	--	LC2.7	BI	21-Aug-16	-	2.6	-	whole body	90	mg/kg ww	400	0.0302	0.563	5.56	0.0191	<0.020	<0.40	0.185	518	0.586	0.361	2.54	613	0.218	250	43.2
LC 9.9-B1-1	Latte	--	LC9.9	BI	21-Aug-16	-	2.4	-	whole body	87	mg/kg ww	447	0.0607	0.837	5.86	0.0209	<0.020	<0.40	0.067	435	0.655	0.291	2.14	921	0.286	246	40.2
YT 0.2-B1-1	YT-24	--	YT0.2	BI	23-Aug-16	-	2.8	-	whole body	88	mg/kg ww	359	0.0466	0.48	5.45	0.017	<0.020	<0.40	0.069	433	0.565	0.335	2.73	622	0.251	278	37.1
YT 5.0-B1-1	YT-24	--	YT5.0	BI	21-Aug-16	-	2.1	-	whole body	89	mg/kg ww	352	0.1	0.674	12.1	0.0159	<0.020	<0.40	0.088	471	0.539	0.462	1.78	564	0.229	215	41.1
CC997-CCG-1	Coffee	CC997	CF10.0	CCG	4-Mar-16	69	2.6	-	whole body	75	µg/g ww	1.17	0.0023	0.0854	3.36	<0.0020	<0.020	<0.40	0.0265	17500	0.02	0.0511	1.18	30.9	0.011	525	8.19
CC4.5-CCG-1	Coffee	CC4.5	CF2.3	CCG	4-Mar-16	85	7.1	-	whole body	78	µg/g ww	5.2	0.0011	0.0451	2.48	<0.0020	<0.020	<0.40	0.0121	11200	0.023	0.018	0.736	16.8	0.0077	343	4.15
CC4.5-CCG-2	Coffee	CC4.5	CF2.3	CCG	4-Mar-16	70	4.2	-	whole body	81	µg/g ww	1.63	<0.0010	0.0477	3.26	<0.0020	<0.020	<0.40	0.0789	14100	0.01	0.0232	1.14	16	0.0097	402	9.29
CC4.5-CCG-3	Coffee	CC4.5	CF2.3	CCG	4-Mar-16	84	7.1	-	whole body	80	µg/g ww	1.58	0.0011	0.0432	4.35	<0.0020	<0.020	<0.40	0.0221	21100	0.014	0.0235	0.789	20.1	0.0067	477	8.43
CC4.5-CCG-4	Coffee	CC4.5	CF2.3	CCG	4-Mar-16	-	6.5	-	whole body	76	µg/g ww	4.7	0.0014	0.0687	4.59	<0.0020	<0.020	<0.40	0.0909	17900	0.019	0.0273	1.01	19.8	0.0098	438	11.8
CC4.5BI-CCG-1	Coffee	CC4.5	CF2.3	CCG	4-Mar-16	-	0.4	-	whole body	72.1	µg/g ww	32.1	<0.0020	0.082	3.7	<0.0040	<0.040	<0.80	0.0244	12400	0.066	0.0561	1.27	87.2	0.021	369	6.67
0-219	Coffee	AQ02	CF8.0	CCG	27-Aug-2014	97	10.2	3	whole body, no head	67.6	µg/g ww	5.5	0.005	0.041	0.53	<0.002	<0.02	<0.1	0.011	2960	0.01	0.016	0.46	18	<0.004	282	1.28
0-220	Coffee	AQ02	CF8.0	CCG	27-Aug-2014	90	7	3	whole body, no head	76.0	µg/g ww	2	0.006	0.057	1.09	<0.002	<0.02	<0.1	0.005	7620	0.01	0.01	0.56	11	<0.004	337	2.66
0-221	Coffee	AQ02	CF8.0	CCG	27-Aug-2014	81	5.2	2	whole body, no head	74.9	µg/g ww	2.9	0.006	0.067	0.92	<0.002	<0.02	<0.1	0.006	6560	0.01	0.009	0.58	12	0.007	331	1.77
0-222	Coffee	AQ02	CF8.0	CCG	27-Aug-2014	68	3.2	1	whole body, no head	73.3	µg/g ww	8.5	0.005	0.082	0.91	<0.002	<0.02	<0.1	0.01	5190	0.02	0.012	0.5	21	0.009	312	3.35
0-255	Coffee	AQ02	CF8.0	CCG	28-Aug-2014	112	16.1	4	whole body, no head	73.8	µg/g ww	4.9	0.029	0.074	3.91	<0.002	<0.02	0.1	0.017	21900	0.02	0.019	0.68	23	0.008	469	8.82
0-256	Coffee	AQ02	CF8.0	CCG	28-Aug-2014	101	13.8	4	whole body, no head	72.7	µg/g ww	2.2	0.032	0.062	1.08	<0.002	<0.02	0.1	0.003	7420	0.01	0.01	0.47	12	0.008	299	2.99
0-257	Coffee	AQ02	CF8.0	CCG	28-Aug-2014	95	9.8	2	whole body, no head	76.3	µg/g ww	8.2	0.053	0.058	0.55	<0.002	<0.02	<0.1	0.039	2420	0.03	0.012	0.72	25	0.03	266	1.49
0-258	Coffee	AQ02	CF8.0	CCG	28-Aug-2014	96	9.7	5	whole body, no head	72.9	µg/g ww	20.4	0.025	0.096	2.93	<0.002	<0.02	<0.1	0.077	16100	0.05	0.03	1.21	56	0.022	350	7.17
0-259	Coffee	AQ02	CF8.0	CCG	28-Aug-2014	90	7.8	2	whole body, no head	70.1	µg/g ww	13.9	0.038	0.082	2.3	<0.002	<0.02	<0.1	0.015	10200	0.05	0.017	0.62	31	0.02	321	5.06
94	Coffee	AQ02	CF8.0	CCG	27-Jul-2015	90	8.2	4	whole body, no head	73.8	µg/g ww	112	0.017	0.164	3.54	0.002	<0.02	0.4	0.057	7410	0.3	0.105	1.26	154	0.036	412	14.6
96	Coffee	AQ02	CF8.0	CCG	27-Jul-2015	90	16.9	4	whole body, no head	72.1	µg/g ww	2.7	0.003	0.073	1.51	<0.002	<0.02	0.4	0.013	6320	<0.01	0.016	0.69	12	<0.004	362	2.89
102	Coffee	AQ02	CF8.0	CCG	27-Jul-2015	94	9	7	whole body, no head	72.1	µg/g ww	37.6	0.012	0.118	3.01	<0.002	<0.02	0.3	0.038	8670	0.1	0.054	0.97	58	0.014	409	7.99
CC0.5-CCG-2	Coffee	CC0.5	CF8.3	CCG	4-Mar-16	66	2.3	-	whole body	82	µg/g ww	3.79	<0.0020	0.058	3.06	<0.0040	<0.040	<0.80	0.0206	14600	<0.020	0.0264	1.44	21.9	0.0232	397	4.4

Sample ID	Watercourse	SSID - old	SSID new	Species[1]	Date	Length (mm)	Weight (g)	Age	Sample Type	Moisture (%)	Units	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese
CF10.0 1-1-A	Coffee	--	CF10.0	CCG	10-Jul-16	76	4	-	whole body	77	µg/g ww	32.6	0.0073	0.0906	3.26	<0.0020	<0.020	<0.40	0.054	11000	0.054	0.0563	1.13	63.6	0.0276	335	8.32
CF10.0 1-1-B	Coffee	--	CF10.0	CCG	10-Jul-16	79	4.6	-	whole body	79	µg/g ww	12.4	0.0074	0.0721	2.49	<0.0020	<0.020	<0.40	0.0279	11300	0.024	0.0318	0.884	31.5	0.0167	341	6.55
CF10.0 1-1-C	Coffee	--	CF10.0	CCG	10-Jul-16	50	1.3	-	whole body	79	µg/g ww	33.3	0.0349	0.122	4.36	<0.0020	<0.020	<0.40	0.073	15100	0.069	0.0705	1.17	68.2	0.172	405	9.14
CF10.0 1-1-D	Coffee	--	CF10.0	CCG	10-Jul-16	71	3.2	-	whole body	81	µg/g ww	12.8	0.011	0.0877	3.36	<0.0020	<0.020	<0.40	0.0395	13300	0.026	0.0478	0.836	34.5	0.0592	394	7.53
CF10.0 1-1-E	Coffee	--	CF10.0	CCG	10-Jul-16	74	3.6	-	whole body	81	µg/g ww	72	0.0083	0.115	3.54	<0.0020	<0.020	<0.40	0.0552	12000	0.104	0.0858	1.23	132	0.054	386	9.03
CF10.0-1-1-F	Coffee	--	CF10.0	CCG	10-Jul-16	54	1.5	-	whole body	86	µg/g ww	21.2	0.0124	0.0931	3.02	<0.0020	<0.020	<0.40	0.044	11300	0.046	0.0434	1.07	46.2	0.0777	371	7.68
CF10.0-1-1-G	Coffee	--	CF10.0	CCG	10-Jul-16	53	1.2	-	whole body	86	µg/g ww	36.8	0.0103	0.11	4.12	<0.0020	<0.020	<0.40	0.0534	11100	0.171	0.058	0.767	70.7	0.0546	334	7.56
CF10.0 1-1-H	Coffee	--	CF10.0	CCG	10-Jul-16	54	1.6	-	whole body	80	µg/g ww	82.6	0.0122	0.117	4.34	<0.0020	<0.020	<0.40	0.092	11200	0.133	0.0883	1.29	134	0.0927	337	11.9
CF10.0 1-1-J	Coffee	--	CF10.0	CCG	10-Jul-16	55	1.5	-	whole body	87	µg/g ww	35.1	0.0129	0.0962	3.72	<0.0020	<0.020	<0.40	0.0519	10500	0.085	0.0666	0.982	65.5	0.259	351	8.26
CF10.0 1-1-I	Coffee	--	CF10.0	CCG	10-Jul-16	55	1.6	-	whole body	88	µg/g ww	54.4	0.0195	0.121	3.9	<0.0020	<0.020	<0.40	0.0713	11200	0.111	0.0703	1.11	95.4	0.119	371	8.53
CF 3.9 3-1-A	Coffee	--	CF3.9	CCG	11-Jul-16	66	3	-	whole body	79	µg/g ww	14.8	0.0156	0.118	3.59	<0.0020	<0.020	<0.40	0.23	14800	0.029	0.045	1.15	31.1	0.202	401	13.3
CF-3.9 3-1-B	Coffee	--	CF3.9	CCG	11-Jul-16	67	3.6	-	whole body	74	µg/g ww	41	0.0095	0.134	4.62	<0.0020	<0.020	<0.40	0.439	17800	0.064	0.0824	1.28	76.3	0.161	407	14
CF3.9 3-1-C	Coffee	--	CF3.9	CCG	11-Jul-16	84	5.8	-	whole body	77	µg/g ww	48.3	0.017	0.0929	3.9	<0.0020	<0.020	<0.40	0.0373	15200	0.075	0.0469	1.02	78.7	0.109	405	6.1
CF3.9 3-1-D	Coffee	--	CF3.9	CCG	11-Jul-16	67	2.9	-	whole body	82	µg/g ww	9.64	0.048	0.0847	2.28	<0.0020	<0.020	<0.40	0.0259	9700	0.019	0.0286	0.943	24.9	0.0721	331	4.61
CF3.9 3-1-E	Coffee	--	CF3.9	CCG	11-Jul-16	67	2.7	-	whole body	79	µg/g ww	28.8	0.0231	0.0928	3.01	<0.0020	<0.020	<0.40	0.039	12100	0.043	0.0497	0.854	54.7	0.122	351	6.88
CF3.9 3-1-F	Coffee	--	CF3.9	CCG	11-Jul-16	50	1.1	-	whole body	79	µg/g ww	70.8	0.0222	0.122	2.23	<0.0020	<0.020	<0.40	0.0573	5500	0.124	0.0704	1.01	110	0.0902	328	4.95
CF3.9 3-1-G	Coffee	--	CF3.9	CCG	11-Jul-16	50	1.2	-	whole body	86	µg/g ww	31.9	0.016	0.114	2.71	<0.0020	<0.020	<0.40	0.0393	11100	0.055	0.0427	0.816	56.5	0.113	360	5.07
CF3.9 3-1-H	Coffee	--	CF3.9	CCG	11-Jul-16	58	1.9	-	whole body	76	µg/g ww	29.4	0.0344	0.092	1.95	<0.0020	<0.020	<0.40	0.0283	6310	0.041	0.0367	0.774	51.4	0.0841	300	3.83
CF3.9 3-1-I	Coffee	--	CF3.9	CCG	11-Jul-16	55	1.5	-	whole body	91	µg/g ww	40.2	0.0706	0.116	3.27	<0.0020	<0.020	<0.40	0.0467	12400	0.063	0.0758	0.95	79.7	0.144	368	7.36
CF3.9 3-1-J	Coffee	--	CF3.9	CCG	11-Jul-16	46	0.8	-	whole body	79	µg/g ww	15.3	0.0292	0.103	2.33	<0.0020	<0.020	<0.40	0.0246	8530	0.029	0.0266	0.808	30.3	0.0953	391	4.98
R1-1	Isaac	AQREF1	IS0.1	CCG	28-Aug-2014	82	6.8	4	whole body, no head	72.7	µg/g ww	2.1	0.013	0.066	1.65	<0.002	<0.02	<0.1	0.007	6070	0.01	0.008	0.4	10	0.005	341	4.38
R1-2	Isaac	AQREF1	IS0.1	CCG	28-Aug-2014	81	5.4	3	whole body, no head	73.0	µg/g ww	11.7	0.033	0.07	4.56	<0.002	<0.02	<0.1	0.133	22900	0.05	0.04	0.93	36	0.018	451	9.12
R1-3	Isaac	AQREF1	IS0.1	CCG	28-Aug-2014	76	4.6	2	whole body, no head	72.5	µg/g ww	7.8	0.023	0.069	4.47	<0.002	<0.02	<0.1	0.214	21400	0.05	0.027	0.83	27	0.015	485	12
R1-4	Isaac	AQREF1	IS0.1	CCG	28-Aug-2014	68	3.5	2	whole body, no head	71.7	µg/g ww	4.6	0.027	0.085	4.13	<0.002	<0.02	0.2	0.225	18300	0.02	0.024	0.58	18	0.021	462	19
R1-5	Isaac	AQREF1	IS0.1	CCG	28-Aug-2014	68	2.7	3	whole body, no head	72.1	µg/g ww	11.2	0.02	0.087	2.94	<0.002	<0.02	0.2	0.281	14500	0.03	0.016	0.63	28	0.013	407	7.78
R1-6	Isaac	AQREF1	IS0.1	CCG	28-Aug-2014	59	2.7	2	whole body, no head	72.1	µg/g ww	10.7	0.019	0.1	2.71	<0.002	<0.02	0.2	0.173	14000	0.03	0.039	0.73	30	0.017	412	11.3
R1-7	Isaac	AQREF1	IS0.1	CCG	28-Aug-2014	63	2.4	2	whole body, no head	75.2	µg/g ww	15.3	0.017	0.077	2.7	<0.002	<0.02	0.2	0.144	10900	0.06	0.022	0.57	40	0.015	359	9.03
R1-8	Isaac	AQREF1	IS0.1	CCG	28-Aug-2014	63	3.2	3	whole body, no head	69.7	µg/g ww	27.3	0.078	0.191	4.04	<0.002	<0.02	0.2	0.036	11900	0.06	0.033	0.62	70	0.027	349	7.48
R1-9	Isaac	AQREF1	IS0.1	CCG	28-Aug-2014	62	2.8	-	whole body, no head	74.3	µg/g ww	14.9	0.016	0.095	3.89	<0.002	<0.02	0.2	0.416	15600	0.04	0.05	0.52	41	0.028	439	15.5
205	Isaac	AQREF1	IS0.1	CCG	28-Jul-2015	65	2.5	2	whole body, no head	72.1	µg/g ww	32.5	0.023	0.157	3.7	<0.008	<0.08	0.5	0.087	9010	0.13	0.038	0.73	57	0.024	417	8.48
206	Isaac	AQREF1	IS0.1	CCG	28-Jul-2015	63	2.1	2	whole body, no head	72.1	µg/g ww	19.4	0.036	0.396	3.71	<0.011	<0.11	<0.5	0.151	12800	0.17	0.053	0.73	104	0.088	455	13
207	Isaac	AQREF1	IS0.1	CCG	28-Jul-2015	63	2.3	1	whole body, no head	72.1	µg/g ww	3.6	<0.009	0.097	2.64	<0.009	<0.09	<0.5	0.141	8080	<0.05	0.024	0.53	10	<0.018	385	7.15
IC-1.9 2-1-A	Independence	--	ID1.9	CCG	12-Jul-16	52	1.7	-	whole body	78	µg/g ww	30.2	0.0083	0.117	4.3	<0.0020	<0.020	<0.40	0.184	15900	0.196	0.0793	1.13	96	0.0626	434	10.3
IC-1.9 2-1-B	Independence	--	ID1.9	CCG	12-Jul-16	57	2.4	-	whole body	76	µg/g ww	29.2	0.0075	0.117	2.82	<0.0020	<0.020	0.4	0.138	9190	0.048	0.0583	0.868	49.9	0.0646	300	7.84
IC-1.9 2-1-C	Independence	--	ID1.9	CCG	12-Jul-16	60	2.2	-	whole body	77	µg/g ww	29.7	0.0168	0.102	2.16	<0.0020	<0.020	<0.40	0.0825	8650	0.041	0.0461	1.09	47.3	0.0663	331	5.5
IC-1.9 3-1-D	Independence	--	ID1.9	CCG	12-Jul-16	45	1	-	whole body	80	µg/g ww	55.1	0.0176	0.11	2	<0.0020	<0.020	<0.40	0.0849	6600	0.114	0.0697	1.09	80.6	0.0935	337	6.01
IC-1.9 3-2-E	Independence	--	ID1.9	CCG	12-Jul-16	64	2.6	-	whole body	80	µg/g ww	46.2	0.0103	0.121	4.39	<0.0020	<0.020	<0.40	0.183	17700	0.087	0.0541	0.974	75.5	0.0751	463	12.9
IC-1.9 2-3-F	Independence	--	ID1.9	CCG	12-Jul-16	52	1.4	-	whole body	82	µg/g ww	38.6	0.0447	0.159	1.69	<0.0020	<0.020	<0.40	0.0405	7270	0.055	0.0462	0.917	74.5	0.0872	329	5.92
IC-1.9 1-1-G	Independence	--	ID1.9	CCG	12-Jul-16	81	6.5	-	whole body	81	µg/g ww	43.5	0.0095	0.141	3.88	<0.0020	<0.020	<0.40	0.187	14800	0.086	0.0485	0.903	71.5	0.1	387	7.14
IC-1.9 1-1-H	Independence	--	ID1.9	CCG	12-Jul-16	68	3.4	-	whole body	81	µg/g ww	37.9	0.0304	0.125	3.9	<0.0020	<0.020	<0.40	0.187	13200	0.069	0.0457	0.888	65.2	0.103	365	10.6

Sample ID	Watercourse	SSID - old	SSID new	Species[1]	Date	Length (mm)	Weight (g)	Age	Sample Type	Moisture (%)	Units	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese
IC-1.9 1-1-I	Independence	--	ID1.9	CCG	12-Jul-16	75	4.6	-	whole body	79	µg/g ww	58.1	0.007	0.122	3.27	<0.0020	<0.020	<0.40	0.114	10900	0.106	0.0602	1.1	90.4	0.0788	351	9.37
IC-1.9 1-1-J	Independence	--	ID1.9	CCG	12-Jul-16	65	3.5	-	whole body	77	µg/g ww	38.5	0.0073	0.113	3.07	<0.0020	<0.020	<0.40	0.249	10000	0.082	0.0532	0.882	61.8	0.0728	363	9
I-301	Independence	AQ10	ID1.9	CCG	28-Aug-2014	80	5.2	3	whole body, no head	74.5	µg/g ww	106	0.011	0.173	1.48	<0.002	<0.02	0.2	0.245	4650	0.25	0.079	1.79	174	0.063	285	7.24
I-302	Independence	AQ10	ID1.9	CCG	28-Aug-2014	84	6.8	4	whole body, no head	68.6	µg/g ww	3	0.008	0.077	1.76	<0.002	<0.02	0.2	0.053	12700	0.01	0.014	0.62	11	0.019	355	6.07
I-303	Independence	AQ10	ID1.9	CCG	28-Aug-2014	90	10.7	3	whole body, no head	68.2	µg/g ww	4.7	0.006	0.069	0.59	<0.002	<0.02	0.1	0.041	3250	0.02	0.011	0.47	14	0.007	270	2.02
I-304	Independence	AQ10	ID1.9	CCG	28-Aug-2014	80	7.6	4	whole body, no head	70.9	µg/g ww	26.4	0.007	0.097	3.83	<0.002	<0.02	0.1	0.184	23400	0.07	0.04	1.03	59	0.029	480	12.4
I-305	Independence	AQ10	ID1.9	CCG	28-Aug-2014	80	8.5	3	whole body, no head	71.3	µg/g ww	103	0.011	0.178	3.43	0.002	<0.02	0.1	0.191	16600	0.22	0.087	1.9	167	0.059	404	12.6
I-306	Independence	AQ10	ID1.9	CCG	28-Aug-2014	80	7.4	4	whole body, no head	71.6	µg/g ww	13.2	0.005	0.094	1.8	<0.002	<0.02	0.1	0.096	10400	0.04	0.032	0.72	35	0.034	333	6.86
I-307	Independence	AQ10	ID1.9	CCG	28-Aug-2014	75	5.6	2	whole body, no head	71.0	µg/g ww	14.3	0.007	0.089	2.11	<0.002	<0.02	<0.1	0.117	13200	0.04	0.026	0.65	31	0.019	355	11.7
I-308	Independence	AQ10	ID1.9	CCG	28-Aug-2014	75	4.8	4	whole body, no head	67.1	µg/g ww	6.5	0.009	0.108	1.83	<0.002	<0.02	0.1	0.05	11100	0.02	0.015	0.54	19	0.035	345	5.8
004	Independence	AQ10	ID1.9	CCG	15-Sep-2015	85	9.5	1	whole body, no head	72.1	µg/g ww	17.8	0.965	0.107	0.66	<0.005	<0.05	<0.2	0.072	1720	0.05	0.049	0.92	45	0.016	292	3.83
042	Los Angeles	AQREF2	LaC4.8	CCG	25-Jul-2015	125	24.4	5	whole body, no head	71.2	µg/g ww	49.7	0.019	0.216	3.24	<0.002	<0.02	0.3	0.111	12300	0.22	0.089	1.55	85	0.02	525	16.2
208	Latte	AQ03	LC0.5	CCG	29-Jul-2015	108	9.2	6	whole body, no head	72.1	µg/g ww	28.3	0.005	0.126	4.58	<0.002	<0.02	0.3	0.047	16200	0.08	0.047	1.12	48	0.016	440	14.4
219	Latte	AQ03	LC0.5	CCG	01-Aug-2015	80	5	1	whole body, no head	72.1	µg/g ww	30.6	0.068	0.149	2.1	<0.004	<0.04	0.3	0.059	8010	0.08	0.055	1.21	45	0.022	415	7.08
003	Latte	AQ03	LC0.5	CCG	12-Sep-2015	126	15.5	7	whole body, no head	72.1	µg/g ww	31.8	0.182	0.119	4	<0.005	<0.05	<0.2	0.045	17700	0.07	0.05	1.01	69	0.022	546	9.51
CCM-CH-1	Coffee	CCM	CF0.5	CH	5-Mar-16	84	5.1	-	whole body	78	µg/g ww	1.46	<0.0020	0.022	1.08	<0.0040	<0.040	<0.80	0.0243	5920	0.048	0.0172	0.599	18.3	0.0048	299	1.49
CCM-CH-2	Coffee	CCM	CF0.5	CH	4-Mar-16	75	3.9	-	whole body	77	µg/g ww	1.61	<0.0020	0.031	1.92	<0.0040	<0.040	<0.80	0.0205	8080	<0.020	0.0383	0.675	19.7	0.0136	332	2.55
CCM-CH-3	Coffee	CCM	CF0.5	CH	5-Mar-16	72	3.2	-	whole body	78	µg/g ww	2.39	<0.0020	0.027	1.21	<0.0040	<0.040	<0.80	0.0645	5130	0.254	0.0253	0.713	17.9	0.0072	289	1.52
CC4.5-CH-1	Coffee	CC4.5	CF2.3	CH	4-Mar-16	75	3.8	-	whole body	77	µg/g ww	2.18	0.0023	0.033	2.55	<0.0040	<0.040	<0.80	0.0204	7990	0.044	0.0374	0.767	29.7	0.0274	360	2.57
CC4.5-CH-2	Coffee	CC4.5	CF2.3	CH	5-Mar-16	81	3.8	-	whole body	82	µg/g ww	1.54	<0.0020	0.03	1.72	<0.0040	<0.040	<0.80	0.016	7550	0.023	0.0302	0.666	23.8	0.0057	310	1.9
CC4.5-CH-3	Coffee	CC4.5	CF2.3	CH	4-Mar-16	70	3.5	-	whole body	59	µg/g ww	24.7	0.0024	0.054	1.86	<0.0040	<0.040	<0.80	0.0159	6630	0.071	0.058	0.851	60.6	0.0195	320	4.07
HF 0.2-CS-1	Halfway	--	HF0.2	CH	23-Aug-16	69	3.2	-	whole body	76	mg/kg ww	10	0.0085	0.036	1.16	<0.0020	<0.020	<0.40	0.0255	4230	0.023	0.0213	0.79	23.8	0.0083	302	1.54
HF 0.2-CS-2	Halfway	--	HF0.2	CH	23-Aug-16	77	4.0	-	whole body	78	mg/kg ww	25.6	0.0061	0.0561	0.873	<0.0020	<0.020	<0.40	0.0358	3650	0.256	0.048	0.676	47.6	0.01	317	2.58
HF 0.2-CS-3	Halfway	--	HF0.2	CH	23-Aug-16	70	3.3	-	whole body	79	mg/kg ww	1.24	0.0067	0.0365	0.776	<0.0020	<0.020	<0.40	0.0122	3960	<0.010	0.0183	0.599	10.8	0.0035	318	1.28
HF 0.2-CS-4	Halfway	--	HF0.2	CH	23-Aug-16	82	4.5	-	whole body	76	mg/kg ww	2.79	0.0102	0.039	0.911	<0.0040	<0.040	<0.80	0.0196	4550	<0.020	0.0476	0.66	11.8	0.0048	341	1.49
HF 0.2-CS-5	Halfway	--	HF0.2	CH	23-Aug-16	73	3.6	-	whole body	79	mg/kg ww	1.64	0.0094	0.0404	0.679	<0.0020	<0.020	<0.40	0.0594	2960	<0.010	0.0428	0.562	11.5	0.0067	285	2.7
HF 0.2-CS-6	Halfway	--	HF0.2	CH	23-Aug-16	69	3.2	-	whole body	74	mg/kg ww	7.97	0.009	0.0377	1.27	<0.0020	<0.020	<0.40	0.0987	5820	0.021	0.0449	1.06	36.2	0.0105	318	3.09
HF 0.2-CS-7	Halfway	--	HF0.2	CH	23-Aug-16	70	3.3	-	whole body	86	mg/kg ww	14.5	0.0078	0.0886	1.1	<0.0020	<0.020	<0.40	0.0367	4750	0.035	0.0366	0.835	33.3	0.008	308	2.53
HF 0.2-CS-8	Halfway	--	HF0.2	CH	23-Aug-16	72	3.5	-	whole body	83	mg/kg ww	11.7	0.0094	0.0526	1.08	<0.0020	<0.020	<0.40	0.0314	5460	0.023	0.0382	0.763	34.9	0.0074	321	2.02
HF 0.2-CS-9	Halfway	--	HF0.2	CH	23-Aug-16	71	3.4	-	whole body	<0.30	mg/kg ww	7.12	0.0078	0.0608	1.13	<0.0020	<0.020	<0.40	0.0306	5260	0.02	0.0449	0.596	26	0.0058	324	3.2
HF 0.2-CS-10	Halfway	--	HF0.2	CH	23-Aug-16	77	4.0	-	whole body	86	mg/kg ww	7.13	0.0084	0.0417	1.1	<0.0020	<0.020	<0.40	0.0333	6080	0.107	0.0202	0.587	28.7	0.0039	321	1.57
HF 0.2-CS-11	Halfway	--	HF0.2	CH	23-Aug-16	76	3.9	-	whole body	78	mg/kg ww	10.6	0.0081	0.0514	0.697	<0.0020	<0.020	<0.40	0.0289	5140	0.023	0.0198	0.637	27	0.0066	321	1.39
HF 0.2-CS-12	Halfway	--	HF0.2	CH	23-Aug-16	-	3.0	-	whole body	81	mg/kg ww	1.81	0.0067	0.0241	0.712	<0.0020	<0.020	<0.40	0.0154	4090	<0.010	0.0106	0.56	13.5	0.0026	347	1.02
052	Coffee	AQ00	CF3.9	GR	26-Jul-2015	268	205	6	muscle	78.7	µg/g ww	5.3	0.034	0.068	0.18	<0.002	<0.02	0.3	0.003	506	0.03	0.015	0.3	10	0.007	284	0.74
054	Coffee	AQ00	CF3.9	GR	26-Jul-2015	247	153	4	muscle	79.0	µg/g ww	1.2	0.012	0.02	0.07	<0.002	<0.02	0.3	0.003	287	<0.01	0.009	0.34	4	<0.004	296	0.25
69	Coffee	AQ02	CF8.0	GR	26-Jul-2015	254	163	6	muscle	78.2	µg/g ww	2.2	0.007	0.034	0.11	<0.002	<0.02	0.3	0.005	584	0.01	0.011	0.64	10	<0.004	304	0.33
70	Coffee	AQ02	CF8.0	GR	26-Jul-2015	278	211	6	muscle	78.0	µg/g ww	1.3	0.005	0.032	0.1	<0.002	<0.02	0.3	0.003	499	<0.01	0.009	0.42	10	<0.004	322	0.45
71	Coffee	AQ02	CF8.0	GR	26-Jul-2015	241	130	4	muscle	77.3	µg/g ww	3.1	0.06	0.029	0.05	<0.002	<0.02	0.3	0.005	162	0.01	0.014	0.43	10	<0.004	308	0.33
72	Coffee	AQ02	CF8.0	GR	26-Jul-2015	208	88	3	muscle	78.8	µg/g ww	2.1	0.006	0.028	0.1	<0.002	<0.02	0.3	0.007	508	0.04	0.016	0.4	8	<0.004	350	0.48
73	Coffee	AQ02	CF8.0	GR	26-Jul-2015	214	88	5	muscle	78.8	µg/g ww	2.1	0.053	0.029	0.12	<0.002	<0.02	0.4	0.006	406	0.01	0.011	0.71	10	<0.004	304	0.33

Sample ID	Watercourse	SSID - old	SSID new	Species[1]	Date	Length (mm)	Weight (g)	Age	Sample Type	Moisture (%)	Units	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese
74	Coffee	AQ02	CF8.0	GR	26-Jul-2015	284	248	5	muscle	78.7	µg/g ww	2.7	0.004	0.022	0.15	<0.002	<0.02	0.4	0.005	559	0.02	0.009	0.38	9	<0.004	312	0.41
CF10.0 AG-1	Coffee	--	CF10.0	GR	10-Jul-16	225	122.9	-	whole body	78	µg/g ww	22.4	0.0034	0.0395	1.97	<0.0020	<0.020	<0.40	0.0802	10100	0.139	0.0392	0.723	41.9	0.0226	358	4.23
CF10.0 AG-2	Coffee	--	CF10.0	GR	10-Jul-16	245	174.3	-	whole body	73	µg/g ww	23.2	0.0027	0.0487	1.77	<0.0020	<0.020	<0.40	0.0342	10900	0.075	0.0459	0.716	43.5	0.0163	394	6.71
CF10.0 AG-3	Coffee	--	CF10.0	GR	10-Jul-16	164	53	-	whole body	77	µg/g ww	19	0.0022	0.0398	3.66	<0.0020	<0.020	<0.40	0.0712	11200	0.128	0.0372	0.702	44	0.0204	362	4.73
CF10.0 AG-4	Coffee	--	CF10.0	GR	10-Jul-16	190	67.6	-	whole body	77	µg/g ww	25.8	0.0022	0.0445	1.37	<0.0020	<0.020	<0.40	0.0623	6600	0.24	0.0873	0.711	64.5	0.0118	299	3.54
CF10.0 2-1-K	Coffee	--	CF10.0	GR	10-Jul-16	280	197.6	-	whole body	74	µg/g ww	14.7	0.0028	0.0339	2.37	<0.0020	<0.020	<0.40	0.0708	10400	0.044	0.0338	0.618	33.3	0.0197	351	3.63
CF10.0 3-1-L	Coffee	--	CF10.0	GR	10-Jul-16	245	148.7	-	whole body	74	µg/g ww	9.78	0.0021	0.0344	3.02	<0.0020	<0.020	<0.40	0.0622	11800	0.079	0.0365	0.625	25.5	0.0084	385	5.03
CF10.0 3-2-M	Coffee	--	CF10.0	GR	10-Jul-16	330	378.5	-	whole body	77	µg/g ww	42.4	0.0039	0.0736	3.61	<0.0020	<0.020	<0.40	0.071	7430	0.065	0.0772	0.81	75.1	0.0286	355	6.04
HF 0.2-AG-1	Halfway	--	HF0.2	GR	23-Aug-16	123		-	whole body	78	mg/kg ww	4.63	0.0119	0.0636	1.68	<0.0020	<0.020	<0.40	0.0602	9190	0.011	0.0332	0.659	14	0.0079	375	2.8
104	Independence	AQ11	ID6.7	GR	24-Aug-2014	197	86	3	muscle	76.2	µg/g ww	1.4	0.227	0.041	0.45	<0.002	<0.02	<0.1	0.029	2390	0.02	0.02	0.44	7	0.064	332	0.76
107	Independence	AQ11	ID6.7	GR	28-Jul-2015	283	239.7	6	muscle	78.1	µg/g ww	0.7	0.005	0.043	0.18	<0.002	<0.02	0.3	0.003	705	<0.01	0.008	0.38	5	<0.004	300	0.39
108	Independence	AQ11	ID6.7	GR	28-Jul-2015	250	142.9	5	muscle	79.0	µg/g ww	1.2	<0.002	0.046	0.25	<0.002	<0.02	0.3	0.004	1550	<0.01	0.013	0.36	6	<0.004	318	0.7
109	Independence	AQ11	ID6.7	GR	28-Jul-2015	260	174.1	6	muscle	78.5	µg/g ww	1	<0.002	0.035	0.06	<0.002	<0.02	0.3	0.006	218	<0.01	0.013	0.32	5	<0.004	279	0.32
110	Independence	AQ11	ID6.7	GR	28-Jul-2015	175	56.4	3	muscle	79.7	µg/g ww	2	0.006	0.032	0.14	<0.002	<0.02	0.4	0.008	828	0.01	0.013	0.39	6	<0.004	330	0.43
111	Independence	AQ11	ID6.7	GR	28-Jul-2015	189	67.9	2	muscle	78.8	µg/g ww	1.2	<0.002	0.035	0.05	<0.002	<0.02	0.3	0.004	316	<0.01	0.012	0.3	4	<0.004	303	0.23
112	Independence	AQ11	ID6.7	GR	28-Jul-2015	177	60.3	2	muscle	79.7	µg/g ww	1.7	0.003	0.031	0.15	<0.002	<0.02	0.3	0.005	687	0.02	0.011	0.28	5	<0.004	330	0.5
113	Independence	AQ11	ID6.7	GR	28-Jul-2015	180	47.2	2	muscle	79.5	µg/g ww	7	0.007	0.038	0.18	<0.002	<0.02	0.3	0.008	725	0.03	0.031	0.34	14	0.006	331	0.78
041	Los Angeles	AQREF2	LaC4.8	GR	25-Jul-2015	251	177	4	muscle	77.6	µg/g ww	0.9	0.08	0.069	0.1	<0.002	<0.02	0.3	0.004	656	0.04	0.019	0.39	5	<0.004	319	0.53
002	Los Angeles	AQREF2	LaC4.8	GR	11-Sep-2015	270	199	3	muscle	78.7	µg/g ww	2	0.272	0.043	0.17	<0.005	<0.05	<0.2	<0.005	385	<0.02	0.021	0.39	7	<0.010	305	0.56
LAC-1-BS	Los Angeles	--	LAC4.8	GR	13-Jul-16	205	85.6	-	whole body	78	µg/g ww	25.8	0.003	0.0544	2.33	<0.0020	<0.020	<0.40	0.0578	10800	0.071	0.0698	0.912	57.8	0.0189	390	8.28
LAC-2-BS	Los Angeles	--	LAC4.8	GR	13-Jul-16	175	48.1	-	whole body	76	µg/g ww	62.4	0.0059	0.188	3.82	0.0039	<0.020	<0.40	0.105	11500	0.484	0.185	0.94	218	0.0572	417	15.1
LAC-3-AG	Los Angeles	--	LAC4.8	GR	13-Jul-16	230	162.3	-	whole body	77	µg/g ww	37.8	0.0037	0.063	1.87	<0.0020	<0.020	<0.40	0.0615	8180	0.085	0.0682	0.903	69.6	0.0216	371	5.53
0178	Latte	AQ04	LC2.7	GR	27-Aug-2014	233	148	3	muscle	79.1	µg/g ww	1.5	0.065	0.027	0.13	<0.002	<0.02	<0.1	0.003	880	<0.01	0.008	0.24	6	0.005	248	0.36
0179	Latte	AQ04	LC2.7	GR	27-Aug-2014	213	121	4	muscle	78.8	µg/g ww	0.8	0.099	0.027	0.05	<0.002	<0.02	<0.1	0.002	303	<0.01	0.006	0.27	4	0.004	286	0.25
0-9	Latte	AQ04	LC2.7	GR	21-Jun-2015	287	246	5	muscle	78.7	µg/g ww	2.4	0.703	0.027	0.11	<0.002	<0.02	<0.1	0.01	84	0.02	0.014	0.49	7	0.009	309	0.36
0-11	Latte	AQ04	LC2.7	GR	21-Jun-2015	316	337	4	muscle	77.9	µg/g ww	1.4	1.16	0.025	0.18	<0.002	<0.02	<0.1	0.006	400	0.01	0.006	0.36	5	0.006	299	0.45
0-22	Latte	AQ04	LC2.7	GR	23-Jun-2015	299	298.4	4	muscle	79.7	µg/g ww	0.7	0.383	0.059	0.26	<0.002	<0.02	<0.1	0.004	483	0.02	0.011	0.4	4	<0.004	293	0.37
0-23	Latte	AQ04	LC2.7	GR	23-Jun-2015	278	213	4	muscle	79.9	µg/g ww	0.7	0.505	0.042	0.15	<0.002	<0.02	<0.1	0.007	154	<0.01	0.011	0.33	4	0.01	288	0.3
0-25	Latte	AQ04	LC2.7	GR	23-Jun-2015	272	208	5	muscle	79.7	µg/g ww	1.7	0.201	0.03	0.07	<0.002	<0.02	<0.1	0.007	81	0.06	0.012	0.46	7	0.005	291	0.37
0-26	Latte	AQ04	LC2.7	GR	23-Jun-2015	273	224.4	5	muscle	79.7	µg/g ww	0.8	0.417	0.031	0.24	<0.002	<0.02	<0.1	0.007	131	0.01	0.011	0.54	4	0.006	282	0.28
LC2.7 3-1-A	Latte	--	LC2.7	GR	9-Jul-16	267	199.6	-	whole body	76	µg/g ww	16.5	0.0051	0.0349	1.54	<0.0020	<0.020	<0.40	0.0767	9400	0.066	0.0323	0.705	36.6	0.018	321	3.85
LC2.7 3-1-B	Latte	--	LC2.7	GR	9-Jul-16	284	276.9	-	whole body	76	µg/g ww	5.64	0.0031	0.0283	2.15	<0.0020	<0.020	<0.40	0.0699	11600	0.037	0.0247	0.685	23	0.0078	363	3.46
LC2.7 3-3-A	Latte	--	LC2.7	GR	9-Jul-16	247	180.2	-	whole body	75	µg/g ww	16.2	0.003	0.0471	2.16	<0.0020	<0.020	<0.40	0.0665	12300	0.266	0.0457	0.911	38.8	0.0296	380	4.74
LC2.7 3-3-B	Latte	--	LC2.7	GR	9-Jul-16	235	157.9	-	whole body	76	µg/g ww	31.9	0.0096	0.046	1.98	<0.0020	<0.020	<0.40	0.0559	12100	0.256	0.0455	0.877	55.1	0.0395	391	4.02
LC2.7 3-3-C	Latte	--	LC2.7	GR	9-Jul-16	168	-	-	whole body	75	µg/g ww	20.3	0.003	0.0442	1.87	<0.0020	<0.020	<0.40	0.109	7940	0.044	0.0453	0.756	39	0.016	324	4.44

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[1] Species as follows: CCG – slimy sculpin, GR – Arctic grayling, CH – Chinook salmon (juvenile), BI – benthic invertebrates.

Table E1. Benthic invertebrate and fish tissue metals data; 2014 – 2016 (continued).

Sample ID	Watercourse	SSID - old	SSID new	Species[1]	Date	Sample Type	Moisture (%)	Units	Mercury	Me Hg (%)	MeHg Estimate	Molybdenum	Nickel	Phosphorus	Potassium	Selenium ww	Selenium dw	Silver	Sodium	Strontium	Thallium	Tin	Titanium	Uranium	Vanadium	Zinc
CF 10.0-B1-1	Coffee	--	CF10.0	BI	20-Aug-16	whole body	83	mg/kg ww	0.0208	0.5	0.0104	0.192	0.862	1310	1160	1.27	7.47	0.0159	445	4.42	0.0135	<0.020	36.6	1.06	2.42	25.1
CF 3.9-B1-1	Coffee	--	CF3.9	BI	20-Aug-16	whole body	86	mg/kg ww	0.0245	0.5	0.0123	0.308	1.76	950	1230	1.07	7.64	0.0122	359	7.66	0.0465	0.072	178	1.75	8.35	22.3
CC4.5-BI-1	Coffee	--	CF2.7	BI	4-Mar-16	whole body	71	µg/g ww	0.039	0.5	0.0195	0.63	4.94	1000	1930	0.393	1.36	<0.020	268	9.17	0.0935	0.7	369	10.7	17.3	34.3
CC4.5-BI-2	Coffee	--	CF2.7	BI	4-Mar-16	whole body	70	µg/g ww	0.0371	0.5	0.0186	0.511	3.92	1290	2330	0.628	2.09	<0.0080	374	11.5	0.0972	0.302	452	7.78	17.6	38.6
CC4.5-BI-3	Coffee	--	CF2.7	BI	5-Mar-16	whole body	81	µg/g ww	0.0397	0.5	0.0199	0.418	3.68	1200	2080	0.409	2.15	<0.0080	341	9.47	0.0875	0.249	428	6.97	17.2	34
CC4.5-BI-4	Coffee	--	CF2.7	BI	5-Mar-16	whole body	73	µg/g ww	0.0414	0.5	0.0207	0.449	4.27	1260	2070	0.458	1.70	<0.012	399	13.8	0.0865	0.142	395	11.1	16	43.8
CC4.5-BI-5	Coffee	--	CF2.7	BI	5-Mar-16	whole body	78	µg/g ww	0.038	0.5	0.0190	0.37	2.35	1190	1380	0.54	2.45	<0.040	384	12.2	0.041	0.52	237	7.34	9.05	27.6
CC4.5-BI-6	Coffee	--	CF2.7	BI	5-Mar-16	whole body	72	µg/g ww	0.0313	0.5	0.0157	0.603	4.26	1480	2590	0.405	1.45	<0.012	315	14.5	0.104	0.161	501	18.1	18.7	203
CCM-BI-1	Coffee	--	CF0.5	BI	5-Mar-16	whole body	80	µg/g ww	0.0452	0.5	0.0226	0.433	2.96	1900	1950	0.491	2.46	<0.012	347	13.6	0.0515	0.097	197	8.89	9.65	286
HF 0.2-B1-1	Halfway	--	HF0.2	BI	23-Aug-16	whole body	90	mg/kg ww	0.0114	0.5	0.0057	0.116	0.811	1250	1110	0.193	1.93	0.0041	436	4.37	0.00782	<0.020	17.5	1.45	1.17	19.2
HF 0.2-B1-2	Halfway	--	HF0.2	BI	23-Aug-16	whole body	88	mg/kg ww	0.0136	0.5	0.0068	0.288	0.753	1380	1180	0.232	1.93	0.0044	442	8.12	0.0054	<0.020	9.84	5.76	0.85	19.8
HF 6.3-B1-1	Halfway	--	HF6.3	BI	20-Aug-16	whole body	88	mg/kg ww	0.0163	0.5	0.0082	0.125	0.442	1310	1150	0.555	4.63	0.0069	387	3.84	0.00529	<0.020	17.3	1.4	0.846	18.5
IC 1.9-B1-1	Independence	--	ID1.9	BI	20-Aug-16	whole body	88	mg/kg ww	0.021	0.5	0.0105	0.217	1.72	1360	1480	0.76	6.33	0.0099	640	2.89	0.0286	0.049	89.6	0.498	3.92	23.4
IC4.5-BI-1	Independence	--	ID4.5	BI	4-Mar-16	whole body	67	µg/g ww	0.03	0.5	0.0150	0.22	4.63	1860	1430	0.54	1.64	<0.048	513	10.9	0.0551	0.25	214	1.26	6.69	47.8
LAC 4.8-B1-1	Los Angeles	--	LaC4.8	BI	20-Aug-16	whole body	89	mg/kg ww	0.0093	0.5	0.0047	0.218	1.47	1070	1550	0.469	4.26	0.0059	1260	2.98	0.00343	<0.020	11	0.178	1.45	14.3
LAC 4.8-B1-2	Los Angeles	--	LaC4.8	BI	20-Aug-16	whole body	92	mg/kg ww	0.0065	0.5	0.0033	0.2	2.79	634	718	0.542	6.78	0.0105	376	6.36	0.00768	<0.020	25	0.282	3.45	14.2
LC 2.7-B1-1	Latte	--	LC2.7	BI	21-Aug-16	whole body	90	mg/kg ww	0.0188	0.5	0.0094	0.112	0.534	1170	1090	0.727	7.27	0.0075	562	4.04	0.00561	<0.020	14.8	0.683	0.939	17.5
LC 9.9-B1-1	Latte	--	LC9.9	BI	21-Aug-16	whole body	87	mg/kg ww	0.0417	0.5	0.0209	0.094	0.433	1200	1010	0.221	1.70	0.0059	434	3.61	0.00513	<0.020	23.4	0.593	1.55	19.2
YT 0.2-B1-1	YT-24	--	YT0.2	BI	23-Aug-16	whole body	88	mg/kg ww	0.0115	0.5	0.0058	0.128	0.476	1400	1290	0.213	1.78	0.0054	513	2.49	0.00512	<0.020	19	0.28	1.12	20.3
YT 5.0-B1-1	YT-24	--	YT5.0	BI	21-Aug-16	whole body	89	mg/kg ww	0.0116	0.5	0.0058	0.099	0.406	1280	1080	0.099	0.90	0.0102	502	1.9	0.00454	<0.020	15.9	0.173	0.973	22.4
CC997-CCG-1	Coffee	CC997	CF10.0	CCG	4-Mar-16	whole body	75	µg/g ww	0.0973	0.81	0.0788	0.019	0.035	11000	3860	2.17	8.68	<0.0040	1500	22.5	0.0185	<0.020	0.477	0.167	0.154	29.8
CC4.5-CCG-1	Coffee	CC4.5	CF2.3	CCG	4-Mar-16	whole body	78	µg/g ww	0.0884	0.81	0.0716	0.013	0.017	7630	2480	1.07	4.86	<0.0040	990	14.7	0.00884	<0.020	0.594	0.0551	0.141	24.2
CC4.5-CCG-2	Coffee	CC4.5	CF2.3	CCG	4-Mar-16	whole body	81	µg/g ww	0.0769	0.81	0.0623	0.015	0.037	9240	2930	1.95	10.26	<0.0040	1230	18.9	0.0119	<0.020	0.365	0.052	0.123	23.1
CC4.5-CCG-3	Coffee	CC4.5	CF2.3	CCG	4-Mar-16	whole body	80	µg/g ww	0.158	0.81	0.1280	0.015	0.022	12200	3100	1.39	6.95	<0.0040	1470	24.9	0.0129	<0.020	0.412	0.124	0.209	36.7
CC4.5-CCG-4	Coffee	CC4.5	CF2.3	CCG	4-Mar-16	whole body	76	µg/g ww	0.168	0.81	0.1361	0.022	0.032	11600	3160	1.46	6.08	<0.0040	1470	24.1	0.0143	<0.020	0.696	0.116	0.249	25
CC4.5BI-CCG-1	Coffee	CC4.5	CF2.3	CCG	4-Mar-16	whole body	72.1	µg/g ww	0.0954	0.81	0.0773	0.023	0.071	7230	2360	1.22	4.37	<0.0080	733	16.8	0.0106	<0.040	2.67	0.107	0.207	23
0-219	Coffee	AQ02	CF8.0	CCG	27-Aug-2014	whole body, no head	67.6	µg/g ww	0.087	0.81	0.0705	<0.01	0.02	4320	3230	1.32	4.07	<0.01	744	3.63	0.004	<0.02	0.62	0.022	0.06	14.7
0-220	Coffee	AQ02	CF8.0	CCG	27-Aug-2014	whole body, no head	76.0	µg/g ww	0.078	0.81	0.0632	<0.01	0.02	6300	3410	1.38	5.75	<0.01	815	9.03	0.006	<0.02	0.46	0.035	0.06	19.2
0-221	Coffee	AQ02	CF8.0	CCG	27-Aug-2014	whole body, no head	74.9	µg/g ww	0.079	0.81	0.0640	<0.01	0.02	5500	3340	1.15	4.58	<0.01	747	8.29	0.004	<0.02	0.61	0.021	0.05	16
0-222	Coffee	AQ02	CF8.0	CCG	27-Aug-2014	whole body, no head	73.3	µg/g ww	0.058	0.81	0.0470	0.01	0.03	4900	3340	1.14	4.27	<0.01	707	6.3	0.005	<0.02	0.92	0.031	0.07	20.1
0-255	Coffee	AQ02	CF8.0	CCG	28-Aug-2014	whole body, no head	73.8	µg/g ww	0.107	0.81	0.0867	0.01	0.04	13700	3380	2.01	7.67	<0.01	1150	29.9	0.006	<0.02	1.26	0.044	0.18	38.8
0-256	Coffee	AQ02	CF8.0	CCG	28-Aug-2014	whole body, no head	72.7	µg/g ww	0.143	0.81	0.1158	<0.01	0.03	5680	3220	0.95	3.48	<0.01	739	8.93	0.005	<0.02	0.47	0.033	0.06	29.3
0-257	Coffee	AQ02	CF8.0	CCG	28-Aug-2014	whole body, no head	76.3	µg/g ww	0.224	0.81	0.1814	0.01	0.04	3240	3200	1.41	5.95	<0.01	732	2.82	0.008	<0.02	0.79	0.029	0.11	17.3
0-258	Coffee	AQ02	CF8.0	CCG	28-Aug-2014	whole body, no head	72.9	µg/g ww	0.092	0.81	0.0745	0.03	0.07	9460	2790	2.74	10.11	<0.01	1230	19	0.01	<0.02	1.94	0.146	0.28	22.6
0-259	Coffee	AQ02	CF8.0	CCG	28-Aug-2014	whole body, no head	70.1	µg/g ww	0.097	0.81	0.0786	<0.01	0.05	6580	3010	1.01	3.38	<0.01	731	11.9	0.009	<0.02	1.24	0.069	0.1	32.8
94	Coffee	AQ02	CF8.0	CCG	27-Jul-2015	whole body, no head	73.8	µg/g ww	0.248	0.81	0.2009	0.04	0.22	8450	4030	1.76	6.72	<0.01	1050	11.3	0.015	<0.02	7.97	0.129	0.43	51.6
96	Coffee	AQ02	CF8.0	CCG	27-Jul-2015	whole body, no head	72.1	µg/g ww	0.13	0.81	0.1053	0.01	0.08	7430	4010	1.56	5.59	<0.01	817	10	0.009	<0.02	0.71	0.032	0.05	21.1
102	Coffee	AQ02	CF8.0	CCG	27-Jul-2015	whole body, no head	72.1	µg/g ww	0.22	0.81	0.1782	0.02	0.13	8460	3930	1.39	4.98	<0.01	899	12.9	0.011	<0.02	2.94	0.081	0.21	36
CC0.5-CCG-2	Coffee	CC0.5	CF8.3	CCG	4-Mar-16	whole body	82	µg/g ww	0.0675	0.81	0.0547	<0.020	0.025	9030	3110	1.78	9.89	<0.0080	1250	16.8	0.0141	<0.040	0.48	0.0708	0.065	27.9

Sample ID	Watercourse	SSID - old	SSID new	Species [1]	Date	Sample Type	Moisture (%)	Units	Mercury	Me Hg (%)	MeHg Estimate	Molybdenum	Nickel	Phosphorus	Potassium	Selenium ww	Selenium dw	Silver	Sodium	Strontium	Thallium	Tin	Titanium	Uranium	Vanadium	Zinc
CF10.0 1-1-A	Coffee	--	CF10.0	CCG	10-Jul-16	whole body	77	µg/g ww	0.0547	0.81	0.0443	0.027	0.069	7660	3000	2.49	10.83	<0.0040	950	14.3	0.0113	0.021	2.4	0.0716	0.208	27.8
CF10.0 1-1-B	Coffee	--	CF10.0	CCG	10-Jul-16	whole body	79	µg/g ww	0.0627	0.81	0.0508	0.016	0.037	8550	2990	2.13	10.14	<0.0040	1010	14.8	0.0123	<0.020	1.03	0.0621	0.127	24.8
CF10.0 1-1-C	Coffee	--	CF10.0	CCG	10-Jul-16	whole body	79	µg/g ww	0.0647	0.81	0.0524	0.037	0.159	10700	3340	3.74	17.81	<0.0040	1030	18	0.0114	0.074	1.88	0.114	0.163	37.1
CF10.0 1-1-D	Coffee	--	CF10.0	CCG	10-Jul-16	whole body	81	µg/g ww	0.0463	0.81	0.0375	0.022	0.045	9810	3360	2.46	12.95	<0.0040	1150	17.1	0.0112	<0.020	1.38	0.0858	0.185	27.1
CF10.0 1-1-E	Coffee	--	CF10.0	CCG	10-Jul-16	whole body	81	µg/g ww	0.0615	0.81	0.0498	0.03	0.1	9040	3040	2.8	14.74	0.005	997	15.9	0.0154	<0.020	6.11	0.0707	0.36	29.3
CF10.0-1-1-F	Coffee	--	CF10.0	CCG	10-Jul-16	whole body	86	µg/g ww	0.0488	0.81	0.0395	0.018	0.063	8720	3260	3	21.43	<0.0040	1050	14.9	0.011	0.087	1.69	0.0735	0.174	30
CF10.0-1-1-G	Coffee	--	CF10.0	CCG	10-Jul-16	whole body	86	µg/g ww	0.044	0.81	0.0356	0.032	0.143	7730	3140	2.57	18.36	<0.0040	943	14	0.0106	0.104	2.47	0.0726	0.21	27.7
CF10.0 1-1-H	Coffee	--	CF10.0	CCG	10-Jul-16	whole body	80	µg/g ww	0.0462	0.81	0.0374	0.047	0.107	8670	3200	2.85	14.25	<0.0040	1080	15	0.0115	0.121	6.51	0.105	0.454	29.1
CF10.0 1-1-J	Coffee	--	CF10.0	CCG	10-Jul-16	whole body	87	µg/g ww	0.0382	0.81	0.0309	0.034	0.073	8380	3090	2.7	20.77	<0.0040	1050	15.3	0.0111	0.078	2.27	0.0641	0.23	26.5
CF10.0 1-1-I	Coffee	--	CF10.0	CCG	10-Jul-16	whole body	88	µg/g ww	0.0418	0.81	0.0339	0.045	0.093	8190	3100	2.51	20.92	0.0046	1020	14.1	0.00915	0.078	3.67	0.0841	0.312	27
CF 3.9 3-1-A	Coffee	--	CF3.9	CCG	11-Jul-16	whole body	79	µg/g ww	0.0927	0.81	0.0751	0.018	0.076	10100	2650	3.03	14.43	<0.0040	1140	18.4	0.0125	<0.020	1.11	0.0364	0.192	32.3
CF-3.9 3-1-B	Coffee	--	CF3.9	CCG	11-Jul-16	whole body	74	µg/g ww	0.0586	0.81	0.0475	0.036	0.183	11900	3180	2.94	11.31	<0.0040	1340	21.3	0.00797	0.037	2.67	0.049	0.289	49.7
CF3.9 3-1-C	Coffee	--	CF3.9	CCG	11-Jul-16	whole body	77	µg/g ww	0.13	0.81	0.1053	0.029	0.071	10400	3090	1.62	7.04	<0.0040	1090	18.6	0.0124	<0.020	3.43	0.131	0.278	31.8
CF3.9 3-1-D	Coffee	--	CF3.9	CCG	11-Jul-16	whole body	82	µg/g ww	0.083	0.81	0.0672	0.016	0.033	7570	3130	2.79	15.50	0.005	1040	13.3	0.00915	<0.020	0.94	0.062	0.118	24.6
CF3.9 3-1-E	Coffee	--	CF3.9	CCG	11-Jul-16	whole body	79	µg/g ww	0.0828	0.81	0.0671	0.026	0.049	8930	3090	2.27	10.81	<0.0040	1070	15.6	0.0106	<0.020	2.01	0.08	0.149	30.5
CF3.9 3-1-F	Coffee	--	CF3.9	CCG	11-Jul-16	whole body	79	µg/g ww	0.0748	0.81	0.0606	0.03	0.117	5310	3320	2.44	11.62	<0.0040	974	7.42	0.00858	0.074	5.28	0.0752	0.259	22.6
CF3.9 3-1-G	Coffee	--	CF3.9	CCG	11-Jul-16	whole body	86	µg/g ww	0.0791	0.81	0.0641	0.019	0.051	8440	3390	2.85	20.36	<0.0040	1090	15	0.00816	0.052	2.1	0.0519	0.169	30.8
CF3.9 3-1-H	Coffee	--	CF3.9	CCG	11-Jul-16	whole body	76	µg/g ww	0.0677	0.81	0.0548	0.022	0.047	5470	3110	3.21	13.38	<0.0040	1020	8.75	0.00816	0.041	1.94	0.0319	0.159	25.4
CF3.9 3-1-I	Coffee	--	CF3.9	CCG	11-Jul-16	whole body	91	µg/g ww	0.0894	0.81	0.0724	0.022	0.086	8810	3300	3.46	38.44	<0.0040	1050	16.4	0.013	0.037	2.52	0.0673	0.243	32.5
CF3.9 3-1-J	Coffee	--	CF3.9	CCG	11-Jul-16	whole body	79	µg/g ww	0.114	0.81	0.0923	0.025	0.062	7280	3400	1.84	8.76	<0.0040	1010	11.8	0.00898	0.183	0.814	0.101	0.055	24.3
R1-1	Isaac	AQREF1	IS0.1	CCG	28-Aug-2014	whole body, no head	72.7	µg/g ww	0.039	0.81	0.0316	<0.01	0.02	5350	3420	0.98	3.59	<0.01	614	9.73	0.003	<0.02	0.41	0.006	0.06	20
R1-2	Isaac	AQREF1	IS0.1	CCG	28-Aug-2014	whole body, no head	73.0	µg/g ww	0.049	0.81	0.0397	0.03	0.07	12500	3090	1.26	4.67	<0.01	1350	26.4	0.004	<0.02	1.57	0.03	0.24	30.5
R1-3	Isaac	AQREF1	IS0.1	CCG	28-Aug-2014	whole body, no head	72.5	µg/g ww	0.038	0.81	0.0308	0.02	0.08	13400	3210	2.19	7.96	<0.01	1290	26.9	0.004	<0.02	1.24	0.017	0.22	31.4
R1-4	Isaac	AQREF1	IS0.1	CCG	28-Aug-2014	whole body, no head	71.7	µg/g ww	0.061	0.81	0.0494	0.02	0.09	12100	3590	1.79	6.33	<0.01	1180	22.5	0.004	<0.02	0.98	0.008	0.35	48.9
R1-5	Isaac	AQREF1	IS0.1	CCG	28-Aug-2014	whole body, no head	72.1	µg/g ww	0.045	0.81	0.0365	0.02	0.06	9730	3510	1.56	5.59	<0.01	1150	20.4	0.004	<0.02	1.13	0.022	0.16	25.7
R1-6	Isaac	AQREF1	IS0.1	CCG	28-Aug-2014	whole body, no head	72.1	µg/g ww	0.032	0.81	0.0259	0.01	0.1	9530	3500	2.63	9.43	<0.01	1060	17.5	0.005	<0.02	1.32	0.007	0.14	28.4
R1-7	Isaac	AQREF1	IS0.1	CCG	28-Aug-2014	whole body, no head	75.2	µg/g ww	0.057	0.81	0.0462	0.02	0.07	7670	3260	1.22	4.92	<0.01	1090	14.4	0.004	<0.02	1.32	0.01	0.19	28.5
R1-8	Isaac	AQREF1	IS0.1	CCG	28-Aug-2014	whole body, no head	69.7	µg/g ww	0.031	0.81	0.0251	0.02	0.08	8330	3290	1.45	4.79	<0.01	973	17.7	0.002	<0.02	2.36	0.029	0.24	23.3
R1-9	Isaac	AQREF1	IS0.1	CCG	28-Aug-2014	whole body, no head	74.3	µg/g ww	0.04	0.81	0.0324	0.02	0.11	9920	3490	1.78	6.93	<0.01	1020	19.5	0.005	<0.02	1.7	0.01	0.27	40
205	Isaac	AQREF1	IS0.1	CCG	28-Jul-2015	whole body, no head	72.1	µg/g ww	0.065	0.81	0.0527	<0.04	0.25	7670	3750	1.4	5.02	<0.04	754	13.4	0.007	<0.08	2.26	0.016	0.27	38.2
206	Isaac	AQREF1	IS0.1	CCG	28-Jul-2015	whole body, no head	72.1	µg/g ww	0.051	0.81	0.0413	<0.05	0.35	9340	3740	2.36	8.46	<0.05	738	17	0.009	<0.1	1.24	0.021	0.42	61.3
207	Isaac	AQREF1	IS0.1	CCG	28-Jul-2015	whole body, no head	72.1	µg/g ww	0.031	0.81	0.0251	<0.05	0.25	6610	3770	1.61	5.77	<0.05	686	10.4	0.006	<0.09	0.55	0.006	0.15	33.5
IC-1.9 2-1-A	Independence	--	ID1.9	CCG	12-Jul-16	whole body	78	µg/g ww	0.0608	0.81	0.0492	0.037	0.265	11200	3150	2.76	12.55	0.0053	1150	20.4	0.00947	0.04	2.47	0.0269	0.347	36.5
IC-1.9 2-1-B	Independence	--	ID1.9	CCG	12-Jul-16	whole body	76	µg/g ww	0.0495	0.81	0.0401	0.025	0.124	6840	2990	2.16	9.00	<0.0040	1010	11.2	0.00808	0.034	1.98	0.0174	0.261	30
IC-1.9 2-1-C	Independence	--	ID1.9	CCG	12-Jul-16	whole body	77	µg/g ww	0.11	0.81	0.0891	0.022	0.069	7120	3210	1.94	8.43	<0.0040	1070	11.1	0.0111	0.04	1.98	0.0242	0.11	31.9
IC-1.9 3-1-D	Independence	--	ID1.9	CCG	12-Jul-16	whole body	80	µg/g ww	0.0771	0.81	0.0625	0.034	0.106	6290	3140	2.05	10.25	<0.0040	1110	8.05	0.00867	0.169	4.37	0.0331	0.163	28.9
IC-1.9 3-2-E	Independence	--	ID1.9	CCG	12-Jul-16	whole body	80	µg/g ww	0.068	0.81	0.0551	0.032	0.127	11600	2990	1.49	7.45	<0.0040	1090	21.3	0.0121	0.032	3.74	0.047	0.302	36
IC-1.9 2-3-F	Independence	--	ID1.9	CCG	12-Jul-16	whole body	82	µg/g ww	0.062	0.81	0.0502	0.027	0.086	6210	3220	2.1	11.67	<0.0040	1050	8.4	0.00824	0.047	2.64	0.0279	0.128	29.8
IC-1.9 1-1-G	Independence	--	ID1.9	CCG	12-Jul-16	whole body	81	µg/g ww	0.102	0.81	0.0826	0.028	0.095	9970	2670	1.21	6.37	<0.0040	1170	18.9	0.0114	<0.020	3.29	0.0521	0.317	31.9
IC-1.9 1-1-H	Independence	--	ID1.9	CCG	12-Jul-16	whole body	81	µg/g ww	0.0685	0.81	0.0555	0.027	0.097	9010	2850	1.5	7.89	<0.0040	1000	16.2	0.0101	<0.020	2.77	0.0473	0.366	48.9

Sample ID	Watercourse	SSID - old	SSID new	Species [1]	Date	Sample Type	Moisture (%)	Units	Mercury	Me Hg (%)	MeHg Estimate	Molybdenum	Nickel	Phosphorus	Potassium	Selenium ww	Selenium dw	Silver	Sodium	Strontium	Thallium	Tin	Titanium	Uranium	Vanadium	Zinc
IC-1.9 1-1-I	Independence	--	ID1.9	CCG	12-Jul-16	whole body	79	µg/g ww	0.0513	0.81	0.0416	0.031	0.118	8180	2930	1.73	8.24	0.0054	1070	13.4	0.00747	<0.020	4.39	0.0358	0.256	26.7
IC-1.9 1-1-J	Independence	--	ID1.9	CCG	12-Jul-16	whole body	77	µg/g ww	0.0562	0.81	0.0455	0.025	0.166	8630	3120	1.98	8.61	<0.0040	1180	13.2	0.00845	0.025	3.32	0.0263	0.294	36.2
I-301	Independence	AQ10	ID1.9	CCG	28-Aug-2014	whole body, no head	74.5	µg/g ww	0.088	0.81	0.0713	0.06	0.19	4550	2910	1.36	5.33	<0.01	954	5.06	0.008	0.02	7.08	0.048	0.37	21.5
I-302	Independence	AQ10	ID1.9	CCG	28-Aug-2014	whole body, no head	68.6	µg/g ww	0.056	0.81	0.0454	0.01	0.04	8510	3000	0.9	2.87	<0.01	895	14.7	0.007	<0.02	0.68	0.014	0.13	27.1
I-303	Independence	AQ10	ID1.9	CCG	28-Aug-2014	whole body, no head	68.2	µg/g ww	0.091	0.81	0.0737	<0.01	0.04	3960	3120	0.93	2.92	<0.01	656	3.88	0.008	<0.02	0.64	0.008	0.07	21.3
I-304	Independence	AQ10	ID1.9	CCG	28-Aug-2014	whole body, no head	70.9	µg/g ww	0.066	0.81	0.0535	0.03	0.11	14200	3060	1.78	6.12	<0.01	1360	28.9	0.008	<0.02	2.75	0.028	0.28	26.4
I-305	Independence	AQ10	ID1.9	CCG	28-Aug-2014	whole body, no head	71.3	µg/g ww	0.073	0.81	0.0591	0.07	0.19	10500	2990	2.53	8.82	<0.01	1210	18.7	0.01	<0.02	6.93	0.049	0.39	24.2
I-306	Independence	AQ10	ID1.9	CCG	28-Aug-2014	whole body, no head	71.6	µg/g ww	0.093	0.81	0.0753	0.02	0.08	7340	3090	1.07	3.77	<0.01	992	11.6	0.008	<0.02	1.32	0.018	0.1	22.1
I-307	Independence	AQ10	ID1.9	CCG	28-Aug-2014	whole body, no head	71.0	µg/g ww	0.041	0.81	0.0332	0.02	0.09	8960	3310	1.73	5.97	<0.01	930	15.2	0.007	<0.02	1.47	0.016	0.14	26.7
I-308	Independence	AQ10	ID1.9	CCG	28-Aug-2014	whole body, no head	67.1	µg/g ww	0.072	0.81	0.0583	0.01	0.04	7690	3080	1.31	3.98	<0.01	855	12.4	0.008	<0.02	0.9	0.015	0.09	27.8
004	Independence	AQ10	ID1.9	CCG	15-Sep-2015	whole body, no head	72.1	µg/g ww	0.069	0.81	0.0559	0.04	0.07	3830	4050	2.41	8.64	<0.02	867	1.95	0.007	<0.05	1.45	0.012	0.08	23.1
042	Los Angeles	AQREF2	LaC4.8	CCG	25-Jul-2015	whole body, no head	71.2	µg/g ww	0.084	0.81	0.0680	0.03	0.24	13700	4500	2.74	9.51	<0.01	1070	26	0.01	<0.02	4.41	0.011	0.47	61.4
208	Latte	AQ03	LC0.5	CCG	29-Jul-2015	whole body, no head	72.1	µg/g ww	0.203	0.81	0.1644	0.02	0.15	13000	3780	1.22	4.37	<0.01	1300	24.6	0.013	<0.02	2.51	0.175	0.27	71.7
219	Latte	AQ03	LC0.5	CCG	01-Aug-2015	whole body, no head	72.1	µg/g ww	0.047	0.81	0.0381	<0.02	0.1	7690	3960	1.88	6.74	<0.02	785	11	0.01	<0.04	2.56	0.029	0.22	29.8
003	Latte	AQ03	LC0.5	CCG	12-Sep-2015	whole body, no head	72.1	µg/g ww	0.213	0.81	0.1725	0.03	0.08	13400	4350	1.15	4.12	<0.02	1450	21.4	0.011	<0.05	2.46	0.098	0.42	52.4
CCM-CH-1	Coffee	CCM	CF0.5	CH	5-Mar-16	whole body	78	µg/g ww	0.0392	0.94	0.0368	<0.020	<0.020	5030	3290	0.502	2.28	<0.0080	1030	5.83	0.00316	<0.040	0.16	0.0124	<0.040	29.9
CCM-CH-2	Coffee	CCM	CF0.5	CH	4-Mar-16	whole body	77	µg/g ww	0.0711	0.94	0.0668	<0.020	<0.020	5910	3270	0.504	2.19	<0.0080	1190	9.23	0.00552	<0.040	0.46	0.0174	<0.040	35.3
CCM-CH-3	Coffee	CCM	CF0.5	CH	5-Mar-16	whole body	78	µg/g ww	0.0396	0.94	0.0372	<0.020	0.023	4390	3140	0.594	2.70	<0.0080	949	5.19	0.00422	<0.040	0.24	0.0115	<0.040	24.1
CC4.5-CH-1	Coffee	CC4.5	CF2.3	CH	4-Mar-16	whole body	77	µg/g ww	0.1	0.94	0.0940	<0.020	<0.020	6540	4200	0.57	2.48	<0.0080	1000	7.98	0.01	<0.040	0.65	0.0246	<0.040	42.1
CC4.5-CH-2	Coffee	CC4.5	CF2.3	CH	5-Mar-16	whole body	82	µg/g ww	0.0581	0.94	0.0546	<0.020	<0.020	5560	3150	0.498	2.77	<0.0080	1000	7.27	0.00601	<0.040	0.23	0.0129	<0.040	31.4
CC4.5-CH-3	Coffee	CC4.5	CF2.3	CH	4-Mar-16	whole body	59	µg/g ww	0.0699	0.94	0.0657	<0.020	0.049	5070	3630	0.534	1.30	<0.0080	1020	6.24	0.00773	<0.040	1.83	0.0604	0.102	31.5
HF 0.2-CS-1	Halfway	--	HF0.2	CH	23-Aug-16	whole body	76	mg/kg ww	0.0211	0.94	0.0198	0.023	0.025	4660	3380	0.59	2.46	<0.0040	870	4.63	0.00195	<0.020	0.578	0.0215	<0.020	25.2
HF 0.2-CS-2	Halfway	--	HF0.2	CH	23-Aug-16	whole body	78	mg/kg ww	0.0271	0.94	0.0255	0.021	0.108	4410	3610	0.66	3.00	<0.0040	963	4.11	0.00348	<0.020	1.56	0.0358	0.046	24.8
HF 0.2-CS-3	Halfway	--	HF0.2	CH	23-Aug-16	whole body	79	mg/kg ww	0.0268	0.94	0.0252	0.011	0.017	4850	3800	0.602	2.87	<0.0040	745	3.7	0.00318	<0.020	0.243	0.00776	<0.020	25.5
HF 0.2-CS-4	Halfway	--	HF0.2	CH	23-Aug-16	whole body	76	mg/kg ww	0.0258	0.94	0.0243	<0.020	0.026	5000	3520	0.613	2.55	<0.0080	883	3.8	0.00283	0.048	0.37	0.00881	<0.040	26.5
HF 0.2-CS-5	Halfway	--	HF0.2	CH	23-Aug-16	whole body	79	mg/kg ww	0.0255	0.94	0.0240	0.013	0.018	4090	3480	0.649	3.09	<0.0040	883	3.69	0.00302	<0.020	0.199	0.00903	<0.020	20.4
HF 0.2-CS-6	Halfway	--	HF0.2	CH	23-Aug-16	whole body	74	mg/kg ww	0.0237	0.94	0.0223	0.042	0.019	5720	3290	0.545	2.10	<0.0040	927	6.08	0.00328	<0.020	0.739	0.0135	0.025	29.8
HF 0.2-CS-7	Halfway	--	HF0.2	CH	23-Aug-16	whole body	86	mg/kg ww	0.0278	0.94	0.0261	0.023	0.043	5040	3480	0.553	3.95	<0.0040	999	5.9	0.00402	<0.020	1	0.0374	0.04	23.1
HF 0.2-CS-8	Halfway	--	HF0.2	CH	23-Aug-16	whole body	83	mg/kg ww	0.0223	0.94	0.0210	0.017	0.034	5210	3220	0.635	3.74	<0.0040	989	5.33	0.00255	<0.020	0.856	0.0271	0.039	29.4
HF 0.2-CS-9	Halfway	--	HF0.2	CH	23-Aug-16	whole body	<0.30	mg/kg ww	0.0235	0.94	0.0221	0.013	0.04	5210	3280	0.676		<0.0040	961	5.6	0.00326	<0.020	0.843	0.015	0.034	28.1
HF 0.2-CS-10	Halfway	--	HF0.2	CH	23-Aug-16	whole body	86	mg/kg ww	0.025	0.94	0.0235	0.016	0.017	5720	3480	0.66	4.71	<0.0040	957	5.46	0.00281	<0.020	0.528	0.00758	<0.020	36
HF 0.2-CS-11	Halfway	--	HF0.2	CH	23-Aug-16	whole body	78	mg/kg ww	0.0293	0.94	0.0275	0.016	0.028	5180	3530	0.523	2.38	<0.0040	911	5.65	0.00304	<0.020	0.684	0.0242	0.03	27.9
HF 0.2-CS-12	Halfway	--	HF0.2	CH	23-Aug-16	whole body	81	mg/kg ww	0.0232	0.94	0.0218	0.011	0.022	4440	3160	0.403	2.12	<0.0040	956	4.32	0.00276	<0.020	0.223	0.00498	<0.020	23
052	Coffee	AQ00	CF3.9	GR	26-Jul-2015	muscle	78.7	µg/g ww	0.09	0.94	0.0846	<0.01	0.06	3330	5110	1.18	5.54	<0.01	300	0.63	0.006	<0.02	0.41	0.003	0.03	4
054	Coffee	AQ00	CF3.9	GR	26-Jul-2015	muscle	79.0	µg/g ww	0.05	0.94	0.0470	<0.01	0.05	3300	5310	1.29	6.14	<0.01	293	0.34	0.005	<0.02	0.23	<0.001	<0.02	5.8
69	Coffee	AQ02	CF8.0	GR	26-Jul-2015	muscle	78.2	µg/g ww	0.072	0.94	0.0677	<0.01	0.05	3890	5750	1.73	7.94	<0.01	353	0.64	0.008	<0.02	0.34	0.001	<0.02	5.2
70	Coffee	AQ02	CF8.0	GR	26-Jul-2015	muscle	78.0	µg/g ww	0.062	0.94	0.0583	<0.01	0.05	3840	5790	1.56	7.09	<0.01	384	0.7	0.004	<0.02	0.27	<0.001	<0.02	4.6
71	Coffee	AQ02	CF8.0	GR	26-Jul-2015	muscle	77.3	µg/g ww	0.054	0.94	0.0508	<0.01	0.05	3650	5880	1.31	5.77	<0.01	381	0.18	0.006	<0.02	0.46	0.001	<0.02	7.3
72	Coffee	AQ02	CF8.0	GR	26-Jul-2015	muscle	78.8	µg/g ww	0.039	0.94	0.0367	<0.01	0.06	3980	5920	1.79	8.44	<0.01	446	0.6	0.005	<0.02	0.35	0.002	<0.02	5.5
73	Coffee	AQ02	CF8.0	GR	26-Jul-2015	muscle	78.8	µg/g ww	0.055	0.94	0.0517	<0.01	0.06	3830	5780	1.71	8.07	<0.01	364	0.47	0.006	<0.02	0.29	0.001	<0.02	6.5

Sample ID	Watercourse	SSID - old	SSID new	Species [1]	Date	Sample Type	Moisture (%)	Units	Mercury	Me Hg (%)	MeHg Estimate	Molybdenum	Nickel	Phosphorus	Potassium	Selenium ww	Selenium dw	Silver	Sodium	Strontium	Thallium	Tin	Titanium	Uranium	Vanadium	Zinc
74	Coffee	AQ02	CF8.0	GR	26-Jul-2015	muscle	78.7	µg/g ww	0.092	0.94	0.0865	<0.01	0.06	3830	5730	1.42	6.67	<0.01	372	0.76	0.004	<0.02	0.37	0.001	<0.02	5.3
CF10.0 AG-1	Coffee	--	CF10.0	GR	10-Jul-16	whole body	78	µg/g ww	0.0221	0.94	0.0208	0.019	0.099	7820	3480	1.21	5.50	<0.0040	942	13.1	0.00382	<0.020	1.81	0.021	0.084	18.8
CF10.0 AG-2	Coffee	--	CF10.0	GR	10-Jul-16	whole body	73	µg/g ww	0.0687	0.94	0.0646	0.018	0.052	8610	3680	1.28	4.74	<0.0040	937	22.9	0.0077	<0.020	2.07 (1)	0.0327	0.105 (2)	19.7
CF10.0 AG-3	Coffee	--	CF10.0	GR	10-Jul-16	whole body	77	µg/g ww	0.0412	0.94	0.0387	0.016	0.077	8210	3630	1.3	5.65	<0.0040	938	12.7	0.00623	<0.020	1.84	0.0219	0.08	23.5
CF10.0 AG-4	Coffee	--	CF10.0	GR	10-Jul-16	whole body	77	µg/g ww	0.0588	0.94	0.0553	0.015	0.11	5660	3380	3	13.04	<0.0040	926	7.76	0.00623	<0.020	2.55	0.0141	0.103	19.8
CF10.0 2-1-K	Coffee	--	CF10.0	GR	10-Jul-16	whole body	74	µg/g ww	0.04	0.94	0.0376	0.017	0.028	7930	3500	1.13	4.35	<0.0040	905	10.5	0.00601	<0.020	1.49	0.0248	0.066	21.2
CF10.0 3-1-L	Coffee	--	CF10.0	GR	10-Jul-16	whole body	74	µg/g ww	0.0465	0.94	0.0437	0.014	0.04	8970	3510	1.14	4.38	<0.0040	983	14.3	0.0078	0.022	1.2	0.0511	0.043	23.1
CF10.0 3-2-M	Coffee	--	CF10.0	GR	10-Jul-16	whole body	77	µg/g ww	0.0309	0.94	0.0290	0.033	0.059	6750	3680	1.82	7.91	<0.0040	875	9.39	0.00781	0.028	3.28	0.0327	0.168	25
HF 0.2-AG-1	Halfway	--	HF0.2	GR	23-Aug-16	whole body	78	mg/kg ww	0.0332	0.94	0.0312	0.011	0.015	8240	4110	1.32	6.00	<0.0040	993	12.9	0.00643	0.024	0.324	0.0114	<0.020	28.6
104	Independence	AQ11	ID6.7	GR	24-Aug-2014	muscle	76.2	µg/g ww	0.049	0.94	0.0461	<0.01	0.01	4010	4600	1.23	5.17	<0.01	481	2.65	0.006	<0.02	0.35	0.001	<0.02	11.9
107	Independence	AQ11	ID6.7	GR	28-Jul-2015	muscle	78.1	µg/g ww	0.075	0.94	0.0705	<0.01	0.06	3750	5550	1.23	5.62	<0.01	310	0.84	0.006	<0.02	0.25	0.001	<0.02	5.3
108	Independence	AQ11	ID6.7	GR	28-Jul-2015	muscle	79.0	µg/g ww	0.051	0.94	0.0479	<0.01	0.07	4280	5500	1.51	7.19	<0.01	326	1.9	0.006	<0.02	0.32	0.001	<0.02	6
109	Independence	AQ11	ID6.7	GR	28-Jul-2015	muscle	78.5	µg/g ww	0.086	0.94	0.0808	<0.01	0.06	3100	5040	1.54	7.16	0.01	295	0.27	0.006	<0.02	0.22	0.001	<0.02	6
110	Independence	AQ11	ID6.7	GR	28-Jul-2015	muscle	79.7	µg/g ww	0.037	0.94	0.0348	<0.01	0.07	4010	5660	1.82	8.97	<0.01	315	0.91	0.005	<0.02	0.34	0.001	<0.02	5.8
111	Independence	AQ11	ID6.7	GR	28-Jul-2015	muscle	78.8	µg/g ww	0.042	0.94	0.0395	<0.01	0.06	3430	5590	1.44	6.79	<0.01	301	0.32	0.005	<0.02	0.22	<0.001	<0.02	5.3
112	Independence	AQ11	ID6.7	GR	28-Jul-2015	muscle	79.7	µg/g ww	0.037	0.94	0.0348	<0.01	0.06	3720	5730	1.71	8.42	<0.01	328	0.74	0.004	<0.02	0.31	0.001	<0.02	6.3
113	Independence	AQ11	ID6.7	GR	28-Jul-2015	muscle	79.5	µg/g ww	0.036	0.94	0.0338	<0.01	0.06	3720	5470	2.07	10.10	<0.01	356	0.84	0.007	<0.02	0.6	0.003	0.02	6.3
041	Los Angeles	AQREF2	LaC4.8	GR	25-Jul-2015	muscle	77.6	µg/g ww	0.065	0.94	0.0611	<0.01	0.03	3840	5560	1.69	7.54	<0.01	305	0.95	0.006	<0.02	0.26	<0.001	<0.02	5.2
002	Los Angeles	AQREF2	LaC4.8	GR	11-Sep-2015	muscle	78.7	µg/g ww	0.068	0.94	0.0639	<0.02	0.03	3000	5200	0.9	4.23	<0.02	280	0.61	0.006	<0.05	0.26	<0.002	<0.05	5.7
LAC-1-BS	Los Angeles	--	LAC4.8	GR	13-Jul-16	whole body	78	µg/g ww	0.036	0.94	0.0338	0.02	0.102	8350	3650	1.3	5.91	<0.0040	1030	15.1	0.00501	<0.020	1.78	0.0108	0.112	20.2
LAC-2-BS	Los Angeles	--	LAC4.8	GR	13-Jul-16	whole body	76	µg/g ww	0.0615	0.94	0.0578	0.024	0.407	9060	3520	1.61	6.71	0.0041	1090	19	0.00914	<0.020	3.29	0.0463	0.322	24.5
LAC-3-AG	Los Angeles	--	LAC4.8	GR	13-Jul-16	whole body	77	µg/g ww	0.0436	0.94	0.0410	0.016	0.126	6890	3810	1.52	6.61	<0.0040	1120	11	0.0057	<0.020	2.1	0.00787	0.16	19.8
0178	Latte	AQ04	LC2.7	GR	27-Aug-2014	muscle	79.1	µg/g ww	0.081	0.94	0.0761	<0.01	<0.01	2530	3510	0.66	3.16	<0.01	293	0.95	0.003	<0.02	0.25	0.001	<0.02	5.1
0179	Latte	AQ04	LC2.7	GR	27-Aug-2014	muscle	78.8	µg/g ww	0.071	0.94	0.0667	<0.01	<0.01	2660	4250	0.92	4.34	<0.01	284	0.3	0.004	<0.02	0.23	<0.001	<0.02	3.9
0-9	Latte	AQ04	LC2.7	GR	21-Jun-2015	muscle	78.7	µg/g ww	0.108	0.94	0.1015	<0.01	0.01	2940	5060	0.85	4.00	<0.01	290	0.12	0.005	<0.02	0.26	0.002	<0.02	7.7
0-11	Latte	AQ04	LC2.7	GR	21-Jun-2015	muscle	77.9	µg/g ww	0.123	0.94	0.1156	<0.01	0.01	3040	4970	0.48	2.17	<0.01	350	0.56	0.004	<0.02	0.2	0.002	<0.02	4.5
0-22	Latte	AQ04	LC2.7	GR	23-Jun-2015	muscle	79.7	µg/g ww	0.127	0.94	0.1194	<0.01	<0.01	3010	4970	0.74	3.65	<0.01	369	0.68	0.004	<0.02	0.15	0.002	<0.02	5
0-23	Latte	AQ04	LC2.7	GR	23-Jun-2015	muscle	79.9	µg/g ww	0.107	0.94	0.1006	<0.01	0.01	2760	4850	0.94	4.68	<0.01	326	0.22	0.005	<0.02	0.14	0.002	<0.02	4.1
0-25	Latte	AQ04	LC2.7	GR	23-Jun-2015	muscle	79.7	µg/g ww	0.132	0.94	0.1241	<0.01	0.01	2800	4810	1.02	5.02	<0.01	314	0.11	0.007	<0.02	0.31	0.002	<0.02	6.6
0-26	Latte	AQ04	LC2.7	GR	23-Jun-2015	muscle	79.7	µg/g ww	0.127	0.94	0.1194	<0.01	0.01	2770	4680	1.08	5.32	<0.01	392	0.19	0.006	<0.02	0.15	0.001	<0.02	6.7
LC2.7 3-1-A	Latte	--	LC2.7	GR	9-Jul-16	whole body	76	µg/g ww	0.105	0.94	0.0987	0.014	0.037	7210	3230	1.2	5.00	<0.0040	999	13.1	0.00579	<0.020	1.14	0.035	0.071	22.6
LC2.7 3-1-B	Latte	--	LC2.7	GR	9-Jul-16	whole body	76	µg/g ww	0.109	0.94	0.1025	<0.010	0.018	8400	3420	0.929	3.87	<0.0040	1120	13.8	0.00745	<0.020	0.634	0.0292	0.025	22.2
LC2.7 3-3-A	Latte	--	LC2.7	GR	9-Jul-16	whole body	75	µg/g ww	0.0639	0.94	0.0601	0.016	0.153	8780	3540	1.2	4.80	<0.0040	1060	14.5	0.00647	<0.020	1.3	0.0441	0.07	29.1
LC2.7 3-3-B	Latte	--	LC2.7	GR	9-Jul-16	whole body	76	µg/g ww	0.0491	0.94	0.0462	0.021	0.121	8750	3550	1.17	4.88	<0.0040	1010	12.8	0.00551	<0.020	2.18	0.0462	0.094	23
LC2.7 3-3-C	Latte	--	LC2.7	GR	9-Jul-16	whole body	75	µg/g ww	0.0427	0.94	0.0401	0.015	0.057	6650	3220	1.73	6.92	<0.0040	890	10.3	0.00643	<0.020	1.7	0.0167	0.069	25.6

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[1] Species as follows: CCG – slimy sculpin, GR – Arctic grayling, CH – Chinook salmon (juvenile), BI – benthic invertebrates.

Your Project #: 14Y0306:102
Site Location: COFFEE CREEK
Your C.O.C. #: 08418991, 08418990

Attention:LYNDSAY DOETZEL

EDI ENVIRONMENTAL DYNAMICS INC.
2195 2nd Avenue
WHITEHORSE, YT
CANADA Y1A 3T8

Report Date: 2016/04/07
Report #: R2153836
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B617947
Received: 2016/03/08, 11:45

Sample Matrix: TISSUE
Samples Received: 21

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Elements by CRC ICPMS - Tissue Wet Wt	21	2016/03/22	2016/03/30	BBY7SOP-00002/21	EPA 6020a,200.3 R1 m
Moisture in Tissue	20	N/A	2016/03/30	BBY8SOP-00017	OMOE E3139 3.1 m

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

[signature redacted]

Encryption Key

Graham Rudkin
Project Manager, Environmental
07 Apr 2016 12:16:24 -07:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Graham Rudkin, Project Manager, Environmental
Email: [email redacted]
Phone# [phone number redacted]
==
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total Cover Pages : 1

Maxxam Job #: B617947
Report Date: 2016/04/07

EDI ENVIRONMENTAL DYNAMICS INC.
Client Project #: 14Y0306:102
Site Location: COFFEE CREEK
Sampler Initials: BS

ELEMENTS BY ATOMIC SPECTROSCOPY - WET WT (TISSUE)

Maxxam ID		OG2657		OG2658	OG2659		OG2660		OG2661		
Sampling Date		2016/03/04		2016/03/04	2016/03/05		2016/03/05		2016/03/05		
COC Number		08418991		08418991	08418991		08418991		08418991		
	UNITS	**CC4.5-BI-1**	**RDL**	**CC4.5-BI-2**	**CC4.5-BI-3**	**RDL**	**CC4.5-BI-4**	**RDL**	**CC4.5-BI-5**	**RDL**	**QC Batch**
Total Metals by ICPMS											
Total Aluminum (Al)	mg/kg	3820	1.0	3840	3370	0.40	3420	0.60	2240	2.0	8223417
Total Antimony (Sb)	mg/kg	0.140	0.0050	0.0995	0.0696	0.0020	0.0907	0.0030	0.065	0.010	8223417
Total Arsenic (As)	mg/kg	5.54	0.025	4.03	3.84	0.010	3.52	0.015	3.78	0.050	8223417
Total Barium (Ba)	mg/kg	112	0.050	139	100	0.020	112	0.030	74.8	0.10	8223417
Total Beryllium (Be)	mg/kg	0.116	0.010	0.119	0.101	0.0040	0.104	0.0060	0.097	0.020	8223417
Total Bismuth (Bi)	mg/kg	<0.10	0.10	<0.040	<0.040	0.040	<0.060	0.060	<0.20	0.20	8223417
Total Boron (B)	mg/kg	<2.0	2.0	<0.80	<0.80	0.80	<1.2	1.2	<4.0	4.0	8223417
Total Cadmium (Cd)	mg/kg	0.135	0.010	0.158	0.142	0.0040	0.197	0.0060	0.144	0.020	8223417
Total Calcium (Ca)	mg/kg	1450	10	1710	1540	4.0	1900	6.0	2110	20	8223417
Total Chromium (Cr)	mg/kg	10.5	0.050	6.78	5.69	0.020	6.56	0.030	2.88	0.10	8223417
Total Cobalt (Co)	mg/kg	4.16	0.020	3.67	3.73	0.0080	3.57	0.012	2.11	0.040	8223417
Total Copper (Cu)	mg/kg	7.26	0.050	7.44	6.48	0.020	6.78	0.030	5.97	0.10	8223417
Total Iron (Fe)	mg/kg	9420	5.0	9050	8510	2.0	8670	3.0	5270	10	8223417
Total Lead (Pb)	mg/kg	5.29	0.010	1.54	1.17	0.0040	1.56	0.0060	0.967	0.020	8223417
Total Magnesium (Mg)	mg/kg	2350	10	2380	2280	4.0	2370	6.0	1240	20	8223417
Total Manganese (Mn)	mg/kg	317	0.10	285	265	0.040	290	0.060	171	0.20	8223417
Total Mercury (Hg)	mg/kg	0.039	0.010	0.0371	0.0397	0.0040	0.0414	0.0060	0.038	0.020	8223417
Total Molybdenum (Mo)	mg/kg	0.630	0.050	0.511	0.418	0.020	0.449	0.030	0.37	0.10	8223417
Total Nickel (Ni)	mg/kg	4.94	0.050	3.92	3.68	0.020	4.27	0.030	2.35	0.10	8223417
Total Phosphorus (P)	mg/kg	1000	10	1290	1200	4.0	1260	6.0	1190	20	8223417
Total Potassium (K)	mg/kg	1930	10	2330	2080	4.0	2070	6.0	1380	20	8223417
Total Selenium (Se)	mg/kg	0.393	0.050	0.628	0.409	0.020	0.458	0.030	0.54	0.10	8223417
Total Silver (Ag)	mg/kg	<0.020	0.020	<0.0080	<0.0080	0.0080	<0.012	0.012	<0.040	0.040	8223417
Total Sodium (Na)	mg/kg	268	10	374	341	4.0	399	6.0	384	20	8223417
Total Strontium (Sr)	mg/kg	9.17	0.050	11.5	9.47	0.020	13.8	0.030	12.2	0.10	8223417
Total Thallium (Tl)	mg/kg	0.0935	0.0020	0.0972	0.0875	0.00080	0.0865	0.0012	0.0410	0.0040	8223417
Total Tin (Sn)	mg/kg	0.70	0.10	0.302	0.249	0.040	0.142	0.060	0.52	0.20	8223417
Total Titanium (Ti)	mg/kg	369	0.25	452	428	0.10	395	0.15	237	0.50	8223417
Total Uranium (U)	mg/kg	10.7	0.0020	7.78	6.97	0.00080	11.1	0.0012	7.34	0.0040	8223417
Total Vanadium (V)	mg/kg	17.3	0.10	17.6	17.2	0.040	16.0	0.060	9.05	0.20	8223417
Total Zinc (Zn)	mg/kg	34.3	0.20	38.6	34.0	0.080	43.8	0.12	27.6	0.40	8223417
RDL = Reportable Detection Limit											

ELEMENTS BY ATOMIC SPECTROSCOPY - WET WT (TISSUE)

Maxxam ID		OG2662	OG2663		OG2664	OG2668	OG2666	OG2667		
Sampling Date		2016/03/05	2016/03/05		2016/03/04	2016/03/05	2016/03/04	2016/03/05		
COC Number		08418991	08418991		08418991	08418990	08418991	08418990		
	UNITS	**CC4.5-BI-6**	**CCM-BI-1**	**RDL**	**CC4.5-CH-1**	**CC4.5-CH-2**	**CC4.5-CH-3**	**CCM-CH-1**	**RDL**	**QC Batch**
Total Metals by ICPMS										
Total Aluminum (Al)	mg/kg	3730	2000	0.60	2.18	1.54	24.7	1.46	0.40	8223417
Total Antimony (Sb)	mg/kg	0.126	0.116	0.0030	0.0023	<0.0020	0.0024	<0.0020	0.0020	8223417
Total Arsenic (As)	mg/kg	5.12	3.06	0.015	0.033	0.030	0.054	0.022	0.010	8223417
Total Barium (Ba)	mg/kg	172	107	0.030	2.55	1.72	1.86	1.08	0.020	8223417
Total Beryllium (Be)	mg/kg	0.126	0.0868	0.0060	<0.0040	<0.0040	<0.0040	<0.0040	0.0040	8223417
Total Bismuth (Bi)	mg/kg	<0.060	<0.060	0.060	<0.040	<0.040	<0.040	<0.040	0.040	8223417
Total Boron (B)	mg/kg	<1.2	<1.2	1.2	<0.80	<0.80	<0.80	<0.80	0.80	8223417
Total Cadmium (Cd)	mg/kg	0.237	0.230	0.0060	0.0204	0.0160	0.0159	0.0243	0.0040	8223417
Total Calcium (Ca)	mg/kg	2320	2460	6.0	7990	7550	6630	5920	4.0	8223417
Total Chromium (Cr)	mg/kg	5.32	3.68	0.030	0.044	0.023	0.071	0.048	0.020	8223417
Total Cobalt (Co)	mg/kg	4.15	2.25	0.012	0.0374	0.0302	0.0580	0.0172	0.0080	8223417
Total Copper (Cu)	mg/kg	8.05	7.61	0.030	0.767	0.666	0.851	0.599	0.020	8223417
Total Iron (Fe)	mg/kg	10300	5550	3.0	29.7	23.8	60.6	18.3	2.0	8223417
Total Lead (Pb)	mg/kg	5.12	4.13	0.0060	0.0274	0.0057	0.0195	0.0048	0.0040	8223417
Total Magnesium (Mg)	mg/kg	2510	1510	6.0	360	310	320	299	4.0	8223417
Total Manganese (Mn)	mg/kg	473	231	0.060	2.57	1.90	4.07	1.49	0.040	8223417
Total Mercury (Hg)	mg/kg	0.0313	0.0452	0.0060	0.100	0.0581	0.0699	0.0392	0.0040	8223417
Total Molybdenum (Mo)	mg/kg	0.603	0.433	0.030	<0.020	<0.020	<0.020	<0.020	0.020	8223417
Total Nickel (Ni)	mg/kg	4.26	2.96	0.030	<0.020	<0.020	0.049	<0.020	0.020	8223417
Total Phosphorus (P)	mg/kg	1480	1900	6.0	6540	5560	5070	5030	4.0	8223417
Total Potassium (K)	mg/kg	2590	1950	6.0	4200	3150	3630	3290	4.0	8223417
Total Selenium (Se)	mg/kg	0.405	0.491	0.030	0.570	0.498	0.534	0.502	0.020	8223417
Total Silver (Ag)	mg/kg	<0.012	<0.012	0.012	<0.0080	<0.0080	<0.0080	<0.0080	0.0080	8223417
Total Sodium (Na)	mg/kg	315	347	6.0	1000	1000	1020	1030	4.0	8223417
Total Strontium (Sr)	mg/kg	14.5	13.6	0.030	7.98	7.27	6.24	5.83	0.020	8223417
Total Thallium (Tl)	mg/kg	0.104	0.0515	0.0012	0.0100	0.00601	0.00773	0.00316	0.00080	8223417
Total Tin (Sn)	mg/kg	0.161	0.097	0.060	<0.040	<0.040	<0.040	<0.040	0.040	8223417
Total Titanium (Ti)	mg/kg	501	197	0.15	0.65	0.23	1.83	0.16	0.10	8223417
Total Uranium (U)	mg/kg	18.1	8.89	0.0012	0.0246	0.0129	0.0604	0.0124	0.00080	8223417
Total Vanadium (V)	mg/kg	18.7	9.65	0.060	<0.040	<0.040	0.102	<0.040	0.040	8223417
Total Zinc (Zn)	mg/kg	203	286	0.12	42.1	31.4	31.5	29.9	0.080	8223417
RDL = Reportable Detection Limit										

Maxxam Job #: B617947
Report Date: 2016/04/07

EDI ENVIRONMENTAL DYNAMICS INC.
Client Project #: 14Y0306:102
Site Location: COFFEE CREEK
Sampler Initials: BS

ELEMENTS BY ATOMIC SPECTROSCOPY - WET WT (TISSUE)

Maxxam ID		OG2665	OG2669		OG2676		OG2671		
Sampling Date		2016/03/04	2016/03/05		2016/03/04		2016/03/04		
COC Number		08418991	08418990		08418990		08418990		
	UNITS	**CCM-CH-2**	**CCM-CH-3**	**RDL**	**CC997-CCG-1**	**RDL**	**CC0.5-CCG-2**	**RDL**	**QC Batch**
Total Metals by ICPMS									
Total Aluminum (Al)	mg/kg	1.61	2.39	0.40	1.17	0.20	3.79	0.40	8223417
Total Antimony (Sb)	mg/kg	<0.0020	<0.0020	0.0020	0.0023	0.0010	<0.0020	0.0020	8223417
Total Arsenic (As)	mg/kg	0.031	0.027	0.010	0.0854	0.0050	0.058	0.010	8223417
Total Barium (Ba)	mg/kg	1.92	1.21	0.020	3.36	0.010	3.06	0.020	8223417
Total Beryllium (Be)	mg/kg	<0.0040	<0.0040	0.0040	<0.0020	0.0020	<0.0040	0.0040	8223417
Total Bismuth (Bi)	mg/kg	<0.040	<0.040	0.040	<0.020	0.020	<0.040	0.040	8223417
Total Boron (B)	mg/kg	<0.80	<0.80	0.80	<0.40	0.40	<0.80	0.80	8223417
Total Cadmium (Cd)	mg/kg	0.0205	0.0645	0.0040	0.0265	0.0020	0.0206	0.0040	8223417
Total Calcium (Ca)	mg/kg	8080	5130	4.0	17500	2.0	14600	4.0	8223417
Total Chromium (Cr)	mg/kg	<0.020	0.254	0.020	0.020	0.010	<0.020	0.020	8223417
Total Cobalt (Co)	mg/kg	0.0383	0.0253	0.0080	0.0511	0.0040	0.0264	0.0080	8223417
Total Copper (Cu)	mg/kg	0.675	0.713	0.020	1.18	0.010	1.44	0.020	8223417
Total Iron (Fe)	mg/kg	19.7	17.9	2.0	30.9	1.0	21.9	2.0	8223417
Total Lead (Pb)	mg/kg	0.0136	0.0072	0.0040	0.0110	0.0020	0.0232	0.0040	8223417
Total Magnesium (Mg)	mg/kg	332	289	4.0	525	2.0	397	4.0	8223417
Total Manganese (Mn)	mg/kg	2.55	1.52	0.040	8.19	0.020	4.40	0.040	8223417
Total Mercury (Hg)	mg/kg	0.0711	0.0396	0.0040	0.0973	0.0020	0.0675	0.0040	8223417
Total Molybdenum (Mo)	mg/kg	<0.020	<0.020	0.020	0.019	0.010	<0.020	0.020	8223417
Total Nickel (Ni)	mg/kg	<0.020	0.023	0.020	0.035	0.010	0.025	0.020	8223417
Total Phosphorus (P)	mg/kg	5910	4390	4.0	11000	2.0	9030	4.0	8223417
Total Potassium (K)	mg/kg	3270	3140	4.0	3860	2.0	3110	4.0	8223417
Total Selenium (Se)	mg/kg	0.504	0.594	0.020	2.17	0.010	1.78	0.020	8223417
Total Silver (Ag)	mg/kg	<0.0080	<0.0080	0.0080	<0.0040	0.0040	<0.0080	0.0080	8223417
Total Sodium (Na)	mg/kg	1190	949	4.0	1500	2.0	1250	4.0	8223417
Total Strontium (Sr)	mg/kg	9.23	5.19	0.020	22.5	0.010	16.8	0.020	8223417
Total Thallium (Tl)	mg/kg	0.00552	0.00422	0.00080	0.0185	0.00040	0.0141	0.00080	8223417
Total Tin (Sn)	mg/kg	<0.040	<0.040	0.040	<0.020	0.020	<0.040	0.040	8223417
Total Titanium (Ti)	mg/kg	0.46	0.24	0.10	0.477	0.050	0.48	0.10	8223417
Total Uranium (U)	mg/kg	0.0174	0.0115	0.00080	0.167	0.00040	0.0708	0.00080	8223417
Total Vanadium (V)	mg/kg	<0.040	<0.040	0.040	0.154	0.020	0.065	0.040	8223417
Total Zinc (Zn)	mg/kg	35.3	24.1	0.080	29.8	0.040	27.9	0.080	8223417

RDL = Reportable Detection Limit

Maxxam Job #: B617947
Report Date: 2016/04/07

EDI ENVIRONMENTAL DYNAMICS INC.
Client Project #: 14Y0306:102
Site Location: COFFEE CREEK
Sampler Initials: BS

ELEMENTS BY ATOMIC SPECTROSCOPY - WET WT (TISSUE)

Maxxam ID		OG2670	OG2673	OG2674	OG2675		OG2672		
Sampling Date		2016/03/04	2016/03/04	2016/03/04	2016/03/04		2016/03/04		
COC Number		08418990	08418990	08418990	08418990		08418990		
	UNITS	**CC4.5-CCG-1**	**CC4.5-CCG-2**	**CC4.5-CCG-3**	**CC4.5-CCG-4**	**RDL**	**CC4.5BI-CCG-1**	**RDL**	**QC Batch**
Total Metals by ICPMS									
Total Aluminum (Al)	mg/kg	5.20	1.63	1.58	4.70	0.20	32.1	0.40	8223417
Total Antimony (Sb)	mg/kg	0.0011	<0.0010	0.0011	0.0014	0.0010	<0.0020	0.0020	8223417
Total Arsenic (As)	mg/kg	0.0451	0.0477	0.0432	0.0687	0.0050	0.082	0.010	8223417
Total Barium (Ba)	mg/kg	2.48	3.26	4.35	4.59	0.010	3.70	0.020	8223417
Total Beryllium (Be)	mg/kg	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	<0.0040	0.0040	8223417
Total Bismuth (Bi)	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	<0.040	0.040	8223417
Total Boron (B)	mg/kg	<0.40	<0.40	<0.40	<0.40	0.40	<0.80	0.80	8223417
Total Cadmium (Cd)	mg/kg	0.0121	0.0789	0.0221	0.0909	0.0020	0.0244	0.0040	8223417
Total Calcium (Ca)	mg/kg	11200	14100	21100	17900	2.0	12400	4.0	8223417
Total Chromium (Cr)	mg/kg	0.023	0.010	0.014	0.019	0.010	0.066	0.020	8223417
Total Cobalt (Co)	mg/kg	0.0180	0.0232	0.0235	0.0273	0.0040	0.0561	0.0080	8223417
Total Copper (Cu)	mg/kg	0.736	1.14	0.789	1.01	0.010	1.27	0.020	8223417
Total Iron (Fe)	mg/kg	16.8	16.0	20.1	19.8	1.0	87.2	2.0	8223417
Total Lead (Pb)	mg/kg	0.0077	0.0097	0.0067	0.0098	0.0020	0.0210	0.0040	8223417
Total Magnesium (Mg)	mg/kg	343	402	477	438	2.0	369	4.0	8223417
Total Manganese (Mn)	mg/kg	4.15	9.29	8.43	11.8	0.020	6.67	0.040	8223417
Total Mercury (Hg)	mg/kg	0.0884	0.0769	0.158	0.168	0.0020	0.0954	0.0040	8223417
Total Molybdenum (Mo)	mg/kg	0.013	0.015	0.015	0.022	0.010	0.023	0.020	8223417
Total Nickel (Ni)	mg/kg	0.017	0.037	0.022	0.032	0.010	0.071	0.020	8223417
Total Phosphorus (P)	mg/kg	7630	9240	12200	11600	2.0	7230	4.0	8223417
Total Potassium (K)	mg/kg	2480	2930	3100	3160	2.0	2360	4.0	8223417
Total Selenium (Se)	mg/kg	1.07	1.95	1.39	1.46	0.010	1.22	0.020	8223417
Total Silver (Ag)	mg/kg	<0.0040	<0.0040	<0.0040	<0.0040	0.0040	<0.0080	0.0080	8223417
Total Sodium (Na)	mg/kg	990	1230	1470	1470	2.0	733	4.0	8223417
Total Strontium (Sr)	mg/kg	14.7	18.9	24.9	24.1	0.010	16.8	0.020	8223417
Total Thallium (Tl)	mg/kg	0.00884	0.0119	0.0129	0.0143	0.00040	0.0106	0.00080	8223417
Total Tin (Sn)	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	<0.040	0.040	8223417
Total Titanium (Ti)	mg/kg	0.594	0.365	0.412	0.696	0.050	2.67	0.10	8223417
Total Uranium (U)	mg/kg	0.0551	0.0520	0.124	0.116	0.00040	0.107	0.00080	8223417
Total Vanadium (V)	mg/kg	0.141	0.123	0.209	0.249	0.020	0.207	0.040	8223417
Total Zinc (Zn)	mg/kg	24.2	23.1	36.7	25.0	0.040	23.0	0.080	8223417

RDL = Reportable Detection Limit

ELEMENTS BY ATOMIC SPECTROSCOPY - WET WT (TISSUE)

Maxxam ID		OG2682		
Sampling Date		2016/03/04		
COC Number		08418991		
	UNITS	**IC4.5-BI-1**	**RDL**	**QC Batch**
Total Metals by ICPMS				
Total Aluminum (Al)	mg/kg	1780	2.4	8223417
Total Antimony (Sb)	mg/kg	0.036	0.012	8223417
Total Arsenic (As)	mg/kg	2.50	0.060	8223417
Total Barium (Ba)	mg/kg	42.5	0.12	8223417
Total Beryllium (Be)	mg/kg	0.055	0.024	8223417
Total Bismuth (Bi)	mg/kg	<0.24	0.24	8223417
Total Boron (B)	mg/kg	<4.8	4.8	8223417
Total Cadmium (Cd)	mg/kg	0.171	0.024	8223417
Total Calcium (Ca)	mg/kg	1890	24	8223417
Total Chromium (Cr)	mg/kg	3.62	0.12	8223417
Total Cobalt (Co)	mg/kg	1.99	0.048	8223417
Total Copper (Cu)	mg/kg	6.32	0.12	8223417
Total Iron (Fe)	mg/kg	4340	12	8223417
Total Lead (Pb)	mg/kg	0.924	0.024	8223417
Total Magnesium (Mg)	mg/kg	1340	24	8223417
Total Manganese (Mn)	mg/kg	159	0.24	8223417
Total Mercury (Hg)	mg/kg	0.030	0.024	8223417
Total Molybdenum (Mo)	mg/kg	0.22	0.12	8223417
Total Nickel (Ni)	mg/kg	4.63	0.12	8223417
Total Phosphorus (P)	mg/kg	1860	24	8223417
Total Potassium (K)	mg/kg	1430	24	8223417
Total Selenium (Se)	mg/kg	0.54	0.12	8223417
Total Silver (Ag)	mg/kg	<0.048	0.048	8223417
Total Sodium (Na)	mg/kg	513	24	8223417
Total Strontium (Sr)	mg/kg	10.9	0.12	8223417
Total Thallium (Tl)	mg/kg	0.0551	0.0048	8223417
Total Tin (Sn)	mg/kg	0.25	0.24	8223417
Total Titanium (Ti)	mg/kg	214	0.60	8223417
Total Uranium (U)	mg/kg	1.26	0.0048	8223417
Total Vanadium (V)	mg/kg	6.69	0.24	8223417
Total Zinc (Zn)	mg/kg	47.8	0.48	8223417
RDL = Reportable Detection Limit				

Maxxam Job #: B617947
Report Date: 2016/04/07

EDI ENVIRONMENTAL DYNAMICS INC.
Client Project #: 14Y0306:102
Site Location: COFFEE CREEK
Sampler Initials: BS

PHYSICAL TESTING (TISSUE)

Maxxam ID		OG2657	OG2658	OG2659	OG2660	OG2661	OG2662	OG2663		
Sampling Date		2016/03/04	2016/03/04	2016/03/05	2016/03/05	2016/03/05	2016/03/05	2016/03/05		
COC Number		08418991	08418991	08418991	08418991	08418991	08418991	08418991		
	UNITS	**CC4.5-BI-1**	**CC4.5-BI-2**	**CC4.5-BI-3**	**CC4.5-BI-4**	**CC4.5-BI-5**	**CC4.5-BI-6**	**CCM-BI-1**	**RDL**	**QC Batch**
Physical Properties										
Moisture	%	71	70	81	73	78	72	80	0.30	8227173
RDL = Reportable Detection Limit										

Maxxam ID		OG2664	OG2668	OG2666	OG2667	OG2665	OG2669	OG2676		
Sampling Date		2016/03/04	2016/03/05	2016/03/04	2016/03/05	2016/03/04	2016/03/05	2016/03/04		
COC Number		08418991	08418990	08418991	08418990	08418991	08418990	08418990		
	UNITS	**CC4.5-CH-1**	**CC4.5-CH-2**	**CC4.5-CH-3**	**CCM-CH-1**	**CCM-CH-2**	**CCM-CH-3**	**CC997-CCG-1**	**RDL**	**QC Batch**
Physical Properties										
Moisture	%	77	82	59	78	77	78	75	0.30	8227173
RDL = Reportable Detection Limit										

Maxxam ID		OG2671	OG2670	OG2673	OG2674	OG2675	OG2682		
Sampling Date		2016/03/04	2016/03/04	2016/03/04	2016/03/04	2016/03/04	2016/03/04		
COC Number		08418990	08418990	08418990	08418990	08418990	08418991		
	UNITS	**CC0.5-CCG-2**	**CC4.5-CCG-1**	**CC4.5-CCG-2**	**CC4.5-CCG-3**	**CC4.5-CCG-4**	**IC4.5-BI-1**	**RDL**	**QC Batch**
Physical Properties									
Moisture	%	82	78	81	80	76	67	0.30	8227173
RDL = Reportable Detection Limit									

GENERAL COMMENTS

Revised Report (Version 2R): Client sample IDs for samples OG2665, OG2668, OG2670, and OG2672 have been corrected, and sample reporting order has also been corrected [GRR].

ELEMENTS BY ATOMIC SPECTROSCOPY - WET WT (TISSUE) Comments

Sample OG2657-01 Elements by CRC ICPMS - Tissue Wet Wt: RDL raised due to limited initial sample amount.
Sample OG2658-01 Elements by CRC ICPMS - Tissue Wet Wt: RDL raised due to limited initial sample amount.
Sample OG2659-01 Elements by CRC ICPMS - Tissue Wet Wt: RDL raised due to limited initial sample amount.
Sample OG2660-01 Elements by CRC ICPMS - Tissue Wet Wt: RDL raised due to limited initial sample amount.
Sample OG2661-01 Elements by CRC ICPMS - Tissue Wet Wt: RDL raised due to limited initial sample amount.
Sample OG2662-01 Elements by CRC ICPMS - Tissue Wet Wt: RDL raised due to limited initial sample amount.
Sample OG2663-01 Elements by CRC ICPMS - Tissue Wet Wt: RDL raised due to limited initial sample amount.
Sample OG2664-01 Elements by CRC ICPMS - Tissue Wet Wt: RDL raised due to limited initial sample amount.
Sample OG2668-01 Elements by CRC ICPMS - Tissue Wet Wt: RDL raised due to limited initial sample amount.
Sample OG2666-01 Elements by CRC ICPMS - Tissue Wet Wt: RDL raised due to limited initial sample amount.
Sample OG2667-01 Elements by CRC ICPMS - Tissue Wet Wt: RDL raised due to limited initial sample amount.
Sample OG2665-01 Elements by CRC ICPMS - Tissue Wet Wt: RDL raised due to limited initial sample amount.
Sample OG2669-01 Elements by CRC ICPMS - Tissue Wet Wt: RDL raised due to limited initial sample amount.
Sample OG2671-01 Elements by CRC ICPMS - Tissue Wet Wt: RDL raised due to limited initial sample amount.
Sample OG2672-01 Elements by CRC ICPMS - Tissue Wet Wt: RDL raised due to limited initial sample amount.
Sample OG2682-01 Elements by CRC ICPMS - Tissue Wet Wt: RDL raised due to limited initial sample amount.

Results relate only to the items tested.

Maxxam Job #: B617947
Report Date: 2016/04/07

QUALITY ASSURANCE REPORT

EDI ENVIRONMENTAL DYNAMICS INC.
Client Project #: 14Y0306:102
Site Location: COFFEE CREEK
Sampler Initials: BS

			Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
8223417	Total Aluminum (Al)	2016/03/30			<0.20	mg/kg				
8223417	Total Antimony (Sb)	2016/03/30	102	75 - 125	<0.0010	mg/kg				
8223417	Total Arsenic (As)	2016/03/30	100	75 - 125	<0.0050	mg/kg			100	75 - 125
8223417	Total Barium (Ba)	2016/03/30	110	75 - 125	<0.010	mg/kg				
8223417	Total Beryllium (Be)	2016/03/30	96	75 - 125	<0.0020	mg/kg				
8223417	Total Bismuth (Bi)	2016/03/30			<0.020	mg/kg				
8223417	Total Boron (B)	2016/03/30			<0.40	mg/kg				
8223417	Total Cadmium (Cd)	2016/03/30	98	75 - 125	<0.0020	mg/kg			110	75 - 125
8223417	Total Calcium (Ca)	2016/03/30			<2.0	mg/kg				
8223417	Total Chromium (Cr)	2016/03/30	106	75 - 125	<0.010	mg/kg			89	75 - 125
8223417	Total Cobalt (Co)	2016/03/30	104	75 - 125	<0.0040	mg/kg				
8223417	Total Copper (Cu)	2016/03/30	105	75 - 125	<0.010	mg/kg			100	75 - 125
8223417	Total Iron (Fe)	2016/03/30			<1.0	mg/kg			113	75 - 125
8223417	Total Lead (Pb)	2016/03/30	88	75 - 125	<0.0020	mg/kg			75	75 - 125
8223417	Total Magnesium (Mg)	2016/03/30			<2.0	mg/kg				
8223417	Total Manganese (Mn)	2016/03/30	103	75 - 125	<0.020	mg/kg				
8223417	Total Mercury (Hg)	2016/03/30	106	75 - 125	<0.0020	mg/kg			104	75 - 125
8223417	Total Molybdenum (Mo)	2016/03/30	102	75 - 125	<0.010	mg/kg				
8223417	Total Nickel (Ni)	2016/03/30	104	75 - 125	<0.010	mg/kg			95	75 - 125
8223417	Total Phosphorus (P)	2016/03/30			<2.0	mg/kg				
8223417	Total Potassium (K)	2016/03/30			<2.0	mg/kg				
8223417	Total Selenium (Se)	2016/03/30	93	75 - 125	<0.010	mg/kg			98	75 - 125
8223417	Total Silver (Ag)	2016/03/30	95	75 - 125	<0.0040	mg/kg				
8223417	Total Sodium (Na)	2016/03/30			<2.0	mg/kg				
8223417	Total Strontium (Sr)	2016/03/30	93	75 - 125	<0.010	mg/kg				
8223417	Total Thallium (Tl)	2016/03/30	98	75 - 125	<0.00040	mg/kg				
8223417	Total Tin (Sn)	2016/03/30	101	75 - 125	<0.020	mg/kg				
8223417	Total Titanium (Ti)	2016/03/30	106	75 - 125	<0.050	mg/kg				
8223417	Total Uranium (U)	2016/03/30	85	75 - 125	<0.00040	mg/kg				
8223417	Total Vanadium (V)	2016/03/30	106	75 - 125	<0.020	mg/kg				
8223417	Total Zinc (Zn)	2016/03/30	101	75 - 125	<0.040	mg/kg			99	75 - 125

QUALITY ASSURANCE REPORT(CONT'D)

			Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	**Parameter**	**Date**	**% Recovery**	**QC Limits**	**Value**	**UNITS**	**Value (%)**	**QC Limits**	**% Recovery**	**QC Limits**
8227173	Moisture	2016/03/30			<0.30	%	1.6	20		

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

[Signature redacted]

Rob Reinert, Data Validation Coordinator

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam
A Bureau Veritas Group Company

RECEVIED IN WHITEHORSE
BY:

Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5. Toll Free (800) 665-8566

CHAIN OF CUSTODY RECORD

COC #
08418991

BBY FCD-00077/05
Page 1 of 2

2016 -03

Invoice Information

Company Name: EDI Environmental Dynamics Inc.
Contact Name: Shannon Jenner
Address: 2195 2nd Avenue
Whitehorse, YT PC: Y1A 3T8
Phone: 867-393-4882
Email: [email redacted]

TEMP: 0 1 2 2

Report Information (if differs from invoice)

Company Name: EDI
Contact Name: Lyndsay Doetzel
Address: same as invoice
PC:
Phone: 867-393-4882
Email: [email redacted]

Project Information (where applicable)

Quotation #: B60053
P.O. #/ AFE#:
Project #: 14Y0306:102
Site Location: Coffee Creek
Site #:
Sampled By: B. Schonewille

Turnaround Time (TAT) Required

☒ Regular TAT 5 days (Most analyses)

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Rush TAT (Surcharges will be applied)
☐ Same Day ☐ 2 Days
☐ 1 Day ☐ 3 Days

Date Required:
Rush Confirmation #:

Regulatory Criteria

☐ BC CSR Soil ☐ BC CSR Water
☐ CCME (Specify) ☐ Other (Specify)
☐ Drinking Water ☐ BC Water Quality

Special Instructions

☐ Return Cooler
☐ Ship Sample Bottles (Please Specify)

LABORATORY USE ONLY

CUSTODY SEAL [✓ Y] / N		COOLER TEMPERATURES
Present	Intact	
Y	Y	3 4 1

COOLING MEDIA PRESENT [✓ Y] / N
COMMENTS

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Analysis Requested

	Sample Identification	Lab Identification	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	BTEX/VPH ☐ MTBE ☐ VOC/VPH ☐	EPH ☐ TEH ☐	PAH ☐ LEPH/HEPH ☐	CCME-PHC BTEX/F1 ☐ F2-F4 ☐	Dissolved Metals Filtered? ☐ Preserved? ☐	Dissolved Mercury Filtered? ☐ Preserved? ☐	Total Metals Field Preserved? ☐	Total Mercury Field Preserved? ☐	Chloride ☐ Fluoride ☐ Sulphate ☐	TSS ☐ TDS ☐ BOD ☐ COD ☐	pH ☐ Conductivity ☐ Alkalinity ☐	Nitrite ☐ Nitrate ☐ Ammonia ☐	Total Metals in Tissue (wet weight)	% Moisture in Tissue			# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE
1	CC4.5-BI-1		2016/03/04	NA	tissue													x	x			1	
2	CC4.5-BI-2		2016/03/04	NA	tissue													x	x			1	
3	CC4.5-BI-3		2016/03/05	NA	tissue													x	x			1	
4	CC4.5-BI-4		2016/03/05	NA	tissue													x	x			1	
5	CC4.5-BI-5		2016/03/05	NA	tissue													x	x			1	
6	CC4.5-BI-6		2016/03/05	NA	tissue													x	x			1	
7	CCM-BI-1		2016/03/05	NA	tissue													x	x			1	
8	CC4.5-CH-1		2016/03/04	NA	tissue													x	x			1	
9	CC4.5-CH-2		2016/03/04	NA	tissue													x	x			1	
10	CC4.5-CH-3		2016/03/04	NA	tissue													x	x			1	

B617947_COC

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	MAXXAM JOB #
[signature redacted]	2016/03/08	11:30	[signature redacted]	2016/03/08	11:45.	B617947
				2016/03/09	13:30	

Maxxam
A Bureau Veritas Group Company

RECEVIED IN WHITEHORSE
BY:
2016 -03- 08
MS.

Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5. Toll Free (800) 665-8566

CHAIN OF CUSTODY RECORD

COC 08418990

BBY FCD-00077/05
Page 2 of 2

Invoice Information

Company Name: EDI Environmental Dynamics Inc.
Contact Name: Shannon Jenner
Address: 2195 2nd Avenue
Whitehorse, YT PC: Y1A 3T8
Phone: 867-393-4882
Email: [email redacted]

TEMP: 0 / 2 / 2

Report Information (if differs from invoice)

Company Name: EDI
Contact Name: Lyndsay Doetzel
Address: same as invoice
PC:
Phone: 867-393-4882
Email: [email redacted]

Project Information (whe

Quotation #: B60053
P.O. #/ AFE#:
Project #: 14Y0306: 102
Site Location: Coffee Creek
Site #:
Sampled By: B. Schonewille

ound Time (TAT) Required

☒ Regular TAT 5 days (Most analyses)

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Rush TAT (Surcharges will be applied)
☐ Same Day ☐ 2 Days
☐ 1 Day ☐ 3 Days

Date Required:
Rush Confirmation #:

Regulatory Criteria

☐ BC CSR Soil ☐ BC CSR Water
☐ CCME (Specify) ☐ Other (Specify)
☐ Drinking Water ☐ BC Water Quality

Special Instructions

☐ Return Cooler
☐ Ship Sample Bottles (Please Specify)

LABORATORY USE ONLY

CUSTODY SEAL [✓ Y] / N		COOLER TEMPERATURES
Present	Intact	
Y	y	3/1

COOLING MEDIA PRESENT [✓ Y] / N

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Analysis Requested

	Sample Identification	Lab Identification	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	BTEX/VPH ☐ MTBE ☐ VOC/VPH ☐	EPH ☐ TEH ☐	PAH ☐ LEPH/HEPH ☐	CCME-PHC BTEX/F1 ☐ F2-F4 ☐	Dissolved Metals Filtered? ☐ Preserved? ☐	Dissolved Mercury Filtered? ☐ Preserved? ☐	Total Metals Field Preserved? ☐	Total Mercury Field Preserved? ☐	Chloride ☐ Fluoride ☐ Sulphate ☐	TSS ☐ TDS ☐ BOD ☐ COD ☐	pH ☐ Conductivity ☐ Alkalinity ☐	Nitrite ☐ Nitrate ☐ Ammonia ☐	Total Metals in Tissue (wet weight)	% Moisture in Tissue			# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE	
1	CCM-CH-1		2016/03/05	NA	tissue													×	×			1		
2	CCM-CH-2		2016/03/05	NA	tissue													×	×			1		
3	CCM-CH-3		2016/03/05	NA	tissue													×	×			1		
4	CC997-CCG-1		2016/03/04	NA	tissue													×	×			1		
5	CC0.5-CCG-2		2016/03/04	NA	tissue													×	×			1		
6	CC4.5-CCG-1		2016/03/04	NA	tissue													×	×			1		
7	CC4.5-CCG-2		2016/03/04	NA	tissue													×	×			1		
8	CC4.5-CCG-3		2016/03/04	NA	tissue													×	×			1		
9	CC4.5-CCG-4		2016/03/04	NA	tissue													×	×			1		
10	CC4.5BI-CCG-1		2016/03/04	NA	tissue													×	×			1		pool of 3 very small scuplins

B617947_COC

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	MAXXAM JOB #
[signature redacted]	2016/03/08	11:30	[signature redacted]	2016/03/08	11:45	B617947
				2016/03/09	13:30	

Your Project #: 14Y0306:102
Site Location: COFFEE CREEK
Your C.O.C. #: 08426765, 08426766, 08426767

Attention:LYNDSAY DOETZEL
EDI ENVIRONMENTAL DYNAMICS INC.
2195 2nd Avenue
WHITEHORSE, YT
CANADA Y1A 3T8

Report Date: 2016/09/27
Report #: R2269922
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B673221
Received: 2016/08/25, 14:15

Sample Matrix: TISSUE
Samples Received: 25

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Elements by CRC ICPMS - Tissue Wet Wt	17	2016/09/19	2016/09/22	BBY7SOP-00021,	BCLM2005,EPA6020bR2m
Elements by CRC ICPMS - Tissue Wet Wt	1	2016/09/19	2016/09/27	BBY7SOP-00021,	BCLM2005,EPA6020bR2m
Elements by CRC ICPMS - Tissue Wet Wt	7	2016/09/20	2016/09/24	BBY7SOP-00021,	BCLM2005,EPA6020bR2m
Moisture in Tissue	25	N/A	2016/09/22	BBY8SOP-00017	OMOE E3139 3.1 m

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Maxxam
REPORT AUTOMATION ENGINE
27 Sep 2016 16:25:39 -07:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Graham Rudkin, Project Manager, Environmental
Email: [email redacted]
Phone# [phone number redacted]
======: =======================================
This report has been generated and distributed using a secure automated process.
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

ELEMENTS BY ATOMIC SPECTROSCOPY - WET WT (TISSUE)

Maxxam ID		PJ3303	PJ3304	PJ3305	PJ3306	PJ3307	PJ3308		
Sampling Date		2016/08/23 12:00	2016/08/23 12:00	2016/08/23 13:00	2016/08/20 12:00	2016/08/20 12:30	2016/08/20 12:00		
COC Number		08426765	08426765	08426765	08426765	08426765	08426765		
	UNITS	**HF 0.2-B1-1**	**HF 0.2-B1-2**	**YT 0.2-B1-1**	**LAC 4.8-B1-1**	**LAC 4.8-B1-2**	**CF 10.0-B1-1**	**RDL**	**QC Batch**
Total Metals by ICPMS									
Total Aluminum (Al)	mg/kg	423	222	359	223	535	687	0.20	8402808
Total Antimony (Sb)	mg/kg	0.0918	0.0887	0.0466	0.0538	0.0632	0.0718	0.0010	8402808
Total Arsenic (As)	mg/kg	0.902	0.596	0.480	0.478	1.88	0.855	0.0050	8402808
Total Barium (Ba)	mg/kg	6.58	9.15	5.45	8.59	20.9	15.2	0.010	8402808
Total Beryllium (Be)	mg/kg	0.0190	0.0200	0.0170	0.0153	0.0441	0.0197	0.0020	8402808
Total Bismuth (Bi)	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	8402808
Total Boron (B)	mg/kg	<0.40	<0.40	<0.40	0.43	0.40	<0.40	0.40	8402808
Total Cadmium (Cd)	mg/kg	0.0955	0.104	0.0690	0.0836	0.135	0.425	0.0020	8402808
Total Calcium (Ca)	mg/kg	534	855	433	414	796	821	2.0	8402808
Total Chromium (Cr)	mg/kg	1.12	0.495	0.565	2.20	1.82	0.920	0.010	8402808
Total Cobalt (Co)	mg/kg	0.386	0.336	0.335	0.478	1.17	0.749	0.0040	8402808
Total Copper (Cu)	mg/kg	3.01	3.40	2.73	3.07	3.85	4.11	0.010	8402808
Total Iron (Fe)	mg/kg	698	457	622	675	1920	1210	1.0	8402808
Total Lead (Pb)	mg/kg	0.187	0.151	0.251	0.181	0.505	0.293	0.0020	8402808
Total Magnesium (Mg)	mg/kg	339	254	278	392	444	414	2.0	8402808
Total Manganese (Mn)	mg/kg	31.1	44.7	37.1	67.0	126	75.3	0.020	8402808
Total Mercury (Hg)	mg/kg	0.0114	0.0136	0.0115	0.0093	0.0065	0.0208	0.0020	8402808
Total Molybdenum (Mo)	mg/kg	0.116	0.288	0.128	0.218	0.200	0.192	0.010	8402808
Total Nickel (Ni)	mg/kg	0.811	0.753	0.476	1.47	2.79	0.862	0.010	8402808
Total Phosphorus (P)	mg/kg	1250	1380	1400	1070	634	1310	2.0	8402808
Total Potassium (K)	mg/kg	1110	1180	1290	1550	718	1160	2.0	8402808
Total Selenium (Se)	mg/kg	0.193	0.232	0.213	0.469	0.542	1.27	0.010	8402808
Total Silver (Ag)	mg/kg	0.0041	0.0044	0.0054	0.0059	0.0105	0.0159	0.0040	8402808
Total Sodium (Na)	mg/kg	436	442	513	1260	376	445	2.0	8402808
Total Strontium (Sr)	mg/kg	4.37	8.12	2.49	2.98	6.36	4.42	0.010	8402808
Total Thallium (Tl)	mg/kg	0.00782	0.00540	0.00512	0.00343	0.00768	0.0135	0.00040	8402808
Total Tin (Sn)	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	8402808
Total Titanium (Ti)	mg/kg	17.5	9.84	19.0	11.0	25.0	36.6	0.050	8402808
Total Uranium (U)	mg/kg	1.45	5.76	0.280	0.178	0.282	1.06	0.00040	8402808
Total Vanadium (V)	mg/kg	1.17	0.850	1.12	1.45	3.45	2.42	0.020	8402808
Total Zinc (Zn)	mg/kg	19.2	19.8	20.3	14.3	14.2	25.1	0.040	8402808
RDL = Reportable Detection Limit									

ELEMENTS BY ATOMIC SPECTROSCOPY - WET WT (TISSUE)

Maxxam ID		PJ3309	PJ3310	PJ3311	PJ3312	PJ3343	PJ3344		
Sampling Date		2016/08/20 13:00	2016/08/20 13:00	2016/08/20 14:00	2016/08/21 12:00	2016/08/21 13:00	2016/08/21 14:00		
COC Number		08426765	08426765	08426765	08426765	08426766	08426766		
	UNITS	**CF 3.9-B1-1**	**HF 6.3-B1-1**	**IC 1.9-B1-1**	**YT 5.0-B1-1**	**LC 2.7-B1-1**	**LC 9.9-B1-1**	**RDL**	**QC Batch**
Total Metals by ICPMS									
Total Aluminum (Al)	mg/kg	1880	384	1270	352	400	447	0.20	8402808
Total Antimony (Sb)	mg/kg	0.0805	0.0923	0.0657	0.100	0.0302	0.0607	0.0010	8402808
Total Arsenic (As)	mg/kg	1.98	0.805	1.57	0.674	0.563	0.837	0.0050	8402808
Total Barium (Ba)	mg/kg	37.4	5.91	18.1	12.1	5.56	5.86	0.010	8402808
Total Beryllium (Be)	mg/kg	0.0497	0.0163	0.0431	0.0159	0.0191	0.0209	0.0020	8402808
Total Bismuth (Bi)	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	8402808
Total Boron (B)	mg/kg	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	8402808
Total Cadmium (Cd)	mg/kg	0.259	0.131	0.187	0.0880	0.185	0.0670	0.0020	8402808
Total Calcium (Ca)	mg/kg	1130	380	573	471	518	435	2.0	8402808
Total Chromium (Cr)	mg/kg	2.05	0.653	2.47	0.539	0.586	0.655	0.010	8402808
Total Cobalt (Co)	mg/kg	1.83	0.273	1.14	0.462	0.361	0.291	0.0040	8402808
Total Copper (Cu)	mg/kg	3.98	2.03	3.20	1.78	2.54	2.14	0.010	8402808
Total Iron (Fe)	mg/kg	3980	523	2330	564	613	921	1.0	8402808
Total Lead (Pb)	mg/kg	0.692	0.161	0.697	0.229	0.218	0.286	0.0020	8402808
Total Magnesium (Mg)	mg/kg	1070	242	791	215	250	246	2.0	8402808
Total Manganese (Mn)	mg/kg	142	29.8	87.3	41.1	43.2	40.2	0.020	8402808
Total Mercury (Hg)	mg/kg	0.0245	0.0163	0.0210	0.0116	0.0188	0.0417	0.0020	8402808
Total Molybdenum (Mo)	mg/kg	0.308	0.125	0.217	0.099	0.112	0.094	0.010	8402808
Total Nickel (Ni)	mg/kg	1.76	0.442	1.72	0.406	0.534	0.433	0.010	8402808
Total Phosphorus (P)	mg/kg	950	1310	1360	1280	1170	1200	2.0	8402808
Total Potassium (K)	mg/kg	1230	1150	1480	1080	1090	1010	2.0	8402808
Total Selenium (Se)	mg/kg	1.07	0.555	0.760	0.099	0.727	0.221	0.010	8402808
Total Silver (Ag)	mg/kg	0.0122	0.0069	0.0099	0.0102	0.0075	0.0059	0.0040	8402808
Total Sodium (Na)	mg/kg	359	387	640	502	562	434	2.0	8402808
Total Strontium (Sr)	mg/kg	7.66	3.84	2.89	1.90	4.04	3.61	0.010	8402808
Total Thallium (Tl)	mg/kg	0.0465	0.00529	0.0286	0.00454	0.00561	0.00513	0.00040	8402808
Total Tin (Sn)	mg/kg	0.072	<0.020	0.049	<0.020	<0.020	<0.020	0.020	8402808
Total Titanium (Ti)	mg/kg	178	17.3	89.6	15.9	14.8	23.4	0.050	8402808
Total Uranium (U)	mg/kg	1.75	1.40	0.498	0.173	0.683	0.593	0.00040	8402808
Total Vanadium (V)	mg/kg	8.35	0.846	3.92	0.973	0.939	1.55	0.020	8402808
Total Zinc (Zn)	mg/kg	22.3	18.5	23.4	22.4	17.5	19.2	0.040	8402808
RDL = Reportable Detection Limit									

ELEMENTS BY ATOMIC SPECTROSCOPY - WET WT (TISSUE)

Maxxam ID		PJ3345	PJ3346	PJ3347	PJ3348		PJ3349		
Sampling Date		2016/08/23 12:00	2016/08/23 12:00	2016/08/23 12:00	2016/08/23 12:00		2016/08/23 12:00		
COC Number		08426766	08426766	08426766	08426766		08426766		
	UNITS	**HF 0.2-AG-1**	**HF 0.2-CS-1**	**HF 0.2-CS-2**	**HF 0.2-CS-3**	**RDL**	**HF 0.2-CS-4**	**RDL**	**QC Batch**
Total Metals by ICPMS									
Total Aluminum (Al)	mg/kg	4.63	10.0	25.6	1.24	0.20	2.79	0.40	8402808
Total Antimony (Sb)	mg/kg	0.0119	0.0085	0.0061	0.0067	0.0010	0.0102	0.0020	8402808
Total Arsenic (As)	mg/kg	0.0636 (1)	0.0360	0.0561	0.0365	0.0050	0.039	0.010	8402808
Total Barium (Ba)	mg/kg	1.68	1.16	0.873	0.776	0.010	0.911	0.020	8402808
Total Beryllium (Be)	mg/kg	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	<0.0040	0.0040	8402808
Total Bismuth (Bi)	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	<0.040	0.040	8402808
Total Boron (B)	mg/kg	<0.40	<0.40	<0.40	<0.40	0.40	<0.80	0.80	8402808
Total Cadmium (Cd)	mg/kg	0.0602	0.0255	0.0358	0.0122	0.0020	0.0196	0.0040	8402808
Total Calcium (Ca)	mg/kg	9190	4230	3650	3960	2.0	4550	4.0	8402808
Total Chromium (Cr)	mg/kg	0.011	0.023	0.256	<0.010	0.010	<0.020	0.020	8402808
Total Cobalt (Co)	mg/kg	0.0332	0.0213	0.0480	0.0183	0.0040	0.0476	0.0080	8402808
Total Copper (Cu)	mg/kg	0.659	0.790	0.676	0.599	0.010	0.660	0.020	8402808
Total Iron (Fe)	mg/kg	14.0	23.8	47.6	10.8	1.0	11.8	2.0	8402808
Total Lead (Pb)	mg/kg	0.0079	0.0083	0.0100	0.0035	0.0020	0.0048	0.0040	8402808
Total Magnesium (Mg)	mg/kg	375	302	317	318	2.0	341	4.0	8402808
Total Manganese (Mn)	mg/kg	2.80	1.54	2.58	1.28	0.020	1.49	0.040	8402808
Total Mercury (Hg)	mg/kg	0.0332	0.0211	0.0271	0.0268	0.0020	0.0258	0.0040	8402808
Total Molybdenum (Mo)	mg/kg	0.011	0.023	0.021	0.011	0.010	<0.020	0.020	8402808
Total Nickel (Ni)	mg/kg	0.015	0.025	0.108	0.017	0.010	0.026	0.020	8402808
Total Phosphorus (P)	mg/kg	8240	4660	4410	4850	2.0	5000	4.0	8402808
Total Potassium (K)	mg/kg	4110	3380	3610	3800	2.0	3520	4.0	8402808
Total Selenium (Se)	mg/kg	1.32	0.590	0.660	0.602	0.010	0.613	0.020	8402808
Total Silver (Ag)	mg/kg	<0.0040	<0.0040	<0.0040	<0.0040	0.0040	<0.0080	0.0080	8402808
Total Sodium (Na)	mg/kg	993	870	963	745	2.0	883	4.0	8402808
Total Strontium (Sr)	mg/kg	12.9	4.63	4.11	3.70	0.010	3.80	0.020	8402808
Total Thallium (Tl)	mg/kg	0.00643	0.00195	0.00348	0.00318	0.00040	0.00283	0.00080	8402808
Total Tin (Sn)	mg/kg	0.024	<0.020	<0.020	<0.020	0.020	0.048	0.040	8402808
Total Titanium (Ti)	mg/kg	0.324	0.578	1.56	0.243	0.050	0.37	0.10	8402808
Total Uranium (U)	mg/kg	0.0114	0.0215	0.0358	0.00776	0.00040	0.00881	0.00080	8402808
Total Vanadium (V)	mg/kg	<0.020	<0.020	0.046	<0.020	0.020	<0.040	0.040	8402808
Total Zinc (Zn)	mg/kg	28.6	25.2	24.8	25.5	0.040	26.5	0.080	8402808

RDL = Reportable Detection Limit

(1) Duplicate RPD above control limit - (10% of analytes failure allowed).

ELEMENTS BY ATOMIC SPECTROSCOPY - WET WT (TISSUE)

Maxxam ID		PJ3350		PJ3351	PJ3352	PJ3364	PJ3365		
Sampling Date		2016/08/23 12:00		2016/08/23 12:00	2016/08/23 12:00	2016/08/23 12:00	2016/08/23 12:00		
COC Number		08426766		08426766	08426766	08426767	08426767		
	UNITS	**HF 0.2-CS-5**	**QC Batch**	**HF 0.2-CS-6**	**HF 0.2-CS-7**	**HF 0.2-CS-8**	**HF 0.2-CS-9**	**RDL**	**QC Batch**
Total Metals by ICPMS									
Total Aluminum (Al)	mg/kg	1.64	8402808	7.97	14.5	11.7	7.12	0.20	8404270
Total Antimony (Sb)	mg/kg	0.0094	8402808	0.0090	0.0078	0.0094	0.0078	0.0010	8404270
Total Arsenic (As)	mg/kg	0.0404	8402808	0.0377	0.0886	0.0526	0.0608	0.0050	8404270
Total Barium (Ba)	mg/kg	0.679	8402808	1.27	1.10	1.08	1.13	0.010	8404270
Total Beryllium (Be)	mg/kg	<0.0020	8402808	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	8404270
Total Bismuth (Bi)	mg/kg	<0.020	8402808	<0.020	<0.020	<0.020	<0.020	0.020	8404270
Total Boron (B)	mg/kg	<0.40	8402808	<0.40	<0.40	<0.40	<0.40	0.40	8404270
Total Cadmium (Cd)	mg/kg	0.0594	8402808	0.0987	0.0367	0.0314	0.0306	0.0020	8404270
Total Calcium (Ca)	mg/kg	2960	8402808	5820	4750	5460	5260	2.0	8404270
Total Chromium (Cr)	mg/kg	<0.010	8402808	0.021	0.035	0.023	0.020	0.010	8404270
Total Cobalt (Co)	mg/kg	0.0428	8402808	0.0449	0.0366	0.0382	0.0449	0.0040	8404270
Total Copper (Cu)	mg/kg	0.562	8402808	1.06	0.835	0.763	0.596	0.010	8404270
Total Iron (Fe)	mg/kg	11.5	8402808	36.2	33.3	34.9	26.0	1.0	8404270
Total Lead (Pb)	mg/kg	0.0067	8402808	0.0105	0.0080	0.0074	0.0058	0.0020	8404270
Total Magnesium (Mg)	mg/kg	285	8402808	318	308	321	324	2.0	8404270
Total Manganese (Mn)	mg/kg	2.70	8402808	3.09	2.53	2.02	3.20	0.020	8404270
Total Mercury (Hg)	mg/kg	0.0255	8402808	0.0237	0.0278	0.0223	0.0235	0.0020	8404270
Total Molybdenum (Mo)	mg/kg	0.013	8402808	0.042	0.023	0.017	0.013	0.010	8404270
Total Nickel (Ni)	mg/kg	0.018	8402808	0.019	0.043	0.034	0.040	0.010	8404270
Total Phosphorus (P)	mg/kg	4090	8402808	5720	5040	5210	5210	2.0	8404270
Total Potassium (K)	mg/kg	3480	8402808	3290	3480	3220	3280	2.0	8404270
Total Selenium (Se)	mg/kg	0.649	8402808	0.545	0.553	0.635	0.676	0.010	8404270
Total Silver (Ag)	mg/kg	<0.0040	8402808	<0.0040	<0.0040	<0.0040	<0.0040	0.0040	8404270
Total Sodium (Na)	mg/kg	883	8402808	927	999	989	961	2.0	8404270
Total Strontium (Sr)	mg/kg	3.69	8402808	6.08	5.90	5.33	5.60	0.010	8404270
Total Thallium (Tl)	mg/kg	0.00302	8402808	0.00328	0.00402	0.00255	0.00326	0.00040	8404270
Total Tin (Sn)	mg/kg	<0.020	8402808	<0.020	<0.020	<0.020	<0.020	0.020	8404270
Total Titanium (Ti)	mg/kg	0.199	8402808	0.739	1.00	0.856	0.843	0.050	8404270
Total Uranium (U)	mg/kg	0.00903	8402808	0.0135	0.0374	0.0271	0.0150	0.00040	8404270
Total Vanadium (V)	mg/kg	<0.020	8402808	0.025	0.040	0.039	0.034	0.020	8404270
Total Zinc (Zn)	mg/kg	20.4	8402808	29.8	23.1	29.4	28.1	0.040	8404270

RDL = Reportable Detection Limit

ELEMENTS BY ATOMIC SPECTROSCOPY - WET WT (TISSUE)

Maxxam ID		PJ3366	PJ3367	PJ3368		
Sampling Date		2016/08/23 12:00	2016/08/23 12:00	2016/08/23 12:00		
COC Number		08426767	08426767	08426767		
	UNITS	**HF 0.2-CS-10**	**HF 0.2-CS-11**	**HF 0.2-CS-12**	**RDL**	**QC Batch**
Total Metals by ICPMS						
Total Aluminum (Al)	mg/kg	7.13	10.6	1.81	0.20	8404270
Total Antimony (Sb)	mg/kg	0.0084	0.0081	0.0067	0.0010	8404270
Total Arsenic (As)	mg/kg	0.0417	0.0514	0.0241	0.0050	8404270
Total Barium (Ba)	mg/kg	1.10	0.697	0.712	0.010	8404270
Total Beryllium (Be)	mg/kg	<0.0020	<0.0020	<0.0020	0.0020	8404270
Total Bismuth (Bi)	mg/kg	<0.020	<0.020	<0.020	0.020	8404270
Total Boron (B)	mg/kg	<0.40	<0.40	<0.40	0.40	8404270
Total Cadmium (Cd)	mg/kg	0.0333	0.0289	0.0154	0.0020	8404270
Total Calcium (Ca)	mg/kg	6080	5140	4090	2.0	8404270
Total Chromium (Cr)	mg/kg	0.107	0.023	<0.010	0.010	8404270
Total Cobalt (Co)	mg/kg	0.0202	0.0198	0.0106	0.0040	8404270
Total Copper (Cu)	mg/kg	0.587	0.637	0.560	0.010	8404270
Total Iron (Fe)	mg/kg	28.7	27.0	13.5	1.0	8404270
Total Lead (Pb)	mg/kg	0.0039	0.0066	0.0026	0.0020	8404270
Total Magnesium (Mg)	mg/kg	321	321	347	2.0	8404270
Total Manganese (Mn)	mg/kg	1.57	1.39	1.02	0.020	8404270
Total Mercury (Hg)	mg/kg	0.0250	0.0293	0.0232	0.0020	8404270
Total Molybdenum (Mo)	mg/kg	0.016	0.016	0.011	0.010	8404270
Total Nickel (Ni)	mg/kg	0.017	0.028	0.022	0.010	8404270
Total Phosphorus (P)	mg/kg	5720	5180	4440	2.0	8404270
Total Potassium (K)	mg/kg	3480	3530	3160	2.0	8404270
Total Selenium (Se)	mg/kg	0.660	0.523	0.403	0.010	8404270
Total Silver (Ag)	mg/kg	<0.0040	<0.0040	<0.0040	0.0040	8404270
Total Sodium (Na)	mg/kg	957	911	956	2.0	8404270
Total Strontium (Sr)	mg/kg	5.46	5.65	4.32	0.010	8404270
Total Thallium (Tl)	mg/kg	0.00281	0.00304	0.00276	0.00040	8404270
Total Tin (Sn)	mg/kg	<0.020	<0.020	<0.020	0.020	8404270
Total Titanium (Ti)	mg/kg	0.528	0.684	0.223	0.050	8404270
Total Uranium (U)	mg/kg	0.00758	0.0242	0.00498	0.00040	8404270
Total Vanadium (V)	mg/kg	<0.020	0.030	<0.020	0.020	8404270
Total Zinc (Zn)	mg/kg	36.0	27.9	23.0	0.040	8404270

RDL = Reportable Detection Limit

PHYSICAL TESTING (TISSUE)

Maxxam ID		PJ3303	PJ3304	PJ3305	PJ3306	PJ3307	PJ3308	PJ3309		
Sampling Date		2016/08/23 12:00	2016/08/23 12:00	2016/08/23 13:00	2016/08/20 12:00	2016/08/20 12:30	2016/08/20 12:00	2016/08/20 13:00		
COC Number		08426765	08426765	08426765	08426765	08426765	08426765	08426765		
	UNITS	**HF 0.2-B1-1**	**HF 0.2-B1-2**	**YT 0.2-B1-1**	**LAC 4.8-B1-1**	**LAC 4.8-B1-2**	**CF 10.0-B1-1**	**CF 3.9-B1-1**	**RDL**	**QC Batch**
Physical Properties										
Moisture	%	90	88	88	89	92	83	86	0.30	8405552
RDL = Reportable Detection Limit										

Maxxam ID		PJ3310	PJ3311	PJ3312	PJ3343	PJ3344	PJ3345	PJ3346		
Sampling Date		2016/08/20 13:00	2016/08/20 14:00	2016/08/21 12:00	2016/08/21 13:00	2016/08/21 14:00	2016/08/23 12:00	2016/08/23 12:00		
COC Number		08426765	08426765	08426765	08426766	08426766	08426766	08426766		
	UNITS	**HF 6.3-B1-1**	**IC 1.9-B1-1**	**YT 5.0-B1-1**	**LC 2.7-B1-1**	**LC 9.9-B1-1**	**HF 0.2-AG-1**	**HF 0.2-CS-1**	**RDL**	**QC Batch**
Physical Properties										
Moisture	%	88	88	89	90	87	78	76	0.30	8405552
RDL = Reportable Detection Limit										

Maxxam ID		PJ3347	PJ3348	PJ3349	PJ3350	PJ3351	PJ3352		
Sampling Date		2016/08/23 12:00	2016/08/23 12:00	2016/08/23 12:00	2016/08/23 12:00	2016/08/23 12:00	2016/08/23 12:00		
COC Number		08426766	08426766	08426766	08426766	08426766	08426766		
	UNITS	**HF 0.2-CS-2**	**HF 0.2-CS-3**	**HF 0.2-CS-4**	**HF 0.2-CS-5**	**HF 0.2-CS-6**	**HF 0.2-CS-7**	**RDL**	**QC Batch**
Physical Properties									
Moisture	%	78	79	76	79	74	86	0.30	8405552
RDL = Reportable Detection Limit									

Maxxam ID		PJ3364	PJ3365	PJ3366	PJ3367	PJ3368		
Sampling Date		2016/08/23 12:00	2016/08/23 12:00	2016/08/23 12:00	2016/08/23 12:00	2016/08/23 12:00		
COC Number		08426767	08426767	08426767	08426767	08426767		
	UNITS	**HF 0.2-CS-8**	**HF 0.2-CS-9**	**HF 0.2-CS-10**	**HF 0.2-CS-11**	**HF 0.2-CS-12**	**RDL**	**QC Batch**
Physical Properties								
Moisture	%	83	<0.30	86	78	81	0.30	8405569
RDL = Reportable Detection Limit								

GENERAL COMMENTS

ELEMENTS BY ATOMIC SPECTROSCOPY - WET WT (TISSUE) Comments

Sample PJ3349-01 Elements by CRC ICPMS - Tissue Wet Wt: RDL raised due to limited initial sample amount.

Results relate only to the items tested.

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
8402808	Total Aluminum (Al)	2016/09/27					<0.20	mg/kg	23	35		
8402808	Total Antimony (Sb)	2016/09/27	125	75 - 125	109	75 - 125	<0.0010	mg/kg	24	35		
8402808	Total Arsenic (As)	2016/09/27	112	75 - 125	106	75 - 125	<0.0050	mg/kg	40 (2)	35	100	75 - 125
8402808	Total Barium (Ba)	2016/09/27	NC	75 - 125	119	75 - 125	<0.010	mg/kg	2.1	35		
8402808	Total Beryllium (Be)	2016/09/27	114	75 - 125	111	75 - 125	<0.0020	mg/kg	NC	35		
8402808	Total Bismuth (Bi)	2016/09/27					<0.020	mg/kg	NC	35		
8402808	Total Boron (B)	2016/09/27					<0.40	mg/kg	NC	35		
8402808	Total Cadmium (Cd)	2016/09/27	109	75 - 125	109	75 - 125	<0.0020	mg/kg	1.3	35	109	75 - 125
8402808	Total Calcium (Ca)	2016/09/27					<2.0	mg/kg	0.68	35		
8402808	Total Chromium (Cr)	2016/09/27	106	75 - 125	99	75 - 125	<0.010	mg/kg	NC	35	89	75 - 125
8402808	Total Cobalt (Co)	2016/09/27	105	75 - 125	100	75 - 125	<0.0040	mg/kg	23	35		
8402808	Total Copper (Cu)	2016/09/27	NC	75 - 125	100	75 - 125	<0.010	mg/kg	1.9	35	100	75 - 125
8402808	Total Iron (Fe)	2016/09/27					<1.0	mg/kg	2.9	35	110	75 - 125
8402808	Total Lead (Pb)	2016/09/27	109	75 - 125	105	75 - 125	<0.0020	mg/kg	NC	35	73 (1)	75 - 125
8402808	Total Magnesium (Mg)	2016/09/27					<2.0	mg/kg	2.1	35		
8402808	Total Manganese (Mn)	2016/09/27	NC	75 - 125	104	75 - 125	<0.020	mg/kg	13	35		
8402808	Total Mercury (Hg)	2016/09/27	NC	75 - 125	110	75 - 125	0.0021, RDL=0.0020	mg/kg	1.3	35	105	75 - 125
8402808	Total Molybdenum (Mo)	2016/09/27	120	75 - 125	106	75 - 125	<0.010	mg/kg	NC	35		
8402808	Total Nickel (Ni)	2016/09/27	104	75 - 125	102	75 - 125	<0.010	mg/kg	NC	35	102	75 - 125
8402808	Total Phosphorus (P)	2016/09/27					<2.0	mg/kg	5.5	35		
8402808	Total Potassium (K)	2016/09/27					<2.0	mg/kg	8.4	35		
8402808	Total Selenium (Se)	2016/09/27	NC	75 - 125	116	75 - 125	<0.010	mg/kg	0.74	35	113	75 - 125
8402808	Total Silver (Ag)	2016/09/27	84	75 - 125	88	75 - 125	<0.0040	mg/kg	NC	35		
8402808	Total Sodium (Na)	2016/09/27					<2.0	mg/kg	2.2	35		
8402808	Total Strontium (Sr)	2016/09/27	NC	75 - 125	106	75 - 125	<0.010	mg/kg	8.2	35		
8402808	Total Thallium (Tl)	2016/09/27	106	75 - 125	108	75 - 125	<0.00040	mg/kg	14	35		
8402808	Total Tin (Sn)	2016/09/27	114	75 - 125	105	75 - 125	<0.020	mg/kg	NC	35		
8402808	Total Titanium (Ti)	2016/09/27	110	75 - 125	99	75 - 125	<0.050	mg/kg	4.4	35		
8402808	Total Uranium (U)	2016/09/27	102	75 - 125	103	75 - 125	0.00052, RDL=0.00040	mg/kg	6.4	35		
8402808	Total Vanadium (V)	2016/09/27	108	75 - 125	102	75 - 125	<0.020	mg/kg	NC	35		

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	**Parameter**	**Date**	**% Recovery**	**QC Limits**	**% Recovery**	**QC Limits**	**Value**	**UNITS**	**Value (%)**	**QC Limits**	**% Recovery**	**QC Limits**
8402808	Total Zinc (Zn)	2016/09/27	NC	75 - 125	106	75 - 125	<0.040	mg/kg	23	35	106	75 - 125
8404270	Total Aluminum (Al)	2016/09/24					<0.20	mg/kg	8.9	35		
8404270	Total Antimony (Sb)	2016/09/24	110	75 - 125	108	75 - 125	<0.0010	mg/kg	NC	35		
8404270	Total Arsenic (As)	2016/09/24	107	75 - 125	104	75 - 125	<0.0050	mg/kg	NC	35	99	75 - 125
8404270	Total Barium (Ba)	2016/09/24	NC	75 - 125	115	75 - 125	<0.010	mg/kg	7.7	35		
8404270	Total Beryllium (Be)	2016/09/24	111	75 - 125	107	75 - 125	<0.0020	mg/kg	NC	35		
8404270	Total Bismuth (Bi)	2016/09/24					<0.020	mg/kg	NC	35		
8404270	Total Boron (B)	2016/09/24					<0.40	mg/kg	NC	35		
8404270	Total Cadmium (Cd)	2016/09/24	110	75 - 125	107	75 - 125	<0.0020	mg/kg	NC	35	107	75 - 125
8404270	Total Calcium (Ca)	2016/09/24					<2.0	mg/kg	1.3	35		
8404270	Total Chromium (Cr)	2016/09/24	106	75 - 125	101	75 - 125	<0.010	mg/kg	NC	35	91	75 - 125
8404270	Total Cobalt (Co)	2016/09/24	106	75 - 125	102	75 - 125	<0.0040	mg/kg	NC	35		
8404270	Total Copper (Cu)	2016/09/24	NC	75 - 125	104	75 - 125	<0.010	mg/kg	17	35	100	75 - 125
8404270	Total Iron (Fe)	2016/09/24					<1.0	mg/kg	NC	35	103	75 - 125
8404270	Total Lead (Pb)	2016/09/24	98	75 - 125	100	75 - 125	<0.0020	mg/kg	NC	35	69 (1)	75 - 125
8404270	Total Magnesium (Mg)	2016/09/24					<2.0	mg/kg	17	35		
8404270	Total Manganese (Mn)	2016/09/24	NC	75 - 125	101	75 - 125	<0.020	mg/kg	7.9	35		
8404270	Total Mercury (Hg)	2016/09/24	109	75 - 125	110	75 - 125	<0.0020	mg/kg	NC	35	102	75 - 125
8404270	Total Molybdenum (Mo)	2016/09/24	104	75 - 125	100	75 - 125	<0.010	mg/kg	NC	35		
8404270	Total Nickel (Ni)	2016/09/24	108	75 - 125	103	75 - 125	<0.010	mg/kg	12	35	158 (1)	75 - 125
8404270	Total Phosphorus (P)	2016/09/24					<2.0	mg/kg	16	35		
8404270	Total Potassium (K)	2016/09/24					<2.0	mg/kg	10	35		
8404270	Total Selenium (Se)	2016/09/24	115	75 - 125	110	75 - 125	<0.010	mg/kg	NC	35	106	75 - 125
8404270	Total Silver (Ag)	2016/09/24	90	75 - 125	94	75 - 125	<0.0040	mg/kg	NC	35		
8404270	Total Sodium (Na)	2016/09/24					<2.0	mg/kg	NC	35		
8404270	Total Strontium (Sr)	2016/09/24	104	75 - 125	100	75 - 125	<0.010	mg/kg	6.2	35		
8404270	Total Thallium (Tl)	2016/09/24	102	75 - 125	107	75 - 125	<0.00040	mg/kg	NC	35		
8404270	Total Tin (Sn)	2016/09/24	103	75 - 125	102	75 - 125	<0.020	mg/kg	NC	35		
8404270	Total Titanium (Ti)	2016/09/24	105	75 - 125	103	75 - 125	<0.050	mg/kg	NC	35		
8404270	Total Uranium (U)	2016/09/24	99	75 - 125	100	75 - 125	<0.00040	mg/kg	NC	35		
8404270	Total Vanadium (V)	2016/09/24	108	75 - 125	107	75 - 125	<0.020	mg/kg	NC	35		

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
8404270	Total Zinc (Zn)	2016/09/24	NC	75 - 125	108	75 - 125	<0.040	mg/kg	18	35	104	75 - 125
8405552	Moisture	2016/09/22					<0.30	%	3.7	20		
8405569	Moisture	2016/09/22					<0.30	%	7.6	20		

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

(1) Reference outside acceptance criteria - re-analysis yields similar results.

(2) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

[Signature redacted]

Andy Lu, Ph.D., P.Chem., Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam
A Bureau Veritas Group Company

Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5. Toll Free (800) 665-8566

CHAIN OF CUSTODY RECORD

COC 08426766

BBY FCD-00077/05
Page 2 of 23

Invoice Information		Report Information (if differs from invoice)		Project Information (wher	
Company Name:	EDI Environmental Dynamics Inc.	Company Name:	EDI	Quotation #:	B60053
Contact Name:	Shannon Jenner	Contact Name:	Lyndsay Doetzel	P.O. #/ AFE#:	
Address:	2195 2nd Avenue	Address:	same as invoice	Project #:	14Y0306:102
	Whitehorse, YT PC: Y1A 3T8		PC:	Site Location:	Coffee Creek
Phone:	867-393-4882	Phone:	867-393-4882	Site #:	
Email:	[email redacted]	Email:	[email redacted]	Sampled By:	J. Taylor / J. Duncan

und Time (TAT) Required

☒ Regular TAT 5 days (Most analyses)

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Rush TAT (Surcharges will be applied)
☐ Same Day ☐ 2 Days
☐ 1 Day ☐ 3 Days

Date Required:

Rush Confirmation #:

Regulatory Criteria

☐ BC CSR Soil ☐ BC CSR Water
☐ CCME (Specify) ☐ Other (Specify)
☐ Drinking Water ☐ BC Water Quality

Special Instructions

☐ Return Cooler
☐ Ship Sample Bottles (Please Specify)

LABORATORY USE ONLY

CUSTODY SEAL Y / [✓ N]		COOLER TEMPERATURES
Present	Intact	
NA		3 2 2
		1 1

COOLING MEDIA PRESENT [✓ Y] / N

COMMENTS

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Analysis Requested

	Sample Identification	Lab Identification	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	BTEX/VPH ☐ MTBE ☐ VOC/VPH ☐	EPH ☐ TEH ☐	PAH ☐ LEPH/HEPH ☐	CCME-PHC BTEX/ F1 ☐ F2 - F4 ☐	Dissolved Metals Filtered? ☐ Preserved? ☐	Dissolved Mercury Filtered? ☐ Preserved? ☐	Total Metals Field Preserved? ☐	Total Mercury Field Preserved? ☐	Chloride ☐ Fluoride ☐ Sulphate ☐	TSS ☐ TDS ☐ BOD ☐ COD ☐	pH ☐ Conductivity ☐ Alkalinity ☐	Nitrite ☐ Nitrate ☐ Ammonia ☐	Total Metals in Tissue (wet weight)	% Moisture in Tissue			# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE
1	LC2.7-B1-1		2016/08/21	13:00	tissue													x	x			1	
2	LC9.9-B1-1		2016/08/21	14:00	tissue													x	x			1	
3	HF0.2-AG-1		2016/08/23	12:00	tissue													x	x			1	
4	HF02-CS-1				tissue													x	x			1	
5	HF0.2-CS-2				tissue													x	x			1	
6	HF0.2-CS-3				tissue													x	x			1	
7	HF0.2-CS-4				tissue													x	x			1	
8	HF0.2-CS-5				tissue													x	x			1	
9	HF0.2-CS-6				tissue													x	x			1	
10	HF0.2-CS-7				tissue													x	x			1	

B673221_COC

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	MAXXAM JOB #
[signature redacted]	2016/08/25	14:00	[signature redacted]	2016/08/26	13:50	B673221

Maxxam
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Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5. Toll Free (800) 665-8566

CHAIN OF CUSTODY RECORD

COC:
08426765

BBY FCD-00077/05
Page 1 of 23

Invoice Information		Report Information (if differs from invoice)		Project Information (wher	
Company Name:	EDI Environmental Dynamics Inc.	Company Name:	EDI	Quotation #:	B60053
Contact Name:	Shannon Jenner	Contact Name:	Lyndsay Doetzel	P.O. #/ AFE#:	
Address:	2195 2nd Avenue	Address:	same as invoice	Project #:	14Y0306:102
	Whitehorse, YT PC: Y1A 3T8		PC:	Site Location:	Coffee Creek
Phone:	867-393-4882	Phone:	867-393-4882	Site #:	
Email:	[email redacted]	Email:	[email redacted]	Sampled By:	J. Taylor / J. Duncan

und Time (TAT) Required

☒ Regular TAT 5 days (Most analyses)

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Rush TAT (Surcharges will be applied)
☐ Same Day ☐ 2 Days
☐ 1 Day ☐ 3 Days

Date Required:

Rush Confirmation #:

Regulatory Criteria

☐ BC CSR Soil ☐ BC CSR Water
☐ CCME (Specify) ☐ Other (Specify)
☐ Drinking Water ☐ BC Water Quality

Special Instructions

☐ Return Cooler
☐ Ship Sample Bottles (Please Specify)

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

LABORATORY USE ONLY

CUSTODY SEAL Y / [✓ N]		COOLER TEMPERATURES
Present	Intact	
UA		322
		11

COOLING MEDIA PRESENT [✓ Y] / N

Analysis Requested

	Sample Identification	Lab Identification	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	BTEX/VPH ☐ MTBE ☐ VOC/VPH ☐	EPH ☐ TEH ☐	PAH ☐ LEPH/HEPH ☐	CCME-PHC BTEX/ F1 ☐ F2 - F4 ☐	Dissolved Metals Filtered? ☐ Preserved? ☐	Dissolved Mercury Filtered? ☐ Preserved? ☐	Total Metals Field Preserved? ☐	Total Mercury Field Preserved? ☐	Chloride ☐ Fluoride ☐ Sulphate ☐	TSS ☐ TDS ☐ BOD ☐ COD ☐	pH ☐ Conductivity ☐ Alkalinity ☐	Nitrite ☐ Nitrate ☐ Ammonia ☐	Total Metals in Tissue (wet weight)	% Moisture in Tissue				# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE	COMMENTS
1	HF02-B1-1		2016/08/23	12:00	tissue													x	x				1		
2	HF02-B1-2		2016/08/23	12:00	tissue													x	x				1		
3	YT0.2-B1-1		2016/08/23	13:00	tissue													x	x				1		
4	LAC4.8-B1-1		2016/08/20	12:00	tissue													x	x				1		
5	LAC4.8-B1-2		2016/08/20	12:50	tissue													x	x				1		
6	CF10.0-B1-1		2016/08/18	12:00	tissue													x	x				1		
7	CF3.9-B1-1		2016/08/18	13:00	tissue													x	x				1		
8	HF6.3-B1-1		2016/08/20	13:00	tissue													x	x				1		
9	IC1.9-B1-1		2016/08/20	14:00	tissue													x	x				1		
10	YT5.0-B1-1		2016/08/21	12:00	tissue													x	x				1		

B673221_COC

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	MAXXAM JOB #
[signature redacted]	2016/08/25	14:00	[signature redacted]	2016/08/26	13:50	B673221

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Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5. Toll Free (800) 665-8566

CHAIN OF CUSTODY RECORD

COC 08426767

BBY FCD-00077/05
Page 3 of 3

Invoice Information

Company Name: EDI Environmental Dynamics Inc.
Contact Name: Shannon Jenner
Address: 2195 2nd Avenue
Whitehorse, YT PC: Y1A 3T8
Phone: 867-393-4882
Email: [email redacted]

Report Information (if differs from invoice)

Company Name: EDI
Contact Name: Lyndsay Doetzel
Address: same as invoice
PC:
Phone: 867-393-4882
Email: [email redacted]

Project Information (where applicable)

Quotation #: B60053
P.O. #/ AFE#:
Project #: 14Y0306:102
Site Location: Coffee Creek
Site #:
Sampled By: J. Taylor / J. Duncan

Turnaround Time (TAT) Required

☒ Regular TAT 5 days (Most analyses)

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Rush TAT (Surcharges will be applied)
☐ Same Day ☐ 2 Days
☐ 1 Day ☐ 3 Days

Date Required:
Rush Confirmation #:

Regulatory Criteria

☐ BC CSR Soil ☐ BC CSR Water
☐ CCME (Specify) ☐ Other (Specify)
☐ Drinking Water ☐ BC Water Quality

Special Instructions

☐ Return Cooler
☐ Ship Sample Bottles (Please Specify)

LABORATORY USE ONLY

CUSTODY SEAL Y / [✓ N]		COOLER TEMPERATURES
Present	Intact	
NA		3 2 2

COOLING MEDIA PRESENT [✓ Y] / N

COMMENTS

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Analysis Requested

	Sample Identification	Lab Identification	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	BTEX/VPH ☐ VOC/VPH ☐ MTBE ☐	EPH ☐ TEH ☐	PAH ☐ LEPH/HEPH ☐	CCME-PHC BTEX/F1 ☐ F2 - F4 ☐	Dissolved Metals Filtered? ☐ Preserved? ☐	Dissolved Mercury Filtered? ☐ Preserved? ☐	Total Metals Field Preserved? ☐	Total Mercury Field Preserved? ☐	Chloride ☐ Fluoride ☐ Sulphate ☐	TSS ☐ TDS ☐ BOD ☐ COD ☐	pH ☐ Conductivity ☐ Alkalinity ☐	Nitrite ☐ Nitrate ☐ Ammonia ☐	Total Metals in Tissue (wet weight)	% Moisture in Tissue			# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE
1	HFO.2-CS-8		2016/08/23	12:00	tissue													x	x			1	
2	HFO.2-CS-9				tissue													x	x			1	
3	HFO.2-CS-10				tissue													x	x			1	
4	HFO.2-CS-11				tissue													x	x			1	
5	HFO.2-CS-12				tissue													x	x			1	
6					tissue													x	x			1	
7					tissue													x	x			1	
8					tissue													x	x			1	
9					tissue													x	x			1	
10					tissue													x	x			1	

B673221_COC

RECEIVED IN WHITEHORSE
BY: Suyano @ 1415
2016-08-25
TEMP: 1 / 1 / 1 / 0

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	MAXXAM JOB #
[signature redacted]	2016/08/25	14:00	[signature redacted]	2016/08/26	13:50	B673221

Your Project #: 14Y0303:102
Site Location: COFFEE CREEK

Attention:LYNDSAY DOETZEL
EDI ENVIRONMENTAL DYNAMICS INC.
2195 2nd Avenue
WHITEHORSE, YT
CANADA Y1A 3T8

Your C.O.C. #: 08427766, 08427767, 08427768, 08427769, 08427770

Report Date: 2016/11/18
Report #: R2302800
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B684483
Received: 2016/09/26, 09:00

Sample Matrix: TISSUE
Samples Received: 45

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Elements by CRC ICPMS - Tissue Wet Wt	45	2016/11/14	2016/11/17	BBY7SOP-00021,	BCLM2005,EPA6020bR2m
Moisture in Tissue	20	N/A	2016/11/15	BBY8SOP-00017	OMOE E3139 3.1 m
Moisture in Tissue	25	N/A	2016/11/16	BBY8SOP-00017	OMOE E3139 3.1 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods. Results relate to samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Your Project #: 14Y0303:102
Site Location: COFFEE CREEK

Attention:LYNDSAY DOETZEL
EDI ENVIRONMENTAL DYNAMICS INC.
2195 2nd Avenue
WHITEHORSE, YT
CANADA Y1A 3T8

Your C.O.C. #: 08427766, 08427767, 08427768, 08427769, 08427770

Report Date: 2016/11/18
Report #: R2302800
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B684483
Received: 2016/09/26, 09:00

Encryption Key

Maxxam
REPORT AUTOMATION ENGINE
18 Nov 2016 10:45:36

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Graham Rudkin, Project Manager, Environmental
Email: [email redacted]
Phone# [phone number redacted]
======= ==
This report has been generated and distributed using a secure automated process.
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

ELEMENTS BY ATOMIC SPECTROSCOPY - WET WT (TISSUE)

Maxxam ID		PP7258	PP7259	PP7260	PP7261	PP7262	PP7263		
Sampling Date		2016/07/09	2016/07/09	2016/07/09	2016/07/09	2016/07/09	2016/07/13		
COC Number		08427766	08427766	08427766	08427766	08427766	08427766		
	UNITS	**LC2.7 3-1-A**	**LC2.7 3-1-B**	**LC2.7 3-3-A**	**LC2.7 3-3-B**	**LC2.7 3-3-C**	**LAC-1-BS**	**RDL**	**QC Batch**
Total Metals by ICPMS									
Total Aluminum (Al)	mg/kg	16.5	5.64	16.2	31.9	20.3	25.8	0.20	8469250
Total Antimony (Sb)	mg/kg	0.0051	0.0031	0.0030	0.0096	0.0030	0.0030	0.0010	8469250
Total Arsenic (As)	mg/kg	0.0349	0.0283	0.0471	0.0460	0.0442	0.0544	0.0050	8469250
Total Barium (Ba)	mg/kg	1.54	2.15	2.16	1.98	1.87	2.33	0.010	8469250
Total Beryllium (Be)	mg/kg	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	8469250
Total Bismuth (Bi)	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	8469250
Total Boron (B)	mg/kg	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	8469250
Total Cadmium (Cd)	mg/kg	0.0767	0.0699	0.0665	0.0559	0.109	0.0578	0.0020	8469250
Total Calcium (Ca)	mg/kg	9400	11600	12300	12100	7940	10800	2.0	8469250
Total Chromium (Cr)	mg/kg	0.066	0.037	0.266	0.256	0.044	0.071	0.010	8469250
Total Cobalt (Co)	mg/kg	0.0323	0.0247	0.0457	0.0455	0.0453	0.0698	0.0040	8469250
Total Copper (Cu)	mg/kg	0.705	0.685	0.911	0.877	0.756	0.912	0.010	8469250
Total Iron (Fe)	mg/kg	36.6	23.0	38.8	55.1	39.0	57.8	1.0	8469250
Total Lead (Pb)	mg/kg	0.0180	0.0078	0.0296	0.0395	0.0160	0.0189	0.0020	8469250
Total Magnesium (Mg)	mg/kg	321	363	380	391	324	390	2.0	8469250
Total Manganese (Mn)	mg/kg	3.85	3.46	4.74	4.02	4.44	8.28	0.020	8469250
Total Mercury (Hg)	mg/kg	0.105	0.109	0.0639	0.0491	0.0427	0.0360	0.0020	8469250
Total Molybdenum (Mo)	mg/kg	0.014	<0.010	0.016	0.021	0.015	0.020	0.010	8469250
Total Nickel (Ni)	mg/kg	0.037	0.018	0.153	0.121	0.057	0.102	0.010	8469250
Total Phosphorus (P)	mg/kg	7210	8400	8780	8750	6650	8350	2.0	8469250
Total Potassium (K)	mg/kg	3230	3420	3540	3550	3220	3650	2.0	8469250
Total Selenium (Se)	mg/kg	1.20	0.929	1.20	1.17	1.73	1.30	0.010	8469250
Total Silver (Ag)	mg/kg	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	0.0040	8469250
Total Sodium (Na)	mg/kg	999	1120	1060	1010	890	1030	2.0	8469250
Total Strontium (Sr)	mg/kg	13.1	13.8	14.5	12.8	10.3	15.1	0.010	8469250
Total Thallium (Tl)	mg/kg	0.00579	0.00745	0.00647	0.00551	0.00643	0.00501	0.00040	8469250
Total Tin (Sn)	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	8469250
Total Titanium (Ti)	mg/kg	1.14	0.634	1.30	2.18	1.70	1.78	0.050	8469250
Total Uranium (U)	mg/kg	0.0350	0.0292	0.0441	0.0462	0.0167	0.0108	0.00040	8469250
Total Vanadium (V)	mg/kg	0.071	0.025	0.070	0.094	0.069	0.112	0.020	8469250
Total Zinc (Zn)	mg/kg	22.6	22.2	29.1	23.0	25.6	20.2	0.040	8469250
RDL = Reportable Detection Limit									

Maxxam Job #: B684483
Report Date: 2016/11/18

EDI ENVIRONMENTAL DYNAMICS INC.
Client Project #: 14Y0303:102
Site Location: COFFEE CREEK
Sampler Initials: DH

ELEMENTS BY ATOMIC SPECTROSCOPY - WET WT (TISSUE)

Maxxam ID		PP7264	PP7265	PP7266	PP7267	PP7268	PP7269		
Sampling Date		2016/07/13	2016/07/13	2016/07/12	2016/07/12	2016/07/12	2016/07/12		
COC Number		08427766	08427766	08427766	08427766	08427767	08427767		
	UNITS	**LAC-2-BS**	**LAC-3-AG**	**IC-1.9 2-1-A**	**IC-1.9 2-1-B**	**IC-1.9 2-1-C**	**IC-1.9 3-1-D**	**RDL**	**QC Batch**
Total Metals by ICPMS									
Total Aluminum (Al)	mg/kg	62.4	37.8	30.2	29.2	29.7	55.1	0.20	8469250
Total Antimony (Sb)	mg/kg	0.0059	0.0037	0.0083	0.0075	0.0168	0.0176	0.0010	8469250
Total Arsenic (As)	mg/kg	0.188	0.0630	0.117	0.117	0.102	0.110	0.0050	8469250
Total Barium (Ba)	mg/kg	3.82	1.87	4.30	2.82	2.16	2.00	0.010	8469250
Total Beryllium (Be)	mg/kg	0.0039	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	8469250
Total Bismuth (Bi)	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	8469250
Total Boron (B)	mg/kg	<0.40	<0.40	<0.40	0.40	<0.40	<0.40	0.40	8469250
Total Cadmium (Cd)	mg/kg	0.105	0.0615	0.184	0.138	0.0825	0.0849	0.0020	8469250
Total Calcium (Ca)	mg/kg	11500	8180	15900	9190	8650	6600	2.0	8469250
Total Chromium (Cr)	mg/kg	0.484	0.085	0.196	0.048	0.041	0.114	0.010	8469250
Total Cobalt (Co)	mg/kg	0.185	0.0682	0.0793	0.0583	0.0461	0.0697	0.0040	8469250
Total Copper (Cu)	mg/kg	0.940	0.903	1.13	0.868	1.09	1.09	0.010	8469250
Total Iron (Fe)	mg/kg	218	69.6	96.0	49.9	47.3	80.6	1.0	8469250
Total Lead (Pb)	mg/kg	0.0572	0.0216	0.0626	0.0646	0.0663	0.0935	0.0020	8469250
Total Magnesium (Mg)	mg/kg	417	371	434	300	331	337	2.0	8469250
Total Manganese (Mn)	mg/kg	15.1	5.53	10.3	7.84	5.50	6.01	0.020	8469250
Total Mercury (Hg)	mg/kg	0.0615	0.0436	0.0608	0.0495	0.110	0.0771	0.0020	8469250
Total Molybdenum (Mo)	mg/kg	0.024	0.016	0.037	0.025	0.022	0.034	0.010	8469250
Total Nickel (Ni)	mg/kg	0.407	0.126	0.265	0.124	0.069	0.106	0.010	8469250
Total Phosphorus (P)	mg/kg	9060	6890	11200	6840	7120	6290	2.0	8469250
Total Potassium (K)	mg/kg	3520	3810	3150	2990	3210	3140	2.0	8469250
Total Selenium (Se)	mg/kg	1.61	1.52	2.76	2.16	1.94	2.05	0.010	8469250
Total Silver (Ag)	mg/kg	0.0041	<0.0040	0.0053	<0.0040	<0.0040	<0.0040	0.0040	8469250
Total Sodium (Na)	mg/kg	1090	1120	1150	1010	1070	1110	2.0	8469250
Total Strontium (Sr)	mg/kg	19.0	11.0	20.4	11.2	11.1	8.05	0.010	8469250
Total Thallium (Tl)	mg/kg	0.00914	0.00570	0.00947	0.00808	0.0111	0.00867	0.00040	8469250
Total Tin (Sn)	mg/kg	<0.020	<0.020	0.040	0.034	0.040	0.169	0.020	8469250
Total Titanium (Ti)	mg/kg	3.29	2.10	2.47	1.98	1.98	4.37	0.050	8469250
Total Uranium (U)	mg/kg	0.0463	0.00787	0.0269	0.0174	0.0242	0.0331	0.00040	8469250
Total Vanadium (V)	mg/kg	0.322	0.160	0.347	0.261	0.110	0.163	0.020	8469250
Total Zinc (Zn)	mg/kg	24.5	19.8	36.5	30.0	31.9	28.9	0.040	8469250

RDL = Reportable Detection Limit

ELEMENTS BY ATOMIC SPECTROSCOPY - WET WT (TISSUE)

Maxxam ID		PP7270	PP7271	PP7272	PP7273	PP7274	PP7275		
Sampling Date		2016/07/12	2016/07/12	2016/07/12	2016/07/12	2016/07/12	2016/07/12		
COC Number		08427767	08427767	08427767	08427767	08427767	08427767		
	UNITS	**IC-1.9 3-2-E**	**IC-1.9 2-3-F**	**IC-1.9 1-1-G**	**IC-1.9 1-1-H**	**IC-1.9 1-1-I**	**IC-1.9 1-1-J**	**RDL**	**QC Batch**
Total Metals by ICPMS									
Total Aluminum (Al)	mg/kg	46.2	38.6	43.5	37.9	58.1	38.5	0.20	8469250
Total Antimony (Sb)	mg/kg	0.0103	0.0447	0.0095	0.0304	0.0070	0.0073	0.0010	8469250
Total Arsenic (As)	mg/kg	0.121	0.159	0.141	0.125	0.122	0.113	0.0050	8469250
Total Barium (Ba)	mg/kg	4.39	1.69	3.88	3.90	3.27	3.07	0.010	8469250
Total Beryllium (Be)	mg/kg	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	8469250
Total Bismuth (Bi)	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	8469250
Total Boron (B)	mg/kg	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	8469250
Total Cadmium (Cd)	mg/kg	0.183	0.0405	0.187	0.187	0.114	0.249	0.0020	8469250
Total Calcium (Ca)	mg/kg	17700	7270	14800	13200	10900	10000	2.0	8469250
Total Chromium (Cr)	mg/kg	0.087	0.055	0.086	0.069	0.106	0.082	0.010	8469250
Total Cobalt (Co)	mg/kg	0.0541	0.0462	0.0485	0.0457	0.0602	0.0532	0.0040	8469250
Total Copper (Cu)	mg/kg	0.974	0.917	0.903	0.888	1.10	0.882	0.010	8469250
Total Iron (Fe)	mg/kg	75.5	74.5	71.5	65.2	90.4	61.8	1.0	8469250
Total Lead (Pb)	mg/kg	0.0751	0.0872	0.100	0.103	0.0788	0.0728	0.0020	8469250
Total Magnesium (Mg)	mg/kg	463	329	387	365	351	363	2.0	8469250
Total Manganese (Mn)	mg/kg	12.9	5.92	7.14	10.6	9.37	9.00	0.020	8469250
Total Mercury (Hg)	mg/kg	0.0680	0.0620	0.102	0.0685	0.0513	0.0562	0.0020	8469250
Total Molybdenum (Mo)	mg/kg	0.032	0.027	0.028	0.027	0.031	0.025	0.010	8469250
Total Nickel (Ni)	mg/kg	0.127	0.086	0.095	0.097	0.118	0.166	0.010	8469250
Total Phosphorus (P)	mg/kg	11600	6210	9970	9010	8180	8630	2.0	8469250
Total Potassium (K)	mg/kg	2990	3220	2670	2850	2930	3120	2.0	8469250
Total Selenium (Se)	mg/kg	1.49	2.10	1.21	1.50	1.73	1.98	0.010	8469250
Total Silver (Ag)	mg/kg	<0.0040	<0.0040	<0.0040	<0.0040	0.0054	<0.0040	0.0040	8469250
Total Sodium (Na)	mg/kg	1090	1050	1170	1000	1070	1180	2.0	8469250
Total Strontium (Sr)	mg/kg	21.3	8.40	18.9	16.2	13.4	13.2	0.010	8469250
Total Thallium (Tl)	mg/kg	0.0121	0.00824	0.0114	0.0101	0.00747	0.00845	0.00040	8469250
Total Tin (Sn)	mg/kg	0.032	0.047	<0.020	<0.020	<0.020	0.025	0.020	8469250
Total Titanium (Ti)	mg/kg	3.74	2.64	3.29	2.77	4.39	3.32	0.050	8469250
Total Uranium (U)	mg/kg	0.0470	0.0279	0.0521	0.0473	0.0358	0.0263	0.00040	8469250
Total Vanadium (V)	mg/kg	0.302	0.128	0.317	0.366	0.256	0.294	0.020	8469250
Total Zinc (Zn)	mg/kg	36.0	29.8	31.9	48.9	26.7	36.2	0.040	8469250
RDL = Reportable Detection Limit									

ELEMENTS BY ATOMIC SPECTROSCOPY - WET WT (TISSUE)

Maxxam ID		PP7276	PP7277		PP7278	PP7279	PP7280		
Sampling Date		2016/07/11	2016/07/11		2016/07/11	2016/07/11	2016/07/11		
COC Number		08427767	08427767		08427768	08427768	08427768		
	UNITS	**CF 3.9 3-1-A**	**CF-3.9 3-1-B**	**QC Batch**	**CF3.9 3-1-C**	**CF3.9 3-1-D**	**CF3.9 3-1-E**	**RDL**	**QC Batch**
Total Metals by ICPMS									
Total Aluminum (Al)	mg/kg	14.8	41.0	8469250	48.3	9.64	28.8	0.20	8469264
Total Antimony (Sb)	mg/kg	0.0156	0.0095	8469250	0.0170	0.0480	0.0231	0.0010	8469264
Total Arsenic (As)	mg/kg	0.118	0.134	8469250	0.0929	0.0847	0.0928	0.0050	8469264
Total Barium (Ba)	mg/kg	3.59	4.62	8469250	3.90	2.28	3.01	0.010	8469264
Total Beryllium (Be)	mg/kg	<0.0020	<0.0020	8469250	<0.0020	<0.0020	<0.0020	0.0020	8469264
Total Bismuth (Bi)	mg/kg	<0.020	<0.020	8469250	<0.020	<0.020	<0.020	0.020	8469264
Total Boron (B)	mg/kg	<0.40	<0.40	8469250	<0.40	<0.40	<0.40	0.40	8469264
Total Cadmium (Cd)	mg/kg	0.230	0.439	8469250	0.0373	0.0259	0.0390	0.0020	8469264
Total Calcium (Ca)	mg/kg	14800	17800	8469250	15200	9700	12100	2.0	8469264
Total Chromium (Cr)	mg/kg	0.029	0.064	8469250	0.075	0.019	0.043	0.010	8469264
Total Cobalt (Co)	mg/kg	0.0450	0.0824	8469250	0.0469	0.0286	0.0497	0.0040	8469264
Total Copper (Cu)	mg/kg	1.15	1.28	8469250	1.02	0.943	0.854	0.010	8469264
Total Iron (Fe)	mg/kg	31.1	76.3	8469250	78.7	24.9	54.7	1.0	8469264
Total Lead (Pb)	mg/kg	0.202	0.161	8469250	0.109	0.0721	0.122	0.0020	8469264
Total Magnesium (Mg)	mg/kg	401	407	8469250	405	331	351	2.0	8469264
Total Manganese (Mn)	mg/kg	13.3	14.0	8469250	6.10	4.61	6.88	0.020	8469264
Total Mercury (Hg)	mg/kg	0.0927	0.0586	8469250	0.130	0.0830	0.0828	0.0020	8469264
Total Molybdenum (Mo)	mg/kg	0.018	0.036	8469250	0.029	0.016	0.026	0.010	8469264
Total Nickel (Ni)	mg/kg	0.076	0.183	8469250	0.071	0.033	0.049	0.010	8469264
Total Phosphorus (P)	mg/kg	10100	11900	8469250	10400	7570	8930	2.0	8469264
Total Potassium (K)	mg/kg	2650	3180	8469250	3090	3130	3090	2.0	8469264
Total Selenium (Se)	mg/kg	3.03	2.94	8469250	1.62	2.79	2.27	0.010	8469264
Total Silver (Ag)	mg/kg	<0.0040	<0.0040	8469250	<0.0040	0.0050	<0.0040	0.0040	8469264
Total Sodium (Na)	mg/kg	1140	1340	8469250	1090	1040	1070	2.0	8469264
Total Strontium (Sr)	mg/kg	18.4	21.3	8469250	18.6	13.3	15.6	0.010	8469264
Total Thallium (Tl)	mg/kg	0.0125	0.00797	8469250	0.0124	0.00915	0.0106	0.00040	8469264
Total Tin (Sn)	mg/kg	<0.020	0.037	8469250	<0.020	<0.020	<0.020	0.020	8469264
Total Titanium (Ti)	mg/kg	1.11	2.67	8469250	3.43	0.940	2.01	0.050	8469264
Total Uranium (U)	mg/kg	0.0364	0.0490	8469250	0.131	0.0620	0.0800	0.00040	8469264
Total Vanadium (V)	mg/kg	0.192	0.289	8469250	0.278	0.118	0.149	0.020	8469264
Total Zinc (Zn)	mg/kg	32.3	49.7	8469250	31.8	24.6	30.5	0.040	8469264

RDL = Reportable Detection Limit

ELEMENTS BY ATOMIC SPECTROSCOPY - WET WT (TISSUE)

Maxxam ID		PP7281	PP7282	PP7283	PP7284	PP7285	PP7286		
Sampling Date		2016/07/11	2016/07/11	2016/07/11	2016/07/11	2016/07/11	2016/07/10		
COC Number		08427768	08427768	08427768	08427768	08427768	08427768		
	UNITS	**CF3.9 3-1-F**	**CF3.9 3-1-G**	**CF3.9 3-1-H**	**CF3.9 3-1-I**	**CF3.9 3-1-J**	**CF10.0 AG-1**	**RDL**	**QC Batch**
Total Metals by ICPMS									
Total Aluminum (Al)	mg/kg	70.8	31.9	29.4	40.2	15.3	22.4	0.20	8469264
Total Antimony (Sb)	mg/kg	0.0222	0.0160	0.0344	0.0706	0.0292	0.0034	0.0010	8469264
Total Arsenic (As)	mg/kg	0.122	0.114	0.0920	0.116	0.103	0.0395	0.0050	8469264
Total Barium (Ba)	mg/kg	2.23	2.71	1.95	3.27	2.33	1.97	0.010	8469264
Total Beryllium (Be)	mg/kg	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	8469264
Total Bismuth (Bi)	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	8469264
Total Boron (B)	mg/kg	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	8469264
Total Cadmium (Cd)	mg/kg	0.0573	0.0393	0.0283	0.0467	0.0246	0.0802	0.0020	8469264
Total Calcium (Ca)	mg/kg	5500	11100	6310	12400	8530	10100	2.0	8469264
Total Chromium (Cr)	mg/kg	0.124	0.055	0.041	0.063	0.029	0.139	0.010	8469264
Total Cobalt (Co)	mg/kg	0.0704	0.0427	0.0367	0.0758	0.0266	0.0392	0.0040	8469264
Total Copper (Cu)	mg/kg	1.01	0.816	0.774	0.950	0.808	0.723	0.010	8469264
Total Iron (Fe)	mg/kg	110	56.5	51.4	79.7	30.3	41.9	1.0	8469264
Total Lead (Pb)	mg/kg	0.0902	0.113	0.0841	0.144	0.0953	0.0226	0.0020	8469264
Total Magnesium (Mg)	mg/kg	328	360	300	368	391	358	2.0	8469264
Total Manganese (Mn)	mg/kg	4.95	5.07	3.83	7.36	4.98	4.23	0.020	8469264
Total Mercury (Hg)	mg/kg	0.0748	0.0791	0.0677	0.0894	0.114	0.0221	0.0020	8469264
Total Molybdenum (Mo)	mg/kg	0.030	0.019	0.022	0.022	0.025	0.019	0.010	8469264
Total Nickel (Ni)	mg/kg	0.117	0.051	0.047	0.086	0.062	0.099	0.010	8469264
Total Phosphorus (P)	mg/kg	5310	8440	5470	8810	7280	7820	2.0	8469264
Total Potassium (K)	mg/kg	3320	3390	3110	3300	3400	3480	2.0	8469264
Total Selenium (Se)	mg/kg	2.44	2.85	3.21	3.46	1.84	1.21	0.010	8469264
Total Silver (Ag)	mg/kg	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	0.0040	8469264
Total Sodium (Na)	mg/kg	974	1090	1020	1050	1010	942	2.0	8469264
Total Strontium (Sr)	mg/kg	7.42	15.0	8.75	16.4	11.8	13.1	0.010	8469264
Total Thallium (Tl)	mg/kg	0.00858	0.00816	0.00816	0.0130	0.00898	0.00382	0.00040	8469264
Total Tin (Sn)	mg/kg	0.074	0.052	0.041	0.037	0.183	<0.020	0.020	8469264
Total Titanium (Ti)	mg/kg	5.28	2.10	1.94	2.52	0.814	1.81	0.050	8469264
Total Uranium (U)	mg/kg	0.0752	0.0519	0.0319	0.0673	0.101	0.0210	0.00040	8469264
Total Vanadium (V)	mg/kg	0.259	0.169	0.159	0.243	0.055	0.084	0.020	8469264
Total Zinc (Zn)	mg/kg	22.6	30.8	25.4	32.5	24.3	18.8	0.040	8469264

RDL = Reportable Detection Limit

ELEMENTS BY ATOMIC SPECTROSCOPY - WET WT (TISSUE)

Maxxam ID		PP7287	PP7288	PP7289	PP7290		PP7291		
Sampling Date		2016/07/10	2016/07/10	2016/07/10	2016/07/10		2016/07/10		
COC Number		08427768	08427769	08427769	08427769		08427769		
	UNITS	**CF10.0 AG-2**	**CF10.0 AG-3**	**CF10.0 AG-4**	**CF10.0 2-1-K**	**QC Batch**	**CF10.0 3-1-L**	**RDL**	**QC Batch**
Total Metals by ICPMS									
Total Aluminum (Al)	mg/kg	23.2	19.0	25.8	14.7	8469264	9.78	0.20	8469326
Total Antimony (Sb)	mg/kg	0.0027	0.0022	0.0022	0.0028	8469264	0.0021	0.0010	8469326
Total Arsenic (As)	mg/kg	0.0487	0.0398	0.0445	0.0339	8469264	0.0344	0.0050	8469326
Total Barium (Ba)	mg/kg	1.77	3.66	1.37	2.37	8469264	3.02	0.010	8469326
Total Beryllium (Be)	mg/kg	<0.0020	<0.0020	<0.0020	<0.0020	8469264	<0.0020	0.0020	8469326
Total Bismuth (Bi)	mg/kg	<0.020	<0.020	<0.020	<0.020	8469264	<0.020	0.020	8469326
Total Boron (B)	mg/kg	<0.40	<0.40	<0.40	<0.40	8469264	<0.40	0.40	8469326
Total Cadmium (Cd)	mg/kg	0.0342	0.0712	0.0623	0.0708	8469264	0.0622	0.0020	8469326
Total Calcium (Ca)	mg/kg	10900	11200	6600	10400	8469264	11800	2.0	8469326
Total Chromium (Cr)	mg/kg	0.075	0.128	0.240	0.044	8469264	0.079	0.010	8469326
Total Cobalt (Co)	mg/kg	0.0459	0.0372	0.0873	0.0338	8469264	0.0365	0.0040	8469326
Total Copper (Cu)	mg/kg	0.716	0.702	0.711	0.618	8469264	0.625	0.010	8469326
Total Iron (Fe)	mg/kg	43.5	44.0	64.5	33.3	8469264	25.5	1.0	8469326
Total Lead (Pb)	mg/kg	0.0163	0.0204	0.0118	0.0197	8469264	0.0084	0.0020	8469326
Total Magnesium (Mg)	mg/kg	394	362	299	351	8469264	385	2.0	8469326
Total Manganese (Mn)	mg/kg	6.71	4.73	3.54	3.63	8469264	5.03	0.020	8469326
Total Mercury (Hg)	mg/kg	0.0687	0.0412	0.0588	0.0400	8469264	0.0465	0.0020	8469326
Total Molybdenum (Mo)	mg/kg	0.018	0.016	0.015	0.017	8469264	0.014	0.010	8469326
Total Nickel (Ni)	mg/kg	0.052	0.077	0.110	0.028	8469264	0.040	0.010	8469326
Total Phosphorus (P)	mg/kg	8610	8210	5660	7930	8469264	8970	2.0	8469326
Total Potassium (K)	mg/kg	3680	3630	3380	3500	8469264	3510	2.0	8469326
Total Selenium (Se)	mg/kg	1.28	1.30	3.00	1.13	8469264	1.14	0.010	8469326
Total Silver (Ag)	mg/kg	<0.0040	<0.0040	<0.0040	<0.0040	8469264	<0.0040	0.0040	8469326
Total Sodium (Na)	mg/kg	937	938	926	905	8469264	983	2.0	8469326
Total Strontium (Sr)	mg/kg	22.9	12.7	7.76	10.5	8469264	14.3	0.010	8469326
Total Thallium (Tl)	mg/kg	0.00770	0.00623	0.00623	0.00601	8469264	0.00780	0.00040	8469326
Total Tin (Sn)	mg/kg	<0.020	<0.020	<0.020	<0.020	8469264	0.022	0.020	8469326
Total Titanium (Ti)	mg/kg	2.07 (1)	1.84	2.55	1.49	8469264	1.20	0.050	8469326
Total Uranium (U)	mg/kg	0.0327	0.0219	0.0141	0.0248	8469264	0.0511	0.00040	8469326

RDL = Reportable Detection Limit

(1) Duplicate RPD above control limit - Reanalysis yields similar results.

ELEMENTS BY ATOMIC SPECTROSCOPY - WET WT (TISSUE)

Maxxam ID		PP7287	PP7288	PP7289	PP7290		PP7291		
Sampling Date		2016/07/10	2016/07/10	2016/07/10	2016/07/10		2016/07/10		
COC Number		08427768	08427769	08427769	08427769		08427769		
	UNITS	**CF10.0 AG-2**	**CF10.0 AG-3**	**CF10.0 AG-4**	**CF10.0 2-1-K**	**QC Batch**	**CF10.0 3-1-L**	**RDL**	**QC Batch**
Total Vanadium (V)	mg/kg	0.105 (1)	0.080	0.103	0.066	8469264	0.043	0.020	8469326
Total Zinc (Zn)	mg/kg	19.7	23.5	19.8	21.2	8469264	23.1	0.040	8469326

RDL = Reportable Detection Limit
(1) Duplicate RPD above control limit - (10% of analytes failure allowed).

ELEMENTS BY ATOMIC SPECTROSCOPY - WET WT (TISSUE)

Maxxam ID		PP7292	PP7293	PP7294	PP7295	PP7296	PP7297		
Sampling Date		2016/07/10	2016/07/10	2016/07/10	2016/07/10	2016/07/10	2016/07/10		
COC Number		08427769	08427769	08427769	08427769	08427769	08427769		
	UNITS	**CF10.0 3-2-M**	**CF10.0 1-1-A**	**CF10.0 1-1-B**	**CF10.0 1-1-C**	**CF10.0 1-1-D**	**CF10.0 1-1-E**	**RDL**	**QC Batch**
Total Metals by ICPMS									
Total Aluminum (Al)	mg/kg	42.4	32.6	12.4	33.3	12.8	72.0	0.20	8469264
Total Antimony (Sb)	mg/kg	0.0039	0.0073	0.0074	0.0349	0.0110	0.0083	0.0010	8469264
Total Arsenic (As)	mg/kg	0.0736	0.0906	0.0721	0.122	0.0877	0.115	0.0050	8469264
Total Barium (Ba)	mg/kg	3.61	3.26	2.49	4.36	3.36	3.54	0.010	8469264
Total Beryllium (Be)	mg/kg	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	8469264
Total Bismuth (Bi)	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	8469264
Total Boron (B)	mg/kg	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	8469264
Total Cadmium (Cd)	mg/kg	0.0710	0.0540	0.0279	0.0730	0.0395	0.0552	0.0020	8469264
Total Calcium (Ca)	mg/kg	7430	11000	11300	15100	13300	12000	2.0	8469264
Total Chromium (Cr)	mg/kg	0.065	0.054	0.024	0.069	0.026	0.104	0.010	8469264
Total Cobalt (Co)	mg/kg	0.0772	0.0563	0.0318	0.0705	0.0478	0.0858	0.0040	8469264
Total Copper (Cu)	mg/kg	0.810	1.13	0.884	1.17	0.836	1.23	0.010	8469264
Total Iron (Fe)	mg/kg	75.1	63.6	31.5	68.2	34.5	132	1.0	8469264
Total Lead (Pb)	mg/kg	0.0286	0.0276	0.0167	0.172	0.0592	0.0540	0.0020	8469264
Total Magnesium (Mg)	mg/kg	355	335	341	405	394	386	2.0	8469264
Total Manganese (Mn)	mg/kg	6.04	8.32	6.55	9.14	7.53	9.03	0.020	8469264
Total Mercury (Hg)	mg/kg	0.0309	0.0547	0.0627	0.0647	0.0463	0.0615	0.0020	8469264
Total Molybdenum (Mo)	mg/kg	0.033	0.027	0.016	0.037	0.022	0.030	0.010	8469264
Total Nickel (Ni)	mg/kg	0.059	0.069	0.037	0.159	0.045	0.100	0.010	8469264
Total Phosphorus (P)	mg/kg	6750	7660	8550	10700	9810	9040	2.0	8469264
Total Potassium (K)	mg/kg	3680	3000	2990	3340	3360	3040	2.0	8469264
Total Selenium (Se)	mg/kg	1.82	2.49	2.13	3.74	2.46	2.80	0.010	8469264
Total Silver (Ag)	mg/kg	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	0.0050	0.0040	8469264
Total Sodium (Na)	mg/kg	875	950	1010	1030	1150	997	2.0	8469264
Total Strontium (Sr)	mg/kg	9.39	14.3	14.8	18.0	17.1	15.9	0.010	8469264
Total Thallium (Tl)	mg/kg	0.00781	0.0113	0.0123	0.0114	0.0112	0.0154	0.00040	8469264
Total Tin (Sn)	mg/kg	0.028	0.021	<0.020	0.074	<0.020	<0.020	0.020	8469264
Total Titanium (Ti)	mg/kg	3.28	2.40	1.03	1.88	1.38	6.11	0.050	8469264
Total Uranium (U)	mg/kg	0.0327	0.0716	0.0621	0.114	0.0858	0.0707	0.00040	8469264
Total Vanadium (V)	mg/kg	0.168	0.208	0.127	0.163	0.185	0.360	0.020	8469264
Total Zinc (Zn)	mg/kg	25.0	27.8	24.8	37.1	27.1	29.3	0.040	8469264

RDL = Reportable Detection Limit

ELEMENTS BY ATOMIC SPECTROSCOPY - WET WT (TISSUE)

Maxxam ID		PP7298	PP7299	PP7300	PP7301	PP7302		
Sampling Date		2016/07/10	2016/07/10	2016/07/10	2016/07/10	2016/07/10		
COC Number		08427770	08427770	08427770	08427770	08427770		
	UNITS	**CF10.0-1-1-F**	**CF10.0-1-1-G**	**CF10.0 1-1-H**	**CF10.0 1-1-J**	**CF10.0 1-1-I**	**RDL**	**QC Batch**
Total Metals by ICPMS								
Total Aluminum (Al)	mg/kg	21.2	36.8	82.6	35.1	54.4	0.20	8469326
Total Antimony (Sb)	mg/kg	0.0124	0.0103	0.0122	0.0129	0.0195	0.0010	8469326
Total Arsenic (As)	mg/kg	0.0931	0.110	0.117	0.0962	0.121	0.0050	8469326
Total Barium (Ba)	mg/kg	3.02	4.12	4.34	3.72	3.90	0.010	8469326
Total Beryllium (Be)	mg/kg	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	8469326
Total Bismuth (Bi)	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	8469326
Total Boron (B)	mg/kg	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	8469326
Total Cadmium (Cd)	mg/kg	0.0440	0.0534	0.0920	0.0519	0.0713	0.0020	8469326
Total Calcium (Ca)	mg/kg	11300	11100	11200	10500	11200	2.0	8469326
Total Chromium (Cr)	mg/kg	0.046	0.171	0.133	0.085	0.111	0.010	8469326
Total Cobalt (Co)	mg/kg	0.0434	0.0580	0.0883	0.0666	0.0703	0.0040	8469326
Total Copper (Cu)	mg/kg	1.07	0.767	1.29	0.982	1.11	0.010	8469326
Total Iron (Fe)	mg/kg	46.2	70.7	134	65.5	95.4	1.0	8469326
Total Lead (Pb)	mg/kg	0.0777	0.0546	0.0927	0.259	0.119	0.0020	8469326
Total Magnesium (Mg)	mg/kg	371	334	337	351	371	2.0	8469326
Total Manganese (Mn)	mg/kg	7.68	7.56	11.9	8.26	8.53	0.020	8469326
Total Mercury (Hg)	mg/kg	0.0488	0.0440	0.0462	0.0382	0.0418	0.0020	8469326
Total Molybdenum (Mo)	mg/kg	0.018	0.032	0.047	0.034	0.045	0.010	8469326
Total Nickel (Ni)	mg/kg	0.063	0.143	0.107	0.073	0.093	0.010	8469326
Total Phosphorus (P)	mg/kg	8720	7730	8670	8380	8190	2.0	8469326
Total Potassium (K)	mg/kg	3260	3140	3200	3090	3100	2.0	8469326
Total Selenium (Se)	mg/kg	3.00	2.57	2.85	2.70	2.51	0.010	8469326
Total Silver (Ag)	mg/kg	<0.0040	<0.0040	<0.0040	<0.0040	0.0046	0.0040	8469326
Total Sodium (Na)	mg/kg	1050	943	1080	1050	1020	2.0	8469326
Total Strontium (Sr)	mg/kg	14.9	14.0	15.0	15.3	14.1	0.010	8469326
Total Thallium (Tl)	mg/kg	0.0110	0.0106	0.0115	0.0111	0.00915	0.00040	8469326
Total Tin (Sn)	mg/kg	0.087	0.104	0.121	0.078	0.078	0.020	8469326
Total Titanium (Ti)	mg/kg	1.69	2.47	6.51	2.27	3.67	0.050	8469326
Total Uranium (U)	mg/kg	0.0735	0.0726	0.105	0.0641	0.0841	0.00040	8469326
Total Vanadium (V)	mg/kg	0.174	0.210	0.454	0.230	0.312	0.020	8469326
Total Zinc (Zn)	mg/kg	30.0	27.7	29.1	26.5	27.0	0.040	8469326

RDL = Reportable Detection Limit

PHYSICAL TESTING (TISSUE)

Maxxam ID		PP7258		PP7259	PP7260	PP7261	PP7262		
Sampling Date		2016/07/09		2016/07/09	2016/07/09	2016/07/09	2016/07/09		
COC Number		08427766		08427766	08427766	08427766	08427766		
	UNITS	**LC2.7 3-1-A**	**QC Batch**	**LC2.7 3-1-B**	**LC2.7 3-3-A**	**LC2.7 3-3-B**	**LC2.7 3-3-C**	**RDL**	**QC Batch**
Physical Properties									
Moisture	%	76	8470310	76	75	76	75	0.30	8470433
RDL = Reportable Detection Limit									

Maxxam ID		PP7263	PP7264		PP7265		PP7266	PP7267		
Sampling Date		2016/07/13	2016/07/13		2016/07/13		2016/07/12	2016/07/12		
COC Number		08427766	08427766		08427766		08427766	08427766		
	UNITS	**LAC-1-BS**	**LAC-2-BS**	**QC Batch**	**LAC-3-AG**	**QC Batch**	**IC-1.9 2-1-A**	**IC-1.9 2-1-B**	**RDL**	**QC Batch**
Physical Properties										
Moisture	%	78	76	8470310	77	8470433	78	76	0.30	8470307
RDL = Reportable Detection Limit										

Maxxam ID		PP7268	PP7269	PP7270	PP7271	PP7272	PP7273	PP7274		
Sampling Date		2016/07/12	2016/07/12	2016/07/12	2016/07/12	2016/07/12	2016/07/12	2016/07/12		
COC Number		08427767	08427767	08427767	08427767	08427767	08427767	08427767		
	UNITS	**IC-1.9 2-1-C**	**IC-1.9 3-1-D**	**IC-1.9 3-2-E**	**IC-1.9 2-3-F**	**IC-1.9 1-1-G**	**IC-1.9 1-1-H**	**IC-1.9 1-1-I**	**RDL**	**QC Batch**
Physical Properties										
Moisture	%	77	80	80	82	81	81	79	0.30	8470307
RDL = Reportable Detection Limit										

Maxxam ID		PP7275	PP7276	PP7277	PP7278	PP7279	PP7280	PP7281		
Sampling Date		2016/07/12	2016/07/11	2016/07/11	2016/07/11	2016/07/11	2016/07/11	2016/07/11		
COC Number		08427767	08427767	08427767	08427768	08427768	08427768	08427768		
	UNITS	**IC-1.9 1-1-J**	**CF 3.9 3-1-A**	**CF-3.9 3-1-B**	**CF3.9 3-1-C**	**CF3.9 3-1-D**	**CF3.9 3-1-E**	**CF3.9 3-1-F**	**RDL**	**QC Batch**
Physical Properties										
Moisture	%	77	79	74	77	82	79	79	0.30	8470307
RDL = Reportable Detection Limit										

PHYSICAL TESTING (TISSUE)

Maxxam ID		PP7282	PP7283	PP7284	PP7285		PP7286	PP7287		
Sampling Date		2016/07/11	2016/07/11	2016/07/11	2016/07/11		2016/07/10	2016/07/10		
COC Number		08427768	08427768	08427768	08427768		08427768	08427768		
	UNITS	**CF3.9 3-1-G**	**CF3.9 3-1-H**	**CF3.9 3-1-I**	**CF3.9 3-1-J**	**QC Batch**	**CF10.0 AG-1**	**CF10.0 AG-2**	**RDL**	**QC Batch**
Physical Properties										
Moisture	%	86	76	91	79	8470307	78	73	0.30	8470310

RDL = Reportable Detection Limit

Maxxam ID		PP7288	PP7289	PP7290	PP7291	PP7292	PP7293	PP7294		
Sampling Date		2016/07/10	2016/07/10	2016/07/10	2016/07/10	2016/07/10	2016/07/10	2016/07/10		
COC Number		08427769	08427769	08427769	08427769	08427769	08427769	08427769		
	UNITS	**CF10.0 AG-3**	**CF10.0 AG-4**	**CF10.0 2-1-K**	**CF10.0 3-1-L**	**CF10.0 3-2-M**	**CF10.0 1-1-A**	**CF10.0 1-1-B**	**RDL**	**QC Batch**
Physical Properties										
Moisture	%	77	77	74	74	77	77	79	0.30	8470310

RDL = Reportable Detection Limit

Maxxam ID		PP7295	PP7296	PP7297	PP7298	PP7299	PP7300	PP7301		
Sampling Date		2016/07/10	2016/07/10	2016/07/10	2016/07/10	2016/07/10	2016/07/10	2016/07/10		
COC Number		08427769	08427769	08427769	08427770	08427770	08427770	08427770		
	UNITS	**CF10.0 1-1-C**	**CF10.0 1-1-D**	**CF10.0 1-1-E**	**CF10.0-1-1-F**	**CF10.0-1-1-G**	**CF10.0 1-1-H**	**CF10.0 1-1-J**	**RDL**	**QC Batch**
Physical Properties										
Moisture	%	79	81	81	86	86	80	87	0.30	8470310

RDL = Reportable Detection Limit

Maxxam ID		PP7302		
Sampling Date		2016/07/10		
COC Number		08427770		
	UNITS	**CF10.0 1-1-I**	**RDL**	**QC Batch**
Physical Properties				
Moisture	%	88	0.30	8470310

RDL = Reportable Detection Limit

GENERAL COMMENTS

Results relate only to the items tested.

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
8469250	Total Aluminum (Al)	2016/11/17					0.21, RDL=0.20	mg/kg	19	35		
8469250	Total Antimony (Sb)	2016/11/17	113	75 - 125	109	75 - 125	<0.0010	mg/kg	NC	35		
8469250	Total Arsenic (As)	2016/11/17	119	75 - 125	112	75 - 125	<0.0050	mg/kg	33	35	105	75 - 125
8469250	Total Barium (Ba)	2016/11/17	NC	75 - 125	121	75 - 125	<0.010	mg/kg	2.1	35		
8469250	Total Beryllium (Be)	2016/11/17	111	75 - 125	111	75 - 125	<0.0020	mg/kg	NC	35		
8469250	Total Bismuth (Bi)	2016/11/17					<0.020	mg/kg	NC	35		
8469250	Total Boron (B)	2016/11/17					<0.40	mg/kg	NC	35		
8469250	Total Cadmium (Cd)	2016/11/17	114	75 - 125	109	75 - 125	<0.0020	mg/kg	15	35	107	75 - 125
8469250	Total Calcium (Ca)	2016/11/17					<2.0	mg/kg	8.6	35		
8469250	Total Chromium (Cr)	2016/11/17	109	75 - 125	111	75 - 125	<0.010	mg/kg	23	35	85	75 - 125
8469250	Total Cobalt (Co)	2016/11/17	108	75 - 125	114	75 - 125	<0.0040	mg/kg	0.64	35		
8469250	Total Copper (Cu)	2016/11/17	NC	75 - 125	113	75 - 125	<0.010	mg/kg	6.3	35	99	75 - 125
8469250	Total Iron (Fe)	2016/11/17					<1.0	mg/kg	28	35	97	75 - 125
8469250	Total Lead (Pb)	2016/11/17	113	75 - 125	114	75 - 125	<0.0020	mg/kg	3.1	35	71 (1)	75 - 125
8469250	Total Magnesium (Mg)	2016/11/17					<2.0	mg/kg	1.2	35		
8469250	Total Manganese (Mn)	2016/11/17	NC	75 - 125	110	75 - 125	<0.020	mg/kg	9.1	35		
8469250	Total Mercury (Hg)	2016/11/17	NC	75 - 125	109	75 - 125	0.0034, RDL=0.0020	mg/kg	13	35	116	75 - 125
8469250	Total Molybdenum (Mo)	2016/11/17	115	75 - 125	101	75 - 125	<0.010	mg/kg	NC	35		
8469250	Total Nickel (Ni)	2016/11/17	105	75 - 125	114	75 - 125	<0.010	mg/kg	15	35	91	75 - 125
8469250	Total Phosphorus (P)	2016/11/17					<2.0	mg/kg	3.9	35		
8469250	Total Potassium (K)	2016/11/17					<2.0	mg/kg	7.3	35		
8469250	Total Selenium (Se)	2016/11/17	NC	75 - 125	116	75 - 125	<0.010	mg/kg	7.6	35	109	75 - 125
8469250	Total Silver (Ag)	2016/11/17	81	75 - 125	94	75 - 125	<0.0040	mg/kg	NC	35		
8469250	Total Sodium (Na)	2016/11/17					<2.0	mg/kg	0.058	35		
8469250	Total Strontium (Sr)	2016/11/17	NC	75 - 125	111	75 - 125	<0.010	mg/kg	2.4	35		
8469250	Total Thallium (Tl)	2016/11/17	109	75 - 125	109	75 - 125	<0.00040	mg/kg	3.3	35		
8469250	Total Tin (Sn)	2016/11/17	103	75 - 125	104	75 - 125	<0.020	mg/kg	NC	35		
8469250	Total Titanium (Ti)	2016/11/17	NC	75 - 125	102	75 - 125	<0.050	mg/kg	25	35		
8469250	Total Uranium (U)	2016/11/17	116	75 - 125	113	75 - 125	<0.00040	mg/kg	5.0	35		

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
8469250	Total Vanadium (V)	2016/11/17	105	75 - 125	109	75 - 125	<0.020	mg/kg	9.1	35		
8469250	Total Zinc (Zn)	2016/11/17	NC	75 - 125	112	75 - 125	<0.040	mg/kg	3.5	35	108	75 - 125
8469264	Total Aluminum (Al)	2016/11/17					<0.20	mg/kg	27	35		
8469264	Total Antimony (Sb)	2016/11/17	110	75 - 125	109	75 - 125	<0.0010	mg/kg	NC	35		
8469264	Total Arsenic (As)	2016/11/17	122	75 - 125	115	75 - 125	<0.0050	mg/kg	11	35	107	75 - 125
8469264	Total Barium (Ba)	2016/11/17	NC	75 - 125	126 (3)	75 - 125	<0.010	mg/kg	28	35		
8469264	Total Beryllium (Be)	2016/11/17	106	75 - 125	111	75 - 125	<0.0020	mg/kg	NC	35		
8469264	Total Bismuth (Bi)	2016/11/17					<0.020	mg/kg	NC	35		
8469264	Total Boron (B)	2016/11/17					<0.40	mg/kg	NC	35		
8469264	Total Cadmium (Cd)	2016/11/17	109	75 - 125	110	75 - 125	<0.0020	mg/kg	8.0	35	109	75 - 125
8469264	Total Calcium (Ca)	2016/11/17					<2.0	mg/kg	24	35		
8469264	Total Chromium (Cr)	2016/11/17	113	75 - 125	107	75 - 125	<0.010	mg/kg	4.5	35	87	75 - 125
8469264	Total Cobalt (Co)	2016/11/17	108	75 - 125	111	75 - 125	<0.0040	mg/kg	5.8	35		
8469264	Total Copper (Cu)	2016/11/17	NC	75 - 125	112	75 - 125	<0.010	mg/kg	11	35	99	75 - 125
8469264	Total Iron (Fe)	2016/11/17					<1.0	mg/kg	35	35	100	75 - 125
8469264	Total Lead (Pb)	2016/11/17	111	75 - 125	118	75 - 125	<0.0020	mg/kg	6.5	35	71 (2)	75 - 125
8469264	Total Magnesium (Mg)	2016/11/17					<2.0	mg/kg	1.4	35		
8469264	Total Manganese (Mn)	2016/11/17	NC	75 - 125	108	75 - 125	<0.020	mg/kg	22	35		
8469264	Total Mercury (Hg)	2016/11/17	NC	75 - 125	112	75 - 125	0.0033, RDL=0.0020	mg/kg	9.2	35	113	75 - 125
8469264	Total Molybdenum (Mo)	2016/11/17	118	75 - 125	102	75 - 125	<0.010	mg/kg	NC	35		
8469264	Total Nickel (Ni)	2016/11/17	107	75 - 125	110	75 - 125	<0.010	mg/kg	NC	35	95	75 - 125
8469264	Total Phosphorus (P)	2016/11/17					<2.0	mg/kg	14	35		
8469264	Total Potassium (K)	2016/11/17					<2.0	mg/kg	4.9	35		
8469264	Total Selenium (Se)	2016/11/17	NC	75 - 125	112	75 - 125	<0.010	mg/kg	0.48	35	108	75 - 125
8469264	Total Silver (Ag)	2016/11/17	77	75 - 125	97	75 - 125	<0.0040	mg/kg	NC	35		
8469264	Total Sodium (Na)	2016/11/17					<2.0	mg/kg	2.0	35		
8469264	Total Strontium (Sr)	2016/11/17	NC	75 - 125	109	75 - 125	<0.010	mg/kg	12	35		
8469264	Total Thallium (Tl)	2016/11/17	117	75 - 125	112	75 - 125	<0.00040	mg/kg	1.2	35		
8469264	Total Tin (Sn)	2016/11/17	102	75 - 125	106	75 - 125	<0.020	mg/kg	NC	35		
8469264	Total Titanium (Ti)	2016/11/17	NC	75 - 125	104	75 - 125	<0.050	mg/kg	61 (4)	35		

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	**Parameter**	**Date**	**% Recovery**	**QC Limits**	**% Recovery**	**QC Limits**	**Value**	**UNITS**	**Value (%)**	**QC Limits**	**% Recovery**	**QC Limits**
8469264	Total Uranium (U)	2016/11/17	117	75 - 125	115	75 - 125	<0.00040	mg/kg	3.6	35		
8469264	Total Vanadium (V)	2016/11/17	117	75 - 125	111	75 - 125	<0.020	mg/kg	36 (4)	35		
8469264	Total Zinc (Zn)	2016/11/17	NC	75 - 125	115	75 - 125	<0.040	mg/kg	5.4	35	108	75 - 125
8469326	Total Aluminum (Al)	2016/11/17					<0.20	mg/kg	14	35		
8469326	Total Antimony (Sb)	2016/11/17	109	75 - 125	111	75 - 125	<0.0010	mg/kg	NC	35		
8469326	Total Arsenic (As)	2016/11/17	120	75 - 125	115	75 - 125	<0.0050	mg/kg	7.4	35	107	75 - 125
8469326	Total Barium (Ba)	2016/11/17	NC	75 - 125	123	75 - 125	<0.010	mg/kg	4.2	35		
8469326	Total Beryllium (Be)	2016/11/17	107	75 - 125	114	75 - 125	<0.0020	mg/kg	NC	35		
8469326	Total Bismuth (Bi)	2016/11/17					<0.020	mg/kg	NC	35		
8469326	Total Boron (B)	2016/11/17					<0.40	mg/kg	NC	35		
8469326	Total Cadmium (Cd)	2016/11/17	111	75 - 125	111	75 - 125	<0.0020	mg/kg	3.3	35	108	75 - 125
8469326	Total Calcium (Ca)	2016/11/17					<2.0	mg/kg	3.8	35		
8469326	Total Chromium (Cr)	2016/11/17	106	75 - 125	113	75 - 125	<0.010	mg/kg	7.2	35	87	75 - 125
8469326	Total Cobalt (Co)	2016/11/17	105	75 - 125	116	75 - 125	<0.0040	mg/kg	2.9	35		
8469326	Total Copper (Cu)	2016/11/17	NC	75 - 125	116	75 - 125	<0.010	mg/kg	0.63	35	101	75 - 125
8469326	Total Iron (Fe)	2016/11/17					<1.0	mg/kg	2.2	35	99	75 - 125
8469326	Total Lead (Pb)	2016/11/17	111	75 - 125	118	75 - 125	<0.0020	mg/kg	NC	35	81	75 - 125
8469326	Total Magnesium (Mg)	2016/11/17					<2.0	mg/kg	2.6	35		
8469326	Total Manganese (Mn)	2016/11/17	NC	75 - 125	116	75 - 125	<0.020	mg/kg	2.5	35		
8469326	Total Mercury (Hg)	2016/11/17	NC	75 - 125	112	75 - 125	0.0039, RDL=0.0020	mg/kg	8.0	35	105	75 - 125
8469326	Total Molybdenum (Mo)	2016/11/17	112	75 - 125	108	75 - 125	<0.010	mg/kg	NC	35		
8469326	Total Nickel (Ni)	2016/11/17	103	75 - 125	117	75 - 125	<0.010	mg/kg	NC	35	91	75 - 125
8469326	Total Phosphorus (P)	2016/11/17					<2.0	mg/kg	1.1	35		
8469326	Total Potassium (K)	2016/11/17					<2.0	mg/kg	2.4	35		
8469326	Total Selenium (Se)	2016/11/17	NC	75 - 125	115	75 - 125	<0.010	mg/kg	4.0	35	110	75 - 125
8469326	Total Silver (Ag)	2016/11/17	79	75 - 125	89	75 - 125	<0.0040	mg/kg	NC	35		
8469326	Total Sodium (Na)	2016/11/17					<2.0	mg/kg	1.8	35		
8469326	Total Strontium (Sr)	2016/11/17	NC	75 - 125	112	75 - 125	<0.010	mg/kg	0.74	35		
8469326	Total Thallium (Tl)	2016/11/17	108	75 - 125	112	75 - 125	<0.00040	mg/kg	2.3	35		
8469326	Total Tin (Sn)	2016/11/17	104	75 - 125	105	75 - 125	<0.020	mg/kg	NC	35		

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
8469326	Total Titanium (Ti)	2016/11/17	112	75 - 125	108	75 - 125	<0.050	mg/kg	32	35		
8469326	Total Uranium (U)	2016/11/17	116	75 - 125	116	75 - 125	<0.00040	mg/kg	3.0	35		
8469326	Total Vanadium (V)	2016/11/17	108	75 - 125	114	75 - 125	<0.020	mg/kg	NC	35		
8469326	Total Zinc (Zn)	2016/11/17	NC	75 - 125	116	75 - 125	<0.040	mg/kg	0.56	35	103	75 - 125
8470307	Moisture	2016/11/15					<0.30	%	11	20		
8470310	Moisture	2016/11/16					<0.30	%	2.6	20		
8470433	Moisture	2016/11/16					<0.30	%	2.4	20		

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

(1) Reference outside acceptance criteria - re-analysis yields similar results.

(2) Reference outside acceptance criteria (10% of analytes failure allowed).

(3) Blank Spike outside acceptance criteria (10% of analytes failure allowed).

(4) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

[signature redacted]

Andy Lu, Ph.D., P.Chem., Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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CHAIN OF CUSTODY RECORD

COC #: 08427766

BBY FCD-00077/05
Page 1 of 5

Invoice Information

Company Name: EDI Environmental Dynamics Inc.
Contact Name: Shannon Jenner
Address: 2195 2nd Avenue
Whitehorse, YT PC: Y1A 3T8
Phone: [phone number redacted]
Email: [email redacted]

Report Information (if differs from invoice)

Company Name: EDI
Contact Name: Lyndsay Doetzel
Address: same as invoice
PC:
Phone: [phone number redacted]
Email: [email redacted]

Project Information (where a

Quotation #: B60053
P.O. #/ AFE#:
Project #: 14Y0306:102
Site Location: Coffee Creek
Site #:
Sampled By: ~~J. Taylor/J. Duncan~~ B. Snow

Time (TAT) Required

☒ Regular TAT 5 days (Most analyses)

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Rush TAT (Surcharges will be applied)
☐ Same Day ☐ 2 Days
☐ 1 Day ☐ 3 Days

Date Required:

Rush Confirmation #:

Regulatory Criteria

☐ BC CSR Soil ☐ BC CSR Water
☐ CCME (Specify) ☐ Other (Specify)
☐ Drinking Water ☐ BC Water Quality

Special Instructions

☐ Return Cooler
☐ Ship Sample Bottles (Please Specify)

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Analysis Requested

	Sample Identification	Lab Identification	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	BTEX/VPH ☐ MTBE ☐ VOC/VPH ☐	EPH ☐ TEH ☐	PAH ☐ LEPH/HEPH ☐	CCME-PHC BTEX/ F1 ☐ F2 - F4 ☐	Dissolved Metals Filtered? ☐ Preserved? ☐	Dissolved Mercury Filtered? ☐ Preserved? ☐	Total Metals Field Preserved? ☐	Total Mercury Field Preserved? ☐	Chloride ☐ Fluoride ☐ Sulphate ☐	TSS ☐ TDS ☐ BOD ☐ COD ☐	pH ☐ Conductivity ☐ Alkalinity ☐	Nitrite ☐ Nitrate ☐ Ammonia ☐	Total Metals in Tissue (wet weight)	% Moisture in Tissue			# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE	COMMENTS
1	LC2.7 3-1-A		2016/07/09		tissue													x	x			1		whole body tissue
2	LC2.7 3-1-B		↓		tissue													x	x			1		↓
3	LC2.7 3-3-A				tissue													x	x			1		
4	LC2.7 3-3-B				tissue													x	x			1		
5	LC2.7 3-3-C				tissue													x	x			1		
6	LaC-1-BS		2016/07/13		tissue													x	x			1		
7	LaC-2-BS		2016/07/13		tissue													x	x			1		
8	LaC-3-AG		2016/07/15		tissue													x	x			1		
9	IC-1.9 2-1-A		2016/07/12		tissue													x	x			1		
10	IC-1.9 2-1-B		2016/07/12		tissue													x	x			1		

LABORATORY USE ONLY

CUSTODY SEAL Y / [✓ N]

Present	Intact	COOLER TEMPERATURES
		9, 10, 10

COOLING MEDIA PRESENT [✓ Y] / N

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)
[signature redacted]	2016/09/26	09:00	[signature redacted]	2016/09/27	16:15

B684483_COC

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CHAIN OF CUSTODY RECORD

COC #: 08427767

BBY FCD-00077/05
Page 2 of 5

Invoice Information

Company Name: EDI Environmental Dynamics Inc.
Contact Name: Shannon Jenner
Address: 2195 2nd Avenue
Whitehorse, YT PC: Y1A 3T8
[phone number redacted]
Phone:
Email: [email redacted]

Report Information (if differs from invoice)

Company Name: EDI
Contact Name: Lyndsay Doetzel
Address: same as invoice
PC:
[phone number redacted]
Phone:
Email: [email redacted]

Project Information (where a

Quotation #: B60053
P.O. #/ AFE#:
Project #: 14Y0306:102
Site Location: Coffee Creek
Site #:
Sampled By: ~~J. Taylor~~ / J. Duncan /D. Hansen

d Time (TAT) Required

☒ Regular TAT 5 days (Most analyses)

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Rush TAT (Surcharges will be applied)
☐ Same Day ☐ 2 Days
☐ 1 Day ☐ 3 Days

Date Required:

Rush Confirmation #:

Regulatory Criteria

☐ BC CSR Soil ☐ BC CSR Water
☐ CCME (Specify) ☐ Other (Specify)
☐ Drinking Water ☐ BC Water Quality

Special Instructions

☐ Return Cooler
☐ Ship Sample Bottles (Please Specify)

Analysis Requested

LABORATORY USE ONLY

CUSTODY SEAL Y [✓ N]		COOLER TEMPERATURES
Present	Intact	
		9,10,10

COOLING MEDIA PRESENT [✓ Y] / N

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

	Sample Identification	Lab Identification	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	BTEX/VPH ☐ MTBE ☐ VOC/VPH ☐	EPH ☐ TEH ☐	PAH ☐ LEPH/HEPH ☐	CCME-PHC BTEX/ F1 ☐ F2 - F4 ☐	Dissolved Metals Filtered? ☐ Preserved? ☐	Dissolved Mercury Filtered? ☐ Preserved? ☐	Total Metals Field Preserved? ☐	Total Mercury Field Preserved? ☐	Chloride ☐ Fluoride ☐ Sulphate ☐	TSS ☐ TDS ☐ BOD ☐ COD ☐	pH ☐ Conductivity ☐ Alkalinity ☐	Nitrite ☐ Nitrate ☐ Ammonia ☐	Total Metals in Tissue (wet weight)	% Moisture in Tissue			# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE	COMMENTS
1	IC-1.9 2-1-C		2016/07/12		tissue													x	x			1		whole body tissue
2	IC-1.9 3-1-D				tissue													x	x			1		
3	IC-1.9 3-2-E				tissue													x	x			1		
4	IC-1.9 2-3-F				tissue													x	x			1		
5	IC-1.9 1-1-G				tissue													x	x			1		
6	IC-1.9 1-1-H				tissue													x	x			1		
7	IC-1.9 1-1-I				tissue													x	x			1		
8	IC-1.9 1-1-J				tissue													x	x			1		
9	CF 3.9 3-1-A		2016/07/11		tissue													x	x			1		
10	CF-3.9 3-1-B		"		tissue													x	x			1		

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)
[signature redacted]	2016/09/26	09:00	[signature redacted]	2014/09/27	16:15

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CHAIN OF CUSTODY RECORD

BBY FCD-00077/05
Page 3 of 5

COC #: 08427768

Invoice Information

Company Name: EDI Environmental Dynamics Inc.
Contact Name: Shannon Jenner
Address: 2195 2nd Avenue
Whitehorse, YT PC: Y1A 3T8
Phone: [phone number redacted]
Email: [email redacted]

Report Information (if differs from invoice)

Company Name: EDI
Contact Name: Lyndsay Doetzel
Address: same as invoice
[phone number redacted] PC:
Phone:
Email: [email redacted]

Project Information (where a

Quotation #: B60053
P.O. #/ AFE#:
Project #: 14Y0306:102
Site Location: Coffee Creek
Site #:
Sampled By: ~~J. Taylor~~/ J. Duncan/ D. Hansen.

d Time (TAT) Required

☒ Regular TAT 5 days (Most analyses)

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Rush TAT (Surcharges will be applied)
☐ Same Day ☐ 2 Days
☐ 1 Day ☐ 3 Days

Date Required:
Rush Confirmation #:

Regulatory Criteria

☐ BC CSR Soil ☐ BC CSR Water
☐ CCME (Specify) ☐ Other (Specify)
☐ Drinking Water ☐ BC Water Quality

Special Instructions

☐ Return Cooler
☐ Ship Sample Bottles (Please Specify)

LABORATORY USE ONLY

CUSTODY SEAL Y [✓ N]
Present | Intact
COOLER TEMPERATURES 9,10,10
COOLING MEDIA PRESENT [✓ Y] / N

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Analysis Requested

	Sample Identification	Lab Identification	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	BTEX/VPH ☐ MTBE ☐ VOC/VPH ☐	EPH ☐ TEH ☐	PAH ☐ LEPH/HEPH ☐	CCME-PHC BTEX/ F1 ☐ F2 - F4 ☐	Dissolved Metals Filtered? ☐ Preserved? ☐	Dissolved Mercury Filtered? ☐ Preserved? ☐	Total Metals Field Preserved? ☐	Total Mercury Field Preserved? ☐	Chloride ☐ Fluoride ☐ Sulphate ☐	TSS ☐ TDS ☐ BOD ☐ COD ☐	pH ☐ Conductivity ☐ Alkalinity ☐	Nitrite ☐ Nitrate ☐ Ammonia ☐	Total Metals in Tissue (wet weight)	% Moisture in Tissue			# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE	COMMENTS
1	CF3.9 3-1-C		2016/07/11		tissue													x	x			1		whole body tissue
2	CF3.9 3-1-D				tissue													x	x			1		
3	CF3.9 3-1-E				tissue													x	x			1		
4	CF3.9 3-1-F				tissue													x	x			1		
5	CF3.9 3-1-G				tissue													x	x			1		
6	CF3.9 3-1-H				tissue													x	x			1		
7	CF 3.9 3-1-I				tissue													x	x			1		
8	CF3.9 3-1-J				tissue													x	x			1		
9	CF10.0 AG-1		2016/07/10		tissue													x	x			1		
10	CF10.0 AG-2		2016/07/10		tissue													x	x			1		

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)
[signature redacted]	2016/09/26	09:20	[signature redacted]	2016/09/27	16:15

B684483_COC

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CHAIN OF CUSTODY RECORD

COC #: 08427769

BBY FCD-00077/05
Page 4 of 5

Invoice Information
Company Name: EDI Environmental Dynamics Inc.
Contact Name: Shannon Jenner
Address: 2195 2nd Avenue
Whitehorse, YT PC: Y1A 3T8
Phone: [phone number redacted]
Email: [email redacted]

Report Information (if differs from invoice)
Company Name: EDI
Contact Name: Lyndsay Doetzel
Address: same as invoice
PC:
Phone: [phone number redacted]
Email: [email redacted]

Project Information (where a
Quotation #: B60053
P.O. #/ AFE#:
Project #: 14Y0306:102
Site Location: Coffee Creek
Site #:
Sampled By: D. Hansen / J. Duncan

Time (TAT) Required
☒ Regular TAT 5 days (Most analyses)
PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Rush TAT (Surcharges will be applied)
☐ Same Day ☐ 2 Days
☐ 1 Day ☐ 3 Days
Date Required:
Rush Confirmation #:

Regulatory Criteria
☐ BC CSR Soil ☐ BC CSR Water
☐ CCME (Specify) ☐ Other (Specify)
☐ Drinking Water ☐ BC Water Quality

Special Instructions
☐ Return Cooler
☐ Ship Sample Bottles (Please Specify)

LABORATORY USE ONLY
CUSTODY SEAL Y / [✓ N]
Present | Intact
COOLER TEMPERATURES: 9, 10, 10
COOLING MEDIA PRESENT [✓ Y] / N

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Analysis Requested

	Sample Identification	Lab Identification	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	BTEX/VPH ☐ MTBE ☐ VOC/VPH ☐	EPH ☐ TEH ☐	PAH ☐ LEPH/HEPH ☐	CCME-PHC BTEX/F1 ☐ F2-F4 ☐	Dissolved Metals Filtered? ☐ Preserved? ☐	Dissolved Mercury Filtered? ☐ Preserved? ☐	Total Metals Field Preserved? ☐	Total Mercury Field Preserved? ☐	Chloride ☐ Fluoride ☐ Sulphate ☐	TSS ☐ TDS ☐ BOD ☐ COD ☐	pH ☐ Conductivity ☐ Alkalinity ☐	Nitrite ☐ Nitrate ☐ Ammonia ☐	Total Metals in Tissue (wet weight)	% Moisture in Tissue				# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE	COMMENTS
1	CF10.0 AG-3		2016/07/10		tissue													x	x				1		whole body
2	CF 10.0 AG-4		2016/07/10		tissue													x	x				1		
3	CF10.0 2-1-K		2016/07/10		tissue													x	x				1		
4	CF10.0 3-1-L		〃		tissue													x	x				1		
5	CF 10.0 3-2-M		2016/07/10		tissue													x	x				1		
6	CF 10.0 1-1-A		2016/07/10		tissue													x	x				1		
7	CF10.0 1-1-B		〃		tissue													x	x				1		see comment on pg 5.
8	CF 10.0 1-1-C				tissue													x	x				1		
9	CF 10.0 1-1-D				tissue													x	x				1		
10	CF 10.0 1-1-E				tissue													x	x				1		

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)
[signature redacted]	2016/09/26	09:00	[signature redacted]	2016/09/27	16:15

B684483_COC

Maxxam
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Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5. Toll Free (800) 665-8566

CHAIN OF CUSTODY RECORD

COC #: 08427770

BBY FCD-00077/05
Page 5 of 5

Invoice Information
Company Name: EDI Environmental Dynamics Inc.
Contact Name: Shannon Jenner
Address: 2195 2nd Avenue
Whitehorse, YT PC: Y1A 3T8
Phone: [phone number redacted]
Email: [email redacted]

Report Information (if differs from invoice)
Company Name: EDI
Contact Name: Lyndsay Doetzel
Address: same as invoice
PC:
Phone: [phone number redacted]
Email: [email redacted]

Project Information (where ap
Quotation #: B60053
P.O. #/ AFE#:
Project #: 14Y0306:102
Site Location: Coffee Creek
Site #:
Sampled By: D. Hansen / J. Duncan

d Time (TAT) Required
☒ Regular TAT 5 days (Most analyses)
PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Rush TAT (Surcharges will be applied)
☐ Same Day ☐ 2 Days
☐ 1 Day ☐ 3 Days
Date Required:
Rush Confirmation #:

Regulatory Criteria
☐ BC CSR Soil ☐ BC CSR Water
☐ CCME (Specify) ☐ Other (Specify)
☐ Drinking Water ☐ BC Water Quality

Special Instructions
☐ Return Cooler
☐ Ship Sample Bottles (Please Specify)

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Analysis Requested

	Sample Identification	Lab Identification	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	BTEX/VPH ☐ MTBE ☐ VOC/VPH ☐	EPH ☐ TEH ☐	PAH ☐ LEPH/HEPH ☐	CCME-PHC BTEX/ F1 ☐ F2 - F4 ☐	Dissolved Metals Filtered? ☐ Preserved? ☐	Dissolved Mercury Filtered? ☐ Preserved? ☐	Total Metals Field Preserved? ☐	Total Mercury Field Preserved? ☐	Chloride ☐ Fluoride ☐ Sulphate ☐	TSS ☐ TDS ☐ BOD ☐ COD ☐	pH ☐ Conductivity ☐ Alkalinity ☐	Nitrite ☐ Nitrate ☐ Ammonia ☐	Total Metals in Tissue (wet weight)	% Moisture in Tissue			# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE
1	CF10.0-1-1-F		2016/07/10		tissue													x	x			1	
2	CF10.0-1-1-G		〃		tissue													x	x			1	
3	CF10.0 1-1-H				tissue													x	x			1	
4	CF10.0 1-1-J				tissue													x	x			1	
5	CF10.0 1-1-I				tissue													x	x			1	
6					tissue													x	x			1	
7					tissue													x	x			1	
8					tissue													x	x			1	
9					tissue													x	x			1	
10					tissue													x	x			1	

LABORATORY USE ONLY
CUSTODY SEAL Y [✓ N]
Present | Intact
COOLER TEMPERATURES: 9,10,10
COOLING MEDIA PRESENT [✓ Y] / N

COMMENTS
if any samples from CF 10.0 are too small for analysis please combine

RECEIVED IN WHITEHORSE
BY: [signature redacted]
2016-09-26
TEMP: -12 / -12 / -12

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)
[signature redacted]	2016/09/26	09:00	[signature redacted]	2016/09/27	16:15

B684483_COC

APPENDIX F. 2016 STREAM CROSSING PHOTOGRAPHS

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Photo 1. Crossing #51 (Indian River Trib 1) – upstream view.

Photo 2. Crossing #51 (Indian River Trib 1) – downstream view.

Photo 3. Crossing #52 (Indian River Trib 2) – upstream view downstream of road.

Photo 4. Crossing #52 (Indian River Trib 2) – downstream view downstream of road.

Photo 5. Crossing #52 (Indian River Trib 2) – upstream view from existing road.

Photo 6. Crossing #52 (Indian River Trib 2) – upstream view from existing road.

Photo 7. Crossing #53 (Indian River Trib 3) – upstream view.

Photo 8. Crossing #53 (Indian River Trib 3) – downstream view.

Photo 9. Crossing #53 (Indian River Trib 3) – upstream view from existing road.

Photo 10. Crossing #53 (Indian River Trib 3) – upstream view towards existing road.

Photo 11. Crossing #54 (Indian River Trib 4) – upstream view.

Photo 12. Crossing #54 (Indian River Trib 4) – downstream view.

Photo 13. Crossing #54.5 (Eureka Trib) – upstream view.

Photo 14. Crossing #54.5 (Eureka Trib) – downstream view.

Photo 15. Crossing #55 (Eureka Creek) – upstream view.

Photo 16. Crossing #55 (Eureka Creek) – downstream view.

Photo 17. Crossing #57 (Maisy May Trib).

Photo 18. Crossing #57 (Maisy May Trib).

Photo 19. Crossing #60 (Maisy May Trib) – upstream view

Photo 20. Crossing #60 (Maisy May Trib) – downstream view.

Photo 21. Crossing #61 (Maisy May Trib).

Photo 22. Crossing #61 (Maisy May Trib).

Photo 23. Crossing #72 (Maisy May Trib) – upstream view.

Photo 24. Crossing #72 (Maisy May Trib) – downstream view.

Photo 25. Crossing #73 (Maisy May Trib).

Photo 26. Crossing #73 (Maisy May Trib).

Photo 27. Crossing #74 (Maisy May Trib) – upstream view.

Photo 28. Crossing #74 (Maisy May Trib) – downstream view.

Photo 29. Crossing #75 (Maisy May Trib 1) – upstream view.

Photo 30. Crossing #75 (Maisy May Trib 1) – downstream view of culvert inlet.

Photo 31. Crossing #75 (Maisy May Trib 1) – culvert outlet.

Photo 32. Crossing #75 (Maisy May Trib 1) – downstream view below road.

Photo 33. Crossing #76 (Maisy May Trib 2) – upstream view.

Photo 34. Crossing #76 (Maisy May Trib 2) – downstream view of existing crossing.

Photo 35. Crossing #76 (Maisy May Trib 2) – culvert inlet.

Photo 36. Crossing #76 (Maisy May Trib 2) – downstream view of culvert outlet.

Photo 37. Crossing #77 (Maisy May Trib 3) – upstream view.

Photo 38. Crossing #77 (Maisy May Trib 3) – upstream of existing crossing looking downstream to existing crossing.

Photo 39. Crossing #77 (Maisy May Trib 3) – existing crossing.

Photo 40. Crossing #77 (Maisy May Trib 3) – upstream view downstream of road.

Photo 41. Crossing MMTT-1 (Maisy May Tailings Trib 1) – upstream view above road crossing.

Photo 42. Crossing MMTT-1 (Maisy May Tailings Trib 1) – downstream view.

Photo 43. Crossing MMTT-2 (Maisy May Tailings Trib 2) – upstream view.

Photo 44. Crossing MMTT-2 (Maisy May Tailings Trib 2) – downstream view.

Photo 45. Crossing MMTT-3 (Maisy May Tailings Trib 3) – area between road and Maisy May Creek.

Photo 46. Crossing MMTT-3 (Maisy May Tailings Trib 3) – area between road and Maisy May Creek.

Photo 47. Crossing MMTT-4 (Maisy May Tailings Trib 4) – area between road and Maisy May Creek.

Photo 48. Crossing MMTT-4 (Maisy May Tailings Trib 4) – evidence of occasional flow on east side of road.

Photo 49. Crossing MMTT-5 (Maisy May Tailings Trib 5) – upstream view.

Photo 50. Crossing MMTT-5 (Maisy May Tailings Trib 5) – downstream view.

Photo 51. Crossing #81 (Maisy May Trib 4) – upstream view

Photo 52. Crossing #81 (Maisy May Trib 4) – downstream view

Photo 53. Crossing #83 (Lower Maisy May Trib) – upstream view.

Photo 54. Crossing #83 (Lower Maisy May Trib) – downstream view.

Photo 55. Crossing #84 (Lower Maisy May Trib 2) – upstream view.

Photo 56. Crossing #84 (Lower Maisy May Trib 2) – downstream view of ponded water.

Photo 57. Crossing #85 (Maisy May Trib) – upstream view.

Photo 58. Crossing #85 (Maisy May Trib) – downstream view.

Photo 59. Crossing #97 (North Stewart Trib) – upstream view.

Photo 60. Crossing #97 (North Stewart Trib) – downstream view.

Photo 61. Crossing #101 (Lower Barker Trib 1) – upstream view.

Photo 62. Crossing #101 (Lower Barker Trib 1) – downstream view.

Photo 63. Crossing #102 (Lower Barker Trib 2) – upstream view.

Photo 64. Crossing #102 (Lower Barker Trib 2) – downstream view.

Photo 65. Crossing #103 (Lower Barker Trib 3) – upstream view.

Photo 66. Crossing #103 (Lower Barker Trib 3) – downstream view.

Photo 67. Crossing #104 (Lower Barker Trib 4) – upstream view.

Photo 68. Crossing #104 (Lower Barker Trib 4) – downstream view.

Photo 69. Crossing #110 (Barker Trib) – upstream view.

Photo 70. Crossing #110 (Barker Trib) – downstream view.

Photo 71. Crossing #111 (mid Barker camp) – upstream view.

Photo 72. Crossing #111 (mid Barker camp) – downstream view.

Photo 73. Crossing #112 (mid Barker tailings 1) – upstream view.

Photo 74. Crossing #112 (mid Barker tailings 1) – downstream view.

Photo 75. Crossing #113 (mid Barker tailings 2) – upstream view.

Photo 76. Crossing #113 (mid Barker tailings 2) – downstream view.

Photo 77. Crossing #114 (Barker trib) – upstream view.

Photo 78. Crossing #114 (Barker trib) – downstream view.

Photo 79. Crossing #115 (Barker trib) – upstream view.

Photo 80. Crossing #210 (Upper Barker Trib 1) – upstream view.

Photo 81. Crossing #210 (Upper Barker Trib 1) – downstream view.

Photo 82. Crossing #209 (Upper Barker Trib 3) – upstream view.

Photo 83. Crossing #209 (Upper Barker Trib 3) – downstream view.

Photo 84. Crossing #208 (Agate Creek) – upstream view.

Photo 85. Crossing #208 (Agate) – downstream view.

Photo 86. Crossing #207 (Upper Barker Trib 4) – upstream view.

Photo 87. Crossing #207 (Upper Barker Trib 4) – downstream view.

Photo 88. Crossing #206 (Ballarat headwaters) – upstream view.

Photo 89. Crossing #206 (Ballarat headwaters) – downstream view.

Photo 90. Crossing #205 (Upper Ballarat) – upstream view.

Photo 91. Crossing #205 (Upper Ballarat) – downstream view.

Photo 92. Crossing #204 (Ballarat Trib) – upstream view.

Photo 93. Crossing #203 (Upper Ballarat Trib) – upstream view.

Photo 94. Crossing #203 (Upper Ballarat Trib) – downstream view.

Photo 95. Crossing #202 (Ballarat Trib) – upstream view downstream of NAR crossing.

Photo 96. Crossing #202 (Ballarat Trib) – downstream view (below NAR crossing).

Photo 97. Crossing #201 (mid Ballarat) – upstream view.

Photo 98. Crossing #201 (mid Ballarat) – downstream view.

Photo 99. Crossing #118 (lower Ballarat Trib 1) – upstream view.

Photo 100. Crossing #118 (lower Ballarat Trib 1) – downstream view.

Photo 101. Crossing #119 (lower Ballarat Trib 2) – upstream view.

Photo 102. **Winter road crossing 1 (Yukon River trib) – upstream view.**

Photo 103. **Winter road crossing 2 (Yukon River trib) – upstream view.**

Photo 104. **Winter road crossing 2 (Yukon River trib) – downstream view.**