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Technical Report Overview

Report: Calcite Effects on Aquatic Biota 2014-2015 Report

Overview: This report provides the results of a phased study that looked at the potential relationship between calcite deposition and benthic invertebrate community structure, periphyton productivity, and the potential effects on fish spawning.

This report was prepared for Teck by Minnow Environmental Inc.

For More Information
If you have questions regarding this report, please:
• Phone toll-free to 1.855.806.6854
• Email **feedbackteckcoal@teck.com**

Future studies will be made available at **teck.com/elkvalley**

Evaluation of Calcite Effects on Aquatic Biota in the Elk Valley (2014 & 2015)

Prepared for:
Teck Coal Limited
Sparwood, BC

Prepared by:
Minnow Environmental Inc.
Georgetown, ON

June 2016

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1.0 INTRODUCTION

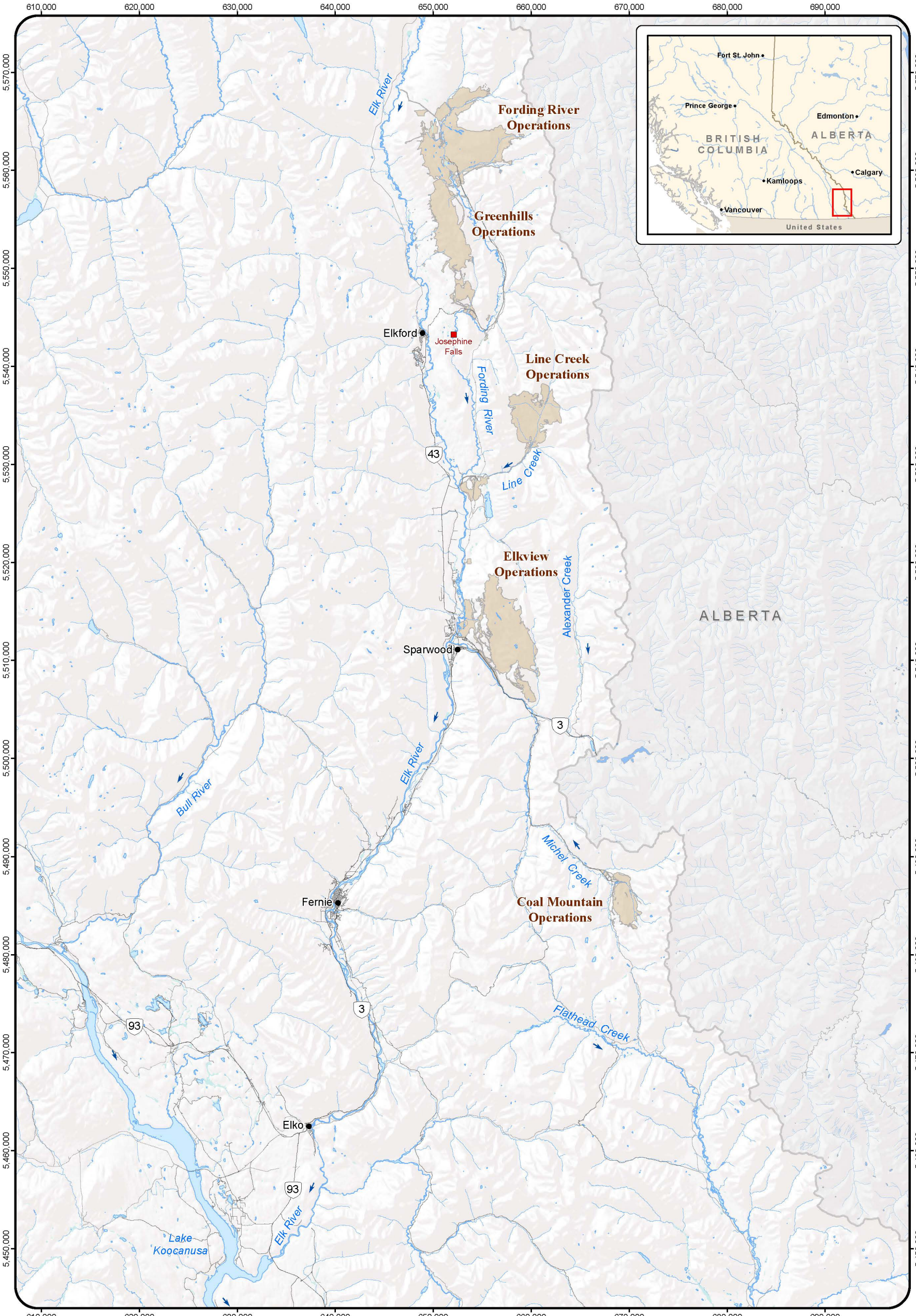
1.1 Setting

The Elk River watershed is located in southeastern British Columbia (BC). Teck Coal Limited (Teck) currently operates five steelmaking coal mines in the watershed, which are: Fording River Operations (FRO), Greenhills Operations (GHO), Line Creek Operations (LCO), Elkview Operations (EVO), and Coal Mountain Operations (CMO) (Figure 1.1).

Calcite formation has been observed in the Elk River watershed downstream of mining activities and, to a lesser extent, in reference streams unaffected by mining. Calcite is created by the reaction of dissolved calcium (Ca^{2+}) and carbonate (CO_3^{2-}) ions under conditions of saturated carbonate and/or increasing water pH or calcium concentrations. Although these conditions can occur naturally, they can be enhanced when water passes through waste rock, which elevates aqueous concentrations of both calcium and carbonate. The ensuing chemical reactions take time to equilibrate[1], and are affected by other habitat characteristics (e.g., water temperature and velocity, the presence of other ions, and potentially substrate type), such that timing and locations of calcite formation are difficult to predict.

Photo 1.1: Rocks affected by calcite

[1] Which means that they may occur some distance downstream of chemical inputs.



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Project No.: 157202.0080

Legend

- City
- Teck Coal Mine Operations
- Provincial Boundary
- Waterbody
- Watercourse
- Highway
- Local Road
- Resource Road
- Water Flow Direction

Figure 1.1: Teck Coal Mine Operations within the Elk River Valley, Southeast British Columbia.

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1.2 Regional Calcite Monitoring Program

Teck initiated a regional calcite monitoring program in 2013 to document calcite deposition in tributary and main stem areas of the Elk River watershed (Robinson et al. 2013). The study was designed to be repeated in three successive years using consistent methods to evaluate changes over time and identify where calcite mitigation may be required. The monitoring program quantified the degree of calcite deposition using a Calcite Index (CI) as described briefly below and in more detail by Robinson and MacDonald (2014).

Calcite deposition was measured at one to three 100-m-long areas (depending on the reach size) in numerous reaches defined throughout the watershed (Robinson et al. 2013, Robinson and MacDonald 2014, 2015). At each 100-m-long area showing any evidence of calcite[2], a modified Wolman (1954) pebble count procedure was applied involving random selection and measurement of 100 substrate particles throughout each 100-m-long area (and distributed in proportion to the habitat types present[3]). To obtain an estimate of stream particle size distribution, the size of each particle was measured along the intermediate axis (i.e., perpendicular to the longest axis). An adaptation of the Wolman pebble count was used to characterize calcite deposition by also recording the presence (score = 1) or absence (score = 0) of calcite on each particle, and the degree of concretion was assessed by determining if the particle was removed with negligible resistance (not concreted; score = 0), noticeable resistance but removable (partially concreted; score = 1), or immovable (fully concreted; score = 2). Substrate that was too fine to be retrieved (e.g., sand, silt) and to visually discern calcite presence/absence was assigned presence and concretion scores of “0”.

The results for each area were then expressed as a CI based on the following equation:

$$CI = CIp + CIc$$

Where:

$$CI = Calcite\ Index$$

$$CI_p = Calcite\ Presence\ Score = \frac{Number\ if\ particles\ with\ calcite}{Number\ of\ particles\ counted}$$

$$CI_c = Calcite\ Concretion\ Score = \frac{Sum\ of\ particle\ concretion\ score}{Number\ of\ particles\ counted}$$

[2] The pebble count is not required in areas with no visible calcite, which are simply assigned a calcite index score of 0.

[3] Riffle, glide, cascade, and pool habitats.

For reaches in which multiple 100-m-long areas were sampled, an average CI was computed for the reach and used to track changes over time. Photos 1.2 to 1.4 show the range of calcite index values observed among streams in the Elk Valley.

Photo 1.2: Substrate with no calcite (CI=0).

Photo 1.3: Substrate covered in calcite but no concretion (CI=1). Note uniform colour of substrate.

Photo 1.4: Substrate covered in concreted calcite (CI=3).

1.3 Evaluation of Calcite Effects on Aquatic Biota

In late 2013 and early 2014, as the results of the first year of regional calcite monitoring were being evaluated and reported, Teck met regularly with members of a Technical Advisory Committee (TAC) that was formed to assist Teck with developing the Elk Valley Water Quality Plan (EVWQP). Development of the EVWQP was a requirement of a Provincial Order (Number M113) issued by the British Columbia (BC) Minister of Environment in April 2013 in response to concerns about increasing waterborne concentrations of selenium, cadmium, nitrate and sulphate, as well as calcite formation within watercourses in the Elk River watershed. Among the recommendations provided by the TAC was the inclusion of assessment of benthic invertebrate community health, periphyton productivity, and fish spawning and incubation success to evaluate the degree to which calcite deposition results in biological effects. This was considered relevant for developing long-term targets for calcite management to protect aquatic ecosystem function in the Elk River watershed. Requirements to evaluate potential calcite effects to benthic invertebrate community health, periphyton productivity, and fish spawning and incubation success were subsequently stipulated in the Ministry of Environment's (MOE's) approval of the Regional Aquatic Effects Monitoring Program (RAEMP) (i.e., letter to Teck dated November 14, 2014), which stated:

> "Teck shall complete the assessment to determine the potential relationships between calcite and benthic invertebrate community structure, periphyton

productivity, and fish spawning and incubation success. Teck shall work in collaboration with the Ministry and Ktunaxa Nation representatives ideally in a monitoring committee forum to prepare study designs for work proposed in 2015 and 2016."

The present study was initiated in September 2014 as part of a phased approach, with initial focus on assessment of potential relationships between calcite deposition and both benthic invertebrate community structure and periphyton productivity. In 2015, evaluation of potential effects on fish spawning and incubation was also initiated, and will be evaluated in greater detail in 2016 (Ecofish 2016). Results from two years of study of calcite effects to periphyton productivity and benthic invertebrate community structure (2014 and 2015) and the first year of study of calcite effects on fish spawning and incubation (2015), were discussed with the Environmental Monitoring Committee (EMC)[4] at meetings held on March 22, and April 27 to provide an opportunity for early input to this report and to the study design for 2016 (Ecofish 2016). Questions and recommendations received from the EMC have been addressed in the report, where applicable. The results presented herein also contribute to addressing Permit 107517 requirements to: "assess seasonal variation in the rate of calcite formation or dissolution, water quality, and presence and density of algae, and the presence and density of benthic invertebrates."

1.4 Study Objectives

The objective of the biological sampling completed in 2014 and 2015 was to collect data aimed at characterizing relationships between 1) calcite deposition and benthic invertebrate community characteristics, and 2) calcite deposition and periphyton productivity endpoints, to determine the level of calcite at which biological effects occur. In 2015, calcite monitoring was also initiated in known westslope cutthroat trout spawning areas of the Upper Fording River, as well as potential juvenile rearing areas, as the first phase of investigating the relationship between calcite and fish spawning and incubation success.

[4] The EMC includes representation from the Ministry of Environment (BCMOE), the Ministry of Energy and Mines, Environment Canada, the Ktunaxa Nation Council (KNC), Interior Health Authority, an independent scientist, and Teck. The EMC was established in fulfilment of requirements under Permit 107517 to provide input and advice to Teck.

2.0 METHODS

2.1 Benthic Invertebrates and Periphyton

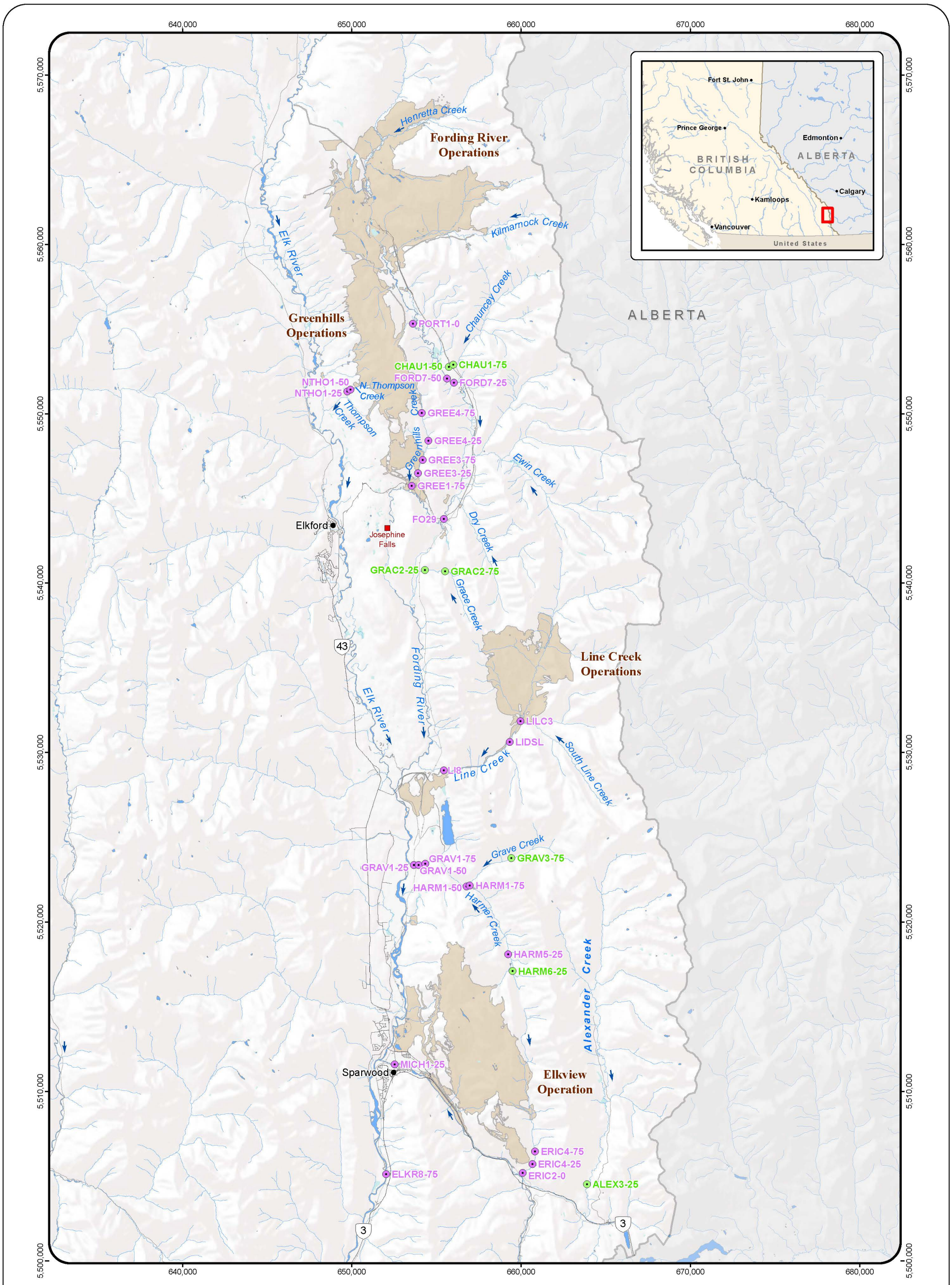
2.1.1 Sampling Design and Overview

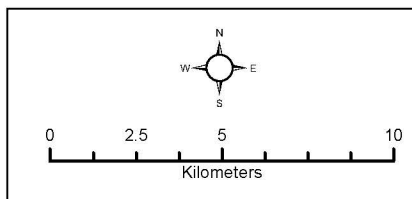
Thirty-one areas (24 mine-exposed and seven reference) were sampled between September 11th and 19th, 2014 (Minnow 2014b; Figure 2.1) and 114 areas (74 mine-exposed and 40 reference) were sampled between September 9th and 19th, 2015 (Figures 2.2 to 2.4). The areas sampled in 2015 included the RAEMP sampling locations, where calcite measurements were added so that the data could support this project. Fifteen additional mine-exposed areas were sampled in 2015 to provide biological data over a broad range of CI values, including the range of 0.5 to 1.5, which was sparsely represented among areas sampled in 2014 (Minnow 2015b). Sampling areas in the current study that were not part of the RAEMP, were located near the middle of the 100-m-long areas monitored as part of the regional calcite monitoring program (Robinson and MacDonald 2015), and were identified by the same location code. Overall, the sampling areas were distributed throughout the Elk River watershed and in adjacent (reference) watersheds within the region (Figures 2.1 to 2.4; Appendix Tables A.1 to A.3).

To assess calcite-related effects on biological communities, it was important to minimize variation in natural habitat characteristics among sampling locations that could confound results (Beatty et al. 2006). Therefore, sampling targeted riffle habitats with cobble-gravel substrate, which is the dominant habitat type throughout the Elk River watershed (Minnow 2014a,b; Windward et al. 2014) and is consistent with the approach used for the RAEMP (Minnow 2015a). The sampling design also included replicate areas within tributaries expected to have similar water quality but a gradient of calcite conditions in an effort to isolate effects attributable to calcite from those potentially related to water quality.

2.1.2 Sample Collection

The study involved concurrent sampling of water quality, benthic invertebrate communities, and periphyton, along with *in-situ* (field) water quality measurements, and field documentation of substrate characteristics, aquatic habitat, and calcite. Sampling locations were identified using a hand-held global positioning system (GPS) unit. All field measurements were recorded on standard field data collection forms copied onto waterproof paper.





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- Mine Exposed
- Reference
- Teck Coal Mine Operations
- Barrier
- Waterbody

- Watercourse
- Highway
- Local Road
- Resource Road
- Rail
- Water Flow Direction
- City

Figure 2.1: Areas Sampled in September 2014 for Calcite Biological Effects Study

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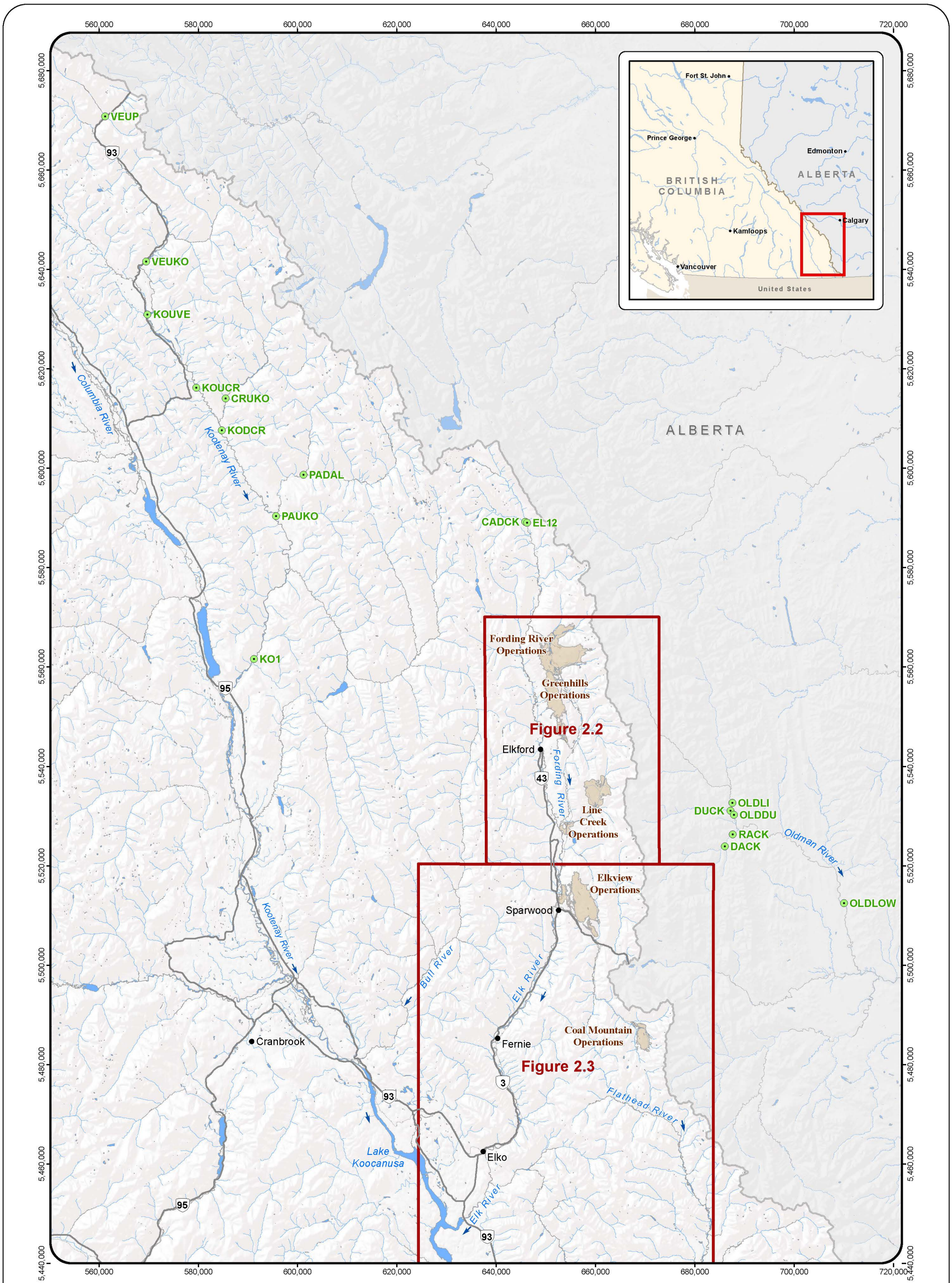

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Sampling Location

- Reference

- Teck Coal Mine Operations
- Waterbody
- Watercourse
- Water Flow Direction
- Highway
- Arterial
- City

Figure 2.2: Regional Reference Areas Sampled in September 2015 (Calcite, Periphyton, and Benthic Invertebrates)

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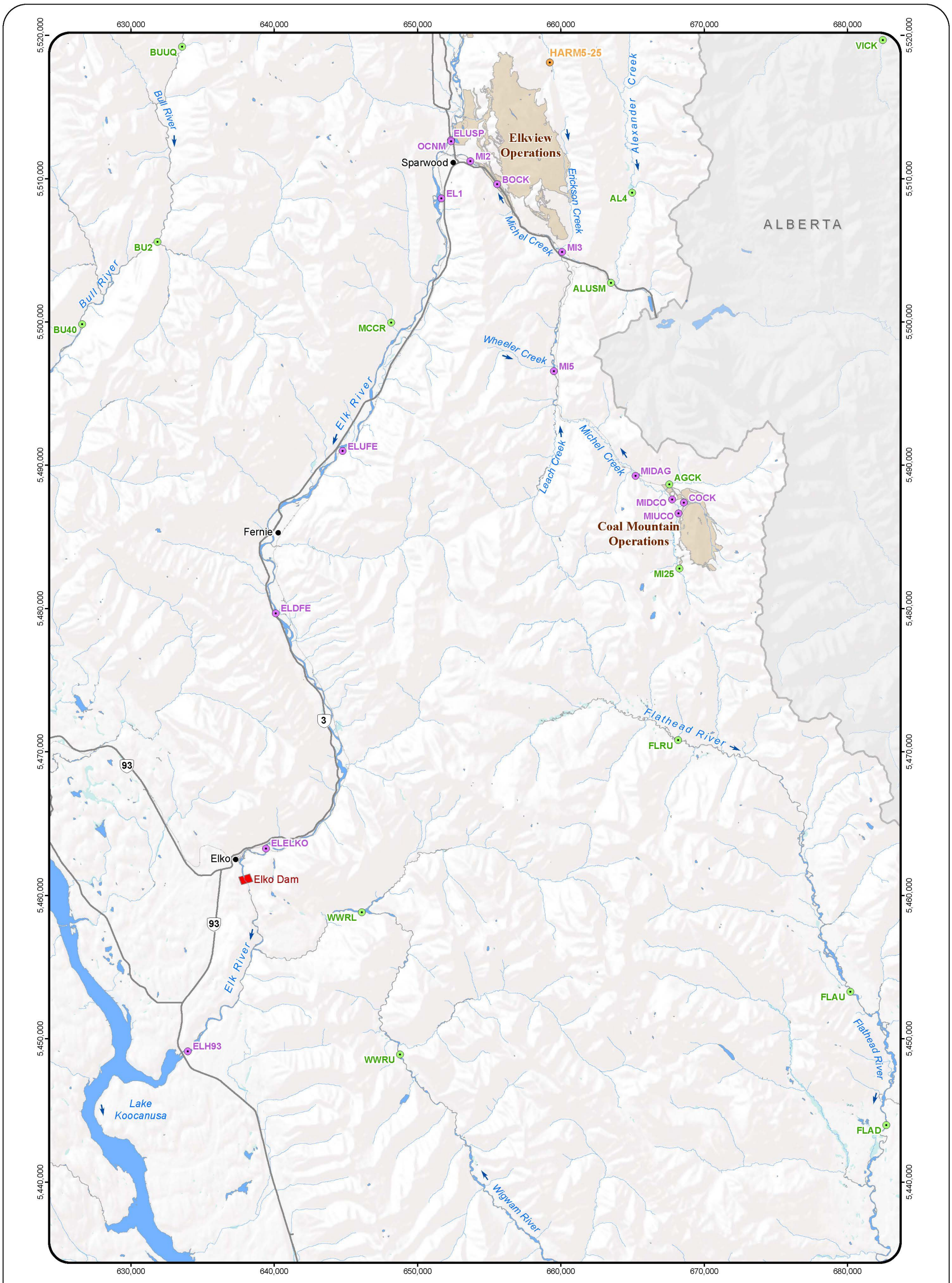
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WWRL
Elk River
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Koocanusa
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Wigwam River
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Creation Date: May 2016
Project No.: 157202.0080
Sampling Location
Mine-Exposed - RAEMP
Mine-Exposed - Calcite Biological Effects Study
Reference - RAEMP
Teck Coal Mine Operations
Barrier
Waterbody
Wetland
Watercourse
Highway
Arterial
Rail
Water Flow Direction
City
Figure 2.3: Calcite, Periphyton and Benthic Invertebrate Sampling Areas in the South Elk River, Bull River and Flathead River Watersheds, September 2015
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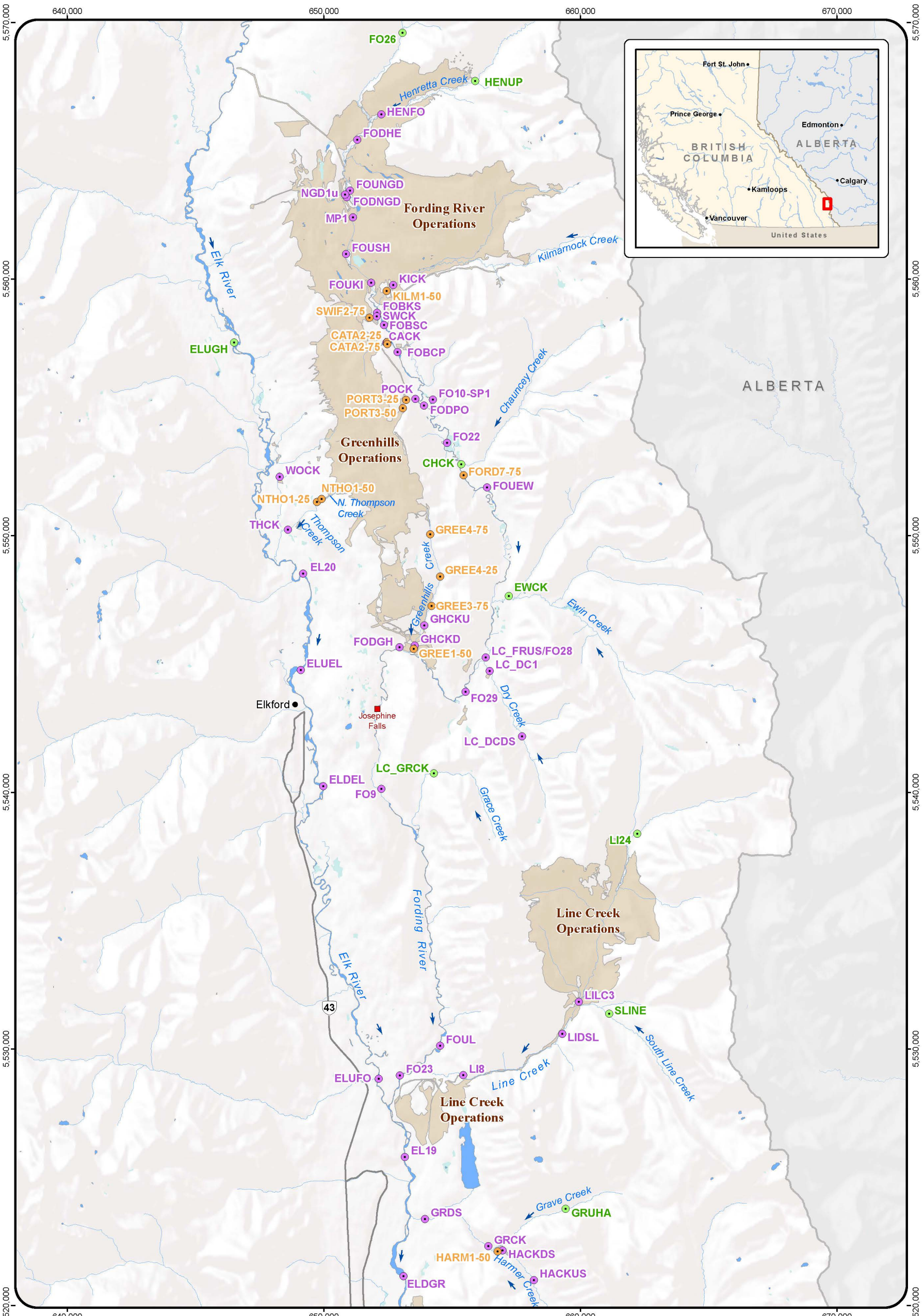

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Creation Date: May 2016
Project No.: 157202.0080

Sampling Location
- Mine-Exposed - RAEMP
- Mine-Exposed - Calcite Biological Effects Study
- Reference - RAEMP

- Teck Coal Mine Operations
- Barrier
- Waterbody
- Watercourse
- Water Flow Direction
- City

Figure 2.4: Calcite, Periphyton and Benthic Invertebrate Sampling Areas in North Elk River Watershed, September 2015

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2.1.2.1 Water

In situ measurements were made and water samples were collected at sampling areas prior to substrates being disturbed by benthic invertebrate and periphyton sampling. Water temperature, pH, dissolved oxygen (DO) and specific conductivity were measured at each station using a YSI Pro Plus that was calibrated daily. Water velocity was also measured at all sampling locations using a Marsh-McBirney Flowmate.

At each area, water samples were collected for analysis of total organic carbon (TOC), dissolved organic carbon (DOC), total suspended solids (TSS), total dissolved solids (TDS), turbidity, total alkalinity, bicarbonate alkalinity, total and dissolved metals/metalloids, anions (nitrate, nitrite, sulphate, chloride, fluoride, bromide), ammonia, total Kjeldahl nitrogen (TKN), and total phosphorus. The samples were collected by wading into a mid-channel area by moving from downstream to upstream, so as not to collect water downstream of disturbed substrates. All samples were collected at mid-depth below the water surface. Samples were collected directly into pre-cleaned sample bottles provided by the laboratory and preserved (as required) immediately upon return to shore. Samples that were analyzed for DOC and dissolved metals were field filtered through a clean 0.45 µm membrane affixed to a sterile syringe directly into an appropriate sample bottle. Samples were stored in a refrigerator until they were shipped in coolers with ice packs to ALS Environmental (Burnaby, BC, in 2014 and Calgary, AB, in 2015) for analysis.

2.1.2.2 Benthic Invertebrate Communities

Benthic invertebrate community sampling followed the 3-minute kick sampling method of the Canadian Aquatic Biomonitoring Network (CABIN) for sampling wadeable streams (Environment Canada 2012a). The samples were collected using a net with a triangular aperture measuring 36 cm per side and a mesh with 400 µm openings. During sampling, the field technician moved across the stream channel (from bank to bank, dependent on stream depth and width) in an upstream direction, actively shuffling his/her feet to dislodge organisms from the substrate. With the net being held immediately downstream of the technician's feet, the detritus and invertebrates disturbed from the substrate were passively collected in the kick-net by the stream current. After three minutes of sampling time, the technician stopped and returned to the stream bank with the sample. The kick-net was rinsed with ambient water to move all debris and invertebrates into the collection cup at the bottom of the net. The collection cup was then removed and the contents were poured into a labelled plastic jar and preserved in a 10% buffered formalin solution. A single sample was collected in each area. Benthic invertebrate community samples were sent to

Cordillera Consulting (lead taxonomist Sue Salter), in Summerland, BC, for sorting and taxonomic identification to lowest practical level (LPL).

In 2015, additional samples were collected from a sub-set of 15 areas by kick sampling three areas of 1 m^2 each. The three samples were composited for taxonomic identification and sent to Cordillera Consulting for analysis.

2.1.2.3 Periphyton

Two periphyton samples, one for chlorophyll-a and one for ash-free dry mass (AFDM), were collected at each sampling area in both study years. A total of five rocks of similar size were sampled (i.e., large enough to collect separate samples for both chlorophyll-a and AFDM analyses), with the periphyton scrapings from the five rocks composited to form each of the two sample types.

Periphyton samples were collected in the same stream segment as benthic invertebrate samples, but were taken from rocks that were not previously disturbed by benthic invertebrate sampling. Riffle micro-habitats with water depth of at least 10 cm, near-bottom water velocity of about 0.1 to 0.4 m/s, and substrate with similar characteristics (including relatively flat rocks with a diameter of at least 12 cm) were targeted. Periphyton samples were not collected from sampling areas located in Erickson Creek in 2014 due to the high prevalence of bryophytes and inability to sample periphyton separately from bryophytes.

Rocks selected for sampling were taken to the shore, where a thin acetate template with a 4-cm^2 (2 x 2 cm) opening in the middle was placed firmly on the rock and the periphyton was scraped from the opening using a scalpel. This process was repeated with four additional rocks, and all five scrapings were placed from the scalpel onto a wetted Whatman GF/F glass fibre filter (90 mm diameter, 0.7 µm pore size) to provide a single, composite sample per area for chlorophyll-a analysis. The filter paper containing the composite sample was folded in half twice, tightly wrapped with aluminum foil, and placed in a labelled Whirl-pak® bag.

The same rocks sampled for chlorophyll-a were also used to collect separate scrapings for analysis of AFDM using the same sample method, except that once the periphyton was scraped from the rock, the material was rinsed directly from the scalpel into a small container using ambient water.

Periphyton samples were stored in coolers with ice packs until they could be transferred into a freezer at the end of each day. Periphyton samples were shipped frozen to ALS Environmental for analysis of chlorophyll-a content and AFDM. Analysis of chlorophyll-a was completed using procedures adapted from EPA Method 445.0; involving routine

acetone extraction followed by fluorescence detection using a non-acidification procedure (a method that is not subject to interferences from chlorophyll-b). Analysis of AFDM followed procedures modified from American Public Health Association (APHA) Method 10300 C. Total AFDM was calculated as the difference between the dried sample weight and the ash weight, both of which were determined gravimetrically. Dry weight was determined by drying the sample at 105°C, and the ash weight was subsequently determined by ashing the dried sample at 500°C.

2.1.3 Habitat Assessment

In accordance with the CABIN sampling method, supporting information was collected at each location, including site access, land use, habitat type, substrate size class, riparian and in-stream vegetation, bank stability, stream characteristics and channel measurements (Environment Canada 2012a). Photos were taken to document the stream habitat and substrate characteristics and archived.

2.1.4 100-Pebble Count and Calcite Index

As stipulated by the CABIN sampling method, the intermediate axis (i.e., axis perpendicular to the longest axis) of each of 100 particles collected randomly at each benthic invertebrate sampling area was measured. The particles were collected over an area that included the benthic invertebrate sampling path while avoiding characterization of previously-disturbed substrate[5]. Moving through the sampling area, the technician stopped at every second step to reach down and evaluate the substrate nearest to the inside toe of his/her right foot, taking care not to bias results by avoiding larger boulders. The intermediate axis of the particle was measured to the nearest 0.5 cm. If the rock could not be picked up, it was measured in the water (e.g. large boulders and embedded rocks) or, in the case of particles too small to be picked up, an observation of “fine” was recorded. For every 10th particle encountered during sampling, an estimate of the degree of embeddedness in surrounding materials was recorded.

For each of the rocks measured during the 100-pebble count, calcite presence (score = 1) or absence (score = 0) was recorded and the degree of concretion was assessed by determining if the particle was removed with negligible resistance (not concreted; score

[5] As noted in Section 1.2, regional calcite monitoring evaluated particles over 100-m-long areas of stream, whereas calcite measurements in this study were made in close proximity to where biological samples were collected (e.g., ~10- to 20-m-long areas). Therefore, the spatial scale of measurements made in this study differs from those made in the regional program for areas identified by the same location code.

= 0), noticeable resistance (partially concreted; score = 1), or was immovable (fully concreted; score = 2). In 2014, substrate that was too fine to visually discern calcite presence/absence was assigned CP and CC scores of "0" consistent with the protocol used in the regional monitoring program (Robinson et al. 2013; Robinson and MacDonald 2014, 2015). In 2015, if fine substrates were encountered during the 100 pebble count, those observations were not included in calculation of the calcite index and additional particles >1 cm (equivalent to the number of fine substrate observations) were collected so that the calcite index was calculated based on 100 particles of sufficient size to visually confirm calcite presence/absence. The CI was calculated as described in Section 1.2 and in Robinson and MacDonald (2014).

To possibly contribute to better understanding of calcite effects on biota, the thickness of calcite was also documented for each of the 100 pebbles examined in 2015. Calcite thickness values were categorized as follows:

0. Rock has no obvious calcite
1. Rock is covered in minor amount of calcite (0-1 mm thick)
2. Rock has noticeable thicker patches of calcite (1-5 mm thick)
3. Rock has obvious clumps of calcite (5-10 mm thick)
4. Rock is mostly obscured by thick calcite (>10 mm thick)
5. Concretion prevented accurate measurement of thickness

CI was still computed in accordance with past practice based on the equation presented in Section 1.1, but plots that explored relationships between calcite and biological responses included exploration of potential relationships with calcite thickness.

2.2 Fish

Calcite measurements were initiated upon confirmation of westslope cutthroat trout spawning activity by Westslope Fisheries (the consultant responsible for the radio telemetry study of the cutthroat trout population in the upper Fording River) and calcite index was measured at redd locations from June 7th to 11th, 2015, using the same methods as described in Section 2.1.4. Calcite measurements were made as near as possible to redds, while also taking care to avoid disturbing them[6]. Calcite measurements were repeated in

[6] Also see footnote associated with Section 2.1.4.

the same areas in September 2015, roughly coinciding with the expected period of fry emergence, to evaluate potential changes in calcite coverage over the incubation period. Water velocity and *in situ* water quality (i.e., pH, conductivity, DO, temperature) were also measured at each area.

2.3 Data Analyses

2.3.1 Benthic Invertebrates and Periphyton

Benthic invertebrate community endpoints were calculated from the detailed community data provided by the laboratory: total abundance, family and LPL richness values for major taxa (e.g., Ephemeroptera (mayflies), Plecoptera (stoneflies), Trichoptera (caddisflies), collectively referred to as EPT), and total abundance and relative abundance (proportion) of taxa at the family and LPL levels of taxonomic identification. The Hilsenhoff Index, Simpson's Diversity index, and Simpson's Eveness index were also calculated for the benthic invertebrate community at the family and LPL levels of taxonomic identification. The Hilsenhoff tolerance values were assigned based on methods from Mandaville (2002). The tolerance index value for each area was calculated using Microsoft Excel following the equation presented in Hilsenhoff (1988):

$$\text{HBI} = \frac{\sum_{i=1}^{n_t}(x_i \times t_i)}{N}$$

Where:

x_i = number of individuals within a taxon i

t_i = tolerance value of a taxon i

n_t = total number of taxa in the sample

N = total number of organisms in the sample

Simpson's Diversity and Evenness indices were computed using Microsoft Excel following the equations presented by Smith and Wilson (1996) and Environment Canada (2012b). These indices take into account both the proportion of taxa and the number of taxa.

$$\text{Diversity} = 1 - \sum_{i=l}^{s}(p_i)^2$$

$$\text{Evenness} = 1/\sum_{i=l}^{s}(p_i)^2/S$$

Where:

p_i = the proportion of the i^{th} taxon in the sample

S = the total number of taxa in the sample

Abundance estimates from benthic invertebrate sampling were predominantly based on the number of invertebrates collected per three-minute kick, but as described in Section 2.1.2, additional density-based kick samples were also collected at a sub-set of 15 areas. A linear regression of density (from area-based kick sampling) versus sample abundance (from 3-minute kick samples) was completed to assess whether sample abundance associated with the 3-minute CABIN kick sampling method can be used as an estimate of organism density.

Non-metric multi-dimensional scaling (NMDS) was used to reduce the complete taxonomic data matrix to fewer dimensions. The Bray-Curtis distance was used as the measure of relative community similarity or dissimilarity, as recommended by McCune and Grace (2002), using PC-ORD© (McCune and Mefford 2011). Rare taxa (i.e., those occurring in less than 5% of areas) were removed from the dataset as their exclusion from multivariate analyses reduces 'noise' (Bailey et al. 2004) and improves the ecological interpretability of the resulting community ordination. The 'slow and through' option, which uses the following settings, was applied: maximum iterations = 400, instability criterion = 0.00001, number of real runs = 40, and number of randomized runs = 50 (McCune and Grace 2002). All NMDS ordinations were evaluated for solution stability, final stress <0.20, and Monte Carlo randomized determination of interpretable axes of $p < 0.05$ (McCune and Grace 2002).

NMDS is a method to visualize the level of similarity of samples based on the rank of the similarities (Clarke 1993). The NMDS takes the N-dimensional (here N = number of taxa) coordinates of each sample (i.e., area) and defines a set of new n-dimensional coordinates that reflect the locations (rank distances) among samples. The n = 2 dimension is frequently used because the sample areas can be plotted on a 2-dimensional scatterplot.

NMDS results of non-transformed data often leads "to shallow interpretation in which only the pattern of a few, very common species is represented" (Clarke 1993). A suite of transformations were applied (log_{10}, square root, 4^{th} root, power 2, and power 4) which assigned different weights to the rare taxa, relative to abundant taxa (Clarke 1993). All transformations were evaluated because it was not known *a priori* which transformation may best explain the differences in community structure (i.e., the appropriate weight to assign to rare taxa relative to abundant taxa). The NMDS analyses were conducted with taxa data matrices representing family and LPL levels of taxonomic identification and using abundance and proportional data. The 2- or 3-dimensional ordination was selected based

on PC-ORD© decision criteria (final stress less than 0.2, randomization test with $p < 0.05$, and a reduction of a least 5 points of stress with each additional axis).

Correlation analysis used the first two NMDS axes for each ordination (LPL and family; each transformation; abundance and proportion) and the taxa from the data matrices to identify the taxa that had a good correlation (Pearson correlation coefficient > 0.6) with the NMDS axis and thus contributed to differences in community structure among areas. These taxa were then assessed further as potential indicators of calcite effects as described below and in Table 2.1.

Table 2.1: Methods used to select benthic invertebrate community endpoints as indicators of calcite effects.

Step	Evaluation method
1	NMDS (conducted many ways) to assess differences in benthic community structure among areas. Identify taxa with good (r > 0.6) correlation with NMDS axes. Include data for all of these taxa, expressed as both absolute and relative abundances, along with results for corresponding higher levels of taxonomy. Also include total sample abundance, total richness at both family-level and lowest-practical-level (LPL) of taxonomy, family and LPL richness for combined Ephemeroptera, Plecoptera, and Trichoptera (EPT) and corresponding orders, Hilsenhoff index (family and LPL), and Simpson's Evenness and Diversity (family and LPL).
2	Select community endpoints from Step 1 that indicate > 10% of mine-exposed areas having values less than the reference normal range (NR) or 10% of values greater than the NR.
3	Determine if abundance or relative abundance tends to identify more mine-exposed areas as having community characteristics outside of the reference NR.
4	Select community endpoints from Steps 2 and 3 with good (r > 0.6) correlation with CI to maximize the likelihood that the endpoints is a indicator of calcite effects.
5	Also evaluate correlations among biological endpoints to identify redundant indicator endpoints.
6	Compare key indicator endpoints by assessing which areas are identified outside of NR based on both the univariate community endpoints and multivariate endpoints that reflect overall community structure.

Reference normal ranges for CI and the periphyton productivity and benthic invertebrate community endpoints were defined as the 2.5^{th} and 97.5^{th} percentiles of the reference area data collected in 2015. The percentiles were estimated using the inclusive percentile function in Microsoft Excel. The method of estimating the percentiles assumes the minimum

and maximum values in the dataset represent the 0th and 100th percentiles and the 2.5th and 97.5th percentiles are estimated using linear interpolation between the two values in the dataset that have a percentile rank closest to the percentile that is being estimated. The upper limit of the normal range for CI was estimated to be 0.97 and rounded up to 1.0.

The use of percentiles to estimate normal ranges is a non-parametric method. Parametric methods of estimating normal ranges (i.e., prediction intervals and tolerance intervals) were explored but not applied because data distributions for many benthic invertebrate endpoints could not be normalized to meet the parametric assumptions of normality. Using the non-parametric allow for normal ranges to be developed using a consistent approach across all community endpoints.

Data for the 74 mine-exposed areas sampled in 2015 were evaluated relative to the reference normal range for each benthic invertebrate community endpoint. Endpoints that identified at least 10% of mine-exposed areas as having values greater than, or 10% of areas less than, the reference normal range were initially retained as potential indicators of calcite effects. Pearson correlations were conducted between these potential indicators and CI, and also relative to the first principal component (PC-1) from a principal component analysis (PCA) of water quality (WQ) variables. The PCA was conducted using 54 WQ variables measured in water samples collected at the same time as biological samples, including hardness, TSS, TDS, TOC, DOC, turbidity, anions, nutrients, and total metals (Appendix Table A.8). The PCA defines new variables (referred to as principal components) that are linear combinations of all other variables. The principal components are defined to maximize the variability explained in the data set and each component is defined to be orthogonal (linearly independent) of the other components. Endpoints with a good correlation with CI or WQ PC-1 (magnitude of $r > 0.6$) were retained and evaluated further as potential indicators of mine exposure, and particularly calcite effects.

Periphyton productivity endpoints (chlorophyll-a and AFDM) and benthic invertebrate community endpoints that were identified as potential indicators of calcite effects based on correlations with CI were plotted relative to CI values for each area sampled in 2014 and 2015. Reference normal ranges (defined as described above using reference area data from 2015) were displayed on the scatterplots to assess the relationship between normal range exceedance and CI. Concentrations of AFDM that were reported below a method detection limit (DL) were plotted as open symbols at the DL and substituted for the DL in calculations of summary statistics.

Pairwise Pearson correlations (or Spearman-rank correlations when paired relationships between variables were non-linear) were conducted between CI, CI_p, CI_c and key water

quality variables (i.e., selenium, nitrate, sulphate and specific conductance[7]) to assess the relationships among the mine-related stressors. Water quality variables were $\log_{10}$-transformed to normalize the data and to achieve linearity for the Pearson correlations. The ratios of key water quality variables to effect benchmarks defined in the Elk Valley Water Quality Plan (Golder 2014a; 2014b; Table 2.2) were calculated and used to evaluate the relationships between benthic invertebrate community endpoints and CI.

Table 2.2: Level 1 invertebrate benchmarks for key water quality constituents identified in the EVWQP (Teck 2014).

Water Quality Constituent	Endpoint/Source	Level 1 (10% Effect) Benchmark	Source
Total Selenium	Sensitive invertebrate species, growth and reproduction	0.104 mg/L	Golder 2014a
Sulphate	BCMOE WQ Guideline	429 mg/L	Golder 2014b
Nitrate-N	Invertebrate reproduction/biomass	$10^{1.0003\times\log10(\text{hardness})-1.52}$ mg/L [a]	Golder 2014b

[a] Hardness as mg/L as CaCO3; minimum benchmark = 3 mg/L; maximum benchmark is 14.5 mg/ at a hardness of 480 mg/L.

In addition to the list of univariate benthic invertebrate community endpoints that were identified as potential indicators of calcite effects, multivariate endpoints were also evaluated by defining multivariate normal ranges, as described below.

A multivariate normal range that summarized results for the selected univariate benthic invertebrate community endpoints was defined using the Mahalanobis distance (D) (or generalized distance as defined in Kilgour et al. [1998]) and calculated using R (R Core Team 2015). The Mahalanobis distance is a standardized distance metric in multi-dimensional space to quantify the distance between a point (i.e., a sampling area) and the overall mean of all points in the reference area. The limits of the multivariate normal range

[7] Although mining influences numerous water quality variables, selenium, nitrate, and sulphate are the ones that most frequently exceed water quality guidelines (Minnow and PLA 2012) and site-specific effect benchmarks (Teck 2014) in mine-exposed areas of the watershed. Specific conductance correlates strongly with concentrations of other mine-related variables (Minnow and PLA 2012), and thus is a good indicator of overall mine-related influence on water quality, similar to PC-1.

are defined by a critical value of D that captures approximately 95% of the reference area multivariate distribution. The comparison of D for an area to the critical D that captures approximately 95% of the reference area multivariate distribution is equivalent to comparing a standardized effect size (i.e., Z-score) to a critical Z value of 1.96 in the univariate comparison.

The Mahalanobis distance is defined as:

$$D = \sqrt{(\bar{X}_r - Exp)' S_r^{-1} (\bar{X}_r - Exp)}$$

where $\bar{X}_r$ is the centroid for the reference areas (vector of mean values for each endpoint at the reference areas), Exp is a vector with the response values for each endpoint at the exposure area, and S_r^{-1} is the inverse of the variance-covariance matrix for the reference areas. The critical value of D that captures 95% of the reference area distribution is $\sqrt{\chi^2_{(0.95,p)}}$ where χ^2 is the chi-square statistic and p is the number of endpoints included in the normal range. Multivariate normality is assumed when calculating D and this assumption was tested for each endpoint individually and data were transformed when required to meet this assumption. The following data transformations were assessed: $\log_{10}$, $\log_{10}$(X+1), logit, inverse, square root, and fourth root. Data were tested for normality using the Shapiro-Wilk test ($\alpha = 0.05$) and the transformation that provided the highest p-value >0.05 was selected.

Multivariate normal ranges for benthic community structure were also defined using the Mahalanobis distance on NMDS scores based on the 2- or 3-dimensional NMDS ordinations. The NMDS ordinations were conducted using proportion data at the family and LPL levels of taxonomic identification. The optimal data transformation was identified as the transformation that provided the smallest estimate of the average skew and kurtosis of all taxa variables (Appendix Tables C.12, C.13, C.24, and C.25) from the following transformations: $\log_{10}$, square root, fourth root, presence/absence, or by using untransformed data.

The final step in the evaluation of selected community endpoints involved comparison of results for univariate and multivariate community endpoints to identify similarities and differences with respect to which areas were classified as being outside of the normal range. This evaluation identified the endpoints most likely to identify areas as being outside of the normal range.

A canonical correspondence analysis (CCA) was conducted to relate community composition to CI and key water quality variables (selenium, nitrate, and sulphate

concentrations), and to assess the extent to which these variables explained differences in community structure among areas. CCA is an ordination technique that defines ordination axes for a matrix of taxa abundance data in light of known environmental variables (Ter Braak 1986). The environmental variables are the constraining variables in the ordination such that the ordination axes are defined as linear combinations of the environmental variables. The ordination scores from the CCA are the fitted values of a multiple regression that models the relationship in the environmental variables and ordination scores from the reciprocal averaging ordination of the taxa data (Peck 2010). Thus, CCA can be used to assess which environmental variables best explain the patterns in community variation. CCA was conducted with the LPL- and family-level taxa matrices using the same transformations as described for the NMDS analysis. CCA was conducted using PC-ORD© and included a randomization test of whether the variability explained by the first axis of the CCA is greater than a random ordination of the data.

2.3.2 Fish

Calcite indices were mapped relative to WCT spawning and juvenile rearing areas identified by Westslope Fisheries in the upper Fording River watershed, to aid in understanding calcite effects on habitat utilization. CI values observed at redds during spawning were compared to those observed shortly after fry emergence to identify any seasonal patterns among areas supporting embryo incubation.

3.0 RESULTS

3.1 Calcite at Periphyton and Invertebrate Sampling Areas

Calcite index (CI) values for areas sampled in 2015[8] ranged from 0, at some reference and mine-exposed areas, to 3.0 (Cataract Creek), reflecting the full range of possible values (Figure 3.1; Appendix Table A.1)[9]. The greatest CI values were associated with sampling areas at Kilmarnock, Swift, Cataract, Greenhills, and North Thompson Creeks. CI values among reference areas in 2015 ranged from 0 to 1.0, with the normal range (2.5th and 97.5th percentiles) also being defined as 0 to 1.0 (Appendix Table A.1). Twenty-two of the 74 mine-exposed areas sampled in 2015 had CI values above the reference area normal range (Figure 3.2; Appendix Table A.2).

3.2 Periphyton Productivity versus Calcite

Significant positive correlations ($p < 0.001$) were observed between CI and periphyton productivity endpoints (i.e. chlorophyll-a and ADFM) measured in 2014 and 2015 (Appendix Table B.4), suggesting periphyton productivity was greater in areas having greater CI (Figure 3.3). Potential hypotheses are that calcite deposits may provide a surface favourable to periphyton growth (Minnow and Larratt 2016), that periphyton growth alters water quality near the periphyton surface in a manner that favours calcite formation, and/or bioavailable nutrient concentrations may be elevated in areas with more calcite. However, correlation coefficients for both relationships were < 0.5, indicating that the relationships were weak (Milton and Arnold 2003). Similarly weak relationships were observed for correlations between the periphyton endpoints and measures of calcite presence/absence, concretion, and thickness (Appendix Table B.4; Figure B.1). The normal ranges of periphyton chlorophyll-a and AFDM are also depicted on Figure 3.3 (gray shade; 2.5th and 97.5th percentiles of observations from reference areas sampled in 2015 as part of the RAEMP; Appendix Table A.1), and were not suggestive of a specific CI value above which periphyton productivity endpoints would be expected to deviate from the normal ranges.

[8] CI values measured for areas sampled in 2014 are presented separately in Appendix Table A.3 and were incorporated, as appropriate, in subsequent analyses relating biological endpoints to calcite.

[9] CI values reported in this study may differ from those reported in the regional monitoring program for the same streams because the spatial scale of calcite measurements for this study was specific to the portion of stream where biological samples were collected (see Section 2.1.4).

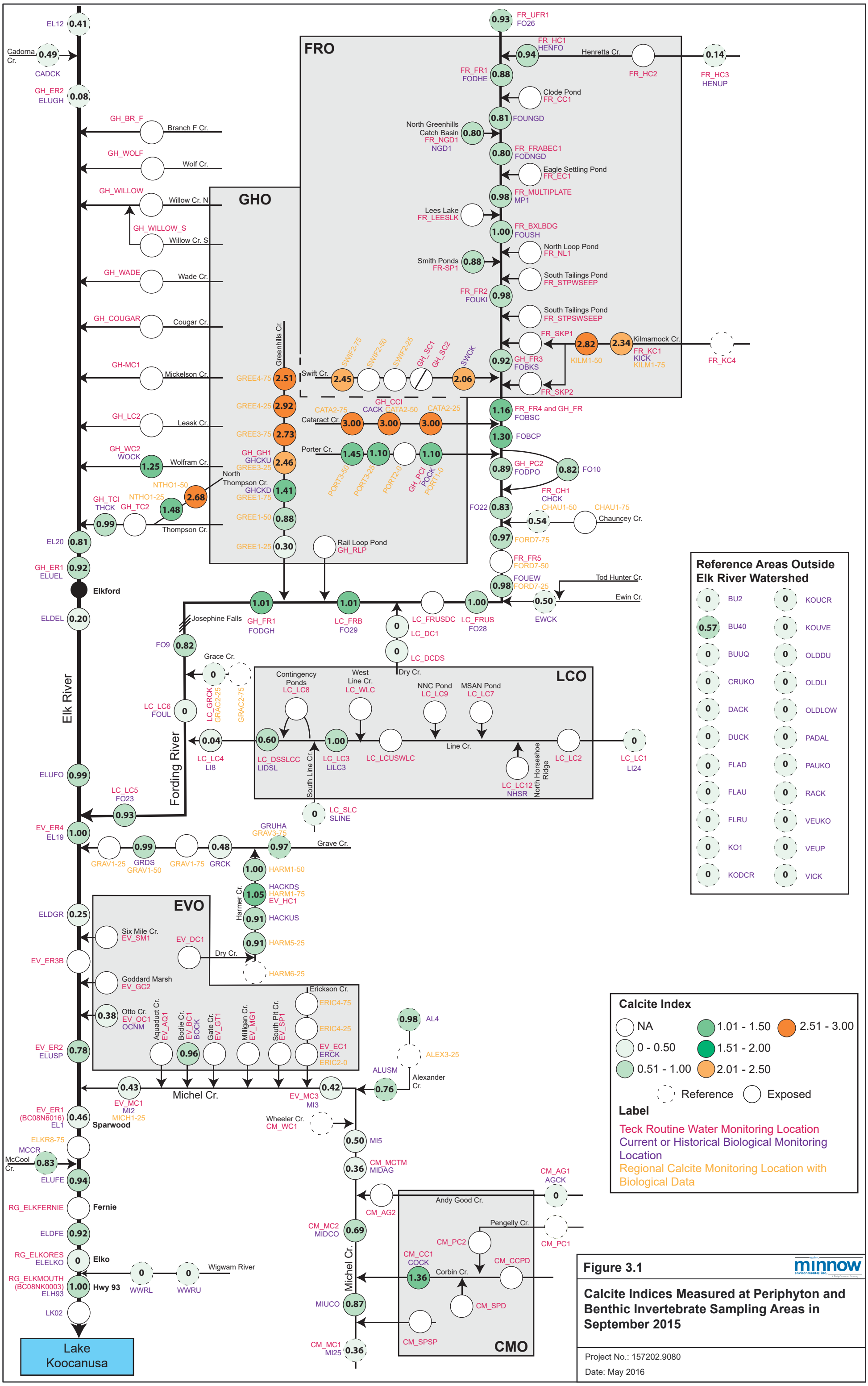


Figure 3.1

Calcite Indices Measured at Periphyton and Benthic Invertebrate Sampling Areas in September 2015

Project No.: 157202.9080

Date: May 2016

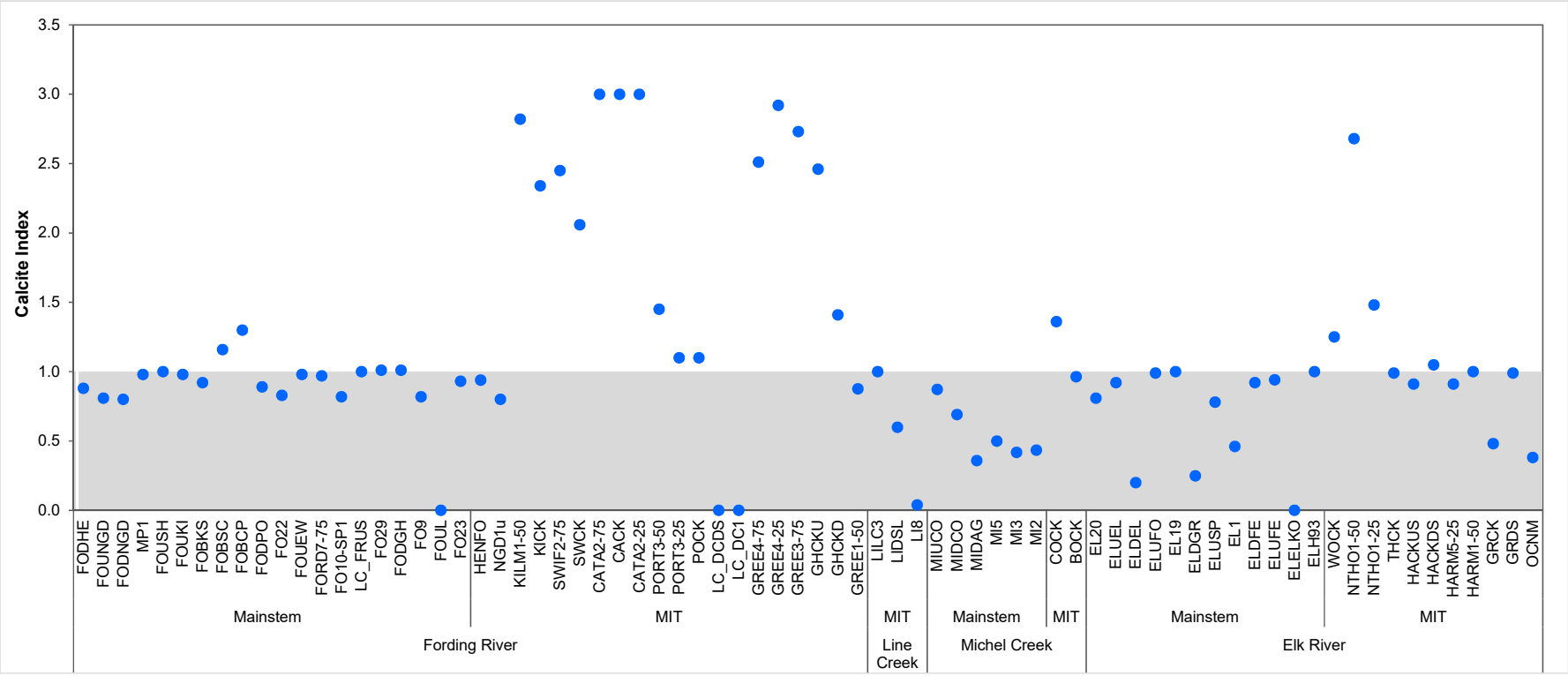


Figure 3.2: Calcite index values for mine-exposed areas compared to the normal range, where normal range is defined as the 2.5 th and 97.5th percentiles of observations for 40 reference areas sampled in 2015. Sampling areas are in upstream to downstream order for mainstem areas versus mine-exposed tributaries (MIT) of the Fording River, Michel Creek, and Elk River.

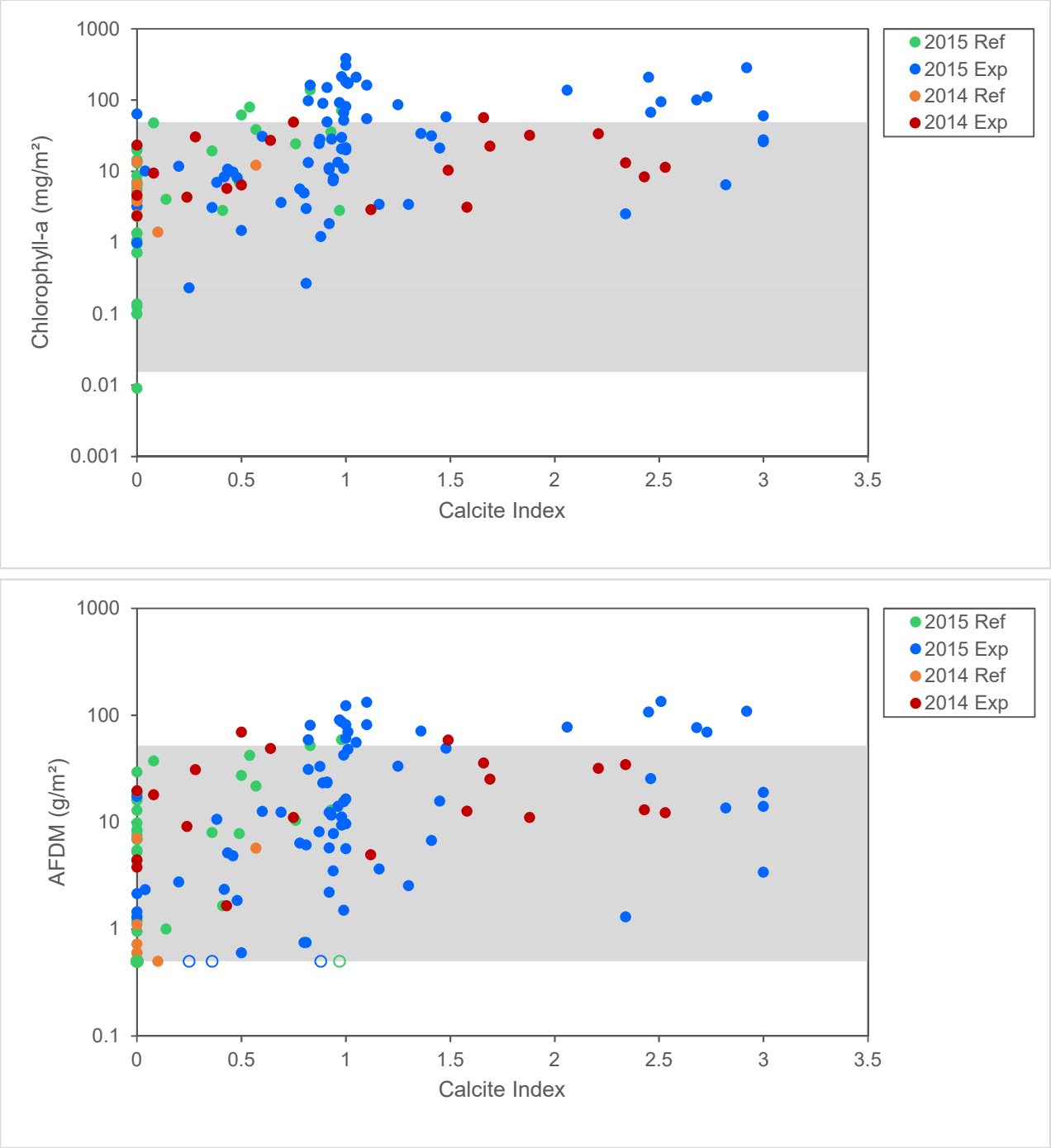


Figure 3.3: Scatterplot of chlorophyll-a and ash-free dry mass (AFDM) in relation to calcite index for all reference and mine-exposed areas sampled in Elk Valley in 2014 and 2015. Gray shade represents the normal range for each periphyton endpoint, defined as values between the 2.5th and 97.5th percentiles for reference area data collected in 2015. Values below the detection limit are plotted as open symbols at the detection limit. The lower limit of the normal range for AFDM is < 0.5.

No relationship was identified between calcite and periphyton community endpoints selected as indicators of mine exposure in the periphyton community supporting study completed for Teck's Elk Valley operations in 2015 (Appendix Figure B.2; Minnow and Larratt 2016).

3.3 Benthic Invertebrate Timed- Versus Density- Based Sampling

At a subset of 15 areas, benthic invertebrates were collected using both the 3-minute travelling kick method of Environment Canada (2012a) and by kick-sampling three separate 1-m^2 areas[10]. The total abundance of benthic invertebrate organisms present in 3-minute kick samples was a strong predictor ($p < 0.001$; $r^2 = 0.867$) of the number of invertebrates measured in the density-based kick samples (Figure 3.4). The total abundances for dominant taxa based on 3-minute kick samples were also strong predictors of density (Figure 3.5). These results demonstrated that the abundance of organisms in 3-minute travelling kick samples can be interpreted as reasonable approximations of benthic invertebrate density.

3.4 Initial Selection of Benthic Invertebrate Community Endpoints

NMDS analyses were completed using abundance and proportional data at both the LPL- and family-level of taxonomy, as well as the presence/absence data matrix, for all reference (n = 40) and mine-exposed (n = 74) areas combined (2015 data only), resulting in a total of 10 data matrices (Appendix Figures C.1 to C.6). Among the 10 data matrices, 12 genera/species (*Baetis, Baetis tricaudatus* group, *Drunella doddsii, Enchytraeus, Limnophora, Micropsectra, Orthocladius, Periocoma/Telmatoscopus, Rithrogena, Sweltsa, Taenionmea,* and *Zapada columbiana)* and nine families *(Baetidae, Chironomidae, Chloroperlidae, Ephemerellidae, Heptagenidae, Muscidae, Nemouridae, Psychodidae, Taeniopterygidae*) best explained community variation among areas based on absolute Pearson correlation coefficients of greater than 0.6 in correlations with NMDS scores. Endpoints considered for further evaluation included the 12 genera/species and nine families identified by NMDS, described above, as well as the corresponding higher levels of taxonomy for each (e.g., family, order [class in the case of oligochaetes]) expressed on both an abundance and proportion basis. The endpoints of total sample abundance, total richness at both family-level and lowest-practical-level (LPL) of taxonomy, family and LPL richness for combined Ephemeroptera, Plecoptera, and Trichoptera (EPT) and

[10] The three samples from the 1-m^2 areas were pooled into a single composite sample for taxonomic identification and enumeration.

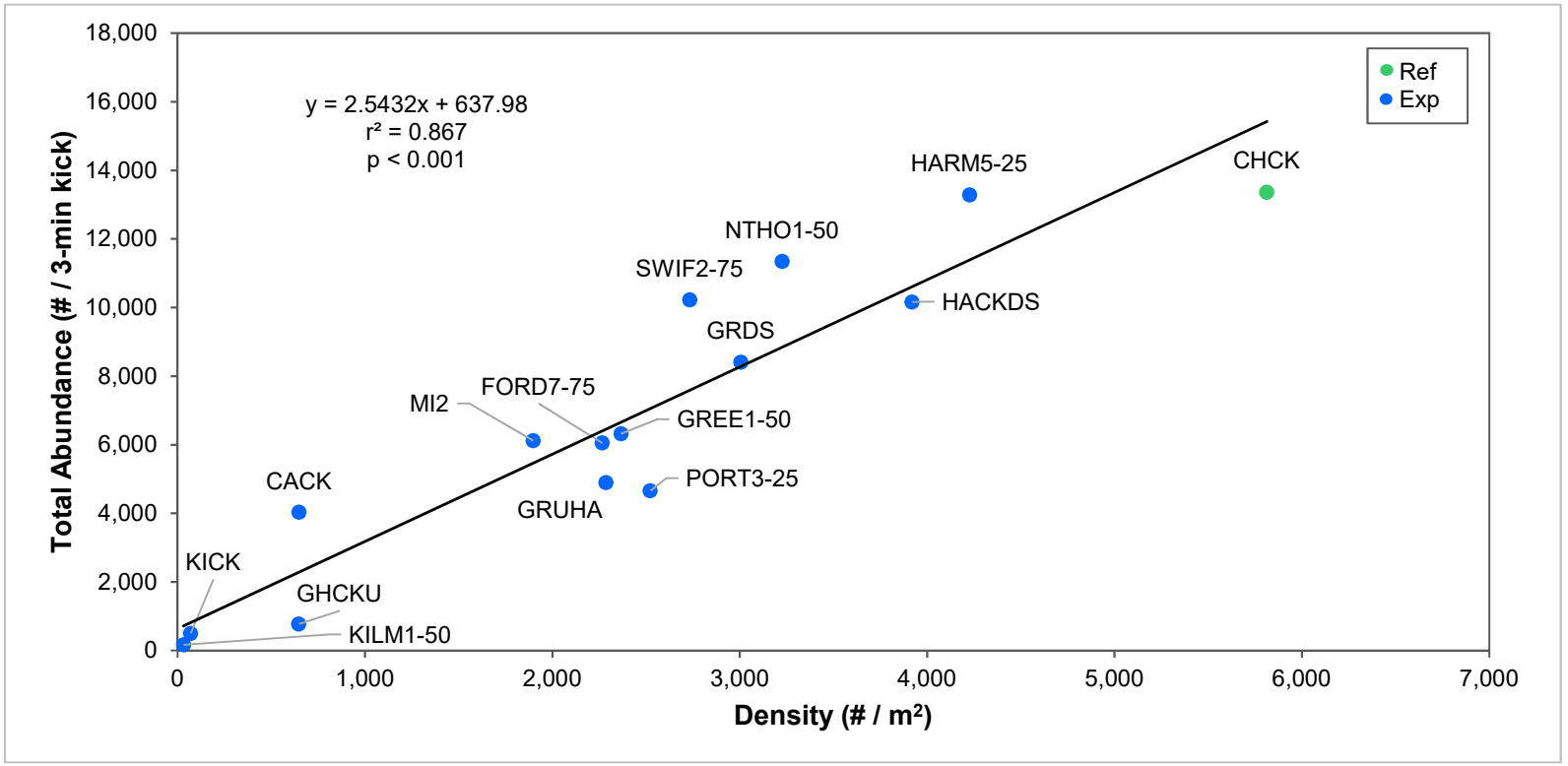


Figure 3.4: Benthic invertebrate density (# / m^2) based on kick sampling over three 1-m^2 areas versus total sample abundance for 3-minute travelling kick samples.

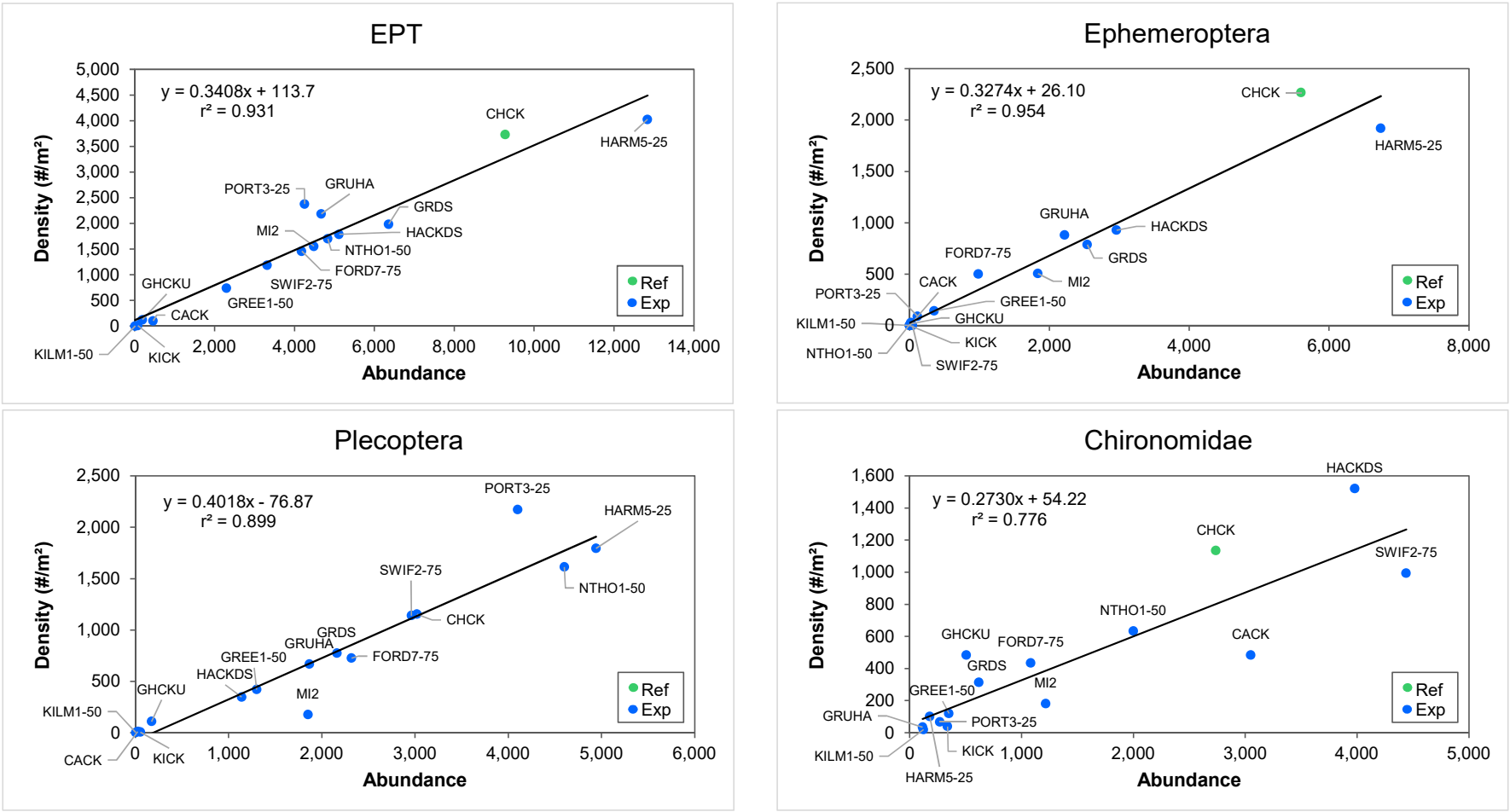


Figure 3.5: Linear regression of benthic invertebrate density (# / m^2) based on kick sampling over three 1-m^2 areas versus total invertebrate abundance for 3-minute travelling kick samples collected in the same area.

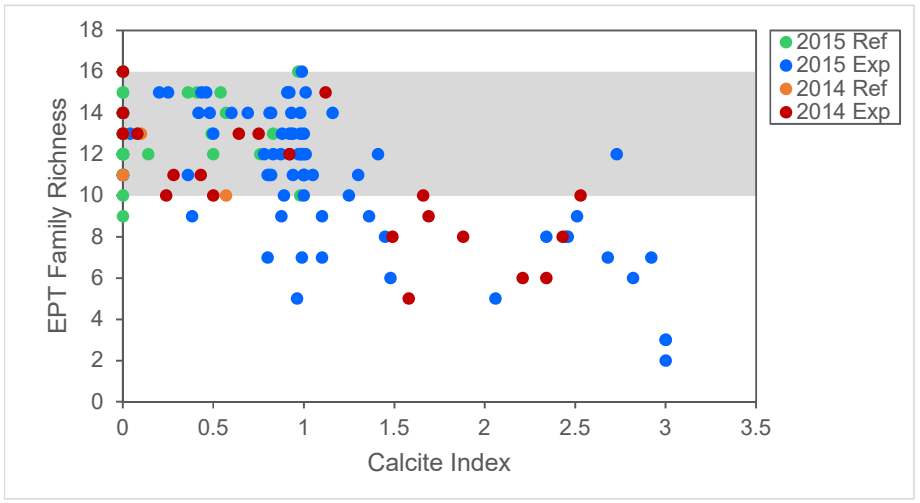
corresponding orders, HBI (family and LPL), and Simpson's Evenness and Diversity (family and LPL) were also evaluated. This resulted in a total of 82 endpoints that were investigated as potential indicators of calcite effects on benthic invertebrate communities (Appendix Table C.9).

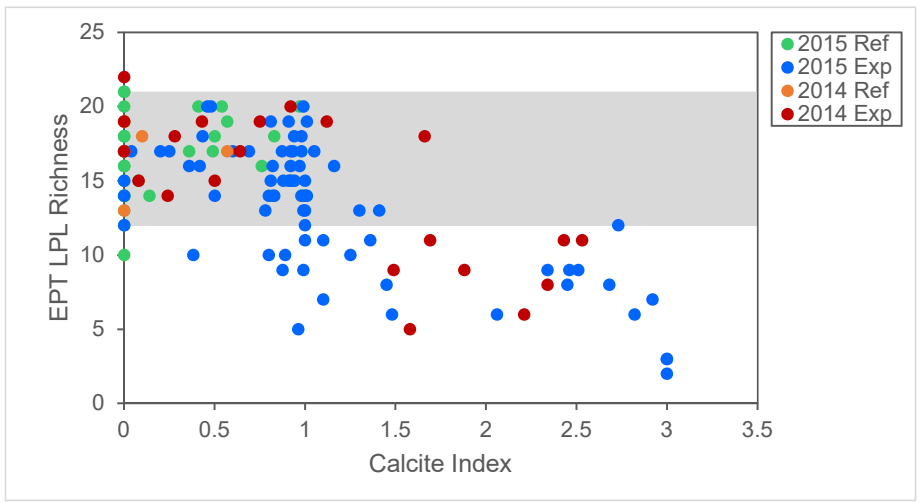
Of the 82 benthic community endpoints, 46 identified at least 8 (>10%) of the mine-exposed areas sampled in 2015 as being less than the 2.5th percentile or greater than the 97.5th percentile of reference area values for the corresponding endpoint (Appendix Table C.9). Eighteen of the 46 endpoints were expressed on the basis of both total sample abundance (#/sample) and community proportion (percent composition, %) (i.e., 36 endpoints in total). For those endpoints, the proportional dataset consistently flagged as many or more areas as having values less than the normal range compared to the abundance dataset for the same endpoint and often flagged as many or more areas having values greater than the normal range. Therefore, the proportional datasets for the 18 endpoints were carried forward to the next phase of the evaluation (Table 2.1), along with the other community endpoints and indices that flagged more than 10% of areas as having values greater than or less than the normal range (total of 28 endpoints).

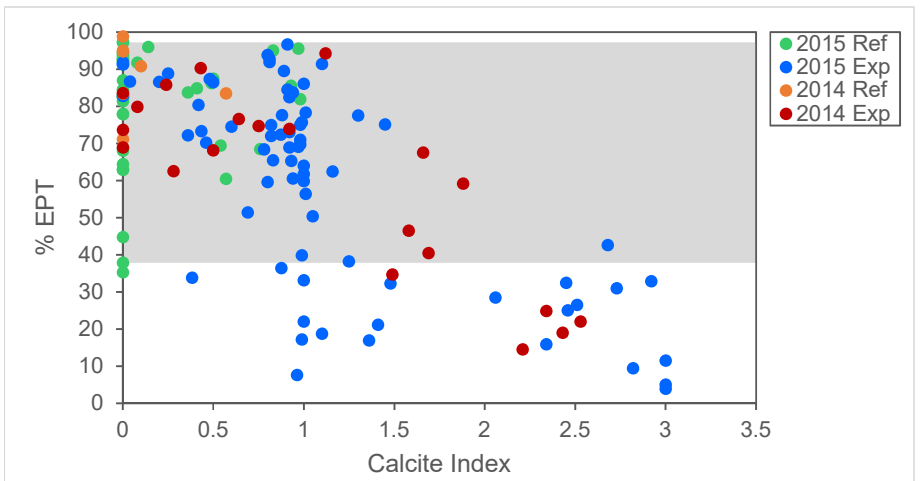
All 28 endpoints correlated significantly ($p < 0.05$) with multiple other benthic invertebrate community endpoints, indicating a high degree of redundancy of information among the various endpoints (Appendix Table C.10). In particular, % Ephemeroptera correlated with the most other endpoints (27 of 28; Appendix Table C.10).

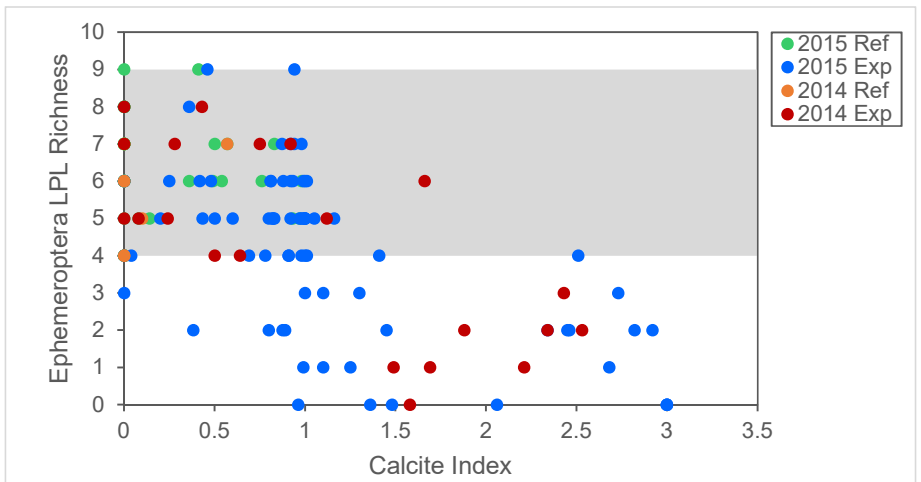
3.5 Benthic Invertebrate Community Endpoints versus Calcite

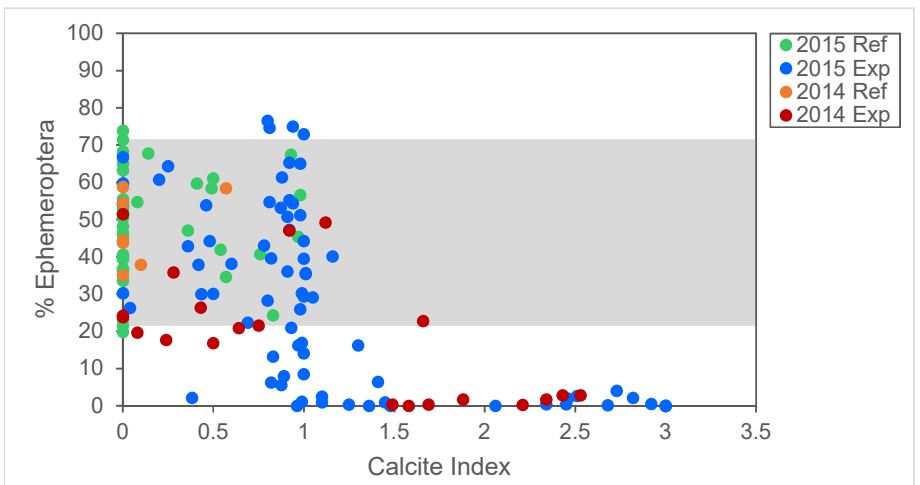
Seven of the reduced set of 28 benthic invertebrate community endpoints correlated most strongly (absolute correlation coefficient > 0.6) with CI: EPT family and LPL richness, Ephemeroptera LPL richness, % EPT, % Ephemeroptera (% E), % Diptera, and % Chironomidae (Table 3.1). Scatterplots of these seven endpoints versus CI suggested a pattern of values deviating outside of the normal range at CI > 1, especially for % E (Figure 3.6). There was strong overlap of % E and % EPT for reference and mine-exposed areas having CI < 1 suggesting no mine-related effects at mine-exposed areas having CI up to about 1 (Appendix Figure C.7). Evaluation of % E and % EPT versus calcite presence/absence, concretion, or thickness scores suggested loss of mayflies occurred in areas with even minimal amounts of concretion and/or where calcite thickness scores were above 2 (i.e., >1 mm thick; Appendix Figure C.7), which occurred at the same areas having CI greater than 1 and elevated water quality concentrations (i.e., interrelated observations).

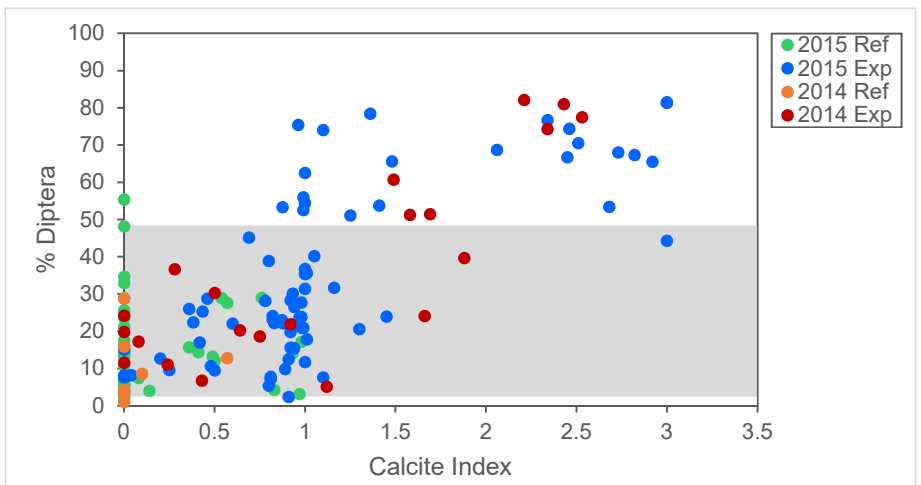












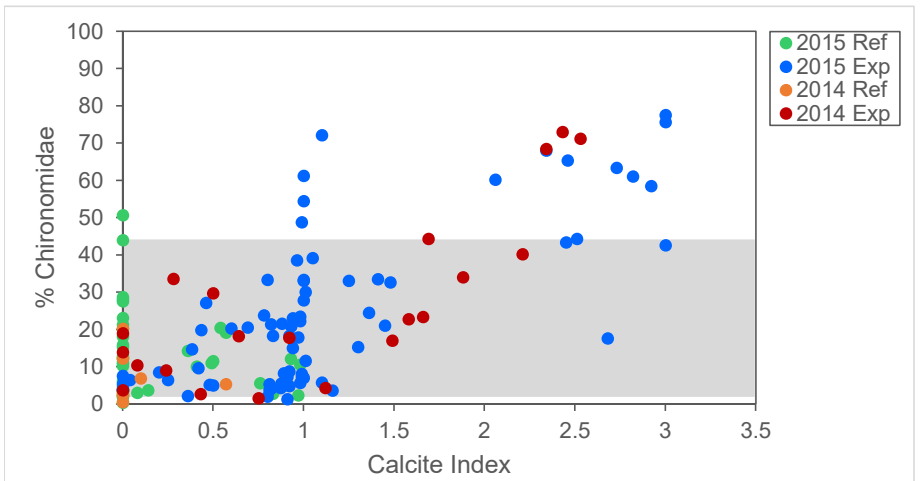


Figure 3.6: Scatterplot of selected benthic invertebrate endpoints in relation to the calcite index for all reference and mine-exposed areas sampled in Elk Valley in 2014 and 2015. Gray shade represents the normal range for each benthic endpoint, defined as the 2.5th and 97.5th percentiles for reference area data collected in 2015.

The results depicted in Figure 3.6 suggested that the seven selected benthic invertebrate community endpoints corresponded directly with relative calcite exposure. However, the same benthic invertebrate community endpoints also correlated with WQ PC-1 (Table 3.1), which reflected a gradient of mine-related influence on water quality (based on water samples collected concurrent with benthic invertebrate samples in 2014 and 2015; Appendix Figure A.1 and Table A.12). In other words, concentrations of key mine-related constituents in water correlated significantly with CI and its component scores of presence/absence and concretion (Table 3.2), such that areas with high calcite also tended to have concentrations of selenium, nitrate, and/or sulphate that were greater than the respective Level 1 benchmarks identified in the EVWQP (Table 2.2; Figure 3.7).

When concentrations of each constituent in water are expressed as a ratio of the Level 1 benchmarks identified in the EVWQP, values progressively greater than 1 indicate greater potential for biological effects, whereas no effect would be expected at areas with ratios less than 1 for all constituents. Green symbols in Figure 3.8 represent areas with % E values that were within the reference area normal range, and were typically found in areas with CI < 1 and concentrations of key constituents in water-to-benchmark ratios < 1. Conversely, a large proportion of areas having CI > 1 also had water-to-benchmark ratios > 1 for key water quality constitutents and % E that were less than the normal range (Table 3.3). Therefore, the relationships between biological endpoints and CI suggested by the scatterplots in Figure 3.6 cannot be solely ascribed to the effects of calcite because of the potentially confounding influence of the effects of water quality on benthic invertebrates.

Canonical correspondence analysis (CCA) was performed in an attempt to better separate the relative effects of calcite versus water quality. The primary axis from the CCA explained very little (<10%) of the variability in community structure. The CCA ordinations separated a few mine-exposed areas (with high CI and concentrations of key water quality variables) along the primary axis from the main group of mine-exposed and reference areas. The constraining environmental variables therefore explained only a small amount of variation in community structure among all areas. The high correlations between CI and the key water quality variables resulted in the vectors on CCA ordinations generally pointing in the same direction, resulting in an inconclusive determination of which environmental variable (CI or water quality) influenced the spatial pattern in the ordination (Appendix Figures C.10 to C.13).

Table 3.1: Pearson correlations of benthic invertebrate community endpoints for reference (n = 40) and mine-exposed areas (n = 74) relative to calcite index and to PC-1 calculated for water quality.

Variables	Calcite Index		PC-1	
	r_p	P-value	r_p	P-value
HBI (Family)	0.574	<0.001	-0.606	<0.001
HBI (LPL)	0.540	<0.001	-0.518	<0.001
Total Abundance	0.035	0.713	-0.115	0.224
EPT Family Richness	-0.653	<0.001	0.642	<0.001
EPT LPL Richness	-0.683	<0.001	0.708	<0.001
Ephemeroptera Family Richness	-0.592	<0.001	0.717	<0.001
Ephemeroptera LPL Richness	-0.640	<0.001	0.792	<0.001
Plecoptera Family Richness	0.513	<0.001	-0.538	<0.001
Plecoptera LPL Richness	0.500	<0.001	-0.548	<0.001
Diptera LPL Richness	-0.383	<0.001	0.296	0.001
% EPT	-0.685	<0.001	0.696	<0.001
% Ephemeroptera	-0.625	<0.001	0.731	<0.001
% Baetidae	-0.314	0.001	0.402	<0.001
% *Baetis tricaudatus* group	-0.070	0.461	0.033	0.730
% Ephemerellidae	-0.300	0.001	0.418	<0.001
% Heptageniidae	-0.520	<0.001	0.557	<0.001
% Plecoptera	-0.023	0.812	-0.053	0.578
% Chloroperlidae	-0.494	<0.001	0.384	<0.001
% Nemouridae	0.212	0.023	-0.361	<0.001
% *Zapada*	0.203	0.030	-0.342	<0.001
% Diptera	0.716	<0.001	-0.708	<0.001
% Chironomidae	0.659	<0.001	-0.541	<0.001
% *Micropsectra*	0.354	<0.001	-0.396	<0.001
% Orthocladius	0.571	<0.001	-0.353	<0.001
% Muscidae	0.529	<0.001	-0.356	<0.001
% Limnophora sp.	0.529	<0.001	-0.356	<0.001
% Psychodidae	0.197	0.036	-0.286	0.002
% *Pericoma/Telmatoscopus* sp.	0.196	0.037	-0.285	0.002

$r \geq 0.6$ or $r \leq -0.6$.

P-value < 0.05.

Table 3.2: Pearson or Spearman correlation analysis for calcite measurements and mine-related water quality variables for reference (n = 40) and mine-exposed (n = 74) areas in 2015, and reference (n = 7) and mine-exposed (n = 24) areas in 2014 associated with the RAEMP and calcite biological studies.

Variable			Calcite			Key Water Quality Variables			
			Index (CI)	Presence (CI_p)	Concretion (CI_c)	log_{10}[Selenium (mg/L)]	log_{10}[Nitrate (mg/L)]	log_{10}[Sulphate (mg/L)]	log_{10}[Specific Conductance (µS/cm)]
Calcite	Index (CI)	Pearson Correlation	-	-	-	-	-	-	-
		P-value (2-tailed)	-	-	-	-	-	-	-
	Presence (CI_p)	Spearman Correlation	0.954	-	-	-	-	-	-
		P-value (2-tailed)	<0.001	-	-	-	-	-	-
	Concretion (CI_c)	Spearman Correlation	0.712	0.551	-	-	-	-	-
		P-value (2-tailed)	<0.001	<0.001	-	-	-	-	-
Key Water Quality Variables	log_{10}[Selenium (mg/L)]	Pearson Correlation	0.757	0.731	0.651	-	-	-	-
		P-value (2-tailed)	<0.001	<0.001	<0.001	-	-	-	-
	log_{10}[Nitrate (mg/L)]	Pearson Correlation	0.669	0.703	0.456	0.882	-	-	-
		P-value (2-tailed)	<0.001	<0.001	<0.001	<0.001	-	-	-
	log_{10}[Sulphate (mg/L)]	Pearson Correlation	0.794	0.725	0.653	0.917	0.853	-	-
		P-value (2-tailed)	<0.001	<0.001	<0.001	<0.001	<0.001	-	-
	log_{10}[Specific Conductance (µS/cm)]	Pearson Correlation	0.822	0.715	0.626	0.894	0.817	0.938	-
		P-value (2-tailed)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-

P-value <0.05.

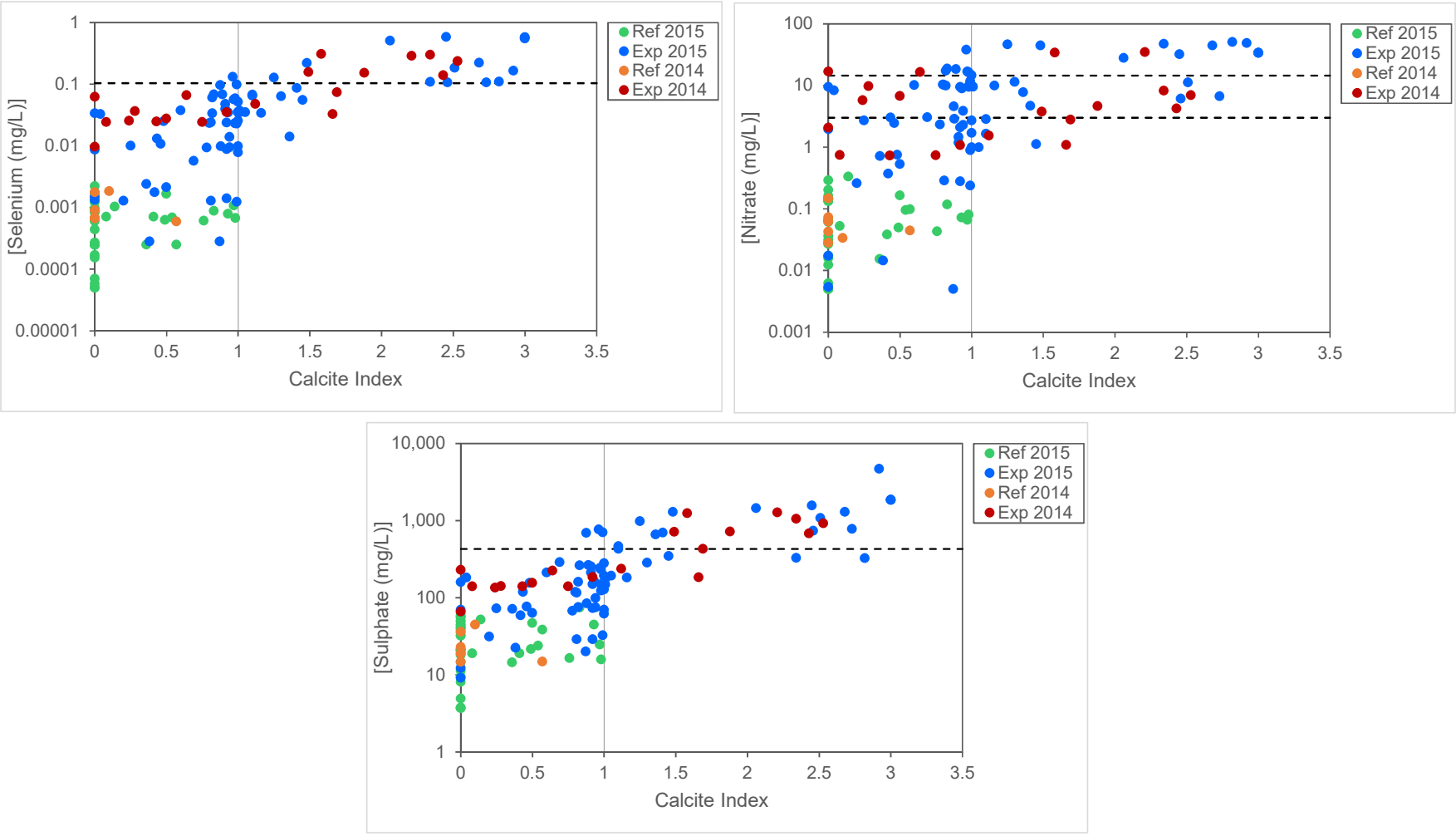


Figure 3.7: Scatterplots of the relationships between calcite index and selected water quality variables for all reference and mine-exposed areas sampled in Elk Valley in 2014 and 2015. Dashed horizontal lines are Level 1 benchmarks from the EVWQP (see Table 2.2). The benchmark for nitrate is dependent on hardness so maximum and minimum benchmarks are plotted. Solid vertical lines represent the upper limit of the normal range for calcite (CI=1).

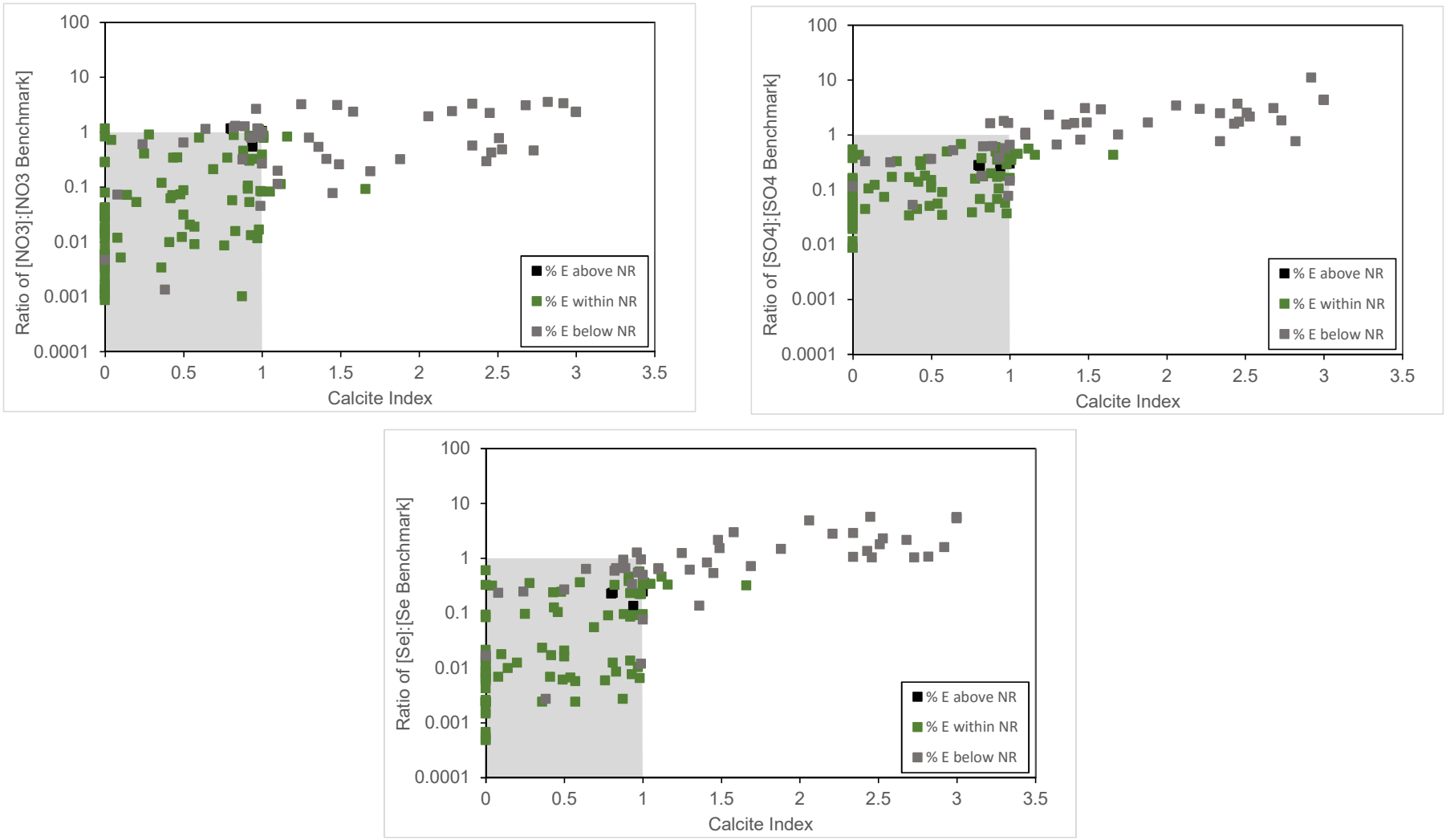


Figure 3.8: Scatterplots of calcite index versus ratio of water quality constituent concentration to the corresponding Level 1 effect benchmark for all reference and mine-exposed areas sampled in Elk Valley in 2014 and 2015 (ratios > 1 indicate increased potential for adverse effects on invertebrates). The gray box formed at CI = 1 and ratio = 1 and the plot axes represents the predicted no-effect area for both endpoints. (NR – normal range).

Table 3.3: Percent Ephemeroptera with comparison to normal (reference community) range (NR), calcite index, and ratios of selenium, sulphate, and nitrate concentrations in water to Level 1 effect benchmarks, and calcite index for all mine-exposed areas sampled in Elk Valley in 2014 and 2015.

Year	Sampling Area	Ephemeroptera (%)	Calcite Index	Ratio of [Se]:[Se Benchmark]	Ratio of [SO_4]:[SO_4 Benchmark]	Ratio of [NO_3]:[NO_3 Benchmark]
2015	BOCK	0	0.96	1.3	1.8	2.6
2015	CACK	0	3.0	5.3	4.3	2.3
2015	CATA2-25	0	3.0	5.5	4.3	2.3
2015	CATA2-75	0	3.0	5.5	4.3	2.3
2015	COCK	0	1.4	0.14	1.5	0.53
2015	KILM1-50	0	2.8	1.1	0.76	3.5
2015	NTHO1-25	0	1.5	2.1	3.0	3.1
2015	SWCK	0	2.1	4.9	3.4	1.9
2014	NTHO1-25	0	1.6	3.0	2.9	2.3
2015	NTHO1-50	0.18	2.7	2.1	3.0	3.1
2014	NTHO1-50	0.26	2.2	2.8	3.0	2.4
2014	GREE1-75	0.31	1.5	1.5	1.7	0.26
2015	WOCK	0.32	1.3	1.2	2.3	3.2
2014	PORT1-0	0.34	1.7	0.71	1.0	0.19
2015	SWIF2-75	0.39	2.5	5.6	3.7	2.2
2015	KICK	0.40	2.3	1.0	0.76	3.3
2015	GREE4-25	0.52	2.9	1.6	11	3.3
2015	POCK	0.90	1.1	0.62	1.0	0.2
2015	PORT3-50	0.96	1.5	0.53	0.81	0.077
2015	THCK	1.1	0.99	0.94	1.6	0.81
2014	GREE3-75	1.7	1.9	1.5	1.7	0.32
2014	GREE4-75	1.7	2.3	2.9	2.4	0.56
2015	GHCKU	1.9	2.5	1.0	1.7	0.42
2015	OCNM	2.1	0.38	0.0027	0.052	0.0013
2015	PORT3-25	2.4	1.1	0.65	1.1	0.11
2015	GREE4-75	2.6	2.5	1.8	2.5	0.77
2014	GREE4-25	2.8	2.5	2.3	2.1	0.48
2014	GREE3-25	2.9	2.4	1.3	1.6	0.29
2015	GREE3-75	4.0	2.7	1.0	1.8	0.46
2015	GREE1-50	5.6	0.88	0.93	1.6	0.32
2015	FO10-SP1	6.2	0.82	0.58	0.18	1.2
2015	GHCKD	6.4	1.4	0.83	1.6	0.32
2015	FODPO	7.9	0.89	0.66	0.62	1.3
2015	LILC3	8.5	1.0	0.49	0.65	1.0
2015	FO22	13	0.83	0.65	0.61	1.3
2015	ELH93	14	1.0	0.075	0.14	0.27
2015	FOBCP	16	1.3	0.61	0.66	0.78
2015	FORD7-75	16	0.97	0.54	0.56	1.2
2014	LIDSL	17	0.50	0.27	0.36	0.64
2015	ELUFO	17	0.99	0.012	0.076	0.045
2014	LI8	18	0.24	0.24	0.31	0.59
2014	GRAV1-25	20	0.08	0.23	0.33	0.072
2014	FORD7-25	21	0.64	0.63	0.52	1.1
2015	FO23	21	0.93	0.33	0.38	0.78
2014	GRAV1-50	22	-	0.23	0.33	0.071
2015	MIDCO	22	0.69	0.055	0.67	0.21
2014	HARM1-75	23	1.7	0.32	0.43	0.091
2014	MICH1-25	24	0	-	-	-
2014	FORD7-50	24	0	0.60	0.54	1.2
2015	FOUEW	26	0.98	0.57	0.54	1.1
2015	LI8	26	0.04	0.31	0.43	0.72
2014	GRAV1-75	26	0.43	0.24	0.33	0.07
2015	NGD1u	28	0.80	-	-	-
2015	HACKDS	29	1.1	0.34	0.45	0.082
2015	EL19	29	1.0	0.095	0.16	0.39
2015	MI2	30	0.43	0.13	0.28	0.34
2015	MI5	30	0.50	0.020	0.15	0.086
2015	GRDS	30	0.99	0.22	0.35	0.083
2015	FOUL	30	0	0.33	0.37	0.82
2015	FODGH	35	1.0	0.36	0.41	0.78
2015	FO29	36	1.0	0.33	0.34	0.86
2014	FO29	36	0.28	0.35	0.33	0.89
2015	HACKUS	36	0.91	0.38	0.49	0.092
2015	MI3	38	0.42	0.017	0.14	0.062
2015	LIDSL	38	0.60	0.36	0.49	0.78
2015	LC_FRUS	39	1.0	0.33	0.36	0.88
2015	FO9	40	0.82	0.32	0.37	0.88
2015	FOBSC	40	1.2	0.33	0.43	0.82
2015	MIDAG	43	0.36	0.023	0.17	0.12
2015	ELUSP	43	0.78	0.090	0.16	0.34
2015	GRCK	44	0.48	0.24	0.36	0.073
2015	HARM1-50	44	1.0	0.34	0.45	0.082
2014	HARM1-50	45	-	0.34	0.43	0.091
2015	FOBKS	47	0.92	0.23	0.35	0.85
2014	HARM5-25	49	1.1	0.46	0.55	0.11
2015	HARM5-25	51	0.91	0.46	0.59	0.10
2015	MP1	51	0.98	0.22	0.29	1.1
2015	MIUCO	53	0.87	0.0027	0.047	0.001
2015	EL1	54	0.46	0.10	0.18	0.34
2015	LC_DC1	54	0	0.013	0.021	0.0034
2015	ELUFE	54	0.94	0.090	0.18	0.32
2015	EL20	55	0.81	0.012	0.067	0.057
2015	ELUEL	55	0.92	0.013	0.067	0.053
2014	ALEX3-25	58	0.57	0.0057	0.034	0.009
2015	LC_DCDS	60	0	0.014	0.029	0.0014
2015	ELDEL	61	0.20	0.012	0.073	0.052
2015	FODHE	61	0.88	0.094	0.20	0.45
2015	ELDGR	64	0.25	0.096	0.17	0.40
2015	FOUKI	65	0.98	0.22	0.35	0.84
2014	ELKR8-75	65	0	0.093	0.15	0.29
2015	ELDFE	65	0.92	0.085	0.17	0.30
2015	ELELKO	67	0	0.083	0.16	0.28
2015	FOUSH	73	1.0	0.25	0.30	1.0
2015	FOUNGD	75	0.81	0.23	0.27	1.1
2015	HENFO	75	0.94	0.13	0.23	0.54
2015	FODNGD	77	0.80	0.23	0.28	1.2

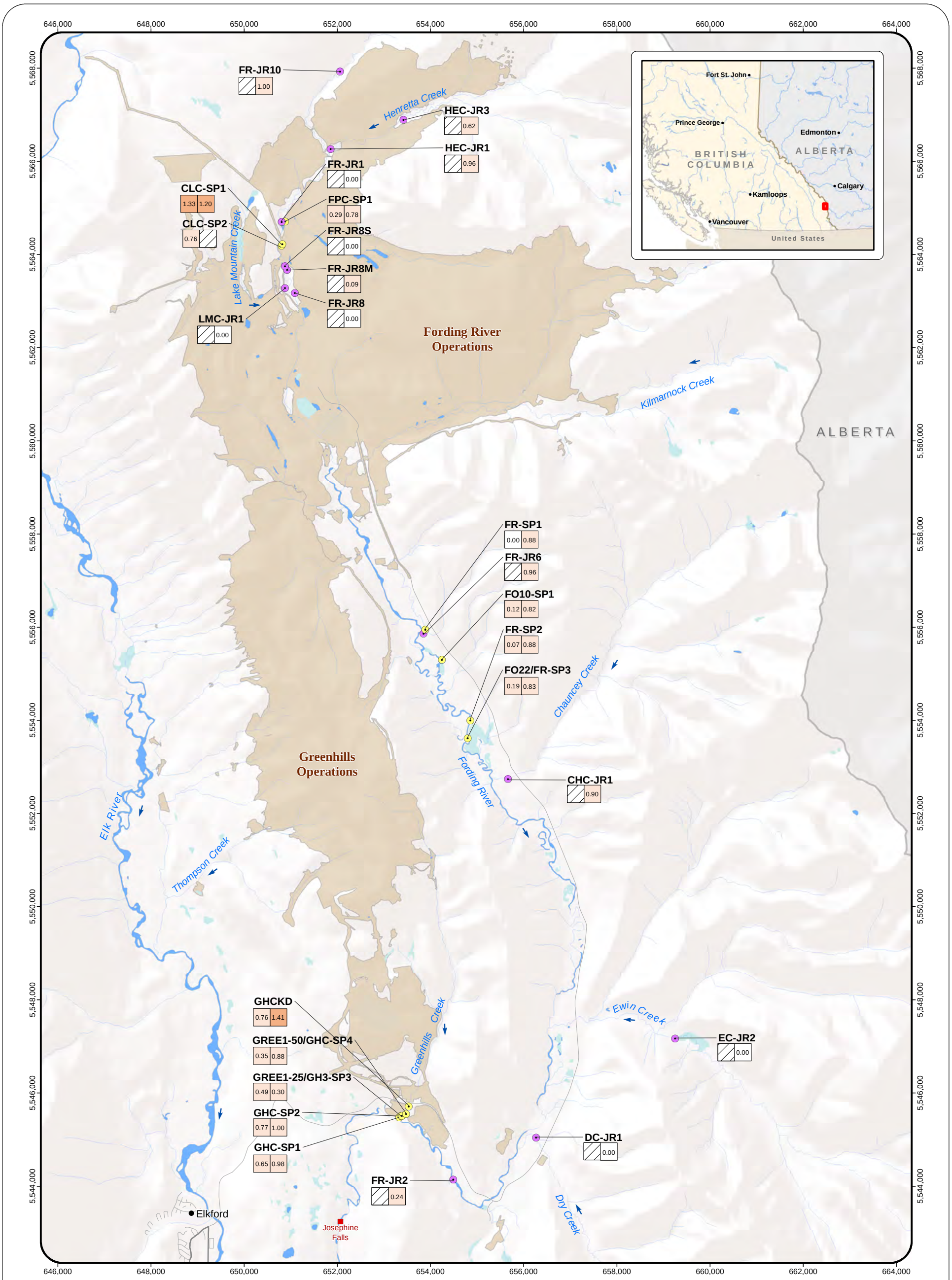
Orange shading for % Ephemeoptera (%E): dark %E > NR; light %E < NR; no shading within the normal range
Blue shading for CI: dark CI ≥ 2.3 (heavy concretion); medium 1.7 < CI < 2.3 (moderate concretion); light 1 < CI < 1.7 (some concretion); no shading CI ≤ 1 (normal).
Grey shading for ratios: dark X ≥ 4; medium 2 ≤ X < 4; light 1 ≤ X < 2; no shading X ≤ 1.

Eleven multivariate indicators, including six that represented overall community structure based on NMDS of transformed or non-transformed data sets at LPL or family levels of taxonomy, showed strong agreement among each other and relative to the univariate indicator endpoints in identifying areas with community characteristics outside of the normal range (Appendix Table C.8). These results demonstrate that the seven univariate community endpoints that were selected as strongest indicators of mine-related influence, including calcite effects, accounted for the mine-related differences in overall community structure indicated by multivariate endpoints.

Overall, the data indicated that benthic invertebrate community structure, and especially the proportion of Ephemeroptera, tends to deviate from the normal range when CI is greater than 1. However, the analysis also showed that there is strong correlation between CI and the concentrations of mine-related water quality constituents such that areas having CI greater than 1 also tend to have concentrations of selenium, nitrate, and/or sulphate that are greater than the Level 1 invertebrate benchmarks indicating potential for effects related to water quality. Therefore, the effects of calcite could not be distinguished from those associated with water quality (i.e., in areas where effects are observed, the effects may be due to calcite or water quality, or both, depending on the area).

3.6 Calcite at Cutthroat Trout Spawning Locations

At spawning areas where CI was computed both in the spring and fall of 2015, CI was almost always greater in the fall than in the spring (Figure 3.9). CI was less than 1 at all but one redd location in the spring and two locations in the fall, potentially indicating preferential utilization of areas with relatively low CI. It is hypothesized that this is because spawning trout preferentially select areas with moveable gravels, and thus avoid areas where calcite concretion makes substrates immovable. Further evaluation of potential effects of calcite on fish spawning and incubation success is planned for 2016 (Ecofish 2016).



MAP INFORMATION
Datum: NAD 83 Map Projection: UTM Zone 11N
Data Source: Reproduced under licence from Her Majesty the Queen in Right of Canada, Department of Natural Resources Canada, GeoBase and BCGov, GeoBC. All rights reserved.
Creation Date: June 2016
Project No.: 157202.0080

Figure 3.9: Calcite Indices Associated with WCT Spawning and Juvenille Rearing Monitoring Locations in the Upper Fording River, 2015. (WCT Locations from Westslope Fisheries)

4.0 SUMMARY AND RECOMMENDATIONS

Calcite formation has been observed in the Elk River watershed downstream of mining activities and, to a lesser extent, in reference streams unaffected by mining. In 2013, Teck initiated a three-year regional calcite monitoring program to document calcite deposition in tributary and main stem areas of the Elk River watershed, using a calcite index that reflects the presence/absence and degree of concretion of calcite based on measurement of 100 rocks in each sampling area. To guide interpretation of the regional monitoring results with respect to potential effects on aquatic biota, a supporting study was initiated by Teck in September 2014. The calcite effects study is being undertaken in a phased approach, with initial focus on assessment of potential relationships between calcite deposition and both benthic invertebrate community structure and periphyton productivity. In 2015, the study was expanded to include initial evaluation of potential effects on fish spawning and incubation success, which will be evaluated in greater detail in 2016. This report presents results from the sampling completed in 2014 and 2015 to evaluate calcite effects on periphyton productivity and benthic invertebrate community structure, as well as the first year of investigation of calcite effects on fish.

In the first year of study (2014), field activities included collection of water samples, benthic invertebrate community samples (using the CABIN 3-minute travelling kick approach), and periphyton productivity samples (i.e., chlorophyll-a and AFDM), along with *in-situ* water quality measurements and field documentation of substrate characteristics, aquatic habitat, and calcite at 31 areas within the Elk River watershed. In 2015, 114 areas (74 mine-exposed and 40 reference) situated throughout the Elk River watershed and in adjacent watersheds within the region, including areas that are part of the RAEMP, were sampled using methods similar to those in 2014. Area-based benthic invertebrate community samples were also collected at a sub-set of 15 areas in 2015, to obtain estimates of organism density. Comparison of results for timed- versus area-based kick sampling demonstrated that the abundance of organisms in 3-minute travelling kick samples can be interpreted as reasonable approximation of organism density.

Periphyton chlorophyll-a and AFDM values were weakly (e.g., $r<0.5$) positively correlated with CI values among areas. It is hypothesized that calcite deposits may provide a surface favourable to periphyton growth), that periphyton growth alters water quality near the periphyton surface in a manner that favours calcite formation, and/or bioavailable nutrient concentrations may be elevated in areas with more calcite. The data were not suggestive of a specific CI value above which periphyton productivity would be expected to deviate from the normal range (defined as the range bounded by the 2.5^{th} and 97.5^{th} percentiles of reference area observations).

A total of 82 benthic invertebrate community endpoints were evaluated as potential indicators of calcite effects using data collected in 2015. Seven of the 82 endpoints were selected as the strongest univariate indicator endpoints because they identified at least 10% of mine-exposed areas as having community characteristics outside of the normal range and they also correlated with CI values (absolute $r > 0.6$). In addition to the univariate endpoints, 11 multivariate indicators were examined, including six that represented overall community structure based on NMDS. The multivariate endpoints showed strong agreement among each other and relative to the univariate endpoints in identifying areas with community characteristics that differed from the normal range observed among reference areas. The results also indicated that the selected univariate community endpoints were effective in identifying areas that were unusual based on overall community structure.

Overall, the data indicated that benthic invertebrate community structure, and especially the proportion of Ephemeroptera, tended to deviate from the normal range when CI was greater than 1. However, the analysis also showed that there was strong correlation between CI and the concentrations of mine-related constituents in water among areas. Areas having CI greater than 1 also tended to have concentrations of selenium, nitrate, and/or sulphate that were greater than the Level 1 invertebrate benchmarks identified in the EVWQP, indicating potential for water quality effects. Therefore, the effects of calcite could not be distinguished from those associated with water quality (i.e., in areas where effects are observed, the effects may be due to calcite or water quality, or both, depending on the area).

Further evaluation of effects of calcite on periphyton productivity or benthic invertebrate community structure is not recommended at this time, except in streams targeted for calcite treatment. At such areas, biological monitoring following mitigation of calcite deposits will allow for characterization of any residual water quality effects because calcite treatment is not expected to reduce concentrations of selenium, nitrate, or sulphate. Evaluation of effects on fish spawning and incubation success should continue as planned in 2016.

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APPENDIX A

Detailed Calcite and Water Quality Data, 2014 and 2015

Table A.1: Reference sampling areas and calcite measurements for the calcite-biological effects study, September 2015.

Area	Area Description	Location Code	UTMS (Zone 11U, NAD83)		Sample Date	Calcite Concretion Score (CI_c)	Calcite Presence Score (CI_p)	Calcite Thickness Score (not used in CI)	Calcite Index (CI)	Alternative Location ID (e.g., 2014 and/or regional calcite monitoring)
			Easting	Northing						
Andy Good Creek	Andy Good u/s CMO influence	AGCK	667551	5488669	12-Sep-15	0	0	0	0	
Alexander Creek	Upper Alexander Creek	AL4	664974	5509024	13-Sep-15	0.1	0.9	1.2	1.0	
	Alexander Creek upstream of Michel	ALUSM	663482	5502718	13-Sep-15	0.1	0.7	0.9	0.8	
Bull River	Bull River	BU2	631852	5505579	13-Sep-15	0	0	0	0	
	Bull River 40 km Bridge	BU40	626589	5499846	13-Sep-15	0	0.6	0.6	0.6	
	Bull River u/s Quinn	BUUQ	633561	5519210	13-Sep-15	0	0	0	0	
Cadorna Creek	Cadorna Creek u/s Elk River	CADCK	645826	5589227	13-Sep-15	0	0.5	0.5	0.5	
Chauncey Creek	Chauncey Creek near mouth	CHCK	655349	5552776	12-Sep-15	0	0.5	0.5	0.5	
Cross River	Cross River u/s Kootenay River	CRUKO	585502	5614058	11-Sep-15	0	0	0	0	
Daisy Creek	Daisy Creek	DACK	685988	5523955	12-Sep-15	0	0	0	0	
Dutch Creek	Dutch Creek	DUCK	687139	5531110	11-Sep-15	0	0	0	0	
Elk River	Elk River d/s of Cadorna	EL12	646175	5589009	13-Sep-15	0	0.4	0.4	0.4	
	Elk River u/s Branch	ELUGH	646497	5557523	17-Sep-15	0	0.1	0.1	0.1	
Ewin Creek	Ewin Creek near mouth	EWCK	657208	5547645	12-Sep-15	0	0.5	0.5	0.5	
Flathead River	Flathead River Downstream	FLAD	682705	5443985	14-Sep-15	0	0	0	0	
	Flathead River Upstream	FLAU	680187	5453294	14-Sep-15	0	0	0	0	
	Upper Flathead River	FLRU	668175	5470823	19-Sep-15	0	0	0	0	
Fording River	Fording u/s Henretta (u/s all mines)	FO26	653064	5569601	14-Sep-15	0	0.9	1.0	0.9	
Grave Creek	Grave Creek u/s Harmer	GRUHA	659422	5523781	11-Sep-15	0	1.0	1.0	1.0	GRAV3-75
Henretta Creek	Henretta u/s all mine operations	HENUP	655887	5567716	15-Sep-15	0	0.1	0.1	0.1	
Kootenay River	Kootenay River	KO1	591185	5561577	13-Sep-15	0	0	0	0	
	Kootenay River d/s Cross River	KODCR	584744	5607649	12-Sep-15	0	0	0	0	
	Kootenay River u/s Cross River	KOUCR	579591	5616187	12-Sep-15	0	0	0	0	
	Kootenay River u/s Vermillion	KOUVE	569766	5630957	10-Sep-15	0	0	0	0	
Grace Creek	Grace Creek	LC_GRCK	654283	5540738	18-Sep-15	0	0	0	0	
Line Creek	Line Creek Reference	LI24	662214	5538393	10-Sep-15	0	0	0	0	
McCool Creek	McCool Creek	MCCR	648151	5499951	11-Sep-15	0	0.8	1.2	0.8	
Michel Creek	Michel u/s CMO influence	MI25	668266	5482795	10-Sep-15	0	0.4	0.4	0.4	
Oldman River	Oldman d/s Dutch, u/s Racehorse	OLDDU	687855	5530302	12-Sep-15	0	0	0	0	
	Oldman d/s Livingstone	OLDLI	687526	5532685	11-Sep-15	0	0	0	0	
	Oldman lower u/s reservoir	OLDLOW	710028	5512469	10-Sep-15	0	0	0	0	
Palliser River	Palliser River d/s Albert	PADAL	601173	5598667	11-Sep-15	0	0	0	0	
	Palliser River u/s Kootenay, d/s Fenwick	PAUKO	595626	5590338	11-Sep-15	0	0	0	0	
Racehorse Creek	Racehorse Creek	RACK	687621	5526336	11-Sep-15	0	0	0	0	
South Line Creek	South Line Creek Reference	SLINE	661122	5531374	15-Sep-15	0	0	0	0	
Vermillion River	Vermillion u/s Kootenay, d/s Simpson	VEUKO	569465	5641604	10-Sep-15	0	0	0	0	
	Vermillion Upper, u/s Simpson	VEUP	561227	5670806	10-Sep-15	0	0	0	0	
Vicary Creek	Vicary Creek	VICK	682461	5519665	10-Sep-15	0	0	0	0	
Wigwam River	Lower Wigwam River	WWRL	646099	5458836	11-Sep-15	0	0	0	0	
	Upper Wigwam River	WWRU	648769	5448916	19-Sep-15	0	0	0	0	
Summary Statistics					**Mean**	**0.00**	**0.19**	**0.21**	**0.19**	**-**
					Median	**0**	**0**	**0**	**0**	
					Minimum	**0**	**0**	**0**	**0**	
					Maxiumum	**0.09**	**0.97**	**1.24**	**0.98**	
					2.5th Percentile	**0**	**0**	**0**	**0**	
					97.5th Percentile	**0.07**	**0.93**	**1.19**	**0.97**	

Table A.2: Mine-exposed sampling areas and calcite measurements for the calcite-biological effects study, September 2015.

Area	Area Description	Location Code	UTMS (Zone 11U, NAD83)		Sample Date	Calcite Concretion Score (CI_c)	Calcite Presence Score (CI_p)	Calcite Thickness Score	Calcite Index (CI)	Alternative Location ID (e.g., 2014 and/or regional calcite monitoring)
			Easting	Northing						
Bodie Creek	Bodie Creek d/s Bodie Pond	BOCK	655536	5509605	14-Sep-15	0	1.0	1.3	1.0	
Cataract Creek	Cataract Creek near mouth	CACK	652429	5557517	11-Sep-15	2.0	1.0	5.0	3.0	CATA2-50
	Cataract Creek d/s of CACK	CATA2-25	652464	5557536	11-Sep-15	2.0	1.0	5.0	3.0	
	Cataract Creek d/s of CATA2-25	CATA2-75	652464	5557463	11-Sep-15	2.0	1.0	5.0	3.0	
Corbin Creek	Corbin Creek near Mouth	COCK	668563	5487395	11-Sep-15	0.4	1.0	1.7	1.4	
Dry Creek	Dry Creek near mouth	LC_DC1	656454	5544727	13-Sep-15	0	0	0	0	
	Dry Creek d/s sedimentation ponds	LC_DCDS	657719	5542179	16-Sep-15	0	0	0	0	
Elk River	Elk d/s Sparwood & Michel	EL1	651655	5508624	16-Sep-15	0	0.5	0.5	0.5	
	Elk River d/s Fording, u/s Grave	EL19	653157	5525801	17-Sep-15	0	1.0	2.1	1.0	
	Elk River d/s Thompson & GHO	EL20	649186	5548524	17-Sep-15	0	0.8	1.2	0.8	
	Elk River d/s Elkford sewage ponds	ELDEL	649968	5540252	17-Sep-15	0	0.2	0.3	0.2	
	Elk River d/s Fernie	ELDFE	640103	5479658	16-Sep-15	0	0.9	1.1	0.9	
	Elk River d/s Grave	ELDGR	653098	5521154	17-Sep-15	0	0.3	0.3	0.3	
	Elk River u/s Elko	ELELKO	639419	5463274	14-Sep-15	0	0	0	0	
	Elk River u/s Hwy 93 Bridge	ELH93	633954	5449117	16-Sep-15	0	1.0	2.0	1.0	
	Elk River u/s Elkford	ELUEL	649097	5544766	13-Sep-15	0.03	0.9	1.6	0.9	
	Elk River u/s Fernie	ELUFE	644755	5490993	15-Sep-15	0	0.9	1.0	0.9	
	Elk River just u/s Fording	ELUFO	652130	5528839	14-Sep-15	0	1.0	1.7	1.0	
	Elk d/s Otto, u/s Sparwood & Michel	ELUSP	652337	5512688	15-Sep-15	0	0.8	1.0	0.8	
Fording River	Fording u/s Chauncey Creek	FO22	654794	5553614	17-Sep-15	0	0.8	0.9	0.8	
	Fording River Downstream of Line Creek	FO23	652965	5528974	16-Sep-15	0	0.9	1.3	0.9	
	Fording River u/s Dry Creek	LC_FRUS/FO28	656307	5545255	13-Sep-15	0	1.0	2.1	1.0	
	Fording d/s Dry, u/s GHO & Hwy Bridge	FO29	655522	5543915	12-Sep-15	0.01	1.0	1.9	1.0	
	Fording d/s Josephine falls, u/s Grace & Line	FO9	652235	5540141	18-Sep-15	0	0.8	1.1	0.8	
	Fording Side Channel (old Fording oxbow)	FO10-SP1	654245	5555299	17-Sep-15	0	0.8	0.8	0.8	
	Fording between Cataract & Porter	FOBCP	652864	5557150	17-Sep-15	0.3	1.0	1.8	1.3	
	Fording between Kilmarnock & Swift	FOBKS	652065	5558691	16-Sep-15	0	0.9	1.2	0.9	
	Fording d/s Swift, u/s Cataract	FOBSC	652342	5558207	17-Sep-15	0.2	1.0	1.5	1.2	
	Fording River d/s GHO	FODGH	652941	5545649	16-Sep-15	0.01	1.0	1.9	1.0	
	Fording d/s Henretta	FODHE	651295	5565429	14-Sep-15	0	0.9	1.6	0.9	
	Fording d/s North Greenhills Diverson	FODNGD	650883	5563190	14-Sep-15	0	0.8	0.8	0.8	
	Fording d/s Porter, u/s Chauncey	FODPO	653901	5555074	15-Sep-15	0	0.9	1.1	0.9	
	Fording u/s FOUEW	FORD7-75	655447	5552357	18-Sep-15	0	1.0	1.6	1.0	
	Fording d/s Chauncey, u/s Ewin	FOUEW	656362	5551883	13-Sep-15	0	1.0	1.9	1.0	FORD7-25
	Fording u/s Kilmarnock Creek	FOUKI	651838	5559855	16-Sep-15	0	1.0	1.4	1.0	
	Fording River Upstream of Line Creek	FOUL	654524	5530128	17-Sep-15	0	0	0	0	
	Fording u/s North Greenhills Diversion	FOUNGD	651021	5563445	15-Sep-15	0	0.8	0.8	0.8	
	Fording u/s Shandley Creek	FOUSH	650863	5560970	15-Sep-15	0	1.0	1.7	1.0	
	Fording Multiplate d/s Eagle Ponds	MP1	651133	5562401	15-Sep-15	0	1.0	1.8	1.0	
Grave Creek	Grave Creek d/s Harmer	GRCK	656412	5522315	17-Sep-15	0	0.5	0.5	0.5	
	Grave Creek near mouth at Elk	GRDS	653936	5523373	12-Sep-15	0	1.0	1.0	1.0	GRAV1-50
Greenhills Creek	Greenhills Creek d/s of settling pond	GHCKD	653534	5545741	15-Sep-15	0.4	1.0	1.9	1.4	GREE1-75
	Greenhills Creek u/s settling pond	GHCKU	653911	5546497	15-Sep-15	1.5	1.0	1.5	2.5	GREE3-25
	Greenhills Creek d/s of GHCKD, near mouth	GREE1-25	653386	5545504	15-Sep-15	0	0.3	0.3	0.3	
	Greenhills Creek d/s of GHCKD	GREE1-50	653494	5545590	15-Sep-15	0.03	0.8	1.0	0.9	
	Greenhills Creek u/s of GHCKU	GREE3-75	654188	5547262	15-Sep-15	1.7	1.0	1.2	2.7	
	Greenhills Creek u/s of GREE3-75	GREE4-25	654524	5548403	16-Sep-15	1.9	1.0	2.8	2.9	
	Greenhills Creek u/s of GREE4-25	GREE4-75	654139	5550048	16-Sep-15	1.5	1.0	1.7	2.5	
Harmer Creek	Harmer d/s Pond near mouth at Grave	HACKDS	656962	5522160	10-Sep-15	0.1	1.0	2.1	1.1	HARM1-75
	Harmer Creek u/s Harmer Pond	HACKUS	658180	5520996	11-Sep-15	0	0.9	1.3	0.9	
	Harmer Creek d/s of HACKDS	HARM1-50	656764	5522109	12-Sep-15	0	1.0	1.8	1.0	
	Harmer Creek u/s of HACKUS	HARM5-25	659229	5518106	12-Sep-15	0	0.9	1.1	0.9	
Henretta Creek	Henretta u/s confluence with Fording	HENFO	652236	5566412	16-Sep-15	0	0.9	1.6	0.9	
Kilmarnock Creek	Kilmarnock d/s of KICK	KILM1-50	652442	5559534	17-Sep-15	1.8	1.0	4.7	2.8	
	Kilmarnock u/s road crossing	KICK	652704	5559764	17-Sep-15	1.4	1.0	3.6	2.3	KILM1-75
Line Creek	Line Creek Downstream of Canyon	LI8	655424	5528983	13-Sep-15	0.02	0.02	0.02	0.04	
	Line Creek Downstream of South Line Creek and Contingency Ponds	LIDSL	659293	5530590	12-Sep-15	0	0.6	0.9	0.6	
	Line Creek Upstream of Active Water Treatment Facility	LILC3	659931	5531848	14-Sep-15	0	1.0	2.0	1.0	
Michel Creek	Michel Creek d/s EVO	MI2	653672	5511222	10-Sep-15	0	0.4	0.5	0.4	
	Michel u/s Erickson Creek	MI3	660077	5504881	14-Sep-15	0	0.4	0.4	0.4	
	Michel d/s CMO	MI5	659497	5496573	13-Sep-15	0	0.5	0.5	0.5	
	Michel d/s Andy Good	MIDAG	665212	5489264	12-Sep-15	0.1	0.3	0.3	0.4	
	Michel d/s Corbin, u/s Andy Good	MIDCO	667757	5487611	11-Sep-15	0	0.7	1.0	0.7	
	Michel u/s Corbin Creek	MIUCO	668203	5486653	10-Sep-15	0.1	0.7	1.0	0.9	
North Greenhills Diversion	North Greenhills Diversion	NGD1u	650820	5563294	8-Oct-15	0	0.8	0.9	0.8	
North Thompson Creek	Harmer d/s Pond near mouth at Grave	NTHO1-25	649731	5551308	18-Sep-15	0.5	1.0	2.8	1.5	
	North Thompson Creek	NTHO1-50	649915	5551422	18-Sep-15	1.7	1.0	4.6	2.7	
Otto Creek	Otto Creek near mouth	OCNM	652337	5512615	15-Sep-15	0	0.4	0.4	0.4	
Porter Creek	Porter Creek	POCK	653558	5555328	14-Sep-15	0.1	1.0	2.1	1.1	PORT2-0/PORT1-0
	Porter Creek u/s of PORT2-0	PORT3-25	653206	5555289	14-Sep-15	0.3	0.8	1.3	1.1	
	Porter Creek u/s of PORT3-25	PORT3-50	653072	5554971	14-Sep-15	0.7	0.7	0.9	1.5	
Swift Creek	Swift Creek	SWCK	652062	5558542	10-Sep-15	1.1	0.9	3.2	2.1	
	Swift Creek u/s of SWIF2-50	SWIF2-75	651761	5558515	10-Sep-15	1.5	1.0	4.0	2.5	
Thompson Creek	Thompson Creek	THCK	648596	5550237	18-Sep-15	0	1.0	1.1	1.0	
Wolfram Creek	Wolfram Creek	WOCK	648277	5552293	17-Sep-15	0.4	0.9	0.9	1.3	

CI values greater than the normal range (i.e., CI > 1.0; see Appendix Table A.1)

Table A.3: Sampling areas and calcite measurements for the calcite-biological effects study, September 2014.

Stream Name	Location Code	UTMS (Zone 11U, NAD83)		Sample Date	Calcite Concretion Score (CI^C)	Calcite Presence Score (CI^P)	Calcite Index (CI)	Location Code (if different from biological site)
		Easting	Northing					
Alexander Creek	ALEX3-25	663885	5504524	16-Sep-14	0	0.57	0.57	-
Chauncey Creek	CHAU1-50	655734	5552765	12-Sep-14	0	0	0	-
Chauncey Creek	CHAU1-75	655981	5552897	12-Sep-14	0	0	0	-
Elk River	ELKR8-75	652014	5505118	15-Sep-14	0	0	0	-
Erickson Creek	ERIC2-0	660091	5505192	15-Sep-14	1.79	0.92	2.71	-
Erickson Creek	ERIC4-25	660656	5505720	15-Sep-14	0	0.7	0.7	-
Erickson Creek	ERIC4-75	660818	5506460	15-Sep-14	0	0.23	0.23	-
Fording River	FO29	655430	5543794	16-Sep-14	0	0.28	0.28	-
Fording River	FORD7-25	656018	5551838	17-Sep-14	0.04	0.6	0.64	-
Fording River	FORD7-50	655616	5552075	13-Sep-14	0	0.03	0.03	-
Grace Creek	GRAC2-25	654319	5540780	14-Sep-14	0.02	0.08	0.1	-
Grace Creek	GRAC2-75	655502	5540694	14-Sep-14	0	0	0	-
Grave Creek	GRAV1-25	653658	5523369	13-Sep-14	0.01	0.07	0.08	-
Grave Creek	GRAV1-50	653936	5523373	17-Sep-14	0.29	0.46	0.75	-
Grave Creek	GRAV1-75	654338	5523448	13-Sep-14	0.15	0.28	0.43	-
Grave Creek	GRAV3-75	659422	5523781	17-Sep-14	0	0	0	-
Greenhills Creek	GREE1-75	653534	5545741	17-Sep-14	0.68	0.81	1.49	-
Greenhills Creek	GREE3-25	653905	5546493	14-Sep-14	1.43	1	2.43	-
Greenhills Creek	GREE3-75	654174	5547280	14-Sep-14	0.91	0.97	1.88	-
Greenhills Creek	GREE4-25	654521	5548405	14-Sep-14	1.56	0.97	2.53	-
Greenhills Creek	GREE4-75	654134	5550052	14-Sep-14	1.34	1	2.34	-
Harmer Creek	HARM1-50	656764	5522109	17-Sep-14	0.17	0.75	0.92	-
Harmer Creek	HARM1-75	656962	5522160	15-Sep-14	0.67	0.99	1.66	-
Harmer Creek	HARM5-25	659229	5518106	16-Sep-14	0.3	0.82	1.12	-
Harmer Creek	HARM6-25	659488	5517110	16-Sep-14	0	0	0	-
Line Creek	LI8	655421	5528971	18-Sep-14	0	0.5	0.5	LINE1-75
Line Creek	LIDSL	659320	5530619	18-Sep-14	0	0.24	0.24	CPOU1-0
Line Creek	LILC3	659947	5531859	18-Sep-14	0	1	1	LINE4-25
Michel Creek	MICH1-25	652519	5511603	13-Sep-14	0	0	0	-
North Thompson Creek	NTHO1-25	649731	5551308	14-Sep-14	0.6	0.98	1.58	-
North Thompson Creek	NTHO1-50	649915	5551422	14-Sep-14	1.23	0.98	2.21	-
Porter Creek	PORT1-0	653602	5555325	15-Sep-14	0.73	0.96	1.69	-

Table A.4: Mean pebble measurements for the calcite-biological effects study, September 2014 and 2015.

	Location ID	2014 Intermediate Axis (cm)	2014 Embeddedness (%)
Reference	ALEX3-25	10.2	43%
	CHAU1-50	10.4	28%
	CHAU1-75	8.8	30%
	GRAC2-25	9.7	18%
	GRAC2-75	6.5	20%
Mine-exposed	ERIC2-0	4.5	0%
	ERIC4-25	5.0	20%
	ERIC4-75	5.1	8%
	FO29	9.5	40%
	FORD7-25	12.6	28%
	FORD7-50	10.0	13%
	GRAV1-25	14.8	33%
	GRAV1-75	12.8	33%
	GREE1-75	7.1	38%
	GREE3-25	8.7	42%
	GREE3-75	7.8	50%
	GREE4-25	6.6	20%
	GREE4-75	7.2	25%
	HARM1-75	12.2	33%
	HARM5-25	10.2	28%
	HARM6-25	7.0	10%
	LI8	10.1	53%
	LIDSL	11.2	35%
	LILC3	12.4	43%
	MICH1-25	7.9	18%
	NTHO1-25	7.8	18%
	NTHO1-50	6.8	8%
	PORT1-0	8.3	18%

	Location ID	2015 Intermediate Axis (cm)	2015 Embeddedness (%)
Reference	AGCK	8.8	38%
	AL4	9.0	40%
	ALUSM	9.6	35%
	BU2	14.9	5%
	BU40	11.8	18%
	BUUQ	13.0	18%
	CADCK	10.3	23%
	CHCK	7.2	40%
	CRUKO	8.0	33%
	DACK	11.9	15%
	DUCK	14.0	23%
	EC-JR2	7.0	30%
	EL12	9.5	15%
	ELUGH	6.5	20%
	EWCK	10.5	13%
	FLAD	9.6	45%
	FLAU	7.6	48%
	FLRU	10.6	15%
	FO26	6.4	18%
	GRUHA	9.5	28%
	HENUP	8.7	10%
	KO1	9.4	65%
	KODCR	8.4	48%
	KOUCR	8.5	35%
	KOUVE	8.3	53%
	LC_GRCK	8.7	28%
	LI24	11.5	35%
	MCCR	12.2	43%
	MI25	8.5	38%
	OLDDU	14.8	25%
	OLDLI	11.4	5%
	OLDLOW	13.9	8%
	PADAL	15.2	48%
	PAUKO	7.0	48%
	RACK	12.7	8%
	SLINE	13.7	40%
	VEUKO	7.7	53%
	VEUP	13.1	48%
	VICK	13.8	10%
	WWRL	7.5	25%
	WWRU	12.8	20%

	Location ID	2015 Intermediate Axis (cm)	2015 Embeddedness (%)
Mine-exposed	BOCK	4.2	30%
	CACK	0.0	0%
	CATA2-25	0.0	0%
	CATA2-75	0.0	0%
	COCK	6.7	45%
	EL1	10.2	33%
	EL19	18.0	30%
	EL20	11.6	28%
	ELDEL	5.1	20%
	ELDFE	12.1	40%
	ELDGR	11.3	35%
	ELELKO	6.6	28%
	ELH93	10.9	33%
	ELUEL	6.9	33%
	ELUFE	11.6	38%
	ELUFO	13.8	25%
	ELUSP	9.8	48%
	FO9	9.0	43%
	FO10-SP1	3.5	50%
	FO22	3.1	10%
	FO23	12.0	33%
	FO29	13.3	25%
	FOBCP	10.3	38%
	FOBKS	10.6	18%
	FOBSC	11.3	20%
	FODGH	10.3	0%
	FODHE	8.2	25%
	FODNGD	6.4	28%
	FODPO	4.4	25%
	FORD7-75	9.4	20%
	FOUEW	9.9	36%
	FOUKI	7.9	20%
	FOUL	12.5	38%
	FOUNGD	7.7	20%
	FOUSH	8.4	25%
	GHCKD	8.8	38%
	GHCKU	6.3	30%
	GRCK	12.3	40%
	GRDS	10.6	18%
	GREE1-25/GH3-SP3	5.2	100%
	GREE1-50/GHC-SP4	6.2	30%
	GREE3-75	8.8	40%
	GREE4-25	10.8	40%
	GREE4-75	6.8	35%
	HACKDS	11.0	20%
	HACKUS	7.2	28%
	HARM1-50	9.6	28%
	HARM5-25	8.6	25%
	HEC-JR1	10.1	28%
	HEC-JR3	9.6	23%
	HENFO	7.7	19%
	KICK	8.6	14%
	KILM1-50	10.2	0%
	LC_DC1	9.5	10%
	LC_DCDS	9.5	40%
	LC_FRUS	13.8	13%
	LI8	9.5	28%
	LIDSL	14.5	38%
	LILC3	11.7	23%
	MI2	9.2	18%
	MI3	9.6	33%
	MI5	11.7	23%
	MIDAG	8.0	28%
	MIDCO	9.2	40%
	MIUCO	8.1	30%
	MP1	12.3	18%
	NGD1u	9.1	18%
	NTHO1-25	6.7	31%
	NTHO1-50	8.3	25%
	OCNM	6.1	30%
	POCK	5.7	28%
	PORT3-25	10.6	35%
	PORT3-50	6.2	33%
	SWCK	8.1	35%
	SWIF2-75	10.5	28%
	THCK	7.5	25%
	WOCK	8.6	28%

Table A.5: Pebble count and calcite measurements in reference areas, September 2015.

AGCK						AL4						ALUSM					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	0	0	10.1		**1**	1	1	2	12.0		**1**	0	1	1	5.3	
2	0	0	0	10.4		**2**	0	1	2	8.2		**2**	0	0	0	3.7	
3	0	0	0	5.3		**3**	1	1	2	9.1		**3**	0	1	1	6.4	
4	0	0	0	7.2		**4**	0	1	1	10.7		**4**	0	1	2	8.7	
5	0	0	0	8.3		**5**	1	1	1	16.1		**5**	0	1	2	18.2	
6	0	0	0	13.2		**6**	0	0	0	4.0		**6**	0	0	0	10.7	
7	0	0	0	5.4		**7**	0	1	1	5.1		**7**	0	1	2	7.8	
8	0	0	0	7.6		**8**	0	1	1	9.7		**8**	0	1	1	14.2	
9	0	0	0	6.7		**9**	0	0	0	1.1		**9**	0	1	1	15.3	
10	0	0	0	3.3	0.5	**10**	0	1	1	11.5	0.5	**10**	0	1	1	14.7	0.25
11	0	0	0	1.3		**11**	2	1	1	13.6		**11**	0	1	2	18.4	
12	0	0	0	7.2		**12**	0	1	1	4.2		**12**	0	1	1	2.9	
13	0	0	0	8.0		**13**	0	1	1	4.4		**13**	0	1	1	10.0	
14	0	0	0	4.6		**14**	0	1	1	9.5		**14**	0	1	2	15.2	
15	0	0	0	4.5		**15**	0	1	1	7.1		**15**	0	1	2	43.0	
16	0	0	0	12.0		**16**	0	1	2	14.2		**16**	0	1	2	26.2	
17	0	0	0	8.1		**17**	0	1	1	4.2		**17**	0	1	2	13.9	
18	0	0	0	1.0		**18**	1	1	1	9.5		**18**	0	1	2	9.5	
19	0	0	0	13.7		**19**	0	0	0	3.7		**19**	0	1	2	9.8	
20	0	0	0	13.6	0.25	**20**	0	1	1	4.3	0.25	**20**	0	1	2	15.2	0.25
21	0	0	0	12.0		**21**	0	1	1	9.8		**21**	0	1	1	11.0	
22	0	0	0	13.2		**22**	0	1	1	7.9		**22**	1	1	1	12.9	
23	0	0	0	5.3		**23**	0	1	1	9.1		**23**	0	1	1	14.2	
24	0	0	0	6.7		**24**	0	1	2	15.6		**24**	0	0	0	6.2	
25	0	0	0	17.7		**25**	0	1	1	7.7		**25**	0	1	1	15.0	
26	0	0	0	15.0		**26**	0	1	1	8.3		**26**	0	1	1	21.1	
27	0	0	0	2.8		**27**	0	1	1	25.6		**27**	1	1	1	10.1	
28	0	0	0	15.9		**28**	0	1	2	9.4		**28**	0	0	0	2.9	
29	0	0	0	7.7		**29**	0	0	0	1.0		**29**	0	0	0	7.9	
30	0	0	0	6.3	0.5	**30**	0	1	1	11.9	0.25	**30**	0	0	0	2.1	0.25
31	0	0	0	2.1		**31**	0	1	1	7.7		**31**	0	1	2	9.7	
32	0	0	0	28.8		**32**	0	1	1	8.2		**32**	0	1	1	7.0	
33	0	0	0	2.3		**33**	0	1	1	6.7		**33**	0	1	2	12.2	
34	0	0	0	3.9		**34**	0	1	1	9.3		**34**	0	1	2	12.6	
35	0	0	0	8.3		**35**	0	1	1	4.5		**35**	0	1	1	9.2	
36	0	0	0	22.1		**36**	0	1	2	12.1		**36**	0	1	1	8.3	
37	0	0	0	7.6		**37**	0	1	2	10.9		**37**	0	0	0	6.0	
38	0	0	0	4.1		**38**	0	0	0	3.7		**38**	0	0	0	6.6	
39	0	0	0	4.1		**39**	0	1	2	25.3		**39**	0	1	1	8.1	
40	0	0	0	4.1	0.25	**40**	0	1	1	12.0	0.75	**40**	0	1	1	12.0	0.5
41	0	0	0	23.4		**41**	0	1	2	14.0		**41**	0	1	1	10.2	
42	0	0	0	7.8		**42**	0	1	1	3.2		**42**	0	1	1	10.6	
43	0	0	0	11.3		**43**	0	1	1	9.4		**43**	0	1	1	13.5	
44	0	0	0	8.0		**44**	0	0	0	0.6		**44**	0	0	0	1.9	
45	0	0	0	6.0		**45**	0	1	2	5.7		**45**	1	1	1	14.5	
46	0	0	0	2.3		**46**	0	1	1	7.6		**46**	0	1	1	5.6	
47	0	0	0	8.4		**47**	0	1	2	5.6		**47**	1	1	1	8.1	
48	0	0	0	7.0		**48**	0	1	1	11.1		**48**	0	1	1	3.5	
49	0	0	0	10.1		**49**	0	1	2	6.9		**49**	1	1	1	12.2	
50	0	0	0	16.9	0.25	**50**	0	0	0	7.2	0.5	**50**	0	1	1	15.1	0
51	0	0	0	15.6		**51**	0	1	1	3.6		**51**	0	1	1	6.9	
52	0	0	0	2.6		**52**	0	1	1	9.5		**52**	0	0	0	6.3	
53	0	0	0	32.3		**53**	1	1	2	10.5		**53**	0	0	0	8.1	
54	0	0	0	7.4		**54**	0	1	1	9.1		**54**	0	1	2	8.4	
55	0	0	0	10.6		**55**	0	1	2	11.6		**55**	0	0	0	8.2	
56	0	0	0	2.7		**56**	0	1	1	7.1		**56**	0	0	0	7.2	
57	0	0	0	1.7		**57**	0	1	1	6.6		**57**	0	0	0	4.3	
58	0	0	0	4.2		**58**	0	1	1	12.6		**58**	0	0	0	10.5	
59	0	0	0	8.1		**59**	0	1	1	28.6		**59**	0	0	0	3.7	
60	0	0	0	11.4	0.75	**60**	0	1	1	8.4	0.25	**60**	0	1	1	6.6	0.5
61	0	0	0	3.4		**61**	0	1	2	8.5		**61**	0	1	1	11.5	
62	0	0	0	24.0		**62**	0	1	1	6.7		**62**	0	1	2	12.4	
63	0	0	0	6.7		**63**	0	0	0	2.3		**63**	0	1	1	7.8	
64	0	0	0	0.8		**64**	0	1	1	6.7		**64**	0	0	0	14.6	
65	0	0	0	0.9		**65**	0	1	2	7.1		**65**	0	0	0	9.2	
66	0	0	0	20.1		**66**	0	1	1	11.5		**66**	0	0	0	5.4	
67	0	0	0	5.1		**67**	0	1	1	5.0		**67**	0	0	0	1.3	
68	0	0	0	3.9		**68**	0	1	2	15.0		**68**	0	1	1	10.4	
69	0	0	0	5.9		**69**	0	1	1	7.2		**69**	0	0	0	1.5	
70	0	0	0	7.0	0.25	**70**	0	1	2	13.5	0.5	**70**	0	0	0	4.3	0.25
71	0	0	0	16.4		**71**	0	1	1	9.1		**71**	0	1	1	15.5	
72	0	0	0	19.8		**72**	0	1	1	7.5		**72**	0	0	0	3.2	
73	0	0	0	3.6		**73**	0	0	0	0.7		**73**	1	1	1	11.4	
74	0	0	0	3.9		**74**	0	1	2	8.5		**74**	0	1	1	11.9	
75	0	0	0	3.8		**75**	1	1	1	10.2		**75**	0	1	1	4.8	
76	0	0	0	3.7		**76**	0	1	1	13.3		**76**	1	1	1	12.9	
77	0	0	0	6.6		**77**	0	0	0	8.5		**77**	0	1	1	11.5	
78	0	0	0	12.5		**78**	0	1	2	10.9		**78**	0	0	0	7.0	
79	0	0	0	3.0		**79**	0	1	1	9.2		**79**	0	1	2	4.4	
80	0	0	0	25.4	0.5	**80**	0	1	1	9.5	0.25	**80**	0	1	1	12.0	0.75
81	0	0	0	6.0		**81**	0	0	0	3.7		**81**	0	1	2	13.6	
82	0	0	0	3.5		**82**	0	1	1	15.3		**82**	0	1	1	4.0	
83	0	0	0	0.9		**83**	0	1	1	8.3		**83**	0	1	1	9.0	
84	0	0	0	1.8		**84**	0	1	1	10.9		**84**	0	1	1	11.2	
85	0	0	0	6.3		**85**	1	1	1	12.7		**85**	0	1	1	12.9	
86	0	0	0	8.6		**86**	0	1	1	13.1		**86**	0	1	2	15.9	
87	0	0	0	3.5		**87**	0	1	2	5.0		**87**	0	1	2	8.2	
88	0	0	0	7.1		**88**	0	1	1	8.6		**88**	0	1	1	12.1	
89	0	0	0	9.0		**89**	0	1	1	4.1		**89**	0	1	1	6.3	
90	0	0	0	3.4	0	**90**	0	1	1	8.0	0.25	**90**	0	0	0	1.6	0
91	0	0	0	5.6		**91**	0	1	2	6.6		**91**	0	1	1	9.6	
92	0	0	0	8.6		**92**	0	1	1	7.8		**92**	0	0	0	3.6	
93	0	0	0	2.2		**93**	0	1	2	7.6		**93**	0	1	2	6.4	
94	0	0	0	2.0		**94**	0	1	2	12.1		**94**	0	0	0	2.8	
95	0	0	0	41.5		**95**	0	1	2	30.0		**95**	0	0	0	6.0	
96	0	0	0	6.6		**96**	0	1	2	10.5		**96**	0	0	0	3.7	
97	0	0	0	9.8		**97**	0	1	2	6.3		**97**	0	1	1	8.8	
98	0	0	0	3.1		**98**	0	1	1	5.5		**98**	0	0	0	1.3	
99	0	0	0	4.3		**99**	0	1	2	6.4		**99**	0	0	0	1.9	
100	0	0	0	20.4	0.5	**100**	0	1	1	3.5	0.5	**100**	0	1	2	15.1	0.75
101	0	0	0	3.2		**101**	0	1	2	8.4		**101**					
102	0	0	0	22.8		**102**	0	1	1	7.4		**102**					
103	0	0	0	8.6		**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.0**	**0.0**	**0.0**	**8.8**	**0.4**	**Mean**	**0.09**	**0.89**	**1.2**	**9.0**	**0.4**	**Mean**	**0.07**	**0.69**	**0.91**	**9.6**	**0.4**
CALCITE INDEX:		**0.0**				**CALCITE INDEX:**		**0.98**				**CALCITE INDEX:**		**0.76**			

Table A.5: Pebble count and calcite measurements in reference areas, September 2015.

BU2						BU40						BUUQ					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	0	0	46.0		**1**	0	1	1	16.0		**1**	0	0	0	4.5	
2	0	0	0	30.0		**2**	0	1	1	11.0		**2**	0	0	0	6.0	
3	0	0	0	9.0		**3**	0	1	1	11.0		**3**	0	0	0	15.5	
4	0	0	0	42.0		**4**	0	0	0	5.5		**4**	0	0	0	20.0	
5	0	0	0	5.0		**5**	0	1	1	6.0		**5**	0	0	0	20.0	
6	0	0	0	8.0		**6**	0	0	0	9.0		**6**	0	0	0	28.0	
7	0	0	0	4.5		**7**	0	1	1	7.5		**7**	0	0	0	13.0	
8	0	0	0	9.0		**8**	0	1	1	14.0		**8**	0	0	0	29.0	
9	0	0	0	6.0		**9**	0	0	0	14.5		**9**	0	0	0	16.0	
10	0	0	0	12.0	0	**10**	0	0	0	5.0	0	**10**	0	0	0	18.0	0.5
11	0	0	0	18.0		**11**	0	0	0	11.5		**11**	0	0	0	7.0	
12	0	0	0	17.0		**12**	0	0	0	11.0		**12**	0	0	0	8.0	
13	0	0	0	14.0		**13**	0	1	1	12.0		**13**	0	0	0	5.0	
14	0	0	0	42.0		**14**	0	0	0	13.5		**14**	0	0	0	6.0	
15	0	0	0	12.0		**15**	0	0	0	18.0		**15**	0	0	0	22.0	
16	0	0	0	7.5		**16**	0	1	1	16.0		**16**	0	0	0	15.0	
17	0	0	0	10.0		**17**	0	0	0	12.5		**17**	0	0	0	19.0	
18	0	0	0	3.5		**18**	0	1	1	5.5		**18**	0	0	0	6.5	
19	0	0	0	52.0		**19**	0	1	1	12.5		**19**	0	0	0	5.0	
20	0	0	0	19.5	0	**20**	0	1	1	10.5	0.25	**20**	0	0	0	15.0	0.5
21	0	0	0	4.0		**21**	0	0	0	17.5		**21**	0	0	0	8.5	
22	0	0	0	13.0		**22**	0	0	0	14.0		**22**	0	0	0	24.0	
23	0	0	0	8.5		**23**	0	1	1	18.0		**23**	0	0	0	8.5	
24	0	0	0	11.0		**24**	0	0	0	9.0		**24**	0	0	0	25.0	
25	0	0	0	28.0		**25**	0	0	0	19.0		**25**	0	0	0	4.0	
26	0	0	0	12.0		**26**	0	0	0	11.0		**26**	0	0	0	44.0	
27	0	0	0	37.0		**27**	0	0	0	10.5		**27**	0	0	0	8.5	
28	0	0	0	10.0		**28**	0	0	0	21.5		**28**	0	0	0	16.0	
29	0	0	0	12.0		**29**	0	0	0	7.5		**29**	0	0	0	3.5	
30	0	0	0	6.0	0	**30**	0	1	1	15.5	0	**30**	0	0	0	6.5	0
31	0	0	0	39.0		**31**	0	0	0	9.0		**31**	0	0	0	6.0	
32	0	0	0	16.0		**32**	0	1	1	7.5		**32**	0	0	0	6.5	
33	0	0	0	22.0		**33**	0	1	1	11.5		**33**	0	0	0	8.0	
34	0	0	0	14.0		**34**	0	1	1	14.0		**34**	0	0	0	5.0	
35	0	0	0	18.0		**35**	0	0	0	10.5		**35**	0	0	0	43.0	
36	0	0	0	4.0		**36**	0	1	1	8.0		**36**	0	0	0	32.0	
37	0	0	0	20.0		**37**	0	0	0	7.5		**37**	0	0	0	10.5	
38	0	0	0	3.0		**38**	0	1	1	13.5		**38**	0	0	0	28.0	
39	0	0	0	17.0		**39**	0	1	1	7.0		**39**	0	0	0	9.0	
40	0	0	0	10.0	0	**40**	0	1	1	13.5	0.25	**40**	0	0	0	8.0	0.25
41	0	0	0	17.0		**41**	0	1	1	14.5		**41**	0	0	0	11.5	
42	0	0	0	12.5		**42**	0	0	0	1.5		**42**	0	0	0	8.0	
43	0	0	0	16.0		**43**	0	1	1	40.0		**43**	0	0	0	14.0	
44	0	0	0	15.0		**44**	0	0	0	9.5		**44**	0	0	0	8.0	
45	0	0	0	8.5		**45**	0	1	1	18.0		**45**	0	0	0	1.5	
46	0	0	0	19.0		**46**	0	1	1	14.5		**46**	0	0	0	5.5	
47	0	0	0	11.5		**47**	0	0	0	8.0		**47**	0	0	0	8.0	
48	0	0	0	13.5		**48**	0	0	0	11.5		**48**	0	0	0	22.0	
49	0	0	0	10.5		**49**	0	1	2	17.5		**49**	0	0	0	13.0	
50	0	0	0	4.0	0	**50**	0	1	1	15.5	0.5	**50**	0	0	0	4.0	0
51	0	0	0	17.0		**51**	0	1	1	12.0		**51**	0	0	0	10.0	
52	0	0	0	2.5		**52**	0	1	1	9.0		**52**	0	0	0	49.0	
53	0	0	0	38.0		**53**	0	0	0	9.0		**53**	0	0	0	21.0	
54	0	0	0	10.0		**54**	0	1	2	22.0		**54**	0	0	0	18.0	
55	0	0	0	7.0		**55**	0	1	1	12.0		**55**	0	0	0	7.0	
56	0	0	0	2.5		**56**	0	0	0	14.0		**56**	0	0	0	6.5	
57	0	0	0	23.0		**57**	0	0	0	8.0		**57**	0	0	0	4.0	
58	0	0	0	9.0		**58**	0	1	2	13.5		**58**	0	0	0	9.5	
59	0	0	0	22.5		**59**	0	1	1	15.5		**59**	0	0	0	2.0	
60	0	0	0	8.0	0	**60**	0	0	0	9.0	0	**60**	0	0	0	5.5	0
61	0	0	0	1.5		**61**	0	1	1	11.0		**61**	0	0	0	3.5	
62	0	0	0	11.5		**62**	0	1	1	6.0		**62**	0	0	0	7.0	
63	0	0	0	13.0		**63**	0	0	0	13.5		**63**	0	0	0	5.0	
64	0	0	0	20.0		**64**	0	1	1	10.0		**64**	0	0	0	3.5	
65	0	0	0	9.0		**65**	0	1	1	10.0		**65**	0	0	0	3.5	
66	0	0	0	8.0		**66**	0	1	1	8.0		**66**	0	0	0	94.0	
67	0	0	0	15.0		**67**	0	0	0	11.0		**67**	0	0	0	12.0	
68	0	0	0	10.0		**68**	0	1	1	17.0		**68**	0	0	0	4.0	
69	0	0	0	7.0		**69**	0	1	1	8.0		**69**	0	0	0	9.0	
70	0	0	0	26.0	0	**70**	0	0	0	14.5	0	**70**	0	0	0	9.5	0
71	0	0	0	11.0		**71**	0	1	1	8.5		**71**	0	0	0	5.5	
72	0	0	0	38.0		**72**	0	1	1	12.0		**72**	0	0	0	9.0	
73	0	0	0	11.0		**73**	0	0	0	10.5		**73**	0	0	0	17.0	
74	0	0	0	13.0		**74**	0	1	1	16.0		**74**	0	0	0	6.0	
75	0	0	0	18.0		**75**	0	1	1	7.0		**75**	0	0	0	8.0	
76	0	0	0	7.0		**76**	0	1	1	10.0		**76**	0	0	0	20.0	
77	0	0	0	21.0		**77**	0	0	0	11.0		**77**	0	0	0	13.5	
78	0	0	0	18.0		**78**	0	1	1	9.0		**78**	0	0	0	11.0	
79	0	0	0	5.5		**79**	0	0	0	9.0		**79**	0	0	0	14.5	
80	0	0	0	22.0	0	**80**	0	1	1	25.0	0.75	**80**	0	0	0	17.0	0.5
81	0	0	0	45.0		**81**	0	0	0	9.0		**81**	0	0	0	15.0	
82	0	0	0	9.5		**82**	0	1	1	7.5		**82**	0	0	0	4.5	
83	0	0	0	13.0		**83**	0	0	0	2.5		**83**	0	0	0	27.0	
84	0	0	0	12.0		**84**	0	1	2	13.5		**84**	0	0	0	6.0	
85	0	0	0	6.0		**85**	0	1	2	16.0		**85**	0	0	0	42.0	
86	0	0	0	18.0		**86**	0	1	1	15.0		**86**	0	0	0	9.0	
87	0	0	0	6.0		**87**	0	0	0	11.5		**87**	0	0	0	10.5	
88	0	0	0	12.5		**88**	0	1	1	9.0		**88**	0	0	0	9.5	
89	0	0	0	5.0		**89**	0	0	0	4.0		**89**	0	0	0	11.0	
90	0	0	0	14.0	0.25	**90**	0	1	1	7.5	0	**90**	0	0	0	10.5	0
91	0	0	0	8.5		**91**	0	1	1	11.0		**91**	0	0	0	17.0	
92	0	0	0	5.0		**92**	0	1	1	10.5		**92**	0	0	0	5.5	
93	0	0	0	14.0		**93**	0	0	0	8.0		**93**	0	0	0	5.0	
94	0	0	0	9.0		**94**	0	1	1	7.0		**94**	0	0	0	5.0	
95	0	0	0	3.0		**95**	0	0	0	14.0		**95**	0	0	0	6.5	
96	0	0	0	22.0		**96**	0	0	0	13.5		**96**	0	0	0	5.0	
97	0	0	0	10.5		**97**	0	0	0	12.0		**97**	0	0	0	4.0	
98	0	0	0	20.0		**98**	0	0	0	12.0		**98**	0	0	0	7.0	
99	0	0	0	11.5		**99**	0	1	1	11.0		**99**	0	0	0	8.0	
100	0	0	0	19.0	0.25	**100**	0	1	2	13.5	0	**100**	0	0	0	6.0	0
101						**101**						**101**					
102						**102**						**102**					
103						**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.0**	**0.0**	**0.0**	**14.9**	**0.1**	**Mean**	**0.0**	**0.57**	**0.63**	**11.8**	**0.2**	**Mean**	**0.0**	**0.0**	**0.0**	**13.0**	**0.2**
CALCITE INDEX:		**0.0**				**CALCITE INDEX:**		**0.57**				**CALCITE INDEX:**		**0.0**			

Table A.5: Pebble count and calcite measurements in reference areas, September 2015.

CADCK						CHCK						CRUKO					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	0	0	7.2		**1**	0	1	1	8.7		**1**	0	0	0	9.2	
2	0	1	1	6.8		**2**	0	1	1	15		**2**	0	0	0	9.5	
3	0	0	0	5.8		**3**	0	0	0	4.3		**3**	0	0	0	5.5	
4	0	0	0	7.7		**4**	0	1	1	9		**4**	0	0	0	11.8	
5	0	0	0	5.4		**5**	0	1	1	6.2		**5**	0	0	0	6.9	
6		0				**6**	0	0	0	11.5		**6**	0	0	0	8.9	
7	0	0	0	4.8		**7**	0	1	1	6.7		**7**	0	0	0	13.1	
8	0	0	0	5.7		**8**	0	1	1	11.3		**8**	0	0	0	7.6	
9	0	1	1	17.6		**9**	0	1	1	5.1		**9**	0	0	0	7.5	
10	0	0	0	4.7	0	**10**	0	0	0	4.2	0	**10**	0	0	0	7.5	0.5
11	0	0	0	16.4		**11**	0	0	0	6.8		**11**	0	0	0	6.2	
12	0	0	0	4.2		**12**	0	0	0	5.2		**12**	0	0	0	6.5	
13	0	0	0	15.7		**13**	0	1	1	16.5		**13**	0	0	0	s	
14	0	1	1	17.9		**14**	0	0	0	8.7		**14**	0	0	0	4.5	
15	0	1	1	17.2		**15**	0	0	0	1.5		**15**	0	0	0	11.6	
16	0	0	0	15.1		**16**	0	0	0	3.1		**16**	0	0	0	7.2	
17	0	0	0	8.2		**17**	0	0	0	4.3		**17**	0	0	0	5.4	
18	0	1	1	19.2		**18**	0	1	1	14		**18**	0	0	0	7.8	
19	0	1	1	17.7		**19**	0	0	0	2.9		**19**	0	0	0	3.9	
20	0	1	1	16.9	0	**20**	0	0	0	6.4	0	**20**	0	0	0	2.8	0.25
21	0	0	0	12.0		**21**	0	0	0	2.9		**21**	0	0	0	14.4	
22	0	1	1	10.0		**22**	0	1	1	8.2		**22**	0	0	0	5.0	
23	0	1	1	13.2		**23**	0	0	0	6.2		**23**	0	0	0	5.6	
24	0	1	1	25.3		**24**	0	0	0	10.1		**24**	0	0	0	5.0	
25	0	1	1	14.4		**25**	0	0	0	3.9		**25**	0	0	0	4.3	
26	0	1	1	14.3		**26**	0	0	0	12.2		**26**	0	0	0	9.5	
27	0	0	0	6.7		**27**	0	1	1	4		**27**	0	0	0	7.4	
28	0	1	1	13.9		**28**	0	0	0	4.6		**28**	0	0	0	4.1	
29	0	1	1	11.8		**29**	0	0	0	2.8		**29**	0	0	0	5.3	
30	0	1	1	3.8	0.25	**30**	0	1	1	10.8	0.5	**30**	0	0	0	4.0	0.75
31	0	1	1	9.5		**31**	0	0	0	2.1		**31**	0	0	0	11.5	
32	0	1	1	12.7		**32**	0	1	1	8.7		**32**	0	0	0	8.0	
33	0	0	0	7.6		**33**	0	0	0	6.2		**33**	0	0	0	9.4	
34	0	1	1	33.2		**34**	0	1	1	6.2		**34**	0	0	0	7.0	
35	0	0	0	2.6		**35**	0	1	1	12.9		**35**	0	0	0	8.2	
36	0	0	0	15.9		**36**	0	1	1	11.5		**36**	0	0	0	5.1	
37	0	1	1	7.3		**37**	0	1	1	9.2		**37**	0	0	0	8.1	
38	0	0	0	3.1		**38**	0	1	1	5.4		**38**	0	0	0	g	
39	0	0	0	4.9		**39**	0	1	1	4.7		**39**	0	0	0	5.2	
40	0	0	0	4.9	0.25	**40**	0	1	1	12.1	0.5	**40**	0	0	0	4.5	0.25
41	0	0	0	11.3		**41**	0	1	1	7.9		**41**	0	0	0	2.8	
42	0	1	1	7.7		**42**	0	0	0	3		**42**	0	0	0	9.1	
43	0	1	1	11.0		**43**	0	0	0	3.3		**43**	0	0	0	10.5	
44	0	0	0	6.9		**44**	0	1	1	8.8		**44**	0	0	0	8.5	
45	0	0	0	6.2		**45**	0	0	0	2.5		**45**	0	0	0	12.4	
46	0	0	0	9.4		**46**	0	1	1	5.3		**46**	0	0	0	15.4	
47	0	0	0	4.6		**47**	0	1	1	6		**47**	0	0	0	3.3	
48	0	1	1	20.2		**48**	0	1	1	13		**48**	0	0	0	8.2	
49	0	1	1	10.6		**49**	0	0	0	8.3		**49**	0	0	0	6.1	
50	0	1	1	14.8	0.25	**50**	0	0	0	3.5	0.5	**50**	0	0	0	8.0	0.25
51	0	1	1	11.7		**51**	0	0	0	2.5		**51**	0	0	0	8.3	
52	0	1	1	22.7		**52**	0	0	0	4		**52**	0	0	0	8.0	
53	0	1	1	11.4		**53**	0	1	1	10.5		**53**	0	0	0	11.7	
54	0	1	1	11.2		**54**	0	0	0	9.4		**54**	0	0	0	8.0	
55	0	0	0	2.7		**55**	0	1	1	10.3		**55**	0	0	0	4.5	
56	0	1	1	13.0		**56**	0	1	1	7.2		**56**	0	0	0	13.0	
57	0	0	0	5.2		**57**	0	1	1	5.1		**57**	0	0	0	7.4	
58	0	1	1	15.2		**58**	0	0	0	6.2		**58**	0	0	0	16.5	
59	0	0	0	7.7		**59**	0	0	0	1.2		**59**	0	0	0	6.8	
60	0	1	1	11.0	0.25	**60**	0	1	1	14.3	0.75	**60**	0	0	0	6.6	0.25
61	0	1	1	9.2		**61**	0	1	1	9		**61**	0	0	0	5.6	
62	0	0	0	3.8		**62**	0	1	1	16		**62**	0	0	0	5.6	
63	0	1	1	13.4		**63**	0	0	0	5.3		**63**	0	0	0	12.0	
64	0	1	1	10.2		**64**	0	1	1	9.2		**64**	0	0	0	13.1	
65	0	0	0	3.3		**65**	0	1	1	14.3		**65**	0	0	0	7.2	
66	0	1	1	12.9		**66**	0	0	0	2		**66**	0	0	0	12.3	
67	0	1	1	22.7		**67**	0	0	0	4.3		**67**	0	0	0	7.0	
68	0	0	0	3.1		**68**	0	0	0	4.8		**68**	0	0	0	9.1	
69	0	1	1	8.2		**69**	0	1	1	7.9		**69**	0	0	0	4.9	
70	0	0	0	6.9	0.5	**70**	0	1	1	5.9	0.5	**70**	0	0	0	7.5	0.25
71	0	1	1	4.0		**71**	0	1	1	6.5		**71**	0	0	0	8.5	
72	0	1	1	6.4		**72**	0	0	0	4.5		**72**	0	0	0	13.1	
73	0	0	0	12.9		**73**	0	0	0	6.3		**73**	0	0	0	8.2	
74	0	1	1	19.4		**74**	0	0	0	5.8		**74**	0	0	0	4.4	
75	0	0	0	7.4		**75**	0	0	0	5.3		**75**	0	0	0	5.4	
76	0	1	1	20.7		**76**	0	1	1	7		**76**	0	0	0	5.5	
77	0	0	0	6.1		**77**	0	1	1	6.3		**77**	0	0	0	8.7	
78	0	0	0	8.5		**78**	0	0	0	5.4		**78**	0	0	0	4.8	
79	0	1	1	16.3		**79**	0	1	1	6.9		**79**	0	0	0	7.5	
80	0	0	0	6.9	0	**80**	0	1	1	5.3	0.25	**80**	0	0	0	4.9	0.25
81	0	0	0	4.1		**81**	0	1	1	10.8		**81**	0	0	0	7.0	
82	0	0	0	7.2		**82**	0	0	0	4.5		**82**	0	0	0	6.9	
83	0	1	1	14.4		**83**	0	1	1	6.7		**83**	0	0	0	6.3	
84	0	0	0	7.3		**84**	0	1	1	7.4		**84**	0	0	0	14.8	
85	0	1	1	5.2		**85**	0	0	0	4.7		**85**	0	0	0	6.4	
86	0	0	0	5.0		**86**	0	1	1	8		**86**	0	0	0	3.5	
87	0	0	0	8.2		**87**	0	1	1	17.5		**87**	0	0	0	10.0	
88	0	1	1	9.7		**88**	0	0	0	4		**88**	0	0	0	4.5	
89	0	0	0	4.2		**89**	0	0	0	3.2		**89**	0	0	0	10.6	
90	0	0	0	15.1	0.5	**90**	0	1	1	5.8	0.75	**90**	0	0	0	1.8	0.25
91	0	0	0	5.7		**91**	0	1	1	7.3		**91**	0	0	0	17.0	
92	0	1	1	8.3		**92**	0	1	1	7.1		**92**	0	0	0	6.0	
93	0	1	1	10.9		**93**	0	1	1	7		**93**	0	0	0	9.5	
94	0	1	1	5.2		**94**	0	0	0	5.7		**94**	0	0	0	6.5	
95	0	0	0	6.9		**95**	0	0	0	4.3		**95**	0	0	0	12.4	
96	0	1	1	9.2		**96**	0	1	1	12		**96**	0	0	0	6.5	
97	0	0	0	7.1		**97**	0	1	1	16		**97**	0	0	0	9.3	
98	0	0	0	9.3		**98**	0	1	1	11.3		**98**	0	0	0	7.3	
99	0	0	0	7.0		**99**	0	0	0	2.9		**99**	0	0	0	17.2	
100	0	0	0	8.1	0.25	**100**	0	1	1	7.4	0.25	**100**	0	0	0	9.5	0.25
101				10.2		**101**						**101**	0	0	0	10.0	
102						**102**						**102**	0	0	0	9.2	
103						**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.0**	**0.49**	**0.49**	**10.3**	**0.2**	**Mean**	**0.0**	**0.54**	**0.54**	**7.2**	**0.4**	**Mean**	**0.0**	**0.0**	**0.0**	**8.0**	**0.3**
CALCITE INDEX:		**0.49**				**CALCITE INDEX:**		**0.54**				**CALCITE INDEX:**		**0.0**			

Table A.5: Pebble count and calcite measurements in reference areas, September 2015.

DACK						DUCK						EL12					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	0	0	4.5		1	0	0	0	9.0		1	0	0	0	16.4	
2	0	0	0	8.0		2	0	0	0	4.5		2	0	1	1	7.4	
3	0	0	0	14.0		3	0	0	0	32.0		3	0	0	0	7.3	
4	0	0	0	9.0		4	0	0	0	10.0		4	0	0	0	24.7	
5	0	0	0	9.0		5	0	0	0	16.0		5	0	0	0	7.5	
6	0	0	0	13.0		6	0	0	0	9.5		6	0	0	0	8.3	
7	0	0	0	21.0		7	0	0	0	19.0		7	0	0	0	3.2	
8	0	0	0	8.5		8	0	0	0	25.0		8	0	0	0	3.9	
9	0	0	0	2.5		9	0	0	0	17.0		9	0	0	0	4.7	
10	0	0	0	11.5	0	10	0	0	0	11.5	0	10	0	0	0	9.5	0
11	0	0	0	11.0		11	0	0	0	13.0		11	0	0	0	7.7	
12	0	0	0	6.5		12	0	0	0	18.0		12	0	0	0	5.6	
13	0	0	0	12.0		13	0	0	0	38.0		13	0	1	1	6.2	
14	0	0	0	11.0		14	0	0	0	36.0		14	0	0	0	3.3	
15	0	0	0	15.5		15	0	0	0	20.0		15	0	0	0	6	
16	0	0	0	12.0		16	0	0	0	16.0		16	0	0	0	4.8	
17	0	0	0	7.0		17	0	0	0	7.5		17	0	1	1	21.9	
18	0	0	0	16.0		18	0	0	0	12.0		18	0	1	1	5.6	
19	0	0	0	15.0		19	0	0	0	12.0		19	0	0	0	5.2	
20	0	0	0	10.5	0.25	20	0	0	0	21.0	0	20	0	1	1	4.4	0
21	0	0	0	3.5		21	0	0	0	5.5		21	0	0	0	10.5	
22	0	0	0	9.0		22	0	0	0	17.0		22	0	0	0	7.4	
23	0	0	0	19.5		23	0	0	0	17.0		23	0	1	1	6.6	
24	0	0	0	7.5		24	0	0	0	5.0		24	0	1	1	7.9	
25	0	0	0	28.0		25	0	0	0	6.0		25	0	1	1	4.3	
26	0	0	0	8.0		26	0	0	0	39.0		26	0	1	1	10.9	
27	0	0	0	2.8		27	0	0	0	26.0		27	0	0	0	5.4	
28	0	0	0	9.0		28	0	0	0	7.5		28	0	1	1	12.7	
29	0	0	0	10.5		29	0	0	0	11.5		29	0	1	1	5	
30	0	0	0	8.0	0	30	0	0	0	18.0	0.25	30	0	1	1	5.1	0.25
31	0	0	0	13.0		31	0	0	0	17.0		31	0	0	0	6.2	
32	0	0	0	10.5		32	0	0	0	11.5		32	0	0	0	17.8	
33	0	0	0	14.0		33	0	0	0	13.5		33	0	0	0	5.9	
34	0	0	0	31.0		34	0	0	0	5.0		34	0	0	0	2.4	
35	0	0	0	15.0		35	0	0	0	11.5		35	0	1	1	5.9	
36	0	0	0	7.0		36	0	0	0	14.5		36	0	1	1	6.7	
37	0	0	0	8.0		37	0	0	0	16.0		37	0	0	0	9.6	
38	0	0	0	9.0		38	0	0	0	3.0		38	0	0	0	10.7	
39	0	0	0	11.0		39	0	0	0	3.0		39	0	0	0	7.5	
40	0	0	0	14.0	0.25	40	0	0	0	14.5	0	40	0	1	1	4.9	0.25
41	0	0	0	17.0		41	0	0	0	12.0		41	0	0	0	3.7	
42	0	0	0	20.0		42	0	0	0	10.5		42	0	0	0	6.6	
43	0	0	0	6.0		43	0	0	0	12.5		43	0	1	1	28.7	
44	0	0	0	7.0		44	0	0	0	18.0		44	0	0	0	4.6	
45	0	0	0	18.0		45	0	0	0	15.0		45	0	1	1	16.4	
46	0	0	0	7.5		46	0	0	0	8.0		46	0	0	0	6.1	
47	0	0	0	10.0		47	0	0	0	5.5		47	0	0	0	3	
48	0	0	0	5.5		48	0	0	0	11.5		48	0	0	0	6.6	
49	0	0	0	5.5		49	0	0	0	5.5		49	0	0	0	7.2	
50	0	0	0	17.5	0	50	0	0	0	12.0	0	50	0	0	0	7.2	0
51	0	0	0	11.0		51	0	0	0	11.0		51	0	0	0	5.5	
52	0	0	0	6.0		52	0	0	0	5.0		52	0	0	0	8.6	
53	0	0	0	14.0		53	0	0	0	28.0		53	0	0	0	2.1	
54	0	0	0	6.0		54	0	0	0	11.5		54	0	0	0	8.8	
55	0	0	0	17.0		55	0	0	0	6.5		55	0	0	0	3	
56	0	0	0	56.0		56	0	0	0	5.0		56	0	0	0	2.3	
57	0	0	0	9.5		57	0	0	0	6.5		57	0	1	1	19.6	
58	0	0	0	15.0		58	0	0	0	24.0		58	0	0	0	11.2	
59	0	0	0	6.0		59	0	0	0	21.0		59	0	1	1	15.2	
60	0	0	0	10.0	0.5	60	0	0	0	17.5	0.5	60	0	0	0	6.8	0
61	0	0	0	6.0		61	0	0	0	9.0		61	0	0	0	4.9	
62	0	0	0	10.0		62	0	0	0	2.5		62	0	1	1	12.1	
63	0	0	0	10.5		63	0	0	0	2.5		63	0	1	1	9.2	
64	0	0	0	10.5		64	0	0	0	8.5		64	0	1	1	18.5	
65	0	0	0	21.0		65	0	0	0	6.0		65	0	1	1	19.2	
66	0	0	0	11.0		66	0	0	0	10.5		66	0	1	1	18.4	
67	0	0	0	6.5		67	0	0	0	46.0		67	0	0	0	4.7	
68	0	0	0	12.0		68	0	0	0	21.0		68	0	1	1	5.5	
69	0	0	0	6.0		69	0	0	0	19.5		69	0	0	0	13.4	
70	0	0	0	10.0	0	70	0	0	0	14.0	0.25	70	0	0	0	28.5	0.25
71	0	0	0	9.0		71	0	0	0	21.0		71	0	1	1	8.1	
72	0	0	0	14.5		72	0	0	0	12.5		72	0	0	0	14.4	
73	0	0	0	7.0		73	0	0	0	5.0		73	0	1	1	7.8	
74	0	0	0	14.5		74	0	0	0	16.0		74	0	1	1	9.3	
75	0	0	0	5.5		75	0	0	0	12.5		75	0	1	1	5.9	
76	0	0	0	6.5		76	0	0	0	21.0		76	0	1	1	11.9	
77	0	0	0	13.0		77	0	0	0	29.0		77	0	0	0	9.6	
78	0	0	0	3.5		78	0	0	0	42.0		78	0	1	1	12.2	
79	0	0	0	6.0		79	0	0	0	4.0		79	0	1	1	7.7	
80	0	0	0	37.0	0.25	80	0	0	0	17.0	0.25	80	0	1	1	22.3	0.25
81	0	0	0	12.0		81	0	0	0	17.5		81	0	1	1	4.9	
82	0	0	0	16.5		82	0	0	0	7.5		82	0	0	0	3.7	
83	0	0	0	8.0		83	0	0	0	16.5		83	0	0	0	3.2	
84	0	0	0	8.0		84	0	0	0	10.5		84	0	1	1	24.9	
85	0	0	0	11.0		85	0	0	0	14.5		85	0	0	0	8.2	
86	0	0	0	12.0		86	0	0	0	18.0		86	0	0	0	4.4	
87	0	0	0	3.0		87	0	0	0	8.5		87	0	0	0	7.7	
88	0	0	0	9.0		88	0	0	0	21.0		88	0	1	1	7.2	
89	0	0	0	10.5		89	0	0	0	2.5		89	0	1	1	7.4	
90	0	0	0	22.0	0	90	0	0	0	13.0	0.5	90	0	0	0	28.7	0.25
91	0	0	0	8.5		91	0	0	0	9.5		91	0	0	0	14.1	
92	0	0	0	18.0		92	0	0	0	8.0		92	0	0	0	14.2	
93	0	0	0	25.0		93	0	0	0	8.5		93	0	0	0	14.1	
94	0	0	0	10.0		94	0	0	0	14.0		94	0	0	0	4.2	
95	0	0	0	10.5		95	0	0	0	3.5		95	0	1	1	3.7	
96	0	0	0	9.5		96	0	0	0	9.0		96	0	1	1	17.8	
97	0	0	0	8.5		97	0	0	0	5.5		97	0	0	0	6	
98	0	0	0	2.5		98	0	0	0	12.5		98	0	0	0	5.2	
99	0	0	0	40.0		99	0	0	0	11.5		99	0	1	1	9.4	
100	0	0	0	5.0	0.25	100	0	0	0	14.0	0.5	100	0	1	1	24.4	0.25
101						101						101					
102						102						102					
103						103						103					
104						104						104					
105						105						105					
106						106						106					
107						107						107					
108						108						108					
109						109						109					
110						110						110					
Mean	0.0	0.0	0.0	11.9	0.2	Mean	0.0	0.0	0.0	14.0	0.2	Mean	0.0	0.41	0.41	9.5	0.2
CALCITE INDEX:		0.0				CALCITE INDEX:		0.0				CALCITE INDEX:		0.41			

Table A.5: Pebble count and calcite measurements in reference areas, September 2015.

ELUGH						EWCK						FLAD					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	0	0	8.2		1	0	0	0	7.6		1	0	0	0	9.5	
2	0	0	0	5.2		2	0	0	0	6.8		2	0	0	0	6.6	
3	0	0	0	8.3		3	0	1	1	8.2		3	0	0	0	6.3	
4	0	0	0	8		4	0	0	0	41		4	0	0	0	3.4	
5	0	0	0	6.1		5	0	1	1	11.4		5	0	0	0	g	
6	0	0	0	8.4		6	0	0	0	8.6		6	0	0	0	14.2	
7	0	0	0	9.8		7	0	0	0	14.5		7	0	0	0	10.3	
8	0	0	0	4.2		8	0	0	0	12		8	0	0	0	7.1	
9	0	0	0	10.5		9	0	1	1	14.3		9	0	0	0	8.2	
10	0	0	0	7.5	0.25	10	0	0	0	7.5	0.25	10	0	0	0	18.1	0.25
11	0	0	0	14.6		11	0	1	1	26.5		11	0	0	0	6.1	
12	0	0	0	9.5		12	0	0	0	10		12	0	0	0	14.2	
13	0	0	0	5.6		13	0	1	1	9		13	0	0	0	4.1	
14	0	0	0	6.2		14	0	1	2	5.8		14	0	0	0	5.4	
15	0	0	0	4.4		15	0	1	1	10.9		15	0	0	0	6.9	
16	0	0	0	10.3		16	0	1	1	16.3		16	0	0	0	17.0	
17	0	0	0	5.8		17	0	0	0	6.5		17	0	0	0	13.2	
18	0	0	0	4.2		18	0	1	1	7.1		18	0	0	0	14.5	
19	0	0	0	7.8		19	0	0	0	8.2		19	0	0	0	7.1	
20	0	0	0	7.2	0	20	0	1	1	5.9	0	20	0	0	0	8.6	0.25
21	0	0	0	3.3		21	0	1	1	9.7		21	0	0	0	4.2	
22	0	0	0	6.7		22	0	0	0	5.7		22	0	0	0	20.4	
23	0	0	0	7		23	0	0	0	7		23	0	0	0	4.3	
24	0	0	0	8.1		24	0	0	0	8.7		24	0	0	0	15.0	
25	0	0	0	8		25	0	1	1	10		25	0	0	0	13.6	
26	0	0	0	6.7		26	0	0	0	6.7		26	0	0	0	13.8	
27	0	0	0	7		27	0	0	0	6.2		27	0	0	0	8.2	
28	0	0	0	5.1		28	0	0	0	11.8		28	0	0	0	g	
29	0	0	0	7.5		29	0	0	0	8.9		29	0	0	0	5.5	
30	0	0	0	9.2	0	30	0	0	0	16	0	30	0	0	0	12.4	0.75
31	0	0	0	3		31	0	1	1	8		31	0	0	0	21.5	
32	0	0	0	5.3		32	0	0	0	12.3		32	0	0	0	12.5	
33	0	0	0	3.9		33	0	0	0	12.1		33	0	0	0	4.6	
34	0	0	0	8.8		34	0	1	1	11.1		34	0	0	0	4.8	
35	0	0	0	10.2		35	0	1	1	8.4		35	0	0	0	17.0	
36	0	0	0	4.8		36	0	0	0	6		36	0	0	0	28.5	
37	0	0	0	7.1		37	0	1	1	10		37	0	0	0	11.4	
38	0	0	0	6.4		38	0	0	0	8.4		38	0	0	0	38.0	
39	0	0	0	4.5		39	0	0	0	11		39	0	0	0	15.6	
40	0	0	0	6.4	0	40	0	1	1	6.7	0	40	0	0	0	11.4	0.75
41	0	0	0	5.6		41	0	1	1	10.3		41	0	0	0	10.5	
42	0	1	1	7.2		42	0	1	1	16		42	0	0	0	7.6	
43	0	0	0	4.1		43	0	1	1	8		43	0	0	0	23.7	
44	0	0	0	2.7		44	0	0	0	14		44	0	0	0	10.4	
45	0	0	0	6		45	0	0	0	15		45	0	0	0	9.3	
46	0	0	0	3.8		46	0	0	0	5.2		46	0	0	0	3.8	
47	0	0	0	4.8		47	0	1	1	14.3		47	0	0	0	5.0	
48	0	0	0	2.6		48	0	1	1	13.2		48	0	0	0	4.0	
49	0	1	1	2.7		49	0	0	0	8.3		49	0	0	0	6.5	
50	0	0	0	4.9	0.5	50	0	1	1	7.1	0	50	0	0	0	3.8	0.25
51	0	0	0	8		51	0	0	0	10		51	0	0	0	9.4	
52	0	0	0	8.1		52	0	1	1	10		52	0	0	0	9.9	
53	0	1	1	9		53	0	1	1	11.7		53	0	0	0	10.2	
54	0	0	0	7		54	0	0	0	6.5		54	0	0	0	12.1	
55	0	0	0	6.8		55	0	1	1	22.5		55	0	0	0	12.4	
56	0	1	1	3.2		56	0	0	0	10.6		56	0	0	0	9.3	
57	0	0	0	8		57	0	1	1	11.4		57	0	0	0	12.6	
58	0	0	0	6.2		58	0	1	1	10.6		58	0	0	0	3.5	
59	0	0	0	4.3		59	0	1	1	7.7		59	0	0	0	5.5	
60	0	0	0	4.5	0.25	60	0	1	1	14	0	60	0	0	0	10.5	0.25
61	0	0	0	7.8		61	0	1	1	15		61	0	0	0	4.4	
62	0	0	0	7.2		62	0	1	1	10.6		62	0	0	0	4.5	
63	0	0	0	6.6		63	0	1	1	21.5		63	0	0	0	7.0	
64	0	0	0	5.4		64	0	0	0	3.9		64	0	0	0	8.4	
65	0	0	0	11		65	0	0	0	10		65	0	0	0	12.5	
66	0	0	0	3.3		66	0	1	1	8.2		66	0	0	0	3.6	
67	0	1	1	6.3		67	0	0	0	10.6		67	0	0	0	5.8	
68	0	0	0	4.3		68	0	0	0	4.9		68	0	0	0	14.2	
69	0	0	0	7.8		69	0	0	0	6.2		69	0	0	0	5.0	
70	0	0	0	6.3	0.25	70	0	0	0	10.6	0.25	70	0	0	0	12.0	0.75
71	0	1	1	10.8		71	0	1	1	14.3		71	0	0	0	5.2	
72	0	0	0	6.1		72	0	1	1	11.4		72	0	0	0	4.1	
73	0	0	0	3.2		73	0	0	0	4		73	0	0	0	10.4	
74	0	0	0	3.5		74	0	0	0	8.5		74	0	0	0	12.3	
75	0	0	0	4.8		75	0	0	0	11		75	0	0	0	12.5	
76	0	0	0	4.1		76	0	0	0	5.4		76	0	0	0	9.9	
77	0	0	0	6		77	0	1	1	7.2		77	0	0	0	5.2	
78	0	0	0	9.2		78	0	1	1	16.3		78	0	0	0	4.0	
79	0	0	0	3.6		79	0	0	0	6.7		79	0	0	0	8.8	
80	0	0	0	7	0.75	80	0	0	0	7.8	0.5	80	0	0	0	3.8	0.25
81	0	0	0	7		81	0	1	2	9		81	0	0	0	5.1	
82	0	0	0	6.7		82	0	0	0	10.5		82	0	0	0	7.4	
83	0	0	0	4.5		83	0	1	1	14.6		83	0	0	0	5.2	
84	0	1	1	8		84	0	1	1	14.5		84	0	0	0	15.0	
85	0	0	0	5		85	0	1	1	16		85	0	0	0	6.3	
86	0	0	0	6.2		86	0	0	0	5.6		86	0	0	0	10.0	
87	0	0	0	4.3		87	0	1	2	20.5		87	0	0	0	14.8	
88	0	1	1	5.9		88	0	1	1	14.9		88	0	0	0	27.5	
89	0	0	0	16		89	0	0	0	6.9		89	0	0	0	14.3	
90	0	0	0	10.1	0	90	0	1	1	7.9	0.25	90	0	0	0	12.7	0.75
91	0	0	0	6.2		91	0	1	1	7		91	0	0	0	9.1	
92	0	0	0	10.7		92	0	0	0	8.3		92	0	0	0	3.0	
93	0	0	0	10.3		93	0	1	1	9.6		93	0	0	0	9.1	
94	0	0	0	4.5		94	0	0	0	5.8		94	0	0	0	4.5	
95	0	0	0	7		95	0	1	1	11.6		95	0	0	0	4.2	
96	0	0	0	5		96	0	0	0	7		96	0	0	0	3.1	
97	0	0	0	7.2		97	0	0	0	5.7		97	0	0	0	7.5	
98	0	0	0	2.2		98	0	1	1	6.2		98	0	0	0	3.9	
99	0	0	0	7.5		99	0	1	1	14		99	0	0	0	7.2	
100	0	0	0	4.2	0	100	0	0	0	7.5	0	100	0	0	0	3.3	0.25
101						101						101	0	0	0	10.6	
102						102						102	0	0	0	3.8	
103						103						103					
104						104						104					
105						105						105					
106						106						106					
107						107						107					
108						108						108					
109						109						109					
110						110						110					
Mean	0.0	0.08	0.08	6.5	0.2	Mean	0.0	0.50	0.53	10.5	0.1	Mean	0.0	0.0	0.0	9.6	0.5
CALCITE INDEX:		0.08				CALCITE INDEX:		0.50				CALCITE INDEX:		0.0			

Table A.5: Pebble count and calcite measurements in reference areas, September 2015.

FLAU						FLRU						FO26					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	0	0	7.4		**1**	0	0	0	11.1		**1**	0	1	1	8.2	
2	0	0	0	13.8		**2**	0	0	0	5.1		**2**	0	1	1	2.5	
3	0	0	0	7.1		**3**	0	0	0	3.1		**3**	0	1	1	11.3	
4	0	0	0	11.6		**4**	0	0	0	4.2		**4**	0	1	1	5.2	
5	0	0	0	7.1		**5**	0	0	0	5.7		**5**	0	1	1	3.4	
6	0	0	0	6.9		**6**	0	0	0	19.8		**6**	0	1	1	8.1	
7	0	0	0	2.6		**7**	0	0	0	8.3		**7**	0	1	1	11	
8	0	0	0	5.5		**8**	0	0	0	8.2		**8**	0	1	1	16.9	
9	0	0	0	4.8		**9**	0	0	0	11.2		**9**	0	1	1	8.3	
10	0	0	0	8.5	0.75	**10**	0	0	0	7.7	0	**10**	0	1	1	12	0.25
11	0	0	0	4.9		**11**	0	0	0	7.6		**11**	0	1	1	11.2	
12	0	0	0	6.5		**12**	0	0	0	12.8		**12**	0	1	1	3.2	
13	0	0	0	7.2		**13**	0	0	0	11.9		**13**	0	1	1	4.6	
14	0	0	0	3.0		**14**	0	0	0	11.7		**14**	0	1	1	6.1	
15	0	0	0	7.9		**15**	0	0	0	19.8		**15**	0	1	1	5	
16	0	0	0	8.8		**16**	0	0	0	13.7		**16**	0	0	0	3.1	
17	0	0	0	15.3		**17**	0	0	0	4.9		**17**	0	1	1	7.8	
18	0	0	0	6.8		**18**	0	0	0	10.8		**18**	0	1	1	7.1	
19	0	0	0	11.8		**19**	0	0	0	9.7		**19**	0	0	0	2	
20	0	0	0	4.3	0.25	**20**	0	0	0	6.2	0	**20**	0	1	1	9.3	0.25
21	0	0	0	4.8		**21**	0	0	0	9.6		**21**	0	1	1	5.4	
22	0	0	0	5.4		**22**	0	0	0	12.5		**22**	0	1	1	2.9	
23	0	0	0	5.9		**23**	0	0	0	7		**23**	0	1	1	10	
24	0	0	0	4.6		**24**	0	0	0	15.3		**24**	0	1	1	5.7	
25	0	0	0	8.0		**25**	0	0	0	9.1		**25**	0	1	1	3.2	
26	0	0	0	5.5		**26**	0	0	0	10.4		**26**	0	1	1	6.2	
27	0	0	0	15.3		**27**	0	0	0	13.9		**27**	0	1	1	6.1	
28	0	0	0	6.7		**28**	0	0	0	13.2		**28**	0	1	1	14	
29	0	0	0	10.8		**29**	0	0	0	19.4		**29**	0	1	1	7.2	
30	0	0	0	7.7	0.5	**30**	0	0	0	14.3	0.25	**30**	0	1	1	6.4	0.25
31	0	0	0	18.4		**31**	0	0	0	12.3		**31**	0	1	1	8.9	
32	0	0	0	7.0		**32**	0	0	0	6.9		**32**	0	1	1	5.1	
33	0	0	0	5.0		**33**	0	0	0	14.4		**33**	0	1	1	4.1	
34	0	0	0	5.5		**34**	0	0	0	6.3		**34**	0	1	1	5.6	
35	0	0	0	4.5		**35**	0	0	0	10.8		**35**	0	1	1	8.2	
36	0	0	0	6.0		**36**	0	0	0	10		**36**	0	1	1	6.7	
37	0	0	0	4.1		**37**	0	0	0	7.3		**37**	0	1	2	4.3	
38	0	0	0	7.5		**38**	0	0	0	5.8		**38**	0	1	1	3	
39	0	0	0	4.9		**39**	0	0	0	6		**39**	0	0	0	2.3	
40	0	0	0	6.6	0.5	**40**	0	0	0	8.7	0	**40**	0	1	1	7.6	0.25
41	0	0	0	6.7		**41**	0	0	0	11.2		**41**	0	1	1	5.9	
42	0	0	0	3.0		**42**	0	0	0	9.4		**42**	0	1	1	6.9	
43	0	0	0	11.5		**43**	0	0	0	10.9		**43**	0	1	1	6.8	
44	0	0	0	7.2		**44**	0	0	0	13.4		**44**	0	1	1	7.8	
45	0	0	0	5.2		**45**	0	0	0	7.5		**45**	0	1	1	7.8	
46	0	0	0	8.2		**46**	0	0	0	10.9		**46**	0	1	1	8.2	
47	0	0	0	6.1		**47**	0	0	0	14.1		**47**	0	1	1	3.5	
48	0	0	0	4.5		**48**	0	0	0	9.1		**48**	0	1	1	3.1	
49	0	0	0	6.4		**49**	0	0	0	17.2		**49**	0	1	1	3.6	
50	0	0	0	9.9	0.5	**50**	0	0	0	13.1	0.25	**50**	0	1	1	6.4	0
51	0	0	0	6.1		**51**	0	0	0	9.7		**51**	0	1	1	8.2	
52	0	0	0	6.4		**52**	0	0	0	12.2		**52**	0	1	1	2.4	
53	0	0	0	7.8		**53**	0	0	0	5.7		**53**	0	1	1	9.1	
54	0	0	0	4.8		**54**	0	0	0	11.8		**54**	0	1	1	4.1	
55	0	0	0	11.3		**55**	0	0	0	13.8		**55**	0	1	1	2.1	
56	0	0	0	6.7		**56**	0	0	0	14.2		**56**	0	0	0	3.5	
57	0	0	0	14.7		**57**	0	0	0	11.1		**57**	0	1	1	4.9	
58	0	0	0	7.5		**58**	0	0	0	14.4		**58**	0	1	1	3.5	
59	0	0	0	8.1		**59**	0	0	0	9.1		**59**	0	1	1	7	
60	0	0	0	5.6	0.5	**60**	0	0	0	16.2	0.25	**60**	0	1	1	4.7	0.25
61	0	0	0	7.8		**61**	0	0	0	10		**61**	0	1	1	8.2	
62	0	0	0	15.5		**62**	0	0	0	5.5		**62**	0	1	1	4.2	
63	0	0	0	7.7		**63**	0	0	0	9.4		**63**	0	1	1	9.1	
64	0	0	0	11.3		**64**	0	0	0	10.3		**64**	0	1	1	14.6	
65	0	0	0	8.4		**65**	0	0	0	11.8		**65**	0	1	1	4.7	
66	0	0	0	13.8		**66**	0	0	0	13.8		**66**	0	0	0	3.3	
67	0	0	0	6.7		**67**	0	0	0	15.3		**67**	0	1	1	3.6	
68	0	0	0	7.4		**68**	0	0	0	19.1		**68**	0	1	1	6.5	
69	0	0	0	3.1		**69**	0	0	0	16.4		**69**	0	1	1	14.2	
70	0	0	0	2.9	0.25	**70**	0	0	0	7.2	0.25	**70**	0	1	1	4.1	0
71	0	0	0	8.9		**71**	0	0	0	8.4		**71**	0	1	1	8.2	
72	0	0	0	2.2		**72**	0	0	0	5.5		**72**	0	1	1	11.7	
73	0	0	0	6.5		**73**	0	0	0	6.6		**73**	0	1	1	3.6	
74	0	0	0	10.9		**74**	0	0	0	11.3		**74**	0	1	1	2.6	
75	0	0	0	4.8		**75**	0	0	0	4.2		**75**	0	0	0	4.9	
76	0	0	0	13.3		**76**	0	0	0	7.1		**76**	0	1	1	4.2	
77	0	0	0	5.0		**77**	0	0	0	16.1		**77**	0	1	1	6.2	
78	0	0	0	11.3		**78**	0	0	0	14.5		**78**	0	1	1	6.6	
79	0	0	0	7.9		**79**	0	0	0	9.5		**79**	0	1	1	4.5	
80	0	0	0	5.5	0.5	**80**	0	0	0	9	0.25	**80**	0	1	1	5.6	0.25
81	0	0	0	16.3		**81**	0	0	0	9.3		**81**	0	1	1	3	
82	0	0	0	8.2		**82**	0	0	0	7.6		**82**	0	1	1	3.7	
83	0	0	0	9.6		**83**	0	0	0	8.1		**83**	0	1	1	2.2	
84	0	0	0	5.7		**84**	0	0	0	10		**84**	0	0	0	0.9	
85	0	0	0	7.1		**85**	0	0	0	12.2		**85**	0	1	1	1.5	
86	0	0	0	3.5		**86**	0	0	0	6.3		**86**	0	1	1	9.2	
87	0	0	0	4.7		**87**	0	0	0	10.1		**87**	0	1	1	5.7	
88	0	0	0	6.2		**88**	0	0	0	7.5		**88**	0	1	1	3.9	
89	0	0	0	2.6		**89**	0	0	0	11.4		**89**	0	1	1	5.7	
90	0	0	0	6.0	0.5	**90**	0	0	0	12.2	0.25	**90**	0	1	1	6.2	0.25
91	0	0	0	4.5		**91**	0	0	0	17.1		**91**	0	1	1	5.5	
92	0	0	0	4.1		**92**	0	0	0	8.3		**92**	0	1	1	5	
93	0	0	0	5.2		**93**	0	0	0	6.3		**93**	0	1	1	18	
94	0	0	0	5.0		**94**	0	0	0	14.4		**94**	0	1	1	3	
95	0	0	0	24.5		**95**	0	0	0	17.8		**95**	0	1	1	15.5	
96	0	0	0	7.4		**96**	0	0	0	15.2		**96**	0	1	1	16	
97	0	0	0	16.2		**97**	0	0	0	4.7		**97**	0	1	1	5.2	
98	0	0	0	5.6		**98**	0	0	0	14.2		**98**	0	1	1	7.2	
99	0	0	0	5.3		**99**	0	0	0	11.6		**99**	0	1	2	11	
100	0	0	0	6.3	0.5	**100**	0	0	0	7.9	0	**100**	0	1	1	3.3	0
101						**101**						**101**					
102						**102**						**102**					
103						**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.0**	**0.0**	**0.0**	**7.6**	**0.5**	**Mean**	**0.0**	**0.0**	**0.0**	**10.6**	**0.2**	**Mean**	**0.0**	**0.93**	**0.95**	**6.4**	**0.2**
CALCITE INDEX:		**0.0**				**CALCITE INDEX:**		**0.0**				**CALCITE INDEX:**		**0.93**			

Table A.5: Pebble count and calcite measurements in reference areas, September 2015.

GRUHA						HENUP						KO1					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	1	1	3.6		**1**	0	0	0	3.2		**1**	0	0	0	9.5	
2	0	1	1	4.4		**2**	0	0	0	6.9		**2**	0	0	0	11.4	
3	0	1	1	7.6		**3**	0	0	0	9.2		**3**	0	0	0	12.1	
4	0	1	1	4		**4**	0	0	0	2.4		**4**	0	0	0	6.4	
5	0	1	1	9.1		**5**	0	0	0	13.6		**5**	0	0	0	9.7	
6	0	1	1	9.7		**6**	0	0	0	5.2		**6**	0	0	0	2.5	
7	0	1	1	4.3		**7**	0	0	0	6.7		**7**	0	0	0	5.2	
8	0	1	1	13.4		**8**	0	0	0	2.7		**8**	0	0	0	14.1	
9	0	1	1	6.8		**9**	0	0	0	6.5		**9**	0	0	0	4.8	
10	0	1	1	15.3	0.25	**10**	0	0	0	7.9	0.25	**10**	0	0	0	13.1	0.75
11	0	1	1	7.8		**11**	0	0	0	3.7		**11**	0	0	0	3.8	
12	0	1	1	6.4		**12**	0	0	0	15.5		**12**	0	0	0	6.7	
13	0	1	1	5.5		**13**	0	0	0	9.2		**13**	0	0	0	9.9	
14	0	1	1	17.6		**14**	0	0	0	12.1		**14**	0	0	0	11.6	
15	0	1	1	7.6		**15**	0	0	0	12.2		**15**	0	0	0	5.6	
16	0	1	1	8.1		**16**	0	0	0	8		**16**	0	0	0	5.4	
17	0	1	1	6.2		**17**	0	0	0	13.8		**17**	0	0	0	9.7	
18	0	1	1	8.5		**18**	0	0	0	4.7		**18**	0	0	0	5.1	
19	0	1	1	6.2		**19**	0	0	0	6.9		**19**	0	0	0	5.4	
20	0	1	1	9.1	0	**20**	0	0	0	6.1	0.25	**20**	0	0	0	11.7	0.75
21	0	1	1	14.9		**21**	0	0	0	6.3		**21**	0	0	0	9.7	
22	0	1	1	7.4		**22**	0	0	0	7.1		**22**	0	0	0	5.3	
23	0	1	1	14.6		**23**	0	1	1	6.3		**23**	0	0	0	13.1	
24	0	1	1	11.6		**24**	0	0	0	11.8		**24**	0	0	0	17.8	
25	0	1	1	5.8		**25**	0	0	0	4		**25**	0	0	0	14.4	
26	0	0	0	3.7		**26**	0	0	0	5.2		**26**	0	0	0	4.5	
27	0	1	1	10		**27**	0	0	0	4.6		**27**	0	0	0	14.6	
28	0	1	1	9.1		**28**	0	0	0	7.2		**28**	0	0	0	12.1	
29	0	1	1	12.9		**29**	0	1	1	4.1		**29**	0	0	0	6.8	
30	0	1	1	10.6	0.25	**30**	0	0	0	10.5	0.25	**30**	0	0	0	9.3	0.75
31	0	1	1	6.3		**31**	0	0	0	8.5		**31**	0	0	0	9.1	
32	0	1	1	6.4		**32**	0	1	1	19.3		**32**	0	0	0	3.8	
33	0	1	1	7.2		**33**	0	0	0	8		**33**	0	0	0	12.4	
34	0	1	1	26		**34**	0	0	0	3.8		**34**	0	0	0	6.4	
35	0	1	1	5.7		**35**	0	0	0	4.4		**35**	0	0	0	15.5	
36	0	1	1	5.4		**36**	0	0	0	3.4		**36**	0	0	0	9.1	
37	0	1	1	15.2		**37**	0	0	0	10.8		**37**	0	0	0	6.5	
38						**38**	0	0	0	11		**38**	0	0	0	2.4	
39	0	1	1	7.7		**39**	0	0	0	4.4		**39**	0	0	0	9.7	
40	0	1	1	4	0.25	**40**	0	0	0	7.3	0	**40**	0	0	0	15.5	0.75
41	0	1	1	11.3		**41**	0	0	0	7.5		**41**	0	0	0	7.4	
42	0	1	1	7.4		**42**	0	0	0	7.9		**42**	0	0	0	6.8	
43	0	1	1	8.8		**43**	0	0	0	8.9		**43**	0	0	0	14.7	
44	0	1	1	12.1		**44**	0	0	0	5.2		**44**	0	0	0	14.4	
45	0	1	1	9.5		**45**	0	0	0	5.2		**45**	0	0	0	4.3	
46	0	1	1	23.2		**46**	0	0	0	3.8		**46**	0	0	0	2.5	
47	0	1	1	6.3		**47**	0	0	0	4.2		**47**	0	0	0	5.7	
48	0	1	1	3.9		**48**	0	0	0	17.3		**48**	0	0	0	11.7	
49	0	1	1	5.4		**49**	0	0	0	5.1		**49**	0	0	0	15.3	
50	0	1	1	12.2	0.5	**50**	0	0	0	8.1	0	**50**	0	0	0	4.0	0.75
51	0	1	1	13.2		**51**	0	0	0	12.3		**51**	0	0	0	7.0	
52	0	1	1	7.1		**52**	0	0	0	9.3		**52**	0	0	0	4.3	
53	0	1	1	8.5		**53**	0	0	0	7.1		**53**	0	0	0	4.4	
54	0	1	1	22		**54**	0	0	0	8.2		**54**	0	0	0	5.5	
55	0	1	1	12.2		**55**	0	0	0	10.2		**55**	0	0	0	8.7	
56	0	1	1	8.1		**56**	0	0	0	12.8		**56**	0	0	0	2.8	
57	0	1	1	10.9		**57**	0	0	0	10.9		**57**	0	0	0	7.4	
58	0	1	1	12.1		**58**	0	0	0	11.3		**58**	0	0	0	16.4	
59	0	1	1	7.2		**59**	0	0	0	10.2		**59**	0	0	0	6.7	
60	0	1	1	7.7	0.25	**60**	0	0	0	8.8	0	**60**	0	0	0	6.9	0.5
61	0	1	1	11.8		**61**	0	1	1	15.2		**61**	0	0	0	6.5	
62	0	1	1	4.5		**62**	0	0	0	5.5		**62**	0	0	0	18.9	
63	0	1	1	18.3		**63**	0	0	0	7.1		**63**	0	0	0	9.7	
64	0	1	1	5		**64**	0	0	0	11.2		**64**	0	0	0	5.2	
65	0	1	1	7.2		**65**	0	0	0	6.7		**65**	0	0	0	5.1	
66	0	1	1	9.8		**66**	0	0	0	11.7		**66**	0	0	0	5.8	
67	0	1	1	14.8		**67**	0	0	0	10.3		**67**	0	0	0	9.0	
68	0	1	1	7.5		**68**	0	0	0	7.6		**68**	0	0	0	4.1	
69	0	1	1	3.6		**69**	0	1	1	11.9		**69**	0	0	0	8.1	
70	0	1	1	8.7	0.5	**70**	0	0	0	20	0	**70**	0	0	0	15.3	0.5
71	0	1	1	20.8		**71**	0	1	1	18.1		**71**	0	0	0	9.2	
72	0	1	1	8.7		**72**	0	1	1	7.5		**72**	0	0	0	6.6	
73	0	1	1	7.2		**73**	0	1	1	13.2		**73**	0	0	0	7.3	
74	0	0	0	3.2		**74**	0	0	0	4.5		**74**	0	0	0	8.5	
75	0	1	1	6.2		**75**	0	1	1	13.7		**75**	0	0	0	14.5	
76	0	1	1	10.6		**76**	0	1	1	14.8		**76**	0	0	0	9.3	
77	0	1	1	7.1		**77**	0	1	1	5.6		**77**	0	0	0	6.6	
78	0	1	1	7		**78**	0	1	1	12.8		**78**	0	0	0	47.0	
79	0	0	0	4.1		**79**	0	1	1	7		**79**	0	0	0	6.5	
80	0	1	1	5.6	0	**80**	0	0	0	16.4	0.25	**80**	0	0	0	7.5	0.75
81	0	1	1	8.5		**81**	0	1	1	10.5		**81**	0	0	0	15.4	
82	0	1	1	7.7		**82**	0	0	0	8.2		**82**	0	0	0	12.0	
83	0	1	1	13.9		**83**	0	0	0	6.7		**83**	0	0	0	19.5	
84	0	1	1	18.2		**84**	0	0	0	6		**84**	0	0	0	6.2	
85	0	1	1	5.7		**85**	0	0	0	6.3		**85**	0	0	0	6.4	
86	0	1	1	8		**86**	0	0	0	5.8		**86**	0	0	0	4.7	
87	0	1	1	10.7		**87**	0	0	0	8		**87**	0	0	0	4.4	
88	0	1	1	5.7		**88**	0	0	0	8.5		**88**	0	0	0	4.8	
89	0	1	1	2.3		**89**	0	0	0	8.4		**89**	0	0	0	20.0	
90	0	1	1	7.4	0.25	**90**	0	0	0	5.2	0	**90**	0	0	0	22.5	0.25
91	0	1	1	14		**91**	0	0	0	8.6		**91**	0	0	0	5.4	
92	0	1	1	14.7		**92**	0	0	0	9.4		**92**	0	0	0	9.9	
93	0	1	1	6.4		**93**	0	0	0	11.2		**93**	0	0	0	7.4	
94	0	1	1	11.9		**94**	0	0	0	15.9		**94**	0	0	0	21.2	
95	0	1	1	11.2		**95**	0	0	0	6.2		**95**	0	0	0	10.1	
96	0	1	1	5		**96**	0	0	0	11.2		**96**	0	0	0	5.5	
97	0	1	1	29.7		**97**	0	0	0	7.7		**97**	0	0	0	6.5	
98	0	1	1	11.8		**98**	0	0	0	7.9		**98**	0	0	0	11.5	
99	0	1	1	6.7		**99**	0	0	0	14.5		**99**	0	0	0	4.9	
100	0	1	1	9.8	0.5	**100**	0	0	0	4.5	0	**100**	0	0	0	16.0	0.75
101	0	1	1	12.8		**101**						**101**					
102						**102**						**102**					
103						**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.0**	**0.97**	**0.97**	**9.5**	**0.3**	**Mean**	**0.0**	**0.14**	**0.14**	**8.7**	**0.1**	**Mean**	**0.0**	**0.0**	**0.0**	**9.4**	**0.7**
CALCITE INDEX:		**0.97**				**CALCITE INDEX:**		**0.14**				**CALCITE INDEX:**		**0.0**			

Table A.5: Pebble count and calcite measurements in reference areas, September 2015.

KODCR						KOUCR						KOUVE					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	0	0	10.5		**1**	0	0	0	7.3		**1**	0	0	0	3.8	
2	0	0	0	6.4		**2**	0	0	0	12.0		**2**	0	0	0	4.2	
3	0	0	0	7.0		**3**	0	0	0	8.4		**3**	0	0	0	5.5	
4	0	0	0	12.1		**4**	0	0	0	12.5		**4**	0	0	0	7.1	
5	0	0	0	7.8		**5**	0	0	0	5.4		**5**	0	0	0	6.9	
6	0	0	0	6.3		**6**	0	0	0	8.6		**6**	0	0	0	s	
7	0	0	0	7.2		**7**	0	0	0	7.4		**7**	0	0	0	6.6	
8	0	0	0	4.1		**8**	0	0	0	10.4		**8**	0	0	0	15.1	
9	0	0	0	7.5		**9**	0	0	0	6.0		**9**	0	0	0	10.5	
10	0	0	0	10.9	0.25	**10**	0	0	0	13.2	0.5	**10**	0	0	0	7.6	0.5
11	0	0	0	13.3		**11**	0	0	0	5.5		**11**	0	0	0	4.7	
12	0	0	0	6.1		**12**	0	0	0	7.5		**12**	0	0	0	6.1	
13	0	0	0	5.4		**13**	0	0	0	8.3		**13**	0	0	0	9.3	
14	0	0	0	4.2		**14**	0	0	0	24.5		**14**	0	0	0	7.1	
15	0	0	0	12.6		**15**	0	0	0	5.9		**15**	0	0	0	8.7	
16	0	0	0	11.8		**16**	0	0	0	8.4		**16**	0	0	0	27.1	
17	0	0	0	12.8		**17**	0	0	0	10.4		**17**	0	0	0	9.4	
18	0	0	0	10.8		**18**	0	0	0	5.4		**18**	0	0	0	3.9	
19	0	0	0	7.8		**19**	0	0	0	5.4		**19**	0	0	0	3.5	
20	0	0	0	5.9	0.75	**20**	0	0	0	7.3	0.5	**20**	0	0	0	9.8	0.5
21	0	0	0	12.4		**21**	0	0	0	8.6		**21**	0	0	0	9.2	
22	0	0	0	13.8		**22**	0	0	0	12.6		**22**	0	0	0	4.9	
23	0	0	0	7.5		**23**	0	0	0	8.2		**23**	0	0	0	2.5	
24	0	0	0	4.6		**24**	0	0	0	13.4		**24**	0	0	0	11.3	
25	0	0	0	6.5		**25**	0	0	0	4.9		**25**	0	0	0	6.0	
26	0	0	0	6.3		**26**	0	0	0	8.0		**26**	0	0	0	6.9	
27	0	0	0	6.9		**27**	0	0	0	14.6		**27**	0	0	0	7.8	
28	0	0	0	11.3		**28**	0	0	0	5.9		**28**	0	0	0	4.8	
29	0	0	0	3.8		**29**	0	0	0	4.1		**29**	0	0	0	10.0	
30	0	0	0	7.4	0.25	**30**	0	0	0	7.5	0.75	**30**	0	0	0	6.2	0.5
31	0	0	0	10.5		**31**	0	0	0	2.9		**31**	0	0	0	6.5	
32	0	0	0	7.0		**32**	0	0	0	14.2		**32**	0	0	0	7.0	
33	0	0	0	7.9		**33**	0	0	0	4.4		**33**	0	0	0	7.0	
34	0	0	0	8.1		**34**	0	0	0	6.8		**34**	0	0	0	4.4	
35	0	0	0	11.4		**35**	0	0	0	6.5		**35**	0	0	0	7.1	
36	0	0	0	2.8		**36**	0	0	0	19.1		**36**	0	0	0	10.3	
37	0	0	0	7.3		**37**	0	0	0	6.1		**37**	0	0	0	6.9	
38	0	0	0	9.4		**38**	0	0	0	3.6		**38**	0	0	0	13.1	
39	0	0	0	8.5		**39**	0	0	0	12.5		**39**	0	0	0	7.4	
40	0	0	0	7.3	0.25	**40**	0	0	0	9.8	0.25	**40**	0	0	0	7.4	0.75
41	0	0	0	12.0		**41**	0	0	0	5.0		**41**	0	0	0	10.2	
42	0	0	0	11.5		**42**	0	0	0	13.2		**42**	0	0	0	1.6	
43	0	0	0	6.4		**43**	0	0	0	6.4		**43**	0	0	0	24.7	
44	0	0	0	7.2		**44**	0	0	0	5.4		**44**	0	0	0	6.1	
45	0	0	0	5.7		**45**	0	0	0	8.7		**45**	0	0	0	15.0	
46	0	0	0	7.6		**46**	0	0	0	4.9		**46**	0	0	0	8.9	
47	0	0	0	7.6		**47**	0	0	0	10.5		**47**	0	0	0	10.9	
48	0	0	0	7.9		**48**	0	0	0	14.2		**48**	0	0	0	12.2	
49	0	0	0	11.1		**49**	0	0	0	9.9		**49**	0	0	0	12.5	
50	0	0	0	3.8	0.75	**50**	0	0	0	6.0	0.25	**50**	0	0	0	5.5	0.25
51	0	0	0	9.0		**51**	0	0	0	9.4		**51**	0	0	0	7.6	
52	0	0	0	10.5		**52**	0	0	0	11.9		**52**	0	0	0	5.0	
53	0	0	0	6.0		**53**	0	0	0	6.0		**53**	0	0	0	9.0	
54	0	0	0	4.0		**54**	0	0	0	6.0		**54**	0	0	0	6.9	
55	0	0	0	13.1		**55**	0	0	0	3.1		**55**	0	0	0	4.0	
56	0	0	0	8.5		**56**	0	0	0	3.6		**56**	0	0	0	9.8	
57	0	0	0	10.6		**57**	0	0	0	12.2		**57**	0	0	0	9.1	
58	0	0	0	11.3		**58**	0	0	0	4.4		**58**	0	0	0	7.5	
59	0	0	0	5.4		**59**	0	0	0	14.3		**59**	0	0	0	4.2	
60	0	0	0	7.0	0.25	**60**	0	0	0	6.8	0.25	**60**	0	0	0	5.0	0.5
61	0	0	0	5.2		**61**	0	0	0	14.7		**61**	0	0	0	6.5	
62	0	0	0	10.1		**62**	0	0	0	8.5		**62**	0	0	0	6.3	
63	0	0	0	5.4		**63**	0	0	0	5.7		**63**	0	0	0	5.5	
64	0	0	0	7.3		**64**	0	0	0	5.6		**64**	0	0	0	11.2	
65	0	0	0	8.3		**65**	0	0	0	23.0		**65**	0	0	0	4.1	
66	0	0	0	5.3		**66**	0	0	0	3.8		**66**	0	0	0	11.5	
67	0	0	0	10.2		**67**	0	0	0	12.6		**67**	0	0	0	12.1	
68	0	0	0	5.0		**68**	0	0	0	12.9		**68**	0	0	0	10.4	
69	0	0	0	9.5		**69**	0	0	0	5.8		**69**	0	0	0	14.9	
70	0	0	0	7.5	0.75	**70**	0	0	0	5.4	0.25	**70**	0	0	0	7.5	0.75
71	0	0	0	12.4		**71**	0	0	0	4.2		**71**	0	0	0	12.4	
72	0	0	0	8.5		**72**	0	0	0	4.4		**72**	0	0	0	9.5	
73	0	0	0	4.5		**73**	0	0	0	7.5		**73**	0	0	0	8.0	
74	0	0	0	15.3		**74**	0	0	0	8.6		**74**	0	0	0	11.2	
75	0	0	0	10.8		**75**	0	0	0	8.7		**75**	0	0	0	6.3	
76	0	0	0	11.2		**76**	0	0	0	12.7		**76**	0	0	0	7.4	
77	0	0	0	9.4		**77**	0	0	0	14.9		**77**	0	0	0	13.5	
78	0	0	0	11.9		**78**	0	0	0	6.3		**78**	0	0	0	8.0	
79	0	0	0	11.4		**79**	0	0	0	4.1		**79**	0	0	0	20.5	
80	0	0	0	9.5	0.5	**80**	0	0	0	11.0	0.25	**80**	0	0	0	3.2	0.75
81	0	0	0	4.3		**81**	0	0	0	7.5		**81**	0	0	0	7.0	
82	0	0	0	7.0		**82**	0	0	0	7.0		**82**	0	0	0	10.4	
83	0	0	0	6.0		**83**	0	0	0	5.2		**83**	0	0	0	8.6	
84	0	0	0	9.1		**84**	0	0	0	4.4		**84**	0	0	0	4.3	
85	0	0	0	5.0		**85**	0	0	0	15.7		**85**	0	0	0	7.9	
86	0	0	0	10.0		**86**	0	0	0	5.8		**86**	0	0	0	7.4	
87	0	0	0	4.4		**87**	0	0	0	11.4		**87**	0	0	0	4.2	
88	0	0	0	7.3		**88**	0	0	0	20.2		**88**	0	0	0	6.1	
89	0	0	0	10.6		**89**	0	0	0	6.8		**89**	0	0	0	3.9	
90	0	0	0	10.6	0.5	**90**	0	0	0	4.9	0.25	**90**	0	0	0	3.4	0.5
91	0	0	0	14.9		**91**	0	0	0	6.9		**91**	0	0	0	6.2	
92	0	0	0	6.8		**92**	0	0	0	9.2		**92**	0	0	0	7.9	
93	0	0	0	9.3		**93**	0	0	0	3.0		**93**	0	0	0	6.5	
94	0	0	0	7.2		**94**	0	0	0	5.8		**94**	0	0	0	8.9	
95	0	0	0	6.0		**95**	0	0	0	8.2		**95**	0	0	0	5.3	
96	0	0	0	8.1		**96**	0	0	0	3.1		**96**	0	0	0	3.8	
97	0	0	0	11.1		**97**	0	0	0	11.9		**97**	0	0	0	26.1	
98	0	0	0	7.0		**98**	0	0	0	3.8		**98**	0	0	0	9.4	
99	0	0	0	10.4		**99**	0	0	0	4.1		**99**	0	0	0	7.8	
100	0	0	0	9.3	0.5	**100**	0	0	0	11.0	0.25	**100**	0	0	0	10.7	0.25
101						**101**						**101**	0	0	0	6.1	
102						**102**						**102**					
103						**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.0**	**0.0**	**0.0**	**8.4**	**0.5**	**Mean**	**0.0**	**0.0**	**0.0**	**8.5**	**0.4**	**Mean**	**0.0**	**0.0**	**0.0**	**8.3**	**0.5**
CALCITE INDEX:		**0.0**				**CALCITE INDEX:**		**0.0**				**CALCITE INDEX:**		**0.0**			

Table A.5: Pebble count and calcite measurements in reference areas, September 2015.

LC_GRCK						LI24						MCCR					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	0	0	6.7		**1**	0	0	0	6		**1**	0	1	1	9	
2	0	0	0	7.1		**2**	0	0	0	5		**2**	0	1	2	6.8	
3	0	0	0	10.5		**3**	0	0	0	4.5		**3**	0	1	2	15.5	
4	0	0	0	10.1		**4**	0	0	0	5.5		**4**	0	1	2	12.5	
5	0	0	0	6.6		**5**	0	0	0	9		**5**	0	1	2	24	
6	0	0	0	9.4		**6**	0	0	0	4.5		**6**	0	1	1	13.5	
7	0	0	0	4.8		**7**	0	0	0	28		**7**	0	1	2	7.5	
8	0	0	0	11		**8**	0	0	0	9.5		**8**	0	1	1	4.5	
9	0	0	0	9		**9**	0	0	0	45		**9**	0	1	2	30	
10	0	0	0	20.3	0	**10**	0	0	0	7	0.5	**10**	0	1	2	5.3	0.5
11	0	0	0	10.1		**11**	0	0	0	21		**11**	0	1	1	2.5	
12	0	0	0	9.6		**12**	0	0	0	9		**12**	0	1	1	7.6	
13	0	0	0	4.4		**13**	0	0	0	14		**13**	0	1	1	6.2	
14	0	0	0	22.6		**14**	0	0	0	6.5		**14**	0	1	1	14.3	
15	0	0	0	3.5		**15**	0	0	0	8		**15**	0	1	2	24	
16	0	0	0	4.6		**16**	0	0	0	29		**16**	0	1	2	16.5	
17	0	0	0	3.6		**17**	0	0	0	6.5		**17**	0	1	1	7.8	
18	0	0	0	7.2		**18**	0	0	0	15		**18**	0	1	1	8.1	
19	0	0	0	8.6		**19**	0	0	0	15.5		**19**	0	1	2	14.8	
20	0	0	0	7.6	0	**20**	0	0	0	6.5	0.5	**20**	0	1	2	44	0.25
21	0	0	0	10.3		**21**	0	0	0	22		**21**	0	1	1	8	
22	0	0	0	4.1		**22**	0	0	0	8		**22**	0	1	2	9.5	
23	0	0	0	9.5		**23**	0	0	0	15.5		**23**	0	1	2	18	
24	0	0	0	3.5		**24**	0	0	0	5.5		**24**	0	0	0	4.2	
25	0	0	0	10.5		**25**	0	0	0	15		**25**	0	1	1	17	
26	0	0	0	18.2		**26**	0	0	0	26		**26**	0	1	1	7.4	
27	0	0	0	12.1		**27**	0	0	0	9.5		**27**	0	1	1	6.6	
28	0	0	0	3.3		**28**	0	0	0	9.5		**28**	0	1	1	8.8	
29	0	0	0	9.5		**29**	0	0	0	8.5		**29**	0	1	2	26	
30	0	0	0	4.4	0.25	**30**	0	0	0	11	0.25	**30**	0	1	1	12	0
31	0	0	0	10.1		**31**	0	0	0	5		**31**	0	1	1	8.5	
32	0	0	0	6.3		**32**	0	0	0	7.5		**32**	0	1	2	12	
33	0	0	0	8.4		**33**	0	0	0	11		**33**	0	1	1	13	
34	0	0	0	3.9		**34**	0	0	0	8.5		**34**	0	1	1	10.8	
35	0	0	0	2.3		**35**	0	0	0	9		**35**	0	1	1	26	
36	0	0	0	4		**36**	0	0	0	5		**36**	0	1	1	17	
37	0	0	0	17.2		**37**	0	0	0	9.5		**37**	0	1	1	4.2	
38	0	0	0	10.5		**38**	0	0	0	3.5		**38**	0	1	2	29.5	
39	0	0	0	5.8		**39**	0	0	0	7		**39**	0	1	2	17.5	
40	0	0	0	16.5	0.25	**40**	0	0	0	7	0.25	**40**	0	1	1	4	0.5
41	0	0	0	11.9		**41**	0	0	0	6		**41**	0	1	2	24	
42	0	0	0	8		**42**	0	0	0	8		**42**	0	1	2	8.2	
43	0	0	0	19.1		**43**	0	0	0	28		**43**	0	1	1	9	
44	0	0	0	3.4		**44**	0	0	0	6.5		**44**	0	0	0	3.2	
45	0	0	0	6.2		**45**	0	0	0	5.5		**45**	0	1	1	16	
46	0	0	0	2.6		**46**	0	0	0	10		**46**	0	1	1	10.5	
47	0	0	0	11.5		**47**	0	0	0	10		**47**	0	0	0	20.5	
48	0	0	0	14.3		**48**	0	0	0	10.5		**48**	0	1	2	15.5	
49	0	0	0	5.9		**49**	0	0	0	17		**49**	0	1	2	22.5	
50	0	0	0	7.1	0.75	**50**	0	0	0	10	0.5	**50**	0	1	2	5	0.25
51	0	0	0	3.2		**51**	0	0	0	7.5		**51**	0	0	0	8.7	
52	0	0	0	5.1		**52**	0	0	0	32		**52**	0	1	2	35	
53	0	0	0	5.7		**53**	0	0	0	7.5		**53**	0	0	0	9	
54	0	0	0	4.6		**54**	0	0	0	4.5		**54**	0	0	0	3.5	
55	0	0	0	10.4		**55**	0	0	0	9.5		**55**	0	1	2	30	
56	0	0	0	7.9		**56**	0	0	0	11.5		**56**	0	0	0	2.5	
57	0	0	0	3.5		**57**	0	0	0	36		**57**	0	1	1	16.5	
58	0	0	0	5.5		**58**	0	0	0	12		**58**	0	1	2	45	
59	0	0	0	5.6		**59**	0	0	0	9.5		**59**	0	0	0	2.7	
60	0	0	0	4.3	0	**60**	0	0	0	23	0.25	**60**	0	0	0	3.2	0.5
61	0	0	0	11.6		**61**	0	0	0	11		**61**	0	0	0	6.7	
62	0	0	0	6.4		**62**	0	0	0	6		**62**	0	1	1	6.2	
63	0	0	0	9		**63**	0	0	0	4.5		**63**	0	0	0	5.3	
64	0	0	0	2.3		**64**	0	0	0	43		**64**	0	0	0	8.8	
65	0	0	0	2.3		**65**	0	0	0	15		**65**	0	1	2	13.2	
66	0	0	0	10.8		**66**	0	0	0	18		**66**	0	1	1	4.5	
67	0	0	0	13.8		**67**	0	0	0	9.5		**67**	0	1	1	7	
68	0	0	0	5.8		**68**	0	0	0	11		**68**	0	0	0	4.5	
69	0	0	0	10.9		**69**	0	0	0	7		**69**	0	1	2	15.5	
70	0	0	0	15	0.5	**70**	0	0	0	5.5		**70**	0	1	2	6	0.75
71	0	0	0	11.8		**71**	0	0	0	8	0.25	**71**	0	0	0	6.5	
72	0	0	0	5.9		**72**	0	0	0	6.5		**72**	0	1	1	3.5	
73	0	0	0	6.2		**73**	0	0	0	7.5		**73**				Sand	
74	0	0	0	10.4		**74**	0	0	0	9.5		**74**	0	0	0	4	
75	0	0	0	4.8		**75**	0	0	0	9		**75**	0	1	1	8.2	
76	0	0	0	2.5		**76**	0	0	0	3		**76**	0	1	2	6.5	
77	0	0	0	10.2		**77**	0	0	0	7.5		**77**	0	1	1	21.3	
78	0	0	0	4.5		**78**	0	0	0	6		**78**	0	1	1	13.5	
79	0	0	0	8.2		**79**	0	0	0	29		**79**	0	1	2	8	
80	0	0	0	17.1	0.25	**80**	0	0	0	10	0.25	**80**	0	1	2	10	0.5
81	0	0	0	6.4		**81**	0	0	0	16		**81**	0	1	2	7.8	
82	0	0	0	12		**82**	0	0	0	6.5		**82**	0	1	1	6.7	
83	0	0	0	10.2		**83**	0	0	0	28		**83**	0	1	2	8.5	
84	0	0	0	9.8		**84**	0	0	0	7.5		**84**	0	1	1	5.4	
85	0	0	0	17.5		**85**	0	0	0	10.5		**85**	0	1	2	10.5	
86	0	0	0	5.8		**86**	0	0	0	9		**86**	0	1	2	8.8	
87	0	0	0	18.4		**87**	0	0	0	10.5		**87**	0	1	2	37	
88	0	0	0	5.7		**88**	0	0	0	5		**88**	0	1	1	6.9	
89	0	0	0	11.4		**89**	0	0	0	8		**89**	0	1	1	5.5	
90	0	0	0	11	0.5	**90**	0	0	0	10.5	0.25	**90**	0	1	1	12.5	0.25
91	0	0	0	7.5		**91**	0	0	0	24		**91**	0	1	2	24	
92	0	0	0	7.6		**92**	0	0	0	11		**92**	0	1	1	6.5	
93	0	0	0	10.1		**93**	0	0	0	7		**93**	0	0	0	2.4	
94	0	0	0	10.9		**94**	0	0	0	4.5		**94**	0	0	0	2.7	
95	0	0	0	11.8		**95**	0	0	0	5		**95**	0	1	2	8.8	
96	0	0	0	8		**96**	0	0	0	4.5		**96**	0	1	2	7.5	
97	0	0	0	9.1		**97**	0	0	0	6		**97**	0	1	2	23.5	
98	0	0	0	9.9		**98**	0	0	0	12		**98**	0	1	1	15.5	
99	0	0	0	9.8		**99**	0	0	0	7		**99**	0	1	2	17	
100	0	0	0	10.4	0.25	**100**	0	0	0	11	0.5	**100**	0	1	1	10.8	0.75
101						**101**						**101**	0	1	1	11	
102						**102**						**102**					
103						**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.0**	**0.0**	**0.0**	**8.7**	**0.3**	**Mean**	**0.0**	**0.0**	**0.0**	**11.5**	**0.4**	**Mean**	**0.0**	**0.83**	**1.2**	**12.2**	**0.4**
CALCITE INDEX:		**0.0**				**CALCITE INDEX:**		**0.0**				**CALCITE INDEX:**		**0.83**			

Table A.5: Pebble count and calcite measurements in reference areas, September 2015.

MI25						OLDDU						OLDLI					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	0	0	2.8		1	0	0	0	8.0		1	0	0	0	10.0	
2	0	0	0	3.7		2	0	0	0	11.0		2	0	0	0	4.5	
3	0	0	0	4.3		3	0	0	0	21.0		3	0	0	0	11.0	
4	0	0	0	3.2		4	0	0	0	49.0		4	0	0	0	16.0	
5	0	0	0	5.5		5	0	0	0	4.0		5	0	0	0	8.0	
6	0	0	0	8.0		6	0	0	0	29.0		6	0	0	0	16.0	
7	0	0	0	15.9		7	0	0	0	12.0		7	0	0	0	14.0	
8	0	0	0	3.8		8	0	0	0	10.0		8	0	0	0	15.0	
9	0	0	0	1.1		9	0	0	0	18.0		9	0	0	0	7.0	
10	0	0	0	6.5	0	10	0	0	0	17.5	0	10	0	0	0	8.0	0
11	0	1	1	24.7		11	0	0	0	12.0		11	0	0	0	28.0	
12	0	1	1	15.9		12	0	0	0	11.5		12	0	0	0	29.0	
13	0	0	0	3.4		13	0	0	0	41.0		13	0	0	0	15.0	
14	0	1	1	15.5		14	0	0	0	25.0		14	0	0	0	21.0	
15	0	0	0	8.9		15	0	0	0	13.0		15	0	0	0	12.0	
16	0	1	1	10.1		16	0	0	0	29.5		16	0	0	0	10.5	
17	0	1	1	11.2		17	0	0	0	13.5		17	0	0	0	11.5	
18	0	1	1	9.8		18	0	0	0	16.5		18	0	0	0	31.0	
19	0	0	0	11.2		19	0	0	0	23.0		19	0	0	0	5.0	
20	0	0	0	2.6	0	20	0	0	0	13.0	0.5	20	0	0	0	14.0	0
21	0	0	0	6.6		21	0	0	0	18.0		21	0	0	0	7.0	
22	0	0	0	10.6		22	0	0	0	13.0		22	0	0	0	9.0	
23	0	0	0	14.3		23	0	0	0	21.0		23	0	0	0	37.0	
24	0	1	1	8.9		24	0	0	0	28.0		24	0	0	0	8.0	
25	0	0	0	1.7		25	0	0	0	17.0		25	0	0	0	9.0	
26	0	0	0	4.4		26	0	0	0	6.0		26	0	0	0	6.5	
27	0	0	0	0.6		27	0	0	0	9.0		27	0	0	0	7.0	
28	0	0	0	1.6		28	0	0	0	17.0		28	0	0	0	9.0	
29	0	0	0	6.2		29	0	0	0	5.5		29	0	0	0	10.0	
30	0	0	0	6.8	0.5	30	0	0	0	14.0	0	30	0	0	0	10.0	0.25
31	0	1	1	16.4		31	0	0	0	7.0		31	0	0	0	21.0	
32	0	0	0	4.4		32	0	0	0	8.0		32	0	0	0	7.0	
33	0	0	0	5.1		33	0	0	0	8.5		33	0	0	0	4.0	
34	0	1	1	11.6		34	0	0	0	6.0		34	0	0	0	7.5	
35	0	0	0	1.0		35	0	0	0	13.5		35	0	0	0	4.5	
36	0	1	1	3.2		36	0	0	0	42.0		36	0	0	0	10.0	
37	0	0	0	4.5		37	0	0	0	15.5		37	0	0	0	3.0	
38	0	1	1	7.8		38	0	0	0	7.5		38	0	0	0	17.0	
39	0	1	1	14.6		39	0	0	0	14.5		39	0	0	0	10.5	
40	0	0	0	3.6	0	40	0	0	0	18.5	0.5	40	0	0	0	14.0	0
41	0	0	0	1.7		41	0	0	0	25.0		41	0	0	0	6.0	
42	0	0	0	10.9		42	0	0	0	22.0		42	0	0	0	27.0	
43	0	0	0	1.3		43	0	0	0	4.5		43	0	0	0	13.0	
44	0	1	1	11.4		44	0	0	0	14.0		44	0	0	0	9.0	
45	0	1	1	16.8		45	0	0	0	23.0		45	0	0	0	10.0	
46	0	1	1	25.2		46	0	0	0	3.5		46	0	0	0	9.0	
47	0	0	0	2.7		47	0	0	0	21.5		47	0	0	0	23.0	
48	0	1	1	12.3		48	0	0	0	7.5		48	0	0	0	8.0	
49	0	0	0	1.0		49	0	0	0	13.0		49	0	0	0	6.0	
50	0	0	0	30.0	0.5	50	0	0	0	17.0	0.25	50	0	0	0	5.0	0
51	0	0	0	3.5		51	0	0	0	22.0		51	0	0	0	13.0	
52	0	1	1	11.2		52	0	0	0	9.0		52	0	0	0	10.5	
53	0	0	0	7.0		53	0	0	0	9.5		53	0	0	0	10.5	
54	0	1	1	15.5		54	0	0	0	6.0		54	0	0	0	8.5	
55	0	0	0	10.2		55	0	0	0	16.0		55	0	0	0	10.0	
56	0	0	0	1.2		56	0	0	0	5.5		56	0	0	0	20.0	
57	0	1	1	19.3		57	0	0	0	24.0		57	0	0	0	22.0	
58	0	1	1	11.4		58	0	0	0	5.0		58	0	0	0	19.0	
59	0	0	0	4.5		59	0	0	0	10.0		59	0	0	0	9.0	
60	0	1	1	9.6	0.5	60	0	0	0	4.5	0	60	0	0	0	6.0	0
61	0	0	0	0.2		61	0	0	0	35.0		61	0	0	0	8.0	
62	0	0	0	0.5		62	0	0	0	7.0		62	0	0	0	5.5	
63	0	1	1	9.0		63	0	0	0	4.5		63	0	0	0	7.5	
64	0	0	0	5.6		64	0	0	0	18.0		64	0	0	0	3.5	
65	0	1	1	10.1		65	0	0	0	14.0		65	0	0	0	10.0	
66	0	1	1	4.2		66	0	0	0	11.5		66	0	0	0	9.0	
67	0	0	0	48.0		67	0	0	0	27.0		67	0	0	0	10.0	
68	0	1	1	7.9		68	0	0	0	13.0		68	0	0	0	11.5	
69	0	1	1	4.8		69	0	0	0	44.0		69	0	0	0	4.0	
70	0	1	1	11.2	0.5	70	0	0	0	9.0	0.25	70	0	0	0	5.0	0
71	0	1	1	8.2		71	0	0	0	11.0		71	0	0	0	6.0	
72	0	0	0	4.7		72	0	0	0	6.5		72	0	0	0	15.0	
73	0	0	0	4.7		73	0	0	0	8.5		73	0	0	0	22.0	
74	0	0	0	3.6		74	0	0	0	6.5		74	0	0	0	7.5	
75	0	0	0	12.0		75	0	0	0	26.0		75	0	0	0	4.0	
76	0	0	0	2.5		76	0	0	0	15.0		76	0	0	0	3.5	
77	0	0	0	16.0		77	0	0	0	8.0		77	0	0	0	25.0	
78	0	1	1	5.6		78	0	0	0	19.0		78	0	0	0	26.0	
79	0	1	1	20.4		79	0	0	0	5.5		79	0	0	0	20.0	
80	0	1	1	13.7	0.5	80	0	0	0	15.0	0	80	0	0	0	10.0	0
81	0	0	0	3.1		81	0	0	0	12.0		81	0	0	0	6.5	
82	0	0	0	3.1		82	0	0	0	9.0		82	0	0	0	8.5	
83	0	0	0	5.6		83	0	0	0	25.0		83	0	0	0	6.5	
84	0	0	0	8.2		84	0	0	0	19.0		84	0	0	0	16.0	
85	0	0	0	6.0		85	0	0	0	9.0		85	0	0	0	7.5	
86	0	0	0	14.3		86	0	0	0	12.0		86	0	0	0	7.0	
87	0	0	0	5.0		87	0	0	0	12.5		87	0	0	0	12.0	
88	0	1	1	5.5		88	0	0	0	8.0		88	0	0	0	9.5	
89	0	1	1	10.5		89	0	0	0	10.5		89	0	0	0	8.0	
90	0	1	1	10.9	0.5	90	0	0	0	5.0	0.5	90	0	0	0	9.0	0
91	0	0	0	5.8		91	0	0	0	4.5		91	0	0	0	6.5	
92	0	0	0	6.6		92	0	0	0	28.5		92	0	0	0	10.0	
93	0	0	0	3.1		93	0	0	0	23.0		93	0	0	0	4.5	
94	0	1	1	5.5		94	0	0	0	7.5		94	0	0	0	9.5	
95	0	0	0	11.6		95	0	0	0	5.5		95	0	0	0	5.5	
96	0	0	0	1.1		96	0	0	0	6.0		96	0	0	0	12.0	
97	0	1	1	12.1		97	0	0	0	14.0		97	0	0	0	9.5	
98	0	0	0	5.1		98	0	0	0	8.0		98	0	0	0	17.0	
99	0	0	0	5.7		99	0	0	0	13.5		99	0	0	0	8.0	
100	0	0	0	23.8	0.75	100	0	0	0	10.0	0.5	100	0	0	0	10.0	0.25
101	0	1	1	9.2		101						101					
102	0	0	0	6.5		102						102					
103	0	0	0	9.5		103						103					
104						104						104					
105						105						105					
106						106						106					
107						107						107					
108						108						108					
109						109						109					
110						110						110					
Mean	0.0	0.36	0.36	8.5	0.4	Mean	0.0	0.0	0.0	14.8	0.3	Mean	0.0	0.0	0.0	11.4	0.1
CALCITE INDEX:		0.36				CALCITE INDEX:		0.0				CALCITE INDEX:		0.0			

Table A.5: Pebble count and calcite measurements in reference areas, September 2015.

OLDLOW						PADAL						PAUKO					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	0	0	16.0		**1**	0	0	0	7.0		**1**	0	0	0	4.0	
2	0	0	0	17.0		**2**	0	0	0	s		**2**	0	0	0	3.5	
3	0	0	0	20.0		**3**	0	0	0	8.9		**3**	0	0	0	2.1	
4	0	0	0	17.0		**4**	0	0	0	7.9		**4**	0	0	0	6.8	
5	0	0	0	6.5		**5**	0	0	0	12.4		**5**	0	0	0	7.6	
6	0	0	0	22.0		**6**	0	0	0	11.1		**6**	0	0	0	6.6	
7	0	0	0	17.0		**7**	0	0	0	17.6		**7**	0	0	0	4.9	
8	0	0	0	5.0		**8**	0	0	0	24.3		**8**	0	0	0	6.5	
9	0	0	0	42.0		**9**	0	0	0	16.7		**9**	0	0	0	14.8	
10	0	0	0	12.5	0.25	**10**	0	0	0	27.2	0.5	**10**	0	0	0	5.5	0.5
11	0	0	0	7.0		**11**	0	0	0	9.8		**11**	0	0	0	10.4	
12	0	0	0	19.0		**12**	0	0	0	20.3		**12**	0	0	0	5.2	
13	0	0	0	12.5		**13**	0	0	0	17.1		**13**	0	0	0	10.6	
14	0	0	0	11.5		**14**	0	0	0	9.2		**14**	0	0	0	7.0	
15	0	0	0	4.0		**15**	0	0	0	23.3		**15**	0	0	0	16.8	
16	0	0	0	14.0		**16**	0	0	0	s		**16**	0	0	0	10.1	
17	0	0	0	9.5		**17**	0	0	0	22.0		**17**	0	0	0	11.2	
18	0	0	0	12.0		**18**	0	0	0	8.1		**18**	0	0	0	8.0	
19	0	0	0	9.5		**19**	0	0	0	241.0		**19**	0	0	0	7.4	
20	0	0	0	7.5	0	**20**	0	0	0	6.2	0.25	**20**	0	0	0	10.5	0.5
21	0	0	0	8.0		**21**	0	0	0	6.1		**21**	0	0	0	23.5	
22	0	0	0	16.0		**22**	0	0	0	12.5		**22**	0	0	0	8.9	
23	0	0	0	19.0		**23**	0	0	0	21.1		**23**	0	0	0	9.4	
24	0	0	0	22.0		**24**	0	0	0	12.5		**24**	0	0	0	5.5	
25	0	0	0	4.5		**25**	0	0	0	14.0		**25**	0	0	0	6.0	
26	0	0	0	16.5		**26**	0	0	0	6.3		**26**	0	0	0	8.5	
27	0	0	0	11.5		**27**	0	0	0	12.0		**27**	0	0	0	6.5	
28	0	0	0	21.0		**28**	0	0	0	9.5		**28**	0	0	0	5.0	
29	0	0	0	9.0		**29**	0	0	0	10.8		**29**	0	0	0	9.5	
30	0	0	0	24.0	0	**30**	0	0	0	24.3	0.5	**30**	0	0	0	7.1	0.25
31	0	0	0	7.5		**31**	0	0	0	13.5		**31**	0	0	0	5.7	
32	0	0	0	6.5		**32**	0	0	0	10.5		**32**	0	0	0	9.3	
33	0	0	0	6.0		**33**	0	0	0	16.3		**33**	0	0	0	3.2	
34	0	0	0	18.5		**34**	0	0	0	11.3		**34**	0	0	0	g	
35	0	0	0	10.0		**35**	0	0	0	15.4		**35**	0	0	0	4.4	
36	0	0	0	9.0		**36**	0	0	0	10.9		**36**	0	0	0	3.4	
37	0	0	0	17.0		**37**	0	0	0	6.7		**37**	0	0	0	2.9	
38	0	0	0	14.0		**38**	0	0	0	10.5		**38**	0	0	0	6.9	
39	0	0	0	11.0		**39**	0	0	0	6.7		**39**	0	0	0	5.8	
40	0	0	0	12.0	0	**40**	0	0	0	17.0	0.5	**40**	0	0	0	4.7	0.5
41	0	0	0	13.0		**41**	0	0	0	10.5		**41**	0	0	0	3.4	
42	0	0	0	18.5		**42**	0	0	0	16.0		**42**	0	0	0	6.8	
43	0	0	0	22.0		**43**	0	0	0	9.8		**43**	0	0	0	5.7	
44	0	0	0	45.0		**44**	0	0	0	10.1		**44**	0	0	0	4.6	
45	0	0	0	18.0		**45**	0	0	0	20.0		**45**	0	0	0	7.6	
46	0	0	0	15.0		**46**	0	0	0	10.7		**46**	0	0	0	6.3	
47	0	0	0	5.5		**47**	0	0	0	18.5		**47**	0	0	0	5.2	
48	0	0	0	8.5		**48**	0	0	0	5.5		**48**	0	0	0	9.5	
49	0	0	0	13.5		**49**	0	0	0	36.5		**49**	0	0	0	5.6	
50	0	0	0	6.5	0	**50**	0	0	0	5.6	0.25	**50**	0	0	0	10.4	0.75
51	0	0	0	18.0		**51**	0	0	0	11.7		**51**	0	0	0	17.2	
52	0	0	0	16.0		**52**	0	0	0	5.5		**52**	0	0	0	5.9	
53	0	0	0	14.0		**53**	0	0	0	6.6		**53**	0	0	0	5.1	
54	0	0	0	17.0		**54**	0	0	0	8.9		**54**	0	0	0	6.1	
55	0	0	0	15.5		**55**	0	0	0	6.6		**55**	0	0	0	6.0	
56	0	0	0	15.0		**56**	0	0	0	s		**56**	0	0	0	10.8	
57	0	0	0	4.0		**57**	0	0	0	11.4		**57**	0	0	0	6.2	
58	0	0	0	11.5		**58**	0	0	0	17.5		**58**	0	0	0	8.5	
59	0	0	0	23.0		**59**	0	0	0	18.4		**59**	0	0	0	12.4	
60	0	0	0	12.0	0.5	**60**	0	0	0	13.6	0.75	**60**	0	0	0	5.5	0.25
61	0	0	0	11.0		**61**	0	0	0	9.0		**61**	0	0	0	5.3	
62	0	0	0	13.5		**62**	0	0	0	9.0		**62**	0	0	0	4.8	
63	0	0	0	6.0		**63**	0	0	0	s		**63**	0	0	0	7.0	
64	0	0	0	17.0		**64**	0	0	0	16.4		**64**	0	0	0	5.5	
65	0	0	0	18.0		**65**	0	0	0	9.3		**65**	0	0	0	4.0	
66	0	0	0	18.0		**66**	0	0	0	14.4		**66**	0	0	0	6.0	
67	0	0	0	6.0		**67**	0	0	0	10.6		**67**	0	0	0	7.8	
68	0	0	0	12.0		**68**	0	0	0	16.3		**68**	0	0	0	10.5	
69	0	0	0	11.0		**69**	0	0	0	13.7		**69**	0	0	0	5.9	
70	0	0	0	13.0	0	**70**	0	0	0	9.3	0.5	**70**	0	0	0	8.0	0.5
71	0	0	0	20.0		**71**	0	0	0	15.2		**71**	0	0	0	6.1	
72	0	0	0	6.0		**72**	0	0	0	10.0		**72**	0	0	0	8.5	
73	0	0	0	3.5		**73**	0	0	0	10.0		**73**	0	0	0	7.3	
74	0	0	0	12.5		**74**	0	0	0	24.3		**74**	0	0	0	11.9	
75	0	0	0	34.0		**75**	0	0	0	26.2		**75**	0	0	0	g	
76	0	0	0	9.0		**76**	0	0	0	4.1		**76**	0	0	0	3.8	
77	0	0	0	4.0		**77**	0	0	0	14.0		**77**	0	0	0	4.5	
78	0	0	0	14.5		**78**	0	0	0	4.1		**78**	0	0	0	7.6	
79	0	0	0	12.0		**79**	0	0	0	18.2		**79**	0	0	0	4.4	
80	0	0	0	33.0	0	**80**	0	0	0	13.4	0.25	**80**	0	0	0	4.9	0.5
81	0	0	0	10.0		**81**	0	0	0	6.9		**81**	0	0	0	5.0	
82	0	0	0	16.0		**82**	0	0	0	13.1		**82**	0	0	0	5.4	
83	0	0	0	20.5		**83**	0	0	0	18.2		**83**	0	0	0	6.4	
84	0	0	0	2.5		**84**	0	0	0	8.6		**84**	0	0	0	4.0	
85	0	0	0	6.0		**85**	0	0	0	7.7		**85**	0	0	0	9.9	
86	0	0	0	15.5		**86**	0	0	0	4.5		**86**	0	0	0	5.4	
87	0	0	0	19.5		**87**	0	0	0	11.4		**87**	0	0	0	7.3	
88	0	0	0	9.5		**88**	0	0	0	8.8		**88**	0	0	0	8.0	
89	0	0	0	14.5		**89**	0	0	0	21.6		**89**	0	0	0	5.8	
90	0	0	0	15.0	0	**90**	0	0	0	7.3	0.5	**90**	0	0	0	6.0	0.5
91	0	0	0	5.0		**91**	0	0	0	20.0		**91**	0	0	0	3.9	
92	0	0	0	20.0		**92**	0	0	0	7.0		**92**	0	0	0	10.0	
93	0	0	0	11.5		**93**	0	0	0	18.0		**93**	0	0	0	2.7	
94	0	0	0	21.0		**94**	0	0	0	3.5		**94**	0	0	0	5.4	
95	0	0	0	6.5		**95**	0	0	0	25.0		**95**	0	0	0	6.5	
96	0	0	0	13.0		**96**	0	0	0	14.4		**96**	0	0	0	5.1	
97	0	0	0	9.5		**97**	0	0	0	9.0		**97**	0	0	0	5.9	
98	0	0	0	29.0		**98**	0	0	0	11.5		**98**	0	0	0	5.9	
99	0	0	0	11.5		**99**	0	0	0	11.4		**99**	0	0	0	4.2	
100	0	0	0	8.5	0	**100**	0	0	0	8.4	0.75	**100**	0	0	0	7.4	0.5
101						**101**	0	0	0	14.5		**101**	0	0	0	7.3	
102						**102**	0	0	0	5.5		**102**	0	0	0	3.4	
103						**103**	0	0	0	14.5		**103**					
104						**104**	0	0	0	18.9		**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.0**	**0.0**	**0.0**	**13.9**	**0.1**	**Mean**	**0.0**	**0.0**	**0.0**	**15.2**	**0.5**	**Mean**	**0.0**	**0.0**	**0.0**	**7.0**	**0.5**
CALCITE INDEX:		**0.0**				**CALCITE INDEX:**		**0.0**				**CALCITE INDEX:**		**0.0**			

Table A.5: Pebble count and calcite measurements in reference areas, September 2015.

RACK						SLINE						VEUKO					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	0	0	10.0		1	0	0	0	11		1	0	0	0	8.5	
2	0	0	0	13.0		2	0	0	0	9		2	0	0	0	6.5	
3	0	0	0	28.0		3	0	0	0	9.5		3	0	0	0	5.0	
4	0	0	0	10.0		4	0	0	0	18		4	0	0	0	7.4	
5	0	0	0	24.0		5	0	0	0	5.5		5	0	0	0	6.5	
6	0	0	0	27.0		6	0	0	0	28		6	0	0	0	11.4	
7	0	0	0	28.0		7	0	0	0	16		7	0	0	0	12.2	
8	0	0	0	15.0		8	0	0	0	7		8	0	0	0	10.3	
9	0	0	0	9.0		9	0	0	0	10.5		9	0	0	0	7.4	
10	0	0	0	8.5	0	10	0	0	0	16	0	10	0	0	0	8.5	0.5
11	0	0	0	8.0		11	0	0	0	13.5		11	0	0	0	6.4	
12	0	0	0	6.5		12	0	0	0	17		12	0	0	0	4.1	
13	0	0	0	8.0		13	0	0	0	18.5		13	0	0	0	6.6	
14	0	0	0	9.0		14	0	0	0	18		14	0	0	0	10.9	
15	0	0	0	8.0		15	0	0	0	13		15	0	0	0	6.8	
16	0	0	0	8.0		16	0	0	0	8		16	0	0	0	4.4	
17	0	0	0	8.5		17	0	0	0	22		17	0	0	0	7.9	
18	0	0	0	12.0		18	0	0	0	33		18	0	0	0	7.6	
19	0	0	0	9.0		19	0	0	0	17.5		19	0	0	0	17.5	
20	0	0	0	14.0	0.25	20	0	0	0	8.5	0.5	20	0	0	0	7.4	0.5
21	0	0	0	8.5		21	0	0	0	11		21	0	0	0	6.4	
22	0	0	0	12.0		22	0	0	0	6.5		22	0	0	0	12.6	
23	0	0	0	9.0		23	0	0	0	8		23	0	0	0	13.8	
24	0	0	0	15.0		24	0	0	0	25		24	0	0	0	8.4	
25	0	0	0	18.0		25	0	0	0	38		25	0	0	0	11.0	
26	0	0	0	5.0		26	0	0	0	3.5		26	0	0	0	11.3	
27	0	0	0	17.0		27	0	0	0	19		27	0	0	0	7.2	
28	0	0	0	14.0		28	0	0	0	7.5		28	0	0	0	5.1	
29	0	0	0	10.0		29	0	0	0	5		29	0	0	0	4.5	
30	0	0	0	7.0	0	30	0	0	0	12	0.75	30	0	0	0	11.9	0.75
31	0	0	0	24.0		31	0	0	0	22		31	0	0	0	7.0	
32	0	0	0	23.0		32	0	0	0	11.5		32	0	0	0	4.0	
33	0	0	0	42.0		33	0	0	0	11		33	0	0	0	4.8	
34	0	0	0	15.0		34	0	0	0	19.5		34	0	0	0	6.8	
35	0	0	0	5.0		35	0	0	0	6		35	0	0	0	8.0	
36	0	0	0	8.0		36	0	0	0	9		36	0	0	0	5.9	
37	0	0	0	7.5		37	0	0	0	17		37	0	0	0	6.1	
38	0	0	0	27.0		38	0	0	0	12		38	0	0	0	4.0	
39	0	0	0	5.0		39	0	0	0	11		39	0	0	0	6.6	
40	0	0	0	29.0	0	40	0	0	0	9.5	0.5	40	0	0	0	6.3	0.5
41	0	0	0	13.0		41	0	0	0	53		41	0	0	0	9.1	
42	0	0	0	27.0		42	0	0	0	7		42	0	0	0	5.6	
43	0	0	0	7.0		43	0	0	0	13.5		43	0	0	0	5.0	
44	0	0	0	29.0		44	0	0	0	6.5		44	0	0	0	5.9	
45	0	0	0	4.5		45	0	0	0	13		45	0	0	0	6.2	
46	0	0	0	5.0		46	0	0	0	7		46	0	0	0	10.8	
47	0	0	0	9.0		47	0	0	0	15.5		47	0	0	0	5.9	
48	0	0	0	17.0		48	0	0	0	6.5		48	0	0	0	10.3	
49	0	0	0	6.5		49	0	0	0	12.5		49	0	0	0	8.0	
50	0	0	0	8.0	0.25	50	0	0	0	7.5	0.5	50	0	0	0	12.2	0.25
51	0	0	0	15.0		51	0	0	0	6.5		51	0	0	0	9.0	
52	0	0	0	6.0		52	0	0	0	16.5		52	0	0	0	6.8	
53	0	0	0	15.5		53	0	0	0	10.5		53	0	0	0	9.5	
54	0	0	0	16.0		54	0	0	0	6.5		54	0	0	0	16.5	
55	0	0	0	7.0		55	0	0	0	13		55	0	0	0	8.5	
56	0	0	0	9.0		56	0	0	0	19.5		56	0	0	0	7.3	
57	0	0	0	8.0		57	0	0	0	12		57	0	0	0	7.2	
58	0	0	0	11.0		58	0	0	0	7		58	0	0	0	7.1	
59	0	0	0	16.0		59	0	0	0	5		59	0	0	0	8.3	
60	0	0	0	15.0	0	60	0	0	0	9	0.75	60	0	0	0	9.9	0.25
61	0	0	0	5.0		61	0	0	0	8		61	0	0	0	4.0	
62	0	0	0	27.0		62	0	0	0	9		62	0	0	0	3.5	
63	0	0	0	18.0		63	0	0	0	7.5		63	0	0	0	5.8	
64	0	0	0	27.0		64	0	0	0	8.5		64	0	0	0	11.2	
65	0	0	0	7.5		65	0	0	0	10		65	0	0	0	6.7	
66	0	0	0	6.0		66	0	0	0	11		66	0	0	0	4.4	
67	0	0	0	14.0		67	0	0	0	30		67	0	0	0	7.0	
68	0	0	0	7.0		68	0	0	0	12		68	0	0	0	8.3	
69	0	0	0	15.0		69	0	0	0	25		69	0	0	0	8.4	
70	0	0	0	6.5	0	70	0	0	0	16	0.25	70	0	0	0	9.5	0.5
71	0	0	0	16.5		71	0	0	0	22.5		71	0	0	0	6.7	
72	0	0	0	17.0		72	0	0	0	9.5		72	0	0	0	10.5	
73	0	0	0	6.0		73	0	0	0	16		73	0	0	0	7.8	
74	0	0	0	7.0		74	0	0	0	4.5		74	0	0	0	7.5	
75	0	0	0	11.5		75	0	0	0	6.5		75	0	0	0	4.5	
76	0	0	0	20.0		76	0	0	0	14		76	0	0	0	14.5	
77	0	0	0	5.0		77	0	0	0	3.5		77	0	0	0	6.1	
78	0	0	0	9.5		78	0	0	0	45		78	0	0	0	5.0	
79	0	0	0	28.5		79	0	0	0	10		79	0	0	0	10.0	
80	0	0	0	12.0	0	80	0	0	0	12	0.5	80	0	0	0	6.5	0.75
81	0	0	0	7.0		81	0	0	0	8.5		81	0	0	0	12.5	
82	0	0	0	7.0		82	0	0	0	9		82	0	0	0	3.3	
83	0	0	0	4.0		83	0	0	0	16		83	0	0	0	6.2	
84	0	0	0	9.0		84	0	0	0	11.5		84	0	0	0	3.8	
85	0	0	0	7.5		85	0	0	0	20		85	0	0	0	5.6	
86	0	0	0	17.0		86	0	0	0	6		86	0	0	0	3.7	
87	0	0	0	5.0		87	0	0	0	15		87	0	0	0	4.2	
88	0	0	0	18.0		88	0	0	0	20		88	0	0	0	9.1	
89	0	0	0	15.0		89	0	0	0	19		89	0	0	0	14.9	
90	0	0	0	13.5	0.25	90	0	0	0	10.5	0	90	0	0	0	10.1	0.5
91	0	0	0	7.0		91	0	0	0	10		91	0	0	0	7.2	
92	0	0	0	11.0		92	0	0	0	24		92	0	0	0	6.3	
93	0	0	0	8.5		93	0	0	0	11		93	0	0	0	g	
94	0	0	0	12.0		94	0	0	0	10.5		94	0	0	0	4.5	
95	0	0	0	9.0		95	0	0	0	8.5		95	0	0	0	7.6	
96	0	0	0	11.0		96	0	0	0	10		96	0	0	0	13.4	
97	0	0	0	5.5		97	0	0	0	18		97	0	0	0	5.9	
98	0	0	0	10.5		98	0	0	0	23		98	0	0	0	8.8	
99	0	0	0	4.0		99	0	0	0	9		99	0	0	0	2.1	
100	0	0	0	12.0	0	100	0	0	0	15	0.25	100	0	0	0	8.6	0.75
101						101						101	0	0	0	4.2	
102						102						102					
103						103						103					
104						104						104					
105						105						105					
106						106						106					
107						107						107					
108						108						108					
109						109						109					
110						110						110					
Mean	0.0	0.0	0.0	12.7	0.1	Mean	0.0	0.0	0.0	13.7	0.4	Mean	0.0	0.0	0.0	7.7	0.5
CALCITE INDEX:		0.0				CALCITE INDEX:		0.0				CALCITE INDEX:		0.0			

Table A.5: Pebble count and calcite measurements in reference areas, September 2015.

VEUP						VICK						WWRL					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	0	0	20.1		**1**	0	0	0	6.0		**1**	0	0	0	8.5	
2	0	0	0	12.5		**2**	0	0	0	15.0		**2**	0	0	0	8.6	
3	0	0	0	11.8		**3**	0	0	0	10.0		**3**	0	0	0	11.2	
4	0	0	0	6.7		**4**	0	0	0	14.0		**4**	0	0	0	7.5	
5	0	0	0	10.0		**5**	0	0	0	24.0		**5**	0	0	0	1.8	
6	0	0	0	24.4		**6**	0	0	0	14.0		**6**	0	0	0	4.9	
7	0	0	0	10.6		**7**	0	0	0	9.0		**7**	0	0	0	18	
8	0	0	0	14.7		**8**	0	0	0	8.0		**8**	0	0	0	4.9	
9	0	0	0	15.2		**9**	0	0	0	21.0		**9**				s	
10	0	0	0	13.7	0.25	**10**	0	0	0	15.0	0.25	**10**	0	0	0	12	0.25
11	0	0	0	17.8		**11**	0	0	0	10.0		**11**	0	0	0	2.4	
12	0	0	0	7.5		**12**	0	0	0	18.0		**12**	0	0	0	2.8	
13	0	0	0	9.4		**13**	0	0	0	12.0		**13**	0	0	0	10.5	
14	0	0	0	16.6		**14**	0	0	0	19.0		**14**	0	0	0	12.3	
15	0	0	0	18.5		**15**	0	0	0	6.0		**15**	0	0	0	9.6	
16	0	0	0	6.5		**16**	0	0	0	5.0		**16**	0	0	0	4	
17	0	0	0	15.9		**17**	0	0	0	10.0		**17**	0	0	0	11.5	
18	0	0	0	8.5		**18**	0	0	0	20.0		**18**	0	0	0	12.5	
19	0	0	0	21.0		**19**	0	0	0	10.0		**19**	0	0	0	6.9	
20	0	0	0	19.6	0.75	**20**	0	0	0	11.5	0	**20**	0	0	0	5	0.25
21	0	0	0	29.1		**21**	0	0	0	16.5		**21**	0	0	0	11.2	
22	0	0	0	9.5		**22**	0	0	0	14.5		**22**	0	0	0	9.3	
23	0	0	0	10.9		**23**	0	0	0	14.5		**23**	0	0	0	19	
24	0	0	0	19.5		**24**	0	0	0	22.0		**24**	0	0	0	4.3	
25	0	0	0	1.6		**25**	0	0	0	4.5		**25**	0	0	0	2.5	
26	0	0	0	9.7		**26**	0	0	0	9.0		**26**	0	0	0	16.5	
27	0	0	0	10.5		**27**	0	0	0	17.0		**27**	0	0	0	14	
28	0	0	0	19.1		**28**	0	0	0	6.0		**28**	0	0	0	13.6	
29	0	0	0	13.3		**29**	0	0	0	9.5		**29**	0	0	0	1.5	
30	0	0	0	9.0	0.75	**30**	0	0	0	15.0	0	**30**	0	0	0	7	0.5
31	0	0	0	11.0		**31**	0	0	0	18.0		**31**				s	
32	0	0	0	10.7		**32**	0	0	0	12.0		**32**	0	0	0	6.2	
33	0	0	0	5.7		**33**	0	0	0	9.5		**33**	0	0	0	16	
34	0	0	0	8.5		**34**	0	0	0	10.0		**34**	0	0	0	3.5	
35	0	0	0	15.3		**35**	0	0	0	20.0		**35**	0	0	0	6.3	
36	0	0	0	1.7		**36**	0	0	0	9.5		**36**	0	0	0	6.8	
37	0	0	0	12.9		**37**	0	0	0	6.5		**37**	0	0	0	4.9	
38	0	0	0	8.2		**38**	0	0	0	8.5		**38**	0	0	0	3.4	
39	0	0	0	28.3		**39**	0	0	0	12.5		**39**	0	0	0	5	
40	0	0	0	7.6	0.25	**40**	0	0	0	7.5	0	**40**	0	0	0	5	0.25
41	0	0	0	15.3		**41**	0	0	0	13.0		**41**	0	0	0	15.8	
42	0	0	0	8.0		**42**	0	0	0	15.0		**42**	0	0	0	3.7	
43	0	0	0	26.6		**43**	0	0	0	18.0		**43**	0	0	0	12.3	
44	0	0	0	8.4		**44**	0	0	0	17.0		**44**	0	0	0	4	
45	0	0	0	14.3		**45**	0	0	0	14.5		**45**	0	0	0	3.3	
46	0	0	0	10.2		**46**	0	0	0	8.5		**46**	0	0	0	1.5	
47	0	0	0	11.7		**47**	0	0	0	13.0		**47**	0	0	0	6.2	
48	0	0	0	2.3		**48**	0	0	0	7.5		**48**	0	0	0	3.5	
49	0	0	0	11.0		**49**	0	0	0	34.0		**49**	0	0	0	2.2	
50	0	0	0	25.8	0.25	**50**	0	0	0	11.0	0	**50**	0	0	0	2	0
51	0	0	0	7.6		**51**	0	0	0	14.0		**51**	0	0	0	4.2	
52	0	0	0	11.0		**52**	0	0	0	15.0		**52**	0	0	0	17.3	
53	0	0	0	3.5		**53**	0	0	0	17.0		**53**	0	0	0	1.5	
54	0	0	0	44.5		**54**	0	0	0	15.0		**54**	0	0	0	7.2	
55	0	0	0	11.6		**55**	0	0	0	12.0		**55**	0	0	0	19.5	
56	0	0	0	9.9		**56**	0	0	0	9.0		**56**	0	0	0	2	
57	0	0	0	13.8		**57**	0	0	0	25.0		**57**	0	0	0	3.8	
58	0	0	0	28.0		**58**	0	0	0	41.0		**58**	0	0	0	1.3	
59	0	0	0	2.8		**59**	0	0	0	30.5		**59**	0	0	0	1	
60	0	0	0	24.0	0.25	**60**	0	0	0	19.0	0	**60**	0	0	0	7.1	0.25
61	0	0	0	6.5		**61**	0	0	0	15.5		**61**	0	0	0	3.2	
62	0	0	0	11.1		**62**	0	0	0	9.0		**62**	0	0	0	4	
63	0	0	0	11.9		**63**	0	0	0	29.0		**63**	0	0	0	2.5	
64	0	0	0	8.5		**64**	0	0	0	31.0		**64**	0	0	0	5	
65	0	0	0	9.5		**65**	0	0	0	8.5		**65**	0	0	0	10.6	
66	0	0	0	12.5		**66**	0	0	0	14.0		**66**	0	0	0	7.5	
67	0	0	0	4.6		**67**	0	0	0	17.5		**67**	0	0	0	17	
68	0	0	0	16.4		**68**	0	0	0	11.0		**68**	0	0	0	5.6	
69	0	0	0	13.8		**69**	0	0	0	11.0		**69**	0	0	0	7.5	
70	0	0	0	9.1	0.5	**70**	0	0	0	16.0	0.25	**70**	0	0	0	10.5	0.5
71	0	0	0	6.9		**71**	0	0	0	20.0		**71**	0	0	0	11.7	
72	0	0	0	12.0		**72**	0	0	0	12.5		**72**	0	0	0	7	
73	0	0	0	20.1		**73**	0	0	0	4.0		**73**	0	0	0	16	
74	0	0	0	11.5		**74**	0	0	0	7.5		**74**	0	0	0	13.2	
75	0	0	0	16.2		**75**	0	0	0	8.0		**75**	0	0	0	15.2	
76	0	0	0	13.1		**76**	0	0	0	8.5		**76**	0	0	0	4.5	
77	0	0	0	11.2		**77**	0	0	0	36.0		**77**	0	0	0	12.8	
78	0	0	0	22.4		**78**	0	0	0	10.0		**78**	0	0	0	12.2	
79	0	0	0	12.6		**79**	0	0	0	18.0		**79**	0	0	0	7.8	
80	0	0	0	6.9	0.75	**80**	0	0	0	7.0	0.25	**80**	0	0	0	2.5	0
81	0	0	0	6.4		**81**	0	0	0	6.0		**81**	0	0	0	8.2	
82	0	0	0	10.0		**82**	0	0	0	21.0		**82**	0	0	0	15.5	
83	0	0	0	23.1		**83**	0	0	0	10.0		**83**	0	0	0	13	
84	0	0	0	13.9		**84**	0	0	0	27.0		**84**	0	0	0	2.5	
85	0	0	0	15.1		**85**	0	0	0	9.0		**85**	0	0	0	1.2	
86	0	0	0	14.3		**86**	0	0	0	28.0		**86**	0	0	0	6	
87	0	0	0	22.3		**87**	0	0	0	13.0		**87**	0	0	0	14.7	
88	0	0	0	12.1		**88**	0	0	0	11.0		**88**	0	0	0	3	
89	0	0	0	12.9		**89**	0	0	0	4.5		**89**	0	0	0	1.2	
90	0	0	0	7.0	0.25	**90**	0	0	0	11.0	0.25	**90**	0	0	0	3.2	0.25
91	0	0	0	7.5		**91**	0	0	0	13.0		**91**	0	0	0	4.5	
92	0	0	0	23.6		**92**	0	0	0	3.5		**92**	0	0	0	4.3	
93	0	0	0	17.9		**93**	0	0	0	6.0		**93**	0	0	0	6.2	
94	0	0	0	8.2		**94**	0	0	0	11.0		**94**	0	0	0	7.5	
95	0	0	0	10.4		**95**	0	0	0	4.0		**95**	0	0	0	4.3	
96	0	0	0	11.9		**96**	0	0	0	11.5		**96**	0	0	0	4.2	
97	0	0	0	19.3		**97**	0	0	0	11.5		**97**	0	0	0	2.1	
98	0	0	0	7.4		**98**	0	0	0	8.0		**98**	0	0	0	12.6	
99	0	0	0	11.6		**99**	0	0	0	15.5		**99**	0	0	0	4.5	
100	0	0	0	8.4	0.75	**100**	0	0	0	8.5	0	**100**	0	0	0	9.3	0.25
101						**101**						**101**	0	0	0	10	
102						**102**						**102**	0	0	0	8.7	
103						**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.0**	**0.0**	**0.0**	**13.1**	**0.5**	**Mean**	**0.0**	**0.0**	**0.0**	**13.8**	**0.1**	**Mean**	**0.0**	**0.0**	**0.0**	**7.5**	**0.3**
CALCITE INDEX:		**0.0**				**CALCITE INDEX:**		**0.0**				**CALCITE INDEX:**		**0.0**			

Table A.5: Pebble count and calcite measurements in reference areas, September 2015.

WWRU					
Count	**Concreted Status (0, 1, or 2)**	**Calcite Present (0 or 1)**	**Calcite Thickness (0 to 5)**	**Intermediate Axis (cm)**	**Embed**
1	0	0	0	8.3	
2	0	0	0	11.2	
3	0	0	0	13.8	
4	0	0	0	3.1	
5	0	0	0	2.9	
6	0	0	0	19.8	
7	0	0	0	7.6	
8	0	0	0	1.6	
9	0	0	0	53.4	
10	0	0	0	3.2	0.25
11	0	0	0	21.4	
12	0	0	0	9.7	
13	0	0	0	16.1	
14	0	0	0	11	
15	0	0	0	10.4	
16	0	0	0	13.2	
17	0	0	0	3.4	
18	0	0	0	2.4	
19	0	0	0	22.5	
20	0	0	0	12.6	0.25
21	0	0	0	22.3	
22	0	0	0	7.8	
23	0	0	0	24.9	
24	0	0	0	16.7	
25	0	0	0	4.9	
26	0	0	0	16.1	
27	0	0	0	6.2	
28	0	0	0	6.1	
29	0	0	0	15.4	
30	0	0	0	5.7	0
31	0	0	0	20.3	
32	0	0	0	24.4	
33	0	0	0	7.2	
34	0	0	0	10.1	
35	0	0	0	30.3	
36	0	0	0	24.6	
37	0	0	0	9.3	
38	0	0	0	10.2	
39	0	0	0	5.8	
40	0	0	0	19.4	0.5
41	0	0	0	7.3	
42	0	0	0	17.6	
43	0	0	0	16.8	
44	0	0	0	18.4	
45	0	0	0	30.4	
46	0	0	0	31.6	
47	0	0	0	18.5	
48	0	0	0	8.9	
49	0	0	0	16.2	
50	0	0	0	6.1	0.25
51	0	0	0	6.6	
52	0	0	0	15.4	
53	0	0	0	2.5	
54	0	0	0	13.1	
55	0	0	0	10.1	
56	0	0	0	4.3	
57	0	0	0	5.7	
58	0	0	0	15.9	
59	0	0	0	5.7	
60	0	0	0	14	0.25
61	0	0	0	7.7	
62	0	0	0	13.1	
63	0	0	0	14.7	
64	0	0	0	11.2	
65	0	0	0	18.6	
66	0	0	0	13.9	
67	0	0	0	1.6	
68	0	0	0	13.8	
69	0	0	0	19	
70	0	0	0	12.5	0.25
71	0	0	0	11.3	
72	0	0	0	10.6	
73	0	0	0	24.4	
74	0	0	0	19.2	
75	0	0	0	18.1	
76	0	0	0	11.4	
77	0	0	0	22.2	
78	0	0	0	10.1	
79	0	0	0	14.4	
80	0	0	0	12.2	0
81	0	0	0	4.8	
82	0	0	0	2.7	
83	0	0	0	14.8	
84	0	0	0	17.1	
85	0	0	0	7.9	
86	0	0	0	5.9	
87	0	0	0	5.6	
88	0	0	0	5.3	
89	0	0	0	3.8	
90	0	0	0	7.4	0
91	0	0	0	11.2	
92	0	0	0	14.6	
93	0	0	0	12.2	
94	0	0	0	16.3	
95	0	0	0	6.5	
96	0	0	0	16.4	
97	0	0	0	9.7	
98	0	0	0	7.4	
99	0	0	0	16.3	
100	0	0	0	10.7	0.25
101					
102					
103					
104					
105					
106					
107					
108					
109					
110					
Mean	**0.0**	**0.0**	**0.0**	**12.8**	**0.2**
CALCITE INDEX:		**0.0**			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

BOCK						CACK						CATA2-25					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	1	1	4.6		**1**	2	1	5			**1**	2	1	5		
2	0	1	4	4.9		**2**	2	1	5			**2**	2	1	5		
3	0	1	2	7.1		**3**	2	1	5			**3**	2	1	5		
4	0	1	1	5.2		**4**	2	1	5			**4**	2	1	5		
5	0	1	1	6.0		**5**	2	1	5			**5**	2	1	5		
6	0	1	2	5.3		**6**	2	1	5			**6**	2	1	5		
7	0	1	2	6.1		**7**	2	1	5			**7**	2	1	5		
8	0	1	2	4.6		**8**	2	1	5			**8**	2	1	5		
9	0	1	2	8.6		**9**	2	1	5			**9**	2	1	5		
10	0	1	2	4.9	0.25	**10**	2	1	5			**10**	2	1	5		
11	0	1	2	6.9		**11**	2	1	5			**11**	2	1	5		
12	0	1	2	4.6		**12**	2	1	5			**12**	2	1	5		
13	0	1	2	7.2		**13**	2	1	5			**13**	2	1	5		
14	0	1	1	4.6		**14**	2	1	5			**14**	2	1	5		
15	0	1	2	6.6		**15**	2	1	5			**15**	2	1	5		
16	0	1	1	4.3		**16**	2	1	5			**16**	2	1	5		
17	0	1	2	6.8		**17**	2	1	5			**17**	2	1	5		
18	0	1	2	3.7		**18**	2	1	5			**18**	2	1	5		
19	0	1	2	4.2		**19**	2	1	5			**19**	2	1	5		
20	0	1	1	5.3	0.25	**20**	2	1	5			**20**	2	1	5		
21	0	1	1	2.7		**21**	2	1	5			**21**	2	1	5		
22	0	1	1	9.0		**22**	2	1	5			**22**	2	1	5		
23	0	1	1	5.1		**23**	2	1	5			**23**	2	1	5		
24	0	0	0	3.2		**24**	2	1	5			**24**	2	1	5		
25	0	1	1	6.2		**25**	2	1	5			**25**	2	1	5		
26	-	1	-	<0.1		**26**	2	1	5			**26**	2	1	5		
27	0	1	1	3.1		**27**	2	1	5			**27**	2	1	5		
28	0	1	1	4.1		**28**	2	1	5			**28**	2	1	5		
29	0	1	1	2.6		**29**	2	1	5			**29**	2	1	5		
30	0	1	1	3.4	0.5	**30**	2	1	5			**30**	2	1	5		
31	0	1	1	5.7		**31**	2	1	5			**31**	2	1	5		
32	0	1	1	3.2		**32**	2	1	5			**32**	2	1	5		
33	0	1	1	3.7		**33**	2	1	5			**33**	2	1	5		
34	-	1	-	<0.1		**34**	2	1	5			**34**	2	1	5		
35	0	1	1	2.4		**35**	2	1	5			**35**	2	1	5		
36	0	1	1	6.0		**36**	2	1	5			**36**	2	1	5		
37	0	1	1	4.0		**37**	2	1	5			**37**	2	1	5		
38	0	1	1	7.8		**38**	2	1	5			**38**	2	1	5		
39	0	1	1	3.4		**39**	2	1	5			**39**	2	1	5		
40	0	0	0	0.5		**40**	2	1	5			**40**	2	1	5		
41	-	1	-	<0.1	0	**41**	2	1	5			**41**	2	1	5		
42	0	1	1	4.3		**42**	2	1	5			**42**	2	1	5		
43	0	1	1	3.7		**43**	2	1	5			**43**	2	1	5		
44	0	1	1	3.8		**44**	2	1	5			**44**	2	1	5		
45	0	1	1	3.2		**45**	2	1	5			**45**	2	1	5		
46	0	1	1	3.3		**46**	2	1	5			**46**	2	1	5		
47	0	1	1	5.0		**47**	2	1	5			**47**	2	1	5		
48	0	1	1	2.7		**48**	2	1	5			**48**	2	1	5		
49	-	1	-	<0.1		**49**	2	1	5			**49**	2	1	5		
50	0	1	1	5.9	0.5	**50**	2	1	5			**50**	2	1	5		
51	0	1	1	4.9		**51**	2	1	5			**51**	2	1	5		
52	0	1	1	4.2		**52**	2	1	5			**52**	2	1	5		
53	-	1	-	<0.1		**53**	2	1	5			**53**	2	1	5		
54	0	1	1	2.9		**54**	2	1	5			**54**	2	1	5		
55	0	1	2	5.4		**55**	2	1	5			**55**	2	1	5		
56	0	1	2	6.0		**56**	2	1	5			**56**	2	1	5		
57	0	0	0	0.2		**57**	2	1	5			**57**	2	1	5		
58	0	1	1	4.3		**58**	2	1	5			**58**	2	1	5		
59	0	1	2	4.5		**59**	2	1	5			**59**	2	1	5		
60	0	1	1	6.3	0	**60**	2	1	5			**60**	2	1	5		
61	0	1	2	3.5		**61**	2	1	5			**61**	2	1	5		
62	0	1	2	5.3		**62**	2	1	5			**62**	2	1	5		
63	0	1	2	4.1		**63**	2	1	5			**63**	2	1	5		
64	0	1	2	4.0		**64**	2	1	5			**64**	2	1	5		
65	0	1	1	5.3		**65**	2	1	5			**65**	2	1	5		
66	0	1	1	3.6		**66**	2	1	5			**66**	2	1	5		
67	0	1	1	4.0		**67**	2	1	5			**67**	2	1	5		
68	0	1	1	4.4		**68**	2	1	5			**68**	2	1	5		
69	0	1	2	6.0		**69**	2	1	5			**69**	2	1	5		
70	0	1	1	5.2	0.5	**70**	2	1	5			**70**	2	1	5		
71	0	1	1	4.5		**71**	2	1	5			**71**	2	1	5		
72	0	1	1	3.9		**72**	2	1	5			**72**	2	1	5		
73	0	1	2	5.5		**73**	2	1	5			**73**	2	1	5		
74	0	1	1	2.6		**74**	2	1	5			**74**	2	1	5		
75	0	1	1	4.0		**75**	2	1	5			**75**	2	1	5		
76	-	1	-	<0.1		**76**	2	1	5			**76**	2	1	5		
77	0	1	1	2.1		**77**	2	1	5			**77**	2	1	5		
78	0	1	2	4.1		**78**	2	1	5			**78**	2	1	5		
79	-	1	-	<0.1		**79**	2	1	5			**79**	2	1	5		
80	0	1	2	3.2	0.25	**80**	2	1	5			**80**	2	1	5		
81	0	1	2	3.4		**81**	2	1	5			**81**	2	1	5		
82	0	1	1	3.4		**82**	2	1	5			**82**	2	1	5		
83	0	1	1	5.1		**83**	2	1	5			**83**	2	1	5		
84	0	1	1	5.1		**84**	2	1	5			**84**	2	1	5		
85	0	1	1	3.8		**85**	2	1	5			**85**	2	1	5		
86	0	1	1	3.8		**86**	2	1	5			**86**	2	1	5		
87	0	1	1	4.2		**87**	2	1	5			**87**	2	1	5		
88	0	1	1	5.6		**88**	2	1	5			**88**	2	1	5		
89	0	1	1	2.9		**89**	2	1	5			**89**	2	1	5		
90	0	1	1	5.3	0.25	**90**	2	1	5			**90**	2	1	5		
91	0	1	1	4.8		**91**	2	1	5			**91**	2	1	5		
92	0	1	1	5.2		**92**	2	1	5			**92**	2	1	5		
93	0	1	1	3.2		**93**	2	1	5			**93**	2	1	5		
94	0	1	2	4.3		**94**	2	1	5			**94**	2	1	5		
95	0	1	2	3.7		**95**	2	1	5			**95**	2	1	5		
96	0	1	2	4.1		**96**	2	1	5			**96**	2	1	5		
97	0	1	1	4.1		**97**	2	1	5			**97**	2	1	5		
98	0	1	2	4.5		**98**	2	1	5			**98**	2	1	5		
99	0	0	0	0.2		**99**	2	1	5			**99**	2	1	5		
100	0	1	2	6.1	0.5	**100**	2	1	5			**100**	2	1	5		
101	0	1	1	0.7		**101**						**101**					
102	0	1	1	5.9		**102**						**102**					
103	0	1	1	3.4		**103**						**103**					
104	0	1	2	5.6		**104**						**104**					
105	0	1	2	4.6		**105**						**105**					
106	0	1	1	4.0		**106**						**106**					
107	0	1	1	2.3		**107**						**107**					
108	0	1	1	6.1		**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.0**	**0.96**	**1.3**	**4.2**	**0.3**	**Mean**	**2.0**	**1.0**	**5.0**			**Mean**	**2.0**	**1.0**	**5.0**		
CALCITE INDEX:		**0.96**				**CALCITE INDEX:**		**3.0**				**CALCITE INDEX:**		**3.0**			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

CATA2-75						CHC-JR1						CLC-SP1					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	2	1	5			**1**	0	1	1	9.2		**1**	0	1	1	7.4	
2	2	1	5			**2**	0	1	1	9.9		**2**	1	1	1	7.3	
3	2	1	5			**3**	0	1	1	11.7		**3**	0	1	1	10.1	
4	2	1	5			**4**	0	1	1	7.6		**4**	1	1	1	3.1	
5	2	1	5			**5**	0	1	1	11.0		**5**	1	1	1	3.2	
6	2	1	5			**6**	0	0	0	3.9		**6**	1	1	1	3.5	
7	2	1	5			**7**	0	0	0	6.1		**7**	1	1	1	11.5	
8	2	1	5			**8**	0	0	0	3.5		**8**	1	1	1	3.5	
9	2	1	5			**9**	0	1	1	8.7		**9**	1	1	1	2.1	
10	2	1	5			**10**	0	1	1	10.0	0.5	**10**	1	1	1	5.2	0.25
11	2	1	5			**11**	0	1	1	9.5		**11**	1	1	1	6.3	
12	2	1	5			**12**	0	0	0	7.1		**12**	0	1	1	8.2	
13	2	1	5			**13**	0	1	1	10.5		**13**	1	1	1	5.5	
14	2	1	5			**14**	0	1	1	6.3		**14**	0	1	1	4.3	
15	2	1	5			**15**	0	0	0	7.5		**15**	1	1	1	5.5	
16	2	1	5			**16**	0	1	1	12.6		**16**	1	1	1	2.2	
17	2	1	5			**17**	0	1	1	11.7		**17**	0	1	1	2.1	
18	2	1	5			**18**	0	1	1	12.0		**18**	0	1	1	2.5	
19	2	1	5			**19**	0	1	1	3.4		**19**	0	1	1	3.3	
20	2	1	5			**20**	0	1	1	14.5	0.25	**20**	0	0	0	2.3	0.75
21	2	1	5			**21**	0	1	1	7.0		**21**	0	0	0	2.8	
22	2	1	5			**22**	0	1	1	8.5		**22**	1	1	3	5.1	
23	2	1	5			**23**	0	0	0	6.2		**23**	0	1	1	5.9	
24	2	1	5			**24**	0	1	1	10.3		**24**	1	1	1	2.4	
25	2	1	5			**25**	0	1	1	26.0		**25**	0	1	1	2.4	
26	2	1	5			**26**	0	1	1	19.8		**26**	0	0	0	1.5	
27	2	1	5			**27**	0	1	1	10.5		**27**	1	1	1	3.5	
28	2	1	5			**28**	0	1	1	11.0		**28**	1	1	1	3.4	
29	2	1	5			**29**	0	1	1	18.5		**29**	1	1	1	2.5	
30	2	1	5			**30**	0	1	1	10.0	0.5	**30**	1	1	3	4.4	0.5
31	2	1	5			**31**	0	1	1	7.9		**31**	1	1	2	2.4	
32	2	1	5			**32**	0	1	1	10.4		**32**	1	1	2	7.9	
33	2	1	5			**33**	0	1	1	17.5		**33**	0	1	1	7.1	
34	2	1	5			**34**	0	1	1	5.5		**34**	0	1	1	3.4	
35	2	1	5			**35**	0	1	1	9.4		**35**	0	1	1	4.1	
36	2	1	5			**36**	0	1	1	19.0		**36**	0	1	1	3.4	
37	2	1	5			**37**	0	1	1	12.8		**37**	1	1	1	3.5	
38	2	1	5			**38**	0	1	1	15.8		**38**	0	1	1	3.5	
39	2	1	5			**39**	0	1	1	17.0		**39**	1	1	1	5.1	
40	2	1	5			**40**	0	1	1	15.0	0.25	**40**	0	0	0	5.5	0.5
41	2	1	5			**41**	0	1	1	11.9		**41**	1	1	1	3.3	
42	2	1	5			**42**	0	1	1	17.5		**42**	0	0	0	6.5	
43	2	1	5			**43**	0	1	1	13.5		**43**	0	1	1	2.5	
44	2	1	5			**44**	0	1	1	4.0		**44**	0	1	1	5.5	
45	2	1	5			**45**	0	1	1	14.7		**45**	0	1	1	3.4	
46	2	1	5			**46**	0	1	1	7.1		**46**	0	1	1	3.6	
47	2	1	5			**47**	0	1	1	12.6		**47**	0	1	1	5.4	
48	2	1	5			**48**	0	1	1	17.0		**48**	1	1	1	3.4	
49	2	1	5			**49**	0	1	1	6.8		**49**	0	1	1	4.5	
50	2	1	5			**50**	0	1	1	8.5	0.25	**50**	0	0	0	2.2	0.5
51	2	1	5			**51**	0	1	1	7.9		**51**	0	1	1	3.5	
52	2	1	5			**52**	0	1	1	5.5		**52**	0	1	1	3.1	
53	2	1	5			**53**	0	1	1	6.1		**53**	0	1	1	5.9	
54	2	1	5			**54**	0	1	1	5.7		**54**	0	0	0	3.4	
55	2	1	5			**55**	0	0	0	2.2		**55**	0	1	1	6.5	
56	2	1	5			**56**	0	1	1	7.5		**56**	0	1	1	9.4	
57	2	1	5			**57**	0	1	1	6.6		**57**	0	1	1	10.5	
58	2	1	5			**58**	0	1	1	7.0		**58**	0	1	1	6.6	
59	2	1	5			**59**	0	1	1	9.7		**59**	0	1	1	7.5	
60	2	1	5			**60**	0	1	1	6.6	0.5	**60**	0	1	1	8.5	0.25
61	2	1	5			**61**	0	1	1	5.8		**61**	0	1	1	9.2	
62	2	1	5			**62**	0	1	1	13.0		**62**	0	1	1	5.1	
63	2	1	5			**63**	0	1	1	5.0		**63**	0	1	1	3.1	
64	2	1	5			**64**	0	1	1	10.2		**64**	0	1	1	6.4	
65	2	1	5			**65**	0	1	1	14.1		**65**	0	1	1	4.2	
66	2	1	5			**66**	0	1	1	7.5		**66**	1	1	1	7.5	
67	2	1	5			**67**	0	1	1	17.2		**67**	0	1	1	4.5	
68	2	1	5			**68**	0	1	1	9.5		**68**	0	1	1	5.5	
69	2	1	5			**69**	0	1	1	8.2		**69**	0	1	1	3.4	
70	2	1	5			**70**	0	1	1	10.4	0.75	**70**	0	1	1	2.9	0.5
71	2	1	5			**71**	0	1	1	10.6		**71**	0	1	1	8.4	
72	2	1	5			**72**	0	1	2	20.4		**72**	0	1	1	4.6	
73	2	1	5			**73**	0	1	1	7.9		**73**	0	1	1	6.8	
74	2	1	5			**74**	0	1	1	9.9		**74**	0	1	1	1.9	
75	2	1	5			**75**	0	1	1	9.2		**75**	0	1	1	3.0	
76	2	1	5			**76**	0	1	1	8.3		**76**	0	1	1	3.4	
77	2	1	5			**77**	0	1	1	21.6		**77**	0	1	1	2.1	
78	2	1	5			**78**	0	1	1	13.0		**78**	0	1	1	5.3	
79	2	1	5			**79**	0	1	1	6.4		**79**	0	1	1	3.6	
80	2	1	5			**80**	0	1	1	15.0	0.5	**80**	0	1	1	3.8	0.5
81	2	1	5			**81**	0	1	1	7.8		**81**	0	1	1	5.2	
82	2	1	5			**82**	0	1	1	15.4		**82**	0	1	1	4.1	
83	2	1	5			**83**	0	1	1	6.2		**83**	0	1	1	3.3	
84	2	1	5			**84**	0	1	1	8.7		**84**	0	1	1	2.5	
85	2	1	5			**85**	0	1	1	12.0		**85**	0	1	1	6.4	
86	2	1	5			**86**	0	1	1	13.0		**86**	1	1	1	3.5	
87	2	1	5			**87**	0	0	0	7.1		**87**	0	1	2	4.2	
88	2	1	5			**88**	0	1	1	27.0		**88**	1	1	1	4.4	
89	2	1	5			**89**	0	1	1	6.2		**89**	0	1	1	2.8	
90	2	1	5			**90**	0	1	1	21.4	0.5	**90**	0	1	1	5.8	0.5
91	2	1	5			**91**	0	1	1	8.1		**91**	0	0	0	1.5	
92	2	1	5			**92**	0	1	1	7.1		**92**	0	1	1	2.0	
93	2	1	5			**93**	0	1	1	6.1		**93**	0	1	1	4.9	
94	2	1	5			**94**	0	0	0	6.5		**94**	0	1	1	2.1	
95	2	1	5			**95**	0	1	1	6.9		**95**	0	1	1	3.1	
96	2	1	5			**96**	0	1	1	8.9		**96**	0	1	1	4.5	
97	2	1	5			**97**	0	1	1	10.6		**97**	1	1	1	2.5	
98	2	1	5			**98**	0	1	1	6.8		**98**	0	1	1	6.1	
99	2	1	5			**99**	0	0	0	6.9		**99**	0	1	3	6.2	
100	2	1	5			**100**	0	1	1	7.2	0.25	**100**	0	1	1	5.1	0.5
101						**101**						**101**					
102						**102**						**102**					
103						**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**2.0**	**1.0**	**5.0**			**Mean**	**0.0**	**0.90**	**0.91**	**10.4**	**0.4**	**Mean**	**0.28**	**0.92**	**1.0**	**4.6**	**0.5**
CALCITE INDEX:		**3.0**				**CALCITE INDEX:**		**0.90**				**CALCITE INDEX:**		**1.2**			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

COCK						DC-JR1						EL1					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	1	1	2	4.7		**1**	0	0	0	8.3		**1**	0	0	0	7.1	
2	0	1	2	4.0		**2**	0	0	0	2.3		**2**	0	0	0	10.9	
3	1	1	2	13.4		**3**	0	0	0	6.5		**3**	0	0	0	9.6	
4	0	1	3	3.2		**4**	0	0	0	6.9		**4**	0	1	1	12.3	
5	1	1	2	1.4		**5**	0	0	0	4.2		**5**	0	0	0	7.9	
6	0	1	3	21.4		**6**	0	0	0	7.9		**6**	0	1	1	8.9	
7	0	1	2	4.5		**7**	0	0	0	10.3		**7**	0	0	0	8.4	
8	0	1	2	2.7		**8**	0	0	0	4.9		**8**	0	0	0	7.1	
9	0	1	2	7.5		**9**	0	0	0	11.6		**9**	0	0	0	6.8	
10	0	1	1	4.7	0.25	**10**	0	0	0	8.7	0.25	**10**	0	1	1	15.1	0.5
11	1	1	2	13.0		**11**	0	0	0	9.2		**11**	0	0	0	5.8	
12	1	1	2	2.7		**12**	0	0	0	7.0		**12**	0	0	0	8.9	
13	0	1	1	4.6		**13**	0	0	0	5.5		**13**	0	0	0	4.9	
14	0	1	2	2.6		**14**	0	0	0	12.0		**14**	0	1	1	11.7	
15	1	1	2	6.2		**15**	0	0	0	9.6		**15**	0	0	0	17.8	
16	0	1	1	2.4		**16**	0	0	0	3.7		**16**	0	0	0	10.5	
17	0	1	2	4.3		**17**	0	0	0	7.0		**17**	0	0	0	12.8	
18	1	1	2	6.3		**18**	0	0	0	8.0		**18**	0	1	1	11.4	
19	0	1	1	3.1		**19**	0	0	0	6.7		**19**	0	1	1	12.6	
20	1	1	2	4.5	0.5	**20**	0	0	0	7.1	0.5	**20**	0	0	0	15.8	0.5
21	0	1	2	2.3		**21**	0	0	0	8.5		**21**	0	0	0	8.8	
22	2	1	2	3.5		**22**	0	0	0	9.5		**22**	0	0	0	12.5	
23	2	1	1	8.1		**23**	0	0	0	7.8		**23**	0	1	1	13.1	
24	0	1	2	7.1		**24**	0	0	0	9.5		**24**	0	0	0	2.1	
25	1	1	2	18.2		**25**	0	0	0	4.9		**25**	0	1	1	6	
26	2	1	2	5.7		**26**	0	0	0	7.4		**26**	0	1	1	9.1	
27	0	1	2	8.1		**27**	0	0	0	3.9		**27**	0	1	1	17.9	
28	0	1	1	4.6		**28**	0	0	0	11.2		**28**	0	1	1	7.5	
29	1	1	2	9.7		**29**	0	0	0	8.1		**29**	0	1	1	11.8	
30	0	1	2	3.2	0.5	**30**	0	0	0	3.6	0	**30**	0	0	0	5.1	0.25
31	0	1	1	4.7		**31**	0	0	0	3.8		**31**	0	1	1	11.6	
32	0	1	3	3.9		**32**	0	0	0	4.0		**32**	0	1	1	11.5	
33	0	1	2	6.1		**33**	0	0	0	3.4		**33**	0	0	0	4.8	
34	0	1	2	4.0		**34**	0	0	0	6.3		**34**	0	0	0	5.6	
35	0	1	2	3.2		**35**	0	0	0	3.3		**35**	0	0	0	16	
36	0	1	1	1.6		**36**	0	0	0	8.5		**36**	0	0	0	16.3	
37	0	1	1	1.3		**37**	0	0	0	8.9		**37**	0	1	1	6.6	
38	0	1	1	4.3		**38**	0	0	0	3.7		**38**	0	1	1	12.4	
39	0	0	0	2.3		**39**	0	0	0	7.4		**39**	0	0	0	4.7	
40	0	1	1	1.5	0	**40**	0	0	0	6.1	0.5	**40**	0	1	1	12.6	0.25
41	0	1	2	3.6		**41**	0	0	0	3.3		**41**	0	1	1	5.1	
42	0	1	2	7.0		**42**	0	0	0	3.4		**42**	0	0	0	12.4	
43	0	1	2	4.9		**43**	0	0	0	5.5		**43**	0	0	0	7.9	
44	1	1	2	4.2		**44**	0	0	0	4.1		**44**	0	0	0	14.4	
45	1	1	2	11.7		**45**	0	0	0	9.7		**45**	0	0	0	6.3	
46	1	1	3	18.2		**46**	0	0	0	10.0		**46**	0	0	0	4.5	
47	1	1	2	7.7		**47**	0	0	0	5.0		**47**	0	1	1	12.1	
48	0	1	1	2.5		**48**	0	0	0	4.6		**48**	0	0	0	6.7	
49	1	1	2	15.2		**49**	0	0	0	8.0		**49**	0	0	0	4.8	
50	0	1	1	1.9	0	**50**	0	0	0	6.0	0.25	**50**	0	1	1	5.6	0.25
51	0	1	2	9.5		**51**	0	0	0	9.0		**51**	0	0	0	7.4	
52	0	1	1	15.5		**52**	0	0	0	3.3		**52**	0	1	1	15.1	
53	1	1	1	12.0		**53**	0	0	0	2.4		**53**	0	0	0	5.9	
54	1	1	2	5.7		**54**	0	0	0	1.8		**54**	0	1	1	9.4	
55	1	1	2	13.7		**55**	0	0	0	6.5		**55**	0	0	0	4.1	
56	0	1	2	6.5		**56**	0	0	0	3.0		**56**	0	0	0	6.2	
57	0	1	1	11.5		**57**	0	0	0	5.4		**57**	0	1	1	14.6	
58	0	1	1	3.4		**58**	0	0	0	4.6		**58**	0	1	1	23.8	
59	0	1	2	5.0		**59**	0	0	0	3.5		**59**	0	0	0	4.5	
60	0	1	1	9.4		**60**	0	0	0	7.2	0.25	**60**	0	0	0	5.8	0
61	0	1	2	11.4	0.5	**61**	0	0	0	10.3		**61**	0	1	1	14.1	
62	0	1	1	1.7		**62**	0	0	0	5.2		**62**	0	1	1	6.6	
63	0	1	2	2.7		**63**	0	0	0	9.8		**63**	0	1	1	4.9	
64	0	1	2	11.7		**64**	0	0	0	7.7		**64**	0	0	0	24.3	
65	0	1	1	2.2		**65**	0	0	0	9.0		**65**	0	1	1	9.1	
66	0	1	2	2.3		**66**	0	0	0	8.1		**66**	0	1	1	23.2	
67	0	1	2	3.8		**67**	0	0	0	8.1		**67**	0	0	0	6.9	
68	1	1	2	15.9		**68**	0	0	0	11.3		**68**	0	0	0	5.9	
69	0	1	2	7.0		**69**	0	0	0	9.4		**69**	0	0	0	5	
70	1	1	1	11.8	0.75	**70**	0	0	0	9.8	0.25	**70**	0	1	1	31.3	0.5
71	1	1	2	10.5		**71**	0	0	0	10.2		**71**	0	0	0	6.8	
72	0	1	2	8.8		**72**	0	0	0	6.3		**72**	0	1	1	7.9	
73	1	1	2	10.5		**73**	0	0	0	7.0		**73**	0	0	0	18.1	
74	1	1	2	17.2		**74**	0	0	0	7.7		**74**	0	1	1	13	
75	0	1	2	2.8		**75**	0	0	0	8.5		**75**	0	0	0	10.5	
76	1	1	2	4.7		**76**	0	0	0	5.7		**76**	0	1	1	15.8	
77	1	1	2	5.7		**77**	0	0	0	8.2		**77**	0	0	0	6.7	
78	0	1	1	3.3		**78**	0	0	0	6.1		**78**	0	1	1	10.9	
79	1	1	2	20.7		**79**	0	0	0	6.4		**79**	0	1	1	6.7	
80	0	1	1	2.8	0.5	**80**	0	0	0	12.5	0.5	**80**	0	1	1	12	0.5
81	1	1	2	10.5		**81**	0	0	0	8.2		**81**	0	0	0	17.4	
82	0	1	1	5.5		**82**	0	0	0	5.6		**82**	0	1	1	14.5	
83	0	1	2	6.4		**83**	0	0	0	5.7		**83**	0	1	1	9.5	
84	0	1	1	6.6		**84**	0	0	0	6.2		**84**	0	0	0	13.3	
85	0	1	1	3.5		**85**	0	0	0	5.2		**85**	0	1	1	8.3	
86	0	1	1	2.0		**86**	0	0	0	5.6		**86**	0	1	1	8.4	
87	1	1	3	17.4		**87**	0	0	0	7.0		**87**	0	0	0	1.9	
88	0	1	2	4.7		**88**	0	0	0	12.4		**88**	0	1	1	11.4	
89	1	1	2	15.0		**89**	0	0	0	3.5		**89**	0	0	0	6.4	
90	0	1	2	4.7	0.75	**90**	0	0	0	8.1	0	**90**	0	0	0	5.2	0.25
91	0	1	2	3.3		**91**	0	0	0	8.0		**91**	0	1	1	15.4	
92	0	1	1	2.8		**92**	0	0	0	5.0		**92**	0	1	1	6.8	
93	0	1	2	1.8		**93**	0	0	0	4.3		**93**	0	0	0	5.3	
94	0	1	2	1.7		**94**	0	0	0	8.2		**94**	0	1	1	15.8	
95	1	1	2	8.4		**95**	0	0	0	9.7		**95**	0	0	0	11.7	
96	2	1	1	9.4		**96**	0	0	0	9.6		**96**	0	0	0	6.8	
97	0	1	2	6.1		**97**	0	0	0	5.0		**97**	0	0	0	4.1	
98	0	1	2	10.3		**98**	0	0	0	5.9		**98**	0	0	0	10.9	
99	0	1	1	1.8		**99**	0	0	0	6.6		**99**	0	1	1	16	
100	0	0	0	1.9	0.75	**100**	0	0	0	10.2	0	**100**	0	1	1	11.8	0.25
101						**101**						**101**					
102						**102**						**102**					
103						**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.38**	**0.98**	**1.7**	**6.7**	**0.5**	**Mean**	**0.0**	**0.0**	**0.0**	**6.9**	**0.3**	**Mean**	**0.0**	**0.46**	**0.46**	**10.2**	**0.3**
CALCITE INDEX:		**1.4**				**CALCITE INDEX:**		**0.0**				**CALCITE INDEX:**		**0.46**			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

EL19						EL20						ELDEL					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	1	2	22		**1**	0	0	0	14		**1**	0	0	0	1.9	
2	0	1	2	17		**2**	0	1	2	13		**2**	0	0	0	2.5	
3	0	1	2	13		**3**	0	1	2	7		**3**	0	0	0	5.7	
4	0	1	2	26		**4**	0	1	2	17		**4**	0	0	0	5.2	
5	0	1	2	10		**5**	0	0	0	4		**5**	0	0	0	5	
6	0	1	2	21		**6**	0	1	2	10.5		**6**	0	0	0	1.6	
7	0	1	2	12.5		**7**	0	0	0	10		**7**	0	0	0	5.4	
8	0	1	2	19		**8**	0	1	1	7		**8**	0	0	0	6.6	
9	0	1	2	9.5		**9**	0	1	2	9.5		**9**	0	0	0	6.9	
10	0	1	2	12.5	0.5	**10**	0	1	2	13.5	0.5	**10**	0	0	0	2.3	0.5
11	0	1	2	10.5		**11**	0	1	2	12		**11**	0	0	0	4.4	
12	0	1	2	20		**12**	0	1	2	9.5		**12**	0	0	0	4	
13	0	1	2	15		**13**	0	1	2	15		**13**	0	0	0	4.9	
14	0	1	2	23		**14**	0	1	1	12.5		**14**	0	0	0	6.3	
15	0	1	2	35		**15**	0	1	2	12		**15**	0	1	1	3.8	
16	0	1	2	16		**16**	0	1	2	10		**16**	0	0	0	6.4	
17	0	1	3	17		**17**	0	1	1	15.5		**17**	0	0	0	3	
18	0	1	2	19.5		**18**	0	1	1	9.5		**18**	0	0	0	2.3	
19	0	1	2	25		**19**	0	1	1	12.5		**19**	0	0	0	4.4	
20	0	1	2	13	0.25	**20**	0	1	2	17	0.25	**20**	0	0	0	3.4	0
21	0	1	2	17		**21**	0	1	2	19		**21**	0	0	0	3.3	
22	0	1	2	27		**22**	0	1	1	11		**22**	0	1	1	7.6	
23	0	1	2	18		**23**	0	1	2	17		**23**	0	0	0	6.4	
24	0	1	2	11.5		**24**	0	0	0	11.5		**24**	0	1	2	5.6	
25	0	1	2	43		**25**	0	1	1	8		**25**	0	0	0	2.7	
26	0	1	2	16.5		**26**	0	1	1	11.5		**26**	0	0	0	3.4	
27	0	1	2	12.5		**27**	0	1	2	16.5		**27**	0	0	0	5.6	
28	0	1	2	10		**28**	0	1	1	16.5		**28**	0	0	0	4.3	
29	0	1	2	35		**29**	0	1	2	11		**29**	0	0	0	3.4	
30	0	1	3	13	0.25	**30**	0	1	1	4.5	0.25	**30**	0	1	1	7.1	0
31	0	1	2	13		**31**	0	1	2	11.5		**31**	0	1	2	4.9	
32	0	1	2	14		**32**	0	1	2	16		**32**	0	0	0	3.8	
33	0	1	2	14.5		**33**	0	1	1	17		**33**	0	1	2	5.6	
34	0	1	2	12		**34**	0	1	2	12		**34**	0	0	0	3.8	
35	0	1	2	9.5		**35**	0	1	2	16		**35**	0	0	0	2.6	
36	0	1	2	16		**36**	0	1	2	15.5		**36**	0	0	0	1.9	
37	0	1	2	9.5		**37**	0	1	1	14		**37**	0	0	0	6.1	
38	0	1	3	11		**38**	0	1	1	11.5		**38**	0	0	0	5.2	
39	0	1	2	14		**39**	0	1	1	7.5		**39**	0	0	0	6	
40	0	1	3	19	0.25	**40**	0	0	0	7.5	0.25	**40**	0	0	0	5.5	0
41	0	1	2	18		**41**	0	1	1	14		**41**	0	0	0	3.7	
42	0	1	2	41		**42**	0	1	1	12		**42**	0	0	0	3.3	
43	0	1	2	32		**43**	0	1	1	14		**43**	0	1	2	6	
44	0	1	2	14.5		**44**	0	0	0	9		**44**	0	1	1	5	
45	0	1	2	17		**45**	0	1	1	8		**45**	0	0	0	2.2	
46	0	1	3	18		**46**	0	1	2	14.5		**46**	0	1	1	9.5	
47	0	1	2	11.5		**47**	0	1	1	10		**47**	0	0	0	5.6	
48	0	1	2	22		**48**	0	1	2	9		**48**	0	0	0	6.1	
49	0	1	2	36		**49**	0	1	1	5.5		**49**	0	0	0	5.1	
50	0	1	2	9.5	0.25	**50**	0	1	1	9	0.25	**50**	0	0	0	6	0.25
51	0	1	2	14.5		**51**	0	1	1	12		**51**	0	0	0	1.8	
52	0	1	2	11		**52**	0	1	1	8.5		**52**	0	0	0	6.2	
53	0	1	2	20		**53**	0	1	2	7.5		**53**	0	0	0	4.4	
54	0	1	2	19		**54**	0	0	0	11		**54**	0	0	0	4	
55	0	1	2	14		**55**	0	0	0	16		**55**	0	0	0	5.6	
56	0	1	2	14		**56**	0	1	2	11.5		**56**	0	0	0	5.4	
57	0	1	2	25		**57**	0	1	1	12		**57**	0	0	0	5.3	
58	0	1	2	10.5		**58**	0	1	2	12		**58**	0	0	0	5.5	
59	0	1	2	19		**59**	0	1	2	13.5		**59**	0	0	0	6.9	
60	0	1	2	11	0.25	**60**	0	1	1	16	0.25	**60**	0	1	2	6.8	0
61	0	1	2	15.5		**61**	0	1	1	12		**61**	0	0	0	4.7	
62	0	1	2	12		**62**	0	1	1	16.5		**62**	0	1	1	7.4	
63	0	1	2	50		**63**	0	0	0	14.5		**63**	0	0	0	5.2	
64	0	1	2	14		**64**	0	1	2	15		**64**	0	0	0	2.8	
65	0	1	3	16		**65**	0	0	0	10		**65**	0	0	0	3.2	
66	0	1	2	49		**66**	0	1	2	9.5		**66**	0	0	0	7.5	
67	0	1	2	14.5		**67**	0	1	2	15.5		**67**	0	0	0	5	
68	0	1	2	18		**68**	0	1	2	13		**68**	0	0	0	3.1	
69	0	1	2	17.5		**69**	0	1	1	14.5		**69**	0	1	1	7.2	
70	0	1	2	10.5	0.25	**70**	0	1	2	14	0.25	**70**	0	1	1	6.1	0.5
71	0	1	2	17		**71**	0	1	1	13.5		**71**	0	0	0	7.4	
72	0	1	2	16		**72**	0	1	2	17		**72**	0	0	0	7.1	
73	0	1	2	12.5		**73**	0	1	2	8		**73**	0	0	0	7.9	
74	0	1	3	19		**74**	0	0	0	9		**74**	0	0	0	5.9	
75	0	1	3	17		**75**	0	1	2	8		**75**	0	0	0	4.9	
76	0	1	2	32		**76**	0	0	0	7.5		**76**	0	0	0	8.4	
77	0	1	2	11		**77**	0	1	1	10		**77**	0	1	2	7	
78	0	1	2	15		**78**	0	0	0	12		**78**	0	0	0	4.6	
79	0	1	2	10.5		**79**	0	0	0	8		**79**	0	0	0	6.4	
80	0	1	2	23	0.5	**80**	0	1	2	14	0.25	**80**	0	0	0	7.1	0.25
81	0	1	2	11		**81**	0	1	2	11		**81**	0	0	0	6.2	
82	0	1	3	12		**82**	0	1	2	13		**82**	0	0	0	5.9	
83	0	1	2	29		**83**	0	1	1	12.5		**83**	0	1	1	7.5	
84	0	1	2	38		**84**	0	1	1	15		**84**	0	0	0	3.2	
85	0	1	1	10		**85**	0	0	0	7		**85**	0	0	0	3.2	
86	0	1	2	17		**86**	0	1	1	11.5		**86**	0	0	0	4.2	
87	0	1	2	8.5		**87**	0	1	1	7.5		**87**	0	0	0	7.9	
88	0	1	2	18		**88**	0	1	2	14.5		**88**	0	0	0	2.5	
89	0	1	2	9.5		**89**	0	1	2	10		**89**	0	0	0	3	
90	0	1	2	14	0.25	**90**	0	1	1	13	0.25	**90**	0	1	2	5.5	0.5
91	0	1	2	16		**91**	0	0	0	7		**91**	0	0	0	6	
92	0	1	2	25		**92**	0	1	2	12.5		**92**	0	0	0	3.9	
93	0	1	2	10		**93**	0	1	1	11		**93**	0	0	0	8.5	
94	0	1	1	17		**94**	0	1	1	10.5		**94**	0	0	0	3.7	
95	0	1	2	32		**95**	0	0	0	4		**95**	0	0	0	4.1	
96	0	1	2	14		**96**	0	1	2	11		**96**	0	1	1	6.5	
97	0	1	2	14		**97**	0	0	0	10		**97**	0	1	2	8	
98	0	1	1	15.5		**98**	0	1	2	4.5		**98**	0	1	1	5.1	
99	0	1	2	15		**99**	0	0	0	14		**99**	0	1	2	4.9	
100	0	1	2	13	0.25	**100**	0	1	1	7.5	0.25	**100**	0	0	0	5.5	0
101						**101**						**101**					
102						**102**						**102**					
103						**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.0**	**1.0**	**2.1**	**18.0**	**0.3**	**Mean**	**0.0**	**0.81**	**1.24**	**11.6**	**0.3**	**Mean**	**0.0**	**0.20**	**0.29**	**5.1**	**0.2**
CALCITE INDEX:		**1.0**				**CALCITE INDEX:**		**0.81**				**CALCITE INDEX:**		**0.20**			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

ELDFE						ELDGR						ELELKO					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	1	1	33.3		**1**	0	0	0	15.3		**1**	0	0	0	5.4	
2	0	1	1	14.1		**2**	0	0	0	16.5		**2**	0	0	0	4.8	
3	0	1	1	18.1		**3**	0	0	0	3.8		**3**	0	0	0	6.0	
4	0	1	1	10.1		**4**	0	0	0	8		**4**	0	0	0	9.9	
5	0	1	1	16		**5**	0	0	0	4.3		**5**	0	0	0	5.3	
6	0	1	1	9.1		**6**	0	0	0	7.2		**6**	0	0	0	2.6	
7	0	0	0	9.4		**7**	0	0	0	11.5		**7**	0	0	0	6.8	
8	0	0	0	1.2		**8**	0	0	0	10		**8**	0	0	0	10.1	
9	0	0	0	18.2		**9**	0	0	0	6.5		**9**	0	0	0	2.8	
10	0	1	1	5	0.25	**10**	0	0	0	9.7	0.25	**10**	0	0	0	17.6	0
11	0	1	1	3.7		**11**	0	0	0	13.4		**11**	0	0	0	2.9	
12	0	1	1	24.2		**12**	0	0	0	23.2		**12**	0	0	0	5.7	
13	0	1	1	18.7		**13**	0	0	0	21.5		**13**	0	0	0	g	
14	0	1	1	6.1		**14**	0	0	0	4.9		**14**	0	0	0	3.3	
15	0	1	1	19.1		**15**	0	0	0	7.8		**15**	0	0	0	4.4	
16	0	1	1	9.6		**16**	0	0	0	10.9		**16**	0	0	0	5.2	
17	0	1	1	11.8		**17**	0	0	0	5.1		**17**	0	0	0	2.8	
18	0	1	1	4.5		**18**	0	0	0	11		**18**	0	0	0	5.1	
19	0	1	2	5.9		**19**	0	0	0	6.7		**19**	0	0	0	5.0	
20	0	1	1	14.7	0.5	**20**	0	0	0	6.1	0.5	**20**	0	0	0	11.0	0.5
21	0	1	2	17.8		**21**	0	0	0	9		**21**	0	0	0	5.5	
22	0	1	1	11.7		**22**	0	0	0	2.1		**22**	0	0	0	1.9	
23	0	1	2	15.2		**23**	0	0	0	11.1		**23**	0	0	0	4.6	
24	0	1	2	12.7		**24**	0	0	0	15.2		**24**	0	0	0	6.3	
25	0	1	1	4.7		**25**	0	0	0	16.3		**25**	0	0	0	5.5	
26	0	1	1	2.3		**26**	0	1	1	8.1		**26**	0	0	0	4.8	
27	0	1	2	3.9		**27**	0	1	2	10.3		**27**	0	0	0	6.2	
28	0	1	1	2.4		**28**	0	0	0	13.4		**28**	0	0	0	5.8	
29	0	1	1	18.1		**29**	0	0	0	10		**29**	0	0	0	5.4	
30	0	1	2	14.6	0.5	**30**	0	0	0	8.4	0.25	**30**	0	0	0	7.2	0.25
31	0	1	1	2.2		**31**	0	0	0	20.7		**31**	0	0	0	4.2	
32	0	1	2	11.4		**32**	0	0	0	6		**32**	0	0	0	8.3	
33	0	1	2	12.1		**33**	0	0	0	8.6		**33**	0	0	0	3.9	
34	0	1	1	18.3		**34**	0	0	0	4.6		**34**	0	0	0	9.4	
35	0	1	1	3		**35**	0	0	0	5.2		**35**	0	0	0	8.5	
36	0	1	1	11.2		**36**	0	0	0	7.5		**36**	0	0	0	5.2	
37	0	1	2	10.2		**37**	0	0	0	27.7		**37**	0	0	0	5.9	
38	0	1	1	3.3		**38**	0	0	0	4.2		**38**	0	0	0	6.5	
39	0	1	1	16.4		**39**	0	0	0	5		**39**	0	0	0	7.3	
40	0	1	1	25	0.5	**40**	0	1	1	12		**40**	0	0	0	3.6	0.25
41	0	0	0	16.4		**41**	0	0	0	8.5	0.25	**41**	0	0	0	8.9	
42	0	1	1	16.4		**42**	0	0	0	15.5		**42**	0	0	0	9.7	
43	0	1	2	12.1		**43**	0	0	0	4.9		**43**	0	0	0	3.8	
44	0	1	1	17		**44**	0	0	0	6.4		**44**	0	0	0	3.6	
45	0	1	1	15.1		**45**	0	0	0	20.9		**45**	0	0	0	g	
46	0	0	0	1.8		**46**	0	0	0	13.2		**46**	0	0	0	22.2	
47	0	1	1	3.9		**47**	0	0	0	10.7		**47**	0	0	0	g	
48	0	1	1	8.2		**48**	0	1	2	8.9		**48**	0	0	0	7.0	
49	0	1	2	19.2		**49**	0	0	0	10.7		**49**	0	0	0	7.0	
50	0	1	2	6.2	0.25	**50**	0	0	0	9.4	0.25	**50**	0	0	0	5.9	0.5
51	0	1	2	3.3		**51**	0	0	0	3.4		**51**	0	0	0	3.5	
52	0	1	2	14.2		**52**	0	1	1	14.6		**52**	0	0	0	7.2	
53	0	1	1	20.2		**53**	0	0	0	11.9		**53**	0	0	0	7.4	
54	0	1	1	4.1		**54**	0	0	0	34.2		**54**	0	0	0	8.9	
55	0	1	1	2.8		**55**	0	0	0	16.8		**55**	0	0	0	6.4	
56	0	1	1	23.7		**56**	0	0	0	15.4		**56**	0	0	0	7.0	
57	0	0	0	5.3		**57**	0	0	0	19.2		**57**	0	0	0	4.8	
58	0	1	1	5.3		**58**	0	0	0	5		**58**	0	0	0	7.1	
59	0	1	1	19		**59**	0	1	1	15.8		**59**	0	0	0	7.9	
60	0	0	0	15.5	0.25	**60**	0	1	1	19.9	0.25	**60**	0	0	0	15.5	0.25
61	0	1	1	3.2		**61**	0	1	1	12.6		**61**	0	0	0	5.5	
62	0	1	1	20.8		**62**	0	1	2	6.5		**62**	0	0	0	6.3	
63	0	1	1	4.5		**63**	0	0	0	2.8		**63**	0	0	0	g	
64	0	1	1	3.7		**64**	0	0	0	7.6		**64**	0	0	0	6.5	
65	0	1	1	11.2		**65**	0	0	0	3.9		**65**	0	0	0	3.6	
66	0	1	2	8.9		**66**	0	0	0	14.3		**66**	0	0	0	8.9	
67	0	1	1	4		**67**	0	1	1	7.9		**67**	0	0	0	3.4	
68	0	1	1	15.4		**68**	0	1	1	19.8		**68**	0	0	0	7.9	
69	0	1	1	14.9		**69**	0	0	0	25		**69**	0	0	0	2.6	
70	0	1	1	9.4	0.5	**70**	0	0	0	12.6	0.5	**70**	0	0	0	10.1	0.25
71	0	1	1	11.9		**71**	0	1	1	5.4		**71**	0	0	0	7.6	
72	0	1	1	35.5		**72**	0	1	1	27.3		**72**	0	0	0	5.8	
73	0	0	0	1.7		**73**	0	0	0	16.7		**73**	0	0	0	3.9	
74	0	1	1	14		**74**	0	0	0	13		**74**	0	0	0	4.6	
75	0	1	1	5.7		**75**	0	0	0	11		**75**	0	0	0	4.8	
76	0	1	1	9		**76**	0	0	0	15.3		**76**	0	0	0	8.2	
77	0	1	1	11.5		**77**	0	0	0	2.1		**77**	0	0	0	5.0	
78	0	1	1	17		**78**	0	0	0	9.3		**78**	0	0	0	5.5	
79	0	1	1	26.3		**79**	0	0	0	12.4		**79**	0	0	0	3.5	
80	0	1	1	15.9	0.5	**80**	0	1	1	20.7	0.5	**80**	0	0	0	5.1	0.25
81	0	1	1	9.9		**81**	0	1	1	12.8		**81**	0	0	0	9.9	
82	0	1	1	15.8		**82**	0	0	0	2.9		**82**	0	0	0	16.4	
83	0	1	1	12.2		**83**	0	1	1	7.3		**83**	0	0	0	12.9	
84	0	1	1	45		**84**	0	0	0	6.1		**84**	0	0	0	3.0	
85	0	1	1	4.9		**85**	0	0	0	13.4		**85**	0	0	0	5.9	
86	0	1	1	6.2		**86**	0	0	0	8.2		**86**	0	0	0	4.8	
87	0	1	1	16.8		**87**	0	0	0	11.4		**87**	0	0	0	5.7	
88	0	1	1	14.1		**88**	0	0	0	8		**88**	0	0	0	2.5	
89	0	1	1	14.2		**89**	0	0	0	8.9		**89**	0	0	0	7.7	
90	0	1	1	6.8	0.5	**90**	0	1	1	7.5	0.25	**90**	0	0	0	3.8	0.25
91	0	1	1	12.8		**91**	0	1	1	7.2		**91**	0	0	0	5.9	
92	0	1	1	10		**92**	0	1	1	6.7		**92**	0	0	0	5.8	
93	0	1	1	22.5		**93**	0	1	1	12.5		**93**	0	0	0	6.7	
94	0	1	1	9.8		**94**	0	1	1	8.9		**94**	0	0	0	7.7	
95	0	1	2	12		**95**	0	0	0	12.6		**95**	0	0	0	9.0	
96	0	1	1	9.4		**96**	0	1	1	19		**96**	0	0	0	5.4	
97	0	1	1	5.7		**97**	0	1	2	17.2		**97**	0	0	0	11.5	
98	0	1	2	12.3		**98**	0	0	0	4.3		**98**	0	0	0	5.2	
99	0	1	2	11.1		**99**	0	1	1	13.2		**99**	0	0	0	10.6	
100	0	1	1	11	0.25	**100**	0	1	1	19.2	0.5	**100**	0	0	0	6.6	0.25
101						**101**						**101**	0	0	0	9.7	
102						**102**						**102**	0	0	0	4.8	
103						**103**						**103**	0	0	0	5.9	
104						**104**						**104**	0	0	0	4.5	
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.0**	**0.92**	**1.1**	**12.1**	**0.4**	**Mean**	**0.0**	**0.25**	**0.29**	**11.3**	**0.4**	**Mean**	**0.0**	**0.0**	**0.0**	**6.6**	**0.3**
CALCITE INDEX:		**0.92**				**CALCITE INDEX:**		**0.25**				**CALCITE INDEX:**		**0.0**			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

ELH93						ELUEL						ELUFE					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	1	2	11.5		**1**	0	1	2	7		**1**	0	1	1	14.2	
2	0	1	2	13.2		**2**	0	1	2	7		**2**	0	1	1	10	
3	0	1	2	12.4		**3**	0	1	2	7.6		**3**	0	1	1	6.8	
4	0	1	2	3.5		**4**	0	1	2	8		**4**	0	1	1	4.8	
5	0	1	2	9.9		**5**	0	1	2	6.4		**5**	0	1	1	13.9	
6	0	1	2	10.2		**6**	0	0	0	2.2		**6**	0	1	1	5.1	
7	0	1	2	7.5		**7**	0	1	2	10.1		**7**	0	1	1	12.8	
8	0	1	2	13.5		**8**	0	1	2	6.3		**8**	0	1	1	2.6	
9	0	1	2	7.8		**9**	0	1	2	9.1		**9**	0	1	1	19.2	
10	0	1	2	13.5		**10**	0	1	1	4.1	0.25	**10**	0	1	1	14	0.25
11	0	1	2	18.6		**11**	0	0	0	2.2		**11**	0	1	1	5.7	
12	0	1	2	8.5		**12**	0	1	2	5.7		**12**	0	1	1	10.8	
13	0	1	2	7.5		**13**	0	1	1	2.4		**13**	0	1	1	18.5	
14	0	1	2	18		**14**	0	1	1	7		**14**	0	1	1	14.6	
15	0	1	2	9		**15**	0	1	2	3.2		**15**	0	1	1	5.7	
16	0	1	2	7.6		**16**	0	1	2	4.1		**16**	0	1	1	7.5	
17	0	1	2	19.2		**17**	0	0	0	2.2		**17**	0	1	1	5.9	
18	0	1	2	13		**18**	0	1	1	3.9		**18**	0	0	0	4.1	
19	0	1	2	18.4		**19**	0	1	2	8.8		**19**	0	1	1	4.6	
20	0	1	2	9.1	0.25	**20**	0	1	2	3.8	0.25	**20**	0	1	1	7.2	0.5
21	0	1	2	14.4		**21**	0	1	1	3		**21**	0	1	1	6.1	
22	0	1	2	20.3		**22**	0	0	0	2		**22**	0	1	1	13.5	
23	0	1	2	9		**23**	0	1	2	6.4		**23**	0	0	0	0.6	
24	0	1	2	9.9		**24**	0	1	2	15.5		**24**	0	1	1	13.8	
25	0	1	2	13.9		**25**	0	1	2	4.9		**25**	0	1	1	6.8	
26	0	1	2	11.2		**26**	0	1	2	9		**26**	0	1	1	7.5	
27	0	1	2	13		**27**	0	1	2	6.7		**27**	0	1	1	12.8	
28	0	1	2	7.1		**28**	0	1	2	5.5		**28**	0	1	1	10	
29	0	1	2	12.8		**29**	0	1	2	5.7		**29**	0	1	1	63.5	
30	0	1	2	5.3	0.25	**30**	0	1	2	7.4	0	**30**	0	1	2	16	0.25
31	0	1	2	15.5		**31**	0	1	1	5.1		**31**	0	1	1	27.5	
32	0	1	2	14		**32**	0	1	2	4.4		**32**	0	1	2	7.8	
33	0	1	2	13.3		**33**	0	1	2	3.9		**33**	0	1	1	19.8	
34	0	1	2	9.5		**34**	0	1	2	2.5		**34**	0	1	1	13.3	
35	0	1	2	12.8		**35**	0	0	0	1.9		**35**	0	1	1	11.6	
36	0	1	2	7		**36**	0	1	2	4.3		**36**	0	1	1	7	
37	0	1	2	7.4		**37**	0	1	1	5.7		**37**	0	1	1	9.8	
38	0	1	2	17.1		**38**	0	0	0	1.8		**38**	0	1	1	15.9	
39	0	1	2	21.1		**39**	0	1	2	11.3		**39**	0	1	1	12.2	
40	0	1	2	18.5	0.25	**40**	0	1	2	5.1	0.25	**40**	0	1	1	10	0.5
41	0	1	2	8.8		**41**	0	1	1	3.9		**41**	0	1	1	15.5	
42	0	1	2	14.4		**42**	0	1	2	8.6		**42**	0	1	1	10.1	
43	0	1	2	10.3		**43**	0	0	0	2.2		**43**	0	1	1	11.2	
44	0	1	2	11.2		**44**	0	1	2	13.4		**44**	0	1	1	14.3	
45	0	1	2	15.1		**45**	0	1	2	9.7		**45**	0	1	1	6.4	
46	0	1	2	16.8		**46**	0	1	2	2.8		**46**	0	1	1	5.5	
47	0	1	2	6.5		**47**	0	1	2	9.9		**47**	0	1	1	1.8	
48	0	1	1	11.1		**48**	0	1	2	9.2		**48**	0	1	1	15.8	
49	0	1	2	7.1		**49**	0	1	2	7.2		**49**	0	1	1	10.5	
50	0	1	2	13.4	0.5	**50**	0	1	1	4.7	0.25	**50**	0	1	1	7.8	0.5
51	0	1	2	7.8		**51**	0	1	2	5		**51**	0	1	1	4.2	
52	0	1	2	8		**52**	0	1	2	7.8		**52**	0	1	1	28.3	
53	0	1	2	9		**53**	0	1	2	8.6		**53**	0	1	1	4.6	
54	0	1	2	10.6		**54**	0	0	0	2.5		**54**	0	1	1	19.5	
55	0	1	2	4.3		**55**	0	1	1	3.7		**55**	0	1	1	4.4	
56	0	1	2	6.6		**56**	0	0	0	5.7		**56**	0	1	1	9.5	
57	0	1	2	8.7		**57**	0	1	2	6.2		**57**	0	1	1	4.2	
58	0	1	2	15.9		**58**	0	1	2	5.9		**58**	0	1	1	21.3	
59	0	1	2	9.1		**59**	0	0	0	3.7		**59**	0	1	1	8.4	
60	0	1	2	8.9	0.25	**60**	0	1	2	5.9	0.5	**60**	0	1	1	18.4	0.25
61	0	1	2	7.4		**61**	0	1	2	7.1		**61**	0	1	1	39.2	
62	0	1	2	6.9		**62**	0	0	0	4.2		**62**	0	1	1	9.5	
63	0	1	2	14.8		**63**	0	1	1	7		**63**	0	1	1	12.8	
64	0	1	2	15.1		**64**	0	1	2	12.9		**64**	0	1	1	20.9	
65	0	1	1	4.3		**65**	0	1	2	12		**65**	0	1	1	6.4	
66	0	1	2	10.6		**66**	0	1	2	11.7		**66**	0	1	1	11	
67	0	1	2	16.4		**67**	0	1	2	10.9		**67**	0	1	1	7	
68	0	1	2	4.6		**68**	0	1	1	6.8		**68**	0	1	1	7.1	
69	0	1	2	10		**69**	0	1	1	9.1		**69**	0	1	1	18.2	
70	0	1	2	9.9	0.5	**70**	0	1	2	7.7	0.75	**70**	0	1	1	4.4	0.25
71	0	1	2	9.9		**71**	0	1	2	10.4		**71**	0	0	0	3.7	
72	0	1	2	12.5		**72**	0	1	2	8.2		**72**	0	1	1	14.3	
73	0	1	2	21.6		**73**	0	1	2	6.2		**73**	0	0	0	10.8	
74	0	1	2	12.9		**74**	0	1	2	11.8		**74**	0	1	1	14.9	
75	0	1	2	12.2		**75**	0	1	2	8.1		**75**	0	1	1	20.5	
76	0	1	2	12.2		**76**	0	1	1	3.1		**76**	0	1	1	3.6	
77	0	1	2	7.9		**77**	0	1	2	14.6		**77**	0	1	1	10.5	
78	0	1	2	14.8		**78**	0	1	2	5.4		**78**	0	1	1	7.9	
79	0	1	2	6		**79**	0	1	2	5.1		**79**	0	0	0	13.5	
80	0	1	2	8.9	0.5	**80**	0	1	2	12.4	0.5	**80**	0	1	1	10.1	0.25
81	0	1	2	4.6		**81**	0	1	2	5.3		**81**	0	1	1	6.4	
82	0	1	2	7.5		**82**	0	1	2	7.1		**82**	0	1	1	14.2	
83	0	1	2	8.7		**83**	0	1	2	12.7		**83**	0	0	0	9.2	
84	0	1	2	9.1		**84**	1	1	2	15.1		**84**	0	1	1	9.6	
85	0	1	2	10.1		**85**	0	1	2	9.1		**85**	0	1	1	4.4	
86	0	1	2	10.4		**86**	0	1	2	5.5		**86**	0	1	1	2.3	
87	0	1	1	6.6		**87**	0	1	2	11.9		**87**	0	1	1	8.2	
88	0	1	1	5.4		**88**	0	1	2	7.3		**88**	0	1	1	8.4	
89	0	1	1	28.5		**89**	0	1	1	3.6		**89**	0	1	1	27.8	
90	0	1	2	5.8	0.25	**90**	0	1	1	9.2	0.25	**90**	0	1	1	9.3	0.5
91	0	1	2	7.2		**91**	0	1	2	8.7		**91**	0	1	1	5.1	
92	0	1	2	10.7		**92**	0	1	2	5.3		**92**	0	1	1	9.4	
93	0	1	2	20.4		**93**	0	1	2	12.7		**93**	0	1	1	13.2	
94	0	1	2	7.3		**94**	1	1	2	8.6		**94**	0	1	1	2.1	
95	0	1	2	9.8		**95**	1	1	2	9		**95**	0	1	1	9.2	
96	0	1	2	12.4		**96**	0	1	2	8.3		**96**	0	1	1	13	
97	0	1	2	2.5		**97**	0	1	2	4		**97**	0	1	1	18.7	
98	0	1	2	7		**98**	0	1	2	3.6		**98**	0	1	1	5.2	
99	0	1	2	2		**99**	0	1	1	6.6		**99**	0	1	1	7.2	
100	0	1	2	5.9	0.25	**100**	0	1	2	11.6		**100**	0	1	1	19.6	0.5
101	0	1	2	8.5	0.25	**101**						**101**	0	1	1	24.3	
102						**102**						**102**					
103						**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.0**	**1.0**	**2.0**	**10.9**	**0.3**	**Mean**	**0.03**	**0.89**	**1.6**	**6.9**	**0.3**	**Mean**	**0.0**	**0.94**	**0.96**	**11.6**	**0.4**
CALCITE INDEX:		**1.0**				**CALCITE INDEX:**		**0.92**				**CALCITE INDEX:**		**0.94**			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

ELUFO						ELUSP						FO9					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	1	1	9.5		**1**	0	1	1	4		**1**	0	1	1	6.2	
2	0	1	2	15		**2**	0	1	1	15.8		**2**	0	1	2	4.7	
3	0	1	2	12		**3**	0	1	1	12.2		**3**	0	1	2	17	
4	0	1	1	8.8		**4**	0	1	1	8.5		**4**	0	1	1	8.5	
5	0	1	2	11.5		**5**	0	1	1	17.3		**5**	0	1	2	10.6	
6	0	1	2	25		**6**	0	1	2	13.6		**6**	0	1	2	30.9	
7	0	1	1	23		**7**	0	0	0	2.8		**7**	0	1	1	6.6	
8	0	1	2	11		**8**	0	1	1	6.2		**8**	0	1	2	6	
9	0	1	2	21.5		**9**	0	1	1	9.9		**9**	0	1	1	9.2	
10	0	1	1	9.5	0	**10**	0	1	1	6	0.25	**10**	0	0	0	7.5	0.5
11	0	1	1	8		**11**	0	1	1	14.2		**11**	0	1	1	6.3	
12	0	1	1	9.5		**12**	0	1	1	17.7		**12**	0	1	1	4.3	
13	0	1	1	10		**13**	0	1	1	12.7		**13**	0	1	1	9.8	
14	0	1	1	6.5		**14**	0	0	0	4.2		**14**	0	1	1	5.6	
15	0	1	2	12		**15**	0	1	1	5.5		**15**	0	1	1	3	
16	0	1	2	21		**16**	0	1	1	3		**16**	0	1	1	5.6	
17	0	1	3	11		**17**	0	1	1	8		**17**	0	1	1	12.5	
18	0	1	2	11		**18**	0	1	1	13		**18**	0	1	1	4	
19	0	1	1	15		**19**	0	0	0	13.6		**19**	0	1	1	4.9	
20	0	1	1	12.5	0.5	**20**	0	0	0	7.9	0.5	**20**	0	0	0	10.9	0.25
21	0	1	2	19		**21**	0	1	1	9		**21**	0	0	0	6.3	
22	0	1	1	21		**22**	0	1	1	7.2		**22**	0	1	2	33	
23	0	1	2	26		**23**	0	1	1	7.4		**23**	0	0	0	3.5	
24	0	1	1	11		**24**	0	1	2	18.2		**24**	0	1	1	5	
25	0	1	2	14		**25**	0	0	0	16.6		**25**	0	0	0	3.8	
26	0	1	1	27		**26**	0	1	1	6.9		**26**	0	1	2	18.9	
27	0	1	1	16		**27**	0	1	1	16.2		**27**	0	0	0	3.3	
28	0	1	2	12		**28**	0	1	1	13.7		**28**	0	1	1	15.9	
29	0	1	2	28		**29**	0	1	1	23.2		**29**	0	1	2	10.3	
30	0	1	3	16	0.25	**30**	0	1	1	7.3	0.75	**30**	0	1	1	10.7	0.25
31	0	1	2	16		**31**	0	1	1	4.5		**31**	0	0	0	6.9	
32	0	1	2	17		**32**	0	1	1	15		**32**	0	1	1	6	
33	0	1	2	11		**33**	0	1	1	12.7		**33**	0	1	2	13.3	
34	0	1	2	19		**34**	0	1	2	13.4		**34**	0	1	2	11.9	
35	0	1	2	6.5		**35**	0	1	1	10		**35**	0	1	1	22.7	
36	0	1	2	9		**36**	0	1	1	16.6		**36**	0	0	0	3.5	
37	0	1	2	16		**37**	0	0	0	5.2		**37**	0	1	2	10	
38	0	1	1	6		**38**	0	0	0	7.4		**38**	0	1	1	10.3	
39	0	1	2	16		**39**	0	1	2	6.7		**39**	0	1	2	14	
40	0	1	2	16	0.5	**40**	0	0	0	6.1	0.5	**40**	0	1	1	18.2	0.5
41	0	1	2	17		**41**	0	0	0	9.7		**41**	0	1	2	3.2	
42	0	1	1	7.5		**42**	0	1	1	8.1		**42**	0	1	2	6.9	
43	0	1	2	15.5		**43**	0	0	0	5.1		**43**	0	1	2	8	
44	0	1	2	12		**44**	0	1	1	16.4		**44**	0	1	2	5.3	
45	0	1	2	12.5		**45**	0	0	0	5.1		**45**	0	0	0	4.4	
46	0	1	2	13		**46**	0	1	1	9.3		**46**	0	1	2	3.5	
47	0	1	2	23		**47**	0	0	0	10.4		**47**	0	1	2	5.7	
48	0	1	1	9		**48**	0	1	1	8		**48**	0	1	1	3.4	
49	0	1	1	23		**49**	0	1	1	6		**49**	0	1	2	10.8	
50	0	1	1	4.5	0.5	**50**	0	0	0	8.2	0.75	**50**	0	1	2	10.5	0.25
51	0	1	2	9.8		**51**	0	1	2	10.6		**51**	0	1	2	15.2	
52	0	1	3	14		**52**	0	1	1	4.2		**52**	0	1	2	13.5	
53	0	1	1	11		**53**	0	1	1	8.9		**53**	0	1	1	10.4	
54	0	1	2	13		**54**	0	1	1	8.4		**54**	0	1	1	10.6	
55	0	1	1	16		**55**	0	1	1	10.3		**55**	0	1	1	3.2	
56	0	1	2	12		**56**	0	1	1	5.2		**56**	0	1	1	8.1	
57	0	1	2	14		**57**	0	1	2	7.6		**57**	0	0	0	3.8	
58	0	1	2	7		**58**	0	0	0	4.1		**58**	0	0	0	4	
59	0	1	1	22		**59**	0	1	1	22.2		**59**	0	1	1	25.4	
60	0	1	2	12	0.25	**60**	0	1	2	12.5	0.25	**60**	0	1	2	25.8	0.5
61	0	1	2	13		**61**	0	1	1	6.6		**61**	0	1	1	6.6	
62	0	1	1	19		**62**	0	1	1	6.8		**62**	0	1	2	9.4	
63	0	1	2	16		**63**	0	1	2	14		**63**	0	1	1	11.4	
64	0	1	1	24		**64**	0	1	1	4.2		**64**	0	1	1	11	
65	0	1	2	18.5		**65**	0	1	2	12.1		**65**	0	1	1	4.2	
66	0	1	3	18		**66**	0	1	1	6.9		**66**	0	1	1	13.6	
67	0	1	2	12		**67**	0	1	1	14.2		**67**	0	1	1	8.8	
68	0	1	1	9		**68**	0	1	2	9.5		**68**	0	1	1	3.6	
69	0	1	1	12		**69**	0	0	0	4.1		**69**	0	1	1	7.2	
70	0	1	2	15.5	0	**70**	0	1	2	9.4	0.5	**70**	0	1	1	10.9	0.25
71	0	1	2	15		**71**	0	1	2	11.4		**71**	0	1	1	14.2	
72	0	0	0	9		**72**	0	1	2	21.8		**72**	0	1	1	5.3	
73	0	1	1	7		**73**	0	1	2	11.3		**73**	0	1	1	1.8	
74	0	1	2	17		**74**	0	1	1	15.5		**74**	0	1	1	6.5	
75	0	1	2	7.5		**75**	0	1	2	9.3		**75**	0	1	1	3.4	
76	0	1	2	5		**76**	0	1	2	8.7		**76**	0	0	0	4.9	
77	0	1	2	4		**77**	0	1	1	12.4		**77**	0	1	1	8.3	
78	0	1	2	13		**78**	0	1	2	12		**78**	0	0	0	3.6	
79	0	1	2	13		**79**	0	1	1	5.9		**79**	0	1	1	5	
80	0	1	2	17	0	**80**	0	1	1	11.4	0.5	**80**	0	1	1	8.4	0.25
81	0	1	2	13.5		**81**	0	1	1	5.3		**81**	0	0	0	5.9	
82	0	1	1	8.5		**82**	0	1	2	5.1		**82**	0	0	0	4	
83	0	1	1	13.5		**83**	0	1	1	7.9		**83**	0	1	1	4.6	
84	0	1	2	16		**84**	0	1	1	15.1		**84**	0	1	1	10.3	
85	0	1	2	16		**85**	0	0	0	6		**85**	0	0	0	4.2	
86	0	1	2	10		**86**	0	0	0	13.6		**86**	0	0	0	6.7	
87	0	1	2	6.5		**87**	0	0	0	8.5		**87**	0	1	1	3.5	
88	0	1	2	7		**88**	0	1	1	7.2		**88**	0	1	1	13	
89	0	1	2	19		**89**	0	1	1	7.7		**89**	0	1	2	19.9	
90	0	1	2	19	0.5	**90**	0	0	0	5.4	0.25	**90**	0	1	1	4.6	0.75
91	0	1	1	11		**91**	0	1	2	13.1		**91**	0	1	1	5	
92	0	1	2	10		**92**	0	0	0	7.2		**92**	0	1	1	4.6	
93	0	1	2	20		**93**	0	1	2	12.3		**93**	0	1	2	8	
94	0	1	2	13		**94**	0	1	1	9.4		**94**	0	0	0	13.5	
95	0	1	2	11		**95**	0	0	0	10.3		**95**	0	1	1	6.6	
96	0	1	2	12		**96**	0	0	0	3.6		**96**	0	1	1	11.8	
97	0	1	2	20		**97**	0	1	1	7.9		**97**	0	1	2	11.3	
98	0	1	1	11		**98**	0	1	1	2.6		**98**	0	1	1	7.3	
99	0	1	2	12		**99**	0	1	1	6		**99**	0	1	1	11.1	
100	0	1	2	15	0	**100**	0	1	1	15.7	0.5	**100**	0	1	1	14.4	0.75
101						**101**						**101**					
102						**102**						**102**					
103						**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.0**	**0.99**	**1.7**	**13.8**	**0.3**	**Mean**	**0.0**	**0.78**	**0.98**	**9.8**	**0.5**	**Mean**	**0.0**	**0.82**	**1.1**	**9.0**	**0.4**
CALCITE INDEX:		**0.99**				**CALCITE INDEX:**		**0.78**				**CALCITE INDEX:**		**0.82**			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

FO10-SP1						FO22						FO23					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	1	1	3.1		1	0	0	0	2.9		1	0	1	2	32	
2	0	0	0	1.8		2	0	1	1	2.1		2	0	1	1	11	
3	0	1	1	5.5		3	0	1	1	2.2		3	0	1	2	15	
4	0	1	1	3.2		4	0	1	2	4.8		4	0	1	2	5.5	
5	0	1	1	3.4		5	0	0	0	2.6		5	0	1	1	7.5	
6	0	0	0	2.7		6	0	0	0	2.5		6	0	1	2	65	
7	0	1	1	2.3		7	0	0	0	2.2		7	0	1	2	18.5	
8	0	1	1	2.4		8	0	0	0	2.8		8	0	1	2	4.5	
9	0	1	1	2.3		9	0	1	1	3.1		9	0	1	2	16.5	
10	0	0	0	2.5	0.5	10	0	0	0	2.7	0	10	0	1	2	9	0.75
11	0	1	1	4.4		11	0	1	1	2		11	0	1	2	10	
12	0	1	1	3.5		12	0	0	0	2.3		12	0	1	2	16.5	
13	0	1	1	2.7		13	0	1	1	2.9		13	0	1	2	5.5	
14	0	1	1	3.1		14	0	1	1	3.1		14	0	1	2	8	
15	0	0	0	1.9		15	0	1	1	2.5		15	0	1	2	10.5	
16	0	0	0	1.8		16	0	1	1	2.6		16	0	1	3		
17	0	1	1	3.6		17	0	0	0	3.5		17	0	1	2	7.5	
18	0	1	1	3.8		18	0	1	2	3.2		18	0	1	3		
19	0	1	1	2.6		19	0	0	0	3.5		19	0	1	2	10	
20	0	1	1	3.5	0.5	20	0	1	1	2.2	0	20	0	1	1	6.5	0.25
21	0	1	1	4.6		21	0	0	0	3.3		21	0	1	1	4	
22	0	1	1	2.5		22	0	1	1	2.2		22	0	1	1	5.5	
23	0	1	1	3.1		23	0	0	0	1.7		23	0	1	1	15	
24	0	1	1	3.4		24	0	1	1	2.1		24	0	1	1	8.5	
25	0	1	1	4.0		25	0	1	1	3.4		25	0	1	2	11.5	
26	0	1	1	3.5		26	0	1	1	2.9		26	0	1	1	9.5	
27	0	1	1	3.1		27	0	1	1	1.8		27	0	1	1	7	
28	0	1	1	1.8		28	0	1	1	2.2		28	0	1	1	11	
29	0	1	1	2.5		29	0	0	0	2.6		29	0	1	2	7	
30	0	1	1	4.5	0.75	30	0	1	1	3.1	0	30	0	1	2	17	0.25
31	0	1	1	4.0		31	0	1	1	3.7		31	0	1	1	13.5	
32	0	1	1	3.4		32	0	1	1	3.6		32	0	1	2	13	
33	0	1	1	4.7		33	0	1	1	3.5		33	0	1	1	6	
34	0	1	1	2.3		34	0	1	1	2.8		34	0	1	1	6.5	
35	0	1	1	2.4		35	0	1	1	2.3		35	0	1	2	13	
36	0	1	1	2.4		36	0	1	2	3		36	0	1	1	15.5	
37	0	1	1	2.5		37	0	1	1	2.8		37	0	1	1	5.5	
38	0	1	1	2.4		38	0	1	1	1.6		38	0	1	1	21	
39	0	1	1	2.5		39	0	1	2	3.2		39	0	1	1	17	
40	0	1	1	2.4	0.75	40	0	1	2	4.4	0.25	40	0	1	1	12	0.25
41	0	1	1	2.4		41	0	1	1	2		41	0	1	1	6.5	
42	0	1	1	2.1		42	0	1	1	1.6		42	0	1	1	14.5	
43	0	1	1	3.3		43	0	0	0	1.7		43	0	1	1	9.5	
44	0	1	1	2.2		44	0	1	1	2		44	0	1	1	5.5	
45	0	1	1	5.3		45	0	1	1	4.1		45	0	0	0	6.5	
46	0	1	1	4.9		46	0	1	1	2.6		46	0	1	2	18	
47	0	1	1	4.6		47	0	1	1	2.1		47	0	1	1	9	
48	0	0	0	3.9		48	0	1	1	3.6		48	0	0	0	4.5	
49	0	1	1	3.1		49	0	1	1	3.6		49	0	1	1	19	
50	0	0	0	2.2	0.25	50	0	1	1	2.8	0.25	50	0	0	0	5.5	0
51	0	0	0	2.3		51	0	1	1	3.6		51	0	0	0	4.5	
52	0	1	1	4.5		52	0	1	1	6.1		52	0	1	1	13	
53	0	0	0	3.2		53	0	1	2	3.4		53	0	1	1	12	
54	0	1	1	6.6		54	0	1	1	4.1		54	0	1	1	18	
55	0	1	1	3.5		55	0	1	1	2		55	0	1	1	5.5	
56	0	1	1	3.1		56	0	1	1	3.9		56	0	1	1	17	
57	0	1	1	4.5		57	0	1	1	6.9		57	0	1	1	4.5	
58	0	0	0	2.2		58	0	1	1	2.3		58	0	1	1	11.5	
59	0	1	1	5.4		59	0	1	1	4.1		59	0	1	2	18	
60	0	1	1	5.3	0.25	60	0	1	1	3.2	0.25	60	0	1	1	9.5	0.5
61	0	1	1	3.6		61	0	1	1	7.7		61	0	1	2	11	
62	0	0	0	4.4		62	0	1	2	3.5		62	0	1	1	5.5	
63	0	1	1	6.0		63	0	0	0	3.4		63	0	1	1	4.5	
64	0	1	1	3.5		64	0	1	1	5		64	0	1	1	10	
65	0	1	1	4.4		65	0	1	1	4		65	0	1	2	25	
66	0	0	0	5.3		66	0	1	2	4.5		66	0	1	1	8.5	
67	0	0	0	6.1		67	0	1	1	3.1		67	0	1	1	8	
68	0	0	0	3.0		68	0	0	0	1.5		68	0	1	1	20	
69	0	1	1	4.1		69	0	1	1	3.1		69	0	1	1	6.5	
70	0	0	0	2.5	0.5	70	0	1	1	4.8	0	70	0	1	2	17.5	0.5
71	0	0	0	4.9		71	0	1	1	3.3		71	0	1	2	20.5	
72	0	1	1	3.1		72	0	1	1	3.5		72	0	1	1	4	
73	0	1	1	4.5		73	0	1	2	2.9		73	0	1	1	6	
74	0	1	1	3.8		74	0	1	1	2.5		74	0	1	1	5	
75	0	1	1	5.6		75	0	0	0	1.9		75	0	1	1	16.5	
76	0	1	1	2.6		76	0	1	1	2.4		76	0	1	1	9.5	
77	0	1	1	4.4		77	0	1	1	2.5		77	0	1	1	13.5	
78	0	1	1	4.1		78	0	1	1	2.5		78	0	0	0	8.5	
79	0	1	1	3.9		79	0	1	1	2.9		79	0	1	2	18	
80	0	1	1	4.0	0.5	80	0	1	1	2.6	0	80	0	1	1	10.5	0.25
81	0	1	1	4.0		81	0	1	1	2.2		81	0	1	1	7.5	
82	0	1	1	2.5		82	0	1	1	5.1		82	0	1	2	9	
83	0	1	1	3.1		83	0	1	1	1.6		83	0	1	1	13	
84	0	0	0	1.9		84	0	1	1	8.2		84	0	1	1	6	
85	0	1	1	4.2		85	0	1	1	3.5		85	0	1	2	21	
86	0	1	1	5.1		86	0	1	1	2.3		86	0	1	1	7.5	
87	0	1	1	3.5		87	0	1	1	2.6		87	0	1	1	13.5	
88	0	1	1	4.5		88	0	1	1	2		88	0	1	1	19	
89	0	1	1	4.5		89	0	1	1	3.6		89	0	1	2	10.5	
90	0	1	1	3.6	0.5	90	0	1	1	3.3	0	90	0	1	1	8	0.25
91	0	1	1	5.9		91	0	1	1	2.1		91	0	1	1	8.5	
92	0	1	1	2.3		92	0	1	1	2.8		92	0	1	2	26	
93	0	1	1	3.1		93	0	1	1	3.8		93	0	1	1	8	
94	0	0	0	3.2		94	0	1	1	2.7		94	0	1	2	20	
95	0	1	1	1.6		95	0	1	1	3.3		95	0	1	2	36	
96	0	1	1	3.7		96	0	1	1	4.1		96	0	1	1	4	
97	0	1	1	2.3		97	0	1	1	2		97	0	0	0	5	
98	0	1	1	5.1		98	0	1	1	2.8		98	0	1	1	17	
99	0	1	1	3.2		99	0	1	1	4.7		99	0	1	1	11.5	
100	0	1	1	3.5	0.5	100	0	0	0	4.4	0.25	100	0	1	2	18	0.25
101						101						101	0	0	0	3.5	
102						102						102	0	1	1	9.5	
103						103						103					
104						104						104					
105						105						105					
106						106						106					
107						107						107					
108						108						108					
109						109						109					
110						110						110					
Mean	0.0	0.82	0.82	3.5	0.5	Mean	0.0	0.83	0.92	3.1	0.1	Mean	0.0	0.93	1.3	12.0	0.3
CALCITE INDEX:		0.82				CALCITE INDEX:		0.83				CALCITE INDEX:		0.93			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

FO29						FOBCP						FOBKS					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	1	2	10.6		**1**	0	1	2	12		**1**	0	1	1	11.2	
2	0	1	2	10.5		**2**	0	1	1	5.4		**2**	0	0	0	6.8	
3	0	1	2	17		**3**	0	1	1	2.7		**3**	0	0	0	15.3	
4	0	1	2	13.8		**4**	0	1	2	5.4		**4**	0	0	0	4.9	
5	0	1	2	6.5		**5**	1	1	2	14		**5**	0	1	1	5.1	
6	0	1	2	8.6		**6**	0	1	1	9.1		**6**	0	1	1	15	
7	0	1	2	13.7		**7**	0	1	1	6.7		**7**	0	1	1	10.5	
8	0	1	2	6.4		**8**	0	1	1	4.4		**8**	0	1	1	13.4	
9	0	1	2	4.8		**9**	0	1	1	10.3		**9**	0	1	1	4.5	
10	0	1	2	3.6	0	**10**	0	1	2	4.2	0.25	**10**	0	1	1	19.2	0
11	0	1	2	15		**11**	0	1	1	8.7		**11**	0	1	1	9	
12	0	1	2	17.7		**12**	0	1	1	9.8		**12**	0	0	0	13.7	
13	0	1	2	12		**13**	0	1	1	2.9		**13**	0	1	1	5.2	
14	0	1	2	6		**14**	0	1	2	10.3		**14**	0	1	2	14.8	
15	0	1	2	7		**15**	0	1	2	16		**15**	0	1	1	7.5	
16	0	1	2	8.6		**16**	0	1	1	12		**16**	0	1	1	15.7	
17	0	1	1	8		**17**	1	1	2	15.1		**17**	0	1	1	8.7	
18	0	1	2	11.1		**18**	1	1	2	11.3		**18**	0	1	1	7.4	
19	0	1	2	7.2		**19**	0	1	2	14.3		**19**	0	1	1	5.4	
20	0	1	2	6.7	0	**20**	0	1	3	14.1	0.25	**20**	0	1	1	11.5	0.25
21	0	1	2	6.3		**21**	0	1	2	10.3		**21**	0	1	1	11.4	
22	0	1	2	7.7		**22**	0	1	2	5.8		**22**	0	1	1	13.5	
23	0	1	2	8.9		**23**	0	1	2	7.3		**23**	0	0	0	11.9	
24	0	1	2	13.9		**24**	0	1	1	10.5		**24**	0	1	1	9	
25	0	1	2	5.6		**25**	0	1	2	10.4		**25**	0	1	2	10.5	
26	0	1	2	7.9		**26**	1	1	2	8.5		**26**	0	1	1	17	
27	0	1	2	8		**27**	1	1	2	15.8		**27**	0	1	1	7.4	
28	0	1	2	23.5		**28**	0	1	3	9		**28**	0	1	1	6.2	
29	0	1	2	9.8		**29**	0	1	1	12.3		**29**	0	1	1	2.2	
30	0	1	2	20.5	0.25	**30**	0	1	2	6.3	0.25	**30**	0	1	2	11.7	0
31	0	1	2	15.4		**31**	0	1	2	9.7		**31**	0	1	1	2.1	
32	0	1	2	28		**32**	0	1	3	12.2		**32**	0	1	1	17	
33	1	1	2	23		**33**	0	1	1	9.9		**33**	0	1	2	19.3	
34	0	1	2	14.2		**34**	0	1	2	3.7		**34**	0	1	1	12	
35	0	1	2	11.3		**35**	1	1	3	10.8		**35**	0	1	1	5.3	
36	0	1	2	13.1		**36**	1	1	2	8		**36**	0	1	1	4.9	
37	0	1	2	13.2		**37**	0	1	1	1.9		**37**	0	1	2	8.1	
38	0	1	2	12	0.5	**38**	0	1	2	4.3		**38**	0	1	2	20.7	
39	0	1	2	11.1		**39**	0	1	2	8.1		**39**	0	1	1	13	
40	0	1	2	8.6	0.5	**40**	0	1	1	4.2	0.5	**40**	0	1	1	6	0.25
41	0	1	2	10		**41**	0	1	2	11.3		**41**	0	1	1	4.3	
42	0	1	2	11.1		**42**	0	1	2	26.4		**42**	0	1	1	19.3	
43	0	1	2	7.8		**43**	0	1	1	5		**43**	0	1	2	11.4	
44	0	1	2	10.6		**44**	1	1	2	11.9		**44**	0	1	1	14.3	
45	0	1	2	5.7		**45**	1	1	1	7.2		**45**	0	1	2	20.7	
46	0	1	2	12.5		**46**	0	1	2	11.1		**46**	0	1	1	11	
47	0	1	2	12.7		**47**	0	1	1	9.2		**47**	0	1	2	8.5	
48	0	1	2	9.5		**48**	0	1	2	17.4		**48**	0	1	1	18.9	
49	0	1	2	12.9		**49**	1	1	2	8.9		**49**	0	1	2	12	
50	0	1	2	3.9	0	**50**	0	1	1	5.8	0.5	**50**	0	1	2	4.4	0.25
51	0	1	2	5.3		**51**	1	1	1	13.9		**51**	0	0	0	5.5	
52	0	1	2	4.5		**52**	1	1	1	16.7		**52**	0	1	1	7	
53	0	1	2	7.2		**53**	0	1	2	14.5		**53**	0	1	1	3.8	
54	0	1	1	6.1		**54**	0	1	2	7		**54**	0	1	2	9	
55	0	1	2	7.7		**55**	1	1	2	11.8		**55**	0	1	2	7.7	
56	0	1	2	7.5		**56**	0	1	1	4.1		**56**	0	1	1	16.8	
57	0	1	2	7.6		**57**	0	1	2	13.5		**57**	0	1	2	8.6	
58	0	1	2	12.3		**58**	0	1	1	10.2		**58**	0	1	2	9	
59	0	1	2	12.7		**59**	0	1	2	17.8		**59**	0	1	2	2.4	
60	0	1	2	8.2	0.25	**60**	0	1	2	10.8	0.5	**60**	0	1	1	2.4	0.25
61	0	1	2	15.6		**61**	0	1	2	11.6		**61**	0	1	1	11	
62	0	1	2	8.6		**62**	0	1	1	8.4		**62**	0	1	2	19.5	
63	0	1	1	3.2		**63**	0	1	2	15.8		**63**	0	1	1	5.7	
64	0	1	2	13		**64**	0	1	1	11.4		**64**	0	1	2	8	
65	0	1	2	9.1		**65**	0	1	2	9.5		**65**	0	1	2	14.3	
66	0	1	2	9.2		**66**	0	1	2	3.7		**66**	0	1	2	11.7	
67	0	1	2	12.5		**67**	0	1	1	22		**67**	0	1	2	13	
68	0	1	2	8.6		**68**	0	1	2	9.2		**68**	0	1	1	14.2	
69	0	1	2	9.9		**69**	1	1	2	18.3		**69**	0	1	2	9.3	
70	0	1	2	11.9	0	**70**	0	1	1	9.6	0.5	**70**	0	1	2	10.5	0.25
71	0	1	2	24.5		**71**	0	1	1	17.2		**71**	0	1	2	8.9	
72	0	1	2	26		**72**	1	1	2	11		**72**	0	1	2	17.3	
73	0	1	2	17.3		**73**	0	1	2	9.5		**73**	0	1	2	11	
74	0	1	1	7.8		**74**	1	1	2	5.9		**74**	0	1	1	17	
75	0	1	2	27		**75**	0	1	3	11.5		**75**	0	1	2	10.6	
76	0	1	2	20.5		**76**	0	1	2	17.9		**76**	0	1	1	5.2	
77	0	1	2	8.6		**77**	1	1	3	8.8		**77**	0	1	1	9.8	
78	0	1	2	22.4		**78**	0	1	1	7.4		**78**	0	1	2	15.4	
79	0	1	2	10.3		**79**	0	1	2	5.9		**79**	0	1	2	7.3	
80	0	1	2	13.5	0.5	**80**	0	1	2	5.4	0	**80**	0	1	1	13.5	0.25
81	0	1	2	10.6		**81**	1	1	2	20.4		**81**	0	1	2	12.9	
82	0	1	2	34		**82**	1	1	2	11.2		**82**	0	1	1	7.6	
83	0	1	2	22.8		**83**	0	1	1	12.9		**83**	0	1	1	20.5	
84	0	1	2	16.1		**84**	1	1	2	15.4		**84**	0	0	0	8.9	
85	0	1	2	18		**85**	0	1	1	9.6		**85**	0	1	1	8.2	
86	0	1	2	56		**86**	1	1	2	19.3		**86**	0	1	2	18.6	
87	0	1	2	22.2		**87**	1	1	1	11.7		**87**	0	1	1	14.7	
88	0	1	2	8.5		**88**	0	1	4	12.4		**88**	0	1	1	8.3	
89	0	1	2	33		**89**	0	1	2	6.4		**89**	0	1	1	2.2	
90	0	1	2	16.9	0.5	**90**	1	1	1	8	0.5	**90**	0	1	1	5.1	0
91	0	1	2	15		**91**	0	1	1	9.7		**91**	0	1	1	9.6	
92	0	1	2	19.9		**92**	0	1	3	9.8		**92**	0	1	2	16	
93	0	1	2	18		**93**	1	1	2	8.7		**93**	0	1	1	18.4	
94	0	1	2	15.1		**94**	1	1	2	7.5		**94**	0	1	1	11.3	
95	0	1	2	11.6		**95**	1	1	2	7		**95**	0	1	1	4	
96	0	1	2	17.3		**96**	1	1	2	13		**96**	0	1	1	15.1	
97	0	1	2	23.5		**97**	0	1	2	10.5		**97**	0	0	0	9.7	
98	0	1	2	29		**98**	1	1	2	8.3		**98**	0	1	1	7.4	
99	0	1	1	10.5		**99**	1	1	2	11.5		**99**	0	1	1	2.6	
100	0	1	1	18.1	0.25	**100**	1	1	2	7.3	0.5	**100**	0	1	1	11	0.25
101						**101**						**101**					
102						**102**						**102**					
103						**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.01**	**1.0**	**1.9**	**13.3**	**0.3**	**Mean**	**0.30**	**1.0**	**1.8**	**10.3**	**0.4**	**Mean**	**0.0**	**0.92**	**1.2**	**10.6**	**0.2**
CALCITE INDEX:		**1.0**				**CALCITE INDEX:**		**1.3**				**CALCITE INDEX:**		**0.92**			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

FOBSC						FODGH						FODHE					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	1	2	2.3		**1**	0	1	1	7		**1**	0	1	1	8.9	
2	0	1	1	15		**2**	0	1	1	8		**2**	0	1	2	7.3	
3	0	1	2	24.2		**3**	0	1	1	9.8		**3**	0	1	1	5	
4	0	1	1	12.9		**4**	0	1	1	10.5		**4**	0	1	1	2.4	
5	0	1	2	13.2		**5**	0	1	1	5.4		**5**	0	1	2	7.1	
6	1	1	1	10.7		**6**	0	1	1	5.8		**6**	0	1	2	9.9	
7	1	1	1	11.4		**7**	0	1	2	13.6		**7**	0	1	1	5.1	
8	0	1	1	14.2		**8**	0	1	2	9.1		**8**	0	0	0	6.7	
9	1	1	1	10.3		**9**	0	1	1	11.2		**9**	0	1	3	14.9	
10	1	1	1	22.4	0.25	**10**	0	1	1	7.5	0	**10**	0	1	1	11.1	0.25
11	0	1	2	24		**11**	0	1	2	10		**11**	0	0	0	8.3	
12	0	1	2	5.2		**12**	0	1	2	14.5		**12**	0	0	0	6.5	
13	0	1	1	11.1		**13**	0	1	1	9.6		**13**	0	1	2	7.8	
14	1	1	1	6.7		**14**	0	1	2	15		**14**	0	1	1	4.5	
15	0	1	2	3.3		**15**	0	1	2	9.3		**15**	0	1	1	5.2	
16	0	1	1	5.6		**16**	0	1	1	13		**16**	0	0	0	4.3	
17	0	1	1	3.2		**17**	0	1	1	16.5		**17**	0	1	1	29.7	
18	0	1	1	7.7		**18**	0	1	2	11.6		**18**	0	1	2	4.1	
19	0	1	1	8.4		**19**	0	1	1	7.7	0	**19**	0	1	2	12.2	
20	0	1	2	9.6	0.25	**20**						**20**	0	1	2	6.3	0.25
21	0	1	2	14.7		**21**	0	1	2	14.4		**21**	0	1	1	4.2	
22	0	1	1	6.5		**22**	0	1	2	8.3		**22**	0	1	1	3.9	
23	0	1	1	11.4		**23**	0	1	2	10.2		**23**	0	1	1	3.9	
24	0	1	1	3.3		**24**	0	1	2	8.9		**24**	0	0	0	9.3	
25	0	1	1	2.5		**25**	0	1	2	12.3		**25**	0	1	2	17.5	
26	0	1	1	1.2		**26**	0	1	2	8.4		**26**	0	1	2	2.8	
27	0	1	1	3.9		**27**	0	1	2	10.1		**27**	0	1	3	10.6	
28	0	1	2	9.6		**28**	0	1	2	13		**28**	0	1	2	3	
29	0	1	1	4.8		**29**	0	1	2	10.5		**29**	0	0	0	5.8	
30	0	1	1	17	0.25	**30**	0	1	2	20.1	0	**30**	0	1	2	3.2	0.25
31	0	1	1	19		**31**	0	1	3	15.4		**31**	0	1	1	4.7	
32	0	1	1	7.5		**32**	0	1	2	10.6		**32**	0	1	2	11.1	
33	0	1	1	7.2		**33**	0	1	2	9.3		**33**	0	0	0	6.6	
34	0	1	2	12.5		**34**	0	1	2	10.4		**34**	0	0	0	3.3	
35	0	1	1	7.3		**35**	0	1	2	8		**35**	0	1	2	4.7	
36	0	1	2	11.9		**36**	0	1	2	7.9		**36**	0	1	1	9.2	
37	0	1	2	8.4		**37**	0	1	2	10.2		**37**	0	0	0	6.8	
38	1	1	1	12		**38**	0	1	1	8.6		**38**	0	1	1	5.9	
39	0	1	2	6.9		**39**	0	1	1	9		**39**	0	1	1	6.8	
40	0	1	1	12.4	0	**40**	0	1	2	7.9	0	**40**	0	0	0	2.4	0
41	0	1	1	5.7		**41**	0	1	2	12.2		**41**	0	1	2	8.2	
42	0	1	1	19.8		**42**	0	1	2	9.4		**42**	0	1	2	13.5	
43	0	1	2	10.6		**43**	0	1	2	8.3		**43**	0	1	1	2.6	
44	0	1	1	6.8		**44**	0	1	2	10.6		**44**	0	1	1	6.1	
45	0	1	2	5.9		**45**	0	1	2	10		**45**	0	1	1	4.7	
46	0	1	2	10		**46**	0	1	2	8.1		**46**	0	1	2	11.8	
47	1	1	2	26.5		**47**	0	1	2	9.3		**47**	0	1	2	4.6	
48	0	1	2	17		**48**	0	1	2	8.3		**48**	0	1	2	12.8	
49	0	1	2	5.1		**49**	0	1	2	8.1		**49**	0	1	1	8.7	
50	0	1	1	6.6	0.25	**50**	0	1	2	7.7	0	**50**	0	1	2	4.3	0
51	0	1	2	17.5		**51**	0	1	3	8.7		**51**	0	1	1	5.3	
52	1	1	2	10.5		**52**	0	1	3	8.5		**52**	0	1	2	6.2	
53	0	1	2	9.1		**53**	0	1	3	11.4		**53**	0	1	4	7.7	
54	0	1	1	4.3		**54**	0	1	2	14.1		**54**	0	1	2	8.6	
55	0	1	1	13.5		**55**	0	1	2	18.3		**55**	0	1	1	5	
56	0	1	1	8.2		**56**	0	1	2	10.5		**56**	0	1	2	8.3	
57	0	1	1	8.5		**57**	0	1	1	5.4		**57**	0	1	1	3.9	
58	0	1	2	9.4		**58**	0	1	2	16.5		**58**	0	1	3	13.7	
59	0	1	1	18.6		**59**	0	1	2	10.1		**59**	0	1	2	7.3	
60	0	1	1	23	0.25	**60**	0	1	2	15.1	0	**60**	0	1	2	10.1	0.25
61	0	1	1	2.6		**61**	0	1	2	12.4		**61**	0	1	3	5.7	
62	0	1	1	7.7		**62**	0	1	2	9.9		**62**	0	1	2	24.1	
63	0	1	2	16.7		**63**	0	1	1	7		**63**	0	1	3	9.9	
64	0	1	2	15.1		**64**	0	1	1	11.4		**64**	0	1	2	7.2	
65	0	1	1	8.5		**65**	0	1	2	9.3		**65**	0	1	2	6.8	
66	0	1	2	23.8		**66**	0	1	2	7.2		**66**	0	1	2	8.3	
67	0	1	1	10.6		**67**	0	1	2	9.6		**67**	0	1	2	7.9	
68	0	1	2	7.6		**68**	0	1	2	8.8		**68**	0	1	3	9.6	
69	0	1	2	19.9		**69**	0	1	2	8.6		**69**	0	1	1	4.8	
70	1	1	1	20.8	0.25	**70**	0	1	1	8.2	0	**70**	0	1	3	15.1	0.5
71	1	1	1	10.4		**71**	0	1	2	11.6		**71**	0	1	2	9.3	
72	0	1	1	15.4		**72**	0	1	2	11.3		**72**	0	1	1	3.2	
73	0	1	1	5		**73**	0	1	2	12.1		**73**	0	1	3	11.4	
74	0	1	1	11.3		**74**	0	1	2	7.7		**74**	0	1	2	13.4	
75	1	1	1	6.7		**75**	0	1	2	12.3		**75**	0	1	2	10.6	
76	1	1	1	10.5		**76**	0	1	1	4.6		**76**	0	1	3	5	
77	0	1	1	7.6		**77**	0	1	2	9.7		**77**	0	1	1	3.7	
78	1	1	2	9.9		**78**	0	1	2	9.6		**78**	0	0	0	5.9	
79	1	1	2	10.7		**79**	0	1	2	8		**79**	0	1	1	5.6	
80	0	1	2	17	0.25	**80**	0	1	2	11.7	0	**80**	0	1	1	6.3	0.25
81	0	1	2	27.5		**81**	0	1	2	8.9		**81**	0	1	2	5.7	
82	0	1	2	9.4		**82**	0	1	2	10		**82**	0	1	4	14.6	
83	0	1	2	9.9		**83**	0	1	1	22		**83**	0	1	2	6	
84	1	1	1	14.7		**84**	0	1	2	9.9		**84**	0	0	0	7.4	
85	0	1	2	9		**85**	0	1	2	8		**85**	0	1	2	13.2	
86	0	1	2	8.9		**86**	0	1	2	10.5		**86**	0	1	4	10	
87	0	1	2	15.5		**87**	0	1	2	9.7		**87**	0	1	2	12.8	
88	0	1	1	28.6		**88**	0	1	3	14.2		**88**	0	1	2	13.4	
89	0	1	2	8.2		**89**	0	1	2	8.6		**89**	0	1	2	11.3	
90	0	1	1	10.5	0	**90**	0	1	2	11.4	0	**90**	0	1	2	12.2	0.5
91	0	1	2	7.3		**91**	0	1	3	9.8		**91**	0	1	2	10.4	
92	0	1	2	14.3		**92**	0	1	2	11.1		**92**	0	1	2	8.3	
93	0	1	2	8.4		**93**	0	1	2	5.5		**93**	0	1	2	7.2	
94	0	1	1	8.1		**94**	0	1	2	9.5		**94**	0	1	1	7.7	
95	0	1	2	18.5		**95**	0	1	2	10.1		**95**	0	1	3	11.1	
96	0	1	1	4.8		**96**	1	1	3	11		**96**	0	1	2	11.4	
97	1	1	2	15		**97**	0	1	3	9.5		**97**	0	1	2	12.7	
98	0	1	2	13.4		**98**	0	1	2	10.4		**98**	0	1	1	10.6	
99	0	1	2	8.4		**99**	0	1	2	9.6		**99**	0	1	1	8.1	
100	0	1	3	10.4	0.25	**100**	0	1	2	13.7	0	**100**	0	1	3	7.2	0.25
101						**101**						**101**					
102						**102**						**102**					
103						**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.16**	**1.0**	**1.5**	**11.3**	**0.2**	**Mean**	**0.01**	**1.0**	**1.9**	**10.3**	**0.0**	**Mean**	**0.0**	**0.88**	**1.6**	**8.2**	**0.3**
CALCITE INDEX:		**1.2**				**CALCITE INDEX:**		**1.0**				**CALCITE INDEX:**		**0.88**			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

FODNGD						FODPO						FORD7-75					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	0	0	1.5		**1**	0	1	1	4.5		**1**	0	0	0	14.0	
2	0	1	1	10.6		**2**	0	0	0	3		**2**	0	1	2	15.0	
3	0	1	1	6.9		**3**	0	1	1	2.5		**3**	0	1	2	14.0	
4	0	0	0	7		**4**	0	1	1	3.4		**4**	0	1	2	12.0	
5	0	1	1	7.4		**5**	0	1	1	4.4		**5**	0	1	1	8.1	
6	0	0	0	5.1		**6**	0	1	1	3.4		**6**	0	1	2	6.8	
7	0	0	0	2.4		**7**	0	1	1	4.6		**7**	0	1	1	12.1	
8	0	1	1	8.7		**8**	0	0	0	2		**8**	0	1	1	7.6	
9	0	0	0	1.8		**9**	0	1	1	6.7		**9**	0	1	1	17.0	
10	0	1	1	10.7	0.5	**10**	0	0	0	2.2	0	**10**	0	1	2	23.5	0.25
11	0	0	0	4.7		**11**	0	0	0	3.7		**11**	0	1	1	8.1	
12	0	1	1	7.9		**12**	0	1	1	3.3		**12**	0	1	1	7.5	
13	0	1	1	5.9		**13**	0	1	2	4.1		**13**	0	1	2	11.2	
14	0	0	0	4.8		**14**	0	1	1	6.7		**14**	0	1	1	6.0	
15	0	1	1	1.9		**15**	0	1	2	6.2		**15**	0	1	2	11.0	
16	0	1	1	4.8		**16**	0	1	1	5.1		**16**	0	1	2	15.0	
17	0	1	1	6.5		**17**	0	0	0	5		**17**	0	1	1	5.0	
18	0	0	0	1.8		**18**	0	1	1	3.8		**18**	0	1	2	18.4	
19	0	0	0	4.8		**19**	0	1	1	5.8		**19**	0	1	1	14.1	
20	0	1	1	7.3	0.25	**20**	0	1	1	6.6	0.25	**20**	0	1	1	5.0	0.5
21	0	1	2	16.8		**21**	0	1	1	4.7		**21**	0	1	2	19.0	
22	0	1	1	2.9		**22**	0	1	1	3.6		**22**	0	1	1	5.1	
23	0	1	1	10.7		**23**	0	1	2	4.1		**23**	0	1	2	11.6	
24	0	1	1	3.5		**24**	0	1	1	3.9		**24**	0	1	2	14.0	
25	0	0	0	3.6		**25**	0	1	1	3.6		**25**	0	1	2	10.5	
26	0	1	1	2.6		**26**	0	1	2	7		**26**	0	1	2	9.5	
27	0	0	0	2.6		**27**	0	1	1	7.3		**27**	0	1	2	20.0	
28	0	1	2	9.2		**28**	0	1	1	5.2		**28**	0	1	2	4.0	
29	0	1	1	3.2		**29**	0	1	1	3.4		**29**	0	1	2	12.2	
30	0	1	1	6.5	0.25	**30**	0	1	1	3.8	0	**30**	0	1	1	16.0	0.25
31	0	1	1	3.1		**31**	0	1	1	4.6		**31**	0	1	2	8.0	
32	0	1	1	4.1		**32**	0	1	1	4.2		**32**	0	1	1	35.5	
33	0	1	1	3.9		**33**	0	1	1	3.9		**33**	0	1	1	27.5	
34	0	1	1	10.3		**34**	0	1	2	4.8		**34**	0	1	2	10.4	
35	0	1	1	4.3		**35**	0	1	1	5.6		**35**	0	1	2	5.2	
36	0	0	0	6		**36**	0	1	1	4.6		**36**	0	1	2	10.3	
37	0	1	1	4.3		**37**	0	1	1	3.7		**37**	0	1	2	15.6	
38	0	1	1	3.9		**38**	0	1	1	3.5		**38**	0	1	2	9.2	
39	0	1	1	2.9		**39**	0	1	1	3		**39**	0	1	1	10.2	
40	0	1	1	3.6	0	**40**	0	1	1	3.8	0.5	**40**	0	1	1	12.3	0
41	0	1	1	5.1		**41**	0	1	1	2.1		**41**	0	1	1	9.0	
42	0	1	1	4.9		**42**	0	1	1	4.5		**42**	0	1	1	5.5	
43	0	0	0	3.6		**43**	0	1	1	3.6		**43**	0	0		16.0	
44	0	0	0	4.7		**44**	0	1	1	1.9		**44**	0	1	2	17.1	
45	0	0	0	3.8		**45**	0	1	2	4.3		**45**	0	1	2	8.5	
46	0	1	1	8.2		**46**	0	1	1	3.7		**46**	0	1	1	5.7	
47	0	0	0	1.5		**47**	0	0	0	2.1		**47**	0	1	2	6.7	
48	0	1	1	32.2		**48**	0	1	2	4.6		**48**	0	1	1	7.6	
49	0	1	1	4.2		**49**	0	1	1	2.3		**49**	0	1	1	5.1	
50	0	1	1	6.5	0.25	**50**	0	1	1	3	0.5	**50**	0	1	2	6.2	0.25
51	0	0	0	5.6		**51**	0	1	1	2.5		**51**	0	1	1	3.2	
52	0	1	2	15.7		**52**	0	1	1	3.7		**52**	0	1	1	5.3	
53	0	1	1	6.5		**53**	0	1	1	5.2		**53**	0	1	2	5.3	
54	0	1	1	3.9		**54**	0	1	1	4.7		**54**	0	1	1	8.5	
55	0	1	1	1.1		**55**	0	0	0	3.1		**55**	0	1	1	10.9	
56	0	1	1	6.6		**56**	0	1	1	4.4		**56**	0	1	1	5.2	
57	0	1	1	3.7		**57**	0	1	1	2.7		**57**	0	1	1	5.4	
58	0	0	0	1.3		**58**	0	1	1	4.6		**58**	0	1	1	4.7	
59	0	1	1	3.9		**59**	0	1	1	3		**59**	0	1	2	16.3	
60	0	1	1	3	0.25	**60**	0	1	1	8.5	0.25	**60**	0	1	2	4.6	0.25
61	0	0	0	4.9		**61**	0	1	1	4.4		**61**	0	1	1	7.0	
62	0	1	1	2.4		**62**	0	1	1	4.7		**62**	0	1	1	7.9	
63	0	1	1	1.2		**63**	0	1	1	3.7		**63**	0	1	2	9.8	
64	0	1	1	7.5		**64**	0	1	1	4.4		**64**	0	1	2	4.4	
65	0	1	1	1.3		**65**	0	1	1	3.8		**65**	0	1	1	3.1	
66	0	1	1	13.1		**66**	0	1	1	3.9		**66**	0	1	2	6.1	
67	0	1	1	6.2		**67**	0	1	2	6.6		**67**	0	1	2	5.3	
68	0	0	0	5		**68**	0	1	1	6.8		**68**	0	1	2	13.0	
69	0	1	1	4.6		**69**	0	1	1	6.4		**69**	0	1	2	7.2	
70	0	1	1	9.7	0.25	**70**	0	1	1	4.7	0.5	**70**	0	1	2	9.2	0.5
71	0	1	1	5.2		**71**	0	1	1	3.6		**71**	0	1	2	12.8	
72	0	1	1	6.2		**72**	0	0	0	5		**72**	0	1	2	5.0	
73	0	1	1	8.9		**73**	0	1	1	2.8		**73**	0	1	2	6.5	
74	0	1	2	15.6		**74**	0	1	1	5.4		**74**	0	1	1	5.6	
75	0	1	1	5.5		**75**	0	1	2	3.9		**75**	0	1	1	4.2	
76	0	1	1	3.5		**76**	0	1	2	5.8		**76**	0	1	1	2.6	
77	0	1	1	7		**77**	0	1	2	6.7		**77**	0	1	2	10.0	
78	0	1	1	5.4		**78**	0	1	2	6.4		**78**	0	1	2	7.0	
79	0	1	1	6.1		**79**	0	1	1	3.3		**79**	0	1	2	9.0	
80	0	1	1	10.9	0.5	**80**	0	1	1	4.5	0	**80**	0	1	2	6.1	0
81	0	1	1	13		**81**	0	1	1	4		**81**	0	1	2	5.6	
82	0	1	1	4.2		**82**	0	1	1	6.7		**82**	0	1	2	10.1	
83	0	1	1	6.5		**83**	0	1	1	5.4		**83**	0	1	2	9.5	
84	0	1	1	10.4		**84**	0	1	2	5.8		**84**	0	1	1	8.3	
85	0	1	1	10.2		**85**	0	1	1	3.1		**85**	0	1	2	8.6	
86	0	1	1	10		**86**	0	0	0	2.5		**86**	0	1	2	7.2	
87	0	1	1	8.2		**87**	0	1	1	4.9		**87**	0	1	1	5.2	
88	0	1	1	3.7		**88**	0	0	0	6.1		**88**	0	1	2	7.0	
89	0	1	1	7.7		**89**	0	1	2	9.1		**89**	0	0	0	7.5	
90	0	1	1	4.8	0	**90**	0	1	2	4	0.25	**90**	0	1	1	7.8	0
91	0	1	1	6.1		**91**	0	1	1	2.5		**91**	0	1	2	9.5	
92	0	1	1	18.7		**92**	0	0	0	1.9		**92**	0	1	2	7.2	
93	0	1	1	4		**93**	0	1	1	6		**93**	0	1	2	11.0	
94	0	1	1	3.4		**94**	0	1	1	7.5		**94**	0	1	2	6.0	
95	0	1	1	1.3		**95**	0	1	1	2.1		**95**	0	1	2	10.5	
96	0	1	1	1.3		**96**	0	1	1	2.8		**96**	0	1	1	4.6	
97	0	1	1	4.8		**97**	0	1	2	4.6		**97**	0	1	2	14.0	
98	0	1	1	14.4		**98**	0	1	2	6.3		**98**	0	1	2	3.4	
99	0	1	1	6.9		**99**	0	1	1	2.4		**99**	0	1	2	10.7	
100	0	1	1	19.3	0.5	**100**	0	1	1	4.4	0.25	**100**	0	1	2	3.3	0
101						**101**						**101**					
102						**102**						**102**					
103						**103**						**103**				0.0	
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.0**	**0.80**	**0.84**	**6.4**	**0.3**	**Mean**	**0.0**	**0.89**	**1.1**	**4.4**	**0.3**	**Mean**	**0.0**	**0.97**	**1.6**	**9.4**	**0.2**
CALCITE INDEX:		**0.80**				**CALCITE INDEX:**		**0.89**				**CALCITE INDEX:**		**0.97**			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

FOUEW						FOUKI						FOUL					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	1	2	9.2		**1**	0	1	2	7.4		**1**	0	0	0	10.5	
2	0	1	2	12.2		**2**	0	1	1	7.6		**2**	0	0	0	11.5	
3	0	1	2	7.3		**3**	0	1	1	4.1		**3**	0	0	0	8	
4	0	1	1	4.6		**4**	0	1	1	5.4		**4**	0	0	0	22	
5	0	1	2	9.2		**5**	0	1	2	13.1		**5**	0	0	0	13.5	
6	0	1	1	6.3		**6**	0	1	2	9.9		**6**	0	0	0	20	
7	0	1	2	12.7		**7**	0	1	2	4.3		**7**	0	0	0	10	
8	0	1	2	8.6		**8**	0	1	2	2.3		**8**	0	0	0	11.5	
9	0	1	2	5		**9**	0	1	2	8.8		**9**	0	0	0	11	
10	0	1	2	12.1	0.75	**10**	0	1	2	6.4	0.25	**10**	0	0	0	7	0.25
11	0	1	2	14		**11**	0	1	1	7.5		**11**	0	0	0	33	
12	0	1	2	20.5		**12**	0	1	2	12.4		**12**	0	0	0	8	
13	0	1	2	10.4		**13**	0	1	2	5.8		**13**	0	0	0	11.5	
14	0	1	2	7.7		**14**	0	1	1	11		**14**	0	0	0	22	
15	0	1	2	9.3		**15**	0	1	2	5.2		**15**	0	0	0	7	
16	0	1	2	7.6		**16**	0	1	2	2.5		**16**	0	0	0	12	
17	0	1	1	8		**17**	0	1	1	11.8		**17**	0	0	0	8	
18	0	1	1	11		**18**	0	1	1	3.1		**18**	0	0	0	23	
19	0	1	2	9		**19**	0	1	1	5		**19**	0	0	0	10.5	
20	0	1	2	12.4	0.5	**20**	0	1	2	13.7	0.25	**20**	0	0	0	16	0.25
21	0	1	2	5.4		**21**	0	1	1	4.7		**21**	0	0	0	8.5	
22	0	1	2	15.5		**22**	0	1	1	3.6		**22**	0	0	0	6	
23	0	1	2	6.7		**23**	0	1	2	9		**23**	0	0	0	10	
24	0	1	2	3		**24**	0	1	1	4.7		**24**	0	0	0	10.5	
25	0	1	2	18		**25**	0	1	2	17.5		**25**	0	0	0	41	
26	0	1	2	17.6		**26**	0	1	1	6.9		**26**	0	0	0	4.5	
27	0	1	2	7.6		**27**	0	1	1	5.5		**27**	0	0	0	9.5	
28	0	1	2	7.7		**28**	0	1	1	8.3		**28**	0	0	0	30	
29	0	1	2	9.6		**29**	0	1	2	12.4		**29**	0	0	0	12	
30	0	1	2	11.8	0.25	**30**	0	1	2	15.9	0.5	**30**	0	0	0	25	
31	0	1	1	11		**31**	0	1	2	14		**31**	0	0	0	14	0.5
32	0	1	1	5.8		**32**	0	1	2	14.9		**32**	0	0	0	5	
33	0	1	2	4.5		**33**	0	1	2	9.4		**33**	0	0	0	8.5	
34	0	1	2	5.7		**34**	0	1	2	6.2		**34**	0	0	0	27	
35	0	1	2	12.8		**35**	0	1	1	5.1		**35**	0	0	0	2.5	
36	0	0	0	2.2		**36**	0	1	1	7.4		**36**	0	0	0	4.5	
37	0	1	2	10.8		**37**	0	1	2	12.8		**37**	0	0	0	8	
38	0	1	2	9.2		**38**	0	1	2	6.3		**38**	0	0	0	7.5	
39	0	1	2	11.5		**39**	0	1	2	13.3		**39**	0	0	0	6	
40	0	0	0	5.3	0.25	**40**	0	1	1	12.3	0	**40**	0	0	0	4	0.5
41	0	1	2	15.5		**41**	0	1	2	10.1		**41**	0	0	0	9	
42	0	1	2	12.5		**42**	0	1	1	1.6		**42**	0	0	0	8.5	
43	0	1	2	16.2		**43**	0	1	2	18.3		**43**	0	0	0	7.5	
44	0	1	2	9.3		**44**	0	1	2	9.3		**44**	0	0	0	27	
45	0	1	2	8		**45**	0	1	1	8.4		**45**	0	0	0	5	
46	0	1	2	9.5		**46**	0	1	2	2.8		**46**	0	0	0	12.5	
47	0	1	2	7.1		**47**	0	1	1	4.7		**47**	0	0	0	4.5	
48	0	1	2	8.4		**48**	0	1	1	2.7		**48**	0	0	0	7.5	
49	0	1	2	9.7		**49**	0	1	1	5.6		**49**	0	0	0	16	
50	0	1	2	8.4		**50**	0	1	2	7	0.25	**50**	0	0	0	17.5	0.25
51	0	1	2	8.7		**51**	0	1	1	4.5		**51**	0	0	0	43	
52	0	1	2	6.3		**52**	0	1	2	13.8		**52**	0	0	0	9	
53	0	1	2	10.1		**53**	0	1	2	11		**53**	0	0	0	4.5	
54	0	1	2	14.5		**54**	0	1	1	4.6		**54**	0	0	0	28	
55	0	1	2	7.7		**55**	0	1	2	13.1		**55**	0	0	0	30	
56	0	1	2	20		**56**	0	1	1	5.8		**56**	0	0	0	19	
57	0	1	2	7.7		**57**	0	1	1	7		**57**	0	0	0	5	
58	0	1	2	7.6		**58**	0	1	2	7.5		**58**	0	0	0	3.5	
59	0	1	3	9.5		**59**	0	1	1	3.2		**59**	0	0	0	8.5	
60	0	1	2	15	0.25	**60**	0	1	2	15.3	0.25	**60**	0	0	0	7	0.5
61	0	1	2	11		**61**	0	1	2	13.2		**61**	0	0	0	6	
62	0	1	2	7.2		**62**	0	0	0	2.3		**62**	0	0	0	5	
63	0	1	2	15		**63**	0	1	1	5.3		**63**	0	0	0	18	
64	0	1	2	16		**64**	0	1	1	7.7		**64**	0	0	0	14.5	
65	0	1	2	10		**65**	0	1	1	6		**65**	0	0	0	9	
66	0	1	2	9.2		**66**	0	1	1	5		**66**	0	0	0	8	
67	0	1	2	8		**67**	0	1	2	14		**67**	0	0	0	7	
68	0	1	2	7		**68**	0	1	1	7.6		**68**	0	0	0	4.5	
69	0	1	2	13.4		**69**	0	1	1	8.4		**69**	0	0	0	19	
70	0	1	2	13.1	0.5	**70**	0	1	1	4.5	0.25	**70**	0	0	0	9	0.25
71	0	1	2	7.8		**71**	0	1	2	9.2		**71**	0	0	0	9.5	
72	0	1	2	12.4		**72**	0	1	2	12.5		**72**	0	0	0	5.5	
73	0	1	2	5		**73**	0	1	1	4.9		**73**	0	0	0	12	
74	0	1	2	5		**74**	0	1	1	3.6		**74**	0	0	0	18	
75	0	1	1	4.5		**75**	0	1	2	10.2		**75**	0	0	0	9	
76	0	1	2	14		**76**	0	1	1	4.6		**76**	0	0	0	17	
77	0	1	2	12		**77**	0	1	2	12		**77**	0	0	0	6	
78	0	1	2	11.5		**78**	0	1	1	7.4		**78**	0	0	0	18	
79	0	1	2	16		**79**	0	1	2	6.8		**79**	0	0	0	25	
80	0	1	2	11	0	**80**	0	0	0	3.5	0	**80**	0	0	0	6	0.25
81	0	1	2	5.7		**81**	0	1	1	9.1		**81**	0	0	0	12	
82	0	1	2	12		**82**	0	1	1	7.5		**82**	0	0	0	8.5	
83	0	1	2	6.8		**83**	0	1	1	1.3		**83**	0	0	0	3	
84	0	1	2	16		**84**	0	1	1	5.4		**84**	0	0	0	6.5	
85	0	1	2	8.1		**85**	0	1	2	13		**85**	0	0	0	7	
86	0	1	3	7.3		**86**	0	1	1	3.9		**86**	0	0	0	2	
87	0	1	2	11.2		**87**	0	1	1	6.4		**87**	0	0	0	21	
88	0	1	2	5.4		**88**	0	1	2	7.4		**88**	0	0	0	19	
89	0	1	2	8.4		**89**	0	1	1	17		**89**	0	0	0	11	
90	0	1	2	8.3	0.25	**90**	0	1	1	10	0.25	**90**	0	0	0	16	0.5
91	0	1	2	9.5		**91**	0	1	1	5.2		**91**	0	0	0	8.5	
92	0	1	2	8.3		**92**	0	1	1	5.7		**92**	0	0	0	32	
93	0	1	2	5.5		**93**	0	1	1	5.4		**93**	0	0	0	9	
94	0	1	2	15.5		**94**	0	1	1	4.3		**94**	0	0	0	24	
95	0	1	2	3.4		**95**	0	1	1	3.6		**95**	0	0	0	9.5	
96	0	1	2	11		**96**	0	1	1	12		**96**	0	0	0	3	
97	0	1	2	12		**97**	0	1	2	15.5		**97**	0	0	0	10.5	
98	0	1	2	9.7		**98**	0	1	2	8.8		**98**	0	0	0	9.5	
99	0	1	2	9		**99**	0	1	1	6.7		**99**	0	0	0	6	
100	0	1	2	15	0.5	**100**	0	1	1	4.1	0	**100**	0	0	0	16	0.5
101						**101**						**101**					
102						**102**						**102**					
103						**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.0**	**0.98**	**1.9**	**9.9**	**0.4**	**Mean**	**0.0**	**0.98**	**1.4**	**7.9**	**0.2**	**Mean**	**0.0**	**0.0**	**0.0**	**12.5**	**0.4**
CALCITE INDEX:		**0.98**				**CALCITE INDEX:**		**0.98**				**CALCITE INDEX:**		**0.0**			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

FOUNGD						FOUSH						FPC_SP1					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	1	1	3		**1**	0	1	1	3.3		**1**	0	0	0	2.6	
2	0	1	1	7.2		**2**	0	1	2	9.2		**2**	0	0	0	4.7	
3	0	0	0	7.9		**3**	0	1	2	6.8		**3**	0	0	0	4.8	
4	0	1	1	5.4		**4**	0	1	2	10.4		**4**	0	0	0	2.5	
5	0	1	1	1.9		**5**	0	1	2	10.1		**5**	0	0	0	3.1	
6	0	1	1	3.1		**6**	0	1	2	10.5		**6**	0	0	0	3.5	
7	0	0	0	6.8		**7**	0	1	2	10.4		**7**	0	0	0	1.5	
8	0	0	0	5.6		**8**	0	1	2	11.5		**8**	0	0	0	5.9	
9	0	1	1	10.3		**9**	0	1	2	16.5		**9**	0	1	1	6.5	
10	0	1	1	6.2	0.25	**10**	0	1	1	9.8	0.25	**10**	0	1	1	5.9	0.25
11	0	1	1	2.4		**11**	0	1	1	6		**11**	0	0	0	5.1	
12	0	0	0	6.3		**12**	0	1	1	7.5		**12**	0	0	0	4.8	
13	0	1	1	9.7		**13**	0	1	2	7.2		**13**	0	0	0	3.2	
14	0	1	1	6.8		**14**	0	1	1	7.2		**14**	0	0	0	1.5	
15	0	1	1	12.7		**15**	0	1	3	7.9		**15**	0	0	0	3.4	
16	0	1	1	6.4		**16**	0	1	1	11		**16**	0	0	0	5.1	
17	0	1	1	11.9		**17**	0	1	2	11.4		**17**	0	0	0	6.2	
18	0	1	1	8		**18**	0	1	2	2.3		**18**	0	0	0	3.1	
19	0	1	1	6.4		**19**	0	1	1	6.4		**19**	0	1	1	11.9	
20	0	1	1	8.1	0	**20**	0	1	1	7	0.25	**20**	0	1	1	10.2	0.5
21	0	1	1	5.7		**21**	0	1	1	8.4		**21**	0	0	0	4.4	
22	0	1	1	11.2		**22**	0	1	1	3.9		**22**	0	0	0	4.1	
23	0	1	1	11.3		**23**	0	1	1	7.9		**23**	0	1	1	8.1	
24	0	0	0	9.6		**24**	0	1	1	6.5		**24**	0	0	0	2.4	
25	0	1	1	5.7		**25**	0	1	1	3		**25**	0	0	0	5.1	
26	0	1	1	8.5		**26**	0	1	1	3.2		**26**	0	0	0	2.9	
27	0	1	1	13.6		**27**	0	1	2	9.5		**27**	0	1	1	17.1	
28	0	1	1	7.2		**28**	0	1	1	7.5		**28**	0	1	1	11.5	
29	0	1	1	14.3		**29**	0	1	1	6.2		**29**	0	1	1	7.1	
30	0	1	1	13.2	0.25	**30**	0	1	2	7.1	0.25	**30**	0	1	1	11.5	0.5
31	0	0	0	16.3		**31**	0	1	1	7.5		**31**	0	1	1	5.5	
32	0	1	1	14.5		**32**	0	1	2	8.2		**32**	0	1	1	5.1	
33	0	1	2	9.7		**33**	0	1	2	10.2		**33**	0	1	1	15.1	
34	0	1	2	9.8		**34**	0	1	2	5.2		**34**	0	1	1	8.1	
35	0	1	1	5.5		**35**	0	1	2	7.1		**35**	0	1	1	19.1	
36	0	1	1	13.7		**36**	0	1	2	12.3		**36**	0	1	1	13.3	
37	0	1	1	7.4		**37**	0	1	2	9.5		**37**	0	1	1	7.4	
38	0	1	1	8.2		**38**	0	1	2	18.3		**38**	0	1	1	4.3	
39	0	1	1	7.1		**39**	0	1	2	7.9		**39**	0	1	1	8.2	
40	0	1	1	12.6	0.25	**40**	0	1	2	10.4	0.25	**40**	0	1	1	10.5	0.25
41	0	1	1	5.8		**41**	0	1	2	4.9		**41**	0	1	1	5.4	
42	0	1	1	10.2		**42**	0	1	2	13.2		**42**	0	1	1	3.1	
43	0	1	1	3.8		**43**	0	1	1	3.4		**43**	0	1	1	8.5	
44	0	1	1	4.3		**44**	0	1	2	11.5		**44**	0	1	1	8	
45	0	1	1	6		**45**	0	1	2	4.8		**45**	0	1	1	5.9	
46	0	1	1	7.1		**46**	0	1	2	12.3		**46**	0	1	1	10.5	
47	0	1	1	1.7		**47**	0	1	2	8.7		**47**	0	1	1	2.5	
48	0	1	1	6.2		**48**	0	1	2	16.1		**48**	0	1	1	11.4	
49	0	1	1	4.2		**49**	0	1	2	14.5		**49**	0	1	1	1.8	
50	0	0	0	4.9	0.25	**50**	0	1	2	6.1	0.25	**50**	0	1	1	4.5	0.25
51	0	1	1	6.6		**51**	0	1	2	7		**51**	0	1	1	4.9	
52	0	0	0	1.5		**52**						**52**	0	1	1	1.9	
53	0	0	0	9.4		**53**	0	1	2	11		**53**	0	1	1	8.1	
54	0	1	1	2.8		**54**	0	1	1	6.9		**54**	0	1	1	5	
55	0	0	0	2.3		**55**	0	1	1	3.2		**55**	0	1	1	8.5	
56	0	1	1	8.2		**56**	0	1	1	11		**56**	0	1	1	6.5	
57	0	0	0	4.1		**57**	0	1	3	11.9		**57**	0	1	1	11.5	
58	0	1	1	4.6		**58**	0	1	1	9		**58**	0	1	1	4.8	
59	0	0	0	2.8		**59**	0	1	2	6.7		**59**	0	1	1	8.9	
60	0	1	1	12.4	0	**60**	0	1	1	7.1	0.25	**60**	0	0	0	5.4	0.25
61	0	1	1	6.2		**61**	0	1	2	4.9		**61**	0	1	1	10.6	
62	0	1	1	4.5		**62**	0	1	2	6.5		**62**	0	1	1	11.4	
63	0	1	1	6.2		**63**	0	1	1	9		**63**	0	1	1	1.8	
64	0	1	1	12.3		**64**	0	1	2	7.5		**64**	0	1	1	7	
65	0	1	1	3.8		**65**	0	1	2	4		**65**	0	1	1	7.8	
66	0	0	0	8.5		**66**	0	1	1	4.7		**66**	0	1	1	3.1	
67	0	1	1	4.1		**67**	0	1	1	8.5		**67**	0	1	1	1.7	
68	0	1	1	8.8		**68**	0	1	2	12.6		**68**	0	1	1	6.4	
69	0	1	1	7.5		**69**	0	1	2	7.5		**69**	0	1	1	4.3	
70	0	1	2	20.4	0.25	**70**	0	1	2	10.7	0.25	**70**	0	1	1	9.6	0.5
71	0	1	1	9.8		**71**	0	1	2	8.8		**71**	0	1	1	4.1	
72	0	0	0	14.7		**72**	0	1	1	4.9		**72**	0	1	1	1.8	
73	0	0	0	6.1		**73**	0	1	2	4.1		**73**	0	1	1	2.1	
74	0	1	1	13.2		**74**	0	1	2	8.5		**74**	0	1	1	1.9	
75	0	1	1	6.2		**75**	0	1	1	7.7		**75**	0	1	1	2.3	
76	0	1	1	6.2		**76**	0	1	3	11		**76**	0	1	1	1.2	
77	0	1	1	8.8		**77**	0	1	2	17.8		**77**	0	1	1	2.1	
78	0	1	1	7.7		**78**	0	1	1	7.4		**78**	0	1	1	5.3	
79	0	1	1	6.2		**79**	0	1	2	10.6		**79**	0	1	1	5.5	
80	0	1	1	7.8	0.25	**80**	0	1	2	4.9	0	**80**	0	1	1	5.6	0.25
81	0	1	1	14.7		**81**	0	1	2	0.1		**81**	0	1	1	5.1	
82	0	1	1	18.4		**82**	0	1	2	5.9		**82**	0	1	1	7.6	
83	0	1	1	8.7		**83**	0	1	2	14.3		**83**	0	1	1	1.8	
84	0	1	1	10.3		**84**	0	1	2	6.8		**84**	0	1	1	6.5	
85	0	1	1	4.2		**85**	0	1	3	11.4		**85**	0	1	1	5.4	
86	0	1	1	8.5		**86**	0	1	2	6.8		**86**	0	1	1	5.6	
87	0	1	1	4.4		**87**	0	1	2	9.7		**87**	0	1	1	3	
88	0	0	0	1.6		**88**	0	1	2	8.1		**88**	0	1	1	6.5	
89	0	0	0	3.5		**89**	0	1	2	9.2		**89**	0	1	1	5.5	
90	0	1	1	5.3	0.25	**90**	0	1	2	10.4	0.25	**90**	0	1	1	3.9	0.25
91	0	1	1	4.6		**91**	0	1	2	6.6		**91**	0	1	1	6.2	
92	0	0	0	4		**92**	0	1	2	6.1		**92**	0	1	1	4.5	
93	0	0	0	7.4		**93**	0	1	2	13.1		**93**	0	1	1	4	
94	0	1	1	4.8		**94**	0	1	1	6.4		**94**	0	1	1	4.1	
95	0	1	1	10.3		**95**	0	1	2	9.3		**95**	0	1	1	7.5	
96	0	1	1	7		**96**	0	1	1	4.3		**96**	0	1	1	6.5	
97	0	1	1	12.2		**97**	0	1	2	10.4		**97**	0	1	1	5.1	
98	0	1	1	7.1		**98**	0	1	2	4.9		**98**	0	1	1	6.1	
99	0	1	1	7.6		**99**	0	1	2	13.6		**99**	0	1	1	6.9	
100	0	1	1	6.2	0.25	**100**	0	1	2	8.1	0.5	**100**	0	1	1	4.4	0.25
101						**101**	0	1	2	9.3		**101**					
102						**102**						**102**					
103						**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.0**	**0.81**	**0.84**	**7.7**	**0.2**	**Mean**	**0.0**	**1.0**	**1.7**	**8.4**	**0.3**	**Mean**	**0.0**	**0.78**	**0.78**	**6.0**	**0.3**
CALCITE INDEX:		**0.81**				**CALCITE INDEX:**		**1.0**				**CALCITE INDEX:**		**0.78**			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

FR-JR1						FR-JR2						FR-JR6					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	0	0	4.8		1	0	0	0	4.2		1	0	1	1	9.6	
2	0	0	0	5.7		2	0	0	0	5.1		2	0	1	1	7.1	
3	0	0	0	5.5		3	0	0	0	9.9		3	0	1	1	6.6	
4	0	0	0	8.8		4	0	0	0	4.4		4	0	1	1	5.5	
5	0	0	0	3.3		5	0	0	0	5.6		5	0	1	1	7.2	
6	0	0	0	10.9		6	0	0	0	11.1		6	0	1	1	7.7	
7	0	0	0	4.9		7	0	0	0	3.9		7	0	1	1	4.0	
8	0	0	0	5.8		8	0	0	0	2.8		8	0	1	1	6.2	
9	0	0	0	7.5		9	0	0	0	9.7		9	0	1	1	9.8	
10	0	0	0	5.9	0.25	10	0	0	0	7.9	0.25	10	0	1	1	3.8	0.5
11	0	0	0	10.9		11	0	0	0	4.4		11	0	1	1	2.4	
12	0	0	0	8.8		12	0	0	0	7.8		12	0	1	1	5.5	
13	0	0	0	1.8		13	0	0	0	3.9		13	0	1	2	5.7	
14	0	0	0	7.7		14	0	0	0	5.8		14	0	1	1	3.9	
15	0	0	0	11.0		15	0	0	0	6.4		15	0	1	1	7.3	
16	0	0	0	10.5		16	0	0	0	7.1		16	0	1	2	4.5	
17	0	0	0	8.9		17	0	0	0	2.9		17	0	0	0	3.6	
18	0	0	0	5.2		18	0	0	0	11.8		18	0	1	1	6.5	
19	0	0	0	5.1		19	0	0	0	7.3		19	0	1	1	5.9	
20	0	0	0	5.7	0.25	20	0	0	0	6.9	0.25	20	0	1	1	4.6	0.25
21	0	0	0	7.6		21	0	0	0	4.6		21	0	1	1	4.1	
22	0	0	0	20.1		22	0	0	0	4.5		22	0	1	1	4.1	
23	0	0	0	5.1		23	0	0	0	10.3		23	0	1	1	5.4	
24	0	0	0	4.8		24	0	0	0	4.6		24	0	1	1	2.7	
25	0	0	0	14.2		25	0	0	0	8.0		25	0	1	1	5.3	
26	0	0	0	3.6		26	0	0	0	4.0		26	0	1	1	10.1	
27	0	0	0	7.7		27	0	0	0	8.1		27	0	1	2	6.3	
28	0	0	0	4.7		28	0	0	0	2.8		28	0	1	2	11.5	
29	0	0	0	4.5		29	0	0	0	17.3		29	0	1	2	9.5	
30	0	0	0	4.0	0.25	30	0	0	0	4.4	0.75	30	0	1	1	13.2	0.5
31	0	0	0	9.5		31	0	0	0	12.2		31	0	1	1	5.4	
32	0	0	0	4.5		32	0	0	0	7.8		32	0	0	0	1.6	
33	0	0	0	9.3		33	0	0	0	5.7		33	0	1	2	13.0	
34	0	0	0	5.6		34	0	0	0	4.4		34	0	1	2	4.5	
35	0	0	0	5.8		35	0	0	0	12.2		35	0	1	1	6.8	
36	0	0	0	5.2		36	0	0	0	3.7		36	0	1	1	3.4	
37	0	0	0	5.3		37	0	0	0	2.7		37	0	1	1	4.5	
38	0	0	0	4.5		38	0	0	0	5.3		38	0	1	1	8.7	
39	0	0	0	9.9		39	0	0	0	11.7		39	0	1	1	8.2	
40	0	0	0	3.5	0.5	40	0	0	0	3.5	0.5	40	0	1	1	8.2	0.5
41	0	0	0	4.5		41	0	0	0	9.2		41	0	1	1	9.3	
42	0	0	0	11.1		42	0	0	0	3.4		42	0	1	1	9.0	
43	0	0	0	7.7		43	0	0	0	5.1		43	0	1	1	12.4	
44	0	0	0	5.6		44	0	0	0	5.1		44	0	1	1	6.2	
45	0	0	0	6.8		45	0	0	0	4.8		45	0	1	1	4.2	
46	0	0	0	8.2		46	0	0	0	3.0		46	0	1	1	5.8	
47	0	0	0	7.2		47	0	0	0	3.7		47	0	1	1	6.8	
48	0	0	0	4.5		48	0	0	0	6.4		48	0	1	1	8.5	
49	0	0	0	sand		49	0	0	0	4.6		49	0	1	1	3.2	
50	0	0	0	4.0	0.25	50	0	0	0	5.5	0.5	50	0	1	1	5.3	0.5
51	0	0	0	4.5		51	0	0	0	6.4		51	0	1	1	4.1	
52	0	0	0	9.9		52	0	0	0	5.5		52	0	1	1	6.9	
53	0	0	0	9.1		53	0	0	0	5.2		53	0	1	1	4.8	
54	0	0	0	10.5		54	0	0	0	4.5		54	0	1	1	12.5	
55	0	0	0	7.4		55	0	0	0	3.9		55	0	1	1	3.1	
56	0	0	0	8.8		56	0	0	0	8.8		56	0	1	1	4.8	
57	0	0	0	8.8		57	0	0	0	4.9		57	0	1	1	7.8	
58	0	0	0	9.0		58	0	0	0	7.5		58	0	1	1	13.9	
59	0	0	0	13.1		59	0	0	0	9.2		59	0	1	1	4.6	
60	0	0	0	5.5	0.25	60	0	0	0	10.7	0.75	60	0	1	1	6.3	0.25
61	0	0	0	8.3		61	0	0	0	4.5		61	0	1	1	3.9	
62	0	0	0	5.5		62	0	0	0	7.1		62	0	1	1	10.2	
63	0	0	0	4.9		63	0	0	0	4.2		63	0	1	1	6.4	
64	0	0	0	10.2		64	0	0	0	4.5		64	0	1	1	9.5	
65	0	0	0	3.5		65	0	0	0	4.2		65	0	1	1	6.4	
66	0	0	0	7.0		66	0	0	0	5.5		66	0	1	1	10.3	
67	0	0	0	8.6		67	0	0	0	4.5		67	0	1	1	5.4	
68	0	0	0	11.5		68	0	0	0	4.5		68	0	1	1	10.3	
69	0	0	0	3.9		69	0	0	0	6.4		69	0	1	1	9.8	
70	0	0	0	2.1	0.25	70	0	0	0	8.0	0.5	70	0	1	1	13.5	0.25
71	0	0	0	7.5		71	0	0	0	6.4		71	0	1	1	10.9	
72	0	0	0	3.8		72	0	0	0	4.8		72	0	1	1	7.9	
73	0	0	0	6.7		73	0	0	0	5.5		73	0	1	1	11.8	
74	0	0	0	11.0		74	0	0	0	3.5		74	0	1	1	9.2	
75	0	0	0	12.5		75	0	0	0	5.2		75	0	1	1	5.9	
76	0	0	0	3.9		76	0	0	0	3.9		76	0	1	1	7.5	
77	0	0	0	4.5		77	0	1	1	6.5		77	0	1	1	8.1	
78	0	0	0	5.5		78	0	1	1	5.4		78	0	1	1	12.9	
79	0	0	0	10.8		79	0	1	1	5.4		79	0	1	1	8.0	
80	0	0	0	6.1	0.5	80	0	1	1	7.9	0.75	80	0	1	2	9.9	0.25
81	0	0	0	12.0		81	0	1	1	11.8		81	0	1	1	9.4	
82	0	0	0	12.0		82	0	1	1	4.8		82	0	1	1	5.3	
83	0	0	0	12.2		83	0	1	1	7.7		83	0	1	1	12.9	
84	0	0	0	12.2		84	0	1	1	3.8		84	0	1	1	9.9	
85	0	0	0	4.9		85	0	1	1	5.7		85	0	1	1	12.5	
86	0	0	0	2.9		86	0	1	1	5.7		86	0	1	1	7.5	
87	0	0	0	8.3		87	0	1	1	8.2		87	0	1	1	9.9	
88	0	0	0	12.4		88	0	1	1	10.0		88	0	1	1	4.1	
89	0	0	0	4.6		89	0	1	1	3.2		89	0	0	0	8.9	
90	0	0	0	5.5	0.5	90	0	1	1	4.8	0.5	90	0	0	0	6.5	0.5
91	0	0	0	5.9		91	0	1	1	8.1		91	0	1	1	5.5	
92	0	0	0	8.3		92	0	1	1	6.5		92	0	1	1	10.5	
93	0	0	0	5.2		93	0	1	1	4.3		93	0	1	1	8.4	
94	0	0	0	8.1		94	0	1	1	4.7		94	0	1	1	9.3	
95	0	0	0	11.0		95	0	1	1	7.9		95	0	1	1	14.1	
96	0	0	0	7.5		96	0	1	1	6.6		96	0	1	1	4.8	
97	0	0	0	17.8		97	0	1	1	4.9		97	0	1	1	4.2	
98	0	0	0	6.4		98	0	1	1	6.5		98	0	1	1	6.4	
99	0	0	0	11.7		99	0	1	1	7.0		99	0	1	1	4.5	
100	0	0	0	10.2	0.25	100	0	1	1	4.2	0.75	100	0	1	1	6.5	0.5
101	0	0	0	4.8		101						101					
102						102						102					
103						103						103					
104						104						104					
105						105						105					
106						106						106					
107						107						107					
108						108						108					
109						109						109					
110						110						110					
Mean	0.0	0.0	0.0	7.5	0.3	Mean	0.0	0.24	0.24	6.2	0.6	Mean	0.0	0.96	1.0	7.3	0.4
CALCITE INDEX:		0.0				CALCITE INDEX:		0.24				CALCITE INDEX:		0.96			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

FR-JR8						FR-JR8M						FR-JR8S					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	0	0	8.1		1	0	1	1	12.1		1	0	0	0	2.9	
2	0	0	0	10.2		2	0	0	0	5.5		2	0	0	0	4.5	
3	0	0	0	8.4		3	0	0	0	6.5		3	0	0	0	3.8	
4	0	0	0	5.3		4	0	0	0	7.8		4	0	0	0	1.8	
5	0	0	0	8.5		5	0	1	1	13.6		5	0	0	0	6.5	
6	0	0	0	6.2		6	0	0	0	8.2		6	0	0	0	5.5	
7	0	0	0	7.4		7	0	0	0	9.1		7	0	0	0	3.1	
8	0	0	0	5.5		8	0	0	0	7.4		8	0	0	0	2.3	
9	0	0	0	12.1		9	0	0	0	8.9		9	0	0	0	3.6	
10	0	0	0	6.4	0.25	10	0	1	1	8.9	0.25	10	0	0	0	6.9	0.25
11	0	0	0	10.5		11	0	0	0	5.9		11	0	0	0	5.0	
12	0	0	0	4.5		12	0	1	1	7.9		12	0	0	0	4.3	
13	0	0	0	9.9		13	0	0	0	7.5		13	0	0	0	4.1	
14	0	0	0	48.0		14	0	0	0	4.9		14	0	0	0	7.3	
15	0	0	0	3.4		15	0	0	0	5.5		15	0	0	0	3.2	
16	0	0	0	5.8		16	0	0	0	8.2		16	0	0	0	1.7	
17	0	0	0	4.7		17	0	0	0	3.6		17	0	0	0	4.3	
18	0	0	0	5.0		18	0	0	0	7.3		18	0	0	0	2.3	
19	0	0	0	11.4		19	0	0	0	9.8		19	0	0	0	1.2	
20	0	0	0	5.0	0.5	20	0	1	1	10.5	0.25	20	0	0	0	2.3	0.5
21	0	0	0	5.0		21	0	1	1	6.5		21	0	0	0	2.6	
22	0	0	0	8.2		22	0	0	0	5.1		22	0	0	0	3.6	
23	0	0	0	10.1		23	0	0	0	4.1		23	0	0	0	3.5	
24	0	0	0	7.5		24	0	0	0	8.3		24	0	0	0	2.9	
25	0	0	0	9.0		25	0	0	0	9.3		25	0	0	0	4.3	
26	0	0	0	6.8		26	0	0	0	3.4		26	0	0	0	4.8	
27	0	0	0	sand		27	0	0	0	11.2		27	0	0	0	2.5	
28	0	0	0	5.9		28	0	0	0	2.1		28	0	0	0	1.8	
29	0	0	0	8.6		29	0	1	1	5.6		29	0	0	0	6.1	
30	0	0	0	11.0	0.25	30	0	0	0	5.4	0.25	30	0	0	0	2.7	0.5
31	0	0	0	4.8		31	0	0	0	4.5		31	0	0	0	5.5	
32	0	0	0	9.4		32	0	1	1	10.9		32	0	0	0	7.6	
33	0	0	0	7.5		33	0	0	0	7.2		33	0	0	0	6.0	
34	0	0	0	6.4		34	0	0	0	4.6		34	0	0	0	7.5	
35	0	0	0	4.8		35	0	0	0	6.5		35	0	0	0	2.0	
36	0	0	0	2.8		36	0	0	0	11.5		36	0	0	0	2.5	
37	0	0	0	5.5		37	0	0	0	3.7		37	0	0	0	3.3	
38	0	0	0	8.7		38	0	0	0	9.2		38	0	0	0	4.0	
39	0	0	0	11.5		39	0	0	0	9.6		39	0	0	0	2.9	
40	0	0	0	5.2	0.5	40	0	0	0	17.9	0.25	40	0	0	0	2.6	0.5
41	0	0	0	9.3		41	0	0	0	11.9		41	0	0	0	1.3	
42	0	0	0	5.3		42	0	0	0	15.0		42	0	0	0	2.9	
43	0	0	0	4.4		43	0	0	0	5.5		43	0	0	0	gravel	
44	0	0	0	10.4		44	0	1	1	8.5		44	0	0	0	1.5	
45	0	0	0	9.4		45	0	0	0	11.3		45	0	0	0	2.9	
46	0	0	0	11.0		46	0	0	0	4.2		46	0	0	0	1.7	
47	0	0	0	6.3		47	0	0	0	5.3		47	0	0	0	4.2	
48	0	0	0	7.4		48	0	0	0	7.0		48	0	0	0	3.5	
49	0	0	0	6.0		49	0	0	0	7.0		49	0	0	0	2.5	
50	0	0	0	3.0	0.25	50	0	0	0	3.6	0.75	50	0	0	0	3.0	0.5
51	0	0	0	5.2		51	0	0	0	7.2		51	0	0	0	3.5	
52	0	0	0	10.7		52	0	0	0	4.1		52	0	0	0	2.2	
53	0	0	0	12.5		53	0	0	0	5.2		53	0	0	0	3.2	
54	0	0	0	12.4		54	0	0	0	7.3		54	0	0	0	4.1	
55	0	0	0	9.0		55	0	0	0	5.2		55	0	0	0	4.5	
56	0	0	0	7.7		56	0	0	0	3.1		56	0	0	0	3.6	
57	0	0	0	6.9		57	0	0	0	8.5		57	0	0	0	2.5	
58	0	0	0	4.5		58	0	0	0	5.3		58	0	0	0	3.4	
59	0	0	0	6.4		59	0	0	0	3.6		59	0	0	0	2.1	
60	0	0	0	2.6	0.5	60	0	0	0	6.0	0.5	60	0	0	0	2.9	0.5
61	0	0	0	4.8		61	0	0	0	2.0		61	0	0	0	3.9	
62	0	0	0	7.5		62	0	0	0	1.8		62	0	0	0	3.5	
63	0	0	0	10.0		63	0	0	0	5.8		63	0	0	0	9.1	
64	0	0	0	7.3		64	0	0	0	8.1		64	0	0	0	1.6	
65	0	0	0	9.4		65	0	0	0	7.2		65	0	0	0	2.5	
66	0	0	0	14.2		66	0	0	0	3.6		66	0	0	0	5.4	
67	0	0	0	8.0		67	0	0	0	4.9		67	0	0	0	10.1	
68	0	0	0	4.7		68	0	0	0	5.5		68	0	0	0	5.0	
69	0	0	0	9.1		69	0	0	0	6.1		69	0	0	0	3.1	
70	0	0	0	12.0	0.5	70	0	0	0	6.5	0.75	70	0	0	0	4.5	0.25
71	0	0	0	7.8		71	0	0	0	5.5		71	0	0	0	3.8	
72	0	0	0	4.2		72	0	0	0	5.5		72	0	0	0	7.5	
73	0	0	0	8.3		73	0	0	0	4.0		73	0	0	0	4.1	
74	0	0	0	11.4		74	0	0	0	4.5		74	0	0	0	sand	
75	0	0	0	8.1		75	0	0	0	5.1		75	0	0	0	7.5	
76	0	0	0	3.5		76	0	0	0	4.4		76	0	0	0	3.2	
77	0	0	0	11.2		77	0	0	0	4.3		77	0	0	0	4.1	
78	0	0	0	6.9		78	0	0	0	5.1		78	0	0	0	1.9	
79	0	0	0	9.9		79	0	0	0	5.6		79	0	0	0	2.5	
80	0	0	0	7.2	0.5	80	0	0	0	8.2	0.25	80	0	0	0	8.5	0.75
81	0	0	0	5.8		81	0	0	0	6.5		81	0	0	0	4.4	
82	0	0	0	3.0		82	0	0	0	4.8		82	0	0	0	6.5	
83	0	0	0	6.8		83	0	0	0	5.7		83	0	0	0	4.9	
84	0	0	0	14.1		84	0	0	0	4.5		84	0	0	0	4.5	
85	0	0	0	11.1		85	0	0	0	3.3		85	0	0	0	6.1	
86	0	0	0	10.7		86	0	0	0	5.3		86	0	0	0	5.4	
87	0	0	0	14.5		87	0	0	0	7.9		87	0	0	0	1.8	
88	0	0	0	16.6		88	0	0	0	4.3		88	0	0	0	5.6	
89	0	0	0	10.1		89	0	0	0	3.1		89	0	0	0	17.4	
90	0	0	0	8.2	0.25	90	0	0	0	5.5	0.25	90	0	0	0	7.0	0.5
91	0	0	0	25.0		91	0	0	0	1.9		91	0	0	0	3.5	
92	0	0	0	14.1		92	0	0	0	6.8		92	0	0	0	4.2	
93	0	0	0	10.6		93	0	0	0	6.6		93	0	0	0	5.6	
94	0	0	0	4.0		94	0	0	0	6.6		94	0	0	0	7.3	
95	0	0	0	8.9		95	0	0	0	6.1		95	0	0	0	4.0	
96	0	0	0	13.5		96	0	0	0	5.9		96	0	0	0	2.0	
97	0	0	0	9.5		97	0	0	0	4.9		97	0	0	0	6.5	
98	0	0	0	11.6		98	0	0	0	6.5		98	0	0	0	5.4	
99	0	0	0	5.4		99	0	0	0	4.2		99	0	0	0	6.1	
100	0	0	0	13.0	0.75	100	0	0	0	7.1	0.25	100	0	0	0	2.5	0.75
101	0	0	0	6.5		101						101	0	0	0	4.7	
102						102						102	0	0	0	5.3	
103						103						103					
104						104						104					
105						105						105					
106						106						106					
107						107						107					
108						108						108					
109						109						109					
110						110						110					
Mean	0.0	0.0	0.0	8.6	0.4	Mean	0.0	0.09	0.09	6.5	0.4	Mean	0.0	0.0	0.0	4.2	0.5
CALCITE INDEX:		0.0				CALCITE INDEX:		0.09				CALCITE INDEX:		0.0			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

FR-JR10						FR-SP1						FR-SP2					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	1	1	4.6		1	0	0	0	3.5		1	0	0	0	3.5	
2	0	1	1	8.9		2	0	1	1	9.6		2	0	0	0	3.6	
3	0	1	1	7.2		3	0	0	0	4.1		3	0	0	0	4.2	
4	0	1	1	3.2		4	0	1	1	4.5		4	0	1	1	4.1	
5	0	1	1	11.5		5	0	1	1	5.2		5	0	1	1	5.8	
6	0	1	1	7.0		6	0	1	1	6.3		6	0	1	1	4.3	
7	0	1	1	4.5		7	0	1	1	6.8		7	0	1	1	3.6	
8	0	1	1	9.4		8	0	0	0	4.6		8	0	1	1	4.3	
9	0	1	1	4.4		9	0	1	1	3.1		9	0	1	1	5.2	
10	0	1	1	8.1	0.75	10	0	1	1	6.8	0.5	10	0	1	1	4.9	0.25
11	0	1	1	4.6		11	0	1	2	4.9		11	0	0	0	1.8	
12	0	1	1	7.9		12	0	1	1	5.9		12	0	1	1	4.9	
13	0	1	1	6.9		13	0	1	1	4.6		13	0	0	0	4.4	
14	0	1	1	8.1		14	0	1	1	4.1		14	0	0	0	3.2	
15	0	1	1	9.5		15	0	1	1	5.1		15	0	0	0	3.5	
16	0	1	1	28.5		16	0	1	1	6.2		16	0	1	1	5.6	
17	0	1	1	5.4		17	0	1	1	4.9		17	0	1	1	4.1	
18	0	1	1	9.1		18	0	1	1	5.4		18	0	1	1	3.7	
19	0	1	1	18.5		19	0	1	1	3.9		19	0	0	0	3.8	
20	0	1	1	8.9	0.5	20	0	1	2	5.9	0.25	20	0	1	1	4.9	0.25
21	0	1	1	4.6		21	0	1	1	7.5		21	0	1	1	2.8	
22	0	1	1	10.7		22	0	1	2	6.2		22	0	1	1	2.3	
23	0	1	1	5.0		23	0	1	1	4.1		23	0	1	1	3.7	
24	0	1	1	2.3		24	0	0	0	3.6		24	0	1	1	4.5	
25	0	1	1	6.2		25	0	1	1	6.7		25	0	0	0	3.6	
26	0	1	1	2.5		26	0	1	1	4.4		26	0	1	1	4.9	
27	0	1	1	8.4		27	0	1	1	4.9		27	0	0	0	4.8	
28	0	1	1	6.7		28	0	1	1	5.0		28	0	1	1	5.0	
29	0	1	1	4.1		29	0	1	2	6.6		29	0	1	1	4.8	
30	0	1	1	6.1	0.25	30	0	1	1	3.2	0.5	30	0	0	0	2.4	0.25
31	0	1	1	9.9		31	0	1	1	2.9		31	0	1	1	7.0	
32	0	1	1	20.3		32	0	1	1	2.7		32	0	0	0	3.8	
33	0	1	1	s		33	0	1	1	2.5		33	0	1	1	7.1	
34	0	1	1	2.9		34	0	1	1	4.8		34	0	1	1	2.7	
35	0	1	1	22.5		35	0	1	1	4.3		35	0	1	1	5.3	
36	0	1	1	6.1		36	0	1	1	4.8		36	0	1	1	5.1	
37	0	1	1	8.9		37	0	1	1	3.3		37	0	1	1	3.1	
38	0	1	1	4.1		38	0	1	1	3.9		38	0	1	1	5.0	
39	0	1	1	8.9		39	0	1	1	3.5		39	0	1	1	3.5	
40	0	1	1	10.5	0.5	40	0	1	1	4.6	0.25	40	0	1	1	2.7	0.5
41	0	1	1	5.4		41	0	1	1	5.1		41	0	1	1	4.2	
42	0	1	1	8.6		42	0	1	1	4.3		42	0	1	1	3.4	
43	0	1	1	5.5		43	0	1	1	4.8		43	0	1	1	3.7	
44	0	1	1	5.1		44	0	1	1	6.1		44	0	1	1	4.7	
45	0	1	1	9.5		45	0	1	1	4.1		45	0	1	1	5.1	
46	0	1	1	15.1		46	0	1	1	51.0		46	0	1	1	4.0	
47	0	1	1	9.3		47	0	1	1	6.5		47	0	1	1	2.9	
48	0	1	1	8.6		48	0	1	1	2.8		48	0	1	1	5.6	
49	0	1	1	14.0		49	0	1	1	4.2		49	0	1	1	4.8	
50	0	1	1	10.2	0.25	50	0	1	1	3.6	0.25	50	0	1	1	5.0	0.25
51	0	1	1	3.0		51	0	1	1	2.8		51	0	1	1	3.4	
52	0	1	1	15.4		52	0	1	1	3.6		52	0	1	1	6.8	
53	0	1	1	5.5		53	0	1	1	3.1		53	0	1	2	5.9	
54	0	1	1	10.1		54	0	1	1	3.2		54	0	1	1	4.1	
55	0	1	1	4.4		55	0	1	1	4.2		55	0	1	2	4.8	
56	0	1	1	9.1		56	0	1	1	4.1		56	0	1	1	2.9	
57	0	1	1	3.0		57	0	1	1	1.9		57	0	1	2	4.6	
58	0	1	1	10.5		58	0	1	1	10.0		58	0	1	1	4.1	
59	0	1	1	7.4		59	0	1	1	3.5		59	0	1	2	5.8	
60	0	1	1	11.4	0.25	60	0	1	1	4.4	0.25	60	0	1	1	2.3	0.5
61	0	1	1	15.1		61	0	1	1	3.2		61	0	1	1	3.3	
62	0	1	1	6.3		62	0	1	1	4.4		62	0	1	2	6.1	
63	0	1	1	7.7		63	0	1	1	3.8		63	0	1	1	3.1	
64	0	1	1	7.8		64	0	1	1	4.6		64	0	1	1	5.8	
65	0	1	1	25.3		65	0	1	1	5.9		65	0	1	1	4.6	
66	0	1	1	21.9		66	0	1	1	3.1		66	0	1	1	3.8	
67	0	1	1	17.2		67	0	1	1	5.8		67	0	1	2	5.2	
68	0	1	1	4.4		68	0	1	1	6.5		68	0	1	2	5.8	
69	0	1	1	29.5		69	0	1	1	3.4		69	0	1	1	7.5	
70	0	1	1	7.4	0.25	70	0	1	1	1.9	0.5	70	0	1	2	4.3	0.25
71	0	1	1	12.5		71	0	1	1	4.1		71	0	1	1	3.3	
72	0	1	1	5.5		72	0	0	0	1.8		72	0	1	1	6.5	
73	0	1	1	7.9		73	0	0	0	2.4		73	0	1	1	1.9	
74	0	1	1	4.5		74	0	0	0	1.8		74	0	1	1	3.4	
75	0	1	1	8.1		75	0	0	0	2.4		75	0	1	1	5.3	
76	0	1	1	4.2		76	0	0	0	1.6		76	0	1	2	6.9	
77	0	1	1	10.6		77	0	1	1	3.1		77	0	1	1	3.7	
78	0	1	1	7.3		78	0	1	1	4.5		78	0	1	1	6.1	
79	0	1	1	23.8		79	0	0	0	1.5		79	0	1	2	3.4	
80	0	1	1	16.1	0.75	80	0	1	1	8.3	0.25	80	0	1	1	3.0	0.5
81	0	1	1	8.5		81	0	0	0	2.8		81	0	1	1	5.0	
82	0	1	1	5.4		82	0	1	1	7.9		82	0	1	2	7.8	
83	0	1	1	7.1		83	0	1	1	3.5		83	0	1	1	5.3	
84	0	1	1	6.2		84	0	0	0	6.5		84	0	1	1	4.1	
85	0	1	1	9.5		85	0	1	1	7.5		85	0	1	1	4.3	
86	0	1	1	3.1		86	0	1	1	2.5		86	0	1	1	4.1	
87	0	1	1	s		87	0	1	1	2.4		87	0	1	2	6.8	
88	0	1	1	16.7		88	0	1	1	4.4		88	0	1	2	3.7	
89	0	1	1	6.8		89	0	1	1	4.8		89	0	1	1	3.5	
90	0	1	1	24.5	0.75	90	0	1	1	7.6	0.5	90	0	1	1	4.9	0.25
91	0	1	1	18.3		91	0	1	1	4.3		91	0	1	1	4.5	
92	0	1	1	6.5		92	0	1	1	4.7		92	0	1	1	4.2	
93	0	1	1	5.4		93	0	1	1	4.5		93	0	1	1	2.9	
94	0	1	1	9.6		94	0	1	1	3.2		94	0	1	1	3.8	
95	0	1	1	10.1		95	0	1	2	6.3		95	0	1	1	6.0	
96	0	1	1	5.3		96	0	1	2	5.3		96	0	1	1	3.4	
97	0	1	1	14.9		97	0	1	1	7.1		97	0	1	1	2.3	
98	0	1	1	6.8		98	0	1	2	7.4		98	0	1	1	4.3	
99	0	1	1	10.8		99	0	1	1	4.5		99	0	1	1	4.2	
100	0	1	1	4.4	0.75	100	0	1	1	3.1	0.25	100	0	1	1	5.7	0.25
101	0	1	1	16.0		101						101					
102						102						102					
103						103						103					
104						104						104					
105						105						105					
106						106						106					
107						107						107					
108						108						108					
109						109						109					
110						110						110					
Mean	0.0	1.0	1.0	9.5	0.5	Mean	0.0	0.88	0.95	5.0	0.4	Mean	0.0	0.88	1.0	4.4	0.3
CALCITE INDEX:		1.0				CALCITE INDEX:		0.88				CALCITE INDEX:		0.88			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

GHC-SP1						GHC-SP2						GHCKD					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	0	0	5.1		**1**	0	1	1	8.5		**1**	0	1	2	10.5	
2	0	0	0	4.5		**2**	0	1	1	9.6		**2**	1	1	2	9.3	
3	0	1	2	4.1		**3**	0	1	1	2.3		**3**	1	1	3	12.0	
4	0	1	1	4.4		**4**	0	1	1	5.6		**4**	0	1	2	5.6	
5	0	1	2	5.9		**5**	0	1	1	10.4		**5**	0	1	2	5.2	
6	0	1	2	7.2		**6**	0	1	2	9.5		**6**	0	1	2	6.1	
7	0	1	2	11.5		**7**	0	1	1	3.5		**7**	0	1	1	9.0	
8	0	1	2	8.6		**8**	0	1	1	2.1		**8**	1	1	3	10.8	
9	0	1	2	5.4		**9**	0	1	1	3.1		**9**	0	1	2	8.2	
10	0	1	2	10.0	0.25	**10**	0	1	1	1.8	0.75	**10**	1	1	3	11.5	0.25
11	0	1	2	5.3		**11**	0	1	1	1.2		**11**	0	1	2	8.1	
12	0	1	1	2.6		**12**	0	1	1	2.2		**12**	2	1	2	14.2	
13	0	1	2	3.8		**13**	0	1	2	6.0		**13**	0	1	1	10.2	
14	0	1	2	6.2		**14**	0	1	1	2.5		**14**	2	1	3	22.3	
15	0	1	2	6.2		**15**	0	1	3	13.2		**15**	0	1	2	6.9	
16	0	1	2	7.1		**16**	0	1	2	4.9		**16**	1	1	3	18.3	
17	0	1	1	3.4		**17**	0	1	2	3.9		**17**	0	1	1	4.1	
18	0	1	2	7.4		**18**	0	1	1	3.8		**18**	0	1	2	5.5	
19	0	1	2	5.4		**19**	0	1	2	8.0		**19**	0	1	1	5.4	
20	0	1	1	8.4	0.25	**20**	0	1	2	8.3	0.75	**20**	0	1	2	5.0	0.5
21	0	1	1	4.5		**21**	0	1	3	9.1		**21**	0	1	2	14.3	
22	0	1	1	4.8		**22**	0	1	2	3.5		**22**	0	1	1	7.5	
23	0	1	1	7.9		**23**	0	1	3	3.5		**23**	0	1	1	7.1	
24	0	1	2	4.6		**24**	0	1	1	1.6		**24**	0	0	0	7.5	
25	0	1	1	5.8		**25**	0	1	2	6.9		**25**	0	1	1	9.6	
26	0	1	2	5.8		**26**	0	1	1	1.5		**26**	0	0	0	11.5	
27	0	1	2	5.7		**27**	0	1	2	8.9		**27**	0	1	1	4.5	
28	0	1	2	4.3		**28**	0	1	1	2.0		**28**	0	1	2	12.2	
29	0	1	2	6.0		**29**	0	1	2	7.5		**29**	0	1	2	4.3	
30	0	1	1	8.2	0.5	**30**	0	1	2	7.6	0.25	**30**	0	1	1	9.0	0.25
31	0	1	1	4.1		**31**	0	1	2	7.8		**31**	1	1	2	15.3	
32	0	1	1	7.1		**32**	0	1	2	8.0		**32**	2	1	2	11.1	
33	0	1	1	3.5		**33**	0	1	1	9.0		**33**	0	1	2	4.8	
34	0	1	2	7.1		**34**	0	1	1	2.1		**34**	0	1	2	13.7	
35	0	1	2	5.5		**35**	0	1	1	8.6		**35**	0	1	2	8.1	
36	0	1	1	7.1		**36**	0	1	1	3.1		**36**	0	1	1	6.3	
37	0	1	1	7.8		**37**	0	1	1	10.0		**37**	0	1	2	10.6	
38	0	1	2	4.2		**38**	0	1	1	6.5		**38**	0	1	2	11.7	
39	0	1	2	7.4		**39**	0	1	1	8.3		**39**	0	1	1	11.8	
40	0	1	2	5.9	0.25	**40**	0	1	3	9.1	0.75	**40**	0	1	2	20.5	0.25
41	0	1	2	6.5		**41**	0	1	1	5.5		**41**	0	1	2	8.1	
42	0	1	2	10.4		**42**	0	1	2	6.6		**42**	0	1	3	10.1	
43	0	1	2	2.7		**43**	0	1	1	3.6		**43**	2	1	3	6.5	
44	0	1	2	7.3		**44**	0	1	1	1.9		**44**	0	1	1	5.1	
45	0	1	2	6.0		**45**	0	1	1	2.3		**45**	0	1	1	11.5	
46	0	1	2	6.2		**46**	0	1	2	12.5		**46**	0	1	2	5.6	
47	0	1	2	10.5		**47**	0	1	1	3.5		**47**	2	1	2	12.8	
48	0	1	2	3.5		**48**	0	1	1	3.9		**48**	0	1	1	8.0	
49	0	1	2	4.5		**49**	0	1	1	4.1		**49**	0	1	1	7.2	
50	0	1	2	6.0	0.25	**50**	0	1	1	3.1	0.25	**50**	0	1	1	7.5	0.25
51	0	1	2	4.8		**51**	0	1	3	9.9		**51**	0	1	3	15.0	
52	0	1	1	3.2		**52**	0	1	2	6.1		**52**	0	1	2	7.0	
53	0	1	2	3.1		**53**	0	1	1	2.1		**53**	0	1	1	4.1	
54	0	1	2	6.0		**54**	0	1	1	2.5		**54**	0	1	1	2.1	
55	0	1	2	6.1		**55**	0	1	1	1.7		**55**	1	1	2	12.1	
56	0	1	1	3.2		**56**	0	1	1	4.2		**56**	0	1	2	5.9	
57	0	1	2	6.1		**57**	0	1	2	7.3		**57**	0	1	3	7.3	
58	0	1	1	3.8		**58**	0	1	2	2.2		**58**	0	1	1	9.8	
59	0	1	1	2.2		**59**	0	1	2	4.2		**59**	0	1	2	10.0	
60	0	1	1	4.5	0.5	**60**	0	1	2	4.1	0.25	**60**	0	1	2	4.8	0.5
61	0	1	2	4.0		**61**	0	1	2	4.5		**61**	2	1	2	12.3	
62	0	1	1	3.4		**62**	0	1	1	8.6		**62**	0	1	1	3.5	
63	0	1	1	4.0		**63**	0	1	1	8.4		**63**	2	1	2	10.3	
64	0	1	1	4.9		**64**	0	1	2	6.5		**64**	1	1	2	7.1	
65	0	1	1	2.8		**65**	0	1	1	2.7		**65**	1	1	2	4.5	
66	0	1	1	3.8		**66**	0	1	2	4.8		**66**	1	1	1	7.1	
67	0	1	2	5.2		**67**	0	1	1	2.2		**67**	0	1	3	9.6	
68	0	1	2	3.5		**68**	0	1	1	3.3		**68**	2	1	3	7.1	
69	0	1	2	5.7		**69**	0	1	1	10.6		**69**	0	1	1	9.2	
70	0	1	2	3.5	0.25	**70**	0	1	1	8.6	0.75	**70**	0	1	3	16.2	0.5
71	0	1	2	6.5		**71**	0	1	1	8.1		**71**	1	1	3	4.9	
72	0	1	2	8.6		**72**	0	1	1	2.6		**72**	0	1	2	5.8	
73	0	1	2	10.9		**73**	0	1	1	8.2		**73**	1	1	2	5.3	
74	0	1	2	6.6		**74**	0	1	2	13.3		**74**	0	1	2	12.8	
75	0	1	2	7.1		**75**	0	1	1	10.0		**75**	0	1	1	3.6	
76	0	1	2	4.1		**76**	0	1	1	11.1		**76**	0	1	2	6.2	
77	0	1	2	6.5		**77**	0	1	2	8.1		**77**	0	1	1	4.5	
78	0	1	2	9.6		**78**	0	1	1	2.2		**78**	0	1	1	10.7	
79	0	1	1	9.1		**79**	0	1	1	1.5		**79**	0	1	2	5.4	
80	0	1	2	8.4	0	**80**	0	1	1	2.8	0.5	**80**	1	1	3	8.1	0.25
81	0	1	1	3.4		**81**	0	1	1	1.7		**81**	0	1	2	6.4	
82	0	1	1	9.8		**82**	0	1	1	7.2		**82**	2	1	2	10.3	
83	0	1	1	7.4		**83**	0	1	1	2.1		**83**	1	1	2	10.3	
84	0	1	1	9.9		**84**	0	1	1	4.1		**84**	1	1	3	9.9	
85	0	1	2	4.0		**85**	0	1	1	2.1		**85**	0	1	1	8.5	
86	0	1	1	11.4		**86**	0	1	1	1.5		**86**	0	1	1	9.5	
87	0	1	2	7.7		**87**	0	1	1	9.1		**87**	0	1	2	6.4	
88	0	1	1	5.3		**88**	0	1	1	7.1		**88**	0	1	3	14.8	
89	0	1	1	3.5		**89**	0	1	2	8.9		**89**	0	0	0	4.9	
90	0	1	2	2.5	0.25	**90**	0	1	1	6.7	0.25	**90**	1	1	3	6.3	0.5
91	0	1	2	7.0		**91**	0	1	3	10.2		**91**	0	1	4	6.4	
92	0	1	2	4.5		**92**	0	1	1	5.6		**92**	2	1	2	7.5	
93	0	1	2	7.4		**93**	0	1	1	3.6		**93**	2	1	2	6.9	
94	0	1	2	5.9		**94**	0	1	2	3.8		**94**	2	1	2	7.1	
95	0	1	2	8.5		**95**	0	1	1	3.3		**95**	0	1	2	7.5	
96	0	1	2	4.7		**96**	0	1	1	3.9		**96**	0	1	1	9.5	
97	0	1	2	11.0		**97**	0	1	2	4.8		**97**	0	1	2	6.4	
98	0	1	2	4.6		**98**	0	1	2	2.2		**98**	2	1	3	19.9	
99	0	1	2	7.1		**99**	0	1	2	2.3		**99**	1	1	4	9.8	
100	0	1	1	2.6	0.25	**100**	0	1	2	1.2	0.75	**100**	1	1	4	12.2	0.5
101						**101**						**101**					
102						**102**						**102**					
103						**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.0**	**0.98**	**1.6**	**5.9**	**0.3**	**Mean**	**0.0**	**1.0**	**1.4**	**5.5**	**0.5**	**Mean**	**0.44**	**0.97**	**1.9**	**8.8**	**0.4**
CALCITE INDEX:		**0.98**				**CALCITE INDEX:**		**1.0**				**CALCITE INDEX:**		**1.4**			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

GHCKU						GRCK						GRDS					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	1	1	1	2.2		**1**	0	1	1	15.8		**1**	0	1	1	10.5	
2	2	1	1	5.5		**2**	0	0	0	4.1		**2**	0	1	1	6.2	
3	1	1	2	5.7		**3**	0	1	1	19.4		**3**	0	1	1	14.6	
4	2	1	2	5.5		**4**	0	0	0	4.6		**4**	0	1	1	10.0	
5	2	1	2	3.7		**5**	0	1	1	8.8		**5**	0	1	1	5.3	
6	2	1	1	17.2		**6**	0	1	1	21.7		**6**	0	1	1	10.2	
7	2	1	1	7.2		**7**	0	1	1	10.5		**7**	0	1	1	10.6	
8	1	1	2	5.5		**8**	0	0	0	1.8		**8**	0	1	1	8.0	
9	1	1	1	10.0		**9**	0	0	0	4.5		**9**	0	1	1	16.0	
10	2	1	2	5.4	0.25	**10**	0	1	1	8.0	0.25	**10**	0	1	1	3.1	0
11	2	1	2	8.7		**11**	0	1	1	13.7		**11**	0	1	1	6.9	
12	1	1	1	12.6		**12**	0	0	0	11.6		**12**	0	1	1	23.7	
13	1	1	1	5.0		**13**	0	1	1	18.2		**13**	0	1	1	3.4	
14	2	1	1	6.1		**14**	0	1	1	24.3		**14**	0	1	1	2.6	
15	2	1	2	20.2		**15**	0	1	1	38.2		**15**	0	1	1	11.0	
16	2	1	1	6.0		**16**	0	1	1	34.2		**16**	0	1	1	6.2	
17	2	1	1	5.8		**17**	0	0	0	2.8		**17**	0	1	1	7.5	
18	2	1	2	14.3		**18**	0	0	0	4.6		**18**	0	1	1	8.7	
19	0	1	1	5.3		**19**	0	0	0	2.3		**19**	0	1	1	8.0	
20	1	1	1	4.8	0.25	**20**	0	1	1	13.1	0.25	**20**	0	1	1	30.5	0.25
21	1	1	2	5.7		**21**	0	0	0	2.6		**21**	0	1	1	15.2	
22	2	1	1	6.3		**22**	0	0	0	21.0		**22**	0	1	1	9.9	
23	1	1	1	7.3		**23**	0	1	1	20.2		**23**	0	1	1	6.6	
24	2	1	1	6.9		**24**	0	0	0	4.9		**24**	0	1	1	23.5	
25	2	1	1	4.4		**25**	0	0	0	0.5		**25**	0	1	1	10.4	
26	2	1	2	8.1		**26**	0	0	0	8.3		**26**	0	1	1	8.0	
27	2	1	2	9.6		**27**	0	1	1	12.1		**27**	0	1	2	26.3	
28	2	1	1	8.3		**28**	0	0	0	4.2		**28**	0	1	1	5.5	
29	1	1	2	10.6		**29**	0	0	0	3.2		**29**	0	1	1	11.8	
30	1	1	1	5.2	0.5	**30**	0	0	0	8.9	0.5	**30**	0	1	1	10.3	0.5
31	1	1	2	7.2		**31**	0	1	1	9.2		**31**	0	1	1	4.6	
32	1	1	2	5.1		**32**	0	0	0	5.0		**32**	0	1	1	9.0	
33	2	1	1	4.1		**33**	0	0	0	5.6		**33**	0	0	0	3.7	
34	1	1	3	5.1		**34**	0	1	1	31.4		**34**	0	1	1	11.6	
35	1	1	1	6.2		**35**	0	0	0	4.3		**35**	0	1	1	9.7	
36	0	1	1	3.5		**36**	0	0	0	2.6		**36**	0	1	1	7.1	
37	1	1	2	6.7		**37**	0	0	0	6.8		**37**	0	1	1	11.2	
38	1	1	1	3.9		**38**	0	1	1	32.3		**38**	0	1	1	7.4	
39	2	1	2	2.5		**39**	0	1	1	7.5		**39**	0	1	1	6.4	
40	1	1	1	3.7	0.25	**40**	0	1	1	5.0	0.5	**40**	0	1	1	7.6	0
41	1	1	1	4.2		**41**	0	1	1	4.9		**41**	0	1	1	6.7	
42	2	1	2	3.4		**42**	0	0	0	2.2		**42**	0	1	1	5.5	
43	2	1	1	3.0		**43**	0	1	1	11.7		**43**	0	1	1	10.2	
44	2	1	1	4.4		**44**	0	1	1	11.5		**44**	0	1	1	6.5	
45	1	1	2	2.6		**45**	0	0	0	5.6		**45**	0	1	1	9.1	
46	2	1	3	8.0		**46**	0	1	1	55.5		**46**	0	1	1	9.2	
47	1	1	2	4.7		**47**	0	1	1	12.8		**47**	0	1	1	30.0	
48	1	1	1	4.8		**48**	0	1	1	23.4		**48**	0	1	1	9.7	
49	2	1	3	4.5		**49**	0	0	0	3.2		**49**	0	1	1	13.8	
50	2	1	1	8.3	0.5	**50**	0	0	0	10.7	0.25	**50**	0	1	1	5.2	0.25
51	1	1	1	3.2		**51**	0	1	1	25.2		**51**	0	1	1	7.6	
52	2	1	1	6.2		**52**	0	0	0	5.5		**52**	0	1	1	8.5	
53	2	1	2	5.7		**53**	0	0	0	2.0		**53**	0	1	1	9.7	
54	1	1	1	3.2		**54**	0	1	1	7.9		**54**	0	1	1	19.5	
55	1	1	2	4.0		**55**	0	1	1	14.4		**55**	0	1	1	19.8	
56	2	1	2	4.2		**56**	0	0	0	6.2		**56**	0	1	1	10.9	
57	2	1	2	8.9		**57**	0	0	0	5.3		**57**	0	1	1	14.1	
58	1	1	2	7.2		**58**	0	0	0	5.4		**58**	0	1	1	6.4	
59	1	1	1	4.9		**59**	0	1	1	26.5		**59**	0	1	1	6.7	
60	2	1	2	7.6	0.5	**60**	0	1	1	6.8	0.25	**60**	0	1	1	6.0	0.25
61	1	1	1	3.9		**61**	0	0	0	4.0		**61**	0	1	1	4.4	
62	1	1	2	8.0		**62**	0	1	1	7.8		**62**	0	1	1	7.5	
63	1	1	1	5.0		**63**	0	0	0	12.8		**63**	0	1	1	18.3	
64	1	1	2	5.0		**64**	0	1	1	11.7		**64**	0	1	1	9.8	
65	1	1	2	3.5		**65**	0	1	1	20.7		**65**	0	1	1	8.2	
66	2	1	2	3.7		**66**	0	0	0	6.8		**66**	0	1	1	4.4	
67	1	1	1	3.9		**67**	0	1	1	9.0		**67**	0	1	1	8.8	
68	2	1	2	7.0		**68**	0	0	0	7.0		**68**	0	1	1	10.2	
69	1	1	1	2.7		**69**	0	0	0	20.8		**69**	0	1	1	23.0	
70	1	1	2	4.4	0.25	**70**	0	0	0	10.3	0.25	**70**	0	1	1	5.8	0
71	2	1	1	11.3		**71**	0	1	1	23.1		**71**	0	1	1	11.6	
72	2	1	1	9.3		**72**	0	0	0	13.5		**72**	0	1	1	42.2	
73	1	1	1	2.2		**73**	0	0	0	3.9		**73**	0	1	1	9.8	
74	1	1	2	5.7		**74**	0	0	0	2.5		**74**	0	1	1	3.2	
75	2	1	1	4.2		**75**	0	1	1	18.5		**75**	0	1	1	7.0	
76	2	1	2	4.1		**76**	0	1	1	35.0		**76**	0	1	1	8.3	
77	2	1	2	7.2		**77**	0	1	1	9.5		**77**	0	1	1	10.2	
78	1	1	1	3.2		**78**	0	1	1	5.0		**78**	0	1	1	20.7	
79	2	1	1	3.3		**79**	0	0	0	16.9		**79**	0	1	1	4.5	
80	1	1	1	6.0	0.5	**80**	0	1	1	21.9	0.5	**80**	0	1	1	7.7	0.25
81	2	1	1	7.2		**81**	0	0	0	6.0		**81**	0	1	1	9.4	
82	1	1	1	3.8		**82**	0	0	0	4.8		**82**	0	1	1	7.7	
83	2	1	1	6.6		**83**	0	1	1	50.0		**83**	0	1	1	6.8	
84	2	1	2	14.5		**84**	0	0	0	4.2		**84**	0	1	1	6.8	
85	2	1	1	6.7		**85**	0	0	0	18.8		**85**	0	1	1	8.0	
86	1	1	1	6.2		**86**	0	1	1	14.5		**86**	0	1	1	25.1	
87	1	1	1	2.0		**87**	0	1	1	33.0		**87**	0	1	1	4.7	
88	1	1	1	6.7		**88**	0	1	1	26.6		**88**	0	1	1	7.9	
89	0	1	1	1.2		**89**	0	0	0	9.5		**89**	0	1	1	9.7	
90	1	1	2	5.2	0	**90**	0	0	0	3.8	0.5	**90**	0	1	1	7.6	0
91	1	1	3	7.6		**91**	0	0	0	5.3		**91**	0	1	1	6.6	
92	2	1	1	3.7		**92**	0	1	1	13.8		**92**	0	1	1	11.8	
93	2	1	2	9.8		**93**	0	0	0	3.8		**93**	0	1	1	12.9	
94	1	1	1	3.6		**94**	0	1	1	11.0		**94**	0	1	1	14.5	
95	2	1	1	11.4		**95**	0	1	1	21.5		**95**	0	1	1	6.9	
96	2	1	2	10.2		**96**	0	1	1	13.0		**96**	0	1	1	13.4	
97	2	1	2	10.4		**97**	0	0	0	9.5		**97**	0	1	1	5.0	
98	2	1	1	5.3		**98**	0	1	1	12.7		**98**	0	1	1	14.8	
99	1	1	2	3.7		**99**	0	0	0	3.3		**99**	0	1	1	12.3	
100	1	1	1	16.6	0	**100**	0	0	0	6.5	0.75	**100**	0	1	1	22.9	0.25
101						**101**	0	0	0	10.7		**101**					
102						**102**	0	0	0	5.4		**102**					
103						**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**1.5**	**1.0**	**1.5**	**6.3**	**0.3**	**Mean**	**0.0**	**0.48**	**0.48**	**12.3**	**0.40**	**Mean**	**0.0**	**0.99**	**1.0**	**10.6**	**0.2**
CALCITE INDEX:		**2.5**				**CALCITE INDEX:**		**0.48**				**CALCITE INDEX:**		**0.99**			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

GREE1-25/GH3-SP3						GREE1-50/GHC-SP4						GREE3-75					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	1	1	5.2		**1**	0	1	1	5.7		**1**	1	1	2	10.4	
2	0	1	1	2.2		**2**	0	1	1	2.3		**2**	2	1	1	21	
3	0	1	1	3.6		**3**	1	1	1	5.5		**3**	2	1	1	9.2	
4	0	1	1	10.5		**4**	0	1	1	7.3		**4**	2	1	1	13.5	
5	0	1	1	4.6		**5**	0	1	1	5.9		**5**	2	1	1	13	
6	0	1	1	9.5		**6**	0	1	1	9.8		**6**	2	1	1	11.7	
7	0	1	1	6.2		**7**	0	1	1	5.5		**7**	2	1	1	12	
8	0	1	1	2.4		**8**	0	1	1	7.6		**8**	2	1	1	8.2	
9	0	1	1	3.9		**9**	0	0	0	2.8		**9**	2	1	1	18	
10	0	1	1	2.0	1	**10**	0	1	1	7.5	0.25	**10**	2	1	2	10	0.5
11	0	0	0	3.7		**11**	1	1	1	3.8		**11**	2	1	1	13	
12	0	0	0	8.5		**12**	0	1	1	7.0		**12**	2	1	1	8	
13	0	0	0	5.1		**13**	0	1	1	5.4		**13**	2	1	1	9.4	
14	0	0	0	3.8		**14**	0	1	1	6.4		**14**	2	1	1	11	
15	0	1	1	11.1		**15**	0	1	1	4.3		**15**	2	1	1	21	
16	0	0	0	4.2		**16**	0	1	1	4.4		**16**	2	1	2	10	
17	0	1	1	9.8		**17**	0	1	1	9.5		**17**	2	1	1	8	
18	0	1	1	3.9		**18**	0	1	1	4.2		**18**	2	1	1	16.5	
19	0	0	0	2.6		**19**	0	1	1	11.8		**19**	2	1	1	10.2	
20	0	1	1	8.1	1	**20**	0	1	1	14.1	0.25	**20**	2	1	1	19	0.5
21	0	1	1	6.1		**21**	1	1	1	12.3		**21**	2	1	1	15.5	
22	0	1	1	3.0		**22**	0	1	1	14.9		**22**	2	1	1	16.5	
23	0	1	1	9.9		**23**	0	1	1	7.2		**23**	2	1	1	12	
24	0	0	0	1.5		**24**	0	1	1	12.8		**24**	2	1	1	10.7	
25	0	0	0	2.8		**25**	0	1	1	5.9		**25**	2	1	1	17	
26	0	0	0	6.4		**26**	0	0	0	6.0		**26**	2	1	2	13.6	
27	0	1	1	6.7		**27**	0	1	1	6.2		**27**	2	1	2	15.5	
28	0	1	1	9.9		**28**	0	1	1	10.1		**28**	0	1	1	2.6	
29	0	0	0	5.9		**29**	0	1	1	7.3		**29**	2	1	1	6.4	
30	0	1	1	9.5	1	**30**	0	0	0	6.8	0.25	**30**	2	1	1	8	0.25
31	0	0	0	2.4		**31**	0	1	1	7.9		**31**	2	1	1	8	
32	0	1	1	8.9		**32**	0	1	2	7.5		**32**	2	1	1	6.5	
33	0	1	1	12.0		**33**	0	1	1	6.3		**33**	2	1	1	12	
34	0	0	0	4.8		**34**	0	1	2	4.1		**34**	2	1	1	10.2	
35	0	0	0	5.2		**35**	0	1	1	8.0		**35**	0	1	2	14	
36	0	0	0	2.4		**36**	0	1	1	8.9		**36**	0	1	1	5	
37	0	0	0	2.5		**37**	0	1	1	5.2		**37**	0	1	1	3.5	
38	0	0	0	4.8		**38**	0	1	1	5.0		**38**	0	1	1	9.5	
39	0	0	0	2.6		**39**	0	1	1	6.9		**39**	2	1	1	11.9	
40	0	1	1	4.9	1	**40**	0	1	1	5.3	0.25	**40**	2	1	1	5.7	0.5
41	0	0	0	8.8		**41**	0	1	1	8.9		**41**	2	1	1	4	
42	0	0	0	2.2		**42**	0	1	1	5.5		**42**	2	1	1	11	
43	0	0	0	1.7		**43**	0	1	1	4.6		**43**	1	1	1	4.5	
44	0	0	0	8.1		**44**	0	1	1	9.1		**44**	2	1	1	4.5	
45	0	1	1	3.5		**45**	0	1	1	8.8		**45**	0	1	1	3.7	
46	0	0	0	6.2		**46**	0	1	1	7.5		**46**	2	1	1	7	
47	0	1	1	8.5		**47**	0	1	1	6.5		**47**	2	1	1	6.2	
48	0	0	0	5.2		**48**	0	1	1	3.3		**48**	2	1	1	9.5	
49	0	0	0	4.6		**49**	0	0		g		**49**	2	1	1	6	
50	0	0	0	1.4	1	**50**	0	1	1	6.7	0.25	**50**	2	1	2	4	0.25
51	0	0	0	4.5		**51**	0	1	1	7.2		**51**	2	1	1	5	
52	0	0	0	10.8		**52**	0	1	1	2.9		**52**	2	1	1	3.5	
53	0	0	0	4.2		**53**	0	1	2	5.8		**53**	2	1	1	8.2	
54	0	0	0	2.5		**54**	0	1	1	7.3		**54**	2	1	1	7	
55	0	0	0	5.4		**55**	0	1	1	6.2		**55**	1	1	1	4.8	
56	0	0	0	3.8		**56**	0	1	1	5.7		**56**	2	1	1	11	
57	0	0	0	3.2		**57**	0	1	1	2.3		**57**	2	1	1	8.5	
58	0	0	0	6.9		**58**	0	1	1	8.3		**58**	2	1	1	6	
59	0	0	0	2.4		**59**	0	1	2	7.5		**59**	2	1	1	12	
60	0	0	0	2.4	1	**60**	0	1	2	7.3	0.25	**60**	1	1	2	3.5	0.5
61	0	0	0	5.5		**61**	0	1	2	8.5		**61**	2	1	2	10.2	
62	0	0	0	8.1		**62**	0	1	2	9.2		**62**	2	1	1	8	
63	0	0	0	8.1		**63**	0	1	1	9.3		**63**	2	1	1	3.2	
64	0	0	0	3.1		**64**	0	1	1	6.8		**64**	2	1	2	9.5	
65	0	0	0	2.0		**65**	0	1	1	4.8		**65**	2	1	1	11.5	
66	0	0	0	1.8		**66**	0	1	1	2.8		**66**	2	1	2	9	
67	0	0	0	5.6		**67**	0	1	1	5.5		**67**	2	1	1	4	
68	0	0	0	3.1		**68**	0	1	1	5.3		**68**	2	1	1	5.2	
69	0	0	0	2.2		**69**	0	1	1	7.4		**69**	2	1	1	5	
70	0	0	0	3.9	1	**70**	0	1	1	4.1	0.25	**70**	1	1	2	3	0.25
71	0	0	0	2.3		**71**	0	0	0	2.3		**71**	1	1	1	19	
72	0	0	0	9.9		**72**	0	1	1	3.6		**72**	2	1	2	5.5	
73	0	0	0	3.1		**73**	0	0	0	4.2		**73**	2	1	1	9	
74	0	0	0	6.0		**74**	0	1	1	6.5		**74**	2	1	1	7.5	
75	0	0	0	1.6		**75**	0	1	1	6.8		**75**	2	1	1	5.5	
76	0	0	0	9.8		**76**	0	1	1	6.0		**76**	2	1	1	10	
77	0	0	0	8.5		**77**	0	0		g		**77**	2	1	2	8.2	
78	0	0	0	2.5		**78**	0	1	1	3.9		**78**	2	1	1	3.5	
79	0	0	0	5.9		**79**	0	1	1	7.8		**79**	2	1	2	9	
80	0	1	1	7.1	1	**80**	0	1	1	3.7	0.5	**80**	2	1	2	8.7	0.75
81	0	0	0	3.3		**81**	0	1	1	3.8		**81**	2	1	1	3.5	
82	0	0	0	6.8		**82**	0	1	1	4.2		**82**	2	1	1	9	
83	0	0	0	2.4		**83**	0	0		g		**83**	2	1	2	13	
84	0	0	0	3.3		**84**	0	1	1	3.5		**84**	0	1	1	2	
85	0	1	1	5.8		**85**	0	0	0	2.5		**85**	2	1	1	16.2	
86	0	1	1	9.1		**86**	0	1	1	4.6		**86**	2	1	2	6	
87	0	0	0	2.3		**87**	0	1	1	4.6		**87**	2	1	2	9.5	
88	0	0	0	6.2		**88**	0	1	1	4.9		**88**	2	1	1	3.3	
89	0	0	0	3.2		**89**	0	1	1	8.9		**89**	1	1	2	7	
90	0	0	0	8.1	1	**90**	0	1	1	4.3	0.5	**90**	1	1	1	4.9	0.25
91	0	0	0	9.1		**91**	0	1	1	4.1		**91**	1	1	1	3.5	
92	0	0	0	2.1		**92**	0	0	0	1.9		**92**	2	1	1	4.5	
93	0	0	0	2.4		**93**	0	0		g		**93**	1	1	1	5	
94	0	1	1	7.5		**94**	0	1	1	5.3		**94**	2	1	2	8.7	
95	0	0	0	3.6		**95**	0	1	1	5.6		**95**	1	1	1	11.5	
96	0	0	0	7.3		**96**	0	1	1	9.9		**96**	2	1	1	9	
97	0	1	1	10.3		**97**	0	0		g		**97**	2	1	1	7	
98	0	0	0	2.8		**98**	0	1	1	3.2		**98**	1	1	2	4	
99	0	0	0	3.8		**99**	0	0	0	3.3		**99**	2	1	2	4.2	
100	0	0	0	2.7	1	**100**	0	0	0	2.1	0.25	**100**	1	1	1	3	0.25
101						**101**	0	1	1	5.0		**101**					
102						**102**	0	1	1	5.5		**102**					
103						**103**	0	1	1	7.7		**103**					
104						**104**	0	0	0	5.5		**104**					
105						**105**	0	0	0	6.3		**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.0**	**0.30**	**0.30**	**5.2**	**1.0**	**Mean**	**0.03**	**0.85**	**0.96**	**6.2**	**0.3**	**Mean**	**1.7**	**1.0**	**1.2**	**8.8**	**0.4**
CALCITE INDEX:		**0.30**				**CALCITE INDEX:**		**0.88**				**CALCITE INDEX:**		**2.7**			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

GREE4-25						GREE4-75						HACKDS					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	2	1	1	17		**1**	2	1	2	9		**1**	0	1	2	9.1	
2	2	1	1	4.5		**2**	2	1	2	10		**2**	0	1	2	16.5	
3	1	1	1	6		**3**	2	1	2	9.5		**3**	0	1	2	2.9	
4	2	1	3	20		**4**	2	1	5	c		**4**	0	1	1	4.4	
5	1	1	2	2.5		**5**	2	1	5	c		**5**	0	1	2	18.7	
6	2	1	3	6		**6**	2	1	5	c		**6**	0	1	2	8.3	
7	2	1	2	22		**7**	2	1	3	14		**7**	0	1	3	13.3	
8	2	1	2	17		**8**	2	1	2	12		**8**	0	1	2	17.4	
9	2	1	2	23.5		**9**	0	1	4	7.9		**9**	0	1	2	16.1	
10	2	1	2	12	0.75	**10**	2	1	1	4	0.75	**10**	0	1	2	6.4	0
11	2	1	2	29		**11**	2	1	2	6.5		**11**	0	1	2	7.7	
12	2	1	3	13		**12**	0	1	2	5.1		**12**				gravel	
13	2	1	2	10		**13**	2	1	1	4.5		**13**	0	1	2	30	
14	2	1	3	10		**14**	2	1	1	8		**14**	0	1	2	8.1	
15	2	1	5	c		**15**	0	1	2	6.6		**15**	0	1	2	4.2	
16	2	1	3	12		**16**	0	1	1	6		**16**	0	1	2	16.3	
17	2	1	2	9		**17**	0	1	1	5		**17**	0	1	2	11	
18	2	1	3	5.5		**18**	2	1	1	8		**18**	0	1	2	9.9	
19	2	1	4	8		**19**	2	1	1	12		**19**	0	1	2	3.6	
20	2	1	3	9	0.5	**20**	2	1	1	8	0	**20**	0	1	2	10.4	0.5
21	2	1	4	10		**21**	2	1	1	4.5		**21**	0	1	3	26	
22	2	1	2	7.5		**22**	2	1	1	4		**22**	0	1	2	10.7	
23	2	1	3	14		**23**	2	1	1	8		**23**	0	1	3	8.7	
24	2	1	2	12		**24**	0	1	2	10.1		**24**	1	1	3	7.3	
25	2	1	2	5		**25**	2	1	1	5		**25**	1	1	3	22.4	
26	2	1	2	6		**26**	2	1	1	10		**26**	0	1	3	12.6	
27	2	1	2	5.5		**27**	2	1	1	6		**27**	0	1	2	12.1	
28	2	1	2	6		**28**	2	1	1	8		**28**	0	1	3	10.6	
29	2	1	4	10		**29**	2	1	1	7		**29**	0	1	2	4.4	
30	2	1	2	6.5	0.75	**30**	2	1	1	5.5	0.25	**30**	0	1	2	8.7	0
31	2	1	5	6		**31**	2	1	1	6.5		**31**	0	1	3	26.5	
32	2	1	5	6		**32**	2	1	4	16.5		**32**	0	1	2	18.3	
33	2	1	3	18		**33**	2	1	1	5.5		**33**	0	1	2	8.4	
34	2	1	3	17		**34**	2	1	1	10		**34**	1	1	2	8.7	
35	2	1	3	13		**35**	2	1	1	4		**35**	0	1	2	9.2	
36	2	1	3	11		**36**	2	1	1	6.5		**36**	0	1	2	10.4	
37	2	1	3	30		**37**	2	1	1	8		**37**	0	1	3	16.1	
38	2	1	3	15		**38**	2	1	1	5		**38**	0	1	3	24.4	
39	0	1	2	3		**39**	2	1	3	7		**39**	0	1	3	16	
40	2	1	2	8	0.25	**40**	2	1	1	7.5	0.25	**40**	0	1	2	10.8	0.25
41	2	1	2	18		**41**	2	1	1	6.9		**41**	0	1	2	4.1	
42	2	1	1	4		**42**	0	1	2	6.2		**42**	0	1	1	2.1	
43	2	1	2	10		**43**	2	1	5	c		**43**	0	1	2	10.1	
44	2	1	1	6		**44**	2	1	1	7		**44**	0	1	2	7.5	
45	1	1	1	4.5		**45**	2	1	1	4.8		**45**	0	1	2	9.9	
46	2	1	2	16		**46**	2	1	1	10.5		**46**	0	1	2	8.2	
47	2	1	3	5		**47**	1	1	4	6.5		**47**	0	1	2	11.1	
48	2	1	3	8		**48**	2	1	1	10		**48**	0	1	2	6.4	
49	2	1	2	7		**49**	2	1	1	3.5		**49**	0	1	2	4.7	
50	2	1	2	6	0.5	**50**	2	1	1	3	0.5	**50**	0	1	2	18.6	0.25
51	2	1	2	8		**51**	2	1	1	3		**51**	0	1	2	12.4	
52	2	1	3	8		**52**	2	1	1	9		**52**	0	1	3	10	
53	2	1	2	10.5		**53**	2	1	1	8		**53**	0	1	2	6.4	
54	2	1	2	13		**54**	2	1	1	5		**54**	0	1	2	7.3	
55	2	1	2	16		**55**	2	1	1	5		**55**	0	1	2	5.4	
56	2	1	3	12		**56**	2	1	1	5.8		**56**	0	1	3	22.4	
57	1	1	4	10		**57**	1	1	2	7.2		**57**	0	1	2	14.4	
58	1	1	3	9.5		**58**	2	1	1	4.4		**58**	0	1	2	7.8	
59	2	1	4	14		**59**	2	1	1	5.4		**59**	0	1	2	7.2	
60	2	1	2	15	0.5	**60**	2	1	1	9	0.75	**60**	0	1	2	10	0.25
61	2	1	3	15		**61**	2	1	1	5.4		**61**	0	1	2	9.1	
62	2	1	2	8		**62**	2	1	1	9		**62**	0	1	2	11.9	
63	2	1	5	c		**63**	2	1	1	7		**63**	0	1	2	6.4	
64	2	1	1	3		**64**	2	1	1	6.5		**64**	0	1	3	19.3	
65	2	1	5	c		**65**	2	1	1	4		**65**	0	1	2	10.9	
66	2	1	5	c		**66**	2	1	1	5		**66**	0	1	2	19.8	
67	2	1	5	c		**67**	2	1	1	9.5		**67**	0	1	1	29	
68	2	1	5	c		**68**	2	1	1	8.8		**68**	0	1	1	5.2	
69	2	1	2	12.5		**69**	2	1	1	4		**69**	0	1	2	16.4	
70	2	1	2	28	0	**70**	2	1	1	8	0.25	**70**	0	1	1	6.3	0
71	2	1	2	10		**71**	2	1	1	7		**71**	0	1	3	5.9	
72	2	1	5	c		**72**	2	1	1	11		**72**	0	1	3	9	
73	2	1	5	c		**73**	2	1	1	8		**73**	0	1	2	6.2	
74	2	1	2	7.5		**74**	0	1	2	6.4		**74**	0	1	2	7.3	
75	2	1	1	6.5		**75**	1	1	2	3.8		**75**	0	1	1	4.3	
76	2	1	2	5		**76**	0	1	3	2.4		**76**	0	1	1	11.4	
77	2	1	1	6		**77**	0	1	1	6.5		**77**	0	1	2	15	
78	2	1	5	c		**78**	0	1	1	6		**78**	0	1	2	10.8	
79	2	1	5	c		**79**	0	1	1	5		**79**	0	1	2	9.4	
80	2	1	2	14	0	**80**	0	1	1	8	0.25	**80**	0	1	2	8.9	0.25
81	2	1	5	c		**81**	1	1	4	6.3		**81**	0	1	1	4.4	
82	2	1	4	16		**82**	0	1	4	3.5		**82**	0	1	1	1.7	
83	2	1	2	6		**83**	1	1	4	3.2		**83**	0	1	1	17.6	
84	2	1	3	5.5		**84**	0	1	3	7.9		**84**	0	1	2	16.3	
85	2	1	5	c		**85**	0	1	4	4.5		**85**	0	1	1	5.7	
86	2	1	3	9		**86**	0	1	4	3.3		**86**	0	1	2	8.8	
87	2	1	5	c		**87**	0	1	1	3.1		**87**	1	1	3	14.5	
88	2	1	2	10		**88**	1	1	4	7.3		**88**	0	1	3	16.9	
89	2	1	2	5.5		**89**	2	1	1	8		**89**	0	1	2	6.7	
90	2	1	1	7	0.5	**90**	2	1	1	9	0.5	**90**	0	1	3	12.5	0.25
91	2	1	2	7.5		**91**	1	1	4	6.1		**91**	0	1	1	2.5	
92	2	1	5	c		**92**	0	1	2	2		**92**	0	1	1	3.8	
93	2	1	5	c		**93**	0	1	1	5.7		**93**	0	1	2	9.4	
94	2	1	3	30		**94**	2	1	1	2		**94**	0	1	2	6.9	
95	2	1	5	c		**95**	1	1	3	9.2		**95**	0	1	2	13.7	
96	2	1	5	c		**96**	1	1	2	8.7		**96**	0	1	2	12.8	
97	1	1	2	4		**97**	2	1	1	6		**97**	0	1	1	4.5	
98	2	1	3	17		**98**	2	1	1	8.9		**98**	0	1	3	15.8	
99	2	1	2	13		**99**	2	1	1	6		**99**	0	1	2	11.7	
100	2	1	2	8.5	0.25	**100**	2	1	1	8.2	0	**100**	0	1	3	3.7	0.25
101						**101**						**101**	1	1	3	12.1	
102						**102**						**102**					
103						**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**1.9**	**1.0**	**2.8**	**10.8**	**0.4**	**Mean**	**1.5**	**1.0**	**1.7**	**6.8**	**0.4**	**Mean**	**0.05**	**1.0**	**2.1**	**11.0**	**0.2**
CALCITE INDEX:		**2.9**				**CALCITE INDEX:**		**2.5**				**CALCITE INDEX:**		**1.1**			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

HACKUS						HARM1-50						HARM5-25					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	1	1	5.9		**1**	0	1	2	10.7		**1**	0	1	1	5.9	
2	0	1	1	4.4		**2**	0	1	2	11.5		**2**	0	1	1	6.9	
3	0	1	1	9.7		**3**	0	1	1	5.5		**3**	0	0	0	3.8	
4				gravel		**4**	0	1	1	7		**4**	0	1	1	6.8	
5	0	1	1	4.7		**5**	0	1	2	6.7		**5**	0	1	2	18	
6	0	1	1	12.4		**6**	0	1	2	14		**6**	0	1	1	11.3	
7	0	1	1	9.6		**7**	0	1	2	14.3		**7**	0	1	1	11.9	
8	0	1	1	4.2		**8**	0	1	1	5.4		**8**	0	1	1	6	
9	0	1	2	5.1		**9**	0	1	1	4.1		**9**	0	1	1	6.2	
10	0	1	2	3.2	0.25	**10**	0	1	1	5.6	0	**10**	0	1	1	5.9	0.5
11	0	1	2	8.2		**11**	0	1	2	19.6		**11**	0	1	1	9.8	
12	0	1	1	4.1		**12**	0	1	1	10.5		**12**	0	1	1	14.5	
13	0	1	1	16.3		**13**	0	1	2	7.3		**13**	0	1	2	12.4	
14	0	0	0	2.5		**14**	0	1	2	7.5		**14**	0	1	1	3.9	
15	0	0	0	3.7		**15**	0	1	2	18.6		**15**	0	1	1	7.5	
16	0	1	1	11.1		**16**	0	1	1	5.4		**16**	0	1	1	4.3	
17	0	0	0	4.3		**17**	0	1	2	10.3		**17**	0	1	1	5.2	
18	0	0	0	2.1		**18**	0	1	2	10.8		**18**	0	1	1	8	
19	0	1	2	9.5		**19**	0	1	2	7.6		**19**	0	1	1	13.2	
20	0	1	2	9.7	0.25	**20**	0	1	2	14.5	0.25	**20**	0	1	1	6.5	0.5
21	0	1	1	4.1		**21**	0	1	2	7.3		**21**	0	0	0	4.4	
22	0	1	2	14.6		**22**	0	1	2	16		**22**	0	1	1	6.3	
23	0	1	1	4.7		**23**	0	1	2	12.4		**23**	0	1	1	5.2	
24	0	1	1	5.3		**24**	0	1	1	6.5		**24**	0	1	1	8.5	
25	0	1	2	10.6		**25**	0	1	2	14.9		**25**	0	1	1	11.5	
26	0	1	1	5.1		**26**	0	1	3	13		**26**	0	1	1	7.9	
27	0	1	1	6		**27**	0	1	2	11.2		**27**	0	1	1	11.3	
28	0	1	2	6.3		**28**	0	1	2	8.4		**28**	0	1	1	7	
29	0	1	1	4.7		**29**	0	1	2	11.6		**29**	0	1	1	9.4	
30	0	1	2	9.7	0.25	**30**	0	1	2	12.3	0.25	**30**	0	1	1	6.8	0.25
31	0	0	0	4.3		**31**	0	1	2	15		**31**	0	1	2	15.5	
32	0	1	1	3.7		**32**	0	1	3	8.9		**32**	0	1	1	8.2	
33	0	1	1	7.8		**33**	0	1	2	14.8		**33**	0	1	1	10.9	
34	0	1	1	5.4		**34**	0	1	2	8.1		**34**	0	1	1	8	
35	0	1	1	4.2		**35**	0	1	2	10		**35**	0	1	2	15.6	
36	0	1	1	5.3		**36**	0	1	2	10.6		**36**	0	1	1	7.3	
37	0	1	2	7.8		**37**	0	1	1	12		**37**	0	1	1	10	
38	0	1	1	14.1		**38**	0	1	2	13.7		**38**	0	1	1	6.5	
39	0	1	2	5.8		**39**	0	1	1	4.9		**39**	0	1	1	8.8	
40	0	1	1	6.1	0.75	**40**	0	1	3	14.5	0	**40**	0	1	2	14.5	0.25
41	0	1	2	7.6		**41**	0	1	2	9.5		**41**	0	1	3	10.5	
42	0	1	1	4.3		**42**	0	1	1	2.1		**42**	0	1	1	12.5	
43	0	1	1	9		**43**	0	1	2	12		**43**	0	1	2	10.5	
44	0	1	2	4.7		**44**	0	1	1	3		**44**	0	1	1	7	
45	0	1	2	11.8		**45**	0	1	3	26.4		**45**	0	1	1	9.2	
46	0	1	1	9.2		**46**	0	1	1	3.5		**46**	0	1	2	13.8	
47	0	1	1	8		**47**	0	1	2	10.4		**47**	0	1	2	12.4	
48	0	1	2	3.9		**48**	0	1	1	4.4		**48**	0	1	1	8.8	
49	0	1	1	19		**49**	0	1	2	3.2		**49**	0	1	1	7.7	
50	0	1	1	21.1	0.25	**50**	0	1	1	9.3	0	**50**	0	1	1	14	0.25
51	0	1	1	15.8		**51**	0	1	1	4.7		**51**	0	1	1	12.1	
52	0	1	1	2.9		**52**	0	1	1	9.6		**52**	0	1	1	11	
53	0	0	0	2.5		**53**	0	1	3	18.2		**53**	0	1	2	11.2	
54	0	1	2	8.3		**54**	0	1	1	8.2		**54**	0	1	2	8.9	
55	0	1	1	1.8		**55**	0	1	2	9.7		**55**	0	0	0	1.7	
56	0	1	2	8.9		**56**	0	1	2	10.3		**56**	0	1	1	10.9	
57	0	1	1	6.2		**57**	0	1	2	5.1		**57**	0	1	1	4.3	
58	0	1	1	8.1		**58**	0	1	2	11		**58**	0	1	1	5.2	
59	0	1	2	4.4		**59**	0	1	3	11.9		**59**	0	0	0	4.9	
60	0	1	2	5.7	0.25	**60**	0	1	2	10.4	0.25	**60**	0	1	1	5.9	0
61	0	1	1	6.1		**61**	0	1	2	7.6		**61**	0	1	2	9.1	
62	0	1	2	8.1		**62**	0	1	1	8.5		**62**	0	1	1	13.9	
63	0	1	2	6.4		**63**	0	1	2	14.1		**63**	0	1	2	15.1	
64	0	0	0	3.9		**64**	0	1	2	8.5		**64**	0	1	1	11.5	
65	0	1	1	7.2		**65**	0	1	2	12.9		**65**	0	1	1	7.9	
66	0	1	1	7.6		**66**	0	1	2	15.5		**66**	0	1	1	6.2	
67	0	1	1	5.1		**67**	0	1	2	13.2		**67**	0	1	1	3.7	
68	0	1	2	3.3		**68**	0	1	2	11.4		**68**	0	1	1	3.2	
69	0	1	1	2.9		**69**	0	1	3	9.2		**69**	0	1	2	8.9	
70	0	1	2	12	0.25	**70**	0	1	2	13	0.5	**70**	0	1	1	9.1	0.5
71	0	1	2	3.5		**71**	0	1	2	14.2		**71**	0	1	1	12.2	
72	0	1	2	8.8		**72**	0	1	3	9		**72**	0	1	1	6	
73	0	0	0	2.7		**73**	0	1	3	21.4		**73**	0	1	1	11.2	
74	0	1	1	8.9		**74**	0	1	1	4		**74**	0	1	1	7.5	
75	0	1	1	2.7		**75**	0	1	3	8.7		**75**	0	1	1	9.4	
76	0	1	1	16.4		**76**	0	1	1	5.4		**76**	0	1	1	4.2	
77	0	1	2	21.7		**77**	0	1	2	7.2		**77**	0	1	1	9.5	
78	0	1	2	8.9		**78**	0	1	1	7.2		**78**	0	1	1	6.4	
79	0	1	1	5.3		**79**	0	1	1	7.2		**79**	0	1	1	10.8	
80	0	1	2	2.6	0	**80**	0	1	1	8.5	0.75	**80**	0	1	1	13.5	0
81	0	1	1	2.2		**81**	0	1	2	12.4		**81**	0	1	1	6.6	
82	0	1	2	2.3		**82**	0	1	1	8.5		**82**	0	1	1	2.6	
83	0	1	1	8.4		**83**	0	1	2	8.7		**83**	0	1	1	11.5	
84	0	1	1	10		**84**	0	1	1	6.4		**84**	0	1	1	10.7	
85	0	1	2	5.7		**85**	0	1	1	5.2		**85**	0	0	0	4.8	
86	0	1	2	6.9		**86**	0	1	1	13.6		**86**	0	1	1	1.3	
87	0	1	1	3.5		**87**	0	1	1	4.6		**87**	0	0	0	4.4	
88	0	1	2	8.6		**88**	0	1	1	6		**88**	0	1	1	6.3	
89	0	1	1	11.7		**89**	0	1	1	2.9		**89**	0	1	4	18.7	
90	0	1	1	7	0.25	**90**	0	1	2	18	0.75	**90**	0	1	1	8	0.25
91	0	1	2	9.4		**91**	0	1	2	8.2		**91**	0	0	0	5.5	
92	0	1	2	4.9		**92**	0	1	3	10.6		**92**	0	1	1	10.9	
93	0	1	1	6.6		**93**	0	1	2	6		**93**	0	1	2	8.9	
94	0	1	1	7.7		**94**	0	1	2	5.4		**94**	0	0	0	6.9	
95	0	1	1	5.2		**95**	0	1	1	7.4		**95**	0	1	1	2.8	
96	0	1	1	9.2		**96**	0	1	2	7.8		**96**	0	1	1	10.5	
97	0	1	1	7.6		**97**	0	1	1	4.2		**97**	0	1	2	6.7	
98	0	0	0	7.3		**98**	0	1	2	3.5		**98**	0	0	0	1.2	
99	0	1	1	8.1		**99**	0	1	2	8.6		**99**	0	1	1	7.1	
100	0	1	1	9.2	0.25	**100**	0	1	2	2.4	0	**100**	0	1	1	6.5	0
101	0	1	1	7.7		**101**						**101**					
102						**102**						**102**					
103						**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.0**	**0.91**	**1.3**	**7.2**	**0.3**	**Mean**	**0.0**	**1.0**	**1.8**	**9.6**	**0.3**	**Mean**	**0.0**	**0.91**	**1.1**	**8.6**	**0.3**
CALCITE INDEX:		**0.91**				**CALCITE INDEX:**		**1.0**				**CALCITE INDEX:**		**0.91**			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

HEC-JR1						HEC-JR3						HENFO					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	0	0	5.2		**1**	0	0	0	8.2		**1**	0	1	2	17.7	
2	0	0	0	9.6		**2**	0	0	0	3.9		**2**	0	1	1	4.2	
3	0	1	1	4.2		**3**	0	0	0	3.0		**3**	0	0	0	2	
4	0	1	1	9.9		**4**	0	1	1	13.8		**4**	0	1	2	9.5	
5	0	1	1	5.3		**5**	0	0	0	9.6		**5**	0	1	2	7.3	
6	0	1	1	4.6		**6**	0	1	2	11.1		**6**	0	1	2	4.6	
7	0	1	1	12.5		**7**	0	0	0	7.8		**7**	0	1	1	5.7	
8	0	1	1	7.2		**8**	0	1	2	13.7		**8**	0	1	2	15	
9	0	1	1	10.4		**9**	0	1	1	14.0		**9**	0	0	0	4.7	
10	0	1	1	11.1	0.25	**10**	0	1	1	17.6	0	**10**	0	1	2	4.4	0
11	0	1	2	7.2		**11**	0	1	1	7.8		**11**	0	1	2	10.3	
12	0	1	1	13.5		**12**	0	1	1	18.4		**12**	0	1	1	2.6	
13	0	1	1	5.0		**13**	0	1	1	9.2		**13**	0	1	2	10.6	
14	0	1	1	15.0		**14**	0	1	1	10.3		**14**	0	1	1	2.7	
15	0	1	1	7.5		**15**	0	1	1	7.6		**15**	0	1	2	10.3	
16	0	1	1	5.5		**16**	0	1	1	23.4		**16**	0	1	2	10.4	
17	0	1	2	7.4		**17**	0	1	1	20.3		**17**	0	1	2	12.7	
18	0	1	1	14.7		**18**	0	1	1	17.8		**18**	0	1	2	9.4	
19	0	0	0	4.5		**19**	0	1	2	11.2		**19**	0	1	2	18.4	
20	0	1	1	11.3	0.75	**20**	0	1	1	6.2	0.25	**20**	0	1	1	2.8	0
21	0	0	0	5.0		**21**	0	1	1	9.3		**21**	0	1	2	9.5	
22	0	1	1	9.3		**22**	0	1	1	5.7		**22**	0	1	2	11.5	
23	0	1	1	10.3		**23**	0	1	1	6.4		**23**	0	1	2	12.9	
24	0	1	2	12.5		**24**	0	1	1	10.9		**24**	0	1	1	3.6	
25	0	1	1	19.2		**25**	0	0	0	8.3		**25**	0	1	2	4.4	
26	0	1	1	9.1		**26**	0	0	0	5.7		**26**	0	1	2	5.2	
27	0	1	1	11.5		**27**	0	0	0	8.5		**27**	0	1	2	7.4	
28	0	1	2	8.0		**28**	0	0	0	3.9		**28**	0	1	2	8.1	
29	0	1	3	13.6		**29**	0	1	1	19.7		**29**	0	1	2	13.4	
30	0	1	2	14.4	0.25	**30**	0	1	1	15.0	0	**30**	0	1	2	8.1	0.75
31	0	1	1	6.2		**31**	0	1	1	4.9		**31**	0	1	1	1.9	
32	0	1	1	8.0		**32**	0	1	1	11.2		**32**	0	1	2	11.9	
33	0	1	1	20.4		**33**	0	1	1	10.7		**33**	0	1	2	8.3	
34	0	1	1	16.5		**34**	0	1	1	5.1		**34**	0	1	1	4	
35	0	1	1	9.9		**35**	0	1	1	22.2		**35**	0	1	1	3.1	
36	0	1	2	10.0		**36**	0	1	1	6.9		**36**	0	1	1	4.1	
37	0	1	2	8.9		**37**	0	1	2	10.3		**37**	0	1	2	4.7	
38	0	1	2	9.6		**38**	0	1	1	22.1		**38**	0	1	2	17.2	
39	0	1	2	14.6		**39**	0	1	1	6.7		**39**	0	1	2	8.7	
40	0	1	2	5.8	0.25	**40**	0	1	1	8.2	0	**40**	0	1	2	14.3	0.5
41	0	1	2	9.4		**41**	0	1	1	17.4		**41**	0	1	1	3.2	
42	0	1	2	9.9		**42**	0	1	1	4.6		**42**	0	1	2	9.2	
43	0	1	1	6.9		**43**	0	1	1	6.0		**43**	0	1	2	9.5	
44	0	1	2	8.9		**44**	0	0	0	8.4		**44**	0	1	2	8.8	
45	0	1	2	19.0		**45**	0	1	1	7.0		**45**	0	1	2	9	
46	0	1	2	4.7		**46**	0	1	1	12.2		**46**	0	1	2	5.7	
47	0	1	1	3.4		**47**	0	0	0	7.1		**47**	0	1	2	10.6	
48	0	1	1	12.0		**48**	0	1	1	12.2		**48**	0	1	2	8.4	
49	0	1	2	19.7		**49**	0	1	2	7.3		**49**	0	1	2	5.3	
50	0	1	2	9.9	0.25	**50**	0	1	1	8.2	0.25	**50**	0	1	1	6.7	0.25
51	0	1	1	4.8		**51**	0	0	0	4.8		**51**	0	1	1	5.3	
52	0	1	1	5.7		**52**	0	1	1	11.7		**52**	0	1	1	2.4	
53	0	1	1	18.0		**53**	0	1	2	8.5		**53**	0	0	0	2.3	
54	0	1	1	3.4		**54**	0	1	1	30.6		**54**	0	0	0	0.7	
55	0	1	2	9.0		**55**	0	0	0	9.4		**55**	0	1	2	13.5	
56	0	1	2	14.0		**56**	0	1	1	11.4		**56**	0	1	2	5.7	
57	0	1	2	9.2		**57**	0	0	0	6.9		**57**	0	1	1	4.8	
58	0	1	2	4.9		**58**	0	1	1	9.0		**58**	0	1	2	5.2	
59	0	1	1	9.5		**59**	0	1	1	8.7		**59**	0	1	2	14.3	
60	0	1	1	3.4	0.25	**60**	0	1	1	6.0	0.5	**60**	0	1	1	6.9	0
61	0	1	2	7.1		**61**	0	0	0	7.2		**61**	0	1	2	6	
62	0	1	1	5.7		**62**	0	0	0	7.2		**62**	0	1	2	16.8	
63	0	1	2	10.4		**63**	0	0	0	3.9		**63**	0	1	3	10.7	
64	0	1	2	10.1		**64**	0	0	0	4.2		**64**	0	1	2	8.6	
65	0	1	2	4.3		**65**	0	0	0	7.6		**65**	0	1	2	4.8	
66	0	1	1	14.1		**66**	0	0	0	12.2		**66**	0	1	2	5.5	
67	0	1	1	13.5		**67**	0	0	0	6.8		**67**	0	1	2	11.1	
68	0	1	2	8.3		**68**	0	0	0	15.1		**68**	0	1	1	7.6	
69	0	1	1	21.5		**69**	0	0	0	8.4		**69**	0	1	2	3.5	
70	0	1	2	11.0	0.25	**70**	0	0	0	9.8	0.5	**70**	0	1	2	12.5	0.25
71	0	1	1	8.2		**71**	0	0	0	11.6		**71**	0	1	2	8	
72	0	1	2	14.3		**72**	0	0	0	8.0		**72**	0	1	2	9.9	
73	0	1	2	20.4		**73**	0	1	1	13.9		**73**	0	1	2	12.6	
74	0	1	2	8.1		**74**	0	1	1	11.3		**74**	0	1	2	6.4	
75	0	1	2	6.0		**75**	0	1	1	12.3		**75**	0	1	2	11.6	
76	0	1	2	7.6		**76**	0	1	1	9.2		**76**	0	1	2	7	
77	0	1	1	18.5		**77**	0	1	1	13.5		**77**	0	1	2	4.1	
78	0	1	2	8.4		**78**	0	0	0	5.2		**78**	0	1	1	4.5	
79	0	1	2	11.5		**79**	0	0	0	8.0		**79**	0	1	1	3.3	
80	0	1	2	9.3	0	**80**	0	0	0	8.5	0.25	**80**	0	1	2	4.6	0
81	0	1	1	7.2		**81**	0	0	0	8.2		**81**	0	1	2	5.6	
82	0	1	2	5.9		**82**	0	0	0	4.5		**82**	0	1	1	2.7	
83	0	1	1	8.0		**83**	0	0	0	8.2		**83**	0	0	0	3.3	
84	0	1	2	8.0		**84**	0	0	0	7.7		**84**	0	1	2	10.9	
85	0	1	1	4.0		**85**	0	1	1	4.8		**85**	0	1	2	13.4	
86	0	1	2	16.0		**86**	0	0	0	10.7		**86**	0	1	2	6.4	
87	0	1	2	11.4		**87**	0	0	0	2.7		**87**	0	1	1	4.6	
88	0	1	1	15.0		**88**	0	0	0	2.6		**88**	0	1	2	8.4	
89	0	1	1	9.0		**89**	0	1	1	6.2		**89**	0	1	2	9.5	
90	0	1	1	17.2	0.5	**90**	0	1	1	8.7	0.25	**90**	0	1	1	6.8	
91	0	1	1	14.6		**91**	0	1	1	11.2		**91**	0	1	2	14.7	
92	0	1	2	6.3		**92**	0	1	1	12.0		**92**	0	1	1	3.3	
93	0	1	2	6.9		**93**	0	1	1	6.5		**93**	0	1	2	9.4	
94	0	1	1	15.0		**94**	0	1	1	3.5		**94**	0	1	2	9.2	
95	0	1	2	14.2		**95**	0	0	0	4.4		**95**	0	1	1	9.8	
96	0	1	1	6.8		**96**	0	1	1	11.1		**96**	0	1	1	2.5	
97	0	1	1	6.0		**97**	0	1	1	9.3		**97**	0	1	2	9.2	
98	0	1	1	15.3		**98**	0	1	1	9.7		**98**	0	1	2	4.6	
99	0	1	2	16.2		**99**	0	0	0	4.2		**99**	0	1	1	10.7	
100	0	1	1	13.5	0	**100**	0	1	2	10.4	0.25	**100**	0	0	0	5.5	0
101						**101**						**101**					
102						**102**						**102**					
103						**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.0**	**0.96**	**1.4**	**10.1**	**0.3**	**Mean**	**0.0**	**0.62**	**0.69**	**9.6**	**0.2**	**Mean**	**0.0**	**0.94**	**1.6**	**7.7**	**0.2**
CALCITE INDEX:		**0.96**				**CALCITE INDEX:**		**0.62**				**CALCITE INDEX:**		**0.94**			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

KICK						KILM1-50						LC_DC1					
Count	**Concreted Status (0, 1, or 2)**	**Calcite Present (0 or 1)**	**Calcite Thickness (0 to 5)**	**Intermediate Axis (cm)**	**Embed**	**Count**	**Concreted Status (0, 1, or 2)**	**Calcite Present (0 or 1)**	**Calcite Thickness (0 to 5)**	**Intermediate Axis (cm)**	**Embed**	**Count**	**Concreted Status (0, 1, or 2)**	**Calcite Present (0 or 1)**	**Calcite Thickness (0 to 5)**	**Intermediate Axis (cm)**	**Embed**
1	2	1	5	cemented		**1**	2	1	5	cemented		**1**	0	0	0	10.5	
2	0	1	1	15.4		**2**	2	1	5	cemented		**2**	0	0	0	9.8	
3	0	0	0	0.7		**3**	2	1	5	cemented		**3**	0	0	0	7.5	
4	2	1	5	9.7		**4**	2	1	5	cemented		**4**	0	0	0	8.4	
5	2	1	5	cemented		**5**	2	1	5	cemented		**5**	0	0	0	8.8	
6	2	1	5	14		**6**	2	1	5	15.3		**6**	0	0	0	10.1	
7	2	1	5	9.5		**7**	2	1	5	cemented		**7**	0	0	0	8	
8	2	1	5	9.5		**8**	2	1	5	25		**8**	0	0	0	8.6	
9	2	1	5	6.1		**9**	2	1	5	cemented		**9**	0	0	0	12.1	
10	2	1	5	5.6	-	**10**	2	1	5	cemented	-	**10**	0	0	0	11.7	0.25
11	2	1	5	9.1		**11**	2	1	5	9.9		**11**	0	0	0	17.1	
12	1	1	1	8.8		**12**	2	1	5	14.4		**12**	0	0	0	5.1	
13	0	0	0	4.4		**13**	2	1	5	17		**13**	0	0	0	7.5	
14	2	1	5	4.5		**14**	2	1	5	11.4		**14**	0	0	0	4.8	
15	2	1	5	5.3		**15**	2	1	5	15.7		**15**	0	0	0	9.8	
16	2	1	5	9.3		**16**	2	1	5	9.8		**16**	0	0	0	7.5	
17	0	1	1	12		**17**	2	1	5	9.4		**17**	0	0	0	8.5	
18	2	1	5	10		**18**	2	1	5	13		**18**	0	0	0	12.2	
19	2	1	5	9.9		**19**	2	1	5	7.4		**19**	0	0	0	10.2	
20	2	1	5	10.5	-	**20**	1	1	1	9.5	0	**20**	0	0	0	9.4	0
21	2	1	5	8.5		**21**	2	1	5	10.2		**21**	0	0	0	6.8	
22	1	1	1	9.8		**22**	2	1	5	11.4		**22**	0	0	0	11.9	
23	2	1	5	8.8		**23**	2	1	5	cemented		**23**	0	0	0	7.7	
24	2	1	5	7.6		**24**	2	1	5	cemented		**24**	0	0	0	4	
25	2	1	5	14.4		**25**	2	1	5	14.6		**25**	0	0	0	10.6	
26	2	1	5	cemented		**26**	1	1	3	11.2		**26**	0	0	0	18.1	
27	2	1	5	cemented		**27**	2	1	5	9.6		**27**	0	0	0	4.2	
28	2	1	5	18.1		**28**	2	1	5	12.2		**28**	0	0	0	7.6	
29	2	1	5	8.7		**29**	2	1	5	12.5		**29**	0	0	0	6	
30	0	1	1	6	0	**30**	2	1	5	13.5	-	**30**	0	0	0	13.2	0.5
31	2	1	5	cemented		**31**	2	1	5	8.3		**31**	0	0	0	7.4	
32	0	0	0	1.6		**32**	2	1	5	10		**32**	0	0	0	5.8	
33	2	1	5	14		**33**	2	1	5	9.4		**33**	0	0	0	7.9	
34	1	1	1	15.9		**34**	2	1	5	9		**34**	0	0	0	11.8	
35	2	1	5	7.8		**35**	2	1	5	9.9		**35**	0	0	0	6.4	
36	2	1	5	cemented		**36**	2	1	5	8.5		**36**	0	0	0	5.2	
37	1	1	2	15.2		**37**	0	1	1	0.9		**37**	0	0	0	8.7	
38	0	1	1	10.3		**38**	2	1	5	8.7		**38**	0	0	0	18.8	
39	0	1	1	16.3		**39**	0	1	1	7.6		**39**	0	0	0	5.5	
40	2	1	5	9.1	0	**40**	2	1	5	12.7	-	**40**	0	0	0	7.5	0
41	2	1	5	cemented		**41**	2	1	5	12.2		**41**	0	0	0	10.2	
42	0	1	1	6.7		**42**	2	1	5	5.5		**42**	0	0	0	6.1	
43	0	1	1	4		**43**	2	1	5	8.9		**43**	0	0	0	8.9	
44	2	1	5	cemented		**44**	2	1	5	12.6		**44**	0	0	0	7.5	
45	2	1	5	cemented		**45**	2	1	5	11.8		**45**	0	0	0	3.7	
46	2	1	5	7.6		**46**	0	1	1	13.5		**46**	0	0	0	6.4	
47	2	1	5	4.7		**47**	2	1	5	cemented		**47**	0	0	0	13.4	
48	2	1	5	13.8		**48**	2	1	5	cemented		**48**	0	0	0	7.6	
49	0	1	1	16.5		**49**	2	1	5	8		**49**	0	0	0	4.5	
50	2	1	5	cemented	-	**50**	2	1	5	14.2	-	**50**	0	0	0	6.9	0
51	0	1	1	5		**51**	2	1	5	4.1		**51**	0	0	0	15.2	
52	2	1	5	2.1		**52**	2	1	5	14.3		**52**	0	0	0	8.8	
53	2	1	5	cemented		**53**	2	1	5	8.2		**53**	0	0	0	10.1	
54	1	1	1	7		**54**	2	1	5	cemented		**54**	0	0	0	17.4	
55	0	1	1	8.1		**55**	2	1	5	cemented		**55**	0	0	0	7.9	
56	0	1	1	2.9		**56**	0	1	1	8.5		**56**	0	0	0	12.6	
57	0	1	1	2.5		**57**	2	1	5	cemented		**57**	0	0	0	11	
58	0	1	1	3		**58**	2	1	5	9		**58**	0	0	0	11	
59	0	1	1	12.8		**59**	2	1	5	4		**59**	0	0	0	11.1	
60	2	1	5	10.5	0.25	**60**	2	1	5	8	-	**60**	0	0	0	8	0
61	1	1	1	10.2		**61**	2	1	5	8.4		**61**	0	0	0	9.5	
62	2	1	5	2.4		**62**	2	1	5	cemented		**62**	0	0	0	27	
63	2	1	5	6.9		**63**	2	1	5	7.8		**63**	0	0	0	18.7	
64	1	1	1	12.9		**64**	2	1	5	cemented		**64**	0	0	0	10.5	
65	0	0	0	2.9		**65**	2	1	5	13		**65**	0	0	0	9.6	
66	2	1	5	5		**66**	2	1	5	cemented		**66**	0	0	0	10.9	
67	0	1	1	9.6		**67**	2	1	5	9		**67**	0	0	0	10.5	
68	0	1	1	12		**68**	2	1	5	6.6		**68**	0	0	0	8.7	
69	2	1	5	8.7		**69**	2	1	5	10.8		**69**	0	0	0	8.7	
70	2	1	5	7.3	0.25	**70**	2	1	5	7.8	-	**70**	0	0	0	8.2	0
71	2	1	5	12.5		**71**	0	1	3	13.2		**71**	0	0	0	8.9	
72	0	1	1	5.8		**72**	2	1	5	4.4		**72**	0	0	0	11.9	
73	2	1	5	cemented		**73**	2	1	5	9.5		**73**	0	0	0	14.6	
74	2	1	5	14.3		**74**	2	1	5	12.6		**74**	0	0	0	2.2	
75	0	1	1	6.2		**75**	2	1	5	8.2		**75**	0	0	0	6	
76	2	1	5	6.1		**76**	0	1	1	2		**76**	0	0	0	13.1	
77	0	0	0	5.4		**77**	2	1	5	cemented		**77**	0	0	0	10.9	
78	1	1	1	8.5		**78**	2	1	5	11.2		**78**	0	0	0	13.4	
79	2	1	5	8.7		**79**	2	1	5	cemented		**79**	0	0	0	6.4	
80	2	1	5	6.4	0.25	**80**	2	1	5	cemented	-	**80**	0	0	0	4	0
81	0	1	1	12.5		**81**	2	1	5	11		**81**	0	0	0	6.8	
82	2	1	5	9.7		**82**	0	1	1	1.6		**82**	0	0	0	8.4	
83	2	1	5	7.5		**83**	2	1	5	cemented		**83**	0	0	0	5.3	
84	2	1	5	4.9		**84**	2	1	5	16.5		**84**	0	0	0	10.5	
85	2	1	5	6		**85**	2	1	5	9.9		**85**	0	0	0	5.3	
86	2	1	5	7.4		**86**	2	1	5	13.6		**86**	0	0	0	8.1	
87	2	1	5	7		**87**	2	1	5	5.7		**87**	0	0	0	12	
88	1	1	1	8.7		**88**	2	1	5	cemented		**88**	0	0	0	3.6	
89	2	1	5	11		**89**	2	1	5	6.3		**89**	0	0	0	8.5	
90	0	1	1	3.2	0	**90**	2	1	5	12.3	-	**90**	0	0	0	8.9	0.25
91	2	1	5	8.6		**91**	2	1	5	14.4		**91**	0	0	0	9	
92	2	1	5	6		**92**	2	1	5	10.6		**92**	0	0	0	4.5	
93	2	1	5	12.3		**93**	2	1	5	cemented		**93**	0	0	0	15.4	
94	2	1	5	6.5		**94**	0	1	2	9.7		**94**	0	0	0	5.9	
95	2	1	5	11.4		**95**	2	1	5	4.5		**95**	0	0	0	7.8	
96	2	1	5	9.9		**96**	2	1	5	cemented		**96**	0	0	0	7.1	
97	2	1	5	cemented		**97**	2	1	5	8.7		**97**	0	0	0	17.5	
98	0	1	1	7.3		**98**	2	1	5	14.3		**98**	0	0	0	13	
99	2	1	5	15		**99**	2	1	5	cemented		**99**	0	0	0	13.5	
100	2	1	5	5.7	0.25	**100**	2	1	5	12.4	-	**100**	0	0	0	18.7	0
101						**101**						**101**					
102						**102**						**102**					
103						**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**1.4**	**0.95**	**3.6**	**8.6**	**0.1**	**Mean**	**1.8**	**1.0**	**4.7**	**10.2**	**0.0**	**Mean**	**0.0**	**0.0**	**0.0**	**9.5**	**0.1**
CALCITE INDEX:		**2.3**				**CALCITE INDEX:**		**2.8**				**CALCITE INDEX:**		**0.0**			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

LC_DCDS						LC_FRUS						LI8					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	0	0	6.5		**1**	0	1	2	13		**1**	0	0	0	8	
2	0	0	0	7		**2**	0	1	2	16.3		**2**	0	0	0	5.5	
3	0	0	0	18		**3**	0	1	1	5.4		**3**	0	0	0	12.5	
4	0	0	0	7.5		**4**	0	1	2	49		**4**	0	0	0	9	
5	0	0	0	5.5		**5**	0	1	2	9.3		**5**	0	0	0	4.5	
6	0	0	0	6		**6**	0	1	2	11.2		**6**	0	0	0	6	
7	0	0	0	23		**7**	0	1	2	13.1		**7**	0	0	0	10	
8	0	0	0	21		**8**	0	1	2	8		**8**	0	0	0	13	
9	0	0	0	12		**9**	0	1	2	10		**9**	0	0	0	7.5	
10	0	0	0	30	0	**10**	0	1	2	13.9	0.5	**10**	0	0	0	4.5	0
11	0	0	0	15		**11**	0	1	3	12.3		**11**	0	0	0	6	
12	0	0	0	11		**12**	0	1	2	8.9		**12**	0	0	0	7.5	
13	0	0	0	17		**13**	0	1	2	8.9		**13**	0	0	0	13	
14	0	0	0	6.5		**14**	0	1	2	13.2		**14**	0	0	0	14	
15	0	0	0	8.5		**15**	0	1	2	10		**15**	0	0	0	7	
16	0	0	0	3.5		**16**	0	1	2	16		**16**	0	0	0	9	
17	0	0	0	3		**17**	0	1	2	17		**17**	1	1	1	11	
18	0	0	0	11.5		**18**	0	1	2	23		**18**	0	0	0	10.5	
19	0	0	0	5		**19**	0	1	3	10.7		**19**	0	0	0	5	
20	0	0	0	7.5	0.75	**20**	0	1	2	13.8	0.25	**20**	1	1	1	8	0.25
21	0	0	0	11.5		**21**	0	1	3	15.1		**21**	0	0	0	9.5	
22	0	0	0	2.5		**22**	0	1	2	11.7		**22**	0	0	0	5.5	
23	0	0	0	21		**23**	0	1	2	8.2		**23**	0	0	0	5.5	
24	0	0	0	2.5		**24**	0	1	2	5.1		**24**	0	0	0	11	
25	0	0	0	11.5		**25**	0	1	2	18.5		**25**	0	0	0	10.5	
26	0	0	0	4.5		**26**	0	1	2	12		**26**	0	0	0	9	
27	0	0	0	5.5		**27**	0	1	2	9		**27**	0	0	0	7.5	
28	0	0	0	10		**28**	0	1	2	9.5		**28**	0	0	0	23	
29	0	0	0	10.5		**29**	0	1	2	10.6		**29**	0	0	0	10	
30	0	0	0	6	0.25	**30**	0	1	2	11.3	0	**30**	0	0	0	12	0.25
31	0	0	0	15		**31**	0	1	2	11.7		**31**	0	0	0	11.5	
32	0	0	0	8		**32**	0	1	2	11.7		**32**	0	0	0	21	
33	0	0	0	7.5		**33**	0	1	2	8.6		**33**	0	0	0	15	
34	0	0	0	12.5		**34**	0	1	2	14		**34**	0	0	0	12	
35	0	0	0	13		**35**	0	1	2	8.6		**35**	0	0	0	8.5	
36	0	0	0	4		**36**	0	1	2	7.5		**36**	0	0	0	11	
37	0	0	0	5		**37**	0	1	2	17		**37**	0	0	0	6.5	
38	0	0	0	11.5		**38**	0	1	2	10.5		**38**	0	0	0	13	
39	0	0	0	10.5		**39**	0	1	1	6.7		**39**	0	0	0	3	
40	0	0	0	10.5	0.25	**40**	0	1	1	7	0	**40**	0	0	0	7.5	0
41	0	0	0	10		**41**	0	1	2	12		**41**	0	0	0	7	
42	0	0	0	5.5		**42**	0	1	2	9		**42**	0	0	0	6	
43	0	0	0	17.5		**43**	0	1	3	12.9		**43**	0	0	0	8	
44	0	0	0	9		**44**	0	1	2	14		**44**	0	0	0	9.5	
45	0	0	0	8.5		**45**	0	1	2	3.3		**45**	0	0	0	11	
46	0	0	0	9.5		**46**	0	1	2	8		**46**	0	0	0	8	
47	0	0	0	13		**47**	0	1	2	19		**47**	0	0	0	5.5	
48	0	0	0	16		**48**	0	1	2	18		**48**	0	0	0	10.5	
49	0	0	0	8		**49**	0	1	2	18.5		**49**	0	0	0	9	
50	0	0	0	14	0.25	**50**	0	1	3	16.3	0	**50**	0	0	0	7	0.5
51	0	0	0	8		**51**	0	1	2	19		**51**	0	0	0	7.5	
52	0	0	0	7.5		**52**	0	1	2	12		**52**	0	0	0	2	
53	0	0	0	3		**53**	0	1	2	11		**53**				silt	
54	0	0	0	5		**54**	0	1	2	7		**54**	0	0	0	4	
55	0	0	0	5.5		**55**	0	1	2	30.5		**55**	0	0	0	2.5	
56	0	0	0	5		**56**	0	1	2	10.5		**56**	0	0	0	9	
57	0	0	0	10		**57**	0	1	2	26		**57**	0	0	0	6	
58	0	0	0	11.5		**58**	0	1	2	32		**58**	0	0	0	14.5	
59	0	0	0	16.5		**59**	0	1	2	31		**59**	0	0	0	9	
60	0	0	0	16	0.75	**60**	0	1	3	12.3	0	**60**	0	0	0	10	0.25
61	0	0	0	11		**61**	0	1	2	15.5		**61**	0	0	0	10.5	
62	0	0	0	19		**62**	0	1	2	14.6		**62**	0	0	0	12	
63	0	0	0	9		**63**	0	1	2	11		**63**	0	0	0	4.5	
64	0	0	0	1.5		**64**	0	1	2	9.5		**64**	0	0	0	15	
65	0	0	0	4.5		**65**	0	1	2	11.8		**65**	0	0	0	19	
66	0	0	0	6		**66**	0	1	2	13.4		**66**	0	0	0	9.5	
67	0	0	0	18		**67**	0	1	2	14.8		**67**	0	0	0	8.5	
68	0	0	0	7.5		**68**	0	1	2	13.2		**68**	0	0	0	5.5	
69	0	0	0	5.5		**69**	0	1	2	57		**69**	0	0	0	28	
70	0	0	0	8	0.5	**70**	0	1	2	17	0	**70**	0	0	0	16	0.75
71	0	0	0	7.5		**71**	0	1	2	19		**71**	0	0	0	11.5	
72	0	0	0	8.5		**72**	0	1	2	14.5		**72**	0	0	0	9	
73	0	0	0	2		**73**	0	1	2	9		**73**	0	0	0	15	
74	0	0	0	4		**74**	0	1	2	26		**74**	0	0	0	34	
75	0	0	0	20		**75**	0	1	2	9.8		**75**	0	0	0	14.5	
76	0	0	0	8		**76**	0	1	2	8.9		**76**	0	0	0	8.5	
77	0	0	0	6		**77**	0	1	2	18.7		**77**	0	0	0	25	
78	0	0	0	8.5		**78**	0	1	2	38.5		**78**	0	0	0	10	
79	0	0	0	6.5		**79**	0	1	1	5.5		**79**	0	0	0	5.5	
80	0	0	0	10.5	0.5	**80**	0	1	3	10.8	0	**80**	0	0	0	7.5	0.5
81	0	0	0	12		**81**	0	1	2	11.2		**81**	0	0	0	5	
82	0	0	0	7		**82**	0	1	2	10.8		**82**	0	0	0	9	
83	0	0	0	9.5		**83**	0	1	2	16.1		**83**	0	0	0	10.5	
84	0	0	0	8		**84**	0	1	2	12.3		**84**	0	0	0	7	
85	0	0	0	10		**85**	0	1	2	13.4		**85**	0	0	0	8.5	
86	0	0	0	6		**86**	0	1	2	4.2		**86**	0	0	0	3.5	
87	0	0	0	11		**87**	0	1	3	11.8		**87**	0	0	0	4.5	
88	0	0	0	9		**88**	0	1	2	14.2		**88**	0	0	0	7	
89	0	0	0	2.5		**89**	0	1	3	7.7		**89**	0	0	0	14.5	
90	0	0	0	12.5	0.25	**90**	0	1	2	10.8	0.25	**90**	0	0	0	5.5	0
91	0	0	0	8		**91**	0	1	2	8.7		**91**	0	0	0	4.5	
92	0	0	0	5		**92**	0	1	2	9.8		**92**	0	0	0	5	
93	0	0	0	10.5		**93**	0	1	2	7.6		**93**	0	0	0	11.5	
94	0	0	0	13		**94**	0	1	3	17		**94**	0	0	0	6	
95	0	0	0	13.5		**95**	0	1	2	6.8		**95**	0	0	0	8	
96	0	0	0	11		**96**	0	1	2	10.8		**96**	0	0	0	3	
97	0	0	0	7		**97**	0	1	2	11		**97**	0	0	0	6.5	
98	0	0	0	4		**98**	0	1	2	18		**98**	0	0	0	6	
99	0	0	0	8.5		**99**	0	1	2	9.1		**99**	0	0	0	9	
100	0	0	0	4.5	0.5	**100**	0	1	2	12.6	0.25	**100**	0	0	0	8.5	0.25
101						**101**						**101**	0	0	0	7	
102						**102**						**102**					
103						**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.0**	**0.0**	**0.0**	**9.5**	**0.4**	**Mean**	**0.0**	**1.0**	**2.1**	**13.8**	**0.1**	**Mean**	**0.02**	**0.02**	**0.02**	**9.5**	**0.3**
CALCITE INDEX:		**0.0**				**CALCITE INDEX:**		**1.0**				**CALCITE INDEX:**		**0.04**			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

LIDSL						LILC3						LMC-JR1					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	1	2	8		**1**	0	1	2	12.5		**1**	0	0	0	11.1	
2	0	1	2	13.5		**2**	0	1	2	6		**2**	0	0	0	7.4	
3	0	1	1	10.5		**3**	0	1	2	7.5		**3**	0	0	0	4.1	
4	0	0	0	10.5		**4**	0	1	2	7		**4**	0	0	0	7.6	
5	0	1	1	14		**5**	0	1	2	9.5		**5**	0	0	0	7.0	
6	0	1	1	11.5		**6**	0	1	2	9		**6**	0	0	0	4.6	
7	0	1	2	43		**7**	0	1	2	9.5		**7**	0	0	0	8.5	
8	0	0	0	12.5		**8**	0	1	2	11.5		**8**	0	0	0	4.0	
9	0	1	2	48		**9**	0	1	2	6.5		**9**	0	0	0	6.0	
10	0	1	1	12	0.5	**10**	0	1	2	7	0.25	**10**	0	0	0	8.5	0.5
11	0	0	0	5.5		**11**	0	1	2	16		**11**	0	0	0	4.5	
12	0	1	2	11.5		**12**	0	1	2	8		**12**	0	0	0	4.5	
13	0	0	0	6.5		**13**	0	1	3	19.5		**13**	0	0	0	8.5	
14	0	1	1	11.5		**14**	0	1	2	7.5		**14**	0	0	0	4.9	
15	0	1	1	8.5		**15**	0	1	2	13		**15**	0	0	0	11.0	
16	0	1	2	25		**16**	0	1	2	8		**16**	0	0	0	3.0	
17	0	0	0	5		**17**	0	1	2	10		**17**	0	0	0	7.5	
18	0	1	2	18		**18**	0	1	2	19		**18**	0	0	0	6.8	
19	0	1	2	20		**19**	0	1	2	8		**19**	0	0	0	5.8	
20	0	1	1	11	0.25	**20**	0	1	2	18	0.25	**20**	0	0	0	3.8	0.5
21	0	1	1	19.5		**21**	0	1	2	5.5		**21**	0	0	0	6.7	
22	0	1	2	41		**22**	0	1	2	8		**22**	0	0	0	5.3	
23	0	1	1	16		**23**	0	1	2	6.5		**23**	0	0	0	8.1	
24	0	1	1	15.5		**24**	0	1	2	4		**24**	0	0	0	12.9	
25	0	1	1	13		**25**	0	1	2	9.5		**25**	0	0	0	7.7	
26	0	0	0	16		**26**	0	1	2	9		**26**	0	0	0	12.9	
27	0	1	1	14		**27**	0	1	2	19.5		**27**	0	0	0	4.4	
28	0	0	0	5		**28**	0	1	2	10.5		**28**	0	0	0	7.1	
29	0	1	2	9.5		**29**	0	1	2	17.5		**29**	0	0	0	16.9	
30	0	1	1	8.5	0.75	**30**	0	1	2	6	0	**30**	0	0	0	7.9	0.25
31	0	1	2	20		**31**	0	1	2	11		**31**	0	0	0	4.5	
32	0	0	0	10.5		**32**	0	1	2	8		**32**	0	0	0	11.0	
33	0	1	1	12		**33**	0	1	2	4.5		**33**	0	0	0	7.4	
34	0	0	0	9		**34**	0	1	2	11.5		**34**	0	0	0	6.3	
35	0	1	2	38		**35**	0	1	2	6		**35**	0	0	0	7.9	
36	0	0	0	16		**36**	0	1	2	12.5		**36**	0	0	0	7.9	
37	0	0	0	9		**37**	0	1	2	6.5		**37**	0	0	0	1.8	
38	0	0	0	7.5		**38**	0	1	1	4		**38**	0	0	0	5.5	
39	0	1	1	9.5		**39**	0	1	2	10		**39**	0	0	0	4.3	
40	0	0	0	10.5	0.25	**40**	0	1	2	7.5	0.5	**40**	0	0	0	6.1	0.25
41	0	0	0	8		**41**	0	1	2	9.5		**41**	0	0	0	17.1	
42	0	1	2	31		**42**	0	1	3	13		**42**	0	0	0	9.5	
43	0	1	1	11		**43**	0	1	2	5.5		**43**	0	0	0	18.1	
44	0	0	0	4.5		**44**	0	1	2	4.5		**44**	0	0	0	4.1	
45	0	1	2	16		**45**	0	1	2	8		**45**	0	0	0	11.6	
46	0	1	2	10.5		**46**	0	1	2	5.5		**46**	0	0	0	3.2	
47	0	1	1	28		**47**	0	1	2	3.5		**47**	0	0	0	13.9	
48	0	1	2	34		**48**	0	1	2	12		**48**	0	0	0	8.1	
49	0	0	0	6.5		**49**	0	1	1	7.5		**49**	0	0	0	22.0	
50	0	1	2	10.5	0.5	**50**	0	1	2	4	0.25	**50**	0	0	0	20.0	0.25
51	0	1	1	7		**51**	0	1	3	16		**51**	0	0	0	16.2	
52	0	1	2	19		**52**	0	1	2	37		**52**	0	0	0	8.4	
53	0	1	1	11.5		**53**	0	1	2	7		**53**	0	0	0	9.5	
54	0	1	2	14.5		**54**	0	1	2	9		**54**	0	0	0	6.8	
55	0	1	2	45		**55**	0	1	2	16.5		**55**	0	0	0	8.5	
56	0	1	2	15.5		**56**	0	1	2	14.5		**56**	0	0	0	14.2	
57	0	1	1	11.5		**57**	0	1	2	5		**57**	0	0	0	8.1	
58	0	0	0	19		**58**	0	1	2	7.5		**58**	0	0	0	6.9	
59	0	0	0	12.5		**59**	0	1	2	7.5		**59**	0	0	0	13.3	
60	0	0	0	13	0.25	**60**	0	1	2	12	0.25	**60**	0	0	0	12.4	0.5
61	0	0	0	5		**61**	0	1	2	21		**61**	0	0	0	11.8	
62	0	0	0	6		**62**	0	1	2	20		**62**	0	0	0	9.4	
63	0	1	1	11.5		**63**	0	1	2	15.5		**63**	0	0	0	10.7	
64	0	1	2	28		**64**	0	1	2	20.5		**64**	0	0	0	5.2	
65	0	0	0	11.5		**65**	0	1	2	7		**65**	0	0	0	8.9	
66	0	1	1	14.5		**66**	0	1	1	10.5		**66**	0	0	0	6.4	
67	0	1	1	14		**67**	0	1	2	5.5		**67**	0	0	0	6.9	
68	0	0	0	4		**68**	0	1	2	8.5		**68**	0	0	0	5.1	
69	0	1	2	30		**69**	0	1	2	6		**69**	0	0	0	5.7	
70	0	0	0	11	0.25	**70**	0	1	2	4	0	**70**	0	0	0	10.3	0.5
71	0	0	0	16		**71**	0	1	2	20		**71**	0	0	0	18.6	
72				gravel		**72**	0	1	2	19.5		**72**	0	0	0	4.1	
73	0	0	0	2		**73**	0	1	2	14		**73**	0	0	0	3.1	
74	0	1	1	9		**74**	0	1	2	16		**74**	0	0	0	6.4	
75	0	0	0	9		**75**	0	1	2	10.5		**75**	0	0	0	10.3	
76	0	1	2	23		**76**	0	1	2	11.5		**76**	0	0	0	2.2	
77	0	0	0	13		**77**	0	1	2	27		**77**	0	0	0	7.1	
78	0	0	0	7.5		**78**	0	1	2	4.5		**78**	0	0	0	3.9	
79	0	1	2	24		**79**	0	1	2	10		**79**	0	0	0	6.5	
80	0	0	0	26	0.5	**80**	0	1	2	9	0.25	**80**	0	0	0	6.5	0.5
81	0	0	0	7		**81**	0	1	2	19		**81**	0	0	0	24.5	
82	0	0	0	5		**82**	0	1	2	11.5		**82**	0	0	0	15.1	
83	0	1	2	33		**83**	0	1	2	53.5		**83**	0	0	0	15.5	
84	0	0	0	5		**84**	0	1	2	11.5		**84**	0	0	0	21.0	
85	0	0	0	9.5		**85**	0	1	2	24		**85**	0	0	0	3.4	
86	0	0	0	8.5		**86**	0	1	2	20		**86**	0	0	0	9.9	
87	0	1	1	12		**87**	0	1	1	4.5		**87**	0	0	0	3.1	
88	0	0	0	13		**88**	0	1	2	18		**88**	0	0	0	12.1	
89	0	1	1	10		**89**	0	1	2	16		**89**	0	0	0	3.5	
90	0	1	1	13	0.25	**90**	0	1	3	14.5	0.25	**90**	0	0	0	12.4	0.25
91	0	1	1	16		**91**	0	1	2	5.5		**91**	0	0	0	18.7	
92	0	1	1	5.5		**92**	0	1	2	16.5		**92**	0	0	0	5.9	
93	0	1	1	15		**93**	0	1	2	14.5		**93**	0	0	0	7.1	
94	0	1	1	9		**94**	0	1	2	20		**94**	0	0	0	6.1	
95	0	1	1	9		**95**	0	1	3	16		**95**	0	0	0	23.5	
96	0	0	0	12		**96**	0	1	2	7		**96**	0	0	0	14.7	
97	0	1	1	28		**97**	0	1	2	10		**97**	0	0	0	5.5	
98	0	0	0	8		**98**	0	1	2	9.5		**98**	0	0	0	3.6	
99	0	0	0	8.5		**99**	0	1	3	11.5		**99**	0	0	0	16.5	
100	0	0	0	10.5	0.25	**100**	0	1	2	15	0.25	**100**	0	0	0	5.0	0.5
101	0	1	1	15		**101**						**101**					
102						**102**						**102**					
103						**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.0**	**0.60**	**0.86**	**14.5**	**0.4**	**Mean**	**0.0**	**1.0**	**2.0**	**11.7**	**0.2**	**Mean**	**0.0**	**0.0**	**0.0**	**8.9**	**0.4**
CALCITE INDEX:		**0.60**				**CALCITE INDEX:**		**1.0**				**CALCITE INDEX:**		**0.0**			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

MI2						MI3						MI5					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	1	1	9.6		**1**	0	0	0	2.7		**1**	0	0	0	11.6	
2	0	1	1	6.2		**2**	0	1	1	2.9		**2**	0	0	0	6.2	
3	0	0	0	1.5		**3**	0	1	1	1.9		**3**	0	0	0	7.9	
4	0	0	0	7.7		**4**	0	0	0	7.2		**4**	0	1	1	7.7	
5	0	0	0	7.8		**5**	0	0	0	4.3		**5**	0	0	0	21.6	
6	0	1	1	14.6		**6**	0	0	0	3.6		**6**	0	0	0	5.4	
7	0	0	0	7.4		**7**	0	0	0	2.3		**7**	0	0	0	4.6	
8	0	1	1	10.6		**8**	0	0	0	9.2		**8**	0	0	0	18.9	
9	0	0	0	5.4		**9**	0	1	1	15.7		**9**	0	1	1	9.5	
10	0	0	0	5.1	0	**10**	0	1	1	8.7	0.25	**10**	0	0	0	26.7	0.25
11	0	0	0	6.9		**11**	0	0	0	4.7		**11**	0	0	0	4.6	
12	0	0	0	7.0		**12**	0	1	1	7.8		**12**	0	1	1	6.5	
13	0	0	0	5.4		**13**	0	1	1	30.3		**13**	0	0	0	21.3	
14	0	0	0	7.7		**14**	0	0	0	10.2		**14**	0	0	0	9.1	
15	0	1	1	8.5		**15**	0	0	0	8.2		**15**	0	0	0	19.6	
16	0	0	0	10.2		**16**	0	0	0	15.1		**16**	0	0	0	17.5	
17	0	0	0	4.3		**17**	0	0	0	6.2		**17**	0	1	1	6.4	
18	0	1	1	5.4		**18**	0	0	0	27.3		**18**	0	1	1	10.1	
19	0	1	1	9.0		**19**	0	0	0	15.4		**19**	0	1	1	11.3	
20	0	1	1	6.4	0	**20**	0	1	1	9.5	0.25	**20**	0	0	0	7.5	0.25
21	0	1	1	18.3		**21**	0	0	0	11.1		**21**	0	1	1	10.2	
22	0	0	0	8.5		**22**	0	0	0	9.7		**22**	0	0	0	1.3	
23	0	1	1	8.7		**23**	0	1	1	24.7		**23**	0	0	0	9.0	
24	0	0	0	2.7		**24**	0	1	1	10.6		**24**	0	1	1	12.7	
25	0	1	1	9.9		**25**	0	0	0	11.7		**25**	0	1	1	7.5	
26	0	0	0	3.2		**26**	0	0	0	11.9		**26**	0	0	0	16.2	
27	0	0	0	9.4		**27**	0	0	0	0.9		**27**	0	1	1	14.4	
28	0	0	0	6.9		**28**	0	0	0	14.3		**28**	0	1	1	11.3	
29				gravel		**29**	0	1	1	21.5		**29**	0	1	1	11.8	
30	0			18.2	0.25	**30**	0	1	1	10.6	0.25	**30**	0	0	0	6.5	0.25
31	0	0	0	14.7		**31**	0	0	0	10.4		**31**	0	1	1	14.2	
32	0	1	1	8.0		**32**	0	0	0	13.9		**32**	0	1	1	6.8	
33	0	1	1	11.4		**33**	0	0	0	2.0		**33**	0	0	0	20.5	
34	0	0	0	2.7		**34**	0	1	1	3.4		**34**	0	1	1	12.9	
35	0	0	0	14.0		**35**	0	0	0	1.8		**35**	0	0	0	7.2	
36	0	0	0	4.9		**36**	0	0	0	8.9		**36**	0	0	0	11.2	
37	0	0	0	4.1		**37**	0	0	0	15.7		**37**	0	0	0	54.5	
38	0	1	1	3.2		**38**	0	1	1	7.6		**38**	0	1	1	10.3	
39	0	0	0	5.6		**39**	0	0	0	7.7		**39**	0	0	0	12.4	
40	0	0	0	14.0	0.75	**40**	0	1	1	12.3	0.5	**40**	0	1	1	5.2	0
41	0	1	1	7.3		**41**	0	0	0	3.0		**41**	0	0	0	3.1	
42	0	1	2	12.9		**42**	0	1	1	11.0		**42**	0	0	0	19.1	
43	0	0	0	5.7		**43**	0	1	1	4.5		**43**	0	0	0	4.6	
44	0	0	0	11.6		**44**	0	0	0	4.3		**44**	0	1	1	15.3	
45	0	0	0	13.7		**45**	0	0	0	2.6		**45**	0	1	1	26.1	
46	0	1	1	8.6		**46**	0	0	0	7.0		**46**	0	1	1	13.8	
47	0	0	0	8.3		**47**	0	0	0	4.5		**47**	0	0	0	5.1	
48	0	1	1	22.7		**48**	0	1	1	12.9		**48**	0	0	0	10.5	
49	0	1	1	9.8		**49**	0	1	1	17.8		**49**	0	0	0	2.8	
50	0	1	1	17.3	0.25	**50**	0	0	0	5.5	0.5	**50**	0	1	1	29.7	0.25
51	0	0	0	12.3		**51**	0	0	0	4.4		**51**	0	0	0	5.1	
52	0	0	0	11.4		**52**	0	1	1	8.4		**52**	0	1	1	18.7	
53	0	1	1	15.9		**53**	0	1	1	15.3		**53**	0	1	1	12.5	
54	0	0	0	7.4		**54**	0	1	1	26.8		**54**	0	1	1	12.2	
55	0	1	1	12.7		**55**	0	1	1	6.5		**55**	0	0	0	11.0	
56	0	0	0	19.6		**56**	0	0	0	15.5		**56**	0	0	0	15.5	
57	0	1	1	12.9		**57**	0	0	0	33.7		**57**	0	1	1	5.6	
58	0	0	0	3.8		**58**	0	0	0	10.0		**58**	0	0	0	15.0	
59	0	1	2	12.5		**59**	0	0	0	14.5		**59**	0	1	1	10.8	
60	0	0	0	8.0	0	**60**	0	0	0	8.2	0.25	**60**	0	0	0	23.9	0.5
61	0	1	1	11.0		**61**	0	0	0	13.7		**61**	0	1	1	10.0	
62	0	0	0	3.1		**62**	0	0	0	13.9		**62**	0	0	0	9.6	
63	0	0	0	9.2		**63**	0	1	1	5.8		**63**	0	1	1	8.6	
64	0	1	1	17.5		**64**	0	0	0	5.8		**64**	0	1	1	18.5	
65	0	0	0	6.2		**65**	0	1	1	8.8		**65**	0	0	0	5.1	
66	0	1	1	23.5		**66**	0	0	0	7.1		**66**	0	0	0	6.9	
67	0	0	0	5.0		**67**	0	0	0	2.0		**67**	0	1	1	4.9	
68	0	0	0	6.7		**68**	0	1	1	35.6		**68**	0	1	1	9.9	
69	0	0	0	8.4		**69**	0	1	1	9.7		**69**	0	1	1	10.5	
70	0	1	1	8.2	0	**70**	0	0	0	3.6	0.5	**70**	0	1	1	11.6	0.5
71	0	1	1	5.0		**71**	0	0	0	0.6		**71**	0	1	1	13.0	
72	0	0	0	4.7		**72**	0	1	1	10.5		**72**	0	1	1	8.5	
73	0	1	2	9.9		**73**	0	0	0	14.5		**73**	0	1	1	2.7	
74	0	1	1	6.7		**74**	0	1	1	3.2		**74**	0	0	0	17.4	
75	0	1	1	16.3		**75**	0	1	1	5.6		**75**	0	0	0	10.4	
76	0	0	0	5.5		**76**	0	1	1	5.2		**76**	0	1	1	11.9	
77	0	0	0	4.2		**77**	0	0	0	5.8		**77**	0	1	1	12.3	
78	0	1	1	11.0		**78**	0	1	1	3.1		**78**	0	1	1	7.5	
79	0	1	2	12.6		**79**	0	0	0	11.4		**79**	0	1	1	11.6	
80	0	1	2	19.3	0	**80**	0	0	0	7.6	0.25	**80**	0	1	1	9.2	0.25
81	0	0	0	2.0		**81**	0	0	0	11.8		**81**	0	0	0	15.2	
82	0	0	0	7.5		**82**	0	0	0	13.4		**82**	0	0	0	11.4	
83				gravel		**83**	0	1	1	2.0		**83**	0	0	0	11.2	
84	0	0	0	7.3		**84**	0	0	0	8.4		**84**	0	1	1	17.6	
85	0	1	1	4.7		**85**	0	1	1	8.0		**85**	0	0	0	17.6	
86	0	1	1	11.5		**86**	0	1	1	3.2		**86**	0	0	0	7.0	
87	0	0	0	5.9		**87**	0	1	1	7.7		**87**	0	0	0	0.9	
88	0	0	0	7.0		**88**	0	0	0	11.5		**88**	0	1	1	4.8	
89	0	0	0	3.7		**89**	0	0	0	0.5		**89**	0	1	2	7.2	
90	0	1	1	12.5	0.25	**90**	0	1	1	5.6	0.25	**90**	0	0	0	5.2	0
91				gravel		**91**	0	0	0	7.7		**91**	0	0	0	5.5	
92	0	0	0	7.2		**92**	0	1	1	22.7		**92**	0	0	0	6.2	
93	0	1	1	9.9		**93**	0	0	0	1.0		**93**	0	1	1	9.4	
94	0	0	0	7.8		**94**	0	0	0	8.1		**94**	0	1	1	12.1	
95	0	0	0	14.4		**95**	0	0	0	4.2		**95**	0	0	0	13.2	
96	0	1	1	14.0		**96**	0	0	0	22.9		**96**	0	1	1	25.2	
97	0	1	1	8.2		**97**	0	1	1	4.3		**97**	0	0	0	8.6	
98	0	0	0	12.7		**98**	0	1	2	4.2		**98**	0	1	1	15.3	
99	0	1	1	9.1		**99**	0	1	1	5.7		**99**	0	1	1	5.4	
100	0	0	0	6.6	0.25	**100**	0	1	1	3.7	0.25	**100**	0	1	1	15.9	0
101	0	0	0	4.8		**101**	0	1	1	18.7		**101**	0	0	0	13.7	
102	0	1	1	15.2		**102**	0	1	1	15.2		**102**	0	1	1	13.4	
103	0	0	0	6.8		**103**	0	0	0	2.2		**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.0**	**0.43**	**0.48**	**9.2**	**0.2**	**Mean**	**0.0**	**0.42**	**0.43**	**9.6**	**0.3**	**Mean**	**0.0**	**0.50**	**0.51**	**11.7**	**0.2**
CALCITE INDEX:		**0.43**				**CALCITE INDEX:**		**0.42**				**CALCITE INDEX:**		**0.50**			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

MIDAG						MIDCO						MIUCO					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	0	0	9.9		1	0	1	1	13.4		1	0	1	1	3.9	
2	0	1	1	11.2		2	0	1	1	10.8		2	0	1	2	11.3	
3	1	1	1	1.3		3	0	1	1	6.9		3	0	1	1	8.7	
4	0	0	0	8.7		4	0	1	1	6.3		4	0	1	1	11.2	
5	0	0	0	7.8		5	0	1	2	7.1		5	0	0	0	1.5	
6	1	0	0	5.6		6	0	0	0	12.7		6	0	1	1	15.3	
7	0	0	0	9.2		7	0	0	0	7.0		7	0	1	2	11.2	
8	0	0	0	4.4		8	0	0	0	6.9		8	0	1	1	3.9	
9	0	0	0	2.6		9	0	0	0	10.5		9	0	0	0	3.1	
10	0	0	0	9.9	0.25	10	0	0	0	8.5	0	10	0	1	2	34.2	0.25
11	0	1	1	8.9		11	0	1	1	2.4		11	0	1	1	13.9	
12	0	1	1	13.6		12	0	1	1	1.6		12	0	1	1	9.3	
13	0	1	1	19.0		13	0	1	1	11.6		13	0	1	2	5.3	
14	1	1	1	7.2		14	0	0	0	7.9		14	0	1	1	7.2	
15	0	0	0	14.3		15	0	1	1	12.9		15	0	1	2	14.9	
16	0	0	0	1.8		16	0	0	0	3.4		16	0	1	1	15.4	
17	0	0	0	9.7		17	0	1	1	19.2		17	2	1	2	4.4	
18	0	0	0	11.4		18	0	1	1	8.6		18	0	1	2	9.1	
19	0	1	1	8.7		19	0	0	0	8.9		19	0	1	2	4.8	
20	0	0	0	11.9	0.5	20	0	1	1	9.6	0.25	20	0	1	2	6.7	0.5
21	1	1	1	13.5		21	0	0	0	2.2		21	0	1	2	15.2	
22	0	0	0	5.3		22	0	1	2	9.6		22	0	1	1	6.8	
23	0	0	0	8.4		23	0	1	2	9.2		23	0	0	0	1.7	
24	0	0	0	3.9		24	0	1	2	17.3		24	0	1	1	13.3	
25	0	0	0	15.4		25	0	1	2	8.5		25	0	1	1	8.9	
26	0	1	2	7.2		26	0	1	2	8.7		26	0	0	0	8.1	
27	0	0	0	8.5		27	0	0	0	8.9		27	0	1	2	18.1	
28	0	0	0	10.0		28	0	1	1	12.9		28	0	0	0	3.3	
29	0	0	0	5.6		29	0	0	0	12.5		29	0	1	1	11.5	
30	0	0	0	12.0	0.25	30	0	1	2	13.2	0.75	30	0	0	0	14.3	0.25
31	0	0	0	3.4		31	0	1	1	8.4		31	0	0	0	4.7	
32	0	0	0	9.2		32	0	0	0	7.2		32	0	0	0	9.2	
33	0	0	0	6.7		33	0	1	2	6.9		33	0	1	1	7.6	
34	0	0	0	1.6		34	0	1	1	2.2		34	0	1	2	6.1	
35	0	1	1	13.2		35	0	1	2	16.3		35	1	0	0	5.2	
36	0	1	1	14.4		36	0	1	1	4.9		36	0	1	2	14.0	
37	0	0	0	7.3		37	0	1	1	8.7		37	0	1	2	14.2	
38	0	0	0	3.9		38	0	1	1	19.3		38	0	1	1	3.0	
39	1	1	1	8.4		39	0	1	1	4.3		39	0	1	2	10.4	
40	1	1	1	5.1	0.5	40	0	1	2	6.4	0.25	40	0	1	2	5.3	0.5
41	0	0	0	3.2		41	0	1	2	12.5		41	0	1	2	21.3	
42	0	0	0	6.9		42	0	1	2	10.4		42	0	0	0	2.4	
43	0	1	1	13.7		43	0	1	1	2.7		43	0	0	0	4.4	
44	0	0	0	1.9		44	0	1	1	3.8		44	1	1	1	5.3	
45	0	0	0	8.9		45	0	1	2	16.3		45	0	1	1	2.2	
46	0	0	0	5.9		46	0	1	2	14.6		46	0	0	0	1.0	
47	0	0	0	10.3		47	0	1	1	11.9		47	0	1	1	4.7	
48	0	1	1	13.1		48	0	1	1	3.5		48	0	1	1	6.7	
49	0	1	1	16.2		49	0	0	0	5.4		49	0	0	0	1.0	
50	0	0	0	12.5	0.5	50	0	0	0	7.4	0.25	50	0	0	0	2.2	0
51	0	1	1	7.4		51	0	1	1	4.4		51	0	0	0	4.3	
52	0	0	0	9.1		52	0	1	1	7.1		52	0	0	0	5.9	
53	0	0	0	3.4		53	0	0	0	2.3		53	0	0	0	2.6	
54	0	0	0	1.8		54	0	1	1	8.6		54	1	0	0	11.1	
55	0	0	0	12.9		55	0	0	0	3.3		55	0	1	1	2.5	
56	0	0	0	4.4		56	0	1	2	24.8		56	1	1	1	8.3	
57	0	0	0	6.8		57	0	1	1	10.3		57	1	1	1	11.8	
58	0	0	0	2.5		58	0	1	2	7.4		58	0	1	1	4.7	
59	0	0	0	9.9		59	0	1	2	15.8		59	0	1	1	8.7	
60	0	0	0	9.0	0.5	60	0	0	0	5.2	0.75	60	0	1	2	10.0	0.5
61	0	1	1	20.2		61	0	1	2	15.2		61	0	0	0	1.7	
62	0	0	0	7.7		62	0	1	2	6.9		62	0	1	1	13.1	
63	0	0	0	2.2		63	0	1	2	13.4		63	0	0	0	4.2	
64	0	0	0	10.5		64	0	0	0	21.9		64	0	1	1	7.9	
65	0	0	0	2.7		65	0	1	1	11.4		65	0	1	1	9.6	
66	0	1	1	6.5		66	0	1	1	8.7		66	0	1	2	5.7	
67	0	0	0	2.2		67	0	0	0	6.3		67	1	1	2	15.6	
68	0	1	1	11.5		68	0	0	0	5.5		68	0	1	2	5.2	
69	0	0	0	8.9		69	0	1	1	7.7		69	0	0	0	0.7	
70	0	0	0	8.9	0	70	0	1	1	23.3	0.5	70	0	1	1	4.0	0.25
71	1	1	1	6.1		71	0	1	1	4.0		71	1	1	1	9.5	
72	0	1	1	12.1		72	0	1	1	4.1		72	0	1	2	8.4	
73	0	0	0	2.1		73	0	1	2	21.8		73	0	1	2	7.7	
74	0	0	0	3.5		74	0	1	1	2.8		74	0	1	1	4.9	
75	0	0	0	1.2		75	0	1	1	6.9		75	1	1	1	20.1	
76	0	0	0	12.7		76	0	1	2	13.1		76	0	1	2	9.2	
77	0	0	0	4.4		77	0	0	0	2.7		77	0	1	2	9.2	
78	0	0	0	7.1		78	0	1	2	10.4		78	1	1	1	6.2	
79	0	0	0	15.6		79	0	0	0	6.5		79	1	0	0	2.3	
80	0	0	0	7.9	0	80	0	1	1	11.7	0.5	80	0	1	1	3.4	0.5
81	0	0	0	3.4		81	0	1	1	12.9		81	0	1	1	16.2	
82	0	0	0	3.8		82	0	0	0	9.0		82	0	0	0	0.9	
83	0	0	0	9.1		83	0	1	2	8.7		83	0	1	1	2.7	
84	0	0	0	5.4		84	0	1	1	5.3		84	1	1	2	3.9	
85	0	0	0	9.1		85	0	1	1	6.2		85	0	1	1	4.0	
86	0	0	0	7.9		86	0	0	0	4.1		86	0	1	2	8.3	
87	0	1	1	2.4		87	0	1	2	8.2		87	0	1	1	9.1	
88	0	1	1	6.9		88	0	1	2	7.9		88	0	0	0	2.7	
89	0	0	0	4.9		89	0	0	0	4.4		89	1	1	1	5.1	
90	0	0	0	7.1	0.25	90	0	1	1	5.3	0.5	90	0	0	0	8.6	0
91	0	0	0	13.6		91	0	1	1	8.1		91	0	1	1	4.7	
92	0	1	1	10.6		92	0	1	2	21.3		92	0	1	1	31.5	
93	0	0	0	5.9		93	0	1	2	16.8		93	1	1	2	2.6	
94	0	0	0	4.8		94	0	0	0	16.2		94	0	1	1	8.8	
95	0	0	0	4.2		95	0	1	1	9.2		95	0	1	2	19.3	
96	0	0	0	7.7		96	0	0	0	8.8		96	0	0	0	2.0	
97	0	0	0	12.3		97	0	0	0	6.6		97	0	0	0	2.0	
98	2	1	1	8.2		98	0	0	0	4.2		98	0	1	1	18.4	
99	0	1	2	7.4		99	0	0	0	3.9		99	0	0	0	1.7	
100	0	0	0	6.9	0	100	0	0	0	5.9	0.25	100	0	1	1	4.6	0.25
101						101						101	0	1	2	11.2	
102						102						102	0	1	1	8.1	
103						103						103					
104						104						104					
105						105						105					
106						106						106					
107						107						107					
108						108						108					
109						109						109					
110						110						110					
Mean	0.09	0.27	0.29	8.0	0.3	Mean	0.0	0.69	0.97	9.2	0.4	Mean	0.15	0.73	1.0	8.1	0.3
CALCITE INDEX:		0.36				CALCITE INDEX:		0.69				CALCITE INDEX:		0.87			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

MP1						NGD1u						NTHO1-25					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	0	0	11.7		**1**	0	0	0	3.7		**1**	1	1	3	3.4	
2	0	1	2	9.9		**2**	0	0	0	14.6		**2**	1	1	2	3.6	
3	0	1	2	12.2		**3**	0	1	1	3.8		**3**	0	1	2	4	
4	0	1	3	12.8		**4**	0	1	1	12		**4**	1	1	2	3.9	
5	0	1	2	8.1		**5**	0	0	0	3.2		**5**	2	1	5	6	
6	0	1	2	6.4		**6**	0	1	1	15.9		**6**	1	1	3	17.6	
7	0	1	1	5.1		**7**	0	1	1	10.7		**7**	0	1	2	6.3	
8	0	1	3	19.3		**8**	0	0	0	4.7		**8**	0	1	2	5.3	
9	0	1	2	8.1		**9**	0	0	0	4.1		**9**	0	1	2	5.1	
10	0	1	2	10.1	0.25	**10**	0	0	0	8.1	0.25	**10**	1	1	4	8.1	0.25
11	0	1	2	8.7		**11**	0	1	1	12.3		**11**	0	1	2	3.5	
12	0	1	2	6.4		**12**	0	0	0	6.7		**12**	0	1	2	2.4	
13	0	1	1	4.3		**13**	0	1	1	7.3		**13**	0	1	2	5.7	
14	0	1	2	9.2		**14**	0	1	1	7.7		**14**	0	1	2	6	
15	0	1	2	12.1		**15**	0	1	1	11.2		**15**	2	1	5	3	
16	0	1	2	13.5		**16**	0	1	1	19.4		**16**	0	1	3	4.7	
17	0	1	2	13.4		**17**	0	1	1	8.3		**17**	0	1	3	3.4	
18	0	1	2	10.7		**18**	0	1	1	6.9		**18**	0	1	3	4.7	
19	0	1	1	9.3		**19**	0	1	1	18.7		**19**	0	1	2	6.5	
20	0	1	2	7.5	0.25	**20**	0	0	0	4.4	0	**20**	2	1	5	10.1	0.75
21	0	1	2	17.8		**21**	0	1	1	8.4		**21**	0	1	2	4.4	
22	0	1	2	4.2		**22**	0	1	1	9.6		**22**	1	1	3	13.4	
23	0	1	3	12.5		**23**	0	1	1	2		**23**	0	1	2	4	
24	0	1	2	6.6		**24**	0	0	0	6.7		**24**	0	1	2	5.9	
25	0	1	1	8.1		**25**	0	0	0	2.3		**25**	2	1	5	7.8	
26	0	1	2	9.2		**26**	0	0	0	7.2		**26**	2	1	5	6.3	
27	0	1	1	14.9		**27**	0	1	1	6.9		**27**	0	1	3	3.7	
28	0	1	3	7.2		**28**	0	1	1	6.3		**28**	0	1	2	2.4	
29	0	1	2	13.6		**29**	0	1	1	10.4		**29**	2	1	5	6.2	
30	0	1	2	8.9	0.25	**30**	0	1	1	2.9	0	**30**	0	1	2	10.1	0.5
31	0	1	2	10.9		**31**	0	1	2	8.4		**31**	1	1	3	8.7	
32	0	1	1	8.2		**32**	0	0	0	3.6		**32**	0	1	2	9.5	
33	0	1	2	9.4		**33**	0	1	1	9.9		**33**	0	1	1	2.4	
34	0	1	2	10		**34**	0	1	1	6.8		**34**	0	1	3	9.2	
35	0	1	2	11		**35**	0	1	1	11.7		**35**	0	1	2	4.1	
36	0	1	3	30.7		**36**	0	1	1	14.4		**36**	0	1	2	12.2	
37	0	1	2	82		**37**	0	1	1	7.4		**37**	0	1	2	8.1	
38	0	1	2	10.6		**38**	0	1	1	18.6		**38**	0	1	2	4.7	
39	0	1	3	15.7		**39**	0	0	0	3.9		**39**	2	1	5	7.1	
40	0	1	1	5.5	0	**40**	0	1	1	19.1	0	**40**	0	1	3	12.5	0
41	0	1	3	17.2		**41**	0	1	1	10.1		**41**	1	1	3	5.9	
42	0	1	2	6.2		**42**	0	1	1	7.4		**42**	0	1	3	12.5	
43	0	1	2	6.1		**43**	0	0	0	1.6		**43**	0	1	2	2	
44	0	1	2	9.4		**44**	0	1	1	2.7		**44**	2	1	5	6.4	
45	0	1	2	9.8		**45**	0	1	1	16.8		**45**	0	1	2	2	
46	0	1	2	11.3		**46**	0	1	1	21.4		**46**	0	1	2	1.6	
47	0	1	2	31.7		**47**	0	1	2	22.4		**47**	0	1	3	11	
48	0	1	2	3.3		**48**	0	1	1	6.9		**48**	0	1	2	2.8	
49	0	1	2	15		**49**	0	1	1	6.8		**49**	0	1	3	6.5	
50	0	1	2	10.1	0.25	**50**	0	1	1	7	0.25	**50**	0	1	3	1.7	0.25
51	0	1	2	19.7		**51**	0	1	1	5.7		**51**	2	1	5	4.5	
52	0	0	0	1.1		**52**	0	1	1	9.2		**52**	2	1	5	9.4	
53	0	1	2	11.9		**53**	0	1	1	9.4		**53**	2	1	5	4.7	
54	0	1	2	19		**54**	0	1	1	8.8		**54**	0	1	2	5.2	
55	0	1	2	116		**55**	0	1	1	7.8		**55**	0	1	2	6.1	
56	0	1	2	15.3		**56**	0	1	1	13.8		**56**	0	1	2	4.3	
57	0	1	2	11.1		**57**	0	1	2	3.1		**57**	1	1	3	5.3	
58	0	1	2	8.3		**58**	0	1	1	8.3		**58**	0	1	3	7.9	
59	0	1	1	12.1		**59**	0	1	1	8.4		**59**	0	1	3	4.8	
60	0	1	2	10.5	0.25	**60**	0	1	1	3.2	0.25	**60**	2	1	5	7.1	0
61	0	1	2	13.3		**61**	0	1	1	14.2		**61**	0	1	2	4	
62	0	1	2	8.4		**62**	0	1	1	8		**62**	1	1	3	4.6	
63	0	1	2	8.2		**63**	0	1	1	15.7		**63**	0	1	2	3.7	
64	0	1	2	9.2		**64**	0	1	1	9.3		**64**	0	1	2	9.8	
65	0	1	2	8.8		**65**	0	0	0	4.5		**65**	0	1	2	6.5	
66	0	1	1	7.2		**66**	0	1	1	11.3		**66**	0	1	1	3.4	
67	0	1	3	5.4		**67**	0	1	1	10.1		**67**	0	1	2	4.9	
68	0	1	2	7.6		**68**	0	1	1	8		**68**	1	1	4	10.9	
69	0	1	2	7.1		**69**	0	1	1	2.5		**69**	0	1	2	4.8	
70	0	1	2	7.5	0.25	**70**	0	1	1	14.7	0.25	**70**	0	1	3	4.3	0.25
71	0	1	2	7.9		**71**	0	1	1	13		**71**	0	1	2	8	
72	0	1	2	21.4		**72**	0	1	1	15.2		**72**	0	1	2	2.1	
73	0	1	3	6.9		**73**	0	1	2	10.3		**73**	0	1	2	9.7	
74	0	1	1	2.1		**74**	0	1	1	18.1		**74**	0	1	2	6.7	
75	0	1	1	5.2		**75**	0	1	1	3.9		**75**	0	1	2	7	
76	0	1	2	14.5		**76**	0	1	1	13.8		**76**	1	1	3	13.7	
77	0	1	2	19.3		**77**	0	1	1	9.8		**77**	0	1	2	6.8	
78	0	1	1	12.2		**78**	0	1	1	6.1		**78**	2	1	5	5.4	
79	0	1	2	14.9		**79**	0	1	1	5.5		**79**	0	1	3	6.1	
80	0	1	2	15.1	0	**80**	0	0	0	3	0.25	**80**	0	1	2	12.2	0.5
81	0	1	1	11		**81**	0	0	0	4		**81**	0	1	2	6.1	
82	0	1	2	20.6		**82**	0	0	0	8.5		**82**	0	1	2	7	
83	0	1	2	11.8		**83**	0	1	1	12.4		**83**	0	1	3	4.2	
84	0	1	2	14.2		**84**	0	1	1	6.1		**84**	1	1	2	6.1	
85	0	1	2	6.3		**85**	0	1	1	9.1		**85**	0	1	2	5.3	
86	0	1	2	8.1		**86**	0	0	0	3.7		**86**	0	1	2	4.4	
87	0	1	1	3.8		**87**	0	1	1	7.6		**87**	0	1	2	10.2	
88	0	1	1	5.9		**88**	0	1	1	13.9		**88**	1	1	2	6.3	
89	0	1	1	3.6		**89**	0	1	1	10.2		**89**	0	1	3	7.5	
90	0	1	2	3.9	0.25	**90**	0	1	1	14.1	0.25	**90**	2	1	5	7.5	-
91	0	1	2	8.1		**91**	0	1	1	12.7		**91**	0	1	3	8	
92	0	1	1	2.6		**92**	0	1	1	9.3		**92**	0	1	2	10.7	
93	0	1	3	8.5		**93**	0	1	1	5.1		**93**	0	1	2	15.5	
94	0	1	2	6.3		**94**	0	1	2	7.3		**94**	2	1	5	13.1	
95	0	1	1	6.9		**95**	0	1	1	15.4		**95**	1	1	3	7.4	
96	0	1	1	4.5		**96**	0	1	1	2.6		**96**	2	1	5	5.8	
97	0	1	1	12.5		**97**	0	0	0	1.8		**97**	0	1	2	3.9	
98	0	1	2	29.7		**98**	0	1	1	8.3		**98**	0	1	2	14.9	
99	0	1	1	10.3		**99**	0	1	1	18.5		**99**	0	1	2	7.5	
100	0	1	1	7.3	0	**100**	0	1	1	12.7	0.25	**100**	1	1	4	11.6	0.25
101						**101**						**101**					
102						**102**						**102**					
103						**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.0**	**0.98**	**1.8**	**12.3**	**0.2**	**Mean**	**0.0**	**0.80**	**0.85**	**9.1**	**0.2**	**Mean**	**0.48**	**1.0**	**2.8**	**6.7**	**0.3**
CALCITE INDEX:		**0.98**				**CALCITE INDEX:**		**0.80**				**CALCITE INDEX:**		**1.5**			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

NTHO1-50						OCNM						POCK					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	2	1	5	Cemented		**1**	0	1	1	5.4		**1**	0	1	2	6	
2	2	1	5	Cemented		**2**	0	0	0	0.6		**2**	2	1	2	19	
3	2	1	5	5.8		**3**	0	1	1	7.4		**3**	0	1	2	6.5	
4	2	1	5	9.9		**4**	0	0	0	1.1		**4**	0	1	3	13.4	
5	2	1	5	4.4		**5**	0	1	1	3.6		**5**	0	0	0	1.5	
6	2	1	5	6		**6**	0	0	0	1		**6**	0	1	2	3.5	
7	2	1	5	Cemented		**7**	0	1	1	3.7		**7**	0	1	3	2.4	
8	2	1	5	Cemented		**8**	0	0	0	1.2		**8**	0	1	3	7.9	
9	0	1	2	4		**9**	0	1	1	14.7		**9**	0	1	3	6.2	
10	2	1	5	Cemented	-	**10**	0	0	0	6.7	0.5	**10**	0	1	3	7.9	0
11	2	1	5	Cemented		**11**	0	0	0	6.9		**11**	0	1	3	12.5	
12	2	1	5	10.5		**12**	0	1	1	6.7		**12**	0	1	2	2.3	
13	1	1	3	4		**13**	0	0	0	3.8		**13**	0	1	2	3	
14	2	1	5	6.1		**14**	0	1	1	8.2		**14**	0	1	2	4.8	
15	2	1	5	Cemented		**15**	0	0	0	1		**15**	0	1	2	7.7	
16	1	1	4	12		**16**	0	0	0	3.3		**16**	0	1	3	11.5	
17	2	1	5	Cemented		**17**	0	1	1	10.8		**17**	0	1	2	3.8	
18	2	1	5	7		**18**	0	0	0	1.6		**18**	0	1	1	3.5	
19	2	1	5	Cemented		**19**	0	1	1	10.2		**19**	0	1	2	4.5	
20	2	1	5	5.5	-	**20**	0	0	0	2.2	0	**20**	0	1	1	1.5	0
21	0	1	2	4.5		**21**	0	0	0	14.6		**21**	0	1	2	6.6	
22	0	1	3	4.3		**22**	0	0	0	1.2		**22**	0	1	2	5	
23	0	1	2	4.5		**23**	0	0	0	11.6		**23**	0	1	2	5.5	
24	2	1	5	Cemented		**24**	0	0	0	8.2		**24**	0	1	2	3.1	
25	2	1	5	Cemented		**25**	0	1	1	7.9		**25**	0	1	2	5.1	
26	1	1	2	12.6		**26**	0	0	0	4.9		**26**	0	1	3	12.5	
27	2	1	5	Cemented		**27**	0	0	0	1.4		**27**	0	1	2	5.6	
28	2	1	5	17		**28**	0	0	0	7.6		**28**	2	1	2	17.8	
29	0	1	2	8.6		**29**	0	0	0	1.6		**29**	0	1	2	5.3	
30	2	1	5	12.2	-	**30**	0	0	0	7.5	0.25	**30**	0	1	3	8.1	0.5
31	0	1	4	11		**31**	0	1	1	5.9		**31**	0	1	1	1.3	
32	0	1	3	8.5		**32**	0	1	1	8.6		**32**	0	1	1	3.8	
33	2	1	5	Cemented		**33**	0	0	0	10.9		**33**	0	1	1	2.7	
34	2	1	5	18.9		**34**	0	0	0	0.8		**34**	0	1	2	3.6	
35	2	1	5	Cemented		**35**	0	1	1	7.9		**35**	0	1	2	4.3	
36	2	1	5	Cemented		**36**	0	1	1	5.5		**36**	0	1	3	10.8	
37	2	1	5	10		**37**	0	0	0	14.4		**37**	1	1	3	11.4	
38	2	1	5	Cemented		**38**	0	0	0	1.2		**38**	0	1	2	7.7	
39	2	1	5	4.8		**39**	0	1	1	10.2		**39**	0	1	3	7.6	
40	1	1	3	6.8	0.25	**40**	0	0	0	6.3	0.25	**40**	0	1	2	9.9	0
41	0	1	3	5.8		**41**	0	0	0	0.7		**41**	0	1	2	2	
42	2	1	5	Cemented		**42**	0	0	0	2.7		**42**	0	0	0	1.4	
43	2	1	5	3.2		**43**	0	1	1	3.4		**43**	0	1	2	3.2	
44	2	1	5	8.6		**44**	0	0	0	1.9		**44**	0	1	3	4.8	
45	2	1	5	6.8		**45**	0	0	0	2.9		**45**	0	1	1	1.9	
46	0	1	2	4		**46**	0	1	1	10		**46**	0	1	2	2.5	
47	0	1	2	3.6		**47**	0	1	1	4.5		**47**	0	1	1	1.6	
48	2	1	5	3.9		**48**	0	1	1	1.9		**48**	0	1	2	2.6	
49	2	1	5	9.1		**49**	0	0	0	1.8		**49**	0	1	1	1.4	
50	2	1	5	3.9	-	**50**	0	0	0	4.3	0.5	**50**	0	1	2	2.5	0
51	2	1	5	5.1		**51**	0	1	1	7.7		**51**	0	1	2	4.1	
52	0	1	2	6.7		**52**	0	1	1	2.5		**52**	0	1	2	6.1	
53	2	1	5	7.5		**53**	0	0	0	1.6		**53**	0	1	2	3.4	
54	2	1	5	Cemented		**54**	0	1	1	3.7		**54**	0	1	2	3.3	
55	2	1	5	5.2		**55**	0	0	0	1.7		**55**	0	1	2	2.9	
56	0	1	2	3.5		**56**	0	0	0	1.7		**56**	0	1	2	3	
57	2	1	5	Cemented		**57**	0	1	1	9.9		**57**	0	1	1	3.9	
58	2	1	5	5.5		**58**	0	1	1	9.5		**58**	0	1	2	2.6	
59	2	1	5	Cemented		**59**	0	1	1	10.8		**59**	0	1	3	3.4	
60	2	1	5	8	-	**60**	0	0	0	8.9	0.25	**60**	1	1	3	11.8	0.75
61	1	1	4	7.2		**61**	0	1	1	11.4		**61**	0	1	2	6.6	
62	1	1	4	10.1		**62**	0	1	1	6.2		**62**	0	1	3	4.8	
63	2	1	5	Cemented		**63**	0	0	0	3.8		**63**	0	1	2	5.1	
64	2	1	5	8.6		**64**	0	0	0	7.7		**64**	0	1	1	1.6	
65	2	1	5	Cemented		**65**	0	0	0	2.8		**65**	0	1	1	2.7	
66	2	1	5	14		**66**	0	0	0	1.7		**66**	0	1	1	2.9	
67	2	1	5	12.5		**67**	0	0	0	6.3		**67**	0	1	2	4.4	
68	2	1	4	13.6		**68**	0	1	1	4.4		**68**	0	1	3	6.5	
69	1	1	4	10.2		**69**	0	0	0	13.6		**69**	0	1	2	2.1	
70	2	1	5	Cemented	-	**70**	0	0	0	1.7	0	**70**	0	1	2	2.3	0.25
71	2	1	5	Cemented		**71**	0	1	1	5.6		**71**	0	1	1	2.2	
72	2	1	5	10.3		**72**	0	1	1	7.1		**72**	0	1	3	12.4	
73	2	1	5	8.4		**73**	0	0	0	3.4		**73**	0	0	0	3.5	
74	2	1	5	Cemented		**74**	0	0	0	2.8		**74**	0	1	2	7	
75	2	1	5	7.4		**75**	0	1	1	3.6		**75**	0	1	2	3.3	
76	2	1	5	Cemented		**76**	0	0	0	2.9		**76**	0	1	2	6.2	
77	2	1	5	Cemented		**77**	0	0	0	1.1		**77**	1	1	3	15.4	
78	2	1	5	Cemented		**78**	0	0	0	0.9		**78**	1	1	2	22.1	
79	2	1	5	Cemented		**79**	0	1	1	9		**79**	0	1	1	2.5	
80	2	1	5	Cemented	-	**80**	0	1	1	4.3	0.5	**80**	0	1	3	7.7	0.5
81	2	1	5	11		**81**	0	0	0	2.2		**81**	1	1	2	2.6	
82	2	1	5	Cemented		**82**	0	0	0	4.4		**82**	2	1	2	12.8	
83	2	1	5	5.1		**83**	0	1	1	6		**83**	0	1	3	7.7	
84	2	1	5	6.4		**84**	0	0	0	3.1		**84**	1	1	2	15.3	
85	2	1	5	5.7		**85**	0	0	0	1.3		**85**	0	1	2	2.8	
86	2	1	5	11.3		**86**	0	1	1	7.4		**86**	1	1	3	6.4	
87	2	1	5	11.6		**87**	0	0	0	3.3		**87**	0	1	2	4.3	
88	1	1	4	11.4		**88**	0	0	0	16.5		**88**	0	1	2	4.1	
89	2	1	5	Cemented		**89**	0	0	0	10.2		**89**	0	1	1	3.1	
90	2	1	5	Cemented	-	**90**	0	1	1	7.1	0.5	**90**	0	1	2	3.1	0.5
91	2	1	5	Cemented		**91**	0	0	0	10.2		**91**	0	1	3	5.7	
92	2	1	5	19		**92**	0	1	1	7.1		**92**	0	1	3	9.1	
93	2	1	5	Cemented		**93**	0	0	0	12.4		**93**	0	1	3	7.9	
94	2	1	5	Cemented		**94**	0	0	0	9.6		**94**	0	1	2	3.1	
95	2	1	5	9.1		**95**	0	0	0	14.5		**95**	0	1	2	3.8	
96	2	1	5	10.1		**96**	0	0	0	12.4		**96**	0	1	3	7.5	
97	2	1	5	8.4		**97**	0	1	1	5.8		**97**	0	1	2	6.1	
98	2	1	5	Cemented		**98**	0	0	0	8.8		**98**	0	1	1	1.6	
99	2	1	5	Cemented		**99**	0	0	0	9.6		**99**	0	1	3	3.6	
100	2	1	5	13.1	0.25	**100**	0	0	0	10.1	0.25	**100**	0	1	2	5.5	0.25
101						**101**	0	1	1	14.3		**101**					
102						**102**	0	0	0	17.5		**102**					
103						**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**1.7**	**1.0**	**4.6**	**8.3**	**0.3**	**Mean**	**0.0**	**0.38**	**0.38**	**6.1**	**0.3**	**Mean**	**0.13**	**0.97**	**2.1**	**5.7**	**0.3**
CALCITE INDEX:		**2.7**				**CALCITE INDEX:**		**0.38**				**CALCITE INDEX:**		**1.1**			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

PORT3-25						PORT3-50						SWCK					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	0	1	1	3.9		**1**	0	0	0	2.5		**1**	2	1	5	5.5	
2	0	1	3	10		**2**	1	1	1	1.7		**2**	1	1	1	2	
3	0	1	1	4.3		**3**	2	1	1	5.6		**3**	2	1	5	7.5	
4	0	1	2	10.2		**4**	0	0	0	4.8		**4**	2	1	5	12	
5	0	1	2	11.2		**5**	2	1	1	7.5		**5**	0	1	1	1.9	
6	0	1	2	7.7		**6**	2	1	2	8.1		**6**	2	1	5	4.5	
7	0	1	1	5.1		**7**	0	0	0	1.6		**7**	2	1	5	17.5	
8	0	1	1	9.5		**8**	0	0	0	1.3		**8**	2	1	5	15	
9	0	1	2	9		**9**	0	1	1	2.7		**9**	2	1	5	12	
10	0	1	1	8.5	0.5	**10**	0	1	1	19.2	0	**10**	1	1	2	18	0.5
11	0	1	1	3.3		**11**	0	0	0	1.7		**11**	0	0	0	6.3	
12	0	0	0	3.1		**12**	0	0	0	2.9		**12**	0	1	1	9	
13	0	1	1	6.5		**13**	2	1	1	17.5		**13**	0	1	1	11.2	
14	0	1	1	3.6		**14**	0	0	0	1		**14**	2	1	5	13.5	
15	0	0	0	1.5		**15**	0	0	0	2.5		**15**	2	1	5	12.5	
16	0	1	1	9.3		**16**	0	1	1	1.5		**16**	2	1	5	10	
17	0	1	3	13.8		**17**	0	0	0	1.6		**17**	0	1	2	5	
18	0	1	2	9.5		**18**	0	1	1	2.7		**18**	2	1	5	4.8	
19	0	0	0	1.7		**19**	0	0	0	3.2		**19**	2	1	5	10	
20	0	1	1	16	0.25	**20**	2	1	2	12.8	0.25	**20**	0	0	0	3.6	0
21	0	1	1	5.8		**21**	1	1	1	3.7		**21**	2	1	5	7	
22	0	0	0	6.3		**22**	0	1	1	1.8		**22**	0	1	1	7.9	
23	0	0	0	3.2		**23**	2	1	1	13		**23**	0	1	1	5.6	
24	0	0	0	22		**24**	0	1	1	5.8		**24**	0	1	1	6.1	
25	0	0	0	2.2		**25**	0	1	1	4.6		**25**	2	1	5	19	
26	0	1	1	19		**26**	0	1	1	5.7		**26**	2	1	5	10	
27	0	0	0	4.5		**27**	0	0	0	5.1		**27**				s	
28	0	1	1	6.8		**28**	0	1	3	5.5		**28**	2	1	5	5.5	
29	0	1	1	13		**29**	2	1	2	6		**29**	2	1	5	19.5	
30	0	1	1	8.5	0	**30**	0	0	0	3	0	**30**	2	1	5	5.5	0.25
31	0	1	1	5		**31**	1	1	1	3.5		**31**	0	0	0	1.9	
32	0	0	0	4		**32**	2	1	2	5.9		**32**	2	1	5	20	
33	0	1	2	9.5		**33**	2	1	2	11.1		**33**	0	1	2	5.9	
34	0	0	0	3.8		**34**	0	0	0	6.1		**34**	2	1	5	6.5	
35	0	0	0	4.9		**35**	2	1	2	16.5		**35**	0	1	1	5.2	
36	0	0	0	1.8		**36**	0	1	1	4.6		**36**	2	1	5	12.5	
37	0	1	2	11.5		**37**	2	1	1	7.3		**37**	0	1	1	5.5	
38	0	1	1	26.4		**38**	0	1	1	8		**38**	2	1	5	4	
39	0	1	1	4.5		**39**	0	0	0	4.5		**39**	0	1	1	6.2	
40	1	1	2	22.5	0.5	**40**	2	1	2	13.4	0.5	**40**	2	1	5	6.8	0.25
41	1	1	2	18.5		**41**	0	1	2	8.6		**41**	2	1	5	19	
42	0	1	1	6		**42**	0	1	1	3.6		**42**	0	1	1	4.8	
43	1	1	2	14.5		**43**	0	0	0	3.3		**43**	0	0	0	4.1	
44	0	1	2	10		**44**	0	0	0	3.4		**44**	0	1	1	3.7	
45	2	1	3	25.2		**45**	0	0	0	2.6		**45**	0	1	1	3.9	
46	0	0	0	2.2		**46**	0	1	3	4.4		**46**	0	1	1	9.1	
47	2	1	3	19.5		**47**	1	1	1	6.2		**47**	2	1	5	17	
48	0	1	1	7.5		**48**	0	0	0	2.5		**48**	2	1	5	15	
49	2	1	2	29		**49**	2	1	1	10.2		**49**	0	1	2	11.1	
50	0	1	1	7	0.25	**50**	1	1	1	3.3	0.25	**50**	0	1	1	6.8	0
51	0	1	2	4.5		**51**	0	0	0	2.5		**51**	0	1	1	3	
52	0	1	2	9.1		**52**	0	0	0	2.6		**52**	2	1	5	7	
53	1	1	2	7.3		**53**	2	1	3	3		**53**	2	1	5	9.5	
54	0	1	1	6.1		**54**	2	1	1	9.1		**54**	2	1	5	7	
55	0	0	0	2.7		**55**	2	1	1	22.8		**55**	0	1	1	2.8	
56	0	1	2	20.5		**56**	0	0	0	2.5		**56**	0	1	2	4.3	
57	1	1	3	17.5		**57**	2	1	1	16.7		**57**	0	1	1	17.1	
58	0	1	1	4.7		**58**	1	1	1	3.6		**58**	0	1	2	11.1	
59	2	1	1	24		**59**	0	1	1	5.2		**59**	2	1	5	4.5	
60	0	1	1	8.2	0	**60**	0	1	1	3	0.25	**60**	2	1	5	6	0.75
61	0	1	2	9		**61**	0	1	1	4.2		**61**	2	1	5	13.5	
62	0	1	1	6.5		**62**	0	1	1	4.2		**62**	2	1	5	7.5	
63	0	1	1	8.3		**63**	0	0	0	2.7		**63**	1	1	1	3	
64	0	0	0	5.9		**64**	0	0	0	2.2		**64**	2	1	5	6	
65	0	1	1	7.6		**65**	2	1	1	5		**65**	0	1	2	8.5	
66	1	1	1	5.5		**66**	0	1	1	3.5		**66**	2	1	5	6	
67	0	1	1	10.4		**67**	0	1	1	5.4		**67**	1	1	1	12.5	
68	1	1	3	12.2		**68**	2	1	1	2.5		**68**	2	1	5	11.5	
69	0	1	1	11.2		**69**	2	1	1	8.7		**69**	1	1	2	6.7	
70	0	1	2	12.5	0.5	**70**	2	1	2	13.1	0.5	**70**	1	1	1	2.5	0.5
71	2	1	2	31		**71**	1	1	2	8.2		**71**	0	0	0	2.2	
72	0	1	1	8.2		**72**	0	1	1	8.8		**72**	2	1	5	5	
73	0	1	1	12.1		**73**	2	1	1	10.3		**73**	2	1	5	8	
74	0	1	1	14		**74**	2	1	1	8.9		**74**	0	1	1	6.9	
75	0	1	1	13.7		**75**	2	1	1	19		**75**	2	1	5	14.5	
76	0	1	2	10.6		**76**	2	1	1	7		**76**	2	1	5	7	
77	0	1	1	8.9		**77**	0	1	1	5.8		**77**	0	1	1	5.3	
78	2	1	2	35		**78**	2	1	1	10.2		**78**	2	1	5	12.5	
79	1	1	2	12.3		**79**	0	0	0	2.2		**79**	2	1	5	14	
80	0	1	2	12	0.75	**80**	0	0	0	5.5	0.5	**80**	2	1	5	12	0.5
81	1	1	1	9		**81**	2	1	2	14		**81**	0	1	1	2.6	
82	0	1	1	5.1		**82**	0	1	1	4.1		**82**	2	1	5	12	
83	0	1	2	8.5		**83**	0	0	0	1.3		**83**	1	1	1	2.5	
84	2	1	1	16.5		**84**	1	1	2	14.5		**84**	2	1	5	6.5	
85	0	1	1	20		**85**	1	1	1	8.2		**85**	2	1	5	4	
86	1	1	2	13.1		**86**	2	1	1	9.1		**86**	2	1	5	7.5	
87	0	1	1	7.5		**87**	0	1	1	3.4		**87**	0	1	2	10	
88	0	1	3	10.7		**88**	1	1	2	9.2		**88**	0	0	0	2.2	
89	0	1	2	13.4		**89**	0	1	1	2		**89**	0	0	0	1.9	
90	0	1	2	14	0.25	**90**	2	1	2	14	0.75	**90**	0	1	2	5.7	0.25
91	0	1	2	11.6		**91**	1	1	1	1.7		**91**	0	1	1	8.2	
92	0	1	1	18.6		**92**	0	1	1	3.5		**92**	2	1	5	6	
93	0	1	2	11.5		**93**	2	1	1	3.8		**93**	0	1	1	2.2	
94	0	1	1	9.7		**94**	0	1	1	6.2		**94**	2	1	5	11	
95	1	1	3	13.9		**95**	1	1	1	16		**95**	0	1	2	4.4	
96	0	1	3	16.5		**96**	0	1	2	2.8		**96**	2	1	5	15.5	
97	1	1	2	19		**97**	0	1	1	1.8		**97**	2	1	5	11.5	
98	0	1	1	6.1		**98**	0	0	0	2.2		**98**	0	1	1	2.5	
99	0	0	0	4.7		**99**	0	1	1	3.2		**99**	2	1	5	9	
100	0	1	1	11.5	0.5	**100**	0	1	1	4.6	0.25	**100**	2	1	5	8	0.5
101						**101**						**101**	0	1	1	1.9	
102						**102**						**102**					
103						**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.26**	**0.84**	**1.3**	**10.6**	**0.4**	**Mean**	**0.72**	**0.73**	**0.94**	**6.2**	**0.3**	**Mean**	**1.1**	**0.93**	**3.2**	**8.1**	**0.4**
CALCITE INDEX:		**1.1**				**CALCITE INDEX:**		**1.5**				**CALCITE INDEX:**		**2.1**			

Table A.6: Pebble count and calcite measurements in mine-exposed areas, September 2015.

SWIF2-75						THCK						WOCK					
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Calcite Thickness (0 to 5)	Intermediate Axis (cm)	Embed
1	2	1	5	16.5		**1**	0	1	1	6		**1**	0	1	1	7.0	
2	2	1	5	12		**2**	0	1	1	4.5		**2**	0	1	1	18.0	
3				s		**3**	0	1	1	4		**3**	0	1	1	6.6	
4	2	1	5	8.5		**4**	0	1	1	5.2		**4**	2	1	1	13.5	
5	2	1	5	5		**5**	0	1	1	6		**5**	2	1	1	14.0	
6	2	1	5	13		**6**	0	1	1	6.2		**6**	2	1	1	28.0	
7	2	1	5	11.5		**7**	0	1	1	7.2		**7**	2	1	1	12.0	
8	2	1	5	6		**8**	0	1	1	6.7		**8**	2	1	1	21.0	
9	2	1	5	8		**9**	0	1	1	6.1		**9**	1	1	1	6.8	
10	2	1	5	8	0.25	**10**	0	1	1	12.7	0.5	**10**	1	1	1	7.9	0
11	2	1	5	11.5		**11**	0	1	1	12.8		**11**	1	1	1	12.8	
12	0	1	2	2.4		**12**	0	1	1	9.5		**12**	0	1	1	17.5	
13	2	1	5	14		**13**	0	1	1	6.9		**13**	1	1	1	14.5	
14	2	1	5	5		**14**	0	1	2	8		**14**	0	1	1	12.5	
15	2	1	5	9		**15**	0	1	1	7.3		**15**	0	1	1	8.4	
16				s		**16**	0	1	1	6.3		**16**	0	1	1	10.3	
17	2	1	5	13		**17**	0	1	1	5.5		**17**	0	1	1	14.0	
18	2	1	5	14		**18**	0	1	1	9.5		**18**	0	1	1	8.4	
19	2	1	5	15		**19**	0	1	1	10.2		**19**	1	1	1	12.4	
20	2	1	5	13	0.25	**20**	0	1	1	3.2	0	**20**	0	1	1	9.7	0
21				s		**21**	0	1	1	8.3		**21**	0	1	1	9.2	
22	2	1	5	36.5		**22**	0	1	1	8.2		**22**	0	1	1	3.0	
23	2	1	5	8		**23**	0	1	1	5.4		**23**	0	0	0	2.0	
24	2	1	5	9		**24**	0	1	1	6.6		**24**	0	0	0	3.4	
25	2	1	5	16		**25**	0	1	1	13.9		**25**	0	0	0	1.0	
26	2	1	5	4		**26**	0	1	1	5.9		**26**	0	1	1	4.8	
27	0	1	2	4.1		**27**	0	1	1	11.9		**27**	0	0	0	3.5	
28	0	1	3	3.2		**28**	0	1	1	9.2		**28**	0	1	1	5.4	
29	0	1	2	5.1		**29**	0	1	1	3.2		**29**	0	1	1	3.8	
30				s		**30**	0	1	1	5	0.25	**30**	0	1	1	7.0	0.25
31	0	1	1	6.6	0	**31**	0	1	1	6.1		**31**	0	0	0	1.8	
32	0	1	1	5.8		**32**	0	1	1	12		**32**	0	0	0	2.5	
33	0	1	1	10.6		**33**	0	1	2	4.5		**33**	0	1	1	2.8	
34	2	1	2	17		**34**	0	1	1	15.6		**34**	0	1	1	8.9	
35	2	1	5	13		**35**	0	1	1	11		**35**	0	1	1	4.8	
36	0	1	1	10.6		**36**	0	1	1	5.4		**36**	0	1	1	6.6	
37	0	1	1	3.2		**37**	0	1	1	5.2		**37**	0	1	1	14.5	
38	0	1	3	6.7		**38**	0	1	1	3.4		**38**	0	1	1	8.5	
39	2	1	5	10.5		**39**	0	1	1	6		**39**	0	1	1	2.6	
40	2	1	5	8.5	0.25	**40**	0	1	1	4.3	0	**40**	1	1	1	7.7	0
41	1	1	2	4.7		**41**	0	1	1	5.4		**41**	0	1	1	3.5	
42	0	1	2	2.2		**42**	0	1	1	2.6		**42**	0	1	1	10.5	
43				s		**43**	0	1	2	13.3		**43**	0	1	1	14.5	
44	2	1	5	12		**44**	0	1	1	20.1		**44**	0	1	1	8.6	
45	0	1	1	2.8		**45**	0	1	2	17.1		**45**	2	1	1	14.7	
46	2	1	5	7		**46**	0	1	1	3.5		**46**	1	1	1	10.7	
47	1	1	2	11		**47**	0	1	1	6.3		**47**	0	1	1	14.8	
48	0	1	1	3.2		**48**	0	1	1	3.3		**48**	1	1	1	8.0	
49	2	1	5	16		**49**	0	1	2	6.1		**49**	1	1	1	6.1	
50	0	1	1	3.6	0.5	**50**	0	1	1	9.6	0.5	**50**	0	1	1	2.3	0
51	0	1	2	3.7		**51**	0	1	1	5		**51**	0	1	1	5.7	
52	0	1	2	7.8		**52**	0	1	1	10.9		**52**	0	1	1	8.5	
53				s		**53**	0	1	1	11.1		**53**	0	1	1	9.2	
54	2	1	5	9		**54**	0	1	1	8.3		**54**	0	1	1	9.8	
55	2	1	5	5.5		**55**	0	1	1	3.9		**55**	0	1	1	8.4	
56	2	1	5	8.5		**56**	0	1	1	12		**56**	0	1	1	5.0	
57	2	1	5	14.5		**57**	0	1	1	4.6		**57**	0	0	0	1.3	
58	2	1	5	16.5		**58**	0	1	1	7.1		**58**	0	1	1	5.9	
59	0	1	1	11.9		**59**	0	1	2	8.8		**59**	0	0	0	4.2	
60	2	1	5	10.5	0.5	**60**	0	1	1	6.4	0.5	**60**	0	1	1	4.8	0.5
61	2	1	5	11		**61**	0	1	1	3.3		**61**	0	1	1	2.5	
62	2	1	5	10		**62**	0	1	1	7.7		**62**	0	1	1	5.8	
63	2	1	5	9.5		**63**	0	1	1	5.3		**63**	0	0	0	3.3	
64	2	1	5	13.5		**64**	0	1	1	6.8		**64**	0	0	0	6.5	
65	2	1	5	33		**65**	0	1	1	9.4		**65**	0	0	0	1.1	
66	2	1	5	14.5		**66**	0	1	1	5.3		**66**	0	0	0	2.6	
67	2	1	5	9.5		**67**	0	1	1	4.2		**67**	0	1	1	5.5	
68	2	1	5	9.5		**68**	0	1	1	3.4		**68**	0	0	0	5.9	
69	2	1	5	15		**69**	0	1	1	11.5		**69**	0	1	1	8.5	
70	2	1	5	26.5	0.25	**70**	0	1	1	5.5	0.25	**70**	1	1	1	7.9	0.5
71	2	1	5	11		**71**	0	1	1	12		**71**	1	1	1	6.5	
72	2	1	5	10.5		**72**	0	1	1	8.5		**72**	1	1	1	7.8	
73	2	1	5	13		**73**	0	1	1	10.8		**73**	0	1	1	10.2	
74	2	1	5	16		**74**	0	1	1	4.2		**74**	0	1	1	15.5	
75	2	1	5	10		**75**	0	1	1	9.4		**75**	0	1	1	10.3	
76	0	1	3	2		**76**	0	1	1	15		**76**	0	1	1	16.0	
77	2	1	5	18.5		**77**	0	1	1	4		**77**	1	1	1	19.0	
78	2	1	5	15		**78**	0	1	1	4.5		**78**	1	1	2	20.1	
79	2	1	5	11		**79**	0	0	0	1.6		**79**	1	1	1	8.7	
80	2	1	5	8.5	0.25	**80**	0	1	1	11	0	**80**	0	1	1	8.0	0
81	2	1	5	9		**81**	0	1	1	4.1		**81**	1	1	2	10.7	
82	2	1	5	12.5		**82**	0	1	1	11		**82**	2	1	1	16.5	
83	2	1	5	3		**83**	0	1	1	7		**83**	0	1	1	2.5	
84	2	1	5	7		**84**	0	1	1	4.5		**84**	1	1	1	14.2	
85	2	1	5	13		**85**	0	1	1	5.2		**85**	2	1	1	12.8	
86	0	1	2	3.5		**86**	0	1	1	9		**86**	1	1	1	4.7	
87	2	1	5	16.5		**87**	0	1	1	6.5		**87**	1	1	2	4.8	
88	0	1	2	3.5		**88**	0	1	1	8.3		**88**	1	1	1	6.6	
89	2	1	5	12		**89**	0	1	1	7.9		**89**	0	1	1	3.9	
90	2	1	5	8	0.25	**90**	0	1	1	2.5	0.25	**90**	1	1	1	6.2	0.75
91	2	1	5	12		**91**	0	1	1	5.8		**91**	0	1	1	7.1	
92	2	1	5	8		**92**	0	1	1	6.5		**92**	0	1	1	11.6	
93	2	1	5	17		**93**	0	1	1	12.2		**93**	1	1	1	9.9	
94	2	1	5	14		**94**	0	1	1	6.4		**94**	0	1	1	8.2	
95	1	1	2	16.5		**95**	0	1	1	11		**95**	0	1	1	7.7	
96	0	1	1	3.3		**96**	0	1	1	3.5		**96**	0	0	0	5.8	
97	2	1	5	17		**97**	0	1	1	9.2		**97**	0	0	0	6.9	
98	0	1	1	7.3		**98**	0	1	1	8.1		**98**	0	1	1	4.7	
99	0	1	2	4		**99**	0	1	1	7.2		**99**	0	1	1	6.6	
100	2	1	5	15	0.25	**100**	0	1	1	6.5	0.25	**100**	2	1	1	18.0	0.75
101	2	1	5	13		**101**						**101**					
102	0	1	2	12		**102**						**102**					
103	2	1	5	12		**103**						**103**					
104	0	1	2	11.1		**104**						**104**					
105	0	1	3	10.5		**105**						**105**					
106	2	1	5	3.5		**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**1.5**	**1.0**	**4.03**	**10.5**	**0.3**	**Mean**	**0.0**	**0.99**	**1.1**	**7.5**	**0.3**	**Mean**	**0.40**	**0.85**	**0.88**	**8.6**	**0.3**
CALCITE INDEX:		**2.5**				**CALCITE INDEX:**		**0.99**				**CALCITE INDEX:**		**1.3**			

Table A.7: Pebble count and calcite measurements in reference and mine-exposed areas, September 2014.

ALEX3-25					CHAU1-50					CHAU1-75					ERIC2-0				
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Intermediate Axis (cm)	Embed
1	0	1	11.1		1	0	0	3.7		1	0	0	0.7		1	2	1	c	
2	0	0	7.7		2	0	0	4.6		2	0	0	2.5		2	2	1	c	
3	0	0	3.5		3	0	0	2.7		3	0	0	2.5		3	2	1	c	
4	0	1	5.5		4	0	0	11.5		4	0	0	6.5		4	2	1	c	
5	0	0	fine		5	0	0	5.1		5	0	0	9		5	2	1	c	
6	0	0	1.6		6	0	0	12.1		6	0	0	6.5		6	2	1	c	
7	0	0	6.3		7	0	0	5.6		7	0	0	8.5		7	2	1	c	
8	0	1	17.6		8	0	0	8.6		8	0	0	13.5		8	2	1	c	
9	0	0	3.1		9	0	0	7.9		9	0	0	9		9	2	1	c	
10	0	1	10.3	0.5	10	0	0	18.6	0.25	10	0	0	15	0.5	10	2	1	c	0
11	0	1	4.7		11	0	0	14.1		11	0	0	8		11	2	1	c	
12	0	0	4.6		12	0	0	7.5		12	0	0	5		12	2	1	c	
13	0	0	3.9		13	0	0	4.5		13	0	0	8		13	2	1	c	
14	0	0	2.9		14	0	0	6.1		14	0	0	2.5		14	2	1	c	
15	0	0	4.7		15	0	0	6		15	0	0	9.5		15	2	1	c	
16	0	0	5.2		16	0	0	4		16	0	0	11.5		16	2	1	c	
17	0	0	fine		17	0	0	8.5		17	0	0	13.5		17	2	1	c	
18	0	1	3.8		18	0	0	6		18	0	0	3		18	2	0	3	
19	0	1	15.9		19	0	0	7.4		19	0	0	2		19	2	0	2	
20	0	0	3.7	0.25	20	0	0	12.8	0	20	0	0	3.5	0.5	20	2	1	c	0
21	0	1	7.1		21	0	0	8		21	0	0	10		21	2	1	c	
22	0	1	18.5		22	0	0	7.4		22	0	0	6.5		22	2	1	c	
23	0	1	14.1		23	0	0	3.6		23	0	0	8		23	2	1	fine	
24	0	0	5.2		24	0	0	3.4		24	0	0	9		24	2	1	c	
25	0	0	3.6		25	0	0	15.2		25	0	0	7		25	2	1	c	
26	0	0	4.8		26	0	0	8.5		26	0	0	5.5		26	2	1	c	
27	0	0	8.1		27	0	0	7		27	0	0	6		27	0	1	3	
28	0	0	5.6		28	0	0	15.1		28	0	0	5		28	0	0	3.5	
29	0	1	24.5		29	0	0	10.3		29	0	0	8.5		29	2	1	2	
30	0	1	9	0.25	30	0	0	19.4	0.75	30	0	0	10	0	30	0	0	3	0
31	0	1	7.7		31	0	0	11		31	0	0	6		31	2	1	c	
32	0	1	17.5		32	0	0	2.8		32	0	0	9		32	2	1	c	
33	0	1	14.9		33	0	0	10		33	0	0	13.5		33	0	0	1.5	
34	0	0	5.9		34	0	0	5.5		34	0	0	1.5		34	2	1	c	
35	0	1	26.7		35	0	0	6.8		35	0	0	2.5		35	2	1	c	
36	0	0	fine		36	0	0	3.5		36	0	0	2.5		36	2	1	c	
37	0	1	4.2		37	0	0	10.1		37	0	0	15		37	2	1	3.7	
38	0	0	4.1		38	0	0	7.8		38	0	0	12		38	2	1	20	
39	0	0	12.5		39	0	0	2.9		39	0	0	3		39	2	1	c	
40	0	1	10.3	0.5	40	0	0	3.5	0	40	0	0	26	0.25	40	1	1	11	0
41	0	1	36.5		41	0	0	9.1		41	0	0	fine		41	2	1	6	
42	0	1	19		42	0	0	10.6		42	0	0	16		42	2	1	c	
43	0	1	12.2		43	0	0	20.3		43	0	0	5.5		43	2	1	4	
44	0	0	18		44	0	0	5.6		44	0	0	4		44	2	1	c	
45	0	1	19		45	0	0	21.6		45	0	0	3		45	2	1	c	
46	0	1	23.4		46	0	0	13.6		46	0	0	6		46	2	1		
47	0	1	9.1		47	0	0	3.5		47	0	0	4.5		47	0	1	2	
48	0	1	6.2		48	0	0	12.1		48	0	0	4		48	2	1	c	
49	0	1	13.2		49	0	0	26.3		49	0	0	3		49	2	1	c	
50	0	1	21	0.25	50	0	0	10.1	0.5	50	0	0	7	0	50	2	1	c	0
51	0	1	21.2		51	0	0	7.1		51	0	0	5		51	2	1	c	
52	0	0	16.5		52	0	0	sand		52	0	0	4		52	0	0	2	
53	0	1	14.3		53	0	0	8.4		53	0	0	4		53	2	1	c	
54	0	1	15.2		54	0	0	11		54	0	0	9		54	2	1	c	
55	0	1	9.1		55	0	0	13		55	0	0	4.5		55	2	1	c	
56	0	1	14.8		56	0	0	20.2		56	0	0	1.5		56	2	1	c	
57	0	1	16.9		57	0	0	15.4		57	0	0	9		57	2	1	c	
58	0	1	18.2		58	0	0	6.5		58	0	0	9		58	2	1	c	
59	0	1	12.6		59	0	0	21.5		59	0	0	6		59	2	1	c	
60	0	0	14.6	0.5	60	0	0	7.8	0	60	0	0	5	0	60	2	1	c	0
61	0	1	7		61	0	0	26.4		61	0	0	8		61	2	1	c	
62	0	1	14		62	0	0	25.4		62	0	0	9		62	2	1	c	
63	0	1	4.2		63	0	0	5.6		63	0	0	2.5		63	2	1	c	
64	0	0	2.5		64	0	0	1.9		64	0	0	2		64	2	1	c	
65	0	0	3.6		65	0	0	4.3		65	0	0	7.5		65	2	1	c	
66	0	1	3.5		66	0	0	12.6		66	0	0	4.5		66	2	1	c	
67	0	1	14		67	0	0	7.1		67	0	0	40		67	0	0	2.5	
68	0	0	fine		68	0	0	7.7		68	0	0	22		68	2	1	c	
69	0	1	10		69	0	0	16.1		69	0	0	12.5		69	2	1	c	
70	0	0	4.6	0.5	70	0	0	15.1	0.5	70	0	0	10	0.5	70	2	1	c	0
71	0	1	4.7		71	0	0	9.1		71	0	0	12		71	2	1	c	
72	0	0	2.9		72	0	0	12.1		72	0	0	35		72	2	1	c	
73	0	1	2.5		73	0	0	8.6		73	0	0	7		73	2	1	c	
74	0	1	13.5		74	0	0	6.5		74	0	0	12.5		74	2	1	c	
75	0	0	7.9		75	0	0	11.1		75	0	0	6.5		75	2	1	c	
76	0	0	4.1		76	0	0	13.5		76	0	0	9.5		76	2	1	c	
77	0	1	21.2		77	0	0	17.1		77	0	0	28		77	2	1	c	
78	0	0	11.5		78	0	0	5.7		78	0	0	14.5		78	2	1	c	
79	0	0	1.3		79	0	0	12.9		79	0	0	10		79	0	0	2.5	
80	0	1	6.2	0.5	80	0	0	6	0	80	0	0	5.5	0	80	2	1	c	0
81	0	0	6.2		81	0	0	36.3		81	0	0	7.5		81	2	1	c	
82	0	0	6.2		82	0	0	2.3		82	0	0	5		82	2	1	c	
83	0	1	25.2		83	0	0	13.1		83	0	0	8.5		83	2	1	c	
84	0	0	9		84	0	0	5.2		84	0	0	22		84	2	1	c	
85	0	1	8.1		85	0	0	6.5		85	0	0	2		85	2	1	c	
86	0	1	2.5		86	0	0	5.3		86	0	0	17		86	2	1	c	
87	0	1	5.1		87	0	0	13.1		87	0	0	3		87	2	1	c	
88	0	0	3.5		88	0	0	1.6		88	0	0	1.5		88	2	1	c	
89	0	1	7.1		89	0	0	12.3		89	0	0	4		89	2	1	c	
90	0	0	5.3	0.75	90	0	0	8.8	0	90	0	0	15	0.75	90	2	1	c	0
91	0	0	5.6		91	0	0	6.2		91	0	0	13		91	2	1	c	
92	0	1	7.7		92	0	0	22.4		92	0	0	5		92	2	1	c	
93	0	1	4.3		93	0	0	7.9		93	0	0	31		93	2	1	c	
94	0	0	8.1		94	0	0	11.3		94	0	0	9.5		94	2	1	c	
95	0	0	21.1		95	0	0	5.3		95	0	0	2		95	2	1	c	
96	0	1	26.2		96	0	0	15.1		96	0	0	5.5		96	2	1	c	
97	0	1	8.1		97	0	0	22.1		97	0	0	10		97	2	1	c	
98	0	0	6.2		98	0	0	11.1		98	0	0	17		98	2	1	c	
99	0	1	5.1		99	0	0	16.3		99	0	0	6		99	2	1	c	
100	0	1	16.5	0.25	100	0	0	16.9	0.75	100	0	0	10.5	0.5	100	2	1	c	0
Mean	**0.0**	**0.6**	**10.2**	**0.43**	**Mean**	**0.0**	**0.0**	**10.4**	**0.28**	**Mean**	**0.0**	**0.0**	**8.8**	**0.30**	**Mean**	**1.8**	**0.9**	**4.5**	**0.00**
CALCITE INDEX:		**0.57**			**CALCITE INDEX:**		**0.00**			**CALCITE INDEX:**		**0.00**			**CALCITE INDEX:**		**2.75**		

Table A.7: Pebble count and calcite measurements in reference and mine-exposed areas, September 2014.

ERIC4-25					ERIC4-75					FO29					FORD7-25				
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Intermediate Axis (cm)	Embed
1	0	0	2.5		1	0	1	7		1	0	1	9		1	0	1	6.5	
2	0	0	1		2	0	0	3		2	0	1	9.5		2	0	0	3.7	
3	0	0	3		3	0	0	1.5		3	0	0	10		3	0	0	5.5	
4	0	1	9		4	0	0	3		4	0	0	16.5		4	0	1	12.5	
5	0	1	3.5		5	0	0	3.5		5	0	0	21		5	0	0	8	
6	0	0	1.5		6	0	0	2		6	0	0	2		6	0	0	7.2	
7	0	0	2.5		7	0	0	fine		7	0	0	11		7	0	0	8	
8	0	1	10		8	0	0	2.5		8	0	0	6.2		8	0	0	12.5	
9	0	1	5		9	0	0	2		9	0	1	19.4		9	0	0	5.1	
10	0	1	7	0	10	0	0	3	0	10	0	0	9	0	10	0	0	10.5	1
11	0	1	5		11	0	0	2		11	0	1	28.3		11	0	1	12	
12	0	1	6		12	0	0	3		12	0	0	8		12	0	1	7	
13	0	1	2		13	0	0	3		13	0	0	7		13	0	1	17	
14	0	1	5		14	0	0	3		14	0	0	3		14	0	0	5.5	
15	0	1	5		15	0	0	3		15	0	0	4		15	0	1	24.8	
16	0	1	3.5		16	0	0	3		16	0	1	6.5		16	0	1	17.7	
17	0	1	4		17	0	1	7		17	0	0	12		17	0	0	7.6	
18	0	0	5		18	0	0	2		18	0	0	10.5		18	0	1	7	
19	0	1	2		19	0	1	8		19	0	0	1		19	0	0	11.2	
20	0	1	9	0	20	0	1	3	0.25	20	0	0	4.5	0.25	20	0	1	24	0.25
21	0	0	fine		21	0	0	1.5		21	0	0	7		21	0	1	6	
22	0	1	13.5		22	0	0	4		22	0	1	9		22	0	1	19.2	
23	0	0	2		23	0	0	4		23	0	0	7		23	0	1	8.2	
24	0	1	4		24	0	0	4.5		24	0	0	9		24	0	0	4	
25	0	1	4		25	0	0	3		25	0	1	8		25	1	1	17.2	
26	0	1	4		26	0	0	2		26	0	0	10		26	0	1	8.2	
27	0	0	2		27	0	0	5		27	0	0	4		27	0	0	8.7	
28	0	1	5		28	0	0	5		28	0	0	3		28	0	1	18.5	
29	0	0	fine		29	0	0	4		29	0	0	7		29	0	0	7.5	
30	0	1	4	0.5	30	0	1	3	0	30	0	0	21	0.5	30	0	1	12.8	0
31	0	1	7		31	0	0	2		31	0	1	6		31	0	1	8.5	
32	0	1	7		32	0	1	5		32	0	0	12		32	0	1	13.5	
33	0	0	1.5		33	0	0	8		33	0	1	18		33	0	0	5.6	
34	0	1	5		34	0	1	9		34	0	0	11		34	0	0	7	
35	0	1	7		35	0	0	4		35	0	0	14		35	0	1	5.7	
36	0	1	3		36	0	0	3		36	0	0	7		36	0	0	3.1	
37	0	0	3		37	0	1	6		37	0	1	8		37	0	0	2	
38	0	1	3.5		38	0	0	2		38	0	1	21		38	0	1	4.5	
39	0	1	3.5		39	0	0	2.5		39	0	0	8		39	0	0	2.2	
40	0	1	6	0.5	40	0	0	3.5	0	40	0	0	6	0	40	0	0	6.2	0
41	0	1	11.5		41	0	0	15		41	0	0	17		41	0	1	12	
42	0	1	11		42	0	0	1.5		42	0	1	6.5		42	0	1	11.5	
43	0	1	17		43	0	0	4.5		43	0	1	9		43	0	0	1	
44	0	1	5		44	0	0	6.5		44	0	0	7		44	0	1	6.1	
45	0	1	5		45	0	1	4		45	0	1	10		45	0	0	7	
46	0	0	3		46	0	0	10		46	0	0	11.5		46	0	1	8.1	
47	0	0	4		47	0	0	fine		47	0	0	4.5		47	0	1	14.5	
48	0	1	8		48	0	0	2		48	0	0	6.5		48	0	1	13.6	
49	0	1	3		49	0	0	5.5		49	0	0	10		49	1	1	26.5	
50	0	1	11	0.75	50	0	0	4	0	50	0	1	10	0.5	50	0	1	31.5	0.5
51	0	0	fine		51	0	0	2		51	0	1	8		51	0	1	14.4	
52	0	0	5		52	0	0	7		52	0	0	fine		52	0	1	16	
53	0	1	6		53	0	1	11		53	0	0	10		53	0	1	10.1	
54	0	1	13		54	0	1	8		54	0	0	49		54	1	1	8.5	
55	0	0	3		55	0	0	2.5		55	0	1	14		55	0	1	30.3	
56	0	1	4		56	0	0	3		56	0	1	8		56	0	1	11.5	
57	0	0	4		57	0	0	4		57	0	0	13		57	0	1	27.6	
58	0	0	2.5		58	0	1	6		58	0	0	3		58	1	1	15.1	
59	0	1	12.5		59	0	0	fine		59	0	0	10		59	0	1	25.5	
60	0	1	5	0	60	0	0	2	0	60	0	0	8	0.25	60	0	1	11.6	0.25
61	0	1	2.5		61	0	0	fine		61	0	0	6		61	0	0	7.7	
62	0	1	5		62	0	0	3		62	0	0	8		62	0	1	32.2	
63	0	0	1		63	0	1	9		63	0	1	11		63	0	1	7.8	
64	0	0	1		64	0	0	10		64	0	0	11		64	0	1	12	
65	0	1	4.5		65	0	0	11		65	0	1	6.5		65	0	1	6.2	
66	0	1	4		66	0	0	4		66	0	0	5.5		66	0	1	16.5	
67	0	1	3.5		67	0	1	19		67	0	1	7		67	0	0	9	
68	0	1	8		68	0	1	11		68	0	1	20		68	0	0	7.9	
69	0	1	4		69	0	1	16		69	0	0	6		69	0	0	10	
70	0	1	5	0	70	0	0	2	0.25	70	0	0	13	0.75	70	0	0	5.7	0
71	0	1	2		71	0	0	4		71	0	0	4.3		71	0	0	3.5	
72	0	1	3		72	0	0	6		72	0	1	7		72	0	0	7.5	
73	0	1	4.5		73	0	0	3.5		73	0	1	9		73	0	0	23	
74	0	1	5		74	0	1	9		74	0	0	11.5		74	0		sand	
75	0	1	7.5		75	0	0	6		75	0	0	7		75	0	0	11	
76	0	1	8		76	0	0	5		76	0	1	9		76	0	0	12.3	
77	0	0	6		77	0	0	7		77	0	1	9		77	0	1	13.9	
78	0	1	5		78	0	0	3		78	0	0	13		78	0	1	18.7	
79	0	1	3		79	0	0	4		79	0	0	7.5		79	0	0	5.2	
80	0	0	2	0.25	80	0	1	10	0.25	80	0	0	7	0.5	80	0	1	26.5	0
81	0	0	3		81	0	0	4		81	0	0	6		81	0	1	8.8	
82	0	1	5		82	0	0	5		82	0	0	7		82	0	1	23.6	
83	0	1	3.5		83	0	0	1.5		83	0	1	13		83	0	1	10.9	
84	0	0	2.5		84	0	1	19		84	0	0	5		84	0	1	25	
85	0	1	2		85	0	1	17		85	0	0	fine		85	0	1	18.4	
86	0	0	1.5		86	0	0	5		86	0	0	19.5		86	0	1	11.2	
87	0	0	2		87	0	0	2		87	0	0	1.5		87	0	1	26.5	
88	0	1	9.5		88	0	0	3		88	0	1	10		88	0	1	16.5	
89	0	1	9		89	0	0	2		89	0	0	6		89	0	1	15.5	
90	0	1	8	0	90	0	0	2.5	0	90	0	0	1	1	90	0	1	28.7	0.5
91	0	0	fine		91	0	1	6		91	0	0	2		91	0	1	16.2	
92	0	0	2		92	0	1	4		92	0	0	3.5		92	0	1	20	
93	0	1	8		93	0	1	7		93	0	0	4		93	0	0	8.2	
94	0	1	4		94	0	0	2		94	0	0	3		94	0	0	11	
95	0	0	2		95	0	0	1		95	0	0	4		95	0	0	10	
96	0	1	8		96	0	0	4		96	0	0	2.5		96	0	0	21.1	
97	0	1	4		97	0	0	3.5		97	0	0	22		97	0	0	5.6	
98	0	1	9		98	0	0	5		98	0	0	18		98	0	0	13.1	
99	0	1	3		99	0	0	3		99	0	0	fine		99	0	1	9.5	
100	0	1	4	0	100	0	0	3	0	100	0	0	10	0.25	100	0	1	23	0.25
Mean	**0.0**	**0.7**	**5.0**	**0.20**	**Mean**	**0.0**	**0.2**	**5.1**	**0.08**	**Mean**	**0.0**	**0.3**	**9.5**	**0.40**	**Mean**	**0.0**	**0.6**	**12.6**	**0.28**
CALCITE INDEX:		**0.70**			**CALCITE INDEX:**		**0.23**			**CALCITE INDEX:**		**0.28**			**CALCITE INDEX:**		**0.65**		

Table A.7: Pebble count and calcite measurements in reference and mine-exposed areas, September 2014.

FORD7-50					GRAC2-25					GRAC2-75					GRAV1-25				
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Intermediate Axis (cm)	Embed
1	0	0	6.4		1	0	0	fine		1	0	0	4.2		1	0	0	3.6	
2	0	0	8.1		2	1	1	3.9		2	0	0	3.2		2	0	0	4.2	
3	0	0	10.8		3	0	0	8.3		3	0	0	15.8		3	0	0	20.1	
4	0	0	7.6		4	0	0	10.2		4	0	0	6.2		4	0	0	8.1	
5	0	0	10.8		5	0	0	9.8		5	0	0	5.7		5	0	0	6.8	
6	0	0	6.2		6	0	0	10.4		6	0	0	1.5		6	0	0	7.2	
7	0	0	14.6		7	0	0	8.5		7	0	0	6.3		7	0	0	5.5	
8	0	0	11		8	0	1	15.5		8	0	0	5.5		8	0	0	30.5	
9	0	0	8.5		9	0	0	6.6		9	0	0	1.8		9	0	0	6.1	
10	0	0	9.3	0.25	10	0	0	11.1	0	10	0	0	3.8	0	10	0	0	9.1	0.5
11	0	0	6		11	0	0	11		11	0	0	fine		11	0	0	fine	
12	0	0	8.5		12	0	0	7.5		12	0	0	2.2		12	0	0	10.2	
13	0	0	8.7		13	0	0	9.1		13	0	0	6.2		13	0	1	bedrock	
14	0	0	14.2		14	0	0	10.5		14	0	0	6.1		14	0	0	5.1	
15	0	0	6		15	0	0	10		15	0	0	5.3		15	0	0	9.2	
16	0	1	10		16	0	0	10.5		16	0	0	10.4		16	0	0	7.1	
17	0	0	8.8		17	0	0	6.2		17	0	0	3.5		17	0	0	23.4	
18	0	0	10.5		18	0	0	4		18	0	0	8.8		18	0	0	4.1	
19	0	0	3.3		19	0	0	12.2		19	0	0	7.8		19	0	0	5.7	
20	0	0	11.3	0	20	0	0	4.9	0	20	0	0	4.3	0	20	0	0	11.2	0
21	0	0	11.5		21	0	0	5.3		21	0	0	8.3		21	0	0	19.5	
22	0	0	3.1		22	0	0	10.4		22	0	0	5.7		22	0	0	16.8	
23	0	0	5.2		23	0	0	7.5		23	0	0	9.5		23	0	0	15.5	
24	0	0	8.6		24	0	0	8.4		24	0	0	5		24	0	0	18.5	
25	0	0	17		25	0	0	10.5		25	0	0	1.7		25	0	0	5.5	
26	0	0	9.3		26	0	0	8.2		26	0	0	4.7		26	0	0	10.3	
27	0	0	11.5		27	0	0	8.7		27	0	0	4.3		27	0	1	bedrock	
28	0	1	14.2		28	0	0	7.5		28	0	0	9.7		28	0	0	10.7	
29	0	0	11.2		29	0	0	7.5		29	0	0	4.6		29	0	1	28.2	
30	0	1	14.2	0	30	0	0	8.4	0.25	30	0	0	5.5	0	30	1	1	28	0.25
31	0	0	14.3		31	0	0	5.4		31	0	0	12.3		31	0	0	13.2	
32	0	0	9.6		32	0	0	9.1		32	0	0	4.1		32	0	0	34.5	
33	0	0	8.5		33	0	0	fine		33	0	0	4.2		33	0	0	6.2	
34	0	0	15.5		34	0	0	7.5		34	0	0	21.2		34	0	0	13.9	
35	0	0	17		35	0	0	5.3		35	0	0	fine		35	0	0	31.1	
36	0	0	8.5		36	0	0	20.5		36	0	0	4.1		36	0	0	19.7	
37	0	0	13		37	0	1	12.5		37	0	0	fine		37	0	0	27.8	
38	0	0	9.2		38	1	1	16.5		38	0	0	6.2		38	0	0	28.5	
39	0	0	12		39	0	0	14.2		39	0	0	8.6		39	0	0	15.2	
40	0	0	14.2	0	40	0	0	8.5	0.5	40	0	0	4.2	0	40	0	0	14.5	0
41	0	0	6.2		41	0	0	6.5		41	0	0	fine		41	0	0	1.2	
42	0	0	7.2		42	0	0	5.1		42	0	0	fine		42	0	0	19.8	
43	0	0	12.2		43	0	0	19.3		43	0	0	7.4		43	0	1	34.2	
44	0	0	6.2		44	0	0	8.7		44	0	0	9.1		44	0	0	9	
45	0	0	11.7		45	0	0	8.3		45	0	0	6.8		45	0	0	20.2	
46	0	0	6.2		46	0	0	10.5		46	0	0	1.1		46	0	1	bedrock	
47	0	0	9		47	0	0	5.3		47	0	0	7.5		47	0	0	21.5	
48	0	0	6.1		48	0	0	9.5		48	0	0	2.3		48	0	0	4.7	
49	0	0	8.2		49	0	0	6.1		49	0	0	11.3		49	0	0	12.5	
50	0	0	7	0	50	0	0	5.5	0	50	0	0	9.9	0.25	50	0	0	5.1	0.5
51	0	0	6.2		51	0	0	fine		51	0	0	12.8		51	0	0	6.7	
52	0	0	13.5		52	0	0	5.6		52	0	0	2.9		52	0	0	19.2	
53	0	0	15.5		53	0	0	17.3		53	0	0	bedrock		53	0	0	25.2	
54	0	0	16.6		54	0	0	5		54	0	0	2.5		54	0	0	19.5	
55	0	0	7.6		55	0	0	8.1		55	0	0	3.3		55	0	0	3	
56	0	0	8.2		56	0	0	3.1		56	0	0	11		56	0	0	10.5	
57	0	0	10		57	0	1	10.5		57	0	0	12.6		57	0	0	14.7	
58	0	0	11.8		58	0	0	22.2		58	0	0	7.2		58	0	0	11.3	
59	0	0	11.5		59	0	0	10.5		59	0	0	2.2		59	0	0	10	
60	0	0	11	0	60	0	0	1.2	0	60	0	0	3.2	0.5	60	0	0	16.4	0.75
61	0	0	11		61	0	0	9		61	0	0	6		61	0	0	7.9	
62	0	0	13.5		62	0	0	22.5		62	0	0	8.1		62	0	0	4.7	
63	0	0	8.5		63	0	0	16.2		63	0	0	10.3		63	0	0	13.5	
64	0	0	8.2		64	0	0	7.9		64	0	0	7.2		64	0	0	fine	
65	0	0	11		65	0	0	6.5		65	0	0	3.6		65	0	0	10	
66	0	0	10.5		66	0	0	7.3		66	0	0	8.2		66	0	0	2.9	
67	0	0	13.5		67	0	0	8.7		67	0	0	6.1		67	0	0	32.3	
68	0	0	8		68	0	0	13.5		68	0	0	fine		68	0	0	9.2	
69	0	0	12.2		69	0	0	5.1		69	0	0	2.2		69	0	0	20.3	
70	0	0	14.5	0	70	0	0	10.5	0.25	70	0	0	5.6	0.5	70	0	0	40.3	0.25
71	0	0	8.5		71	0	0	5.5		71	0	0	10.6		71	0	0	9.2	
72	0	0	8.6		72	0	0	10.5		72	0	0	5.2		72	0	0	15.8	
73	0	0	11.6		73	0	0	9.3		73	0	0	6.3		73	0	0	6	
74	0	0	10.4		74	0	0	3.5		74	0	0	5.5		74	0	0	14.5	
75	0	0	8.1		75	0	0	9.1		75	0	0	14.5		75	0	0	36.2	
76	0	0	11.3		76	0	0	35.1		76	0	0	2		76	0	0	10.3	
77	0	0	13.8		77	0	1	10.4		77	0	0	fine		77	0	0	2.8	
78	0	0	11.5		78	0	0	11.6		78	0	0	4.7		78	0	0	10.1	
79	0	0	9.9		79	0	0	3.5		79	0	0	4.1		79	0	0	27.5	
80	0	0	8.2	0.5	80	0	0	23.5	0.25	80	0	0	3	0.25	80	0	0	10.3	0
81	0	0	5.3		81	0	0	14.5		81	0	0	10.5		81	0	0	20.5	
82	0	0	5.8		82	0	0	21		82	0	0	4.1		82	0	0	29.4	
83	0	0	10.5		83	0	0	7.6		83	0	0	2.9		83	0	0	7.1	
84	0	0	sand		84	0	0	4		84	0	0	4.1		84	0	0	28.3	
85	0	0	10.5		85	0	1	19.5		85	0	0	12.6		85	0	0	11	
86	0	0	4.1		86	0	0	18.4		86	0	0	2		86	0	0	bedrock	
87	0	0	6		87	0	0	8.2		87	0	0	8.6		87	0	0	4.5	
88	0	0	14.2		88	0	0	8.1		88	0	0	6		88	0	0	28.2	
89	0	0	9.1		89	0	0	5.6		89	0	0	6.1		89	0	0	13.5	
90	0	0	8.5	0.5	90	0	0	7.6	0	90	0	0	9.5	0.5	90	0	0	21	0.75
91	0	0	7.2		91	0	0	6		91	0	0	2.3		91	0	0	7.3	
92	0	0	12.2		92	0	0	5.2		92	0	0	4.4		92	0	0	14	
93	0	0	3.5		93	0	0	7.8		93	0	0	11		93	0	0	17	
94	0	0	6.5		94	0	1	7		94	0	0	1.5		94	0	0	5.6	
95	0	0	7.1		95	0	0	11		95	0	0	1.1		95	0	0	22.5	
96	0	0	8.1		96	0	0	9.2		96	0	0	20.1		96	0	0	17.9	
97	0	0	24.3		97	0	0	6		97	0	0	9.8		97	0	0	6.3	
98	0	0	7		98	0	0	3.8		98	0	0	12.6		98	0	1	43.3	
99	0	0	17.2		99	0	0	5.5		99	0	0	8		99	0	0	7.3	
100	0	0	7.6	0	100	0	0	13.6	0.5	100	0	0	4.9	0	100	0	0	3	0.25
Mean	**0.0**	**0.0**	**10.0**	**0.13**	**Mean**	**0.0**	**0.1**	**9.7**	**0.18**	**Mean**	**0.0**	**0.0**	**6.5**	**0.20**	**Mean**	**0.0**	**0.1**	**14.8**	**0.33**
CALCITE INDEX:		**0.03**			**CALCITE INDEX:**		**0.10**			**CALCITE INDEX:**		**0.00**			**CALCITE INDEX:**		**0.08**		

Table A.7: Pebble count and calcite measurements in reference and mine-exposed areas, September 2014.

GRAV1-75					GREE1-75					GREE3-25					GREE3-75				
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Intermediate Axis (cm)	Embed
1	0	0	5.5		1	0	1	5.1		1	1	1	10.5		1	1	1	4.9	
2	0	0	11.9		2	0	1	5		2	1	1	2.7		2	1	1	11.3	
3	0	0	13.1		3	0	1	5.2		3	1	1	9.5		3	1	1	8.3	
4	0	0	5.8		4	0	1	1.8		4	2	1	6.5		4	2	1	7.2	
5	0	0	9.5		5	2	1	19.2		5	1	1	1		5	1	1	9.8	
6	0	0	7		6	0	1	5.2		6	2	1	9.2		6	1	1	2.9	
7	0	0	7.9		7	2	1	12.2		7	2	1	6.3		7	1	1	9.8	
8	0	0	3.8		8	0	1	12.5		8	1	1	6.2		8	2	1	10	
9	0	0	4.9		9	2	1	6.2		9	2	1	4.3		9	1	1	10.5	
10	0	0	4.6	0	10	0	1	5	0.25	10	0	1	13.1	0	10	1	1	9.1	0.25
11	0	0	3.9		11	0	1	1.2		11	1	1	4.2		11	1	1	2.9	
12	0	0	21.2		12	0	1	6.6		12	2	1	14.2		12	1	1	5	
13	0	0	4.1		13	1	1	3.3		13	2	1	11.5		13	1	1	9.5	
14	0	0	16.1		14	0	1	5.6		14	1	1	2.8		14	1	1	4.5	
15	0	1	18.7		15	2	1	11.1		15	1	1	3.5		15	1	1	4.9	
16	0	0	13.2		16	0	1	10.9		16	2	1	5.5		16	1	1	9.2	
17	2	1	22.2		17	1	1	4.1		17	1	1	3.8		17	0	1	fine	
18	0	1	20		18	1	1	3.7		18	1	1	10.5		18	0	1	2.5	
19	0	0	7.4		19	1	1	6.9		19	1	1	6.5		19	0	1	2	
20	0	1	19.5	0.75	20	0	1	4.2	0.25	20	2	1	14.5	0.5	20	1	1	4.1	0.5
21	2	1	26.2		21	1	1	4.7		21	2	1	4.5		21	1	1	3.2	
22	0	0	5.5		22	1	1	11.9		22	1	1	9		22	1	1	12.7	
23	0	0	3.1		23	2	1	5		23	2	1	11.5		23	1	1	8.2	
24	0	0	17.6		24	0	0	fine		24	1	1	17.6		24	1	1	15.1	
25	0	0	8		25	0	0	fine		25	1	1	9.5		25	0	1	7.2	
26	0	1	26.8		26	0	1	6.7		26	1	1	4		26	1	1	9.7	
27	0	0	5.1		27	2	1	7.5		27	1	1	8		27	0	1	1.5	
28	0	0	8.1		28	0	0	fine		28	1	1	9.5		28	1	1	1.7	
29	0	0	7.5		29	0	1	8.1		29	1	1	3.1		29	1	1	5.5	
30	0	0	35	0.25	30	0	1	7	0	30	1	1	3.1	0.5	30	1	1	4.1	0.25
31	0	0	10.3		31	0	0	fine		31	0	1	3.8		31	1	1	7.7	
32	0	0	8.1		32	1	1	3.7		32	1	1	1.6		32	1	1	9.1	
33	0	0	7		33	1	1	2.2		33	2	1	3.5		33	0	1	5.7	
34	0	0	4.3		34	0	1	10.5		34	1	1	9.7		34	0	1	4.2	
35	0	0	3.8		35	0	1	4.5		35	2	1	7.6		35	0	1	3.9	
36	0	0	9.5		36	0	1	6.5		36	1	1	13.7		36	0	1	10.5	
37	0	0	sand		37	0	1	3.6		37	2	1	16.5		37	0	1	6.5	
38	0	0	9.1		38	0	0	fine		38	1	1	7.2		38	0	1	7.1	
39	0	1	2.5		39	0	0	fine		39	1	1	9.2		39	1	1	4.7	
40	1	1	18.2	0.5	40	0	1	6.2	0.25	40	1	1	8.7	0.25	40	1	1	5.2	0.5
41	0	1	16.3		41	2	1	calcite		41	1	1	14.2		41	2	1	6.3	
42	2	1	36.3		42	0	0	fine		42	1	1	3.8		42	1	1	16.4	
43	0	0	4		43	0	1	6.2		43	1	1	10.8		43	1	1	8.7	
44	0	0	3.8		44	1	1	9		44	2	1	2.7		44	1	1	4.1	
45	0	0	3.1		45	1	1	8		45	2	1	7.5		45	0	1	fine	
46	0	0	3.3		46	0	1	8.5		46	1	1	5.2		46	1	1	10.2	
47	0	0	11.7		47	1	1	12.1		47	2	1	10.7		47	1	1	19.6	
48	0	0	4		48	0	1	9.5		48	1	1	9.2		48	1	1	5.6	
49	0	0	30.5		49	1	1	2		49	1	1	10.5		49	1	1	3.6	
50	0	0	7.5	0	50	1	1	9.9	0.5	50	1	1	5.5	0.25	50	2	1	2.2	0.75
51	0	0	7.5		51	1	1	4.2		51	1	1	3.2		51	1	1	12.6	
52	0	0	9.3		52	1	1	7		52	2	1	7.1		52	2	1	8.5	
53	0	1	45		53	2	1	21.5		53	1	1	9.2		53	2	1	2.2	
54	0	0	7.9		54	0	0	fine		54	1	1	3.8		54	1	1	4.9	
55	0	0	4.5		55	1	1	3.2		55	2	1	1.5		55	1	1	7.1	
56	0	1	38.5		56	1	1	3.7		56	1	1	1.8		56	0	1	11.2	
57	0	1	8.2		57	1	1	11		57	1	1	4.6		57	0	1	7.8	
58	0	1	7.5		58	1	1	18.2		58	2	1	14.5		58	1	1	5.4	
59	0	1	10.2		59	2	1	6.1		59	1	1	10.5		59	1	1	16.2	
60	1	1	17.2	0.25	60	1	1	1.6	0.5	60	2	1	13.5		60	2	1	18	0.5
61	2	1	20.5		61	1	1	8.5		61	1	1	16.1		61	0	1	14.1	
62	1	1	25.5		62	1	1	7.1		62	2	1	7.3		62	2	1	9.5	
63	0	0	6		63	2	1	5.5		63	2	1	10.5		63	1	1	4.7	
64	0	0	6.8		64	2	1	4.5		64	1	1	5.7		64	1	1	11.8	
65	0	1	38.2		65	0	0	fine		65	2	1	7.8		65	1	1	11.5	
66	0	0	3.7		66	0	0	fine		66	2	1	9.2		66	1	1	6.8	
67	0	0	5		67	0	0	fine		67	1	1	10.1		67	0	1	5.8	
68	0	0	4.8		68	1	1	5.5		68	2	1	5.3		68	0	1	7.1	
69	0	0	30.5		69	0	0	fine		69	2	1	13.3		69	0	1	9.2	
70	0	0	26.5	0.75	70	2	1	4.5	0.5	70	2	1	16.5	0.5	70	1	1	10.8	0.25
71	0	0	7.3		71	1	1	6.5		71	1	1	11.5		71	1	1	4.2	
72	0	0	4.8		72	1	1	15.2		72	0	1	1.5		72	2	1	15.1	
73	0	0	33.5		73	1	1	4.1		73	2	1	10.5		73	2	1	2.5	
74	0	0	3.5		74	1	1	9.5		74	2	1	9.1		74	2	1	3.7	
75	0	1	bedrock		75	0	0	fine		75	2	1	11.8		75	2	1	5.5	
76	0	0	9.5		76	1	1	10.4		76	2	1	10.2		76	1	1	3.9	
77	0	1	36.5		77	1	1	6.5		77	1	1	5.5		77	1	1	7.4	
78	0	0	6.1		78	1	1	2.5		78	1	1	7.6		78	0	1	4.3	
79	1	1	14.1		79	0	1	6		79	2	1	4.2		79	0	1	3.1	
80	2	1	26.8	0.25	80	1	1	6	0.25	80	1	1	3.6	0.25	80	1	1	4.5	0.75
81	0	0	8.1		81	0	1	7		81	2	1	22.5		81	1	1	6.8	
82	0	0	8.4		82	0	1	3.5		82	2	1	8.2		82	1	1	11.5	
83	0	0	5.5		83	0	0	fine		83	2	1	19.7		83	0	1	3.5	
84	0	0	5.2		84	0	0	fine		84	2	1	13.5		84	1	1	4.4	
85	0	0	5.3		85	2	1	9.2		85	2	1	20.5		85	0	1	6.8	
86	0	0	6.9		86	0	1	1.3		86	1	1	8.9		86	2	1	9.9	
87	0	0	11.2		87	0	1	1.8		87	2	1	3.9		87	1	1	3.6	
88	0	0	4.2		88	1	1	10.5		88	2	1	20.4		88	1	1	17.2	
89	0	0	3.3		89	1	1	13.4		89	2	1	3.3		89	0	0	fine	
90	1	1	45.5	0.5	90	2	1	8.5	0.75	90	2	1	6.1	0.75	90	2	1	26.2	0.75
91	0	0	4.7		91	0	0	fine		91	1	1	5.5		91	2	1	23.2	
92	0	1	24.5		92	1	1	7.8		92	1	1	14.6		92	1	1	4.6	
93	0	0	5.1		93	0	0	fine		93	1	1	4.1		93	0	0	fine	
94	1	1	19.5		94	1	1	5.5		94	2	1	21.2		94	0	0	fine	
95	1	1	22		95	1	1	10		95	2	1	2		95	1	1	4.9	
96	0	0	7.1		96	0	0	fine		96	2	1	8.3		96	0	1	1.2	
97	0	1	30.2		97	2	1	7.2		97	1	1	11.7		97	1	1	4.7	
98	0	0	5.5		98	0	0	fine		98	2	1	8.8		98	2	1	19.5	
99	0	0	4.6		99	1	1	4.6		99	1	1	26.7		99	1	1	2.1	
100	0	0	4	0	100	1	1	6.6	0.5	100	2	1	9.5	0.75	100	1	1	12.5	0.5
Mean	**0.2**	**0.3**	**12.8**	**0.33**	**Mean**	**0.7**	**0.8**	**7.1**	**0.38**	**Mean**	**1.4**	**1.0**	**8.7**	**0.42**	**Mean**	**0.9**	**1.0**	**7.8**	**0.50**
CALCITE INDEX:		**0.45**			**CALCITE INDEX:**		**1.49**			**CALCITE INDEX:**		**2.43**			**CALCITE INDEX:**		**1.87**		

Table A.7: Pebble count and calcite measurements in reference and mine-exposed areas, September 2014.

GREE4-25					GREE4-75					HARM1-75					HARM5-25				
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Intermediate Axis (cm)	Embed
1	1	1	4.5		1	2	1	5		1	0	1	15		1	0	0	5.8	
2	2	1	19		2	2	1	8		2	0	1	6.5		2	0	0	15.5	
3	2	1	2.5		3	2	1	3		3	1	1	6.5		3	1	1	18.2	
4	2	1	12		4	2	1	4		4	1	1	8.2		4	1	1	10.1	
5	2	1	5.5		5	2	1	6		5	0	1	9.7		5	0	1	11.8	
6	1	1	10		6	2	1	12		6	1	1	3.2		6	0	0	8.1	
7	2	1	4		7	1	1	8		7	1	1	12.8		7	1	1	15.2	
8	1	1	4.5		8	0	1	9		8	1	1	19.5		8	0	0	3.1	
9	2	1	6		9	1	1	5		9	1	1	11.1		9	1	1	9.8	
10	2	1	4	0	10	1	1	5	0.25	10	1	1	11.2	0.5	10	1	1	11.1	0.75
11	2	1	3		11	2	1	8		11	0	1	8.2		11	1	1	9.2	
12	2	1	4		12	2	1	7		12	0	1	6.5		12	1	1	12.5	
13	1	1	7		13	0	1	4		13	2	1	14.1		13	0	0	3	
14	2	1	5.5		14	0	1	5		14	2	1	calcite		14	0	1	6.1	
15	1	1	4		15	0	1	7		15	2	1	11.2		15	0	1	8.1	
16	2	1	4.5		16	2	1	6		16	0	1	10.2		16	0	0	6	
17	2	1	6.5		17	0	1	3		17	0	1	12.1		17	0	1	15.2	
18	2	1	7		18	2	1	6		18	2	1	23.3		18	1	1	2.9	
19	2	1	3.5		19	2	1	8		19	1	1	14.1		19	0	1	14.3	
20	2	1	6.5	0.25	20	1	1	11	0	20	1	1	7.8	0.25	20	0	1	10	0
21	2	1	3		21	2	1	9		21	1	1	11.9		21	0	1	11.5	
22	2	1	5		22	2	1	5		22	1	1	20.5		22	0	0	3.8	
23	2	1	5		23	0	1	3.5		23	2	1	10.2		23	1	1	2.6	
24	2	1	6.5		24	2	1	3		24	1	1	11.5		24	0	0	3.9	
25	2	1	7		25	1	1	6.5		25	1	1	11.5		25	0	0	9	
26	0	0	1.5		26	2	1	6		26	1	1	10.5		26	0	1	8.1	
27	0	1	11		27	2	1	8		27	1	1	8.2		27	0	1	13.5	
28	1	1	7		28	2	1	10		28	0	1	9.2		28	0	1	8.8	
29	2	1	4		29	1	1	8		29	2	1	43.2		29	0	0	3.3	
30	2	1	5	0.25	30	2	1	7	0	30	0	1	7.5	0	30	0	1	7.2	0.5
31	2	1	5		31	1	1	3		31	0	1	13.5		31	0	1	14.2	
32	2	1	10		32	2	1	4		32	0	1	8.1		32	0	1	8.5	
33	1	1	15		33	1	1	3		33	0	1	10.5		33	1	1	5.7	
34	1	1	10.5		34	1	1	6		34	0	1	7.4		34	0	1	6.8	
35	2	1	4		35	1	1	7		35	0	1	9.2		35	0	0	4.2	
36	2	1	14		36	2	1	10		36	1	1	10.5		36	0	1	10.5	
37	0	1	2.5		37	1	1	10		37	0	1	12.6		37	0	1	15.1	
38	1	1	5		38	0	1	11		38	0	1	9		38	0	1	16.6	
39	1	1	4		39	0	1	9		39	0	1	10.3		39	0	1	14.9	
40	2	1	7	0.25	40	0	1	7.5	0.75	40	0	1	12.8	0	40	0	1	12.5	0
41	2	1	4.5		41	1	1	calcite		41	0	1	12.1		41	1	1	17	
42	2	1	11		42	2	1	6		42	0	1	7.6		42	0	1	6.2	
43	2	1	10		43	2	1	7		43	0	1	9.5		43	0	1	9	
44	2	1	6		44	2	1	7.5		44	0	1	6.6		44	0	1	8	
45	2	1	27		45	2	1	6		45	1	1	11.5		45	1	1	10.5	
46	2	1	5		46	1	1	8		46	1	1	14.2		46	1	1	12.5	
47	2	1	7		47	2	1	9		47	0	1	7.1		47	0	1	16.5	
48	2	1	3		48	2	1	6		48	0	1	6.8		48	1	1	20.1	
49	2	1	6		49	2	1	5		49	0	1	15.3		49	0	0	5.5	
50	0	1	5.5	0	50	2	1	11	0.5	50	0	1	15.2	0	50	1	1	14	0.25
51	0	0	fine		51	2	1	10		51	1	1	14.2		51	0	1	12.5	
52	0	1	9		52	2	1	10		52	0	1	15.1		52	1	1	14.4	
53	1	1	5		53	2	1	9		53	0	1	11.5		53	0	1	8.1	
54	2	1	3		54	2	1	9		54	1	1	12.5		54	1	1	10.9	
55	0	1	15		55	2	1	6		55	0	1	11.1		55	0	1	13.9	
56	2	1	4		56	2	1	7.5		56	0	1	13.2		56	1	1	10.5	
57	2	1	8		57	2	1	9		57	1	1	14.5		57	0	1	13.5	
58	2	1	7		58	1	1	7		58	1	1	13.1		58	0	1	16.1	
59	2	1	12.5		59	2	1	7		59	0	1	6.5		59	0	1	5.5	
60	2	1	8.5	0.25	60	2	1	13	0.25	60	1	1	9.4	0.75	60	0	1	5.2	0.5
61	2	1	2		61	2	1	10		61	2	1	calcite		61	0	1	17	
62	1	1	6.5		62	2	1	9		62	1	1	9.2		62	0	1	10.4	
63	2	1	4.5		63	2	1	14		63	1	1	7.4		63	0	1	6.8	
64	2	1	5		64	1	1	7		64	1	1	3.6		64	2	1	13.5	
65	1	1	4		65	2	1	9		65	1	1	9.6		65	1	1	14	
66	2	1	8		66	1	1	7.5		66	0	1	7		66	0	1	17.3	
67	1	1	5		67	2	1	7		67	0	1	15.9		67	1	1	10.6	
68	2	1	5		68	2	1	6.5		68	1	1	12.2		68	0	1	7.1	
69	1	1	8		69	2	1	9		69	1	1	10		69	1	1	23.5	
70	2	1	17	0	70	1	1	11	0	70	0	1	24.5	0	70	1	1	15.3	0.25
71	1	1	4.5		71	1	1	3		71	0	1	12.5		71	0	1	9.2	
72	1	1	3		72	1	1	9		72	0	0	6.8		72	0	1	12.5	
73	2	1	4		73	1	1	2		73	0	1	13.5		73	0	1	10.6	
74	2	1	2.5		74	0	1	7		74	0	1	14.4		74	1	1	13.3	
75	2	1	4		75	0	1	4.5		75	0	1	4.9		75	0	1	8.7	
76	0	1	11		76	1	1	7		76	1	1	4.5		76	0	1	6.7	
77	1	1	3		77	2	1	3		77	1	1	20.2		77	0	1	5	
78	1	1	4.5		78	1	1	9		78	0	1	11		78	0	1	5	
79	2	1	4		79	1	1	7		79	1	1	11.4		79	0	0	1	
80	2	1	10	0.25	80	2	1	9.5	0.75	80	1	1	3.5	0.5	80	1	1	15.9	0.25
81	2	1	3		81	2	1	9		81	1	1	14.9		81	1	1	11.9	
82	1	1	11		82	0	1	8		82	2	1	49.9		82	0	1	11.6	
83	2	1	6		83	0	1	4		83	2	1	43.3		83	0	1	22.2	
84	2	1	9		84	0	1	4		84	1	1	28.5		84	1	1	5.9	
85	2	1	7		85	0	1	5		85	2	1	calcite		85	0	0	1.9	
86	2	1	5		86	1	1	10		86	0	1	14.2		86	0	0	1.5	
87	1	1	9		87	1	1	9.5		87	1	1	8.5		87	0	1	8.2	
88	2	1	5		88	1	1	7		88	1	1	3.5		88	1	1	14.1	
89	1	1	5		89	2	1	8		89	1	1	15.1		89	0	1	11.5	
90	2	1	4	0.25	90	1	1	9.5	0	90	1	1	6.5	0.75	90	0	1	8.6	0
91	2	1	12		91	1	1	8		91	2	1	calcite		91	0	1	11.6	
92	2	1	6		92	1	1	7		92	1	1	18.5		92	0	0	9	
93	1	1	6		93	1	1	7		93	1	1	13.4		93	0	1	9.5	
94	2	1	8		94	2	1	7.5		94	1	1	13.5		94	0	0	6.5	
95	1	1	5		95	1	1	6.5		95	1	1	18		95	0	0	8.1	
96	0	0	1.5		96	0	1	5		96	0	1	6.2		96	0	1	10.5	
97	2	1	3.5		97	2	1	10		97	0	1	6.5		97	0	1	12.6	
98	0	1	5		98	2	1	6		98	1	1	7.3		98	0	1	13	
99	2	1	5		99	0	1	6		99	0	1	11		99	0	1	8	
100	2	1	8	0.5	100	1	1	8	0	100	1	1	3	0.5	100	1	1	6.2	0.25
Mean	**1.6**	**1.0**	**6.6**	**0.20**	**Mean**	**1.3**	**1.0**	**7.2**	**0.25**	**Mean**	**0.7**	**1.0**	**12.2**	**0.33**	**Mean**	**0.3**	**0.8**	**10.2**	**0.28**
CALCITE INDEX:		**2.53**			**CALCITE INDEX:**		**2.34**			**CALCITE INDEX:**		**1.66**			**CALCITE INDEX:**		**1.12**		

Table A.7: Pebble count and calcite measurements in reference and mine-exposed areas, September 2014.

HARM6-25					LI8					LIDSL					LILC3				
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Intermediate Axis (cm)	Embed
1	0	0	4.6		1	0	0	5		1	0	0	10.5		1	0	1	18	
2	0	0	7.1		2	0	0	6		2	0	0	18		2	0	1	9	
3	0	0	7.6		3	0	0	5.5		3	0	0	12		3	0	1	20	
4	0	0	7.3		4	0	0	6.5		4	0	0	4		4	0	1	2.5	
5	0	0	5.1		5	0	0	8.5		5	0	1	27		5	0	1	4	
6	0	0	13.1		6	0	0	8.5		6	0	0	13		6	0	1	14	
7	0	0	3.2		7	0	1	5		7	0	1	10		7	0	1	6.5	
8	0	0	13.3		8	0	0	4.5		8	0	0	14		8	0	1	6	
9	0	0	10		9	0	0	5		9	0	0	12		9	0	1	3.5	
10	0	0	6.2	0.25	10	0	0	17	0.75	10	0	1	11	0.5	10	0	1	5	0.25
11	0	0	6.4		11	0	0	4.5		11	0	0	7.5		11	0	1	2	
12	0	0	7.2		12	0	0	14		12	0	1	8.5		12	0	1	21	
13	0	0	12		13	0	0	11		13	0	1	13		13	0	1	4.5	
14	0	0	3.6		14	0	0	12		14	0	1	10.5		14	0	1	4.5	
15	0	0	9.3		15	0	0	14		15	0	0	15		15	0	1	5.5	
16	0	0	3.5		16	0	0	8		16	0	0	17		16	0	1	10.5	
17	0	0	3.6		17	0	0	10		17	0	0	17		17	0	1	34	
18	0	0	4.5		18	0	0	7		18	0	0	8.5		18	0	1	22	
19	0	0	3.2		19	0	0	10		19	0	0	8		19	0	1	7.5	
20	0	0	5	0	20	0	0	7	0.75	20	0	0	15	0.25	20	0	1	7.5	0.25
21	0	0	2.7		21	0	0	5.5		21	0	0	9		21	0	1	5	
22	0	0	3.9		22	0	0	16		22	0	0	10.5		22	0	1	2.9	
23	0	0	3.4		23	0	0	9.5		23	0	0	6.5		23	0	1	8	
24	0	0	3.7		24	0	1	15		24	0	0	12.5		24	0	1	5.5	
25	0	0	8		25	0	0	11		25	0	1	11.5		25	0	1	28	
26	0	0	6.1		26	0	0	5		26	0	0	7.5		26	0	1	6.5	
27	0	0	5.5		27	0	0	21		27	0	1	16		27	0	1	11.5	
28	0	0	3		28	0	0	15.5		28	0	0	8.5		28	0	1	23	
29	0	0	3.9		29	0	0	30		29	0	0	12		29	0	1	16	
30	0	0	3	0.25	30	0	0	7	0.5	30	0	0	10	0.25	30	0	1	11.5	0.25
31	0	0	fine		31	0	0	gravel		31	0	0	11		31	0	1	6.5	
32	0	0	5.5		32	0	0	13		32	0	1	10		32	0	1	12	
33	0	0	8.1		33	0	0	29		33	0	0	6.5		33	0	1	31	
34	0	0	7		34	0	0	7.5		34	0	1	14		34	0	1	3.5	
35	0	0	6.4		35	0	0	13		35	0	1	15		35	0	1	17	
36	0	0	3		36	0	0	12.5		36	0	0	15		36	0	1	7.5	
37	0	0	11.1		37	0	0	13		37	0	0	13		37	0	1	7.5	
38	0	0	8.1		38	0	0	7.5		38	0	0	14		38	0	1	4.5	
39	0	0	9.2		39	0	0	9.5		39	0	0	10		39	0	1	26	
40	0	0	5.2	0.25	40	0	0	13	0.5	40	0	0	4.5	0.25	40	0	1	12	0.75
41	0	0	5.2		41	0	0	4		41	0	1	11.5		41	0	1	23	
42	0	0	4.1		42	0	0	5.5		42	0	0	9		42	0	1	12	
43	0	0	2		43	0	0	9		43	0	0	6		43	0	1	30	
44	0	0	5.6		44	0	0	7		44	0	1	10		44	0	1	15	
45	0	0	6.4		45	0	0	7		45	0	1	14		45	0	1	13	
46	0	0	7.8		46	0	0	17		46	0	0	15.5		46	0	1	2.5	
47	0	0	4.4		47	0	0	9		47	0	0	9.5		47	0	1	7.5	
48	0	0	7.6		48	0	0	9		48	0	1	10		48	0	1	17	
49	0	0	9.2		49	0	0	19		49	0	0	9		49	0	1	9	
50	0	0	5	0	50	0	0	16	0.25	50	0	0	6	0.25	50	0	1	24	0.5
51	0	0	6.5		51	0	0	9		51	0	0	18		51	0	1	8	
52	0	0	4.4		52	0	0	10		52	0	1	16		52	0	1	52	
53	0	0	4.9		53	0	0	gravel		53	0	0	6		53	0	1	17	
54	0	0	8.1		54	0	0	7.5		54	0	0	9		54	0	1	6.5	
55	0	0	7		55	0	0	24		55	0	0	15		55	0	1	11	
56	0	0	8.8		56	0	0	15.5		56	0	0	12.5		56	0	1	13	
57	0	0	3.5		57	0	0	7		57	0	0	6.5		57	0	1	9	
58	0	0	9.5		58	0	0	8		58	0	0	8.5		58	0	1	7	
59	0	0	3		59	0	1	11.5		59	0	0	13		59	0	1	12	
60	0	0	10	0	60	0	0	9.5	0.75	60	0	0	12	0.25	60	0	1	7.5	0.25
61	0	0	5.9		61	0	0	3.5		61	0	0	8		61	0	1	6	
62	0	0	12.1		62	0	0	4.5		62	0	0	15		62	0	1	8	
63	0	0	6		63	0	0	gravel		63	0	1	14.5		63	0	1	16	
64	0	0	14		64	0	0	17		64	0	0	12		64	0	1	11	
65	0	0	9.5		65	0	0	18		65	0	0	5		65	0	1	11	
66	0	0	7.5		66	0	0	8.5		66	0	1	10		66	0	1	11	
67	0	0	8.4		67	0	0	10		67	0	0	6		67	0	1	15	
68	0	0	11.1		68	0	0	7		68	0	0	9		68	0	1	12.5	
69	0	0	7.3		69	0	0	9.5		69	0	0	5.5		69	0	1	6	
70	0	0	12.8	0	70	0	0	6.5	0.5	70	0	0	17	0.5	70	0	1	4	0.75
71	0	0	10.1		71	0	0	5.5		71	0	0	15.5		71	0	1	8	
72	0	0	12.5		72	0	0	4.5		72	0	0	10		72	0	1	8.5	
73	0	0	7.9		73	0	0	6		73	0	0	12		73	0	1	17	
74	0	0	8		74	0	0	6.5		74	0	1	17		74	0	1	13	
75	0	0	8.5		75	0	0	4.5		75	0	0	9.5		75	0	1	9	
76	0	0	10		76	0	0	3		76	0	0	12		76	0	1	11.5	
77	0	0	7.9		77	0	0	9		77	0	1	17		77	0	1	17	
78	0	0	6.6		78	0	0	6		78	0	0	8.5		78	0	1	16	
79	0	0	8.5		79	0	1	5.5		79	0	1	10.5		79	0	1	12	
80	0	0	9.1	0	80	0	0	9	0.25	80	0	0	13	0.25	80	0	1	5	0.5
81	0	0	9		81	0	0	8		81	0	0	7.5		81	0	1	5	
82	0	0	10.1		82	0	0	11		82	0	0	19		82	0	1	8	
83	0	0	9.9		83	0	0	10		83	0	0	11		83	0	1	15	
84	0	0	12		84	0	0	6.5		84	0	0	4		84	0	1	29	
85	0	0	12.5		85	0	0	11		85	0	0	10.5		85	0	1	8.5	
86	0	0	9.9		86	0	0	7		86	0	0	4.5		86	0	1	9.5	
87	0	0	5		87	0	0	gravel		87	0	0	8.5		87	0	1	27	
88	0	0	5.5		88	0	0	8		88	0	0	11		88	0	1	5	
89	0	0	8.1		89	0	0	9		89	0	1	12		89	0	1	4.5	
90	0	0	2.5		90	0	0	9	0.75	90	0	1	17.5	0.5	90	0	1	29	0.5
91	0	0	4.5	0.25	91	0	0	5		91	0	0	6.5		91	0	1	7.5	
92	0	0	4.1		92	0	0	12		92	0	0	14		92	0	1	11	
93	0	0	8.6		93	0	0	35		93	0	0	7		93	0	1	17	
94	0	0	5.9		94	0	0	7		94	0	0	10.5		94	0	1	9.5	
95	0	0	6.8		95	0	0	6		95	0	0	5		95	0	1	23	
96	0	0	8.6		96	0	1	14		96	0	0	12		96	0	1	16	
97	0	0	2.5		97	0	0	8		97	0	0	10		97	0	1	27	
98	0	0	3.1		98	0	0	6		98	0	0	7.5		98	0	1	10	
99	0	0	10.2		99	0	0	14		99	0	1	13		99	0	1	6	
100	0	0	1.1	0	100	0	0	14	0.25	100	0	0	12	0.5	100	0	1	7	0.25
Mean	**0.0**	**0.0**	**7.0**	**0.10**	**Mean**	**0.0**	**0.1**	**10.1**	**0.53**	**Mean**	**0.0**	**0.2**	**11.2**	**0.35**	**Mean**	**0.0**	**1.0**	**12.4**	**0.43**
CALCITE INDEX:		**0.00**			**CALCITE INDEX:**		**0.05**			**CALCITE INDEX:**		**0.24**			**CALCITE INDEX:**		**1.00**		

Table A.7: Pebble count and calcite measurements in reference and mine-exposed areas, September 2014.

MICH1-25%					NTHO1-25					NTHO1-50					PORT1-0				
Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Intermediate Axis (cm)	Embed	Count	Concreted Status (0, 1, or 2)	Calcite Present (0 or 1)	Intermediate Axis (cm)	Embed
1	0	0	7.5		1	1	1	5		1	2	1	9		1	1	1	9.6	
2	0	0	9		2	1	1	7.5		2	2	1	18		2	1	1	2.5	
3	0	0	10		3	0	1	6		3	2	1	10		3	1	1	6.1	
4	0	0	8		4	0	1	9		4	2	1	10		4	1	1	10.1	
5	0	0	7		5	0	1	7		5	2	1	15		5	1	1	5.7	
6	0	0	3.5		6	0	1	7		6	2	1	11		6	1	1	10.2	
7	0	0	5		7	0	1	10		7	2	1	10		7	2	1	calcite	
8	0	0	6.5		8	0	1	7		8	2	1	6		8	1	1	10.5	
9	0	0	4		9	0	1	7		9	1	1	8		9	2	1	calcite	
10	0	0	8	0	10	0	1	4	0	10	0	1	3.5	0	10	1	1	10.5	0.25
11	0	0	7		11	0	1	5		11	0	1	5		11	2	1	calcite	
12	0	0	6		12	0	1	6		12	1	1	4		12	0	1	3.5	
13	0	0	10		13	0	1	3		13	2	1	11		13	0	1	8.8	
14	0	0	6.5		14	0	1	13		14	2	1	5		14	1	1	2.7	
15	0	0	5.5		15	0	1	4		15	0	1	13		15	1	1	8.1	
16	0	0	4.5		16	0	1	4		16	0	1	8		16	0	1	12.1	
17	0	0	8		17	0	1	3		17	2	1	10		17	0	1	4.3	
18	0	0	5.5		18	0	1	1.5		18	2	1	17		18	0	1	5.7	
19	0	0	7.5		19	2	1	5		19	1	1	10		19	0	1	6.2	
20	0	0	10	0	20	1	1	7	0.5	20	0	1	2	0	20	0	1	10.2	0.75
21	0	0	8.5		21	2	1	9		21	0	1	2.5		21	2	1	11.2	
22	0	0	11.5		22	1	1	8		22	2	1	calcite		22	1	1	7	
23	0	0	13		23	1	1	8		23	2	1	calcite		23	0	1	8.1	
24	0	0	6		24	2	1	6		24	0	1	2		24	1	1	4.8	
25	0	0	9.5		25	0	1	13		25	0	1	2.5		25	1	1	6.5	
26	0	0	10		26	0	1	15		26	0	1	3		26	1	1	11	
27	0	0	9		27	2	1	8		27	1	1	9		27	0	0	2.2	
28	0	0	6		28	0	1	6		28	1	1	13		28	1	1	7	
29	0	0	6		29	0	1	9		29	2	1	calcite		29	1	1	10.5	
30	0	0	1.5	0	30	0	1	8	0	30	0	1	2	0	30	0	1	7.5	0
31	0	0	4		31	1	1	8.5		31	1	1	5		31	2	1	9	
32	0	0	2		32	0	1	9		32	2	1	9		32	1	1	3	
33	0	0	16		33	2	1	6		33	2	1	9		33	1	1	4.9	
34	0	0	9.5		34	0	1	14		34	0	1	4		34	0	1	6	
35	0	0	11		35	0	1	6		35	2	1	6		35	1	1	11	
36	0	0	8		36	0	1	15		36	2	1	12		36	2	1	6.5	
37	0	0	5		37	0	1	12		37	2	1	calcite		37	1	1	4.3	
38	0	0	4		38	0	1	6		38	2	1	11		38	1	1	8.6	
39	0	0	9		39	2	1	6.5		39	2	1	8		39	0	1	10.9	
40	0	0	7.5	0.5	40	2	1	12	0.25	40	0	1	7	0	40	1	1	5.1	0.25
41	0	0	3		41	2	1	calcite		41	2	1	4		41	1	1	8	
42	0	0	11		42	2	1	calcite		42	2	1	9		42	1	1	15.1	
43	0	0	5		43	1	1	10		43	2	1	9		43	2	1	13.5	
44	0	0	6		44	2	1	8		44	2	1	10		44	1	1	10.2	
45	0	0	7		45	1	1	2		45	2	1	11		45	0	1	17.1	
46	0	0	4		46	1	1	15		46	2	1	12		46	0	1	2.5	
47	0	0	10		47	2	1	18		47	2	1	6		47	0	0	1.8	
48	0	0	5		48	2	1	22		48	1	1	4		48	1	1	15.5	
49	0	0	12		49	2	1	18		49	1	1	11		49	1	1	5.9	
50	0	0	11	0.5	50	2	1	6	0.5	50	1	1	4	0	50	0	0	2.1	0
51	0	0	13		51	0	1	3		51	0	1	1.5		51	1	1	1.6	
52	0	0	7		52	0	1	1		52	0	1	2		52	1	1	22.2	
53	0	0	5.5		53	0	1	6		53	0	1	2.5		53	1	1	9.1	
54	0	0	8		54	0	1	5		54	2	1	calcite		54	1	1	4.3	
55	0	0	10		55	0	1	3		55	2	1	calcite		55	0	0	1.6	
56	0	0	3		56	2	1	9		56	0	1	4		56	0	1	11	
57	0	0	7		57	0	1	8		57	0	1	4		57	0	1	15	
58	0	0	6		58	2	1	4		58	2	1	calcite		58	2	1	15	
59	0	0	8.5		59	0	1	5.5		59	2	1	calcite		59	0	1	14.2	
60	0	0	9	0	60	0	1	11	0	60	2	1	calcite		60	0	1	1	0
61	0	0	7		61	0	1	9		61	1	1	10	0	61	0	1	2	
62	0	0	7		62	0	1	8		62	2	1	calcite		62	0	1	18	
63	0	0	6		63	0	1	2		63	2	1	calcite		63	2	1	17.5	
64	0	0	11		64	0	1	2.5		64	0	1	4		64	1	1	14.5	
65	0	0	4.5		65	0	1	4		65	2	1	calcite		65	2	1	calcite	
66	0	0	7		66	0	0	1		66	2	1	9		66	2	1	14.7	
67	0	0	4		67	0	1	6		67	0	1	4		67	2	1	16.5	
68	0	0	7		68	2	1	19		68	2	1	7		68	0	1	5.5	
69	0	0	6.5		69	0	1	9		69	2	1	calcite		69	2	1	11.5	
70	0	0	5	0	70	0	1	5	0.5	70	0	1	1.5	0	70	2	1	13.3	0
71	0	0	7		71	0	1	9.5		71	0	1	6		71	0	1	10.2	
72	0	0	8		72	0	1	5.5		72	0	1	3		72	0	1	6.1	
73	0	0	10		73	0	1	10		73	2	1	calcite		73	0	1	11.1	
74	0	0	9		74	0	1	2		74	2	1	calcite		74	1	1	13.5	
75	0	0	9		75	0	1	6		75	2	1	calcite		75	0	1	2.2	
76	0	0	5		76	0	1	9.5		76	2	1	5		76	0	1	5.8	
77	0	0	5		77	0	1	6.5		77	1	1	5		77	0	1	11	
78	0	0	5		78	0	1	6		78	0	1	6		78	0	1	4	
79	0	0	5.5		79	0	1	7		79	0	1	8		79	1	1	3.6	
80	0	0	6	0.25	80	0	1	5	0	80	0	1	3	0	80	0	1	3.3	0
81	0	0	6		81	0	1	3		81	0	1	6.5		81	1	1	12.6	
82	0	0	10		82	0	0	fine		82	2	1	calcite		82	0	1	15.5	
83	0	0	14		83	2	1	calcite		83	2	1	calcite		83	2	1	calcite	
84	0	0	14		84	0	1	4		84	2	1	calcite		84	0	1	7.2	
85	0	0	12		85	0	1	3		85	0	1	3		85	0	1	12.6	
86	0	0	11		86	0	1	2.5		86	2	1	9		86	0	1	10.2	
87	0	0	12		87	0	1	14		87	1	1	5.5		87	0	1	7.5	
88	0	0	7		88	2	1	15		88	2	1	13		88	0	1	4.1	
89	0	0	12		89	2	1	calcite		89	1	1	calcite		89	2	1	5.5	
90	0	0	10.5	0	90	0	1	8	0	90	0	0	1	0.75	90	1	1	13.1	0.25
91	0	0	14		91	0	1	7		91	0	0	1		91	1	1	1.6	
92	0	0	5		92	0	1	5.5		92	0	1	4		92	1	1	14.4	
93	0	0	8		93	0	1	8		93	1	1	11.5		93	1	1	4	
94	0	0	8		94	0	1	15		94	2	1	5		94	0	1	10	
95	0	0	5.5		95	2	1	calcite		95	0	1	3		95	0	1	6	
96	0	0	9		96	2	1	calcite		96	0	1	3.5		96	1	1	3.9	
97	0	0	12		97	2	1	calcite		97	2	1	3		97	0	1	4	
98	0	0	13		98	2	1	12		98	2	1	calcite		98	1	1	3.3	
99	0	0	12		99	2	1	20		99	2	1	3	0	99	0	1	5	
100	0	0	15	0.5	100	1	1	8	0	100	2	1	calcite		100	0	1	5	0.25
Mean	**0.0**	**0.0**	**7.9**	**0.18**	**Mean**	**0.6**	**1.0**	**7.8**	**0.18**	**Mean**	**1.2**	**1.0**	**6.8**	**0.08**	**Mean**	**0.7**	**1.0**	**8.3**	**0.18**
CALCITE INDEX:		**0.00**			**CALCITE INDEX:**		**1.58**			**CALCITE INDEX:**		**2.20**			**CALCITE INDEX:**		**1.69**		

Table A.8: Water quality data for areas sampled, September 2015.

Analytes		Units	BOCK	CACK	CATA2-25	CATA2-75	COCK	EL1	EL19	EL20
			14-Sep-2015	11-Sep-2015	11-Sep-2015	11-Sep-2015	11-Sep-2015	16-Sep-2015	17-Sep-2015	17-Sep-2015
Physical Tests	Hardness (as $CaCO_3$)	mg/L	1,170	2,390	2,530	2,530	913	235	231	166
	Total Suspended Solids	mg/L	1.8	< 1.0	< 1.0	1.4	1	< 1.0	1.6	< 1.0
	Total Dissolved Solids	mg/L	1650	3240	3270	3390	1220	280	271	192
	Turbidity	NTU	2.28	0.1	0.9	2.13	0.7	1.03	0.6	0.26
Anions & Nutrients	Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	227	467	483	433	270	163	157	150
	Alkalinity, Carbonate (as $CaCO_3$)	mg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
	Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
	Alkalinity, Total (as $CaCO_3$)	mg/L	227	467	483	433	270	163	157	150
	Ammonia, Total (as N)	mg/L	0.0649	< 0.005	0.0067	< 0.005	0.0151	0.0117	< 0.005	< 0.005
	Bromide (Br)	mg/L	< 0.05	< 0.25	< 0.25	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05
	Chloride (Cl)	mg/L	27.9	6.1	6	6.2	5.7	1.97	1.35	< 0.5
	Fluoride (F)	mg/L	0.306	0.11	0.1	0.11	0.13	0.172	0.137	0.112
	Nitrate (as N)	mg/L	38	33.9	33.7	33.8	7.72	2.44	2.71	0.286
	Nitrite (as N)	mg/L	0.0335	< 0.005	0.0082	< 0.005	0.0232	0.0025	< 0.001	< 0.001
	Total Kjeldahl Nitrogen	mg/L	< 0.05	0.159	0.228	0.15	0.224	< 0.05	< 0.05	< 0.05
	Orthophosphate-Dissolved (as P)	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	0.0011	0.0033	0.0011	0.001
	Phosphorus (P)-Total	mg/L	0.0058	0.0035	0.0044	0.0075	0.0038	0.0054	0.0028	0.0027
	Sulfate (SO_4)	mg/L	765	1860	1850	1850	659	76.5	69.9	28.8
Organic / Inorganic Carbon	Dissolved Organic Carbon	mg/L	0.58	1.45	1.56	1.44	0.74	1.13	< 0.5	< 0.5
	Total Organic Carbon	mg/L	0.64	1.5	1.65	1.5	0.79	1.24	0.61	< 0.5
Total Metals	Aluminum (Al)	mg/L	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
	Antimony (Sb)	mg/L	0.00447	0.00055	0.00056	0.00061	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Arsenic (As)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Barium (Ba)	mg/L	0.189	0.0223	0.0241	0.0249	0.0661	0.0727	0.0684	0.0558
	Beryllium (Be)	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
	Bismuth (Bi)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Boron (B)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Cadmium (Cd)	mg/L	0.000255	0.000618	0.00056	0.000743	< 0.000025	< 0.000025	< 0.000025	< 0.000025
	Calcium (Ca)	mg/L	235	409	438	436	196	63	61.1	49
	Chromium (Cr)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Cobalt (Co)	mg/L	0.00056	< 0.0005	< 0.0005	< 0.0005	0.00219	< 0.0005	< 0.0005	< 0.0005
	Copper (Cu)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Iron (Fe)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Lead (Pb)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Lithium (Li)	mg/L	0.146	0.0583	0.0626	0.0609	0.0293	0.008	0.0075	< 0.005
	Magnesium (Mg)	mg/L	154	401	334	326	111	19.5	18.3	11.4
	Manganese (Mn)	mg/L	0.00381	0.0009	0.0011	0.00469	0.00905	0.00169	0.00205	0.00172
	Mercury (Hg)	mg/L	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005
	Molybdenum (Mo)	mg/L	0.0184	0.0023	0.00246	0.00234	0.00152	0.00115	0.00111	0.00096
	Nickel (Ni)	mg/L	0.0671	0.053	0.058	0.0577	0.0387	< 0.0025	< 0.0025	< 0.0025
	Phosphorus (P)	mg/L	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
	Potassium (K)	mg/L	6.47	4.23	4.67	4.46	3.27	0.68	0.6	0.38
	Selenium (Se)	mg/L	0.131	0.547	0.577	0.572	0.0141	0.0107	0.00983	0.00129
	Silicon (Si)	mg/L	2.54	3.5	2.79	2.74	2.18	2.03	1.98	1.81
	Silver (Ag)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Sodium (Na)	mg/L	8.32	1.64	1.82	1.75	20.5	2.43	2.11	0.84
	Strontium (Sr)	mg/L	0.805	0.231	0.249	0.244	0.563	0.208	0.224	0.213
	Sulfur (S)	mg/L	274	711	590	575	231	23.4	21.9	9.4
	Thallium (Tl)	mg/L	0.000077	0.000061	0.000064	0.000061	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Tin (Sn)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Titanium (Ti)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015
	Uranium (U)	mg/L	0.0117	0.019	0.0205	0.0202	0.00626	0.0012	0.00106	0.000721
	Vanadium (V)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Zinc (Zn)	mg/L	0.018	0.035	0.034	0.043	< 0.015	< 0.015	< 0.015	< 0.015
	Zirconium (Zr)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015
Dissolved Metals	Aluminum (Al)	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
	Antimony (Sb)	mg/L	0.00422	0.00059	0.00061	0.00063	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Arsenic (As)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Barium (Ba)	mg/L	0.22	0.025	0.0247	0.0259	0.0641	0.0781	0.0667	0.0529
	Beryllium (Be)	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
	Bismuth (Bi)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Boron (B)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Cadmium (Cd)	mg/L	0.000259	0.000661	0.000556	0.000693	< 0.000025	< 0.000025	< 0.000025	< 0.000025
	Calcium (Ca)	mg/L	226	449	441	446	185	63	60.9	47.3
	Chromium (Cr)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Cobalt (Co)	mg/L	0.00052	< 0.0005	< 0.0005	< 0.0005	0.00196	< 0.0005	< 0.0005	< 0.0005
	Copper (Cu)	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	Iron (Fe)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Lead (Pb)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Lithium (Li)	mg/L	0.146	0.0642	0.0646	0.063	0.0278	0.008	0.0076	< 0.005
	Magnesium (Mg)	mg/L	147	308	347	343	109	18.8	19.2	11.7
	Manganese (Mn)	mg/L	0.00267	0.00089	0.00072	0.00252	0.00592	0.00084	0.00102	0.00099
	Mercury (Hg)	mg/L	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005
	Molybdenum (Mo)	mg/L	0.0172	0.00244	0.00246	0.00246	0.0015	0.00124	0.00107	0.00089
	Nickel (Ni)	mg/L	0.062	0.0592	0.0584	0.0601	0.0381	< 0.0025	< 0.0025	< 0.0025
	Phosphorus (P)	mg/L	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
	Potassium (K)	mg/L	6.07	4.6	4.63	4.6	3.14	0.68	0.62	0.38
	Selenium (Se)	mg/L	0.127	0.577	0.566	0.575	0.0135	0.0114	0.00996	0.00143
	Silicon (Si)	mg/L	2.42	2.43	2.8	2.73	2.07	2	2.14	1.9
	Silver (Ag)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Sodium (Na)	mg/L	8.25	1.79	1.78	1.81	19.7	2.57	2.09	0.9
	Strontium (Sr)	mg/L	0.763	0.251	0.249	0.251	0.542	0.214	0.225	0.209
	Sulfur (S)	mg/L	242	557	604	594	218	25.7	24.5	10.3
	Thallium (Tl)	mg/L	0.000073	0.000067	0.000065	0.000067	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Tin (Sn)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Titanium (Ti)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015
	Uranium (U)	mg/L	0.0113	0.0204	0.0203	0.0205	0.0059	0.00123	0.00107	0.000701
	Vanadium (V)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Zinc (Zn)	mg/L	0.0152	0.0389	0.0338	0.048	< 0.005	< 0.005	< 0.005	< 0.005
	Zirconium (Zr)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015

Table A.8: Water quality data for areas sampled, September 2015.

Analytes		Units	ELDEL	ELDFE	ELDGR	ELELKO	ELH93	ELUEL	ELUFE	ELUFO
			17-Sep-2015	16-Sep-2015	17-Sep-2015	14-Sep-2015	16-Sep-2015	13-Sep-2015	15-Sep-2015	14-Sep-2015
Physical Tests	Hardness (as $CaCO_3$)	mg/L	164	232	221	231	212	174	235	175
	Total Suspended Solids	mg/L	< 1.0	1.9	< 1.0	2.2	< 1.0	< 1.0	2	2
	Total Dissolved Solids	mg/L	201	270	292	275	253	201	302	204
	Turbidity	NTU	0.28	1.44	0.33	1.15	0.58	0.53	0.6	0.81
Anions & Nutrients	Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	147	160	157	153	153	130	160	143
	Alkalinity, Carbonate (as $CaCO_3$)	mg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
	Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
	Alkalinity, Total (as $CaCO_3$)	mg/L	147	160	157	153	153	130	160	143
	Ammonia, Total (as N)	mg/L	< 0.005	0.0078	0.0071	0.0126	< 0.005	< 0.005	< 0.005	0.0058
	Bromide (Br)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Chloride (Cl)	mg/L	< 0.5	2.22	1.44	2.21	1.86	< 0.5	2.2	1.39
	Fluoride (F)	mg/L	0.141	0.168	0.156	0.167	0.154	0.11	0.172	0.167
	Nitrate (as N)	mg/L	0.26	2.09	2.7	1.95	1.7	0.278	2.28	0.237
	Nitrite (as N)	mg/L	0.0015	0.0041	0.0033	0.0011	0.0024	0.0019	< 0.001	< 0.001
	Total Kjeldahl Nitrogen	mg/L	< 0.05	0.135	0.091	0.403	0.092	0.076	0.118	0.1
	Orthophosphate-Dissolved (as P)	mg/L	< 0.001	0.0013	< 0.001	< 0.001	0.0019	< 0.001	< 0.001	< 0.001
	Phosphorus (P)-Total	mg/L	0.0021	0.005	0.0035	0.0063	0.004	0.0042	0.0034	0.0022
	Sulfate (SO_4)	mg/L	31.4	73	72.6	69.9	61.9	28.9	75.1	32.6
Organic / Inorganic Carbon	Dissolved Organic Carbon	mg/L	1.21	0.97	1.08	0.71	1.11	1.02	0.6	0.57
	Total Organic Carbon	mg/L	1.37	1.52	1	1.08	1.21	1.23	0.56	0.56
Total Metals	Aluminum (Al)	mg/L	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
	Antimony (Sb)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Arsenic (As)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Barium (Ba)	mg/L	0.0536	0.0789	0.0716	0.0881	0.0869	0.0574	0.0838	0.059
	Beryllium (Be)	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
	Bismuth (Bi)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Boron (B)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Cadmium (Cd)	mg/L	< 0.000025	< 0.000025	< 0.000025	< 0.000025	< 0.000025	< 0.000025	0.000027	< 0.000025
	Calcium (Ca)	mg/L	50.7	64.7	62.8	64.4	60	52.2	66.7	52.9
	Chromium (Cr)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Cobalt (Co)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Copper (Cu)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Iron (Fe)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Lead (Pb)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Lithium (Li)	mg/L	< 0.005	0.0087	0.0089	0.0074	0.0081	< 0.005	0.01	< 0.005
	Magnesium (Mg)	mg/L	11.5	18.4	18.4	19.7	18.7	11.8	21.6	12.7
	Manganese (Mn)	mg/L	0.00125	0.00559	0.00109	0.0027	0.00124	0.00192	0.00196	0.00364
	Mercury (Hg)	mg/L	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005
	Molybdenum (Mo)	mg/L	0.00101	0.00119	0.00107	0.00124	0.00118	0.00103	0.00132	0.00109
	Nickel (Ni)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Phosphorus (P)	mg/L	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
	Potassium (K)	mg/L	0.38	0.71	0.64	0.73	0.67	0.42	0.67	0.49
	Selenium (Se)	mg/L	0.00129	0.00883	0.01	0.00862	0.00785	0.0014	0.00941	0.00123
	Silicon (Si)	mg/L	1.83	1.88	1.95	1.9	2.14	1.88	2.18	2.02
	Silver (Ag)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Sodium (Na)	mg/L	0.9	2.72	2.15	2.94	2.56	0.9	2.89	2
	Strontium (Sr)	mg/L	0.249	0.228	0.228	0.228	0.2	0.228	0.222	0.265
	Sulfur (S)	mg/L	11	22	24.7	24.3	20.1	10.1	25.8	11.4
	Thallium (Tl)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Tin (Sn)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Titanium (Ti)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015
	Uranium (U)	mg/L	0.000777	0.00114	0.00115	0.00105	0.00105	0.000812	0.00119	0.000757
	Vanadium (V)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Zinc (Zn)	mg/L	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
	Zirconium (Zr)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015
Dissolved Metals	Aluminum (Al)	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
	Antimony (Sb)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Arsenic (As)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Barium (Ba)	mg/L	0.0509	0.0835	0.0661	0.0826	0.089	0.0561	0.0789	0.0566
	Beryllium (Be)	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
	Bismuth (Bi)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Boron (B)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Cadmium (Cd)	mg/L	< 0.000025	< 0.000025	< 0.000025	< 0.000025	< 0.000025	< 0.000025	< 0.000025	< 0.000025
	Calcium (Ca)	mg/L	47.4	62.9	58.4	62.2	56.9	50.5	62.2	50.6
	Chromium (Cr)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Cobalt (Co)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Copper (Cu)	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	Iron (Fe)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Lead (Pb)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Lithium (Li)	mg/L	< 0.005	0.0082	0.0082	0.0072	0.0077	< 0.005	0.0086	< 0.005
	Magnesium (Mg)	mg/L	11.2	18.2	18.3	18.3	17.1	11.5	19.3	11.8
	Manganese (Mn)	mg/L	0.00091	0.00417	0.00098	0.00107	0.00081	0.00088	0.00123	0.00209
	Mercury (Hg)	mg/L	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005
	Molybdenum (Mo)	mg/L	0.00092	0.00126	0.00097	0.00127	0.00124	0.00099	0.00128	0.00113
	Nickel (Ni)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Phosphorus (P)	mg/L	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
	Potassium (K)	mg/L	0.37	0.69	0.59	0.67	0.61	0.4	0.68	0.43
	Selenium (Se)	mg/L	0.00108	0.00958	0.00949	0.00852	0.00796	0.00137	0.00925	0.00122
	Silicon (Si)	mg/L	1.84	1.92	2.01	1.78	2.04	1.87	2	1.91
	Silver (Ag)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Sodium (Na)	mg/L	0.85	2.81	2.02	2.74	2.5	0.85	2.73	1.85
	Strontium (Sr)	mg/L	0.236	0.228	0.212	0.215	0.203	0.217	0.207	0.252
	Sulfur (S)	mg/L	10	23.7	23.1	21.3	21.1	9.9	23.4	10.2
	Thallium (Tl)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Tin (Sn)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Titanium (Ti)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015
	Uranium (U)	mg/L	0.000731	0.00113	0.00104	0.00101	0.00103	0.000752	0.00112	0.000738
	Vanadium (V)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Zinc (Zn)	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
	Zirconium (Zr)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015

Table A.8: Water quality data for areas sampled, September 2015.

Analytes		Units	ELUSP	FO29	FO10-SP1	FO22	FO23-1	FO9	FOBCP	FOBKS
			15-Sep-2015	13-Sep-2015	17-Sep-2015	12-Sep-2015	16-Sep-2015	18-Sep-2015	17-Sep-2015	16-Sep-2015
Physical Tests	Hardness (as $CaCO_3$)	mg/L	227	369	532	550	376	374	513	369
	Total Suspended Solids	mg/L	1.2	< 1.0	11	< 1.0	2.3	< 1.0	< 1.0	1.6
	Total Dissolved Solids	mg/L	282	438	658	714	464	474	669	429
	Turbidity	NTU	0.55	0.39	3.2	0.25	1.37	0.19	0.23	0.56
Anions & Nutrients	Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	157	160	210	200	183	183	187	167
	Alkalinity, Carbonate (as $CaCO_3$)	mg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
	Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
	Alkalinity, Total (as $CaCO_3$)	mg/L	157	160	210	200	183	183	187	167
	Ammonia, Total (as N)	mg/L	< 0.005	< 0.005	< 0.005	0.0073	< 0.005	< 0.005	0.0075	0.0056
	Bromide (Br)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Chloride (Cl)	mg/L	1.55	0.94	1.56	1.38	1.39	1.26	1.21	0.83
	Fluoride (F)	mg/L	0.175	0.126	0.107	0.114	0.187	0.146	0.16	0.183
	Nitrate (as N)	mg/L	2.34	9.58	17.4	18.8	8.89	9.95	11.4	9.46
	Nitrite (as N)	mg/L	0.0013	0.0061	0.0072	0.0061	0.0028	0.0041	0.0151	0.0095
	Total Kjeldahl Nitrogen	mg/L	0.112	0.146	< 0.05	0.069	0.081	< 0.05	< 0.25	0.11
	Orthophosphate-Dissolved (as P)	mg/L	< 0.001	< 0.001	0.002	< 0.001	0.0018	< 0.001	< 0.001	< 0.001
	Phosphorus (P)-Total	mg/L	0.0041	0.0036	0.0046	0.0037	0.0056	0.003	0.0048	0.0042
	Sulfate (SO_4)	mg/L	67.7	148	75.8	263	164	160	284	149
Organic / Inorganic Carbon	Dissolved Organic Carbon	mg/L	0.58	0.57	< 0.5	0.55	1.09	1.11	1.23	< 0.5
	Total Organic Carbon	mg/L	0.57	0.6	< 0.5	0.53	1.28	1.39	1.33	< 0.5
Total Metals	Aluminum (Al)	mg/L	< 0.015	< 0.015	0.019	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
	Antimony (Sb)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Arsenic (As)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Barium (Ba)	mg/L	0.0742	0.116	0.132	0.118	0.102	0.109	0.0767	0.0848
	Beryllium (Be)	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
	Bismuth (Bi)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Boron (B)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Cadmium (Cd)	mg/L	< 0.000025	0.000028	0.000044	0.000042	0.000069	< 0.000025	0.000045	0.000056
	Calcium (Ca)	mg/L	63.6	95.5	117	124	95.7	87.4	106	84.7
	Chromium (Cr)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Cobalt (Co)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Copper (Cu)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Iron (Fe)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Lead (Pb)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Lithium (Li)	mg/L	0.0076	0.016	0.0323	0.0288	0.0219	0.0179	0.038	0.0322
	Magnesium (Mg)	mg/L	19.8	38.6	53.2	60.6	38.9	35.5	56	34.5
	Manganese (Mn)	mg/L	0.00503	0.00143	0.00275	0.00439	0.00119	0.00087	0.00727	0.0117
	Mercury (Hg)	mg/L	< 0.000005	< 0.000005	< 0.000005	< 0.000005	0.0000053	< 0.000005	< 0.000005	< 0.000005
	Molybdenum (Mo)	mg/L	0.00121	0.0008	0.00083	0.00083	0.00113	0.00083	0.00133	0.00116
	Nickel (Ni)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	0.0053	< 0.0025
	Phosphorus (P)	mg/L	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
	Potassium (K)	mg/L	0.62	1.14	1.89	1.78	1.16	1.08	1.69	1.48
	Selenium (Se)	mg/L	0.00937	0.0348	0.0606	0.068	0.0347	0.0336	0.0638	0.0239
	Silicon (Si)	mg/L	2.2	2.35	2.04	2.31	2.32	1.97	1.88	1.86
	Silver (Ag)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Sodium (Na)	mg/L	2.5	1.89	2.06	2.15	3.4	1.83	1.69	1.69
	Strontium (Sr)	mg/L	0.228	0.148	0.147	0.161	0.168	0.134	0.145	0.141
	Sulfur (S)	mg/L	23.3	55.4	79.3	94.7	54.7	54.7	96.8	48.3
	Thallium (Tl)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Tin (Sn)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Titanium (Ti)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015
	Uranium (U)	mg/L	0.00117	0.00174	0.00268	0.00276	0.00208	0.00162	0.00318	0.00178
	Vanadium (V)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Zinc (Zn)	mg/L	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
	Zirconium (Zr)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015
Dissolved Metals	Aluminum (Al)	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
	Antimony (Sb)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Arsenic (As)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Barium (Ba)	mg/L	0.0678	0.111	0.127	0.12	0.102	0.108	0.0764	0.0836
	Beryllium (Be)	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
	Bismuth (Bi)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Boron (B)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Cadmium (Cd)	mg/L	< 0.000025	< 0.000025	0.000036	0.000039	0.000039	< 0.000025	0.000045	0.000051
	Calcium (Ca)	mg/L	60.2	88.3	113	123	88.3	86.4	105	82.6
	Chromium (Cr)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Cobalt (Co)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Copper (Cu)	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	Iron (Fe)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Lead (Pb)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Lithium (Li)	mg/L	0.0073	0.0156	0.032	0.0297	0.0209	0.0182	0.0375	0.0317
	Magnesium (Mg)	mg/L	18.6	36	60.8	58.8	37.7	38.4	60.7	39.6
	Manganese (Mn)	mg/L	0.00368	0.00079	0.00216	0.00398	< 0.0005	< 0.0005	0.00651	0.00985
	Mercury (Hg)	mg/L	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005
	Molybdenum (Mo)	mg/L	0.00118	0.0008	0.00083	0.00083	0.00107	0.00076	0.00134	0.00112
	Nickel (Ni)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	0.006	< 0.0025
	Phosphorus (P)	mg/L	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
	Potassium (K)	mg/L	0.6	1.11	1.91	1.79	1.16	1.08	1.73	1.48
	Selenium (Se)	mg/L	0.0094	0.0342	0.0601	0.0664	0.0349	0.0339	0.064	0.023
	Silicon (Si)	mg/L	2.08	2.17	2.19	2.21	2.18	2.06	1.9	2.01
	Silver (Ag)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Sodium (Na)	mg/L	2.33	1.77	2.01	2.14	3.25	1.79	1.73	1.65
	Strontium (Sr)	mg/L	0.215	0.137	0.142	0.161	0.168	0.134	0.144	0.137
	Sulfur (S)	mg/L	21.3	50.3	84.9	89.2	55.2	52.8	89.1	53.4
	Thallium (Tl)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Tin (Sn)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Titanium (Ti)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015
	Uranium (U)	mg/L	0.00108	0.00167	0.00254	0.00273	0.00205	0.00155	0.00308	0.00175
	Vanadium (V)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Zinc (Zn)	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
	Zirconium (Zr)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015

Table A.8: Water quality data for areas sampled, September 2015.

Analytes		Units	FOBSC	FODGH	FODHE	FODNGD	FODPO	FORD7-75	FOUEW	FOUKI
			17-Sep-2015	16-Sep-2015	14-Sep-2015	14-Sep-2015	15-Sep-2015	18-Sep-2015	13-Sep-2015	16-Sep-2015
Physical Tests	Hardness (as $CaCO_3$)	mg/L	400	403	208	294	551	496	495	373
	Total Suspended Solids	mg/L	< 1.0	< 1.0	1	1.4	1.1	< 1.0	< 1.0	< 1.0
	Total Dissolved Solids	mg/L	483	475	280	406	711	670	630	440
	Turbidity	NTU	0.25	0.38	0.37	0.73	0.25	0.19	0.25	0.39
Anions & Nutrients	Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	190	167	133	160	243	203	195	177
	Alkalinity, Carbonate (as $CaCO_3$)	mg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
	Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
	Alkalinity, Total (as $CaCO_3$)	mg/L	190	167	133	160	243	203	195	177
	Ammonia, Total (as N)	mg/L	< 0.005	< 0.005	< 0.005	0.0274	< 0.005	< 0.005	< 0.005	0.0056
	Bromide (Br)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Chloride (Cl)	mg/L	0.86	1.12	< 0.5	< 0.5	1.3	1.27	1.42	0.84
	Fluoride (F)	mg/L	0.169	0.129	0.215	0.181	0.146	0.096	0.103	0.151
	Nitrate (as N)	mg/L	9.95	9.53	2.86	10.3	18.4	16.9	16.3	9.47
	Nitrite (as N)	mg/L	0.0094	0.005	0.0032	0.0071	0.0024	0.0039	0.0058	0.012
	Total Kjeldahl Nitrogen	mg/L	< 0.05	0.084	< 0.05	0.134	< 0.05	< 0.25	0.055	0.096
	Orthophosphate-Dissolved (as P)	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	0.0021	< 0.001	0.0013	< 0.001
	Phosphorus (P)-Total	mg/L	0.0058	0.0037	0.0034	0.0051	0.0047	0.0037	0.0033	0.0068
	Sulfate (SO_4)	mg/L	183	175	84.4	119	264	242	231	150
Organic / Inorganic Carbon	Dissolved Organic Carbon	mg/L	1.2	0.59	0.51	0.54	1.01	1.46	0.83	0.57
	Total Organic Carbon	mg/L	1.36	0.62	0.53	0.55	1.15	1.4	0.86	0.53
Total Metals	Aluminum (Al)	mg/L	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
	Antimony (Sb)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Arsenic (As)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Barium (Ba)	mg/L	0.0804	0.11	0.0438	0.0849	0.106	0.112	0.118	0.0845
	Beryllium (Be)	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
	Bismuth (Bi)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Boron (B)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Cadmium (Cd)	mg/L	0.000056	0.000028	< 0.000025	0.000037	0.00003	< 0.000025	0.00004	0.000045
	Calcium (Ca)	mg/L	90.7	89.4	64.5	81.8	119	113	118	85
	Chromium (Cr)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Cobalt (Co)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Copper (Cu)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Iron (Fe)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Lead (Pb)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Lithium (Li)	mg/L	0.0352	0.0154	< 0.005	0.0273	0.0314	0.0307	0.0262	0.0321
	Magnesium (Mg)	mg/L	38.7	38.9	19	26.7	58	51.8	54	34.8
	Manganese (Mn)	mg/L	0.00956	0.00161	0.0029	0.00181	0.00132	0.00379	0.00323	0.0128
	Mercury (Hg)	mg/L	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005
	Molybdenum (Mo)	mg/L	0.0013	0.00092	0.00077	0.00121	0.00087	0.00081	0.00083	0.00126
	Nickel (Ni)	mg/L	0.0028	< 0.0025	< 0.0025	0.0028	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Phosphorus (P)	mg/L	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
	Potassium (K)	mg/L	1.5	1.12	0.58	1.16	1.81	1.62	1.64	1.48
	Selenium (Se)	mg/L	0.0339	0.037	0.00982	0.0234	0.0682	0.0566	0.0588	0.0233
	Silicon (Si)	mg/L	1.81	2.09	1.58	1.83	2.21	2.04	2.25	1.9
	Silver (Ag)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Sodium (Na)	mg/L	1.69	1.81	0.66	1.43	2.16	2.04	2.09	1.72
	Strontium (Sr)	mg/L	0.137	0.14	0.114	0.141	0.157	0.149	0.157	0.145
	Sulfur (S)	mg/L	62.7	57.9	28.9	42.9	86	84.5	83.2	48.6
	Thallium (Tl)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Tin (Sn)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Titanium (Ti)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015
	Uranium (U)	mg/L	0.00215	0.00179	0.000865	0.0015	0.00283	0.00248	0.00254	0.00184
	Vanadium (V)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Zinc (Zn)	mg/L	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
	Zirconium (Zr)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015
Dissolved Metals	Aluminum (Al)	mg/L	0.0054	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
	Antimony (Sb)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Arsenic (As)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Barium (Ba)	mg/L	0.08	0.111	0.0389	0.0807	0.11	0.109	0.114	0.0847
	Beryllium (Be)	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
	Bismuth (Bi)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Boron (B)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Cadmium (Cd)	mg/L	0.000041	< 0.000025	< 0.000025	0.000026	0.000041	0.000029	0.000027	0.000054
	Calcium (Ca)	mg/L	90.8	87.2	57.1	75.8	124	109	110	83.7
	Chromium (Cr)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Cobalt (Co)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Copper (Cu)	mg/L	0.0016	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	Iron (Fe)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Lead (Pb)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Lithium (Li)	mg/L	0.0349	0.0161	< 0.005	0.0258	0.0314	0.029	0.0251	0.0324
	Magnesium (Mg)	mg/L	42.1	45.1	15.9	25.4	58.4	54.7	53.1	39.8
	Manganese (Mn)	mg/L	0.00895	0.00101	0.00188	0.00061	0.00078	0.00334	0.0028	0.0121
	Mercury (Hg)	mg/L	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005
	Molybdenum (Mo)	mg/L	0.00133	0.00092	0.00078	0.00121	0.00078	0.00081	0.00076	0.00113
	Nickel (Ni)	mg/L	0.003	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Phosphorus (P)	mg/L	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
	Potassium (K)	mg/L	1.54	1.16	0.49	1.13	1.75	1.59	1.6	1.49
	Selenium (Se)	mg/L	0.0336	0.0366	0.0102	0.0233	0.0701	0.0572	0.057	0.023
	Silicon (Si)	mg/L	1.89	2.28	1.41	1.73	2.18	2.08	2.13	2.03
	Silver (Ag)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Sodium (Na)	mg/L	1.68	1.77	0.52	1.35	2.12	1.93	2.01	1.66
	Strontium (Sr)	mg/L	0.139	0.135	0.103	0.13	0.161	0.144	0.149	0.138
	Sulfur (S)	mg/L	59.3	63.2	27.6	35.9	93	80.3	78.2	53.2
	Thallium (Tl)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Tin (Sn)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Titanium (Ti)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015
	Uranium (U)	mg/L	0.00211	0.00177	0.000799	0.00138	0.00281	0.00242	0.00245	0.00176
	Vanadium (V)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Zinc (Zn)	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
	Zirconium (Zr)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015

Table A.8: Water quality data for areas sampled, September 2015.

Analytes		Units	FOUL	FOUNGD	FOUSH	GHCKD	GHCKU	GRCK	GRDS	GREE1-50
			17-Sep-2015	15-Sep-2015	15-Sep-2015	15-Sep-2015	15-Sep-2015	17-Sep-2015	12-Sep-2015	15-Sep-2015
Physical Tests	Hardness (as $CaCO_3$)	mg/L	380	299	312	917	1,030	341	353	912
	Total Suspended Solids	mg/L	< 1.0	< 1.0	6.3	< 1.0	1.5	< 1.0	2.1	< 1.0
	Total Dissolved Solids	mg/L	453	369	382	1200	1370	428	429	1220
	Turbidity	NTU	0.38	0.27	3.56	1.06	0.24	0.31	0.47	0.63
Anions & Nutrients	Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	177	157	160	210	273	183	175	213
	Alkalinity, Carbonate (as $CaCO_3$)	mg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
	Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
	Alkalinity, Total (as $CaCO_3$)	mg/L	177	157	160	210	273	183	175	213
	Ammonia, Total (as N)	mg/L	< 0.005	0.0196	0.008	0.0094	0.0065	0.0081	0.0086	0.0061
	Bromide (Br)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	< 0.05	< 0.25
	Chloride (Cl)	mg/L	1.13	< 0.5	< 0.5	< 2.5	< 2.5	0.89	2.42	< 2.5
	Fluoride (F)	mg/L	0.12	0.185	0.178	0.14	0.17	0.181	0.117	0.14
	Nitrate (as N)	mg/L	9.41	10.1	9.84	4.67	6.09	0.754	0.889	4.59
	Nitrite (as N)	mg/L	0.0016	0.005	0.0086	0.012	< 0.005	< 0.001	< 0.001	0.0132
	Total Kjeldahl Nitrogen	mg/L	0.069	0.09	0.075	0.28	0.224	0.319	0.22	0.186
	Orthophosphate-Dissolved (as P)	mg/L	0.0011	0.0021	0.0019	0.0015	0.0019	0.0032	0.0015	0.0022
	Phosphorus (P)-Total	mg/L	0.0032	0.0039	0.0123	0.0141	0.006	0.0045	0.0071	0.0061
	Sulfate (SO_4)	mg/L	159	116	128	696	737	155	152	691
Organic / Inorganic Carbon	Dissolved Organic Carbon	mg/L	< 0.5	1.14	1.16	2.72	0.83	1.44	0.66	2.57
	Total Organic Carbon	mg/L	< 0.5	1.03	1.33	2.75	2.34	1.54	0.67	2.53
Total Metals	Aluminum (Al)	mg/L	< 0.015	< 0.015	0.054	0.037	< 0.015	0.021	0.016	< 0.015
	Antimony (Sb)	mg/L	< 0.0005	< 0.0005	< 0.0005	0.00108	0.00143	< 0.0005	< 0.0005	0.00124
	Arsenic (As)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Barium (Ba)	mg/L	0.112	0.0812	0.087	0.0446	0.0581	0.0679	0.071	0.0485
	Beryllium (Be)	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
	Bismuth (Bi)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Boron (B)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Cadmium (Cd)	mg/L	< 0.000025	< 0.000025	0.000039	< 0.000025	< 0.000025	< 0.000025	< 0.000025	< 0.000025
	Calcium (Ca)	mg/L	87.3	81.3	84.2	136	185	75	76.8	152
	Chromium (Cr)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Cobalt (Co)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Copper (Cu)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Iron (Fe)	mg/L	< 0.05	< 0.05	0.125	0.07	< 0.05	< 0.05	< 0.05	< 0.05
	Lead (Pb)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Lithium (Li)	mg/L	0.0149	0.0276	0.028	0.0111	0.0115	0.0081	0.0061	0.0125
	Magnesium (Mg)	mg/L	38.1	27	31.3	120	144	37.7	39.1	131
	Manganese (Mn)	mg/L	0.00078	0.00097	0.0162	0.00471	0.0025	0.00239	0.00185	0.00144
	Mercury (Hg)	mg/L	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005
	Molybdenum (Mo)	mg/L	0.0009	0.00117	0.0012	0.00396	0.00419	0.0011	0.00108	0.00433
	Nickel (Ni)	mg/L	< 0.0025	< 0.0025	< 0.0025	0.025	0.04	< 0.0025	< 0.0025	0.026
	Phosphorus (P)	mg/L	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
	Potassium (K)	mg/L	1.13	1.15	1.29	2.55	3.1	0.82	0.83	2.7
	Selenium (Se)	mg/L	0.0338	0.024	0.0255	0.0861	0.107	0.0251	0.0228	0.0964
	Silicon (Si)	mg/L	2.24	1.82	2.02	2.35	3.49	2.12	2.32	2.56
	Silver (Ag)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Sodium (Na)	mg/L	1.9	1.36	1.53	2.41	2.78	1.78	1.91	2.62
	Strontium (Sr)	mg/L	0.142	0.14	0.141	0.169	0.223	0.129	0.147	0.192
	Sulfur (S)	mg/L	53.5	37.8	42.4	199	236	53.8	52.4	214
	Thallium (Tl)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Tin (Sn)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Titanium (Ti)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015
	Uranium (U)	mg/L	0.00164	0.00153	0.00161	0.00635	0.00813	0.00222	0.00213	0.00701
	Vanadium (V)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Zinc (Zn)	mg/L	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
	Zirconium (Zr)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015
Dissolved Metals	Aluminum (Al)	mg/L	< 0.005	< 0.005	< 0.005	0.0051	< 0.005	< 0.005	< 0.005	< 0.005
	Antimony (Sb)	mg/L	< 0.0005	< 0.0005	< 0.0005	0.00113	0.00126	< 0.0005	< 0.0005	0.00112
	Arsenic (As)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Barium (Ba)	mg/L	0.105	0.0822	0.0837	0.0496	0.0564	0.065	0.0699	0.0497
	Beryllium (Be)	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
	Bismuth (Bi)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Boron (B)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Cadmium (Cd)	mg/L	< 0.000025	< 0.000025	0.000028	< 0.000025	< 0.000025	< 0.000025	< 0.000025	< 0.000025
	Calcium (Ca)	mg/L	84	79.6	81.5	155	186	72.6	76.3	154
	Chromium (Cr)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Cobalt (Co)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Copper (Cu)	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	Iron (Fe)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Lead (Pb)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Lithium (Li)	mg/L	0.0153	0.0276	0.0283	0.0121	0.0113	0.0073	0.0069	0.0122
	Magnesium (Mg)	mg/L	41.4	24.4	26.4	129	138	38.9	39.6	128
	Manganese (Mn)	mg/L	< 0.0005	0.00061	0.00964	0.00118	0.00214	0.00108	0.00067	0.00109
	Mercury (Hg)	mg/L	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005
	Molybdenum (Mo)	mg/L	0.00083	0.00118	0.00121	0.00442	0.00395	0.00097	0.00106	0.00439
	Nickel (Ni)	mg/L	< 0.0025	< 0.0025	< 0.0025	0.0283	0.0369	< 0.0025	< 0.0025	0.0255
	Phosphorus (P)	mg/L	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
	Potassium (K)	mg/L	1.13	1.12	1.23	2.67	2.88	0.8	0.84	2.6
	Selenium (Se)	mg/L	0.0331	0.024	0.0242	0.0974	0.107	0.0248	0.0237	0.0966
	Silicon (Si)	mg/L	2.31	1.74	1.8	2.48	3.22	2.1	2.31	2.45
	Silver (Ag)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Sodium (Na)	mg/L	1.84	1.32	1.47	2.61	2.69	1.67	1.86	2.6
	Strontium (Sr)	mg/L	0.136	0.143	0.143	0.195	0.213	0.125	0.144	0.194
	Sulfur (S)	mg/L	55.6	38.2	41.8	210	241	51.3	50.9	215
	Thallium (Tl)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Tin (Sn)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Titanium (Ti)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015
	Uranium (U)	mg/L	0.00152	0.00147	0.00154	0.00702	0.00769	0.00208	0.00211	0.00696
	Vanadium (V)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Zinc (Zn)	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
	Zirconium (Zr)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015

Table A.8: Water quality data for areas sampled, September 2015.

Analytes		Units	GREE3-75	GREE4-25	GREE4-75	HACKDS	HACKUS	HARM1-50	HARM5-25	HENFO
			15-Sep-2015	16-Sep-2015	16-Sep-2015	10-Sep-2015	11-Sep-2015	12-Sep-2015	12-Sep-2015	16-Sep-2015
Physical Tests	Hardness (as $CaCO_3$)	mg/L	1,080	1,470	1,660	400	428	400	462	238
	Total Suspended Solids	mg/L	< 1.0	< 1.0	2.8	< 1.0	1	< 1.0	< 1.0	< 1.0
	Total Dissolved Solids	mg/L	1420	1790	2050	482	528	510	578	281
	Turbidity	NTU	0.23	0.27	1.22	0.25	0.24	0.45	0.34	0.33
Anions & Nutrients	Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	277	300	450	315	210	150	175	133
	Alkalinity, Carbonate (as $CaCO_3$)	mg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
	Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
	Alkalinity, Total (as $CaCO_3$)	mg/L	277	300	450	315	210	150	175	133
	Ammonia, Total (as N)	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	0.0112	< 0.005	< 0.005	< 0.005
	Bromide (Br)	mg/L	< 0.25	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Chloride (Cl)	mg/L	< 2.5	11.6	< 2.5	1.37	1.13	1.04	1.4	< 0.5
	Fluoride (F)	mg/L	0.16	0.26	< 0.1	0.188	0.18	0.15	0.146	0.242
	Nitrate (as N)	mg/L	6.67	48.5	11.2	0.994	1.19	0.993	1.46	3.88
	Nitrite (as N)	mg/L	0.0067	0.0062	0.0201	0.0023	< 0.001	0.0014	< 0.001	0.0017
	Total Kjeldahl Nitrogen	mg/L	0.223	0.207	0.215	0.148	0.169	0.203	0.199	0.065
	Orthophosphate-Dissolved (as P)	mg/L	0.002	0.001	0.0108	0.0062	0.0077	0.0045	0.005	< 0.001
	Phosphorus (P)-Total	mg/L	0.0055	0.0044	0.0164	0.0108	0.0098	0.0102	0.0089	0.0026
	Sulfate (SO_4)	mg/L	777	4690	1080	192	212	192	254	99.1
Organic / Inorganic Carbon	Dissolved Organic Carbon	mg/L	2.14	1.48	1.64	0.92	0.83	0.64	0.62	< 0.5
	Total Organic Carbon	mg/L	2.35	1.43	1.39	0.99	0.86	0.66	0.55	< 0.5
Total Metals	Aluminum (Al)	mg/L	< 0.015	< 0.015	0.022	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
	Antimony (Sb)	mg/L	0.0014	0.00214	0.00264	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Arsenic (As)	mg/L	< 0.0005	0.00052	0.00061	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Barium (Ba)	mg/L	0.0521	0.0414	0.0452	0.067	0.0682	0.0694	0.0436	0.0297
	Beryllium (Be)	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
	Bismuth (Bi)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Boron (B)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Cadmium (Cd)	mg/L	< 0.000025	< 0.000025	0.000858	< 0.000025	< 0.000025	0.000025	< 0.000025	< 0.000025
	Calcium (Ca)	mg/L	178	244	307	86.8	88.7	90.5	92.5	62.5
	Chromium (Cr)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Cobalt (Co)	mg/L	< 0.0005	< 0.0005	0.00128	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Copper (Cu)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Iron (Fe)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Lead (Pb)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Lithium (Li)	mg/L	0.0103	0.0096	0.0122	0.0065	0.0063	0.0062	0.0072	< 0.005
	Magnesium (Mg)	mg/L	141	177	195	47.9	52.4	50.7	56.6	19
	Manganese (Mn)	mg/L	0.00341	0.0111	0.0265	0.00344	0.00078	0.00354	< 0.0005	0.0045
	Mercury (Hg)	mg/L	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005
	Molybdenum (Mo)	mg/L	0.00424	0.00565	0.00684	0.00102	0.00102	0.00103	0.00105	0.00081
	Nickel (Ni)	mg/L	0.0445	0.0774	0.107	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Phosphorus (P)	mg/L	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
	Potassium (K)	mg/L	3.08	3.62	4.01	0.95	0.97	0.96	1.15	0.59
	Selenium (Se)	mg/L	0.107	0.165	0.184	0.0352	0.0395	0.0355	0.0476	0.0139
	Silicon (Si)	mg/L	3.28	3.23	3.17	2.21	2.2	2.29	1.86	1.42
	Silver (Ag)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Sodium (Na)	mg/L	2.55	1.91	1.83	1.67	1.68	1.71	1.63	0.54
	Strontium (Sr)	mg/L	0.196	0.185	0.202	0.13	0.122	0.135	0.116	0.116
	Sulfur (S)	mg/L	233	313	345	66.3	74	73.6	86.2	31.2
	Thallium (Tl)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Tin (Sn)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Titanium (Ti)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015
	Uranium (U)	mg/L	0.0082	0.0108	0.0129	0.00274	0.00292	0.00271	0.00353	0.000976
	Vanadium (V)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Zinc (Zn)	mg/L	< 0.015	< 0.015	0.064	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
	Zirconium (Zr)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015
Dissolved Metals	Aluminum (Al)	mg/L	< 0.005	< 0.005	0.0053	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
	Antimony (Sb)	mg/L	0.00146	0.00216	0.00252	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Arsenic (As)	mg/L	< 0.0005	< 0.0005	0.00058	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Barium (Ba)	mg/L	0.0532	0.0428	0.0444	0.0637	0.0654	0.0653	0.0424	0.0297
	Beryllium (Be)	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
	Bismuth (Bi)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Boron (B)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Cadmium (Cd)	mg/L	< 0.000025	< 0.000025	0.000833	< 0.000025	< 0.000025	< 0.000025	< 0.000025	< 0.000025
	Calcium (Ca)	mg/L	194	244	301	82.6	85.8	83.2	88.2	62.5
	Chromium (Cr)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Cobalt (Co)	mg/L	< 0.0005	< 0.0005	0.00117	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Copper (Cu)	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	Iron (Fe)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Lead (Pb)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Lithium (Li)	mg/L	0.0113	0.0093	0.011	0.0056	0.0058	0.0067	0.0074	0.0054
	Magnesium (Mg)	mg/L	144	209	222	47.2	51.8	46.7	58.6	19.9
	Manganese (Mn)	mg/L	0.00287	0.0111	0.0245	0.0024	0.00063	0.00248	< 0.0005	0.00349
	Mercury (Hg)	mg/L	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005
	Molybdenum (Mo)	mg/L	0.00447	0.00575	0.00668	0.00093	0.00092	0.00094	0.00093	0.00077
	Nickel (Ni)	mg/L	0.0437	0.072	0.104	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Phosphorus (P)	mg/L	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
	Potassium (K)	mg/L	3.04	3.57	4	0.93	0.96	0.91	1.08	0.58
	Selenium (Se)	mg/L	0.118	0.166	0.187	0.0326	0.0387	0.0321	0.0455	0.0136
	Silicon (Si)	mg/L	3.27	3.49	3.45	2.07	2.03	2.11	1.88	1.53
	Silver (Ag)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Sodium (Na)	mg/L	2.56	1.8	1.75	1.62	1.66	1.55	1.48	0.5
	Strontium (Sr)	mg/L	0.202	0.183	0.193	0.123	0.12	0.124	0.109	0.114
	Sulfur (S)	mg/L	251	333	356	65.6	73.4	65.8	86	35.4
	Thallium (Tl)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Tin (Sn)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Titanium (Ti)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015
	Uranium (U)	mg/L	0.00828	0.0109	0.0123	0.00253	0.00275	0.00245	0.00331	0.000948
	Vanadium (V)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Zinc (Zn)	mg/L	< 0.005	< 0.005	0.0615	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
	Zirconium (Zr)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015

Table A.8: Water quality data for areas sampled, September 2015.

Analytes		Units	KICK	KILM1-50	LC_DC1	LC_FRUS	LC-DCDS	LI8	LIDSL	LILC3
			17-Sep-2015	17-Sep-2015	13-Sep-2015	13-Sep-2015	16-Sep-2015	14-Sep-2015	14-Sep-2015	14-Sep-2015
Physical Tests	Hardness (as $CaCO_3$)	mg/L	817	802	170	376	130	384	426	536
	Total Suspended Solids	mg/L	< 1.0	< 1.0	1.1	< 1.0	5.9	23.2	< 1.0	< 1.0
	Total Dissolved Solids	mg/L	1110	1120	186	452	119	481	535	712
	Turbidity	NTU	< 0.1	< 0.1	0.75	0.28	4.42	5.1	0.44	0.39
Anions & Nutrients	Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	310	293	180	160	130	177	190	213
	Alkalinity, Carbonate (as $CaCO_3$)	mg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
	Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
	Alkalinity, Total (as $CaCO_3$)	mg/L	310	293	180	160	130	177	190	213
	Ammonia, Total (as N)	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
	Bromide (Br)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Chloride (Cl)	mg/L	0.79	0.81	< 0.5	1.44	< 0.5	1.67	1.77	2.35
	Fluoride (F)	mg/L	0.164	0.157	0.081	0.105	0.079	0.238	0.208	0.185
	Nitrate (as N)	mg/L	47.3	50.8	0.0173	9.97	0.0054	8.33	10.1	14.7
	Nitrite (as N)	mg/L	0.0022	0.0068	< 0.001	0.0086	0.0021	0.0029	0.0017	0.0012
	Total Kjeldahl Nitrogen	mg/L	0.251	< 0.5	0.167	0.129	0.21	< 0.05	< 0.05	< 0.05
	Orthophosphate-Dissolved (as P)	mg/L	< 0.001	< 0.001	0.008	< 0.001	< 0.001	0.0017	0.0012	0.0011
	Phosphorus (P)-Total	mg/L	< 0.002	< 0.002	0.0145	0.0042	0.0272	0.0104	0.0026	0.0038
	Sulfate (SO_4)	mg/L	327	326	9.14	155	12.3	183	212	279
Organic / Inorganic Carbon	Dissolved Organic Carbon	mg/L	0.98	1.23	1.03	0.54	1.75	0.59	0.55	0.5
	Total Organic Carbon	mg/L	0.98	1.04	1.06	0.55	2.42	0.59	0.52	0.56
Total Metals	Aluminum (Al)	mg/L	< 0.015	< 0.015	< 0.015	< 0.015	0.027	0.03	< 0.015	< 0.015
	Antimony (Sb)	mg/L	< 0.0005	0.00052	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Arsenic (As)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Barium (Ba)	mg/L	0.0339	0.0349	0.19	0.11	0.123	0.0821	0.0786	0.0829
	Beryllium (Be)	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
	Bismuth (Bi)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Boron (B)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Cadmium (Cd)	mg/L	0.000617	0.000589	0.00005	0.000029	0.00005	0.000192	0.00033	0.000539
	Calcium (Ca)	mg/L	180	179	45.9	93.7	32.9	97.9	103	126
	Chromium (Cr)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Cobalt (Co)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Copper (Cu)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Iron (Fe)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Lead (Pb)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Lithium (Li)	mg/L	0.0593	0.057	0.0095	0.0158	0.0076	0.0317	0.0385	0.0583
	Magnesium (Mg)	mg/L	84.2	82.6	17.2	37.7	10.6	39.7	51	57.6
	Manganese (Mn)	mg/L	< 0.0005	< 0.0005	0.00198	0.00126	0.00191	0.00254	< 0.0005	< 0.0005
	Mercury (Hg)	mg/L	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005
	Molybdenum (Mo)	mg/L	0.00162	0.00143	0.00124	0.00078	0.00095	0.00167	0.00174	0.0022
	Nickel (Ni)	mg/L	0.0123	0.0128	< 0.0025	< 0.0025	< 0.0025	0.0046	0.0076	0.0127
	Phosphorus (P)	mg/L	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
	Potassium (K)	mg/L	3.31	3.33	1.3	1.08	1.04	1.21	1.35	1.82
	Selenium (Se)	mg/L	0.109	0.11	0.00132	0.0348	0.00149	0.0326	0.0376	0.0514
	Silicon (Si)	mg/L	1.71	1.72	3	2.21	1.61	2.27	2.68	2.27
	Silver (Ag)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Sodium (Na)	mg/L	2.11	2.13	1.11	1.78	0.7	6.32	7.41	10.5
	Strontium (Sr)	mg/L	0.158	0.158	0.0557	0.146	0.0439	0.2	0.201	0.229
	Sulfur (S)	mg/L	114	112	3.7	55.1	3.7	61.3	82.3	96.8
	Thallium (Tl)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Tin (Sn)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Titanium (Ti)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015
	Uranium (U)	mg/L	0.00674	0.00661	0.000357	0.00176	0.000272	0.00293	0.00318	0.00421
	Vanadium (V)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Zinc (Zn)	mg/L	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	0.022
	Zirconium (Zr)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015
Dissolved Metals	Aluminum (Al)	mg/L	< 0.005	< 0.005	0.0059	< 0.005	0.0112	< 0.005	< 0.005	< 0.005
	Antimony (Sb)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Arsenic (As)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Barium (Ba)	mg/L	0.0346	0.0339	0.18	0.109	0.134	0.0774	0.0741	0.0789
	Beryllium (Be)	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
	Bismuth (Bi)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Boron (B)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Cadmium (Cd)	mg/L	0.000573	0.000632	0.000028	< 0.000025	< 0.000025	0.000104	0.000252	0.000498
	Calcium (Ca)	mg/L	179	177	42.9	89.7	34	91	99.7	121
	Chromium (Cr)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Cobalt (Co)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Copper (Cu)	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	Iron (Fe)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Lead (Pb)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Lithium (Li)	mg/L	0.0579	0.0562	0.0096	0.0155	0.0077	0.0321	0.0392	0.0578
	Magnesium (Mg)	mg/L	89.8	87.4	15.2	36.9	11	38.1	43.1	56.5
	Manganese (Mn)	mg/L	< 0.0005	< 0.0005	0.00117	0.00088	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Mercury (Hg)	mg/L	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005
	Molybdenum (Mo)	mg/L	0.00155	0.00152	0.0012	0.00083	0.00098	0.0016	0.00164	0.00207
	Nickel (Ni)	mg/L	0.0123	0.0121	< 0.0025	< 0.0025	< 0.0025	0.0041	0.007	0.0118
	Phosphorus (P)	mg/L	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
	Potassium (K)	mg/L	3.21	3.3	1.27	1.09	0.98	1.1	1.26	1.68
	Selenium (Se)	mg/L	0.11	0.111	0.00148	0.0348	0.00162	0.0324	0.0392	0.0513
	Silicon (Si)	mg/L	1.77	1.75	2.72	2.13	1.7	2.15	2.1	2.18
	Silver (Ag)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Sodium (Na)	mg/L	2.04	2.07	1.03	1.76	0.75	6.19	7.14	9.75
	Strontium (Sr)	mg/L	0.156	0.158	0.0518	0.14	0.0466	0.188	0.193	0.215
	Sulfur (S)	mg/L	104	102	3.4	52.2	4.2	55.3	65	83.4
	Thallium (Tl)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Tin (Sn)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Titanium (Ti)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015
	Uranium (U)	mg/L	0.00655	0.0065	0.00033	0.00171	0.000295	0.00277	0.0031	0.00389
	Vanadium (V)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Zinc (Zn)	mg/L	0.0068	0.0074	< 0.005	< 0.005	< 0.005	0.0057	0.0102	0.0191
	Zirconium (Zr)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015

Table A.8: Water quality data for areas sampled, September 2015.

Analytes		Units	MI2	MI3	MI5	MIDAG	MIDCO	MIUCO	MP1	NTHO1-25
			10-Sep-2015	14-Sep-2015	13-Sep-2015	12-Sep-2015	11-Sep-2015	10-Sep-2015	15-Sep-2015	18-Sep-2015
Physical Tests	Hardness (as $CaCO_3$)	mg/L	293	198	204	201	480	164	307	1,650
	Total Suspended Solids	mg/L	2.8	1	< 1.0	< 1.0	1.4	< 1.0	< 1.0	< 1.0
	Total Dissolved Solids	mg/L	360	243	247	248	637	180	381	2400
	Turbidity	NTU	0.59	0.71	0.36	0.39	0.5	0.4	0.37	0.31
Anions & Nutrients	Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	75	147	130	125	225	163	150	280
	Alkalinity, Carbonate (as $CaCO_3$)	mg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
	Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
	Alkalinity, Total (as $CaCO_3$)	mg/L	75	147	130	125	225	163	150	280
	Ammonia, Total (as N)	mg/L	0.0061	0.0053	< 0.005	< 0.005	< 0.005	0.0059	0.0097	< 0.005
	Bromide (Br)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Chloride (Cl)	mg/L	3.11	0.97	0.84	0.69	3.24	< 0.5	< 0.5	16.4
	Fluoride (F)	mg/L	0.167	0.121	0.119	0.18	0.105	0.069	0.174	0.047
	Nitrate (as N)	mg/L	3.01	0.37	0.531	0.716	3.05	< 0.005	9.86	44.7
	Nitrite (as N)	mg/L	0.0028	< 0.001	0.0029	< 0.001	0.0049	0.0012	0.0078	0.009
	Total Kjeldahl Nitrogen	mg/L	0.138	0.104	0.171	0.187	0.207	< 0.05	0.111	0.229
	Orthophosphate-Dissolved (as P)	mg/L	0.0042	0.0052	0.0063	0.0013	0.0018	0.0032	0.0021	< 0.001
	Phosphorus (P)-Total	mg/L	0.0081	0.0077	0.0091	0.0057	0.0039	0.0054	0.0044	0.0045
	Sulfate (SO_4)	mg/L	119	59	63.6	71.7	288	20.1	124	1300
Organic / Inorganic Carbon	Dissolved Organic Carbon	mg/L	0.87	0.78	0.58	0.5	0.71	0.62	0.93	4.07
	Total Organic Carbon	mg/L	0.87	0.76	0.59	0.53	0.74	0.62	1.08	4.34
Total Metals	Aluminum (Al)	mg/L	< 0.015	0.024	< 0.015	0.021	< 0.015	0.018	< 0.015	< 0.015
	Antimony (Sb)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Arsenic (As)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Barium (Ba)	mg/L	0.116	0.131	0.101	0.0431	0.0859	0.0777	0.0801	0.0487
	Beryllium (Be)	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
	Bismuth (Bi)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Boron (B)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.082
	Cadmium (Cd)	mg/L	0.000055	0.000036	< 0.000025	< 0.000025	< 0.000025	< 0.000025	< 0.000025	< 0.000025
	Calcium (Ca)	mg/L	75.7	57	57.5	55.5	110	45.8	75.9	311
	Chromium (Cr)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Cobalt (Co)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Copper (Cu)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Iron (Fe)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Lead (Pb)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Lithium (Li)	mg/L	0.0141	< 0.005	< 0.005	< 0.005	0.0139	< 0.005	0.0249	0.0827
	Magnesium (Mg)	mg/L	29.4	15.4	16.4	16.2	56	13.6	28.1	214
	Manganese (Mn)	mg/L	0.0025	0.00258	0.00078	0.00121	0.00268	0.00566	0.00202	0.00176
	Mercury (Hg)	mg/L	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005
	Molybdenum (Mo)	mg/L	0.00189	0.00072	0.00081	0.00077	0.00114	0.00077	0.00115	0.00441
	Nickel (Ni)	mg/L	0.0038	< 0.0025	< 0.0025	< 0.0025	0.0107	< 0.0025	< 0.0025	0.0078
	Phosphorus (P)	mg/L	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
	Potassium (K)	mg/L	1.08	0.68	0.7	0.55	1.69	0.49	1.17	3.56
	Selenium (Se)	mg/L	0.0131	0.00176	0.00213	0.0024	0.00571	0.00028	0.0232	0.221
	Silicon (Si)	mg/L	2.35	2.19	2.09	1.53	2.2	2.24	1.78	2.61
	Silver (Ag)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Sodium (Na)	mg/L	3.21	2.96	2.83	2.49	10.8	2.56	1.4	44.9
	Strontium (Sr)	mg/L	0.189	0.156	0.153	0.151	0.327	0.145	0.127	1.14
	Sulfur (S)	mg/L	40.5	20.7	22.8	25.2	105	7.3	38.2	455
	Thallium (Tl)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Tin (Sn)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Titanium (Ti)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015
	Uranium (U)	mg/L	0.00172	0.000634	0.00076	0.001	0.00267	0.000304	0.00144	0.0153
	Vanadium (V)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Zinc (Zn)	mg/L	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
	Zirconium (Zr)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015
Dissolved Metals	Aluminum (Al)	mg/L	0.0052	< 0.005	0.0058	< 0.005	0.0053	0.0061	< 0.005	< 0.005
	Antimony (Sb)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Arsenic (As)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Barium (Ba)	mg/L	0.117	0.127	0.102	0.0439	0.0861	0.0777	0.0853	0.0469
	Beryllium (Be)	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
	Bismuth (Bi)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Boron (B)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.078
	Cadmium (Cd)	mg/L	0.000047	< 0.000025	< 0.000025	< 0.000025	< 0.000025	< 0.000025	< 0.000025	< 0.000025
	Calcium (Ca)	mg/L	73	55	55.5	54.6	104	44.6	79.8	301
	Chromium (Cr)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Cobalt (Co)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Copper (Cu)	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	Iron (Fe)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Lead (Pb)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Lithium (Li)	mg/L	0.0137	< 0.005	< 0.005	< 0.005	0.0132	< 0.005	0.0281	0.0783
	Magnesium (Mg)	mg/L	26.8	14.7	15.8	15.8	53.3	12.8	26.2	218
	Manganese (Mn)	mg/L	0.00123	0.00077	< 0.0005	0.00055	0.00213	0.00387	0.00152	0.00167
	Mercury (Hg)	mg/L	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005
	Molybdenum (Mo)	mg/L	0.00201	0.00074	0.00076	0.00077	0.00119	0.00074	0.00118	0.00408
	Nickel (Ni)	mg/L	0.0037	< 0.0025	< 0.0025	< 0.0025	0.0114	< 0.0025	< 0.0025	0.0082
	Phosphorus (P)	mg/L	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
	Potassium (K)	mg/L	1.08	0.7	0.67	0.56	1.61	0.49	1.2	3.56
	Selenium (Se)	mg/L	0.0136	0.00162	0.0021	0.00242	0.00557	0.00031	0.026	0.225
	Silicon (Si)	mg/L	2.29	2.13	2.06	1.5	2.07	2.12	1.81	2.58
	Silver (Ag)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Sodium (Na)	mg/L	3.19	2.95	2.72	2.52	10.4	2.57	1.43	44.2
	Strontium (Sr)	mg/L	0.185	0.149	0.148	0.15	0.318	0.141	0.14	1.1
	Sulfur (S)	mg/L	41	18.1	21.7	24.2	98.3	7	41.8	406
	Thallium (Tl)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Tin (Sn)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Titanium (Ti)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015
	Uranium (U)	mg/L	0.00164	0.000621	0.000754	0.000983	0.00255	0.00029	0.00156	0.0146
	Vanadium (V)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Zinc (Zn)	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
	Zirconium (Zr)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015

Table A.8: Water quality data for areas sampled, September 2015.

Analytes		Units	NTHO1-50	OCNM	OCNM-X	POCK	PORT3-25	PORT3-50	SWCK	SWIF2-75
			18-Sep-2015	15-Sep-2015	15-Sep-2015	14-Sep-2015	14-Sep-2015	14-Sep-2015	10-Sep-2015	10-Sep-2015
Physical Tests	Hardness (as $CaCO_3$)	mg/L	1,640	354	355	671	698	533	1,760	1,920
	Total Suspended Solids	mg/L	1.2	1.4	1.4	1	1.2	1.4	< 1.0	< 1.0
	Total Dissolved Solids	mg/L	2340	391	384	855	919	714	2550	2770
	Turbidity	NTU	0.31	3.84	3.92	0.45	0.31	0.42	0.21	0.26
Anions & Nutrients	Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	287	327	310	200	200	200	323	357
	Alkalinity, Carbonate (as $CaCO_3$)	mg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
	Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
	Alkalinity, Total (as $CaCO_3$)	mg/L	287	327	310	200	200	200	323	357
	Ammonia, Total (as N)	mg/L	0.0052	0.014	0.0149	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
	Bromide (Br)	mg/L	< 0.05	0.137	0.081	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25
	Chloride (Cl)	mg/L	16.2	17	17	1.12	0.99	0.65	< 2.5	< 2.5
	Fluoride (F)	mg/L	0.045	0.399	0.4	0.33	0.3	0.418	0.12	0.13
	Nitrate (as N)	mg/L	44.3	0.0144	0.0169	2.85	1.65	1.12	28	32.2
	Nitrite (as N)	mg/L	0.0143	0.002	< 0.001	< 0.001	< 0.001	< 0.001	0.0057	0.0056
	Total Kjeldahl Nitrogen	mg/L	0.111	0.191	0.155	0.142	0.11	0.061	0.223	0.374
	Orthophosphate-Dissolved (as P)	mg/L	< 0.001	< 0.001	< 0.001	0.0015	0.0037	0.0031	0.0047	0.0032
	Phosphorus (P)-Total	mg/L	0.0052	0.0086	0.0094	0.0042	0.0065	0.005	0.0059	0.0043
	Sulfate (SO_4)	mg/L	1300	22.5	22.5	428	466	346	1450	1570
Organic / Inorganic Carbon	Dissolved Organic Carbon	mg/L	4.16	1.94	2.17	0.76	0.81	0.57	1.91	1.87
	Total Organic Carbon	mg/L	4.24	2.04	2.05	0.8	0.73	0.65	1.99	1.88
Total Metals	Aluminum (Al)	mg/L	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	0.017	< 0.015	< 0.015
	Antimony (Sb)	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.00084	0.00101
	Arsenic (As)	mg/L	< 0.0005	0.00088	0.00084	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Barium (Ba)	mg/L	0.0509	0.469	0.453	0.0954	0.0971	0.1	0.0262	0.0197
	Beryllium (Be)	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
	Bismuth (Bi)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Boron (B)	mg/L	0.083	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Cadmium (Cd)	mg/L	< 0.000025	< 0.000025	< 0.000025	< 0.000025	< 0.000025	< 0.000025	0.000258	0.000957
	Calcium (Ca)	mg/L	314	91.3	89.7	122	121	94.2	334	383
	Chromium (Cr)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Cobalt (Co)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Copper (Cu)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Iron (Fe)	mg/L	< 0.05	0.483	0.479	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Lead (Pb)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Lithium (Li)	mg/L	0.0805	0.0284	0.0282	0.0066	0.008	0.005	0.0479	0.0551
	Magnesium (Mg)	mg/L	205	36.2	36.1	91.3	102	75.3	292	328
	Manganese (Mn)	mg/L	0.00381	0.217	0.214	0.00066	< 0.0005	0.00059	0.00153	0.0021
	Mercury (Hg)	mg/L	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005
	Molybdenum (Mo)	mg/L	0.00447	0.00438	0.00426	0.00307	0.00253	0.00349	0.0046	0.0056
	Nickel (Ni)	mg/L	0.0084	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	0.0487	0.0653
	Phosphorus (P)	mg/L	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
	Potassium (K)	mg/L	3.76	2.92	2.8	1.06	1.15	0.88	4.05	4.62
	Selenium (Se)	mg/L	0.223	0.00028	0.00027	0.0649	0.0675	0.0551	0.505	0.584
	Silicon (Si)	mg/L	2.44	4.9	4.97	2.4	2.65	2.48	2.88	2.47
	Silver (Ag)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Sodium (Na)	mg/L	45.7	11.6	11.3	0.94	1.01	0.75	2.22	1.51
	Strontium (Sr)	mg/L	1.16	0.449	0.441	0.148	0.128	0.102	0.19	0.204
	Sulfur (S)	mg/L	437	8.1	8.1	145	162	115	558	624
	Thallium (Tl)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.000063
	Tin (Sn)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Titanium (Ti)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015
	Uranium (U)	mg/L	0.0154	0.000417	0.00039	0.00532	0.00515	0.0047	0.0137	0.0165
	Vanadium (V)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Zinc (Zn)	mg/L	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	0.018	0.053
	Zirconium (Zr)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015
Dissolved Metals	Aluminum (Al)	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
	Antimony (Sb)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.00085	0.00097
	Arsenic (As)	mg/L	< 0.0005	0.00072	0.00067	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Barium (Ba)	mg/L	0.0493	0.428	0.427	0.0903	0.0916	0.0947	0.027	0.0194
	Beryllium (Be)	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
	Bismuth (Bi)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Boron (B)	mg/L	0.078	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Cadmium (Cd)	mg/L	< 0.000025	< 0.000025	< 0.000025	< 0.000025	0.000027	< 0.000025	0.000253	0.000936
	Calcium (Ca)	mg/L	302	83.6	83.2	116	116	89.8	347	377
	Chromium (Cr)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Cobalt (Co)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Copper (Cu)	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	Iron (Fe)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Lead (Pb)	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
	Lithium (Li)	mg/L	0.0757	0.0257	0.0258	0.0067	0.0079	0.0052	0.0503	0.0547
	Magnesium (Mg)	mg/L	217	35.3	35.8	92.9	99	74.9	217	237
	Manganese (Mn)	mg/L	0.00341	0.198	0.198	< 0.0005	< 0.0005	< 0.0005	0.00149	0.00191
	Mercury (Hg)	mg/L	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005
	Molybdenum (Mo)	mg/L	0.00434	0.0041	0.00396	0.00268	0.00252	0.00312	0.00468	0.00546
	Nickel (Ni)	mg/L	0.0079	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	0.0485	0.0632
	Phosphorus (P)	mg/L	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
	Potassium (K)	mg/L	3.66	2.74	2.71	1.01	1.08	0.84	4.25	4.54
	Selenium (Se)	mg/L	0.228	< 0.00025	0.00029	0.0651	0.0673	0.055	0.498	0.565
	Silicon (Si)	mg/L	2.55	4.74	4.6	2.26	2.42	2.3	1.88	1.64
	Silver (Ag)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	Sodium (Na)	mg/L	44.4	10.8	10.8	0.92	0.89	0.68	2.3	1.44
	Strontium (Sr)	mg/L	1.11	0.419	0.411	0.135	0.12	0.0947	0.191	0.198
	Sulfur (S)	mg/L	388	7.7	7.4	139	144	113	426	468
	Thallium (Tl)	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.00006
	Tin (Sn)	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Titanium (Ti)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015
	Uranium (U)	mg/L	0.0146	0.000358	0.000377	0.00478	0.00474	0.00427	0.0137	0.0156
	Vanadium (V)	mg/L	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	Zinc (Zn)	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.0187	0.0535
	Zirconium (Zr)	mg/L	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015

Table A.8: Water quality data for areas sampled, September 2015.

Analytes		Units	THCK	WOCK
			18-Sep-2015	17-Sep-2015
Physical Tests	Hardness (as $CaCO_3$)	mg/L	940	1,410
	Total Suspended Solids	mg/L	1.6	< 1.0
	Total Dissolved Solids	mg/L	1290	1820
	Turbidity	NTU	1.24	1.03
Anions & Nutrients	Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	190	260
	Alkalinity, Carbonate (as $CaCO_3$)	mg/L	< 1.0	< 1.0
	Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	< 1.0	< 1.0
	Alkalinity, Total (as $CaCO_3$)	mg/L	190	260
	Ammonia, Total (as N)	mg/L	< 0.005	0.0222
	Bromide (Br)	mg/L	< 0.05	< 0.05
	Chloride (Cl)	mg/L	17.8	6.1
	Fluoride (F)	mg/L	0.048	< 0.1
	Nitrate (as N)	mg/L	11.8	46.2
	Nitrite (as N)	mg/L	0.0107	0.0054
	Total Kjeldahl Nitrogen	mg/L	0.32	< 0.05
	Orthophosphate-Dissolved (as P)	mg/L	0.0011	0.0011
	Phosphorus (P)-Total	mg/L	0.009	0.0065
	Sulfate (SO_4)	mg/L	702	983
Organic / Inorganic Carbon	Dissolved Organic Carbon	mg/L	2.86	1.8
	Total Organic Carbon	mg/L	2.99	1.55
Total Metals	Aluminum (Al)	mg/L	0.026	0.022
	Antimony (Sb)	mg/L	< 0.0005	0.00253
	Arsenic (As)	mg/L	< 0.0005	< 0.0005
	Barium (Ba)	mg/L	0.0825	0.118
	Beryllium (Be)	mg/L	< 0.0001	< 0.0001
	Bismuth (Bi)	mg/L	< 0.00025	< 0.00025
	Boron (B)	mg/L	< 0.05	< 0.05
	Cadmium (Cd)	mg/L	< 0.000025	0.000093
	Calcium (Ca)	mg/L	180	253
	Chromium (Cr)	mg/L	< 0.0005	< 0.0005
	Cobalt (Co)	mg/L	< 0.0005	0.00423
	Copper (Cu)	mg/L	< 0.0025	< 0.0025
	Iron (Fe)	mg/L	< 0.05	< 0.05
	Lead (Pb)	mg/L	< 0.00025	< 0.00025
	Lithium (Li)	mg/L	0.0329	0.0792
	Magnesium (Mg)	mg/L	116	168
	Manganese (Mn)	mg/L	0.00204	0.0053
	Mercury (Hg)	mg/L	< 0.000005	< 0.000005
	Molybdenum (Mo)	mg/L	0.00168	0.0091
	Nickel (Ni)	mg/L	< 0.0025	0.132
	Phosphorus (P)	mg/L	< 0.25	< 0.25
	Potassium (K)	mg/L	2.17	5.36
	Selenium (Se)	mg/L	0.0981	0.128
	Silicon (Si)	mg/L	2.77	3.02
	Silver (Ag)	mg/L	< 0.00005	< 0.00005
	Sodium (Na)	mg/L	15.4	16
	Strontium (Sr)	mg/L	0.564	0.699
	Sulfur (S)	mg/L	252	295
	Thallium (Tl)	mg/L	< 0.00005	< 0.00005
	Tin (Sn)	mg/L	< 0.0005	< 0.0005
	Titanium (Ti)	mg/L	< 0.0015	< 0.0015
	Uranium (U)	mg/L	0.00468	0.0135
	Vanadium (V)	mg/L	< 0.0025	< 0.0025
	Zinc (Zn)	mg/L	< 0.015	< 0.015
	Zirconium (Zr)	mg/L	< 0.0015	< 0.0015
Dissolved Metals	Aluminum (Al)	mg/L	< 0.005	< 0.005
	Antimony (Sb)	mg/L	< 0.0005	0.00246
	Arsenic (As)	mg/L	< 0.0005	< 0.0005
	Barium (Ba)	mg/L	0.0796	0.114
	Beryllium (Be)	mg/L	< 0.0001	< 0.0001
	Bismuth (Bi)	mg/L	< 0.00025	< 0.00025
	Boron (B)	mg/L	< 0.05	< 0.05
	Cadmium (Cd)	mg/L	< 0.000025	0.000073
	Calcium (Ca)	mg/L	180	246
	Chromium (Cr)	mg/L	< 0.0005	< 0.0005
	Cobalt (Co)	mg/L	< 0.0005	0.00407
	Copper (Cu)	mg/L	< 0.001	< 0.001
	Iron (Fe)	mg/L	< 0.05	< 0.05
	Lead (Pb)	mg/L	< 0.00025	< 0.00025
	Lithium (Li)	mg/L	0.0311	0.0786
	Magnesium (Mg)	mg/L	119	194
	Manganese (Mn)	mg/L	< 0.0005	0.00457
	Mercury (Hg)	mg/L	< 0.000005	< 0.000005
	Molybdenum (Mo)	mg/L	0.00165	0.00889
	Nickel (Ni)	mg/L	< 0.0025	0.13
	Phosphorus (P)	mg/L	< 0.25	< 0.25
	Potassium (K)	mg/L	2.1	5.41
	Selenium (Se)	mg/L	0.0981	0.129
	Silicon (Si)	mg/L	2.73	3.15
	Silver (Ag)	mg/L	< 0.00005	< 0.00005
	Sodium (Na)	mg/L	15	15.9
	Strontium (Sr)	mg/L	0.558	0.675
	Sulfur (S)	mg/L	217	319
	Thallium (Tl)	mg/L	< 0.00005	< 0.00005
	Tin (Sn)	mg/L	< 0.0005	< 0.0005
	Titanium (Ti)	mg/L	< 0.0015	< 0.0015
	Uranium (U)	mg/L	0.00457	0.0131
	Vanadium (V)	mg/L	< 0.0025	< 0.0025
	Zinc (Zn)	mg/L	< 0.005	0.0068
	Zirconium (Zr)	mg/L	< 0.0015	< 0.0015

Table A.9: Water quality data for all reference and mine-exposed calcite monitoring areas, 2014.

Analytes		Reference						
		ALEX3-25	CHAU1-50	CHAU1-75	GRAC2-25	GRAC2-75	GRAV3-75	HARM6-25
Physical Tests	Calcite Presence Score	0.57	0	0	0.08	0	0	0
	Concretion Score	0	0	0	0.02	0	0	0
	Calcite Index	0.57	0	0	0.10	0	0	0
	Hardness (as $CaCO_3$)	163	148	145	215	202	191	145
	pH	8.37	8.42	8.38	8.35	8.33	-	8.26
Anions and Nutrients	Alkalinity, Bicarbonate (as $CaCO_3$)	148	127	130	169	165	-	126
	Alkalinity, Carbonate (as $CaCO_3$)	<3.5	<1.0	<1.0	4.5	3.2	-	<2.0
	Alkalinity, Hydroxide (as $CaCO_3$)	<1.0	<1.0	<1.0	<1.0	<1.0	-	<2.0
	Alkalinity, Total (as $CaCO_3$)	152	127	130	173	168	164	126
	Ammonia, Total (as N)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0249	<0.0050	<0.0050
	Bromide (Br)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F)	0.199	0.211	0.210	0.158	0.151	0.130	0.257
	Nitrate (as N)	0.0442	0.0619	0.0730	0.0335	0.0281	0.0426	0.147
	Nitrite (as N)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen	0.0730	0.0600	0.0580	0.106	0.127	0.0870	0.0560
	Phosphorus (P)-Total	0.0026	0.0043	0.0031	0.0069	0.0209	0.0059	0.0058
	Sulfate (SO_4)	14.8	18.9	18.9	44.6	36.2	22.9	14.7
Organic / Inorganic Carbon	Dissolved Organic Carbon	0.79	0.69	0.70	0.93	0.76	1.15	0.55
	Total Organic Carbon	0.79	0.75	0.66	1.28	1.35	1.07	0.61
Total Metals	Aluminum (Al)-Total	0.0217	0.00710	0.00910	0.0378	0.0705	0.0507	0.00760
	Antimony (Sb)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Arsenic (As)-Total	0.00015	0.00012	0.00011	0.00010	0.00012	0.00015	0.00020
	Barium (Ba)-Total	0.0605	0.0548	0.0533	0.0607	0.0644	0.0855	0.0457
	Beryllium (Be)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total	0.011	<0.010	<0.010	0.017	0.018	0.021	<0.010
	Cadmium (Cd)-Total	<0.000010	0.000011	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Calcium (Ca)-Total	45.0	40.7	41.2	51.6	50.3	47.5	40.5
	Chromium (Cr)-Total	0.00030	0.00022	0.00022	0.00031	0.00031	0.00029	0.00032
	Cobalt (Co)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Copper (Cu)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Iron (Fe)-Total	0.03	0.019	0.011	0.065	0.10	0.04	<0.010
	Lead (Pb)-Total	<0.000050	<0.000050	<0.000050	0.000066	0.000080	<0.00005	<0.00005
	Lithium (Li)-Total	0.00293	0.00204	0.00234	0.00648	0.00724	0.00755	0.00186
	Magnesium (Mg)-Total	11.8	10.2	10.3	18.1	17.3	16.7	10.3
	Manganese (Mn)-Total	0.00206	0.000667	0.000668	0.00507	0.00610	0.00170	0.000345
	Mercury (Hg)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total	0.000618	0.000585	0.000591	0.00136	0.00133	0.00118	0.000788
	Nickel (Ni)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Phosphorus (P)-Total	-	-	-	<0.050	<0.050	-	-
	Potassium (K)-Total	0.328	0.313	0.313	0.680	0.690	0.576	0.247
	Selenium (Se)-Total	0.00059	0.00069	0.00066	0.00184	0.00177	0.00091	0.00067
	Silicon (Si)-Total	1.90	1.69	1.71	2.61	2.62	2.76	1.86
	Silver (Ag)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total	0.932	0.683	0.677	2.30	2.73	3.08	0.471
	Strontium (Sr)-Total	0.0945	0.0679	0.0692	0.180	0.173	0.149	0.0735
	Sulfur (S)-Total	-	-	-	14.5	12.2	-	-
	Thallium (Tl)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Tin (Sn)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total	<0.010	<0.010	<0.010	<0.010	<0.010	<0.0100	<0.0100
	Uranium (U)-Total	0.000573	0.000574	0.000584	0.000966	0.000854	0.00054	0.00066
	Vanadium (V)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Dissolved Metals	Aluminum (Al)-Dissolved	<0.0030	<0.0030	<0.0030	0.0016	0.0014	<0.0030	<0.0030
	Antimony (Sb)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Arsenic (As)-Dissolved	0.00013	0.00013	<0.00010	<0.00010	<0.00010	0.00012	0.0002
	Barium (Ba)-Dissolved	0.0596	0.0553	0.0497	0.0614	0.0625	0.0824	0.0456
	Beryllium (Be)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Dissolved	<0.010	<0.010	<0.010	0.014	0.016	<0.016	<0.010
	Cadmium (Cd)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Calcium (Ca)-Dissolved	45.9	42.1	41.2	54.7	51.7	48.6	41.1
	Chromium (Cr)-Dissolved	0.00019	0.00018	0.00016	0.00018	0.00019	0.00015	0.00026
	Cobalt (Co)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Copper (Cu)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00020	<0.00020	<0.00050	<0.00050
	Iron (Fe)-Dissolved	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Lead (Pb)-Dissolved	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Lithium (Li)-Dissolved	0.00303	0.00226	0.00263	0.00669	0.00714	0.00765	0.00198
	Magnesium (Mg)-Dissolved	11.7	10.3	10.3	19.1	17.6	16.9	10.2
	Manganese (Mn)-Dissolved	0.00135	0.000435	0.000444	0.000692	0.000624	0.000141	<0.000050
	Mercury (Hg)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved	0.000570	0.000577	0.000540	0.00137	0.00121	0.00110	0.000754
	Nickel (Ni)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Phosphorus (P)-Dissolved	-	-	-	<0.050	<0.050	-	-
	Potassium (K)-Dissolved	0.317	0.311	0.284	0.700	0.650	0.542	0.238
	Selenium (Se)-Dissolved	0.00065	0.00075	0.00075	0.00193	0.00192	0.00104	0.00075
	Silicon (Si)-Dissolved	1.86	1.70	1.71	2.69	2.55	2.68	1.84
	Silver (Ag)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Dissolved	0.918	0.676	0.629	2.39	2.70	2.95	0.465
	Strontium (Sr)-Dissolved	0.0914	0.0680	0.0670	0.180	0.173	0.143	0.0721
	Sulfur (S)-Dissolved	-	-	-	15.1	12.2	-	-
	Thallium (Tl)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Tin (Sn)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Dissolved	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved	0.000541	0.000554	0.000548	0.000923	0.000835	0.000518	0.000644
	Vanadium (V)-Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved	<0.0030	<0.0030	<0.0030	<0.0010	<0.0010	<0.0030	<0.0030

Table A.9: Water quality data for all reference and mine-exposed calcite monitoring areas, 2014.

	Analytes	Mine-exposed											
		ELKR8-75	FO29	FORD7-25	FORD7-50	GRAV1-25	GRAV1-50	GRAV1-75	GREE1-75	GREE3-25	GREE3-75	GREE4-25	GREE4-75
Physical Tests	Calcite Presence Score	0	0.28	0.60	0.03	0.07	0.46	0.28	0.81	1.00	0.97	0.97	1.00
	Concretion Score	0	0	0.04	0	0.01	0.29	0.15	0.68	1.43	0.91	1.56	1.34
	Calcite Index	0	0.28	0.64	0.03	0.08	0.75	0.43	1.49	2.43	1.88	2.53	2.34
	Hardness (as $CaCO_3$)	241	362	497	500	342	344	344	974	1,010	1,050	1,310	1,490
	pH	-	8.4	8.37	8.35	-	-	-	8.43	8.29	8.28	8.21	8.13
Anions and Nutrients	Alkalinity, Bicarbonate (as $CaCO_3$)	-	184	206	205	-	-	-	240	288	295	330	387
	Alkalinity, Carbonate (as $CaCO_3$)	-	<1.0	<1.0	<1.0	-	-	-	<1.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as $CaCO_3$)	-	<1.0	<1.0	<1.0	-	-	-	<1.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as $CaCO_3$)	168	184	206	205	188	189	187	241	288	295	330	387
	Ammonia, Total (as N)	<0.0054	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0061	<0.0050	<0.0050	<0.0050	<0.0050
	Bromide (Br)	<0.050	<0.050	<0.25	<0.50	<0.050	<0.050	<0.050	<0.50	<0.50	<0.50	<1.0	<1.0
	Chloride (Cl)	2.11	1.05	<2.5	<5.0	0.98	0.98	0.98	<5.0	<5.0	<5.0	<10	<10
	Fluoride (F)	0.223	0.205	0.170	<0.20	0.247	0.245	0.245	<0.20	0.300	0.300	<0.40	<0.40
	Nitrate (as N)	2.08	9.78	16.5	16.9	0.747	0.738	0.732	3.74	4.23	4.61	6.95	8.19
	Nitrite (as N)	0.0029	0.0050	0.0107	0.013	<0.0010	<0.0010	<0.0010	0.022	<0.010	<0.010	0.022	<0.020
	Total Kjeldahl Nitrogen	0.129	<0.050	<0.050	<0.050	0.137	0.117	0.128	<0.050	<0.050	0.207	<0.050	<0.050
	Phosphorus (P)-Total	0.0022	0.0022	<0.0020	0.0034	0.0040	0.0037	0.0047	0.0041	0.0038	0.0025	0.0045	0.0075
	Sulfate (SO_4)	66	141	224	230	140	140	140	712	680	718	919	1,050
Organic / Inorganic Carbon	Dissolved Organic Carbon	0.70	0.83	0.71	0.73	0.96	1.01	1.01	1.96	1.82	2.13	1.74	1.40
	Total Organic Carbon	0.69	0.78	0.64	0.74	1.10	1.03	1.03	2.81	1.81	1.97	1.72	1.45
Total Metals	Aluminum (Al)-Total	0.0291	0.0067	0.0034	0.0058	0.0144	0.0124	0.0166	0.0047	0.0048	0.0050	0.0073	0.0057
	Antimony (Sb)-Total	<0.00010	0.00011	0.00014	0.00013	<0.00010	<0.00010	<0.00010	0.00022	0.00017	0.00024	0.00024	0.00035
	Arsenic (As)-Total	0.00022	<0.00010	0.00011	0.00010	0.00017	0.00015	0.00017	0.00020	0.00016	0.00017	0.00017	0.00019
	Barium (Ba)-Total	0.0753	0.0900	0.104	0.0988	0.0636	0.0619	0.0669	0.0517	0.0598	0.0549	0.0465	0.0432
	Beryllium (Be)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total	0.014	0.013	0.015	0.015	0.012	0.015	0.013	0.015	0.012	0.012	0.010	0.010
	Cadmium (Cd)-Total	0.000017	0.000021	0.000041	0.000042	0.000016	0.000015	0.000017	<0.00001	0.000011	0.000015	0.000026	0.000068
	Calcium (Ca)-Total	63.8	87.9	118	111	74.0	75.8	77.2	169	191	189	249	284
	Chromium (Cr)-Total	0.00035	0.00018	0.00019	0.00032	0.00024	0.00024	0.00028	0.00023	0.00019	0.00027	0.00024	0.00030
	Cobalt (Co)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Copper (Cu)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Iron (Fe)-Total	0.037	0.014	<0.010	0.016	0.017	0.016	0.021	<0.010	<0.010	<0.010	0.011	0.013
	Lead (Pb)-Total	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000325
	Lithium (Li)-Total	0.00743	0.0144	0.0224	0.0216	0.00679	0.00681	0.00699	0.0143	0.0118	0.0121	0.0109	0.0137
	Magnesium (Mg)-Total	19.8	32.9	49.2	46.5	36.0	36.6	37.5	132	124	127	174	198
	Manganese (Mn)-Total	0.00350	0.00158	0.00308	0.00334	0.00159	0.00177	0.00173	0.00196	0.0105	0.0137	0.0297	0.0447
	Mercury (Hg)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total	0.00116	0.000851	0.000930	0.000893	0.00111	0.00109	0.00109	0.00125	0.00105	0.00117	0.001000	0.00111
	Nickel (Ni)-Total	<0.00050	0.00052	0.00110	0.00104	<0.00050	<0.00050	<0.00050	0.00330	0.00429	0.00481	0.00771	0.0113
	Phosphorus (P)-Total	-	-	-	-	-	-	-	-	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Total	0.702	0.992	1.57	1.51	0.773	0.753	0.813	1.96	1.91	1.93	2.22	2.44
	Selenium (Se)-Total	0.00967	0.0363	0.0659	0.0621	0.0242	0.0243	0.0247	0.157	0.139	0.152	0.236	0.298
	Silicon (Si)-Total	2.14	1.99	2.03	1.93	2.23	2.28	2.34	2.49	3.18	3.07	3.12	2.97
	Silver (Ag)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total	2.35	1.52	1.84	1.74	1.78	1.76	1.82	2.65	2.70	2.50	1.99	1.86
	Strontium (Sr)-Total	0.196	0.133	0.148	0.138	0.137	0.135	0.140	0.189	0.203	0.185	0.165	0.181
	Sulfur (S)-Total	-	-	-	-	-	-	-	-	222	223	314	358
	Thallium (Tl)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000015
	Tin (Sn)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total	0.012	0.014	0.017	0.016	0.013	0.013	0.013	0.021	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total	0.00111	0.00162	0.00249	0.00230	0.00199	0.00210	0.00207	0.00756	0.00729	0.00781	0.01050	0.01350
	Vanadium (V)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0037
Dissolved Metals	Aluminum (Al)-Dissolved	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0010	<0.0010	0.0011	0.0012
	Antimony (Sb)-Dissolved	<0.00010	<0.00010	0.00013	0.00012	<0.00010	<0.00010	<0.00010	0.00020	0.00017	0.00017	0.00022	0.00028
	Arsenic (As)-Dissolved	0.00018	<0.00010	<0.00010	<0.00010	0.00015	0.00013	0.00015	0.00018	0.00014	0.00015	0.00016	0.00017
	Barium (Ba)-Dissolved	0.0759	0.0994	0.103	0.105	0.0652	0.0647	0.0646	0.0524	0.0599	0.0556	0.0513	0.0425
	Beryllium (Be)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Dissolved	<0.010	<0.010	0.011	0.011	<0.010	<0.010	<0.010	0.010	0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Dissolved	0.000013	0.000020	0.000032	0.000037	0.000014	0.000012	0.000014	<0.000010	0.000013	0.000012	0.000024	0.000065
	Calcium (Ca)-Dissolved	64.0	90.5	119	119	76.3	76.7	77.00000	171	195	199	246	284
	Chromium (Cr)-Dissolved	0.00024	0.00011	<0.00010	<0.00010	0.00016	0.00015	0.00013	0.00013	0.00012	0.00016	0.00022	0.00019
	Cobalt (Co)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Copper (Cu)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00030	0.00027	0.00035	0.00047
	Iron (Fe)-Dissolved	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Lead (Pb)-Dissolved	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00007
	Lithium (Li)-Dissolved	0.00754	0.0141	0.0230	0.0228	0.00729	0.00712	0.00708	0.0128	0.0123	0.0123	0.0110	0.0129
	Magnesium (Mg)-Dissolved	19.6	33.1	48.8	49.2	36.9	37	36.9	133	127	135	168	189
	Manganese (Mn)-Dissolved	0.00149	0.00112	0.00268	0.00273	0.000705	0.000728	0.000725	0.00134	0.00998	0.0140	0.0299	0.0438
	Mercury (Hg)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved	0.00107	0.000802	0.000915	0.000860	0.00103	0.00101	0.00104	0.00118	0.000989	0.00106	0.000916	0.000997
	Nickel (Ni)-Dissolved	<0.00050	0.00052	0.00101	0.00101	<0.00050	<0.00050	<0.00050	0.00309	0.00412	0.00486	0.00784	0.0110
	Phosphorus (P)-Dissolved	-	-	-	-	-	-	-	-	<0.05000	<0.05000	<0.05000	<0.05000
	Potassium (K)-Dissolved	0.674	1.06	1.54	1.57	0.796	0.786	0.771	1.91	1.99	2.02	2.14	2.4
	Selenium (Se)-Dissolved	0.0108	0.0399	0.0697	0.0691	0.0273	0.0282	0.0281	0.164	0.143	0.165	0.243	0.311
	Silicon (Si)-Dissolved	2.06	2.01	2.00	2.01	2.24	2.27	2.27	2.51	3.25	3.18	3.04	2.92
	Silver (Ag)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Dissolved	2.28	1.60	1.74	1.76	1.8	1.78	1.75	2.58	2.54	2.57	2.06	1.86
	Strontium (Sr)-Dissolved	0.189	0.131	0.142	0.144	0.135	0.135	0.135	0.186	0.196	0.188	0.17	0.173
	Sulfur (S)-Dissolved	-	-	-	-	-	-	-	-	223	232	301	343
	Thallium (Tl)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000012
	Tin (Sn)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Dissolved	0.011	0.014	0.017	0.017	0.012	0.013	0.013	0.021	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved	0.00107	0.00160	0.00233	0.00234	0.00194	0.00195	0.00200	0.00728	0.00721	0.00794	0.0107	0.0131
	Vanadium (V)-Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0014	<0.0010	0.001	0.0025

Table A.9: Water quality data for all reference and mine-exposed calcite monitoring areas, 2014.

	Analytes	Mine-exposed									
		HARM1-50	HARM1-75	HARM5-25	LIDSL	LI8	LILC3	MICH1-75	NTH01-25	NTH01-50	PORT1-0
Physical Tests	Calcite Presence Score	0.99	0.75	0.82	0.24	0.50	1.00	0	0.98	0.98	0.96
	Concretion Score	0.67	0.17	0.30	0	0	0	0	0.60	1.23	0.73
	Calcite Index	0.92	1.66	1.12	0.50	0.24	1.00	0	1.58	2.21	1.69
	Hardness (as $CaCO_3$)	394	394	452	349	322	506	244	1,590	1,630	676
	pH	-	8.26	8.28	8.44	8.48	8.39	8.4	8.23	8.21	8.34
Anions and Nutrients	Alkalinity, Bicarbonate (as $CaCO_3$)	-	190	191	174	171	198	167	268	279	202
	Alkalinity, Carbonate (as $CaCO_3$)	-	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<2.00	<2.00	7.4
	Alkalinity, Hydroxide (as $CaCO_3$)	-	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<2.00	<2.00	<1.00
	Alkalinity, Total (as $CaCO_3$)	190	190	191	174	171	198	167	268	279	209
	Ammonia, Total (as N)	<0.0050	<0.0050	<0.0050	<0.0065	<0.0056	<0.0481	<0.0053	<0.0050	<0.0050	<0.0050
	Bromide (Br)	<0.250	<0.050	<0.250	<0.250	<0.050	<0.500	<0.050	<1.0	<1.0	<0.50
	Chloride (Cl)	<2.5	1.2	<2.5	2.6	2.34	5.10	1.67	11.0	11.0	<5.0
	Fluoride (F)	0.300	0.227	0.260	0.250	0.296	0.210	0.185	<0.40	<0.40	0.460
	Nitrate (as N)	1.08	1.09	1.53	6.74	5.77	9.94	0.801	33.9	34.6	2.79
	Nitrite (as N)	<0.005	0.0013	0.0055	0.0034	0.0015	0.0100	0.0018	<0.020	<0.020	<0.010
	Total Kjeldahl Nitrogen	0.127	0.125	0.0680	<0.050	<0.050	<0.050	0.0650	<0.050	<0.050	0.129
	Phosphorus (P)-Total	0.0049	0.0060	0.0046	0.0039	0.0063	0.0044	0.0040	0.0036	0.0044	0.0040
	Sulfate (SO_4)	185	184	237	155	135	218	73	1,240	1,270	431
Organic / Inorganic Carbon	Dissolved Organic Carbon	0.85	0.90	0.83	0.86	1.02	1	0.91	2.36	2.33	0.97
	Total Organic Carbon	0.95	1.03	0.91	0.79	0.8	0.86	0.83	2.44	2.36	0.83
Total Metals	Aluminum (Al)-Total	0.0118	0.0070	0.0055	0.0066	0.0059	0.0036	0.0090	0.011	0.0168	0.0063
	Antimony (Sb)-Total	<0.0001	<0.00010	0.00012	0.00026	0.00024	0.00041	0.00011	0.00131	0.00124	<0.00010
	Arsenic (As)-Total	0.00019	0.00017	0.00019	0.00018	0.00016	0.00012	0.00019	0.00033	0.00036	0.00024
	Barium (Ba)-Total	0.0591	0.0567	0.0397	0.0548	0.0628	0.0600	0.0928	0.0381	0.0384	0.086
	Beryllium (Be)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Total	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total	0.011	<0.010	0.011	0.015	0.016	0.022	0.014	0.032	0.0	<0.010
	Cadmium (Cd)-Total	0.000022	0.000017	0.000020	0.000245	0.000155	0.000337	0.000022	0.000027	0.000068	0.000034
	Calcium (Ca)-Total	84.4	85	90.4	81.8	79.7	104.0	60.2	296	306	115
	Chromium (Cr)-Total	0.00024	0.00022	0.00027	0.00049	0.00023	0.00027	0.00023	0.00010	0.00011	0.00039
	Cobalt (Co)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00033	<0.00042	<0.00010
	Copper (Cu)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00081	0.00080	<0.00050
	Iron (Fe)-Total	0.017	<0.010	<0.010	0.017	<0.010	<0.020	0.017	0.010	0.017	<0.010
	Lead (Pb)-Total	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Lithium (Li)-Total	0.00680	0.00647	0.00811	0.0213	0.0209	0.0420	0.0056	0.0682	0.0668	0.00763
	Magnesium (Mg)-Total	45.0	42.9	55.1	31.2	29.4	45.9	19.4	199	202	79.9
	Manganese (Mn)-Total	0.00392	0.00314	0.000303	0.00178	0.000877	0.006160	0.00227	0.0128	0.0187	0.000704
	Mercury (Hg)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total	0.000917	0.000914	0.000980	0.00165	0.00158	0.00205	0.000816	0.00734	0.00721	0.00273
	Nickel (Ni)-Total	0.00072	0.00067	0.00137	0.00568	0.00378	0.00972	<0.00050	0.0400	0.0401	0.00131
	Phosphorus (P)-Total	-	<0.050	-	-	-	-	-	<0.050	<0.050	<0.050
	Potassium (K)-Total	0.905	0.870	1.03	1.05	0.987	1.480	0.632	4.40	4.49	0.990
	Selenium (Se)-Total	0.0351	0.0328	0.0475	0.0276	0.0254	0.0363	0.00724	0.307	0.288	0.0738
	Silicon (Si)-Total	2.06	2.04	1.78	1.88	2.02	2.06	2.06	2.38	2.41	2.24
	Silver (Ag)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total	1.51	1.51	1.47	4.50	4.19	6.88	2.36	14.00000	13.3	0.856
	Strontium (Sr)-Total	0.121	0.120	0.110	0.151	0.169	0.191	0.136	0.456	0.453	0.133
	Sulfur (S)-Total	-	62.4	-	-	-	-	-	399	403	134
	Thallium (Tl)-Total	<0.000010	<0.000010	0.000011	<0.000010	<0.000010	<0.000013	<0.000010	0.000027	0.000027	0.000011
	Tin (Sn)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total	0.014	<0.010	0.014	0.013	0.014	0.016	0.011	<0.010	<0.010	<0.010
	Uranium (U)-Total	0.00244	0.00241	0.00320	0.00253	0.00244	0.00347	0.000913	0.0157	0.0149	0.00501
	Vanadium (V)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total	<0.0030	<0.0030	<0.0030	0.0121	0.0074	0.0163	<0.0030	0.0035	0.0061	0.0056
Dissolved Metals	Aluminum (Al)-Dissolved	<0.0030	0.0018	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0013	0.0018	0.0014
	Antimony (Sb)-Dissolved	<0.00010	<0.00010	<0.00010	0.00026	0.00021	0.00031	<0.00010	0.00123	0.00123	<0.00010
	Arsenic (As)-Dissolved	0.00015	0.00014	0.00017	0.00014	0.00017	0.00010	0.00018	0.00031	0.00029	0.00022
	Barium (Ba)-Dissolved	0.0593	0.0585	0.0396	0.0568	0.0624	0.0705	0.0918	0.0377	0.0382	0.0914
	Beryllium (Be)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Dissolved	<0.010	<0.010	<0.010	0.012	0.012	0.017	0.010	0.027	0.027	<0.010
	Cadmium (Cd)-Dissolved	0.000021	0.000017	0.000019	0.000230	0.000138	0.000263	0.000018	0.000023	0.000058	0.000026
	Calcium (Ca)-Dissolved	85.1	87.2	91.2	86.1	81.1	119.0	63.8	302	314	127
	Chromium (Cr)-Dissolved	0.00015	0.00016	0.0002	0.00013	0.00014	0.00011	0.00014	<0.00010	<0.00010	0.00027
	Cobalt (Co)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00031	0.00040	<0.00010
	Copper (Cu)-Dissolved	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00079	0.00059	<0.00020
	Iron (Fe)-Dissolved	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Lead (Pb)-Dissolved	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Lithium (Li)-Dissolved	0.00705	0.00647	0.00856	0.0245	0.0225	0.0395	0.00603	0.0664	0.0679	0.00770
	Magnesium (Mg)-Dissolved	44.1	42.7	54.5	32.4	29.1	50.9	20.5	203	205	87.2
	Manganese (Mn)-Dissolved	0.00285	0.00268	0.000111	0.00145	0.000507	0.002820	0.00165	0.0115	0.0175	0.000376
	Mercury (Hg)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved	0.000874	0.000845	0.000933	0.00159	0.00153	0.00169	0.000813	0.00668	0.0067	0.00263
	Nickel (Ni)-Dissolved	0.000780	0.000670	0.00128	0.00559	0.00358	0.00678	<0.00050	0.0393	0.0401	0.00125
	Phosphorus (P)-Dissolved		<0.05000	-	-	-	-	-	<0.05000	<0.05000	<0.05000
	Potassium (K)-Dissolved	0.901	0.88	1.03	1.09	0.992	1.440	0.654	4.4	4.67	1.08
	Selenium (Se)-Dissolved	0.0381	0.0354	0.0553	0.0301	0.0256	0.0571	0.00824	0.303	0.289	0.0800
	Silicon (Si)-Dissolved	2.01	2.1	1.75	1.95	2.02	2.32	2.16	2.38	2.44	2.5
	Silver (Ag)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Dissolved	1.47	1.56	1.46	4.60	4.21	6.77	2.40	13.7	14.2	0.887
	Strontium (Sr)-Dissolved	0.117	0.118	0.107	0.160	0.163	0.204	0.138	0.441	0.449	0.136
	Sulfur (S)-Dissolved	-	62	-	-	-	-	-	402	405	146
	Thallium (Tl)-Dissolved	<0.000010	<0.000010	<0.000012	<0.000010	<0.000010	<0.000010	<0.000010	0.000023	0.000036	<0.000010
	Tin (Sn)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Dissolved	0.013	<0.010	0.014	0.013	0.012	0.017	0.011	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved	0.00237	0.00237	0.00311	0.00270	0.00235	0.00341	0.000927	0.0145	0.0148	0.00513
	Vanadium (V)-Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved	<0.0030	<0.0010	<0.0030	0.0094	0.0057	0.0117	<0.0030	0.0020	0.0058	0.0042

Table A.10: In situ water quality measures, September 2015.

	Station ID	Date Sampled	Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (%)	Specific Conductance (µS/cm)	Conductivity (µS/cm)	pH
Reference	AGCK	12-Sep-15	6.2	12.8	103.2	230	148	8.11
	AL4	13-Sep-15	7.3	10.6	87.7	293	194	8.27
	ALUSM	13-Sep-15	9.5	9.3	81.3	308	217	8.68
	BU2	13-Sep-15	8.6	10.8	92.0	371	254	8.38
	BU40	13-Sep-15	9.6	10.7	94.3	327	231	8.42
	BUUQ	13-Sep-15	6.7	11.5	93.8	343	223	8.25
	CADCK	13-Sep-15	7.4	11.5	95.6	250	165	8.52
	CHCK	12-Sep-15	7.3	10.5	95.5	240	159	8.50
	CRUKO	11-Sep-15	8.9	11.1	96.1	226	156	na
	DACK	12-Sep-15	10.2	9.8	90.6	390	280	8.19
	DUCK	11-Sep-15	6.4	11.3	91.6	332	214	8.14
	EL12	13-Sep-15	7.9	12.0	101.5	233	156	8.50
	ELUGH	17-Sep-15	6.5	11.6	94.0	234	151	8.28
	EWCK	12-Sep-15	6.2	11.0	88.6	279	179	8.26
	FLAD	14-Sep-15	6.3	10.9	88.2	256	165	9.13
	FLAU	14-Sep-15	5.6	10.2	81.3	207	170	na
	FLRU	19-Sep-15	7.2	11.8	97.5	170	112	8.42
	FO26	14-Sep-15	7.8	9.4	83.0	335	225	8.45
	GRUHA	11-Sep-15	5.6	9.4	74.4	375	236	8.33
	HENUP	15-Sep-15	4.4	10.4	82.0	291	176	8.37
	KO1	13-Sep-15	9.3	11.7	102.2	268	187	na
	KODCR	12-Sep-15	6.0	12.5	100.5	233	143	na
	KOUCR	12-Sep-15	5.3	12.2	95.8	234	145	na
	KOUVE	10-Sep-15	7.0	11.4	94.0	253	167	na
	LC_GRCK	18-Sep-15	4.0	11.9	91.1	401	241	8.18
	LI24	10-Sep-15	4.3	10.2	78.7	289	176	8.27
	MCCR	11-Sep-15	10.2	10.4	92.6	397	285	8.44
	MI25	10-Sep-15	6.6	8.9	73.5	285	185	8.36
	OLDDU	12-Sep-15	10.7	9.7	87.7	351	255	8.27
	OLDLI	11-Sep-15	9.4	10.6	93.3	356	250	7.75
	OLDLOW	10-Sep-15	10.9	13.9	125.5	382	279	6.55
	PADAL	11-Sep-15	5.3	10.6	84.1	274	171	na
	PAUKO	11-Sep-15	4.2	12.0	91.6	270	162	na
	RACK	11-Sep-15	12.6	10.0	94.6	337	257	8.04
	SLINE	15-Sep-15	3.2	11.9	88.8	336	196	8.55
	VEUKO	10-Sep-15	4.9	11.9	93.1	221	136	8.10
	VEUP	10-Sep-15	2.0	13.2	95.5	208	116	na
	VICK	10-Sep-15	11.0	12.3	111.0	288	211	7.40
	WWRL	11-Sep-15	7.2	11.2	92.5	191	126	8.14
	WWRU	19-Sep-15	8.8	10.5	90.8	172	119	8.41
Mine-Exposed	BOCK	14-Sep-15	8.7	10.4	90.0	1,890	1301	8.18
	CACK	11-Sep-15	4.8	na	na	3,249	1993	8.06
	CATA2-25	11-Sep-15	6.9	12.5	105.6	3,217	2105	7.76
	CATA2-75	11-Sep-15	6.1	na	na	3,247	2074	8.03
	COCK	11-Sep-15	9.8	10.7	94.7	1,461	1036	7.94
	EL1	16-Sep-15	7.0	11.0	90.4	461	302	8.47
	EL19	17-Sep-15	5.1	10.2	80.4	428	265	8.48
	EL20	17-Sep-15	7.5	14.0	116.4	309	205	8.27
	ELDEL	17-Sep-15	9.2	10.3	89.5	318	222	8.30
	ELDFE	16-Sep-15	10.1	no data	86.6	453	324	8.54
	ELDGR	17-Sep-15	7.9	10.2	86.2	439	296	8.55
	ELELKO	14-Sep-15	9.2	12.5	108.8	396	277	9.21
	ELH93	16-Sep-15	10.0	10.2	90.7	413	294	8.68
	ELUEL	13-Sep-15	10.5	11.3	101.0	308	223	8.36
	ELUFE	15-Sep-15	9.9	10.6	94.1	463	330	8.50
	ELUFO	14-Sep-15	9.6	11.6	102.1	347	245	8.33
	ELUSP	15-Sep-15	8.4	10.6	90.1	446	305	8.37
	FO22	17-Sep-15	6.1	11.0	88.8	806	516	8.03

Table A.10: In situ water quality measures, September 2015.

Station ID		Date Sampled	Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (%)	Specific Conductance (µS/cm)	Conductivity (µS/cm)	pH
Mine-Exposed	FO23	16-Sep-15	5.5	12.3	98.2	658	413	8.71
	FO29	12-Sep-15	8.9	11.3	97.9	552	382	8.44
	FO9	18-Sep-15	5.7	12.1	96.9	706	446	8.30
	FO10-SP1	17-Sep-15	4.9	12.3	96.5	898	553	na
	FOBCP	17-Sep-15	11.1	9.6	87.3	840	616	8.52
	FOBKS	16-Sep-15	9.5	8.5	74.7	628	442	8.49
	FOBSC	17-Sep-15	11.3	9.9	90.6	689	509	8.49
	FODGH	16-Sep-15	6.0	13.4	108.1	579	369	8.50
	FODHE	14-Sep-15	7.2	9.7	81.4	411	271	8.45
	FODNGD	14-Sep-15	8.5	10.7	91.6	544	377	8.27
	FODPO	15-Sep-15	6.5	11.6	94.5	799	516	7.89
	FORD7-75	18-Sep-15	5.5	11.2	88.8	747	469	8.15
	FOUEW	13-Sep-15	7.2	11.1	92.1	714	471	8.37
	FOUKI	16-Sep-15	9.8	8.9	78.5	627	445	8.42
	FOUL	17-Sep-15	5.3	11.4	90.2	654	408	8.63
	FOUNGD	15-Sep-15	8.3	10.0	94.3	550	375	8.23
	FOUSH	15-Sep-15	9.2	11.1	96.5	577	403	8.33
	GHCKD	15-Sep-15	8.2	10.3	87.9	1,302	883	na
	GHCKU	15-Sep-15	5.4	12.8	102.2	1,291	807	8.67
	GRCK	17-Sep-15	5.2	10.6	83.7	596	371	8.46
	GRDS	12-Sep-15	na	na	na	397	153	8.11
	GREE1-50	15-Sep-15	7.7	10.7	89.9	1,290	870	na
	GREE3-75	15-Sep-15	4.9	12.9	100.9	1,362	838	8.60
	GREE4-25	16-Sep-15	2.9	13.3	98.7	1,694	978	8.47
	GREE4-75	16-Sep-15	4.0	12.9	98.5	1,895	1134	8.16
	HACKDS	10-Sep-15	7.6	11.9	99.5	641	429	8.35
	HACKUS	11-Sep-15	4.6	11.1	85.8	717	437	8.28
	HARM1-50	12-Sep-15	na	na	na	455	178	8.05
	HARM5-25	12-Sep-15	na	na	na	510	234	8.02
	HENFO	16-Sep-15	6.2	11.0	89.0	431	276	8.20
	KICK	17-Sep-15	6.7	11.6	95.6	1,380	897	7.59
	KILM1-50	17-Sep-15	8.9	9.3	85.4	1,369	948	7.93
	LC_DC1	13-Sep-15	8.0	11.0	92.7	256	173	8.74
	LC_DCDS	16-Sep-15	5.7	11.6	92.3	240	151	8.77
	LC_FRUS/FO28	13-Sep-15	6.0	10.9	87.3	557	354	8.39
	LI8	13-Sep-15	7.6	10.0	83.8	681	454	8.65
	LIDSL	12-Sep-15	6.5	10.0	80.9	749	483	8.30
	LILC3	14-Sep-15	5.2	12.5	98.6	943	587	8.13
	MI2	10-Sep-15	7.6	11.9	99.3	518	346	8.22
	MI3	14-Sep-15	10.2	9.6	85.4	378	271	8.33
	MI5	13-Sep-15	8.7	10.1	86.5	386	266	7.97
	MIDAG	12-Sep-15	10.8	10.8	97.9	381	278	8.31
	MIDCO	11-Sep-15	13.2	10.1	96.2	849	657	8.34
	MIUCO	10-Sep-15	12.7	8.6	82.2	306	234	8.91
	MP1	15-Sep-15	8.7	9.0	78.4	567	390	8.31
	NTHO1-25	18-Sep-15	5.4	11.5	91.8	2,520	1567	8.37
	NTHO1-50	18-Sep-15	6.6	10.1	83.2	2,535	1647	8.35
	OCNM	15-Sep-15	9.8	6.5	57.2	689	490	7.63
	POCK	14-Sep-15	6.14	11.73	94.9	865	553	8.53
	PORT3-25	14-Sep-15	4.88	11.39	89.2	932	574	8.53
	PORT3-50	14-Sep-15	4.63	11.31	87.9	745	455	8.53
	SWCK	10-Sep-15	4.4	12.4	96.7	2,575	1559	7.96
	SWIF2-75	10-Sep-15	4.1	13.3	102.4	2,746	1648	8.08
	THCK	18-Sep-15	10.3	9.0	80.5	1,503	1080	8.55
	WOCK	17-Sep-15	6.0	11.7	94.3	1,739	1109	8.80

na - water quality meter was considered unreliable and therefore no reading is presented.

Table A.11: In situ water quality measures, September 2014.

	Station ID	Date Sampled	Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (%)	Specific Conductance (µS/cm)	Conductivity (µS/cm)	pH
Reference	ALEX3-25	16-Sep-14	6.3	11.1	105.0	194	124	8.43
	CHAU1-50	12-Sep-14	5.5	10.7	101.9	302	191	8.31
	CHAU1-50-2	17-Sep-14	7.7	11.2	112.6	176	118	8.45
	CHAU1-75	12-Sep-14	5.0	11.3	86.4	265	164	8.09
	CHAU1-75-2	17-Sep-14	7.0	10.4	103.5	176	116	8.45
	GRAC2-25	14-Sep-14	4.8	10.6	98.7	258	159	8.39
	GRAC2-75	14-Sep-14	4.6	10.5	97.7	245	149	8.36
	GRAV3-75	17-Sep-14	8.4	10.4	89.1	341	-	8.35
	GRAV3-75-2	16-Sep-14	4.0	10.5	80.5	343	-	8.44
	HARM6-25	16-Sep-14	3.3	10.2	90.9	175	103	8.08
Mine-Exposed	ELKR8-75	15-Sep-14	10.1	9.9	87.6	416	-	8.24
	ELKR8-75-2	16-Sep-14	9.6	10.6	93.0	408	-	8.70
	ERIC2-0	15-Sep-14	6.7	11.6	94.8	1,468	955	8.51
	ERIC4-25	15-Sep-14	5.6	10.3	82.1	1,497	942	8.42
	ERIC4-75	15-Sep-14	5.2	10.6	81.8	1,512	939	8.10
	FO29	16-Sep-14	6.0	11.5	92.4	651	415	8.50
	FORD7-25	Sep-2014	5.8	9.5	90.7	755	478	7.89
	FORD7-25-2	17-Sep-14	8.1	11.2	114.6	591	399	8.26
	FORD7-50	13-Sep-14	6.1	9.4	90.2	749	478	8.16
	FORD7-50-2	17-Sep-14	8.1	10.9	111.9	593	390	8.26
	GRAV1-25	13-Sep-14	6.3	11.1	88.5	583	375	8.71
	GRAV1-25-2	16-Sep-14	4.5	85.5	11.0	597	-	8.58
	GRAV1-50	17-Sep-14	10.3	10.3	92.7	568	-	8.49
	GRAV1-75	13-Sep-14	6.6	10.2	95.8	508	322	8.47
	GRAV1-75-2	16-Sep-14	4.7	11.4	89.2	567	-	8.63
	GRAV1-75-3	16-Sep-14	5.2	10.8	84.8	594	-	8.66
	GREE1-75	17-Sep-14	10.5	9.3	99.5	1,021	738	8.47
	GREE3-25	14-Sep-14	2.7	10.8	95.5	977	562	8.47
	GREE3-75	14-Sep-14	3.2	10.7	96.3	1,052	616	8.55
	GREE4-25	14-Sep-14	2.0	11.5	81.1	1,961	1,101	8.60
	GREE4-75	14-Sep-14	6.5	10.3	84.8	2,211	1,430	8.54
	HARM1-50	17-Sep-14	8.0	10.5	89.1	650	-	8.14
	HARM1-50-2	16-Sep-14	5.4	10.6	83.2	676	-	8.57
	HARM1-75	15-Sep-14	6.3	11.8	111.1	429	276	8.46
	HARM5-25	16-Sep-14	4.4	10.2	92.9	618	314	8.35
	LI8	18-Sep-14	7.4	10.1	83.5	602	-	8.71
	LIDSL	18-Sep-14	6.5	10.5	84.8	644	416	8.44
	LILC3	18-Sep-14	5.7	11.1	88.0	821	518	8.24
	MICH1-25	13-Sep-14	5.4	10.4	82.0	445	279	7.72
	NTHO1-25	14-Sep-14	8.6	9.8	84.1	2,414	1,656	8.53
	NTHO1-50	14-Sep-14	8.1	10.0	84.9	2,434	1,646	8.51
	PORT1-0	15-Sep-14	4.8	10.8	101.5	738	452	8.50

Table A.12: Standardized coefficients for PC-1 and PC-2 for the principal component analysis of water quality varaibles for reference (n = 40) and mine-exposed (n = 74) areas associated with the RAEMP and Calcite studies, September 2015.

	Water Quality Variable	PC-1	PC-2
Other Parameters	Hardness	-0.9758	0.0087
	Total Suspended Solids	0.2330	0.7403
	Total Dissolved Solids	-0.9740	0.0167
	Turbidity	0.1886	0.8374
	Alkalinity	-0.8788	-0.0126
	Total Alkalinity	-0.8788	-0.0126
	Ammonia	-0.2422	0.1319
	Chloride	-0.7840	0.3032
	Fluoride	-0.3299	-0.4444
	Nitrate	-0.7945	-0.0672
	Nitrite	-0.7159	0.1036
	Total Kjeldahl Nitrogen	-0.4382	-0.0352
	Orthophosphate (Dissolved)	0.0188	-0.0839
	Total Phosphorus	0.0498	0.5790
	Sulphate	-0.9227	0.0230
	Dissolved Organic Carbon	-0.5322	0.3542
	Total Organic Carbon	-0.5337	0.3009
	Specific Conductivity	-0.9825	0.0162
	Conductivity	-0.9728	0.0192
Total Metals	Aluminum	0.2785	0.7798
	Arsenic	-0.3351	-0.1431
	Barium	-0.1823	-0.0328
	Cadmium	-0.6758	-0.2457
	Calcium	-0.9775	-0.0084
	Iron	0.1560	0.7138
	Lithium	-0.8470	-0.0862
	Magnesium	-0.9632	0.0295
	Manganese	-0.1979	0.6763
	Molybdenum	-0.8413	0.0758
	Nickel	-0.8188	-0.0257
	Potassium	-0.9572	0.0824
	Selenium	-0.9057	-0.1972
	Silicon	-0.5108	0.2570
	Sodium	-0.5642	0.3524
	Strontium	-0.4551	0.3551
	Sulphur	-0.9281	0.0179
	Uranium	-0.9258	-0.0257
Dissolved Metals	Aluminum	0.1002	0.1508
	Barium	-0.1963	-0.0309
	Cadmium	-0.6899	-0.3075
	Calcium	-0.9777	-0.0133
	Lithium	-0.8465	-0.1125
	Magnesium	-0.9625	0.0347
	Manganese	-0.4873	0.1639
	Molybdenum	-0.8487	0.0446
	Nickel	-0.8357	-0.0894
	Potassium	-0.9617	0.0622
	Selenium	-0.9046	-0.1948
	Silicon	-0.4760	0.1767
	Sodium	-0.5679	0.3575
	Strontium	-0.4645	0.3731
	Sulphur	-0.9253	0.0211
	Uranium	-0.9226	-0.0198
	Zinc	-0.6551	-0.3334

coefficient < -0.9 for PC-1

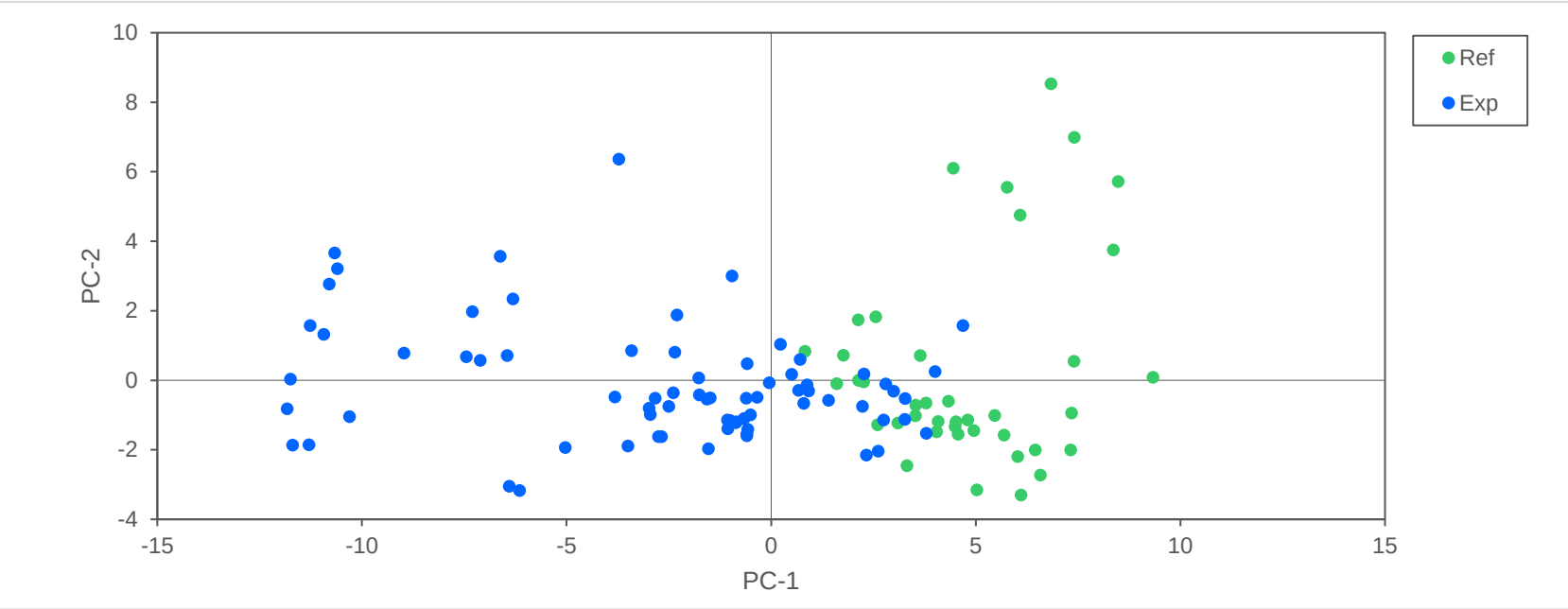


Figure A.1: Scatterplot of principal component 2 (PC-2) versus principal component 1 (PC-1) for water quality variables for all reference and mine-exposed areas sampled in Elk Valley in 2015.

APPENDIX B

Detailed Periphyton Productivity Data

Table B.1: Periphyton ash-free dry mass (AFDM) and chlorophyll-a for samples collected from reference areas in September 2015.

Area Description	Sampling Area Code	Date	Chlorophyll-a (mg/m^2)	AFDM (g/m^2)
Normal Range[a]		**Minimum:**	**0.10**	**<0.50**
		Maximum:	**81.0**	**52.2**
Andy Good u/s CMO influence	AGCK	12-Sep-15	0.97	0.50
Upper Alexander Creek	AL4	13-Sep-15	71	59
Alexander Creek upstream of Michel	ALUSM	13-Sep-15	24	10
Bull River	BU2	13-Sep-15	14	13
Bull River 40 km Bridge	BU40	13-Sep-15	39	22
Bull River u/s Quinn	BUUQ	13-Sep-15	1.4	<0.50
Cadorna Creek u/s Elk River	CADCK	13-Sep-15	7.0	7.8
Chauncey Creek near mouth	CHCK	12-Sep-15	80	42
Cross River u/s Kootenay River	CRUKO	11-Sep-15	0.10	<0.50
Daisy Creek	DACK	12-Sep-15	23	6.9
Dutch Creek	DUCK	11-Sep-15	6.6	5.4
Elk River d/s of Cadorna	EL12	13-Sep-15	2.8	1.7
Elk River u/s Branch	ELUGH	17-Sep-15	48	37
Ewin Creek near mouth	EWCK	12-Sep-15	62	27
Flathead River Downstream	FLAD	14-Sep-15	6.7	29
Flathead River Upstream	FLAU	14-Sep-15	0.72	<0.50
Upper Flathead River	FLRU	19-Sep-15	13	8.5
Fording u/s Henretta (u/s all mines)	FO26	14-Sep-15	36	13
Grave Creek u/s Harmer	GRUHA	11-Sep-15	2.8	<0.50
Henretta u/s all mine operations	HENUP	15-Sep-15	4.1	1.0
Kootenay River	KO1	13-Sep-15	0.14	<0.50
Kootenay River d/s Cross River	KODCR	12-Sep-15	3.2	1.2
Kootenay River u/s Cross River	KOUCR	12-Sep-15	2.3	5.5
Kootenay River u/s Vermillion	KOUVE	10-Sep-15	15	19
Grace Creek	LC_GRCK	18-Sep-15	1.4	<0.50
McCool Creek	MCCR	11-Sep-15	139	52
Michel u/s CMO influence	MI25	10-Sep-15	19	8.0
Oldman d/s Dutch, u/s Racehorse	OLDDU	12-Sep-15	14	17
Oldman d/s Livingstone	OLDLI	11-Sep-15	6.6	5.3
Oldman lower u/s reservoir	OLDLOW	10-Sep-15	5.5	9.8
Palliser River d/s Albert	PADAL	11-Sep-15	0.73	0.60
Palliser River u/s Kootenay, d/s Fenwick	PAUKO	11-Sep-15	0.0091	<0.50
Racehorse Creek	RACK	11-Sep-15	4.3	1.3
Vermillion u/s Kootenay, d/s Simpson	VEUKO	10-Sep-15	1.1	0.95
Vermillion Upper, u/s Simpson	VEUP	10-Sep-15	6.2	4.3
Vicary Creek	VICK	10-Sep-15	8.7	6.9
Lower Wigwam River	WWRL	11-Sep-15	21	7.6
Upper Wigwam River	WWRU	19-Sep-15	0.13	1.2
Line Creek Reference (LI24)	LI24-1	10-Sep-15	7.2	3.4
	LI24-2	10-Sep-15	9.7	3.5
	LI24-3	10-Sep-15	7.1	3.3
	LI24-4	10-Sep-15	7.9	5.0
	LI24-5	10-Sep-15	9.6	4.8
	LI24-6	10-Sep-15	4.9	3.0
	LI24-7	10-Sep-15	6.5	3.2
	LI24-8	10-Sep-15	8.1	3.0
	LI24-9	10-Sep-15	5.8	-
	LI24-10	10-Sep-15	4.8	3.2
		Mean[b] =	**7.2**	**3.6**
South Line Creek Reference (SLINE)	SLINE-1	15-Sep-15	42	20
	SLINE-2	15-Sep-15	16	6.3
	SLINE-3	15-Sep-15	24	11
	SLINE-4	15-Sep-15	29	13
	SLINE-5	15-Sep-15	18	7.4
	SLINE-6	15-Sep-15	28	9.6
	SLINE-7	15-Sep-15	9.9	4.2
	SLINE-8	15-Sep-15	9.2	3.8
	SLINE-9	15-Sep-15	4.8	1.6
	SLINE-10	15-Sep-15	17	6.1
		Mean[b] =	**20**	**8.3**
Summary Statistics		**Mean**	**18**	**11**
		Median	**6.6**	**6.2**
		Minimum	**0.0091**	**<0.5**
		Maxiumum	**139**	**59**
		2.5th Percentile	**0.10**	**<0.5**
		97.5th Percentile	**81**	**52.2**

value outside of the normal range for AFDM or chlorophyll-a.

[a] The normal range for AFDM and chlorophyll-a were defined as the 2.5th and 97.5th percentiles of observations among reference areas.

[b] Concentrations reported as less than the method detection limit (MDL) were substituted with the MDL to calculate the mean.

Table B.2: Periphyton ash-free dry mass (AFDM) and chlorophyll-a for samples collected from mine-exposed areas in September 2015. Gray shade indicates values outside the normal range (i.e., between 2.5th and 97.5th percentiles).

Area Description	Sampling Area Code	Date	Chlorophyll-a (mg/m^2)	AFDM (g/m^2)
Normal Range[a]		Minimum:	0.1	<0.50
		Maximum:	81.0	52.2
Bodie Creek d/s Bodie Pond	BOCK	14-Sep-15	13	14
Cataract Creek near mouth	CACK	11-Sep-15	26	3.4
Cataract Creek d/s of CACK	CATA2-25	11-Sep-15	60	19
Cataract Creek d/s of CATA2-25	CATA2-75	11-Sep-15	28	14
Corbin Creek near Mouth	COCK	11-Sep-15	34	71
Elk d/s Sparwood & Michel	EL1	16-Sep-15	9.8	4.9
Elk River d/s Fording, u/s Grave	EL19	17-Sep-15	20	9.7
Elk River d/s Thompson & GHO	EL20	17-Sep-15	0.27	6.1
Elk River d/s Elkford sewage ponds	ELDEL	19-Sep-15	12	2.8
Elk River d/s Fernie	ELDFE	16-Sep-15	11	12
Elk River d/s Grave	ELDGR	19-Sep-15	0.23	<0.50
Elk River u/s Elko	ELELKO	14-Sep-15	3.2	1.5
Elk River u/s Hwy 93 Bridge	ELH93	16-Sep-15	81	61
Elk River u/s Elkford	ELUEL	13-Sep-15	11	5.8
Elk River u/s Fernie	ELUFE	15-Sep-15	7.9	7.8
Elk River just u/s Fording	ELUFO	18-Sep-15	52	42
Elk d/s Otto, u/s Sparwood & Michel	ELUSP	15-Sep-15	5.6	6.4
Fording d/s Josephine falls, u/s Grace & Line	FO9	18-Sep-15	13	31
Fording Side Channel (old Fording oxbow)	FO10-SP1	17-Sep-15	98	59
Fording u/s Chauncey Creek	FO22	12-Sep-15	162	81
Fording d/s Dry, u/s GHO & Hwy Bridge	FO29	12-Sep-15	172	70
Fording between Cataract & Porter	FOBCP	17-Sep-15	3.4	2.6
Fording between Kilmarnock & Swift	FOBKS	16-Sep-15	1.8	2.2
Fording d/s Swift, u/s Cataract	FOBSC	17-Sep-15	3.4	3.7
Fording River d/s GHO	FODGH	16-Sep-15	172	48
Fording d/s Henretta	FODHE	14-Sep-15	1.2	<0.50
Fording d/s North Greenhills Diverson	FODNGD	14-Sep-15	5.0	0.75
Fording d/s Porter, u/s Chauncey	FODPO	15-Sep-15	90	23
Fording u/s FOUEW	FORD7-75	18-Sep-15	92	91
Fording d/s Chauncey, u/s Ewin	FOUEW	13-Sep-15	213	87
Fording u/s Kilmarnock Creek	FOUKI	16-Sep-15	21	11
Fording u/s North Greenhills Diversion	FOUNGD	15-Sep-15	3.0	0.75
Fording u/s Shandley Creek	FOUSH	15-Sep-15	21	16
Greenhills Creek d/s of settling pond	GHCKD	15-Sep-15	31	6.8
Greenhills Creek u/s settling pond	GHCKU	15-Sep-15	67	26
Grave Creek d/s Harmer	GRCK	19-Sep-15	8.1	1.9
Grave Creek near mouth at Elk	GRDS	12-Sep-15	11	1.5
Greenhills Creek d/s of GHCKD	GREE1-50	15-Sep-15	28	33
Greenhills Creek u/s of GHCKU	GREE3-75	15-Sep-15	111	70
Greenhills Creek u/s of GREE3-75	GREE4-25	16-Sep-15	283	109
Greenhills Creek u/s of GREE4-25	GREE4-75	16-Sep-15	95	135
Harmer d/s Pond near mouth at Grave	HACKDS	10-Sep-15	208	56
Harmer Creek u/s Harmer Pond	HACKUS	11-Sep-15	150	24
Harmer Creek d/s of HACKDS	HARM1-50	12-Sep-15	307	82
Harmer Creek u/s of HACKUS	HARM5-25	12-Sep-15	49	23
Henretta u/s confluence with Fording	HENFO	16-Sep-15	7.4	3.5
Kilmarnock u/s road crossing	KICK	17-Sep-15	2.5	1.3
Kilmarnock d/s of KICK	KILM1-50	17-Sep-15	6.5	14
Dry Creek near mouth	LC_DC1	13-Sep-15	64	17
Dry Creek d/s sedimentation ponds	LC_DCDS	15-Sep-15	3.9	2.2
Fording River u/s Dry Creek	LC_FRUS	13-Sep-15	382	5.7
Michel Creek d/s EVO	MI2	10-Sep-15	11	5.2
Michel u/s Erickson Creek	MI3	14-Sep-15	8.4	2.4
Michel d/s CMO	MI5	13-Sep-15	1.5	0.60
Michel d/s Andy Good	MIDAG	12-Sep-15	3.1	<0.50
Michel d/s Corbin, u/s Andy Good	MIDCO	11-Sep-15	3.7	12
Michel u/s Corbin Creek	MIUCO	11-Sep-15	25	8.1
Fording Multiplate d/s Eagle Ponds	MP1	15-Sep-15	30	9.4
Harmer d/s Pond near mouth at Grave	NTHO1-25	18-Sep-15	58	49
North Thompson Creek	NTHO1-50	18-Sep-15	100	77
Otto Creek near mouth	OCNM	15-Sep-15	7.0	11
Porter Creek	POCK	14-Sep-15	161	133
Porter Creek u/s of PORT2-0	PORT3-25	14-Sep-15	55	82
Porter Creek u/s of PORT3-25	PORT3-50	14-Sep-15	21	16
Swift Creek	SWCK	10-Sep-15	138	78
Swift Creek u/s of SWIF2-50	SWIF2-75	10-Sep-15	208	107
Thompson Creek	THCK	18-Sep-15	66	16
Wolfram Creek	WOCK	17-Sep-15	86	33

Table B.2: Periphyton ash-free dry mass (AFDM) and chlorophyll-a for samples collected from mine-exposed areas in September 2015. Gray shade indicates values outside the normal range (i.e., between 2.5th and 97.5th percentiles).

Area Description	Sampling Area Code	Date	Chlorophyll-a (mg/m^2)	AFDM (g/m^2)
		Minimum:	**0.1**	**<0.50**
	Normal Range[a]	**Maximum:**	**81.0**	**52.2**
Line Creek Upstream of Active Water Treatment Facility (LILC3)	LILC3-1	14-Sep-15	69	81
	LILC3-2	14-Sep-15	123	77
	LILC3-3	14-Sep-15	179	89
	LILC3-4	14-Sep-15	260	168
	LILC3-5	14-Sep-15	242	118
	LILC3-6	14-Sep-15	223	172
	LILC3-7	14-Sep-15	197	117
	LILC3-8	14-Sep-15	185	132
	LILC3-9	14-Sep-15	188	140
	LILC3-10	14-Sep-15	139	135
		Mean[b] =	**180**	**123**
Line Creek Downstream of South Line Creek and Contingency Ponds (LIDSL)	LIDSL-1	12-Sep-15	73	37
	LIDSL-2	12-Sep-15	69	17
	LIDSL-3	12-Sep-15	9.4	5.3
	LIDSL-4	12-Sep-15	25	14
	LIDSL-5	12-Sep-15	52	26
	LIDSL-6	12-Sep-15	25	6.1
	LIDSL-7	12-Sep-15	17	7.6
	LIDSL-8	12-Sep-15	14	5.2
	LIDSL-9	12-Sep-15	4.0	1.2
	LIDSL-10	12-Sep-15	21	5.9
		Mean[b] =	**31**	**13**
Line Creek Downstream of Canyon (LI8)	LI8-1	13-Sep-15	1.4	0.5
	LI8-2	13-Sep-15	0.59	<0.50
	LI8-3	13-Sep-15	15	5.2
	LI8-4	13-Sep-15	9.0	2.7
	LI8-5	13-Sep-15	2.6	0.75
	LI8-6	13-Sep-15	4.0	1.5
	LI8-7	13-Sep-15	2.3	0.75
	LI8-8	13-Sep-15	4.9	1.1
	LI8-9	13-Sep-15	10	2.7
	LI8-10	13-Sep-15	51	7.7
		Mean[b] =	**10**	**2.33**
Fording River Upstream of Line Creek (FOUL)	FOUL-1	17-Sep-15	0.95	2.5
	FOUL-2	17-Sep-15	1.1	2.0
	FOUL-3	17-Sep-15	1.1	1.3
	FOUL-4	17-Sep-15	0.77	<0.50
	FOUL-5	17-Sep-15	0.37	<0.50
	FOUL-6	17-Sep-15	1.9	<0.50
	FOUL-7	17-Sep-15	0.35	1.9
	FOUL-8	17-Sep-15	0.25	1.9
	FOUL-9	17-Sep-15	0.80	0.50
	FOUL-10	17-Sep-15	2.3	1.7
		Mean[b] =	**0.99**	**1.3**
Fording River Downstream of Line Creek (FO23)	FO23-1	16-Sep-15	4.1	0.65
	FO23-2	16-Sep-15	26	5.4
	FO23-3	16-Sep-15	31	15
	FO23-4	16-Sep-15	125	73
	FO23-5	16-Sep-15	24	3.9
	FO23-6	16-Sep-15	8.7	3.9
	FO23-7	16-Sep-15	57	12
	FO23-8	16-Sep-15	2.3	0.90
	FO23-9	16-Sep-15	1.2	<0.50
	FO23-10	16-Sep-15	4.1	1.3
		Mean[b] =	**28**	**11.63**

[a] The normal range for AFDM and chlorophyll-a were defined as the 2.5th and 97.5th percentiles for the reference area distribution.

[b] Concentrations reported as less than the method detection limit (MDL) were substituted with the MDL to calculate the mean.

Table B.3: Ash-free dry mass (AFDM) and chlorophyll-a concentrations for periphyton samples collected in September 2014.

Site Description	Sample ID	Date	AFDM (g/m^2)	Chlorophyll-a (mg/m^2)
Reference	ALEX3-25	16-SEP-14	5.70	12.2
	CHAU1-50-1	12-SEP-14	19.6	4.85
	CHAU1-75-1	17-SEP-14	3.05	2.92
	CHAU1-75-2	12-SEP-14	7.05	13.6
	GRAC2-25	14-SEP-14	0.500	1.41
	GRAC2-75	14-SEP-14	0.600	6.60
	HARM6-25	16-SEP-14	1.10	2.45
Mine-exposed	ELKR8-75[a]	15-SEP-14	3.78	23.4
	FO29	16-SEP-14	31.0	30.4
	FORD7-25	13-SEP-14	48.8	27.1
	FORD7-50-1	13-SEP-14	19.6	2.37
	FORD7-50-2	17-SEP-14	22.4	2.81
	GRAV1-25-1	13-SEP-14	18.1	9.45
	GRAV1-25-2	16-SEP-14	7.65	11.3
	GRAV1-75	13-SEP-14	1.65	5.75
	GRAV1-50[a]	17-SEP-14	11.1	48.8
	GRAV3-75[a]	17-SEP-14	0.720	3.81
	GREE1-75	17-SEP-14	58.5	10.4
	GREE3-25-1	14-SEP-14	13.0	8.35
	GREE3-75-1	14-SEP-14	11.1	31.9
	GREE4-25	14-SEP-14	12.3	11.4
	GREE4-75	14-SEP-14	34.6	13.2
	HARM1-75	15-SEP-14	35.7	56.5
	HARM5-25	16-SEP-14	4.95	2.89
	LI8[b]	5-SEP-14	9.11	4.32
	LIDSL[b]	8-SEP-14	69.5	6.43
	LILC3[b]	3-SEP-14	55.5	7.73
	MICH1-25	13-SEP-14	4.45	4.60
	NTHO1-25	14-SEP-14	12.7	3.14
	NTHO1-50	14-SEP-14	31.9	33.8
	PORT1-0	15-SEP-14	25.2	22.5

[a] Samples collected by Lotic Environmental.

[b] Collected as part of the Line Creek LAEMP. Values are an average of 10 samples each.

Table B.4: Pearson or Spearman correlation of productivity endpoints and calcite endpoints for reference (n = 40) and mine-exposed (n = 74) areas associated with the RAEMP and Calcite studies, September 2015.

Variables		AFDM	Chlorophyll-a	Calcite Index	Calcite Thickness	Calcite Presence	Calcite Concretion
AFDM	Pearson Correlation	-	-	-	-	-	-
	P-value (2-tailed)	-	-	-	-	-	-
Chlorophyll-a	Pearson Correlation	0.707	-	-	-	-	-
	P-value (2-tailed)	<0.001	-	-	-	-	-
Calcite Index	Pearson Correlation	0.467	0.395	-	-	-	-
	P-value (2-tailed)	<0.001	<0.001	-	-	-	-
Calcite Thickness	Pearson Correlation	0.415	0.408	0.909	-	-	-
	P-value (2-tailed)	<0.001	<0.001	<0.001	-	-	-
Calcite Presence	Spearman Correlation	0.529	0.604	0.961	0.958	-	-
	P-value (2-tailed)	<0.001	<0.001	<0.001	<0.001	-	-
Calcite Concretion	Spearman Correlation	0.349	0.357	0.687	0.579	0.539	-
	P-value (2-tailed)	<0.001	<0.001	<0.001	<0.001	<0.001	-

p-value < 0.05

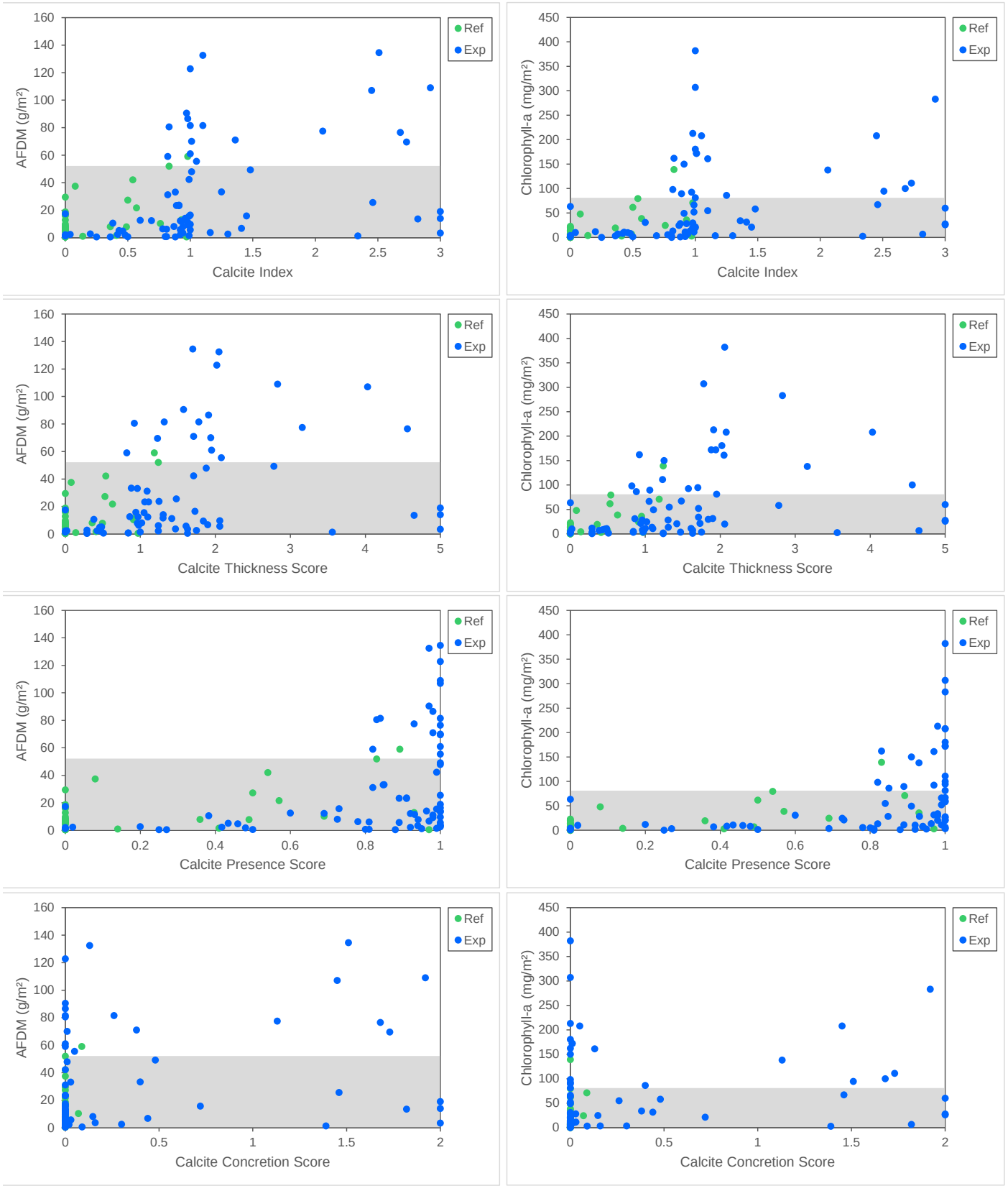


Figure B.1: Plots of periphyton endpoints with significant ($p < 0.05$) absolute Pearson's correlation coefficient (r) greater than 0.60 with calcite endpoints (Table B.4) based on samples collected at reference (n = 40) and mine-exposed areas (n = 74), sampled in 2015. Shading represents the normalrange defined as the 2.5th and 97.5th percentiles of the distribution of reference area values.

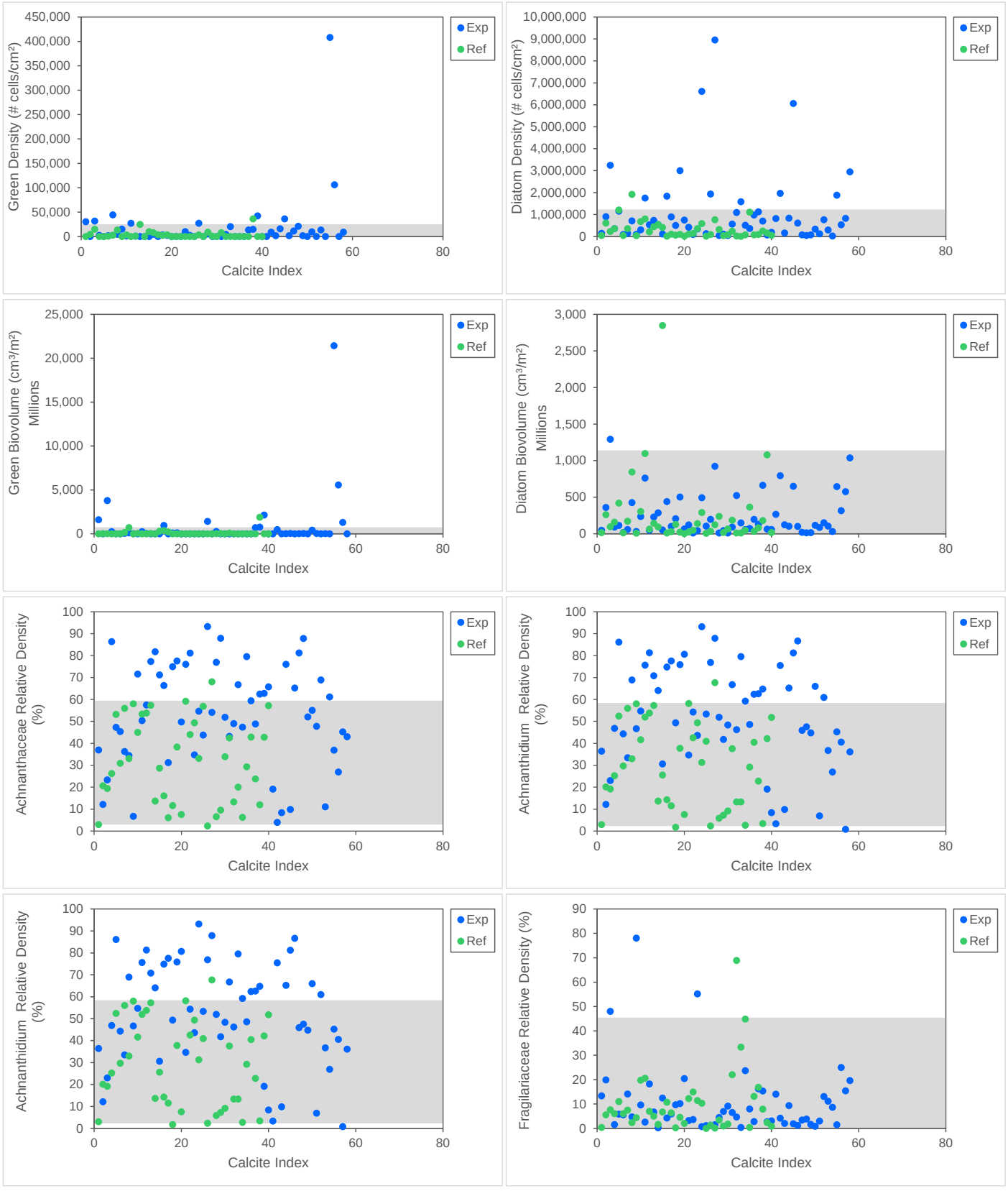


Figure B.2: Plots of periphyton endpoints with significant ($p < 0.05$) absolute Pearson's correlation coefficient (r) greater than 0.60 for RAEMP reference (n = 40) and mine-influenced areas (n = 58) to PC-1 for water quality, September 2015. Shading represents the normal range defined as the 2.5th and 97.5th percentiles of the distribution of reference area values. Periphyton community data from Minnow and Larratt (2016).

APPENDIX C

Detailed Benthic Invertebrate Community Data

Table C.1: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference (n = 40) and mine-exposed (n = 74) areas based on lowest practical level of taxonomy, September 2015.

Station	Reference																															
	AGCK	AL4	ALUSM	BU2	BU40	BUUQ	CADCK	CHCK	CRUKO	DACK	DUCK	EL12	ELUGH	EWCK	FLAD	FLAU	FO26	FLRU	GRUHA	HENUP	KO1	KODCR	KOUCR	KOUVE	LC_GRCK	LI24	MCCR	MI25	OLDDU	OLDLI	OLDLOW	PADAL	PAUKO
Phylum: Arthropoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Hexapoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Insecta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Ephemeroptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Ameletidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ameletus	180	0	0	5	10	20	0	60	4	80	17	40	0	0	0	40	80	17	13	40	125	78	46	144	0	164	0	80	50	0	18	8	5
| Family: Baetidae	0	0	0	5	90	0	20	40	0	20	0	0	0	0	60	60	0	0	0	0	0	1	4	0	0	0	0	0	0	0	0	0	0
Acentrella sp.	0	0	0	5	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55	0	0
Acentrella turbida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27	0	0
Baetis	40	2,620	220	15	160	170	1,040	200	54	2,340	533	1,480	300	300	300	80	1,280	917	813	80	3	94	69	131	240	0	1,160	520	156	143	155	65	64
Baetis bicaudatus	20	180	0	10	0	0	20	40	2	40	0	40	0	60	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0
Baetis tricaudatus group	0	40	40	20	0	50	20	0	1	420	17	100	89	100	0	0	0	17	138	0	5	6	3	6	40	0	280	0	50	243	45	5	5
| Family: Ephemerellidae	40	1,080	2,320	30	250	40	160	500	33	900	550	320	167	640	440	400	960	50	63	400	13	4	21	0	120	55	360	1,180	0	29	718	104	19
Caudatella sp.	0	180	0	0	30	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Drunella doddsii	40	280	160	55	30	200	320	260	4	360	17	160	167	660	240	140	360	50	100	60	0	3	7	31	0	9	300	420	44	543	27	7	8
Drunella flavilinea	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	5
Drunella grandis group	0	0	60	0	70	0	0	0	1	0	0	0	0	0	40	0	0	167	0	0	0	1	0	31	0	0	0	0	13	0	0	5	1
Drunella sp.	0	200	0	0	10	40	0	20	0	20	17	0	0	20	0	0	0	0	13	0	0	1	0	0	0	9	0	0	0	0	0	0	1
Drunella spinifera	0	0	0	0	0	0	0	40	0	0	33	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ephemerella	0	60	120	0	10	0	0	0	5	0	50	0	0	20	440	420	0	583	0	0	3	14	9	6	0	0	20	40	100	100	36	15	25
| Family: Heptageniidae	4,280	1,300	560	465	530	610	3,780	4,260	109	820	133	2,580	1,322	1,620	1,200	1,180	3,560	900	913	4,100	473	71	65	319	640	1,291	480	1,080	306	2,114	209	74	75
Cinygmula sp.	60	0	0	0	0	0	20	80	1	0	0	60	11	0	0	0	0	0	0	0	0	1	2	0	0	218	40	0	0	0	0	0	0
Epeorus	20	260	60	15	0	0	300	100	28	60	0	0	44	180	0	0	40	0	113	200	0	5	3	0	260	0	80	20	0	14	0	3	0
Rhithrogena	220	0	80	190	0	100	860	0	19	120	17	340	111	60	0	0	60	17	50	200	3	35	18	19	40	155	80	0	0	771	0	1	11
| Family: Leptophlebiidae	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	80	0	50	0	0	0	0	0	0	0	0	0	0	0	0	100	1	0
Paraleptophlebia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Plecoptera	0	0	0	0	0	20	0	0	0	0	83	0	0	0	0	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Capniidae	0	0	0	15	20	10	300	0	0	160	17	20	11	0	20	0	0	0	13	20	48	28	55	19	180	55	60	80	6	57	0	3	4
Capnia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Utacapnia sp.	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Chloroperlidae	20	80	0	45	20	0	120	0	2	60	0	20	22	120	20	0	40	17	38	0	0	0	8	0	80	36	0	60	0	0	18	2	3
Suwallia	20	0	0	0	0	0	0	0	0	0	0	0	0	40	0	160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	4
Sweltsa sp.	120	120	140	30	110	20	60	80	5	240	50	40	133	60	520	0	280	50	38	40	5	21	16	44	40	264	160	240	125	743	64	12	7
| Family: Leuctridae	0	0	0	0	0	30	0	20	3	60	33	0	11	0	0	0	20	0	13	0	0	0	0	6	0	9	0	40	0	14	0	0	0
Despaxia augusta	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Paraleuctra sp.	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Nemouridae	0	0	0	5	50	0	120	400	1	0	0	0	0	0	0	340	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Amphinemura sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Visoka cataractae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Zapada	20	200	200	15	10	30	0	0	0	380	133	220	11	240	60	20	100	83	225	80	0	2	2	38	960	36	320	360	56	29	9	3	2
Zapada cinctipes	0	0	40	0	50	10	0	20	0	420	33	0	67	20	80	100	0	50	0	0	0	0	1	0	40	0	0	0	0	29	9	0	0
Zapada columbiana	40	20	0	0	40	140	20	140	0	160	17	0	0	0	0	0	40	17	138	60	0	0	1	0	560	182	500	0	0	0	0	9	0
Zapada oregonensis group	80	20	80	0	20	0	80	300	1	40	33	0	0	80	0	20	180	0	113	20	0	0	1	0	60	0	0	20	0	0	0	30	6
| Family: Peltoperlidae	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	80	0	0	0	0	0	0	0	0
Yoraperla sp.	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	20	0	20	0	0	0	0	0	0
| Family: Perlidae	0	0	0	5	20	10	0	0	0	160	50	280	78	0	60	40	0	0	0	0	0	0	4	19	0	0	0	0	25	86	36	0	1
Calineuria californica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Claassenia sabulosa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0
Doroneuria sp.	0	0	0	0	0	0	0	0	0	40	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	14	0	0	0
Hesperoperla sp.	0	0	0	0	10	0	0	0	0	0	0	0	11	0	0	0	0	17	0	0	0	1	1	19	0	0	0	0	0	86	9	0	0
| Family: Perlodidae	0	260	120	15	60	20	280	1,580	24	80	100	360	178	0	80	0	520	67	50	0	8	0	15	19	140	9	100	360	6	29	227	100	23
Isoperla sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Megarcys sp.	20	20	0	5	0	20	240	280	2	40	17	0	0	80	0	0	180	0	13	40	0	0	0	0	0	36	20	40	6	43	0	0	1
| Family: Pteronarcyidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pteronarcella sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	6	0	0	0	0	0	0	0	0	0
Pteronarcys	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Taeniopterygidae	140	160	40	15	0	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Taenionema	1,300	1,000	160	135	40	590	1,640	180	181	240	33	840	767	280	60	40	120	17	1,188	1,760	0	6	12	0	20	127	800	1,040	13	343	9	46	118
| Order: Trichoptera	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0
| Family: Apataniidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apatania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedomoecus sierra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Brachycentridae	0	0	0	35	10	0	20	0	0	0	0	0	0	0	200	0	80	150	13	20	0	0	0	0	0	0	0	0	0	0	0	0	0
Brachycentrus americanus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brachycentrus occidentalis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brachycentrus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Micrasema	0	0	0	0	0	0	0	100	0	0	0	60	144	60	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table C.1: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference (n = 40) and mine-exposed (n = 74) areas based on lowest practical level of taxonomy, September 2015.

Station	Reference																															
	AGCK	AL4	ALUSM	BU2	BU40	BUUQ	CADCK	CHCK	CRUKO	DACK	DUCK	EL12	ELUGH	EWCK	FLAD	FLAU	FO26	FLRU	GRUHA	HENUP	KO1	KODCR	KOUCR	KOUVE	LC_GRCK	LI24	MCCR	MI25	OLDDU	OLDLI	OLDLOW	PADAL	PAUKO
| Family: Glossosomatidae	0	0	0	45	20	0	20	0	8	0	0	0	0	0	0	0	20	0	0	0	0	0	0	6	160	0	0	0	25	0	0	0	0
Glossosoma	0	0	1,080	185	70	80	0	20	8	20	83	0	0	160	360	0	0	17	138	0	0	0	0	0	200	0	140	40	300	57	0	2	0
| Family: Hydropsychidae	20	120	20	0	120	30	20	200	21	60	0	0	0	80	140	0	0	0	38	40	5	0	0	0	200	27	200	60	13	43	718	4	0
Arctopsyche sp.	0	0	0	0	140	0	0	0	3	0	0	0	56	0	40	0	0	0	0	0	0	16	32	0	0	0	0	60	19	100	0	7	15
Cheumatopsyche	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydropsyche	0	0	0	10	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	382	0	2
Parapsyche sp.	20	0	0	0	0	0	0	60	6	20	33	20	0	20	20	0	20	0	0	20	0	0	0	0	0	0	20	0	0	14	0	2	0
| Family: Hydroptilidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydroptila	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lepidostomatidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lepidostoma	0	0	0	0	0	0	120	0	0	0	0	0	0	340	0	0	100	0	50	0	3	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Leptoceridae	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Limnephilidae	0	60	440	0	0	50	0	60	0	60	0	100	0	0	0	780	0	67	0	0	0	0	0	0	820	73	0	0	0	0	36	1	0
Clostoeca disjuncta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dicosmoecus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ecclisomyia sp.	260	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hesperophylax sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Rhyacophilidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rhyacophila	20	620	60	20	70	30	40	140	1	660	450	80	0	0	60	40	0	17	275	0	3	5	1	0	200	18	160	140	13	71	9	3	5
Rhyacophila brunnea/vemna group	0	100	60	0	0	10	0	60	0	20	83	40	11	0	20	0	0	33	25	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Rhyacophila betteni group	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0
Rhyacophila hyalinata group	0	0	0	0	0	0	20	20	0	0	17	0	0	0	0	0	0	0	13	20	0	0	0	0	0	0	0	20	0	14	0	0	0
Rhyacophila vofixa group	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Uenoidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Neothremma sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,160	18	280	0	0	0	0	2	0
Oligophlebodes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5,440	20	19	0	0	0	0
| Order: Coleoptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Curculionidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Dytiscidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Agabus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Elmidae	0	0	0	0	0	0	0	0	0	100	50	0	0	0	20	0	0	0	0	0	0	0	0	6	0	0	20	0	0	0	0	0	0
Heterlimnius sp.	0	60	40	0	0	0	0	0	0	100	133	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Narpus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Optioservus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60	0	134	13	0	0	0	0	0	20	0	40	0	6	14	0	0	0
| Family: Hydrophilidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ametor sp. (Adult)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Staphylinidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Diptera	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Athericidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Atherix	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	1
| Family: Blephariceridae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Blepharicera sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Philorus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Ceratopogonidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Atrichopogon sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bezzia/ Palpomyia	0	0	0	0	0	0	20	0	0	0	0	0	0	40	160	0	33	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Forcipomyia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Probezzia	0	60	80	10	0	0	0	0	0	0	17	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0
| Family: Chironomidae	0	80	60	5	0	20	320	800	0	140	100	20	11	100	240	40	40	83	13	100	13	11	8	38	0	18	80	40	31	86	9	0	6
| Subfamily: Chironominae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Tribe: Chironomini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cryptochironomus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Microtendipes pedellus group	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0
Paracladopelma sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
Paratendipes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phaenopsectra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polypedilum sp.	0	0	20	0	0	30	0	0	0	0	0	0	0	0	460	0	0	233	0	0	0	0	0	0	0	0	0	0	113	29	36	0	0
Stictochironomus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Tribe: Tanytarsini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cladotanytarsus	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Micropsectra	20	60	100	0	10	30	100	400	0	80	150	340	22	20	620	300	220	100	0	40	3	1	0	25	0	0	0	60	0	0	18	0	0
Rheotanytarsus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	27	0	0
Stempellina sp.	0	0	0	0	0	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stempellinella sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Sublettea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Subfamily: Diamesinae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Tribe: Boreoheptagyiini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table C.1: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference (n = 40) and mine-exposed (n = 74) areas based on lowest practical level of taxonomy, September 2015.

Station	Reference																															
	AGCK	AL4	ALUSM	BU2	BU40	BUUQ	CADCK	CHCK	CRUKO	DACK	DUCK	EL12	ELUGH	EWCK	FLAD	FLAU	FO26	FLRU	GRUHA	HENUP	KO1	KODCR	KOUCR	KOUVE	LC_GRCK	LI24	MCCR	MI25	OLDDU	OLDLI	OLDLOW	PADAL	PAUKO
Boreoheptagyia sp.	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Tribe: Diamesini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diamesa	0	120	20	0	0	0	60	0	0	0	0	20	0	20	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pagastia	40	20	40	5	50	20	60	260	1	20	717	120	11	20	0	120	180	0	0	20	0	0	0	56	20	0	0	80	13	0	0	0	1
Potthastia longimana group	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pseudodiamesa sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	20	80	20	100	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0
| Subfamily: Orthocladiinae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brillia sp.	0	0	20	0	20	0	0	0	0	0	0	0	11	20	0	0	20	0	0	0	0	1	5	0	280	0	0	20	0	0	0	9	1
Corynoneura	0	0	0	0	0	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
Cricotopus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	360	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cricotopus (Nostococladius)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	833	0	0	0	0	0	0	0	0	0	640	19	43	9	0	1
Eukiefferiella	0	60	40	5	100	70	360	280	0	80	350	140	0	40	860	0	60	0	13	0	0	1	4	13	0	0	200	20	31	0	27	0	2
Heleniella sp.	0	0	0	0	40	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	0	0	0	0
Heterotrissocladius sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Heterotrissocladius marcidus group.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydrobaenus	0	0	20	0	0	0	0	180	1	0	0	0	0	0	0	0	60	0	0	0	0	0	1	0	40	0	0	20	13	0	0	1	0
Krenosmittia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
Limnophyes sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	3	1
Orthocladius	20	800	100	20	410	200	300	100	0	540	1,017	200	56	240	3,060	800	360	233	38	60	23	45	33	256	0	9	0	60	181	14	127	5	8
Orthocladius lignicola	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parametriocnemus	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parorthocladius sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	0	0	0	0
Psectrocladius	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pseudosmittia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rheocricotopus	20	0	60	0	20	70	40	420	0	120	200	0	0	180	100	280	80	0	13	40	0	0	0	0	20	64	40	20	0	57	0	2	1
Synorthocladius	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thienemanniella	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60	0	0	13	0	3	0	1	0	0	0	0	0	6	0	0	0	0
Tvetenia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tvetenia bavarica group	0	20	20	0	10	10	0	300	0	80	67	0	11	20	540	20	0	0	13	0	0	1	26	19	60	27	0	20	19	0	109	1	0
| Subfamily: Prodiamesinae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Odontomesa sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Subfamily: Tanypodinae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0
| Tribe: Pentaneurini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pentaneura sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thienemannimyia group	0	0	0	0	0	0	0	0	0	20	0	0	0	0	120	120	0	100	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
| Tribe: Procladiini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Procladius	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Dixidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dixa sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Empididae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	20	0	0	0	5	1	0	25	0	0	0	0	6	14	0	0	0
Chelifera/ Metachela	0	40	80	0	180	10	0	60	0	0	17	20	0	0	80	20	0	0	25	0	0	1	1	63	20	0	0	20	0	0	0	0	1
Clinocera sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Hemerodromia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oreogeton sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	1	0
Wiedemannia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Muscidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Limnophora sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Pelecorhynchidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glutops sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0
| Family: Psychodidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pericoma/Telmatoscopus sp.	40	540	1,900	0	0	0	140	1,000	0	200	150	300	178	0	140	280	20	67	13	0	0	0	0	25	0	0	160	20	0	0	0	0	0
Psychoda sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Simuliidae	0	0	0	0	0	0	0	20	0	40	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	6
Simulium	0	40	0	0	0	0	0	40	0	80	0	20	0	0	0	0	0	17	0	0	0	0	0	6	0	0	0	0	0	0	55	1	9
| Family: Stratiomyidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Euparyphus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Tabanidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tabanus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Tipulidae	0	0	20	15	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	3	2	5	0	20	18	0	0	0	0	0	5	0
Antocha sp.	0	0	0	0	110	0	0	0	0	20	17	0	0	0	40	0	0	117	0	0	0	0	0	0	0	0	0	0	31	29	0	0	0
Dicranota	0	40	0	0	0	10	80	0	0	20	33	20	0	20	0	0	140	0	0	20	3	0	0	0	0	36	20	60	13	14	0	0	0
Hesperoconopa sp.	0	0	0	0	0	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hexatoma sp.	0	0	0	0	0	0	0	0	2	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29	45	3	0
Limnophila sp.	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	4	12
Tipula	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Hemiptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Corixidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sigara	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table C.1: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference (n = 40) and mine-exposed (n = 74) areas based on lowest practical level of taxonomy, September 2015.

Station	Reference																															
	AGCK	AL4	ALUSM	BU2	BU40	BUUQ	CADCK	CHCK	CRUKO	DACK	DUCK	EL12	ELUGH	EWCK	FLAD	FLAU	FO26	FLRU	GRUHA	HENUP	KO1	KODCR	KOUCR	KOUVE	LC_GRCK	LI24	MCCR	MI25	OLDDU	OLDLI	OLDLOW	PADAL	PAUKO
| Order: Lepidoptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Megaloptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Sialidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sialis sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Odonata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Aeshnidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aeshna sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Crustacea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Malacostraca	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Amphipoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Gammaridae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gammarus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hyalellidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hyalella	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Chelicerata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Arachnida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Trombidiformes	0	0	0	5	30	0	0	60	0	0	33	20	0	0	0	20	0	0	0	0	0	1	0	0	0	0	0	0	0	0	9	0	0
| Family: Aturidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aturus	0	0	0	0	0	0	0	0	0	0	33	0	0	0	0	20	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0
| Family: Feltriidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Feltria sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hydryphantidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Protzia sp.	0	0	0	5	30	0	0	0	0	40	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	9	0	0
| Family: Hygrobatidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Atractides	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hygrobates	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lebertiidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lebertia	20	20	40	10	170	0	0	140	0	0	83	0	33	20	40	20	20	0	0	0	3	0	0	31	0	18	0	0	25	14	9	1	1
| Family: Mideopsidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mideopsis sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Sperchontidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sperchon	0	0	20	10	110	30	0	0	1	0	0	0	0	0	0	0	20	17	25	0	10	0	0	3	0	0	9	0	40	6	0	82	1	7
Sperchonopsis sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	2
| Family: Stygothrombiidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stygothrombium sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Torrenticolidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Testudacarus sp.	0	0	0	5	50	0	0	0	0	0	0	40	0	0	40	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Torrenticola	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	20	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Oribatei	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Oribatidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oribatida	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	13	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Phylum: Mollusca	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Bivalvia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Veneroida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Pisidiidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pisidium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Gastropoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Basommatophora	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lymnaeidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fossaria sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Physidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Physa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phylum: Annelida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Clitellata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Oligochaeta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Lumbriculida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lumbriculidae	0	20	20	10	0	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	20	0	0	0	0	0	0
Rhynchelmis sp.	0	0	100	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Tubificida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Enchytraeidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Enchytraeus	0	0	0	15	20	0	0	0	0	0	67	0	0	0	800	0	0	0	0	0	0	0	1	813	0	18	0	0	13	0	0	0	0
Fridericia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lumbricidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Naididae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
Nais	0	0	0	0	0	0	40	0	4	0	0	0	0	0	260	0	0	0	0	0	0	1	0	13	0	0	0	0	75	0	18	0	0
| Subfamily: Tubificinae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Individuals	**7,180**	**10,960**	**8,900**	**1,515**	**3,440**	**3,070**	**11,200**	**13,360**	**541**	**9,840**	**5,951**	**8,740**	**4,044**	**6,060**	**12,740**	**6,520**	**9,400**	**5,506**	**4,891**	**7,500**	**846**	**466**	**489**	**2,276**	**6,760**	**3,008**	**11,620**	**7,140**	**1,977**	**6,086**	**3,523**	**557**	**471**

Table C.1: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference (n = 40) and mine-exposed (n = 74) areas based on lowest practical level of taxonomy, September 2015.

Station	Reference							Mine-exposed																								
	RACK	SLINE	VEUKO	VEUP	VICK	WWRL	WWRU	BOCK	CACK	CATA2-25	CATA2-75	COCK	EL19	EL1	EL20	ELDFE	ELELKO	ELH93	ELDEL	ELUEL	ELUFE	ELUFO	ELDGR	ELUSP	FO19-SP1	FO22	FO23	FO29	FO9	FOBCP	FOBKS	FOBSC
Phylum: Arthropoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Hexapoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Insecta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Ephemeroptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Ameletidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ameletus	50	217	107	12	80	0	8	0	0	0	0	0	0	0	0	80	20	36	0	83	40	20	12	0	0	0	30	100	20	0	0	45
| Family: Baetidae	0	33	0	0	0	0	0	0	0	0	0	0	20	0	0	60	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0
Acentrella sp.	20	0	0	0	0	0	0	0	0	0	0	0	10	140	83	140	220	29	0	0	80	0	0	0	0	0	0	0	0	0	0	0
Acentrella turbida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0
Baetis	120	0	3	55	920	386	48	0	0	0	0	0	310	160	283	100	340	0	380	433	120	280	92	400	0	80	210	500	280	150	363	164
Baetis bicaudatus	0	17	0	36	0	0	45	0	0	0	0	0	0	60	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0
Baetis tricaudatus group	20	33	2	5	20	57	8	0	0	0	0	0	40	120	167	20	300	0	60	200	20	0	32	300	20	60	50	520	140	13	438	227
| Family: Ephemerellidae	110	650	30	24	240	300	78	0	0	0	0	0	40	1,980	117	9,640	420	43	300	317	4,660	880	68	260	20	760	180	660	40	63	100	91
Caudatella sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Drunella doddsii	20	67	0	0	280	343	8	0	0	0	0	0	70	260	850	0	40	0	540	200	20	20	68	120	60	700	40	60	80	75	13	27
Drunella flavilinea	0	50	0	12	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0
Drunella grandis group	10	0	1	0	20	0	0	0	0	0	0	0	20	20	17	100	0	0	0	17	20	80	8	20	160	80	10	200	20	0	0	9
Drunella sp.	0	0	0	0	0	14	0	0	0	0	0	0	0	20	0	0	0	0	40	0	0	20	0	0	0	20	20	20	0	0	0	0
Drunella spinifera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ephemerella	230	0	17	0	0	0	3	0	0	0	0	0	0	160	0	320	0	79	0	17	420	0	4	0	20	20	0	0	0	0	13	0
| Family: Heptageniidae	1,020	2,117	332	83	1,700	829	25	0	0	0	0	0	420	1,020	1,567	460	1,680	200	3,140	1,467	540	160	428	1,560	580	1,060	230	980	1,900	388	975	582
Cinygmula sp.	0	17	7	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60	0	0	0	0	0	0	0	0	0	0	0	0	0
Epeorus	0	483	2	12	60	29	10	0	0	0	0	0	0	20	17	0	0	0	40	0	0	0	0	0	0	0	0	0	0	0	38	27
Rhithrogena	180	200	3	10	60	0	123	0	0	0	0	0	20	180	300	0	2,200	0	140	100	20	20	116	120	0	0	10	0	180	0	25	0
| Family: Leptophlebiidae	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	280	40	14	0	0	20	40	0	0	0	0	0	0	0	0	0	0
Paraleptophlebia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Plecoptera	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Capniidae	20	0	46	24	0	0	0	0	13	17	10	20	0	0	0	20	20	14	40	17	0	0	4	0	160	40	10	0	140	50	13	18
Capnia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Utacapnia sp.	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Chloroperlidae	0	0	6	0	0	0	3	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	40	10	0	0	0	13	0
Suwallia	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sweltsa sp.	260	200	2	0	240	57	18	0	0	0	0	20	30	140	133	60	340	0	380	133	0	0	116	220	100	80	70	60	120	0	25	9
| Family: Leuctridae	20	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	20	0	0	0	0
Despaxia augusta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Paraleuctra sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Nemouridae	0	0	0	0	0	0	0	60	0	0	0	1,740	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Amphinemura sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Visoka cataractae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Zapada	10	117	0	17	780	71	0	0	0	0	0	20	20	0	0	40	40	0	20	17	0	0	8	0	980	1,260	490	780	320	400	25	73
Zapada cinctipes	40	100	0	0	180	0	10	260	0	0	0	580	10	40	33	20	0	7	120	17	20	440	4	0	0	0	40	120	60	250	50	18
Zapada columbiana	60	217	0	7	80	0	0	0	0	0	0	40	0	0	17	0	0	0	0	0	0	0	0	0	120	0	0	20	0	0	0	0
Zapada oregonensis group	0	67	1	17	100	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	40	80	30	60	20	0	0	0
| Family: Peltoperlidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0
Yoraperla sp.	0	67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Perlidae	30	0	0	0	220	0	0	0	0	0	0	0	590	100	100	180	0	0	140	333	220	920	48	480	0	0	410	20	100	88	25	9
Calineuria californica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Claassenia sabulosa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Doroneuria sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hesperoperla sp.	0	0	0	0	0	0	0	0	0	0	0	0	40	40	0	20	0	0	180	0	0	0	4	20	0	0	50	0	0	0	0	0
| Family: Perlodidae	20	50	27	36	220	71	10	0	0	6	30	100	40	360	217	740	200	79	160	200	340	400	40	240	6,860	7,320	40	280	220	1,275	338	236
Isoperla sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Megarcys sp.	0	217	0	2	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	100	0	0	0	75	25	55
| Family: Pteronarcyidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pteronarcella sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	440	0	20	17	0	60	0	60	0	0	0	0	0	0	0	0
Pteronarcys	0	0	0	0	0	0	0	0	0	0	0	0	0	100	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Taeniopterygidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Taenionema	60	267	7	57	360	157	13	160	0	0	0	20	60	140	917	0	120	7	620	317	0	0	40	100	680	520	90	60	580	238	200	91
| Order: Trichoptera	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	20	0	0	0	20	0	0	0
| Family: Apataniidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apatania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedomoecus sierra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Brachycentridae	0	0	0	0	0	0	0	0	0	0	0	0	40	20	383	0	0	0	20	0	0	0	0	60	0	0	80	60	20	38	0	0
Brachycentrus americanus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0
Brachycentrus occidentalis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brachycentrus sp.	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Micrasema	0	0	0	0	0	0	0	20	0	0	0	40	0	0	0	0	0	0	0	183	40	140	0	0	0	0	10	0	0	0	0	0

Table C.1: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference (n = 40) and mine-exposed (n = 74) areas based on lowest practical level of taxonomy, September 2015.

Station	Reference							Mine-exposed																							
	RACK	SLINE	VEUKO	VEUP	VICK	WWRL	WWRU	BOCK	CACK	CATA2-25	CATA2-75	COCK	EL19	EL1	EL20	ELDFE	ELELKO	ELH93	ELDEL	ELUEL	ELUFE	ELUFO	ELDGR	ELUSP	FO19-SP1	FO22	FO23	FO29	FO9	FOBCP	FOBKS	FOBSC
| Family: Glossosomatidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	20	0	0	0	0	0	0
Glossosoma	10	0	0	19	20	1,200	310	0	0	0	0	0	20	80	233	0	0	0	120	83	0	80	20	340	20	780	50	160	160	0	25	36
| Family: Hydropsychidae	10	467	0	36	0	71	0	0	0	0	0	0	10	120	83	40	100	29	80	0	20	0	0	40	0	0	0	0	0	0	0	9
Arctopsyche sp.	0	0	0	0	0	71	0	0	0	0	0	0	0	0	33	20	100	0	0	0	20	0	0	0	0	0	10	0	20	13	63	0
Cheumatopsyche	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydropsyche	0	0	0	2	0	0	0	0	0	0	0	0	0	0	17	40	440	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parapsyche sp.	0	17	0	7	0	0	0	0	0	0	0	0	20	40	0	0	0	0	0	0	0	0	4	0	0	0	0	20	0	25	13	9
| Family: Hydroptilidae	0	0	0	0	0	0	0	80	0	0	0	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydroptila	0	0	0	0	0	0	0	20	0	0	0	1,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lepidostomatidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lepidostoma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	160	120	43	0	0	20	0	0	0	0	0	0	0	0	0	0	0
| Family: Leptoceridae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Limnephilidae	120	133	0	0	20	86	3	20	425	72	100	100	10	60	17	0	0	0	60	0	0	0	12	0	80	40	0	20	0	0	13	0
Clostoeca disjuncta	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dicosmoecus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ecclisomyia sp.	0	67	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
Hesperophylax sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Rhyacophilidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rhyacophila	50	183	0	7	140	29	5	0	0	0	0	760	90	20	17	0	0	0	0	50	0	0	8	40	260	480	250	80	300	138	63	27
Rhyacophila brunnea/vemna group	0	17	0	0	40	0	0	0	0	0	0	260	0	0	17	0	0	0	0	17	0	20	4	0	140	240	40	20	100	0	13	27
Rhyacophila betteni group	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	0
Rhyacophila hyalinata group	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	27
Rhyacophila vofixa group	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Uenoidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Neothremma sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oligophlebodes	10	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	0	0	0	0	0
| Order: Coleoptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Curculionidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Dytiscidae	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0
Agabus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Elmidae	0	0	0	0	0	14	0	0	0	0	0	160	0	0	0	0	0	0	0	0	0	20	0	0	0	1,040	0	20	0	0	0	0
Heterlimnius sp.	0	0	0	0	0	0	0	0	0	0	0	240	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Narpus	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Optioservus sp.	120	0	2	0	480	0	8	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	1,460	20	120	0	0	0	0
| Family: Hydrophilidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ametor sp. (Adult)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Staphylinidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Diptera	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0
| Family: Athericidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Atherix	0	0	0	0	0	0	0	0	0	0	0	0	20	20	0	120	0	0	0	0	160	60	8	80	0	0	0	0	0	0	0	0
| Family: Blephariceridae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Blepharicera sp.	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Philorus sp.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Ceratopogonidae	0	0	0	0	0	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Atrichopogon sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bezzia/ Palpomyia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	0	0	25	13	9
Forcipomyia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Probezzia	0	0	1	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Chironomidae	60	17	4	5	40	229	8	100	50	44	190	420	50	400	33	340	40	164	160	167	300	140	4	40	660	860	60	460	140	138	88	18
| Subfamily: Chironominae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Tribe: Chironomini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cryptochironomus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Microtendipes pedellus group	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Paracladopelma sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Paratendipes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phaenopsectra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polypedilum sp.	20	0	0	0	20	14	0	0	0	0	0	0	0	0	0	200	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stictochironomus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Tribe: Tanytarsini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cladotanytarsus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Micropsectra	30	0	0	0	60	0	0	2,240	1,000	172	130	2,180	150	20	50	60	20	186	140	100	120	340	8	20	40	320	10	400	60	13	25	45
Rheotanytarsus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stempellina sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stempellinella sp.	0	0	0	0	0	0	0	0	475	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	20	0	0	0	0
Sublettea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0	0
| Subfamily: Diamesinae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Tribe: Boreoheptagyiini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table C.1: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference (n = 40) and mine-exposed (n = 74) areas based on lowest practical level of taxonomy, September 2015.

Station	Reference							Mine-exposed																							
	RACK	SLINE	VEUKO	VEUP	VICK	WWRL	WWRU	BOCK	CACK	CATA2-25	CATA2-75	COCK	EL19	EL1	EL20	ELDFE	ELELKO	ELH93	ELDEL	ELUEL	ELUFE	ELUFO	ELDGR	ELUSP	FO19-SP1	FO22	FO23	FO29	FO9	FOBCP	FOBKS	FOBSC
Boreoheptagyia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Tribe: Diamesini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diamesa	0	0	0	2	0	0	0	160	0	22	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
Pagastia	0	0	0	0	80	57	0	0	0	0	0	840	10	0	33	0	0	0	20	17	20	80	8	180	380	420	30	540	0	38	63	36
Potthastia longimana group	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pseudodiamesa sp.	0	0	0	0	0	0	0	20	38	0	10	0	20	40	0	0	0	0	0	0	0	60	0	0	0	0	0	0	0	0	0	0
| Subfamily: Orthocladiinae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brillia sp.	20	17	3	0	0	0	5	160	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0
Corynoneura	0	0	0	0	0	0	0	0	50	83	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cricotopus	0	0	0	0	0	0	0	0	300	0	0	580	0	0	0	0	0	0	0	0	0	240	0	0	0	0	0	0	0	0	0	0
Cricotopus (Nostococladius)	10	0	0	0	1,420	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0
Eukiefferiella	30	0	0	36	20	29	0	180	25	0	230	160	100	0	50	40	40	7	60	50	80	1,460	4	40	20	160	80	140	0	75	13	0
Heleniella sp.	0	0	0	0	0	0	0	20	0	0	0	40	0	0	0	0	40	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0
Heterotrissocladius sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Heterotrissocladius marcidus group.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0
Hydrobaenus	0	0	60	2	0	0	0	0	0	239	30	140	0	0	0	0	0	0	0	0	0	40	0	0	80	0	110	140	20	0	13	0
Krenosmittia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Limnophyes sp.	0	0	1	0	0	0	0	80	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0
Orthocladius	80	67	16	167	60	357	3	20	1,088	978	890	2,580	730	1,360	100	2,160	80	971	120	83	1,900	1,960	52	1,100	1,680	1,660	390	580	40	238	0	0
Orthocladius lignicola	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parametriocnemus	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parorthocladius sp.	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Psectrocladius	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pseudosmittia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rheocricotopus	60	33	3	0	60	271	0	20	25	0	0	0	0	160	50	60	0	0	80	33	0	60	0	0	20	80	70	120	0	0	0	0
Synorthocladius	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thienemanniella	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60	0	0	0	0
Tvetenia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tvetenia bavarica group	10	17	0	0	20	29	3	20	0	0	0	140	10	120	17	140	100	79	80	0	40	0	8	160	60	380	10	120	20	150	0	0
| Subfamily: Prodiamesinae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Odontomesa sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Subfamily: Tanypodinae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Tribe: Pentaneurini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pentaneura sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thienemannimyia group	30	0	0	0	20	0	0	0	0	0	0	60	0	0	0	80	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Tribe: Procladiini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Procladius	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Dixidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dixa sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Empididae	20	0	2	0	0	0	0	0	38	0	0	0	10	0	0	40	0	0	20	17	20	20	8	20	0	20	50	60	0	50	0	27
Chelifera/ Metachela	0	0	0	2	0	0	0	0	0	0	0	80	20	20	17	20	0	0	40	33	100	120	0	80	60	80	40	20	0	0	0	0
Clinocera sp.	0	0	0	0	0	0	0	0	0	0	0	0	10	40	0	0	0	0	0	0	40	60	0	0	0	0	30	0	0	0	0	0
Hemerodromia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oreogeton sp.	0	183	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wiedemannia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Muscidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Limnophora sp.	0	0	1	0	0	14	0	40	100	67	50	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Pelecorhynchidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glutops sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Psychodidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pericoma/Telmatoscopus sp.	100	0	1	0	220	14	3	20	38	0	0	15,480	30	0	100	0	0	0	220	300	20	40	8	40	100	220	150	380	1,320	100	963	664
Psychoda sp.	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Simuliidae	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0
Simulium	0	0	0	0	0	0	0	2,800	13	0	0	20	10	0	33	0	280	0	0	0	0	0	4	0	20	120	10	0	0	38	0	118
| Family: Stratiomyidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Euparyphus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Tabanidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tabanus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Tipulidae	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	20	0	0	0	20	0	0	0	0	0	0	0
Antocha sp.	10	0	0	0	0	14	0	0	0	0	0	0	10	20	0	20	0	0	0	0	20	20	0	0	0	20	50	0	0	0	0	0
Dicranota	0	0	0	0	20	0	0	40	25	11	10	60	0	0	0	0	0	0	20	0	0	20	0	0	40	200	10	20	20	13	0	0
Hesperoconopa sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hexatoma sp.	30	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Limnophila sp.	0	0	0	0	80	0	3	0	0	0	0	0	0	0	0	60	40	0	0	0	0	0	12	60	0	0	10	0	0	0	0	0
Tipula	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Hemiptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Corixidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sigara	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table C.1: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference (n = 40) and mine-exposed (n = 74) areas based on lowest practical level of taxonomy, September 2015.

Station	Reference							Mine-exposed																							
	RACK	SLINE	VEUKO	VEUP	VICK	WWRL	WWRU	BOCK	CACK	CATA2-25	CATA2-75	COCK	EL19	EL1	EL20	ELDFE	ELELKO	ELH93	ELDEL	ELUEL	ELUFE	ELUFO	ELDGR	ELUSP	FO19-SP1	FO22	FO23	FO29	FO9	FOBCP	FOBKS	FOBSC
| Order: Lepidoptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Megaloptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Sialidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sialis sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Odonata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Aeshnidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aeshna sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Crustacea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Malacostraca	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Amphipoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Gammaridae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gammarus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hyalellidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hyalella	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Chelicerata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Arachnida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Trombidiformes	0	0	0	5	0	0	0	0	0	0	0	60	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0
| Family: Aturidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aturus	0	0	1	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0
| Family: Feltriidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Feltria sp.	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hydryphantidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Protzia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hygrobatidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Atractides	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hygrobates	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lebertiidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lebertia	10	0	3	0	20	29	8	0	0	0	0	140	20	40	0	480	0	7	20	50	760	60	12	140	200	20	60	200	220	38	13	36
| Family: Mideopsidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mideopsis sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Sperchontidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sperchon	10	17	1	40	20	0	0	0	0	0	0	0	20	20	0	40	0	0	0	0	140	20	4	40	0	0	10	0	0	13	13	27
Sperchonopsis sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	40	0	20	0	0	0	60	0	0	0	0
| Family: Stygothrombiidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stygothrombium sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Torrenticolidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Testudacarus sp.	10	0	0	0	0	0	0	0	0	0	0	0	50	0	0	60	0	0	0	0	40	220	4	20	0	0	40	20	0	0	0	0
Torrenticola	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Oribatei	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Oribatidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oribatida	0	0	1	0	0	0	0	20	0	6	0	0	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0
Phylum: Mollusca	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Bivalvia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Veneroida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Pisidiidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pisidium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0
| Class: Gastropoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Basommatophora	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lymnaeidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fossaria sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Physidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Physa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phylum: Annelida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Clitellata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Oligochaeta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Lumbriculida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lumbriculidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0	0	0	0	17	0	0	0	0	20	0	0	0	0	13	0	0
Rhynchelmis sp.	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Tubificida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Enchytraeidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Enchytraeus	10	0	0	5	0	0	0	1,100	275	261	1,760	560	20	0	0	600	0	0	0	33	0	40	0	0	40	60	30	0	0	13	88	109
Fridericia	0	0	0	0	0	0	0	80	0	0	70	0	0	0	0	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0
| Family: Lumbricidae	0	0	0	0	0	0	0	160	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Naididae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nais	10	0	0	0	0	0	0	20	0	0	0	40	0	0	0	0	0	664	0	0	460	240	0	0	0	0	0	220	40	0	0	0
| Subfamily: Tubificinae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Individuals	**3,210**	**6,505**	**705**	**756**	**8,520**	**4,856**	**777**	**8,140**	**4,030**	**1,990**	**3,540**	**29,180**	**3,240**	**7,720**	**6,218**	**17,160**	**7,880**	**2,858**	**7,740**	**5,135**	**11,000**	**8,980**	**1,288**	**6,460**	**13,800**	**21,140**	**3,780**	**8,580**	**6,720**	**4,260**	**4,161**	**2,923**

Table C.1: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference (n = 40) and mine-exposed (n = 74) areas based on lowest practical level of taxonomy, September 2015.

Station	Mine-exposed																												
	FODGH	FODHE	FODPO	FORD7	FOUEW	FOUKI	FOUL	FOUNGD	FOUSH	GHCKD	GHCKU	GRCK	GRDS	GREE1-50	GREE3-75	GREE4-25	GREE4-75	HACKDS	HACKUS	HARM1-50	HARM5-25	HENFO	KICK	KILM1	LC_DC1	LC_DCDS	LC_FRUS	LI8
Phylum: Arthropoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Hexapoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Insecta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Ephemeroptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Ameletidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ameletus	0	80	0	0	0	60	0	60	100	40	0	20	20	0	0	0	1	20	0	0	80	300	0	0	0	40	7	0	
| Family: Baetidae	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	7	10	
Acentrella sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Acentrella turbida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Baetis	440	1,000	0	83	40	250	218	500	1,140	480	0	20	1,020	267	3	0	1	760	980	2,220	140	180	0	0	120	180	87	130	
Baetis bicaudatus	0	0	0	17	0	0	0	0	60	0	0	480	0	0	0	0	0	20	0	300	0	0	0	0	0	0	7	0	
Baetis tricaudatus group	160	300	0	33	0	290	45	360	1,000	80	0	80	460	67	0	0	2	300	420	1,300	100	40	0	0	0	20	33	100	
| Family: Ephemerellidae	1,220	3,640	120	83	460	120	64	500	240	0	9	1,000	720	0	8	0	2	580	1,620	1,380	920	4,000	1	0	1,080	1,400	67	10	
Caudatella sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Drunella doddsii	180	60	20	33	80	10	64	80	0	0	0	300	20	0	0	0	1	0	140	40	0	0	0	0	220	320	7	70	
Drunella flavilinea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	0	0	0	0	20	
Drunella grandis group	80	0	0	67	40	10	0	0	20	0	0	20	0	0	0	6	0	0	20	0	0	20	0	0	0	0	40	0	
Drunella sp.	0	0	0	0	0	0	0	20	0	40	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	
Drunella spinifera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Ephemerella	0	0	0	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
| Family: Heptageniidae	1,740	5,200	680	633	1,340	1,430	427	3,720	2,700	40	4	1,180	200	17	18	6	1	1,240	2,400	900	5,440	5,600	1	0	2,360	2,540	560	520	
Cinygmula sp.	0	20	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	20	0	0	
Epeorus	0	60	0	33	40	10	0	60	80	0	0	300	20	0	3	0	0	0	20	60	60	140	0	0	40	20	0	20	
Rhithrogena	60	60	0	0	0	40	91	100	0	0	2	0	80	0	0	0	0	0	0	0	0	20	0	0	60	20	0	0	
| Family: Leptophlebiidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Paraleptophlebia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
| Order: Plecoptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
| Family: Capniidae	0	0	20	0	0	10	18	0	20	0	11	0	0	0	23	382	57	0	20	0	0	40	1	1	0	20	0	0	
Capnia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	1	0	0	0	0	
Utacapnia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
| Family: Chloroperlidae	0	0	20	50	0	0	45	0	0	0	0	40	0	0	0	0	0	0	0	20	0	0	0	0	40	0	0	0	
Suwallia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Sweltsa sp.	60	40	80	0	0	0	227	80	60	280	0	140	180	50	13	6	1	0	260	60	380	40	0	0	160	380	13	20	
| Family: Leuctridae	0	40	0	0	0	0	0	0	0	20	0	40	40	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	
Despaxia augusta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Paraleuctra sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
| Family: Nemouridae	0	0	0	0	0	0	9	0	0	20	0	0	0	83	0	0	5	0	0	20	0	0	0	0	20	0	0	0	
Amphinemura sp.	0	0	0	0	0	0	0	0	0	120	0	0	0	0	0	0	0	20	0	20	0	0	0	0	0	0	0	0	
Visoka cataractae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	0	0	
Zapada	1,780	1,720	1,200	567	320	20	45	240	80	60	0	440	880	17	35	329	2	80	1,880	460	420	180	38	1	680	1,140	53	260	
Zapada cinctipes	120	0	0	17	20	60	155	0	200	60	62	60	140	1,133	3	0	0	20	20	280	0	20	0	0	0	0	60	0	
Zapada columbiana	0	0	0	17	0	30	0	0	0	0	11	140	120	0	0	0	0	280	220	340	280	80	1	1	120	120	0	20	
Zapada oregonensis group	120	0	60	50	300	10	9	20	0	0	0	140	160	0	0	0	0	580	340	300	0	60	12	0	220	40	80	170	
| Family: Peltoperlidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60	0	520	0	0	0	0	0	0	10	
Yoraperla sp.	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	220	0	2,740	0	0	0	0	20	0	0	
| Family: Perlidae	0	20	0	17	20	10	155	20	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	
Calineuria californica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Claassenia sabulosa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Doroneuria sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hesperoperla sp.	0	0	0	0	0	0	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	
| Family: Perlodidae	820	580	2,120	1,517	1,700	130	0	260	200	0	20	340	300	0	13	29	0	140	280	380	40	40	1	0	60	80	127	50	
Isoperla sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Megarcys sp.	80	120	140	33	100	10	0	100	100	0	2	100	0	0	3	0	0	0	100	0	100	20	0	0	40	20	7	30	
| Family: Pteronarcyidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Pteronarcella sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Pteronarcys	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
| Family: Taeniopterygidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Taenionema	960	180	3,180	50	40	10	782	400	160	0	67	360	300	0	98	0	3	20	2,380	80	440	600	0	0	340	280	13	390	
| Order: Trichoptera	0	0	0	0	0	0	0	0	0	240	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	
| Family: Apataniidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Apatania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	640	0	0	40	0	0	0	0	0	0	
Pedomoecus sierra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
| Family: Brachycentridae	20	20	0	0	20	0	55	0	20	0	0	20	20	0	0	0	0	60	0	0	0	20	0	0	0	0	0	10	
Brachycentrus americanus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Brachycentrus occidentalis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Brachycentrus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Micrasema	0	0	0	0	0	0	0	0	0	240	0	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Table C.1: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference (n = 40) and mine-exposed (n = 74) areas based on lowest practical level of taxonomy, September 2015.

Station	Mine-exposed																											
	FODGH	FODHE	FODPO	FORD7	FOUEW	FOUKI	FOUL	FOUNGD	FOUSH	GHCKD	GHCKU	GRCK	GRDS	GREE1-50	GREE3-75	GREE4-25	GREE4-75	HACKDS	HACKUS	HARM1-50	HARM5-25	HENFO	KICK	KILM1	LC_DC1	LC_DCDS	LC_FRUS	LI8
| Family: Glossosomatidae	0	0	0	0	0	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glossosoma	300	0	1,200	33	680	10	0	0	0	0	4	40	40	0	5	0	0	0	240	0	40	0	0	0	120	40	0	860
| Family: Hydropsychidae	40	20	0	0	20	0	0	0	80	20	0	200	20	17	3	0	0	0	200	80	100	40	6	0	140	20	0	30
Arctopsyche sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cheumatopsyche	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydropsyche	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parapsyche sp.	20	20	0	0	0	10	0	0	0	0	0	100	20	0	0	0	0	80	60	140	0	20	0	0	20	100	20	10
| Family: Hydroptilidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydroptila	0	0	0	0	0	0	0	0	0	140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lepidostomatidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lepidostoma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Leptoceridae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Limnephilidae	40	20	60	0	20	30	18	0	40	20	0	0	0	267	10	6	0	0	20	0	120	0	7	8	0	0	0	0
Clostoeca disjuncta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dicosmoecus sp.	0	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ecclisomyia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hesperophylax sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Rhyacophilidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rhyacophila	100	0	300	683	200	0	36	120	0	180	2	400	480	150	3	0	1	260	480	40	780	20	9	1	80	40	27	40
Rhyacophila brunnea/vemna group	260	0	60	100	40	0	0	20	0	160	0	20	80	167	0	0	0	60	40	140	40	0	0	0	0	0	87	20
Rhyacophila betteni group	0	0	0	0	0	0	0	20	0	0	0	20	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0
Rhyacophila hyalinata group	0	0	0	0	0	10	0	20	0	0	0	40	40	0	0	0	0	60	40	0	0	0	2	0	0	0	0	10
Rhyacophila vofixa group	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	10
| Family: Uenoidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	110
Neothremma sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	80	0	0	0	0	0	0	0
Oligophlebodes	0	0	0	17	0	0	0	20	0	0	0	660	960	0	0	0	0	480	0	0	0	0	0	0	560	100	0	0
| Order: Coleoptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Curculionidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0
| Family: Dytiscidae	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Agabus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Elmidae	20	0	20	17	40	0	0	0	0	0	0	20	40	0	0	0	0	20	180	0	0	0	0	0	0	0	7	0
Heterlimnius sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0
Narpus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Optioservus sp.	60	0	20	267	80	10	9	0	0	40	0	60	200	67	0	6	0	60	120	120	60	0	0	0	0	0	0	0
| Family: Hydrophilidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ametor sp. (Adult)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Staphylinidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Diptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0
| Family: Athericidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Atherix	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Blephariceridae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Blepharicera sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Philorus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Ceratopogonidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Atrichopogon sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bezzia/ Palpomyia	0	40	40	0	0	30	0	120	20	20	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0
Forcipomyia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Probezzia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Chironomidae	300	520	200	50	360	90	55	40	160	200	64	0	100	67	25	76	14	440	200	980	0	320	174	0	120	260	67	90
| Subfamily: Chironominae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Tribe: Chironomini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cryptochironomus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Microtendipes pedellus group	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Paracladopelma sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Paratendipes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phaenopsectra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80	0	0
Polypedilum sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stictochironomus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Tribe: Tanytarsini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cladotanytarsus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Micropsectra	160	1,600	60	0	20	20	36	40	80	1,720	9	0	20	117	15	0	1	0	20	60	40	900	17	6	60	100	20	0
Rheotanytarsus	0	0	0	0	0	0	0	0	0	0	0	60	0	0	0	0	0	1,200	40	580	0	0	0	58	0	0	0	0
Stempellina sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stempellinella sp.	0	320	0	17	0	0	0	0	0	620	4	0	0	0	0	0	0	0	0	0	0	0	0	17	0	0	0	0
Sublettea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Subfamily: Diamesinae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Tribe: Boreoheptagyiini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table C.1: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference (n = 40) and mine-exposed (n = 74) areas based on lowest practical level of taxonomy, September 2015.

Station	Mine-exposed																												
	FODGH	FODHE	FODPO	FORD7	FOUEW	FOUKI	FOUL	FOUNGD	FOUSH	GHCKD	GHCKU	GRCK	GRDS	GREE1-50	GREE3-75	GREE4-25	GREE4-75	HACKDS	HACKUS	HARM1-50	HARM5-25	HENFO	KICK	KILM1	LC_DC1	LC_DCDS	LC_FRUS	LI8
Boreoheptagyia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0
| Tribe: Diamesini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diamesa	0	0	0	0	0	0	0	0	0	0	7	0	0	0	5	59	15	0	0	0	0	40	12	1	0	0	0	0	0
Pagastia	360	160	100	117	140	30	0	20	40	0	11	0	0	0	18	18	0	120	100	80	40	220	40	4	20	0	200	10	
Potthastia longimana group	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pseudodiamesa sp.	0	0	0	0	0	0	0	0	0	0	7	0	0	0	15	12	3	20	20	0	0	0	65	10	0	0	0	0	0
| Subfamily: Orthocladiinae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brillia sp.	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	1	0	20	0	0	
Corynoneura	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cricotopus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cricotopus (Nostococladius)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eukiefferiella	0	60	20	117	100	0	0	20	40	20	11	20	80	0	23	35	19	180	120	400	0	20	0	14	0	0	27	40	
Heleniella sp.	0	0	0	0	0	0	9	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Heterotrissocladius sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Heterotrissocladius marcidus group.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydrobaenus	20	0	0	0	0	0	0	0	0	0	13	0	0	0	25	35	1	40	140	20	0	0	0	0	20	40	7	0	
Krenosmittia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Limnophyes sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0
Orthocladius	420	900	420	783	1,080	50	45	160	120	120	364	220	360	17	370	1,029	67	1,320	360	1,300	40	460	30	11	0	0	247	60	
Orthocladius lignicola	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parametriocnemus	0	0	0	0	0	0	0	0	0	0	0	40	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parorthocladius sp.	0	0	0	0	0	0	0	0	0	0	0	0	40	0	3	0	0	20	0	0	0	0	0	0	0	0	0	0	0
Psectrocladius	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pseudosmittia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rheocricotopus	20	20	0	0	0	0	9	0	40	0	0	0	20	0	0	6	0	420	120	800	0	40	0	0	20	60	0	10	
Synorthocladius	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thienemanniella	0	0	0	0	0	10	0	0	0	20	0	0	0	67	0	29	0	0	0	60	0	0	0	2	0	0	0	0	
Tvetenia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tvetenia bavarica group	0	100	60	0	0	0	9	0	40	20	16	40	0	0	5	47	13	220	20	360	60	80	0	0	20	20	7	10	
| Subfamily: Prodiamesinae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Odontomesa sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Subfamily: Tanypodinae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Tribe: Pentaneurini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pentaneura sp.	0	0	0	0	0	0	0	0	0	200	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thienemannimyia group	0	0	0	0	20	0	0	0	0	540	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Tribe: Procladiini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Procladius	0	0	0	0	0	0	0	0	0	40	0	0	0	67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Dixidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dixa sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Empididae	20	20	20	17	0	0	0	0	20	160	7	0	0	33	10	0	10	0	0	20	0	0	0	0	0	0	0	0	
Chelifera/ Metachela	60	0	20	117	20	0	18	0	0	20	7	0	0	0	8	0	2	0	20	40	40	0	0	0	100	20	13	30	
Clinocera sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0
Hemerodromia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oreogeton sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wiedemannia sp.	0	0	0	0	0	0	64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Muscidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Limnophora sp.	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	76	0	0	0	0	0	0	35	5	0	0	0	0	
| Family: Pelecorhynchidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glutops sp.	0	0	0	0	0	0	0	0	0	20	0	0	0	33	0	0	1	0	0	0	40	0	0	0	40	0	7	20	
| Family: Psychodidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pericoma/Telmatoscopus sp.	480	40	20	83	80	480	145	40	240	880	29	380	1,120	2,750	3	82	7	0	620	60	20	20	5	0	120	0	47	0	
Psychoda sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Simuliidae	0	0	40	0	0	0	9	0	0	20	0	0	0	17	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Simulium	0	0	0	67	0	0	9	0	0	900	7	0	0	133	3	0	18	0	0	60	0	40	0	0	0	0	0	0	0
| Family: Stratiomyidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Euparyphus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Tabanidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tabanus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Tipulidae	20	0	0	17	0	0	0	0	0	80	4	20	0	0	0	0	4	0	60	0	0	0	2	0	0	0	0	10	
Antocha sp.	0	0	0	50	0	10	0	0	20	0	0	0	0	17	0	0	0	100	0	100	20	0	0	0	0	0	7	0	
Dicranota	100	0	20	0	20	10	0	60	20	20	16	20	20	33	10	6	28	0	100	40	0	0	0	0	20	20	0	0	
Hesperoconopa sp.	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hexatoma sp.	0	0	0	0	0	0	45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Limnophila sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0
Tipula	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Hemiptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Corixidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sigara	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table C.1: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference (n = 40) and mine-exposed (n = 74) areas based on lowest practical level of taxonomy, September 2015.

Station	Mine-exposed																											
	FODGH	FODHE	FODPO	FORD7	FOUEW	FOUKI	FOUL	FOUNGD	FOUSH	GHCKD	GHCKU	GRCK	GRDS	GREE1-50	GREE3-75	GREE4-25	GREE4-75	HACKDS	HACKUS	HARM1-50	HARM5-25	HENFO	KICK	KILM1	LC_DC1	LC_DCDS	LC_FRUS	LI8
| Order: Lepidoptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Megaloptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Sialidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sialis sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Odonata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Aeshnidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aeshna sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Crustacea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Malacostraca	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Amphipoda	0	0	0	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Gammaridae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gammarus	0	0	0	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hyalellidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hyalella	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Chelicerata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Arachnida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Trombidiformes	0	0	0	0	20	0	9	0	0	20	0	0	0	0	0	0	0	0	20	0	0	0	1	0	0	0	0	0
| Family: Aturidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aturus	0	0	0	0	0	0	0	0	0	100	0	20	0	33	0	0	0	40	0	80	0	0	0	0	0	0	0	0
| Family: Feltriidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Feltria sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hydryphantidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Protzia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hygrobatidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Atractides	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hygrobates	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lebertiidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lebertia	160	0	20	67	220	30	27	0	80	140	2	20	20	0	0	0	2	0	80	0	0	60	26	6	20	20	27	20
| Family: Mideopsidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mideopsis sp.	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Sperchontidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sperchon	40	0	0	17	40	0	0	0	20	0	2	20	0	0	0	0	0	0	20	0	0	40	3	8	0	20	13	40
Sperchonopsis sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Stygothrombiidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stygothrombium sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Torrenticolidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Testudacarus sp.	0	0	0	0	0	0	18	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0
Torrenticola	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0
| Order: Oribatei	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Oribatidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oribatida	0	0	0	0	0	0	0	0	0	20	0	0	0	33	0	0	4	0	0	0	0	0	0	0	0	0	7	0
Phylum: Mollusca	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Bivalvia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Veneroida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Pisidiidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pisidium	0	0	0	0	0	0	0	0	0	540	0	0	0	167	0	0	0	20	0	0	0	0	0	0	0	0	20	0
| Class: Gastropoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
| Order: Basommatophora	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lymnaeidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fossaria sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Physidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Physa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phylum: Annelida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Clitellata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Oligochaeta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Lumbriculida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lumbriculidae	20	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	60	0	0	20
Rhynchelmis sp.	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	40	0	60	0	0	0	0	0	0	70
| Order: Tubificida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Enchytraeidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Enchytraeus	80	20	0	17	0	80	0	0	60	360	0	0	0	133	8	18	1	0	0	0	0	0	0	0	0	0	0	10
Fridericia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lumbricidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Naididae	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nais	0	0	0	50	0	0	0	0	0	20	0	0	0	0	0	6	1	800	0	200	0	0	6	0	0	0	0	0
| Subfamily: Tubificinae	0	0	0	0	0	0	0	0	0	1,300	0	0	0	217	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Individuals	**10,980**	**17,060**	**10,340**	**6,053**	**7,720**	**3,490**	**3,006**	**7,260**	**7,320**	**10,560**	**774**	**7,740**	**8,400**	**6,320**	**804**	**2,322**	**302**	**10,160**	**15,540**	**14,020**	**13,280**	**13,820**	**497**	**167**	**7,140**	**7,640**	**2,065**	**3,390**

Table C.1: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference (n = 40) and mine-exposed (n = 74) areas based on lowest practical level of taxonomy, September 2015.

Station	Mine-exposed																				
	LIDSL	LILC3	M12	M13	M15	MIDAG	MIDCO	MIUCO	MP1	NGD1	NGDLU	NTHO1-25	NTHO1-50	OCNM	POCK	PORT3-25	PORT3-50	SWCK	SWIF2-75	THCK	WOCK
Phylum: Arthropoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Hexapoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Insecta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Ephemeroptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Ameletidae	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ameletus	0	0	67	0	0	20	0	20	50	0	0	0	0	0	0	114	17	0	0	0	0
| Family: Baetidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acentrella sp.	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acentrella turbida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Baetis	220	140	267	360	220	180	180	320	233	680	1,680	0	0	0	120	0	0	0	0	13	0
Baetis bicaudatus	0	0	0	0	0	20	0	40	17	0	20	0	0	0	0	0	0	0	0	0	0
Baetis tricaudatus group	200	160	117	260	20	60	20	100	233	680	0	0	0	0	0	0	0	0	0	13	0
| Family: Ephemerellidae	120	160	183	440	320	1,600	1,300	1,880	217	420	0	0	20	11	20	0	0	0	0	0	0
Caudatella sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Drunella doddsii	80	200	183	140	480	800	640	740	0	20	0	0	0	0	0	0	8	0	20	0	4
Drunella flavilinea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Drunella grandis group	20	0	0	0	0	20	220	80	33	20	0	0	0	0	0	0	0	0	0	0	0
Drunella sp.	0	0	0	0	0	60	0	20	0	20	0	0	0	0	0	0	0	0	0	0	0
Drunella spinifera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ephemerella	0	0	0	20	40	140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Heptageniidae	1,880	980	983	1,420	980	3,080	380	880	2,017	4,040	1,060	0	0	0	60	0	0	0	20	0	0
Cinygmula sp.	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0
Epeorus	80	0	0	20	0	80	20	0	0	80	0	0	0	0	0	0	0	0	0	0	0
Rhithrogena	0	0	17	220	60	160	0	60	0	40	0	0	0	0	0	0	0	0	0	0	0
| Family: Leptophlebiidae	0	0	0	20	20	0	0	0	0	0	0	0	0	18	0	0	0	0	0	0	0
Paraleptophlebia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Plecoptera	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0
| Family: Capniidae	20	0	67	0	80	0	60	0	50	40	20	120	40	0	20	0	33	86	1,240	0	156
Capnia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57	180	0	0
Utacapnia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Chloroperlidae	0	0	0	0	0	0	60	0	0	0	0	0	0	0	0	0	0	0	20	0	0
Suwallia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sweltsa sp.	140	220	267	80	120	140	160	120	17	80	140	0	0	4	0	0	17	0	0	7	4
| Family: Leuctridae	0	0	0	20	0	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0
Despaxia augusta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Paraleuctra sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Nemouridae	0	0	0	20	0	0	0	0	0	0	60	0	0	0	0	0	0	0	0	7	20
Amphinemura sp.	0	0	0	0	0	0	0	0	0	0	0	0	40	7	0	0	0	300	0	20	0
Visoka cataractae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Zapada	440	240	600	0	60	620	980	160	350	240	520	3,400	4,220	111	2,080	643	908	1,014	100	0	32
Zapada cinctipes	0	0	100	240	0	80	800	20	50	20	1,660	1,400	280	0	340	0	0	0	0	153	216
Zapada columbiana	20	40	0	0	0	0	0	0	17	0	40	0	0	54	20	386	242	0	480	7	0
Zapada oregonensis group	360	560	50	0	20	0	40	0	0	0	0	0	0	0	20	0	0	0	0	0	0
| Family: Peltoperlidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,600	242	0	40	0	4
Yoraperla sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	671	267	0	20	0	0
| Family: Perlidae	0	20	17	0	20	0	20	0	17	20	0	0	0	0	0	0	0	0	0	0	0
Calineuria californica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Claassenia sabulosa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Doroneuria sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hesperoperla sp.	0	0	33	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Perlodidae	120	300	0	80	60	320	120	200	133	280	180	0	20	7	260	786	150	57	880	0	4
Isoperla sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Megarcys sp.	80	360	0	0	0	20	0	20	67	20	20	0	0	0	0	0	0	0	0	0	0
| Family: Pteronarcyidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pteronarcella sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pteronarcys	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Taeniopterygidae	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Taenionema	400	80	717	220	120	1,140	300	420	50	240	0	0	0	4	0	14	0	0	0	0	4
| Order: Trichoptera	20	40	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Apataniidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apatania	100	0	267	900	2,640	1,640	680	260	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedomoecus sierra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Brachycentridae	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brachycentrus americanus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brachycentrus occidentalis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brachycentrus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Micrasema	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table C.1: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference (n = 40) and mine-exposed (n = 74) areas based on lowest practical level of taxonomy, September 2015.

Station	Mine-exposed																				
	LIDSL	LILC3	M12	M13	M15	MIDAG	MIDCO	MIUCO	MP1	NGD1	NGDLU	NTHO1-25	NTHO1-50	OCNM	POCK	PORT3-25	PORT3-50	SWCK	SWIF2-75	THCK	WOCK
| Family: Glossosomatidae	0	0	0	160	60	0	0	0	0	0	0	0	0	0	40	0	0	0	0	0	0
Glossosoma	40	0	267	1,380	800	220	60	80	0	0	0	0	0	0	0	29	0	0	0	7	0
| Family: Hydropsychidae	460	1,920	50	60	0	0	0	20	0	0	0	0	0	71	0	0	0	0	0	27	4
Arctopsyche sp.	0	0	33	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cheumatopsyche	0	0	0	0	0	0	0	0	0	0	0	0	0	146	0	0	0	0	0	0	4
Hydropsyche	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parapsyche sp.	120	840	0	0	0	0	40	20	33	0	0	20	20	0	0	0	0	0	0	0	0
| Family: Hydroptilidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydroptila	0	0	0	0	0	0	0	0	0	0	0	220	20	0	0	0	0	0	0	0	0
| Family: Lepidostomatidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lepidostoma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Leptoceridae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Limnephilidae	120	60	17	0	0	0	20	0	67	20	0	20	160	11	520	14	0	200	220	127	20
Clostoeca disjuncta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dicosmoecus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ecclisomyia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Hesperophylax sp.	0	0	0	20	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0
| Family: Rhyacophilidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rhyacophila	40	60	17	0	20	40	160	100	100	320	300	20	0	7	360	0	75	14	0	27	0
Rhyacophila brunnea/vemna group	0	0	17	0	0	20	60	20	33	60	20	0	0	14	300	0	0	43	0	0	4
Rhyacophila betteni group	40	0	0	0	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	7	0
Rhyacophila hyalinata group	0	40	0	0	0	0	40	20	17	20	40	0	0	0	0	0	0	0	0	0	0
Rhyacophila vofixa group	20	0	0	0	0	20	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Uenoidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Neothremma sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oligophlebodes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Coleoptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Curculionidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0
| Family: Dytiscidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Agabus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0
| Family: Elmidae	0	0	0	0	0	20	120	0	0	0	0	0	0	0	0	0	0	86	0	73	0
Heterlimnius sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Narpus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Optioservus sp.	0	0	17	80	260	140	200	320	17	0	0	0	0	0	120	0	0	28	0	347	0
| Family: Hydrophilidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ametor sp. (Adult)	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0
| Family: Staphylinidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
| Order: Diptera	0	0	0	0	0	0	0	0	0	0	0	0	20	7	0	0	0	14	0	0	8
| Family: Athericidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Atherix	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Blephariceridae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Blepharicera sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Philorus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Ceratopogonidae	0	0	0	0	0	0	0	0	0	0	0	0	100	4	0	0	0	0	0	0	0
Atrichopogon sp.	0	0	0	0	0	0	0	0	0	0	0	0	160	0	0	0	0	0	0	0	0
Bezzia/ Palpomyia	20	0	0	0	0	20	100	40	17	0	0	0	0	0	0	0	0	0	0	7	0
Forcipomyia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0
Probezzia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Chironomidae	360	2,900	250	380	80	60	460	60	150	60	20	2,980	160	7	560	14	0	171	120	67	16
| Subfamily: Chironominae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Tribe: Chironomini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cryptochironomus	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0
Microtendipes pedellus group	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Paracladopelma sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Paratendipes	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0
Phaenopsectra	0	0	33	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0
Polypedilum sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stictochironomus	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0
| Tribe: Tanytarsini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cladotanytarsus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Micropsectra	0	0	300	160	140	20	40	20	50	20	580	400	940	7	5,160	0	75	829	20	47	12
Rheotanytarsus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stempellina sp.	0	0	0	0	20	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stempellinella sp.	0	0	0	0	0	0	0	0	0	0	320	0	0	11	0	0	33	0	0	0	0
Sublettea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Subfamily: Diamesinae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Tribe: Boreoheptagyiini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table C.1: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference (n = 40) and mine-exposed (n = 74) areas based on lowest practical level of taxonomy, September 2015.

Station	Mine-exposed																				
	LIDSL	LILC3	M12	M13	M15	MIDAG	MIDCO	MIUCO	MP1	NGD1	NGDLU	NTHO1-25	NTHO1-50	OCNM	POCK	PORT3-25	PORT3-50	SWCK	SWIF2-75	THCK	WOCK
Boreoheptagyia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Tribe: Diamesini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diamesa	0	60	0	0	0	60	180	0	0	0	180	40	20	0	0	0	0	0	0	0	136
Pagastia	60	300	17	0	0	20	40	20	233	40	20	0	0	4	740	29	17	29	20	0	40
Potthastia longimana group	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pseudodiamesa sp.	0	0	0	0	0	20	0	0	0	0	120	0	20	4	0	0	0	100	480	0	36
| Subfamily: Orthocladiinae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brillia sp.	0	20	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	20	0	8
Corynoneura	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cricotopus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cricotopus (Nostococladius)	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0
Eukiefferiella	180	1,220	67	20	0	20	280	20	100	20	200	140	160	0	920	129	17	86	2,280	7	36
Heleniella sp.	0	0	0	0	0	0	0	0	0	0	0	60	20	0	0	0	0	0	0	0	0
Heterotrissocladius sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Heterotrissocladius marcidus group.	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0
Hydrobaenus	40	60	0	0	0	0	0	0	17	0	0	0	40	0	0	43	17	86	1,080	7	8
Krenosmittia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Limnophyes sp.	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	14	0	0	0	0	0
Orthocladius	500	3,620	300	20	0	0	1,300	60	700	20	440	220	320	0	8,040	14	83	286	100	0	88
Orthocladius lignicola	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parametriocnemus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	275	0	200	0	4
Parorthocladius sp.	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0
Psectrocladius	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pseudosmittia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rheocricotopus	240	3,000	117	160	120	40	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0
Synorthocladius	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thienemanniella	0	0	33	0	0	0	0	0	0	0	0	80	0	11	140	14	33	1,914	80	47	8
Tvetenia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tvetenia bavarica group	40	680	100	0	0	80	220	0	17	0	1,300	1,340	260	0	440	0	0	229	40	0	20
| Subfamily: Prodiamesinae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Odontomesa sp.	0	0	0	0	0	0	0	0	0	0	0	0	60	0	0	0	0	0	0	0	0
| Subfamily: Tanypodinae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Tribe: Pentaneurini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pentaneura sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thienemannimyia group	0	0	0	0	0	0	0	20	0	0	60	0	0	132	0	0	0	14	0	13	0
| Tribe: Procladiini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Procladius	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0
| Family: Dixidae	0	0	0	0	0	0	0	0	0	0	0	0	20	0	20	0	0	0	0	0	0
Dixa sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Empididae	0	40	0	0	0	0	0	0	0	0	20	0	0	4	40	0	0	0	40	27	28
Chelifera/ Metachela	0	0	17	0	0	0	0	0	17	0	20	0	40	0	100	14	17	14	0	0	4
Clinocera sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hemerodromia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oreogeton sp.	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wiedemannia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Muscidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Limnophora sp.	0	0	0	0	0	0	0	0	0	0	0	60	0	0	0	0	0	0	0	0	0
| Family: Pelecorhynchidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glutops sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29	17	29	0	0	0
| Family: Psychodidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pericoma/Telmatoscopus sp.	60	0	133	480	280	3,340	2,820	1,380	150	100	120	2,800	3,280	7	140	29	33	271	2,100	7	52
Psychoda sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Simuliidae	0	60	50	0	20	0	0	0	0	0	0	0	60	0	0	0	0	0	0	7	0
Simulium	0	120	33	0	0	0	0	0	0	40	360	2,340	220	39	60	0	8	43	0	1,100	96
| Family: Stratiomyidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Euparyphus sp.	0	0	0	0	0	0	0	0	0	0	0	0	60	4	0	0	0	0	0	0	12
| Family: Tabanidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tabanus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0	0	0	0	0	0	0
| Family: Tipulidae	0	0	0	0	0	0	0	0	0	20	0	0	60	18	0	0	0	0	40	0	4
Antocha sp.	0	0	0	0	0	0	20	0	0	40	0	0	0	0	0	0	0	0	0	0	0
Dicranota	20	20	0	0	20	60	80	20	50	60	20	100	20	0	40	14	0	143	200	7	20
Hesperoconopa sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hexatoma sp.	0	0	100	80	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0
Limnophila sp.	0	0	0	0	0	40	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tipula	0	0	0	0	0	0	0	0	0	0	0	0	20	4	0	0	0	0	0	0	0
| Order: Hemiptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Corixidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sigara	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0

Table C.1: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference (n = 40) and mine-exposed (n = 74) areas based on lowest practical level of taxonomy, September 2015.

Station	Mine-exposed																				
	LIDSL	LILC3	M12	M13	M15	MIDAG	MIDCO	MIUCO	MP1	NGD1	NGDLU	NTHO1-25	NTHO1-50	OCNM	POCK	PORT3-25	PORT3-50	SWCK	SWIF2-75	THCK	WOCK
| Order: Lepidoptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Megaloptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Sialidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sialis sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	46	0	0	0	0	0	0	0
| Order: Odonata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Aeshnidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aeshna sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0	0	0	0	0	0	0
Subphylum: Crustacea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Malacostraca	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Amphipoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Gammaridae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gammarus	0	0	0	0	0	0	0	0	0	0	0	0	0	86	0	0	0	0	0	0	0
| Family: Hyalellidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hyalella	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Chelicerata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Arachnida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Trombidiformes	20	40	0	0	0	0	0	0	0	0	0	0	40	7	220	0	8	0	20	0	4
| Family: Aturidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aturus	0	40	0	0	0	0	0	0	0	0	0	0	0	0	620	0	0	0	20	0	0
| Family: Feltriidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Feltria sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hydryphantidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Protzia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hygrobatidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Atractides	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hygrobates	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lebertiidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lebertia	80	140	33	40	0	40	40	40	83	60	0	0	0	11	20	0	8	0	0	7	4
| Family: Mideopsidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mideopsis sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Sperchontidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sperchon	120	620	0	0	0	0	0	0	17	0	20	0	0	11	120	0	0	0	20	0	96
Sperchonopsis sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0
| Family: Stygothrombiidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stygothrombium sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Torrenticolidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Testudacarus sp.	0	0	0	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0
Torrenticola	0	0	33	60	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Oribatei	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Oribatidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oribatida	0	0	0	0	0	0	0	0	0	0	0	0	20	7	20	29	0	0	0	0	0
Phylum: Mollusca	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Bivalvia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Veneroida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Pisidiidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pisidium	0	0	0	0	0	0	0	0	0	0	0	0	0	179	0	0	0	0	0	20	0
| Class: Gastropoda	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0
| Order: Basommatophora	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lymnaeidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fossaria sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Physidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Physa	0	0	0	0	0	0	0	0	0	0	0	0	80	0	0	0	0	0	0	0	0
Phylum: Annelida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Clitellata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Oligochaeta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Lumbriculida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lumbriculidae	0	0	0	0	0	0	0	0	0	0	0	0	0	7	80	0	0	0	0	0	0
Rhynchelmis sp.	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Tubificida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Enchytraeidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Enchytraeus	0	0	0	0	0	20	0	0	0	0	40	300	300	0	100	0	0	43	0	33	24
Fridericia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lumbricidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Naididae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nais	0	0	0	20	0	40	60	0	0	0	80	20	0	0	300	0	0	0	0	0	0
| Subfamily: Tubificinae	0	0	0	0	0	0	0	0	0	0	0	20	0	207	0	14	0	0	20	167	0
Total Individuals	**6,980**	**19,360**	**6,119**	**7,660**	**7,120**	**14,520**	**12,360**	**7,820**	**5,470**	**7,840**	**9,760**	**16,100**	**11,340**	**1,373**	**22,160**	**4,657**	**2,608**	**6,214**	**10,220**	**2,412**	**1,244**

Table C.2: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference (n = 40) and mine-exposed (n = 74) areas based on family level of taxonomy, September 2015.

Station	Reference												
	AGCK	AL4	ALUSM	BU2	BU40	BUUQ	CADCK	CHCK	CRUKO	DACK	DUCK	EL12	ELUGH
Phylum: Arthropoda	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Hexapoda	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Insecta	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Ephemeroptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Ameletidae	180	0	0	5	10	20	0	60	4	80	17	40	0
| Family: Baetidae	60	2,840	260	55	250	220	1,100	280	57	2,820	550	1,620	389
| Family: Ephemerellidae	80	1,800	2,660	85	400	280	480	820	43	1,280	667	560	334
| Family: Heptageniidae	4,580	1,560	700	670	530	710	4,960	4,440	157	1,000	150	2,980	1,488
| Family: Leptophlebiidae	0	0	0	0	0	0	0	0	0	0	0	20	0
| Order: Plecoptera	0	0	0	0	0	20	0	0	0	0	83	0	0
| Family: Capniidae	0	0	0	15	20	10	300	0	0	160	17	120	11
| Family: Chloroperlidae	160	200	140	75	130	20	180	80	7	300	50	60	155
| Family: Leuctridae	0	0	40	0	0	30	0	20	3	80	33	0	11
| Family: Nemouridae	140	240	320	20	170	180	220	860	2	1,000	216	220	78
| Family: Peltoperlidae	0	0	0	0	0	0	0	20	0	0	0	0	0
| Family: Perlidae	0	0	0	5	30	10	0	0	0	200	67	280	89
| Family: Perlodidae	20	280	120	20	60	40	520	1,860	26	120	117	360	178
| Family: Pteronarcyidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Taeniopterygidae	1,440	1,160	200	150	40	790	1,640	180	181	240	33	840	767
| Order: Trichoptera	0	0	0	0	10	0	0	0	0	0	0	0	0
| Family: Apataniidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Brachycentridae	0	0	0	35	10	0	20	100	0	0	0	60	144
| Family: Glossosomatidae	0	0	1,080	230	90	80	20	20	16	20	83	0	0
| Family: Hydropsychidae	40	120	20	10	260	30	40	260	30	80	33	20	56
| Family: Hydroptilidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lepidostomatidae	0	0	0	0	0	0	120	0	0	0	0	0	0
| Family: Leptoceridae	0	0	0	0	0	10	0	0	0	0	0	0	0
| Family: Limnephilidae	260	60	440	0	0	50	0	60	0	60	0	100	0
| Family: Rhyacophilidae	20	720	120	20	70	40	60	220	1	680	550	140	11
| Family: Uenoidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Coleoptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Curculionidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Dytiscidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Elmidae	0	60	40	0	0	0	0	0	0	200	183	0	0
| Family: Hydrophilidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Staphylinidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Diptera	0	0	0	0	0	10	0	0	0	0	0	0	0
| Family: Athericidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Blephariceridae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Ceratopogonidae	0	60	80	10	0	0	20	0	0	0	17	20	0
| Family: Chironomidae	140	1,160	500	35	660	470	1,240	2,740	2	1,100	2,618	880	122
| Family: Dixidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Empididae	0	40	80	0	180	10	0	60	0	0	17	20	0
| Family: Muscidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Pelecorhynchidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Psychodidae	40	540	1,900	0	0	0	140	1,000	0	200	150	300	178
| Family: Simuliidae	0	40	0	0	0	0	0	60	0	120	0	20	0
| Family: Stratiomyidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Tabanidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Tipulidae	0	40	20	15	110	10	80	0	7	60	67	20	0
| Order: Hemiptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Corixidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Lepidoptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Megaloptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Sialidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Odonata	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Aeshnidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Crustacea	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Malacostraca	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Amphipoda	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Gammaridae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hyalellidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Chelicerata	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Arachnida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Trombidiformes	0	0	0	5	30	0	0	60	0	0	33	20	0
| Family: Aturidae	0	0	0	0	0	0	0	0	0	0	33	0	0
| Family: Feltriidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hydryphantidae	0	0	0	5	30	0	0	0	0	40	0	0	0
| Family: Hygrobatidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lebertiidae	20	20	40	10	170	0	0	140	0	0	83	0	33
| Family: Mideopsidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Sperchontidae	0	0	20	10	110	30	0	0	1	0	0	0	0
| Family: Stygothrombiidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Torrenticolidae	0	0	0	5	50	0	0	0	0	0	0	40	0
| Order: Oribatei	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Oribatidae	0	0	0	0	0	0	0	20	0	0	0	0	0
Phylum: Mollusca	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Bivalvia	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Veneroida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Pisidiidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Gastropoda	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Basommatophora	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lymnaeidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Physidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Phylum: Annelida	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Clitellata	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Oligochaeta	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Lumbriculida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lumbriculidae	0	20	120	10	0	0	20	0	0	0	17	0	0
| Order: Tubificida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Enchytraeidae	0	0	0	15	20	0	0	0	0	0	67	0	0
| Family: Lumbricidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Naididae	0	0	0	0	0	0	40	0	4	0	0	0	0
| Family: Tubificidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Individuals	**7,180**	**10,960**	**8,900**	**1,515**	**3,440**	**3,070**	**11,200**	**13,360**	**541**	**9,840**	**5,951**	**8,740**	**4,044**

Table C.2: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference (n = 40) and mine-exposed (n = 74) areas based on family level of taxonomy, September 2015.

Station	Reference												
	EWCK	FLAD	FLAU	FO26	FLRU	GRUHA	HENUP	KO1	KODCR	KOUCR	KOUVE	LC_GRCK	LI24
Phylum: Arthropoda	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Hexapoda	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Insecta	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Ephemeroptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Ameletidae	0	0	40	80	17	13	40	125	78	46	144	0	164
| Family: Baetidae	460	380	140	1,280	934	951	80	8	101	76	137	280	0
| Family: Ephemerellidae	1,380	1,160	960	1,320	850	176	460	16	23	37	68	120	73
| Family: Heptageniidae	1,860	1,200	1,180	3,660	917	1,076	4,500	476	112	88	338	940	1,664
| Family: Leptophlebiidae	0	0	80	0	117	0	0	0	0	0	0	0	0
| Order: Plecoptera	0	0	80	0	0	0	0	0	0	0	0	0	0
| Family: Capniidae	0	20	0	0	0	13	20	48	28	55	19	180	55
| Family: Chloroperlidae	220	540	160	320	67	76	40	5	21	24	44	120	300
| Family: Leuctridae	0	0	0	20	0	26	0	0	0	0	6	0	9
| Family: Nemouridae	340	140	480	320	150	476	160	0	2	5	38	1,620	218
| Family: Peltoperlidae	20	0	0	0	0	25	0	0	0	0	0	100	0
| Family: Perlidae	0	60	80	0	17	0	0	0	1	5	38	0	0
| Family: Perlodidae	80	80	0	700	67	63	40	8	1	15	19	140	45
| Family: Pteronarcyidae	0	0	0	0	0	0	0	0	0	2	6	0	0
| Family: Taeniopterygidae	280	60	40	120	17	1,188	1,760	0	6	12	0	20	127
| Order: Trichoptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Apataniidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Brachycentridae	60	220	0	80	167	13	20	0	0	0	0	0	0
| Family: Glossosomatidae	160	360	0	20	17	138	0	0	0	0	6	360	0
| Family: Hydropsychidae	100	200	0	20	0	38	60	5	16	32	0	200	27
| Family: Hydroptilidae	0	0	40	0	0	0	0	0	0	0	0	0	0
| Family: Lepidostomatidae	340	0	0	100	0	50	0	3	0	0	0	0	0
| Family: Leptoceridae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Limnephilidae	0	0	780	0	67	0	0	0	0	0	0	820	73
| Family: Rhyacophilidae	0	80	40	0	67	351	20	3	5	1	0	200	18
| Family: Uenoidae	0	0	0	0	0	0	0	0	0	0	0	1,160	18
| Order: Coleoptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Curculionidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Dytiscidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Elmidae	0	20	60	0	134	13	0	0	0	0	6	20	0
| Family: Hydrophilidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Staphylinidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Diptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Athericidae	0	180	0	0	0	0	0	3	0	0	0	0	0
| Family: Blephariceridae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Ceratopogonidae	0	40	160	0	33	0	0	0	1	0	0	0	0
| Family: Chironomidae	700	6,460	1,800	1,140	1,582	116	280	104	60	78	413	420	118
| Family: Dixidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Empididae	20	180	20	20	0	25	0	5	3	1	94	20	0
| Family: Muscidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Pelecorhynchidae	0	0	0	0	0	0	0	0	0	0	0	20	0
| Family: Psychodidae	0	140	280	20	67	13	0	0	0	0	25	0	0
| Family: Simuliidae	0	0	0	0	17	0	0	0	0	1	6	0	0
| Family: Stratiomyidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Tabanidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Tipulidae	20	60	0	140	117	0	20	6	2	6	0	20	54
| Order: Hemiptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Corixidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Lepidoptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Megaloptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Sialidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Odonata	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Aeshnidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Crustacea	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Malacostraca	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Amphipoda	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Gammaridae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hyalellidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Chelicerata	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Arachnida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Trombidiformes	0	0	20	0	0	0	0	0	1	0	0	0	0
| Family: Aturidae	0	0	20	0	0	0	0	0	0	0	6	0	0
| Family: Feltriidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hydryphantidae	0	0	0	0	0	13	0	0	0	0	0	0	0
| Family: Hygrobatidae	0	0	0	0	17	0	0	15	0	0	0	0	0
| Family: Lebertiidae	20	40	20	20	0	0	0	3	0	0	31	0	18
| Family: Mideopsidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Sperchontidae	0	0	0	20	17	25	0	10	0	4	0	0	9
| Family: Stygothrombiidae	0	0	20	0	0	0	0	0	0	0	0	0	0
| Family: Torrenticolidae	0	60	20	0	34	0	0	0	0	0	0	0	0
| Order: Oribatei	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Oribatidae	0	0	0	0	0	13	0	0	1	0	0	0	0
Phylum: Mollusca	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Bivalvia	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Veneroida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Pisidiidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Gastropoda	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Basommatophora	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lymnaeidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Physidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Phylum: Annelida	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Clitellata	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Oligochaeta	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Lumbriculida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lumbriculidae	0	0	0	0	0	0	0	0	3	0	6	0	0
| Order: Tubificida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Enchytraeidae	0	800	0	0	0	0	0	0	0	1	813	0	18
| Family: Lumbricidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Naididae	0	260	0	0	0	0	0	3	1	0	13	0	0
| Family: Tubificidae	0	0	0	0	17	0	0	0	0	0	0	0	0
Total Individuals	**6,060**	**12,740**	**6,520**	**9,400**	**5,506**	**4,891**	**7,500**	**846**	**466**	**489**	**2,276**	**6,760**	**3,008**

Table C.2: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference (n = 40) and mine-exposed (n = 74) areas based on family level of taxonomy, September 2015.

Station	Reference												
	MCCR	MI25	OLDDU	OLDLI	OLDLOW	PADAL	PAUKO	RACK	SLINE	VEUKO	VEUP	VICK	WWRL
Phylum: Arthropoda	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Hexapoda	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Insecta	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Ephemeroptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Ameletidae	0	80	50	0	18	8	5	50	217	107	12	80	0
| Family: Baetidae	1,460	520	206	386	282	70	69	160	83	5	96	940	443
| Family: Ephemerellidae	680	1,660	157	672	781	131	59	370	767	48	36	540	671
| Family: Heptageniidae	680	1,100	306	2,899	209	78	86	1,200	2,817	344	110	1,820	858
| Family: Leptophlebiidae	0	0	0	0	100	1	0	0	0	0	0	0	0
| Order: Plecoptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Capniidae	60	80	6	57	0	3	4	20	0	46	24	0	0
| Family: Chloroperlidae	160	300	125	743	82	17	14	260	200	10	0	240	57
| Family: Leuctridae	0	40	0	14	0	0	0	20	17	0	0	0	0
| Family: Nemouridae	820	380	56	58	18	42	8	110	501	1	41	1,140	71
| Family: Peltoperlidae	20	0	0	0	0	0	0	0	67	0	0	0	0
| Family: Perlidae	0	20	25	186	54	0	1	30	0	0	0	220	0
| Family: Perlodidae	120	400	12	72	227	100	24	20	267	27	38	300	71
| Family: Pteronarcyidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Taeniopterygidae	800	1,040	13	343	9	46	118	60	267	7	57	360	157
| Order: Trichoptera	0	20	0	0	0	0	0	0	0	0	0	0	0
| Family: Apataniidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Brachycentridae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Glossosomatidae	140	40	325	57	0	2	0	10	0	0	19	20	1,200
| Family: Hydropsychidae	220	120	32	157	1,100	13	17	10	484	0	45	0	142
| Family: Hydroptilidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lepidostomatidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Leptoceridae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Limnephilidae	0	0	0	0	36	1	0	120	217	0	2	20	86
| Family: Rhyacophilidae	160	160	13	85	18	4	5	50	200	0	7	180	29
| Family: Uenoidae	5,720	20	19	0	0	2	0	10	33	0	0	0	0
| Order: Coleoptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Curculionidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Dytiscidae	0	0	0	0	0	0	0	0	0	1	0	0	0
| Family: Elmidae	60	0	6	14	0	0	0	120	0	2	0	480	14
| Family: Hydrophilidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Staphylinidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Diptera	0	0	0	0	0	0	0	0	17	0	0	0	0
| Family: Athericidae	0	0	0	0	0	0	1	0	0	0	0	0	0
| Family: Blephariceridae	0	0	0	0	0	0	0	0	0	1	5	0	0
| Family: Ceratopogonidae	0	0	0	14	0	0	0	0	0	1	0	0	0
| Family: Chironomidae	320	1,020	457	229	362	21	22	350	151	87	212	1,820	986
| Family: Dixidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Empididae	0	20	6	14	0	1	1	20	183	2	2	0	0
| Family: Muscidae	0	0	0	0	0	0	0	0	0	1	0	0	14
| Family: Pelecorhynchidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Psychodidae	160	20	0	0	0	0	0	100	0	1	0	220	14
| Family: Simuliidae	0	0	0	0	55	1	15	0	0	0	0	0	0
| Family: Stratiomyidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Tabanidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Tipulidae	20	60	44	72	45	12	12	40	0	8	0	100	14
| Order: Hemiptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Corixidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Lepidoptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Megaloptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Sialidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Odonata	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Aeshnidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Crustacea	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Malacostraca	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Amphipoda	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Gammaridae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hyalellidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Chelicerata	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Arachnida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Trombidiformes	0	0	0	0	9	0	0	0	0	0	5	0	0
| Family: Aturidae	0	0	0	0	0	0	0	0	0	1	0	0	0
| Family: Feltriidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hydryphantidae	0	0	0	0	9	0	0	0	0	0	0	0	0
| Family: Hygrobatidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lebertiidae	0	0	25	14	9	1	1	10	0	3	0	20	29
| Family: Mideopsidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Sperchontidae	0	40	6	0	82	3	9	10	17	1	40	20	0
| Family: Stygothrombiidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Torrenticolidae	0	0	0	0	0	0	0	40	0	0	0	0	0
| Order: Oribatei	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Oribatidae	0	0	0	0	0	0	0	0	0	1	0	0	0
Phylum: Mollusca	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Bivalvia	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Veneroida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Pisidiidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Gastropoda	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Basommatophora	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lymnaeidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Physidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Phylum: Annelida	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Clitellata	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Oligochaeta	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Lumbriculida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lumbriculidae	20	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Tubificida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Enchytraeidae	0	0	13	0	0	0	0	10	0	0	5	0	0
| Family: Lumbricidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Naididae	0	0	75	0	18	0	0	10	0	0	0	0	0
| Family: Tubificidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Individuals	**11,620**	**7,140**	**1,977**	**6,086**	**3,523**	**557**	**471**	**3,210**	**6,505**	**705**	**756**	**8,520**	**4,856**

Table C.2: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference (n = 40) and mine-exposed (n = 74) areas based on family level of taxonomy, September 2015.

Station	Ref	Mine-exposed											
	WWRU	BOCK	CACK	CATA2-25	CATA2-75	COCK	EL19	EL1	EL20	ELDEL	ELDFE	ELDGR	ELELKO
Phylum: Arthropoda	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Hexapoda	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Insecta	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Ephemeroptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Ameletidae	8	0	0	0	0	0	0	0	0	0	80	12	20
| Family: Baetidae	101	0	0	0	0	0	380	480	533	440	320	124	860
| Family: Ephemerellidae	89	0	0	0	0	0	130	2,440	984	880	10,060	148	460
| Family: Heptageniidae	158	0	0	0	0	0	440	1,220	1,884	3,380	460	544	3,880
| Family: Leptophlebiidae	0	0	0	0	0	0	0	20	0	0	280	0	40
| Order: Plecoptera	0	0	13	0	0	0	0	0	0	0	0	0	0
| Family: Capniidae	0	0	13	23	10	20	0	0	0	40	20	4	20
| Family: Chloroperlidae	21	0	0	0	0	40	30	140	133	380	60	116	340
| Family: Leuctridae	0	0	0	0	0	0	0	0	0	0	0	4	0
| Family: Nemouridae	10	320	0	0	0	2,420	30	40	50	140	60	12	60
| Family: Peltoperlidae	0	0	0	0	0	0	0	0	0	40	0	0	0
| Family: Perlidae	0	0	0	0	0	0	630	140	100	320	200	52	0
| Family: Perlodidae	10	0	0	6	30	100	40	360	217	160	740	40	220
| Family: Pteronarcyidae	0	0	0	0	0	0	0	100	33	20	0	0	440
| Family: Taeniopterygidae	13	160	0	0	0	20	60	140	984	620	0	40	120
| Order: Trichoptera	0	0	13	0	0	0	0	0	0	0	0	0	20
| Family: Apataniidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Brachycentridae	0	20	0	0	0	40	50	20	383	20	0	0	0
| Family: Glossosomatidae	310	0	0	0	0	0	20	80	233	120	0	20	0
| Family: Hydropsychidae	0	0	0	0	0	0	30	160	133	80	100	4	640
| Family: Hydroptilidae	0	100	0	0	0	1,200	0	0	0	0	0	0	0
| Family: Lepidostomatidae	0	0	0	0	0	0	0	0	0	0	160	0	120
| Family: Leptoceridae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Limnephilidae	3	20	425	72	100	100	10	60	17	60	0	12	0
| Family: Rhyacophilidae	5	0	0	0	0	1,020	90	20	34	0	0	12	0
| Family: Uenoidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Coleoptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Curculionidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Dytiscidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Elmidae	8	0	0	0	0	420	0	0	0	0	20	0	0
| Family: Hydrophilidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Staphylinidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Diptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Athericidae	0	0	0	0	0	0	20	20	0	0	120	8	0
| Family: Blephariceridae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Ceratopogonidae	0	0	0	0	0	40	0	20	0	0	0	0	0
| Family: Chironomidae	22	3,140	3,051	1,544	1,510	7,160	1,080	2,100	333	660	3,140	84	320
| Family: Dixidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Empididae	0	0	38	0	0	80	40	60	17	60	60	8	0
| Family: Muscidae	0	40	100	67	50	40	0	0	0	0	0	0	0
| Family: Pelecorhynchidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Psychodidae	3	20	51	0	0	15,480	30	0	100	220	0	8	0
| Family: Simuliidae	0	2,900	13	0	0	20	10	0	33	0	0	4	280
| Family: Stratiomyidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Tabanidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Tipulidae	3	40	25	11	10	60	10	20	0	40	80	12	40
| Order: Hemiptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Corixidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Lepidoptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Megaloptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Sialidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Odonata	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Aeshnidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Crustacea	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Malacostraca	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Amphipoda	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Gammaridae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hyalellidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Chelicerata	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Arachnida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Trombidiformes	0	0	0	0	0	60	0	20	0	0	0	0	0
| Family: Aturidae	0	0	0	0	0	100	0	0	0	0	0	0	0
| Family: Feltriidae	0	0	0	0	0	20	0	0	0	0	0	0	0
| Family: Hydryphantidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hygrobatidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lebertiidae	8	0	0	0	0	140	20	40	0	20	480	12	0
| Family: Mideopsidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Sperchontidae	0	0	0	0	0	0	20	20	0	0	40	4	0
| Family: Stygothrombiidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Torrenticolidae	0	0	0	0	0	0	50	0	0	0	60	4	0
| Order: Oribatei	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Oribatidae	0	20	0	6	0	0	0	0	0	40	0	0	0
Phylum: Mollusca	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Bivalvia	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Veneroida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Pisidiidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Gastropoda	0	0	0	0	0	0	0	0	0	0	20	0	0
| Order: Basommatophora	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lymnaeidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Physidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Phylum: Annelida	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Clitellata	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Oligochaeta	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Lumbriculida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lumbriculidae	5	0	0	0	0	0	0	0	17	0	0	0	0
| Order: Tubificida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Enchytraeidae	0	1,180	275	261	1,830	560	20	0	0	0	600	0	0
| Family: Lumbricidae	0	160	13	0	0	0	0	0	0	0	0	0	0
| Family: Naididae	0	20	0	0	0	40	0	0	0	0	0	0	0
| Family: Tubificidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Individuals	**777**	**8,140**	**4,030**	**1,990**	**3,540**	**29,180**	**3,240**	**7,720**	**6,218**	**7,740**	**17,160**	**1,288**	**7,880**

Table C.2: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference (n = 40) and mine-exposed (n = 74) areas based on family level of taxonomy, September 2015.

Station	Mine-exposed												
	ELH93	ELUEL	ELUFE	ELUFO	ELUSP	FO19-SP1	FO22	FO23	FO29	FO9	FOBCP	FOBKS	FOBSC
Phylum: Arthropoda	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Hexapoda	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Insecta	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Ephemeroptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Ameletidae	36	83	40	20	0	0	0	30	100	20	0	0	45
| Family: Baetidae	29	633	240	280	700	20	160	270	1,020	420	163	801	391
| Family: Ephemerellidae	122	551	5,120	1,000	400	260	1,580	250	960	140	138	126	127
| Family: Heptageniidae	200	1,567	560	180	1,680	580	1,060	240	980	2,080	388	1,038	609
| Family: Leptophlebiidae	14	0	20	40	0	0	0	0	0	0	0	0	0
| Order: Plecoptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Capniidae	14	17	0	0	0	160	40	10	0	140	50	13	18
| Family: Chloroperlidae	0	133	0	0	220	100	120	80	60	120	0	38	9
| Family: Leuctridae	0	0	0	0	0	0	0	0	20	0	0	0	0
| Family: Nemouridae	7	34	20	440	0	1,140	1,340	560	980	400	650	75	91
| Family: Peltoperlidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Perlidae	0	333	220	920	500	0	0	460	20	100	88	25	9
| Family: Perlodidae	79	200	340	400	240	6,880	7,420	40	280	220	1,350	363	291
| Family: Pteronarcyidae	0	17	0	60	60	0	0	0	0	0	0	0	0
| Family: Taeniopterygidae	7	317	0	0	100	680	520	90	60	580	238	200	91
| Order: Trichoptera	0	0	0	0	0	20	0	0	0	20	0	0	0
| Family: Apataniidae	0	17	0	0	0	0	0	0	0	0	0	0	0
| Family: Brachycentridae	0	183	40	140	80	0	0	90	60	20	38	0	0
| Family: Glossosomatidae	0	83	0	80	360	20	800	50	160	160	0	25	36
| Family: Hydropsychidae	79	0	40	0	40	0	0	10	20	20	38	76	18
| Family: Hydroptilidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lepidostomatidae	43	0	20	0	0	0	0	0	0	0	0	0	0
| Family: Leptoceridae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Limnephilidae	0	0	0	0	0	80	40	0	20	0	0	13	9
| Family: Rhyacophilidae	0	67	0	20	40	400	720	290	100	400	164	76	81
| Family: Uenoidae	0	0	0	0	0	0	40	0	0	0	0	0	0
| Order: Coleoptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Curculionidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Dytiscidae	0	0	0	0	0	0	0	10	0	0	0	0	0
| Family: Elmidae	0	0	0	20	0	0	2,500	20	140	0	0	0	0
| Family: Hydrophilidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Staphylinidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Diptera	0	0	0	0	0	0	20	0	0	0	0	0	0
| Family: Athericidae	0	0	160	60	80	0	0	0	0	0	0	0	0
| Family: Blephariceridae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Ceratopogonidae	0	0	0	0	0	0	40	0	0	0	25	13	9
| Family: Chironomidae	1,557	450	2,540	4,380	1,540	2,960	3,880	790	2,580	280	652	202	108
| Family: Dixidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Empididae	0	50	160	200	100	60	100	120	80	0	50	0	27
| Family: Muscidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Pelecorhynchidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Psychodidae	0	300	20	40	40	100	220	150	380	1,320	100	963	664
| Family: Simuliidae	0	0	0	0	0	20	220	10	0	0	38	0	118
| Family: Stratiomyidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Tabanidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Tipulidae	0	0	40	40	60	60	220	70	20	20	13	0	0
| Order: Hemiptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Corixidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Lepidoptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Megaloptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Sialidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Odonata	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Aeshnidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Crustacea	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Malacostraca	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Amphipoda	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Gammaridae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hyalellidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Chelicerata	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Arachnida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Trombidiformes	0	0	0	0	0	0	0	0	20	0	0	0	0
| Family: Aturidae	0	0	0	0	0	0	20	0	0	0	0	0	0
| Family: Feltriidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hydryphantidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hygrobatidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lebertiidae	7	50	760	60	140	200	20	60	200	220	38	13	36
| Family: Mideopsidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Sperchontidae	0	0	160	60	60	0	0	10	60	0	13	13	27
| Family: Stygothrombiidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Torrenticolidae	0	0	40	220	20	0	0	40	20	0	0	0	0
| Order: Oribatei	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Oribatidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Phylum: Mollusca	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Bivalvia	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Veneroida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Pisidiidae	0	0	0	0	0	0	0	0	20	0	0	0	0
| Class: Gastropoda	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Basommatophora	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lymnaeidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Physidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Phylum: Annelida	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Clitellata	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Oligochaeta	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Lumbriculida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lumbriculidae	0	17	0	0	0	20	0	0	0	0	13	0	0
| Order: Tubificida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Enchytraeidae	0	33	0	80	0	40	60	30	0	0	13	88	109
| Family: Lumbricidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Naididae	664	0	460	240	0	0	0	0	220	40	0	0	0
| Family: Tubificidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Individuals	**2,858**	**5,135**	**11,000**	**8,980**	**6,460**	**13,800**	**21,140**	**3,780**	**8,580**	**6,720**	**4,260**	**4,161**	**2,923**

Table C.2: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference (n = 40) and mine-exposed (n = 74) areas based on family level of taxonomy, September 2015.

Station	Mine-exposed												
	FODGH	FODHE	FODPO	FORD7	FOUEW	FOUKI	FOUL	FOUNGD	FOUSH	GHCKD	GHCKU	GRCK	GRDS
Phylum: Arthropoda	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Hexapoda	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Insecta	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Ephemeroptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Ameletidae	0	80	0	0	0	60	0	60	100	40	0	20	20
| Family: Baetidae	600	1,340	0	133	40	540	263	860	2,200	560	0	580	1,480
| Family: Ephemerellidae	1,480	3,700	140	183	580	190	128	600	260	40	9	1,340	740
| Family: Heptageniidae	1,800	5,340	680	666	1,380	1,480	518	3,900	2,780	40	6	1,480	300
| Family: Leptophlebiidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Plecoptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Capniidae	0	0	20	0	0	10	18	0	20	0	11	0	0
| Family: Chloroperlidae	60	40	100	50	0	0	272	80	60	280	0	180	180
| Family: Leuctridae	0	40	0	0	0	0	0	0	0	20	0	40	40
| Family: Nemouridae	2,020	1,720	1,260	651	640	120	218	260	280	260	73	780	1,300
| Family: Peltoperlidae	0	0	0	0	0	0	0	0	0	0	0	0	20
| Family: Perlidae	0	20	0	17	20	10	182	20	0	0	0	0	20
| Family: Perlodidae	900	700	2,260	1,550	1,800	140	0	360	300	0	22	440	300
| Family: Pteronarcyidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Taeniopterygidae	960	180	3,180	50	40	10	782	400	160	0	67	360	300
| Order: Trichoptera	0	0	0	0	0	0	0	0	0	240	0	0	0
| Family: Apataniidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Brachycentridae	20	20	0	0	20	0	55	0	20	240	0	20	20
| Family: Glossosomatidae	300	0	1,200	33	680	10	0	0	0	0	4	80	40
| Family: Hydropsychidae	60	40	0	0	20	10	0	0	80	20	0	300	40
| Family: Hydroptilidae	0	0	0	0	0	0	0	0	0	140	0	0	0
| Family: Lepidostomatidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Leptoceridae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Limnephilidae	40	20	60	50	20	30	18	0	40	20	0	0	0
| Family: Rhyacophilidae	360	0	360	783	240	10	36	180	0	340	2	480	600
| Family: Uenoidae	0	0	0	17	0	0	0	20	0	0	0	660	960
| Order: Coleoptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Curculionidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Dytiscidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Elmidae	80	0	40	284	120	10	9	0	0	40	0	80	240
| Family: Hydrophilidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Staphylinidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Diptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Athericidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Blephariceridae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Ceratopogonidae	0	40	40	0	0	30	0	120	20	20	0	0	0
| Family: Chironomidae	1,280	3,680	860	1,084	1,720	200	163	280	520	3,540	506	400	620
| Family: Dixidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Empididae	80	20	40	134	20	0	82	0	20	180	14	0	0
| Family: Muscidae	0	0	0	0	0	0	0	0	20	0	0	0	0
| Family: Pelecorhynchidae	0	0	0	0	0	0	0	0	0	20	0	0	0
| Family: Psychodidae	480	40	20	83	80	480	145	40	240	880	29	380	1,120
| Family: Simuliidae	0	0	40	67	0	0	18	0	0	920	7	0	0
| Family: Stratiomyidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Tabanidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Tipulidae	120	0	20	67	20	20	45	80	40	120	20	40	20
| Order: Hemiptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Corixidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Lepidoptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Megaloptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Sialidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Odonata	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Aeshnidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Crustacea	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Malacostraca	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Amphipoda	0	0	0	0	0	0	0	0	0	40	0	0	0
| Family: Gammaridae	0	0	0	0	0	0	0	0	0	40	0	0	0
| Family: Hyalellidae	0	0	0	0	0	0	0	0	0	20	0	0	0
Subphylum: Chelicerata	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Arachnida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Trombidiformes	0	0	0	0	20	0	9	0	0	20	0	0	0
| Family: Aturidae	0	0	0	0	0	0	0	0	0	100	0	20	0
| Family: Feltriidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hydryphantidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hygrobatidae	20	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lebertiidae	160	0	20	67	220	30	27	0	80	140	2	20	20
| Family: Mideopsidae	0	20	0	0	0	0	0	0	0	0	0	0	0
| Family: Sperchontidae	40	0	0	17	40	0	0	0	20	0	2	20	0
| Family: Stygothrombiidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Torrenticolidae	0	0	0	0	0	0	18	0	0	0	0	0	20
| Order: Oribatei	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Oribatidae	0	0	0	0	0	0	0	0	0	20	0	0	0
Phylum: Mollusca	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Bivalvia	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Veneroida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Pisidiidae	0	0	0	0	0	0	0	0	0	540	0	0	0
| Class: Gastropoda	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Basommatophora	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lymnaeidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Physidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Phylum: Annelida	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Clitellata	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Oligochaeta	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Lumbriculida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lumbriculidae	20	0	0	0	0	20	0	0	0	0	0	20	0
| Order: Tubificida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Enchytraeidae	80	20	0	17	0	80	0	0	60	360	0	0	0
| Family: Lumbricidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Naididae	20	0	0	50	0	0	0	0	0	20	0	0	0
| Family: Tubificidae	0	0	0	0	0	0	0	0	0	1,300	0	0	0
Total Individuals	**10,980**	**17,060**	**10,340**	**6,053**	**7,720**	**3,490**	**3,006**	**7,260**	**7,320**	**10,560**	**774**	**7,740**	**8,400**

Table C.2: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference (n = 40) and mine-exposed (n = 74) areas based on family level of taxonomy, September 2015.

Station	Mine-exposed												
	GREE1-50	GREE3-75	GREE4-25	GREE4-75	HACKDS	HACKUS	HARM1-50	HARM5-25	HENFO	KICK	KILM1	LC_DC1	LC_DCDS
Phylum: Arthropoda	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Hexapoda	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Insecta	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Ephemeroptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Ameletidae	0	0	0	1	20	0	0	80	300	0	0	0	40
| Family: Baetidae	334	3	0	3	1,120	1,400	3,820	240	220	0	0	120	200
| Family: Ephemerellidae	0	8	6	3	580	1,780	1,420	920	4,060	1	0	1,300	1,720
| Family: Heptageniidae	17	21	6	1	1,240	2,420	960	5,500	5,780	1	0	2,460	2,600
| Family: Leptophlebiidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Plecoptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Capniidae	0	23	382	60	0	20	0	0	40	1	2	0	20
| Family: Chloroperlidae	50	13	6	1	0	260	80	380	40	0	0	200	380
| Family: Leuctridae	0	0	0	0	0	0	0	20	0	0	0	0	0
| Family: Nemouridae	1,233	38	329	7	980	2,460	1,420	700	340	51	2	1,080	1,300
| Family: Peltoperlidae	0	0	0	0	0	280	0	3,260	0	0	0	0	20
| Family: Perlidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Perlodidae	0	16	29	0	140	380	380	140	60	1	0	100	100
| Family: Pteronarcyidae	17	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Taeniopterygidae	0	98	0	3	20	2,380	80	440	600	0	0	340	280
| Order: Trichoptera	0	8	0	0	0	0	0	0	0	0	0	0	0
| Family: Apataniidae	0	0	0	0	0	640	0	0	40	0	0	0	0
| Family: Brachycentridae	50	0	0	0	60	0	0	0	20	0	0	0	0
| Family: Glossosomatidae	0	5	0	0	0	240	0	40	0	0	0	120	40
| Family: Hydropsychidae	17	3	0	0	80	260	220	100	60	6	0	160	120
| Family: Hydroptilidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lepidostomatidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Leptoceridae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Limnephilidae	267	10	6	0	0	20	0	120	0	7	8	0	0
| Family: Rhyacophilidae	317	3	0	1	400	560	180	820	20	11	1	80	60
| Family: Uenoidae	0	0	0	0	480	40	100	80	0	0	0	560	100
| Order: Coleoptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Curculionidae	0	0	0	0	0	0	0	0	0	0	9	0	0
| Family: Dytiscidae	0	0	0	1	0	0	0	0	0	0	0	0	0
| Family: Elmidae	67	0	6	0	80	300	120	60	0	0	0	0	0
| Family: Hydrophilidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Staphylinidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Diptera	0	3	0	1	0	0	0	0	0	0	0	0	0
| Family: Athericidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Blephariceridae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Ceratopogonidae	0	0	0	0	0	0	0	0	0	1	2	0	0
| Family: Chironomidae	352	510	1,358	134	3,980	1,140	4,640	180	2,080	338	124	260	580
| Family: Dixidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Empididae	33	18	0	19	0	20	60	40	0	0	0	100	20
| Family: Muscidae	0	0	76	0	0	0	0	0	0	35	5	0	0
| Family: Pelecorhynchidae	33	0	0	1	0	0	0	40	0	0	0	40	0
| Family: Psychodidae	2,750	3	82	7	0	620	60	20	20	5	0	120	0
| Family: Simuliidae	150	3	0	19	0	0	60	0	40	0	0	0	0
| Family: Stratiomyidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Tabanidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Tipulidae	50	10	6	32	100	160	140	40	0	2	0	20	20
| Order: Hemiptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Corixidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Lepidoptera	0	0	6	0	0	0	0	0	0	0	0	0	0
| Order: Megaloptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Sialidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Odonata	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Aeshnidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Crustacea	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Malacostraca	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Amphipoda	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Gammaridae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hyalellidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Chelicerata	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Arachnida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Trombidiformes	0	0	0	0	0	20	0	0	0	1	0	0	0
| Family: Aturidae	33	0	0	0	40	0	80	0	0	0	0	0	0
| Family: Feltriidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hydryphantidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hygrobatidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lebertiidae	0	0	0	2	0	80	0	0	60	26	6	20	20
| Family: Mideopsidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Sperchontidae	0	0	0	0	0	20	0	0	40	3	8	0	20
| Family: Stygothrombiidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Torrenticolidae	0	0	0	0	20	0	0	0	0	0	0	0	0
| Order: Oribatei	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Oribatidae	33	0	0	4	0	0	0	0	0	0	0	0	0
Phylum: Mollusca	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Bivalvia	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Veneroida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Pisidiidae	167	0	0	0	20	0	0	0	0	0	0	0	0
| Class: Gastropoda	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Basommatophora	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lymnaeidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Physidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Phylum: Annelida	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Clitellata	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Oligochaeta	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Lumbriculida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lumbriculidae	0	0	0	0	0	40	0	60	0	1	0	60	0
| Order: Tubificida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Enchytraeidae	133	8	18	1	0	0	0	0	0	0	0	0	0
| Family: Lumbricidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Naididae	0	0	6	1	800	0	200	0	0	6	0	0	0
| Family: Tubificidae	217	0	0	0	0	0	0	0	0	0	0	0	0
Total Individuals	**6,320**	**804**	**2,322**	**302**	**10,160**	**15,540**	**14,020**	**13,280**	**13,820**	**497**	**167**	**7,140**	**7,640**

Table C.2: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference (n = 40) and mine-exposed (n = 74) areas based on family level of taxonomy, September 2015.

Station	Mine-exposed												
	LC_FRUS	LI8	LIDSL	LILC3	M12	M13	M15	MIDAG	MIDCO	MIUCO	MP1	NGD1	NGD1u
Phylum: Arthropoda	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Hexapoda	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Insecta	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Ephemeroptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Ameletidae	7	0	60	0	67	0	0	20	0	20	50	0	0
| Family: Baetidae	134	240	420	300	401	620	240	260	200	460	483	1,360	1,700
| Family: Ephemerellidae	114	110	220	360	366	600	840	2,620	2,160	2,720	250	480	0
| Family: Heptageniidae	560	540	1,960	980	1,000	1,660	1,040	3,320	400	960	2,017	4,160	1,060
| Family: Leptophlebiidae	0	0	0	0	0	20	20	0	0	0	0	0	0
| Order: Plecoptera	0	0	0	0	0	0	0	0	0	0	0	0	20
| Family: Capniidae	0	0	20	0	67	0	80	0	60	0	50	40	20
| Family: Chloroperlidae	13	20	140	220	267	80	120	140	220	120	17	80	140
| Family: Leuctridae	0	0	0	0	0	20	0	0	0	0	17	0	0
| Family: Nemouridae	193	450	820	840	750	260	80	700	1,820	180	417	260	2,280
| Family: Peltoperlidae	0	10	0	0	0	0	0	0	0	0	0	0	0
| Family: Perlidae	20	0	0	20	50	20	20	0	20	0	17	20	0
| Family: Perlodidae	134	80	200	660	0	80	60	340	120	220	200	300	200
| Family: Pteronarcyidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Taeniopterygidae	13	390	400	80	717	240	120	1,140	300	420	50	240	0
| Order: Trichoptera	0	0	20	40	0	0	20	0	0	0	0	0	0
| Family: Apataniidae	0	0	100	0	267	900	2,640	1,640	680	260	0	0	0
| Family: Brachycentridae	0	10	0	0	83	0	0	0	0	0	0	0	0
| Family: Glossosomatidae	0	860	40	0	267	1,540	860	220	60	80	0	0	0
| Family: Hydropsychidae	20	40	580	2,760	133	100	0	0	40	40	33	0	0
| Family: Hydroptilidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lepidostomatidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Leptoceridae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Limnephilidae	0	0	120	60	17	20	0	0	20	0	67	20	0
| Family: Rhyacophilidae	114	80	100	100	34	0	20	80	260	180	150	400	400
| Family: Uenoidae	0	110	0	0	0	0	0	0	0	0	0	0	0
| Order: Coleoptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Curculionidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Dytiscidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Elmidae	20	0	0	0	17	80	260	160	320	320	17	0	0
| Family: Hydrophilidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Staphylinidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Diptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Athericidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Blephariceridae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Ceratopogonidae	0	0	20	0	0	0	0	20	100	40	17	0	0
| Family: Chironomidae	575	220	1,420	11,860	1,217	740	360	320	2,540	340	1,284	160	3,260
| Family: Dixidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Empididae	13	30	20	40	17	0	0	0	0	0	17	0	40
| Family: Muscidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Pelecorhynchidae	7	20	0	0	0	0	0	0	0	0	0	0	0
| Family: Psychodidae	47	0	60	0	133	480	280	3,340	2,820	1,380	150	100	120
| Family: Simuliidae	0	0	0	180	83	0	20	0	0	0	0	40	360
| Family: Stratiomyidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Tabanidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Tipulidae	7	10	20	20	100	80	20	100	120	40	50	120	20
| Order: Hemiptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Corixidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Lepidoptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Megaloptera	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Sialidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Odonata	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Aeshnidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Crustacea	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Malacostraca	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Amphipoda	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Gammaridae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hyalellidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Chelicerata	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Arachnida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Trombidiformes	0	0	20	40	0	0	0	0	0	0	0	0	0
| Family: Aturidae	0	0	0	40	0	0	0	0	0	0	0	0	0
| Family: Feltriidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hydryphantidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hygrobatidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lebertiidae	27	20	80	140	33	40	0	40	40	40	83	60	0
| Family: Mideopsidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Sperchontidae	13	40	120	620	0	0	0	0	0	0	17	0	20
| Family: Stygothrombiidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Torrenticolidae	7	0	0	0	33	60	20	0	0	0	17	0	0
| Order: Oribatei	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Oribatidae	7	0	0	0	0	0	0	0	0	0	0	0	0
Phylum: Mollusca	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Bivalvia	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Veneroida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Pisidiidae	20	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Gastropoda	0	10	0	0	0	0	0	0	0	0	0	0	0
| Order: Basommatophora	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lymnaeidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Physidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Phylum: Annelida	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Clitellata	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Oligochaeta	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Lumbriculida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lumbriculidae	0	90	20	0	0	0	0	0	0	0	0	0	0
| Order: Tubificida	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Enchytraeidae	0	10	0	0	0	0	0	20	0	0	0	0	40
| Family: Lumbricidae	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Naididae	0	0	0	0	0	20	0	40	60	0	0	0	80
| Family: Tubificidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Individuals	**2,065**	**3,390**	**6,980**	**19,360**	**6,119**	**7,660**	**7,120**	**14,520**	**12,360**	**7,820**	**5,470**	**7,840**	**9,760**

Table C.2: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference (n = 40) and mine-exposed (n = 74) areas based on family level of taxonomy, September 2015.

Station	Mine-exposed									
	NTHO1-25	NTHO1-50	OCNM	POCK	PORT3-25	PORT3-50	SWCK	SWIF2-75	THCK	WOCK
Phylum: Arthropoda	0	0	0	0	0	0	0	0	0	0
Subphylum: Hexapoda	0	0	0	0	0	0	0	0	0	0
| Class: Insecta	0	0	0	0	0	0	0	0	0	0
| Order: Ephemeroptera	0	0	0	0	0	0	0	0	0	0
| Family: Ameletidae	0	0	0	0	114	17	0	0	0	0
| Family: Baetidae	0	0	0	120	0	0	0	0	26	0
| Family: Ephemerellidae	0	20	11	20	0	8	0	20	0	4
| Family: Heptageniidae	0	0	0	60	0	0	0	20	0	0
| Family: Leptophlebiidae	0	0	18	0	0	0	0	0	0	0
| Order: Plecoptera	0	0	0	0	0	0	0	0	0	0
| Family: Capniidae	120	40	0	20	0	33	143	1,420	0	156
| Family: Chloroperlidae	0	0	4	0	0	17	0	20	7	4
| Family: Leuctridae	0	0	0	0	0	0	0	0	0	0
| Family: Nemouridae	4,800	4,540	172	2,460	1,029	1,150	1,314	580	187	268
| Family: Peltoperlidae	0	0	0	0	2,271	509	0	60	0	4
| Family: Perlidae	0	0	0	0	0	0	0	0	0	0
| Family: Perlodidae	0	20	7	260	786	150	57	880	0	4
| Family: Pteronarcyidae	0	0	0	0	0	0	0	0	0	0
| Family: Taeniopterygidae	0	0	4	0	14	0	0	0	0	4
| Order: Trichoptera	0	0	0	0	0	0	0	0	0	0
| Family: Apataniidae	0	0	0	0	0	0	0	0	0	0
| Family: Brachycentridae	0	0	0	0	0	0	0	0	0	0
| Family: Glossosomatidae	0	0	0	40	29	0	0	0	7	0
| Family: Hydropsychidae	20	20	217	0	0	0	0	0	27	8
| Family: Hydroptilidae	220	20	0	0	0	0	0	0	0	0
| Family: Lepidostomatidae	0	0	0	0	0	0	0	0	0	0
| Family: Leptoceridae	0	0	0	0	0	0	0	0	0	0
| Family: Limnephilidae	20	180	11	520	14	0	200	320	127	20
| Family: Rhyacophilidae	20	0	21	660	0	75	57	0	34	4
| Family: Uenoidae	0	0	0	0	0	0	0	0	0	0
| Order: Coleoptera	0	0	0	0	0	0	0	0	0	0
| Family: Curculionidae	0	0	0	0	0	0	14	0	0	0
| Family: Dytiscidae	0	0	7	0	0	0	0	0	0	0
| Family: Elmidae	0	0	0	120	0	0	114	0	420	0
| Family: Hydrophilidae	0	0	4	0	0	0	0	0	0	0
| Family: Staphylinidae	0	0	0	0	0	0	0	0	0	4
| Order: Diptera	0	20	7	0	0	0	14	0	0	8
| Family: Athericidae	0	0	0	0	0	0	0	0	0	0
| Family: Blephariceridae	0	0	0	0	0	0	0	0	0	0
| Family: Ceratopogonidae	0	260	4	0	0	0	14	0	7	0
| Family: Chironomidae	5,260	2,000	202	16,000	271	550	3,744	4,440	195	412
| Family: Dixidae	0	20	0	20	0	0	0	0	0	0
| Family: Empididae	0	40	4	140	14	17	14	40	27	32
| Family: Muscidae	60	0	0	0	0	0	0	0	0	0
| Family: Pelecorhynchidae	0	0	0	0	29	17	29	0	0	0
| Family: Psychodidae	2,800	3,280	7	140	29	33	271	2,100	7	52
| Family: Simuliidae	2,340	280	39	60	0	8	43	0	1,107	96
| Family: Stratiomyidae	0	60	4	0	0	0	0	0	0	12
| Family: Tabanidae	0	0	18	0	0	0	0	0	0	0
| Family: Tipulidae	100	100	22	40	14	0	143	240	7	24
| Order: Hemiptera	0	0	0	0	0	0	0	0	0	0
| Family: Corixidae	0	0	4	0	0	0	0	0	0	0
| Order: Lepidoptera	0	0	0	0	0	0	0	0	0	0
| Order: Megaloptera	0	0	0	0	0	0	0	0	0	0
| Family: Sialidae	0	0	46	0	0	0	0	0	0	0
| Order: Odonata	0	0	0	0	0	0	0	0	0	0
| Family: Aeshnidae	0	0	18	0	0	0	0	0	0	0
Subphylum: Crustacea	0	0	0	0	0	0	0	0	0	0
| Class: Malacostraca	0	0	0	0	0	0	0	0	0	0
| Order: Amphipoda	0	0	0	0	0	0	0	0	0	0
| Family: Gammaridae	0	0	86	0	0	0	0	0	0	0
| Family: Hyalellidae	0	0	0	0	0	0	0	0	0	0
Subphylum: Chelicerata	0	0	0	0	0	0	0	0	0	0
| Class: Arachnida	0	0	0	0	0	0	0	0	0	0
| Order: Trombidiformes	0	40	7	220	0	8	0	20	0	4
| Family: Aturidae	0	0	0	620	0	0	0	20	0	0
| Family: Feltriidae	0	0	0	0	0	0	0	0	0	0
| Family: Hydryphantidae	0	0	0	0	0	0	0	0	0	0
| Family: Hygrobatidae	0	0	0	0	0	0	0	0	0	0
| Family: Lebertiidae	0	0	11	20	0	8	0	0	7	4
| Family: Mideopsidae	0	0	0	0	0	0	0	0	0	0
| Family: Sperchontidae	0	0	11	120	0	8	0	20	0	96
| Family: Stygothrombiidae	0	0	0	0	0	0	0	0	0	0
| Family: Torrenticolidae	0	0	0	0	0	0	0	0	0	0
| Order: Oribatei	0	0	0	0	0	0	0	0	0	0
| Family: Oribatidae	0	20	7	20	29	0	0	0	0	0
Phylum: Mollusca	0	0	0	0	0	0	0	0	0	0
| Class: Bivalvia	0	0	0	0	0	0	0	0	0	0
| Order: Veneroida	0	0	0	0	0	0	0	0	0	0
| Family: Pisidiidae	0	0	179	0	0	0	0	0	20	0
| Class: Gastropoda	0	0	7	0	0	0	0	0	0	0
| Order: Basommatophora	0	0	0	0	0	0	0	0	0	0
| Family: Lymnaeidae	0	0	0	0	0	0	0	0	0	0
| Family: Physidae	0	80	0	0	0	0	0	0	0	0
Phylum: Annelida	0	0	0	0	0	0	0	0	0	0
Subphylum: Clitellata	0	0	0	0	0	0	0	0	0	0
| Class: Oligochaeta	0	0	0	0	0	0	0	0	0	0
| Order: Lumbriculida	0	0	0	0	0	0	0	0	0	0
| Family: Lumbriculidae	0	0	7	80	0	0	0	0	0	0
| Order: Tubificida	0	0	0	0	0	0	0	0	0	0
| Family: Enchytraeidae	300	300	0	100	0	0	43	0	33	24
| Family: Lumbricidae	0	0	0	0	0	0	0	0	0	0
| Family: Naididae	20	0	0	300	0	0	0	0	0	0
| Family: Tubificidae	20	0	207	0	14	0	0	20	167	0
Total Individuals	**16,100**	**11,340**	**1,373**	**22,160**	**4,657**	**2,608**	**6,214**	**10,220**	**2,412**	**1,244**

Table C.3: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference and mine-exposed areas based on lowest practical level of taxonomy, September 2014.

	Species	Reference							Mine-exposed					
		ALEX3-25	CHAU1-50	CHAU1-75	GRAC2-25	GRAC2-75	GRAV3-75	HARM6-25	ELKR8-75-1[a]	ELKR8-75-2[a]	ELKR8-75-3[a]	ERIC2-0	ERIC4-25	ERIC4-75
Insects	| Order: Ephemeroptera	0	0	0	0	17	0	0	0	0	0	0	0	0
	| Family: Ameletidae	0	0	0	0	0	0	0	0	0	0	0	0	0
	Ameletus	0	0	0	0	0	20	180	8	31	45	0	0	0
	| Family: Baetidae	380	0	60	0	0	20	80	0	15	0	0	0	0
	Acentrella sp.	0	0	0	0	0	0	0	40	0	0	0	0	0
	Baetis	360	640	260	217	33	20	460	50	100	109	0	0	0
	Baetis bicaudatus	0	480	180	100	33	340	180	0	0	0	0	0	0
	Baetis tricaudatus group	60	40	0	0	0	80	0	33	0	27	0	0	0
	Diphetor hageni	0	20	0	0	0		0				0	0	0
	| Family: Ephemerellidae	1,840	1,020	960	150	733	1,700	540	25	115	55	14	80	0
	Caudatella sp.	40	0	0	0	0	0	0	0	0	0	0	0	0
	Drunella coloradensis	40	20	0	0	0	0	0	0	0	0	0	0	0
	Drunella doddsii	60	180	80	33	283	100	220	20	0	55	0	0	0
	Drunella grandis group	0	0	0	0	0	0	0	5	0	0	0	0	0
	Drunella sp.	0	0	0	0	0	0	0	3	0	0	0	0	0
	Drunella spinifera	20	0	0	0	0	0	0	0	0	0	0	0	0
	Ephemerella	0	0	0	0	0	0	0	3	8	0	0	0	0
	Ephemerella velmae	0	0	0	0	0	0	0	3	0	9	0	0	0
	Serratella	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Heptageniidae	1,020	4,600	1,560	667	1,083	4,740	4,020	215	1,277	1,382	29	0	0
	Cinygmula sp.	20	0	0	33	0	0	140	0	0	9	0	0	0
	Epeorus deceptivus	0	0	0	0	0	0	0	0	0	0	0	0	0
	Epeorus grandis group	1,180	0	0	0	0	0	0	0	0	0	0	0	0
	Epeorus longimanus	0	0	0	0	0	0	0	0	0	0	0	0	0
	Epeorus sp.	0	640	300	750	250	100	800	0	8	0	0	0	0
	Rhithrogena	0	140	40	50	117	620	60	5	15	9	0	0	0
	| Family: Leptophlebiidae	0	0	0	0	0	0	0	0	8	0	0	0	0
	Paraleptophlebia	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Order: Plecoptera	0	0	0	0	0	0	0	5	0	27	0	0	0
	| Family: Capniidae	0	0	0	150	283	720	0	0	0	18	0	0	0
	| Family: Chloroperlidae	0	0	20	0	117	1,640	40	10	0	18	0	20	20
	Haploperla sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
	Paraperla sp.	0	20	0	0	0	40	0	0	0	0	0	0	0
	Sweltsa sp.	80	20	0	67	117	20	280	30	23	100	0	100	140
	| Family: Leuctridae	0	0	20	0	0	80	80	0	0	0	0	0	0
	| Family: Nemouridae	180	0	0	0	0	0	0	3	0	0	0	0	0
	Amphinemura sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
	Visoka cataractae	0	0	0	17	100	80	0	0	0	0	0	0	0
	Zapada	220	120	100	517	250	460	140	13	77	27	543	1,880	1,000
	Zapada cinctipes	0	240	0	17	0	0	0	0	31	9	0	60	40
	Zapada columbiana	240	0	0	517	300	1,000	680	0	0	36	629	1,200	1,080
	Zapada oregonensis group	0	100	80	17	33	80	0	0	0	0	0	0	0
	| Family: Peltoperlidae	0	0	0	0	0	0	0	0	0	0	0	0	0
	Yoraperla sp.	0	20	0	83	117	100	7,740	0	0	0	2,257	10,580	8,020
	| Family: Perlidae	0	0	0	0	0	0	0	30	215	191	0	0	0
	Claassenia sabulosa	0	0	0	0	0	0	0	3	0	0	0	0	0
	Hesperoperla sp.	0	0	0	0	0	0	0	3	8	9	0	0	0
	| Family: Perlodidae	200	280	120	100	83	0	560	10	0	0	614	160	280
	Diura sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
	Megarcys sp.	20	460	280	50	17	80	20	0	0	0	0	60	60
	Setvena sp.	0	0	0	0	33	0	60	0	0	0	57	0	0
	Skwala	0	0	0	0	0	0	0	13	54	18	0	0	0
	| Family: Pteronarcyidae	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pteronarcella sp.	0	0	0	0	0	0	0	33	31	73	0	0	0
	| Family: Taeniopterygidae	840	660	100	333	750	4,980	760	0	0	0	0	100	0
	Taenionema	0	0	0	0	0	0	0	33	8	164	0	0	0
	| Order: Trichoptera	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Apataniidae	0	0	0	0	0	0	0	0	0	0	0	0	0
	Apatania	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Brachycentridae	0	0	0	0	0	0	0	3	31	36	0	0	0
	Brachycentrus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
	Micrasema	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Glossosomatidae	20	0	0	0	0	0	0	3	8	18	0	60	80
	Glossosoma	0	0	0	0	0	0	0	50	23	127	0	0	0
	| Family: Hydropsychidae	80	720	60	167	33	160	0	3	8	0	14	0	0
	Arctopsyche grandis	0	0	0	0	0	0	0	8	0	18	0	0	0
	Arctopsyche sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
	Parapsyche sp.	20	0	0	0	17	0	0	0	0	0	0	0	0
	| Family: Hydroptilidae	0	0	0	0	0	0	0	0	0	0	0	0	0
	Ochrotrichia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Lepidostomatidae	0	0	0	0	0	0	0	0	0	0	0	0	0
	Lepidostoma	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Limnephilidae	0	60	160	33	67	0	0	0	0	0	0	40	140
	Homophylax sp.	0	0	0	0	0	0	160	0	0	0	0	0	0
	| Family: Rhyacophilidae	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rhyacophila	0	480	80	150	300	40	240	3	0	0	0	0	20
	Rhyacophila atrata complex	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rhyacophila betteni group	220	0	0	0	0	0	0	0	0	0	0	0	0
	Rhyacophila brunnea/vemna group	0	0	0	33	0	0	0	0	0	0	0	80	100
	Rhyacophila hyalinata group	20	60	40	0	0	0	0	0	0	0	0	0	0
	Rhyacophila malkini	20	0	0	0	0	0	0	0	0	0	0	0	0
	Rhyacophila vofixa group	0	20	0	0	0	40	0	0	0	0	0	0	0
	| Family: Uenoidae	0	0	0	0	0	220	0	0	0	0	0	0	0
	Neothremma sp.	0	0	0	550	283	0	640	0	0	0	0	0	0
	Oligophlebodes	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Order: Coleoptera	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Dytiscidae	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Elmidae	0	0	0	17	0	0	0	0	8	0	0	0	0
	Heterlimnius corpulentus	0	0	0	0	0	0	0	0	0	0	0	0	0
	Heterlimnius sp.	320	0	0	0	33	20	0	0	0	0	0	0	0
	| Family: Hydrophilidae	0	0	0	0	0	0	0	0	0	0	0	0	0
	Ametor sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Order: Diptera	0	0	0	0	0	0	0	0	0	0	43	0	0
	| Family: Athericidae	0	0	0	0	0	0	0	0	0	0	0	0	0
	Atherix	0	0	0	0	0	0	0	10	31	18	0	0	0
	| Family: Ceratopogonidae	0	0	0	0	0	0	0	0	0	0	0	0	0
	Atrichopogon sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
	Bezzia/ Palpomyia	0	0	0	0	0	0	0	0	0	0	14	0	0
	Probezzia	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Chironomidae	80	180	240	33	33	0	160	0	0	0	129	440	300
	| Subfamily: Chironominae	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Tribe: Tanytarsini	0	0	0	0	0	0	0	0	0	0	0	0	0
	Micropsectra	0	20	20	17	0	0	20	0	15	0	0	40	0
	Rheotanytarsus	0	0	0	0	0	0	0	0	0	0	0	0	0
	Stempellina sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
	Tanytarsus	0	0	0	0	0	0	0	3	0	0	0	0	0

Table C.3: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference and mine-exposed areas based on lowest practical level of taxonomy, September 2014.

Species		Reference							Mine-exposed					
		ALEX3-25	CHAU1-50	CHAU1-75	GRAC2-25	GRAC2-75	GRAV3-75	HARM6-25	ELKR8-75-1[a]	ELKR8-75-2[a]	ELKR8-75-3[a]	ERIC2-0	ERIC4-25	ERIC4-75
Insects	| Subfamily: Diamesinae	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Tribe: Diamesini	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diamesa	60	160	0	0	0	0	0	0	0	0	0	0	0
	Pagastia	0	140	120	0	0	0	0	3	15	0	0	60	100
	Pseudodiamesa sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Subfamily: Orthocladiinae	0	0	0	0	0	0	0	0	0	0	0	0	0
	Brillia sp.	20	0	20	183	17	20	0	0	0	0	0	0	0
	Eukiefferiella	40	100	220	50	17	0	180	3	0	0	114	1,380	660
	Heleniella sp.	20	0	0	0	0	0	0	0	0	0	0	0	0
	Hydrobaenus	20	40	40	0	0	0	0	0	0	0	0	40	0
	Krenosmittia sp.	0	0	0	0	0	0	20	0	0	0	0	0	0
	Metriocnemus sp.	0	20	0	0	0	0	0	0	0	0	0	0	0
	Orthocladius complex	20	180	520	17	0	0	0	0	0	0	0	0	0
	Orthocladius lignicola	0	0	0	0	0	0	0	0	0	0	0	0	0
	Orthocladius sp.	0	0	0	0	0	0	0	18	69	55	0	0	0
	Parakiefferiella	0	0	0	0	0	0	0	0	0	0	0	20	0
	Parametriocnemus	0	0	0	17	0	0	0	0	0	0	0	0	0
	Paraphaenocladius sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rheocricotopus	140	560	80	17	0	60	0	0	15	9	0	0	0
	Synorthocladius	0	0	0	0	0	0	0	3	23	0	0	0	0
	Tvetenia	60	200	20	33	67	0	220	0	0	0	100	1,240	820
	| Tribe: Corynoneurini	0	0	0	0	0	0	0	0	0	0	0	0	0
	Corynoneura	0	0	0	0	0	0	0	0	0	0	0	0	0
	Thienemanniella	0	0	0	0	0	0	0	0	0	0	0	60	0
	| Tribe: Orthocladiini	0	0	0	0	0	0	0	0	0	0	0	0	0
	Chaetocladius	0	20	0	0	0	20	0	0	0	0	0	0	0
	| Subfamily: Tanypodinae	0	0	0	0	0	0	0	0	0	0	0	0	0
	Labrundinia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Tribe: Pentaneuriini	0	0	0	0	0	0	0	0	0	0	0	0	0
	Thienemannimyia group	0	0	0	0	0	0	0	0	0	9	0	0	0
	| Family: Dixidae	0	0	0	0	0	0	0	0	0	0	0	0	0
	Dixa sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Dixidae	0	0	0	0	0	0	0	0	0	0	0	0	0
	Dixa sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Empididae	0	40	0	0	0	0	20	0	0	0	0	0	60
	Chelifera/ Metachela	80	40	140	17	17	0	0	8	15	9	0	80	60
	Clinocera sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Muscidae	0	0	0	0	0	0	0	0	0	0	0	0	0
	Limnophora sp.	0	0	20	0	0	0	0	0	0	0	0	0	0
	| Family: Pelecorhynchidae	0	0	0	0	0	0	0	0	0	0	0	0	0
	Glutops sp.	0	0	0	0	17	0	0	0	0	0	0	0	40
	| Family: Psychodidae	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pericoma/Telmatoscopus sp.	480	340	360	50	83	20	0	3	8	0	0	20	40
	Psychoda sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Simuliidae	0	20	0	0	0	0	0	0	0	9	0	0	20
	Gymnopais sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
	Prosimulium	0	0	0	0	0	0	0	0	0	9	0	0	0
	Simulium	60	0	0	0	0	0	0	3	0	0	0	0	0
	| Family: Tipulidae	0	0	0	0	0	0	0	5	15	0	0	0	0
	Antocha sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
	Dicranota	0	40	0	17	0	60	20	8	8	0	0	20	20
	Hexatoma sp.	0	0	0	0	0	0	0	25	23	9	0	0	0
	Limnophila sp.	20	0	0	0	0	0	0	0	0	0	0	0	0
	Molophilus sp.	0	0	20	0	0	0	0	0	0	0	0	0	0
	Tipula	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Order: Odonata	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Coenagrionidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Crustacea	| Class: Malacostraca	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Order: Amphipoda	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Hyalellidae	0	0	0	0	0	0	0	0	0	0	0	0	0
	Hyalella	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Order: Isopoda	0	0	0	0	0	0	0	0	0	0	0	0	0
Arachnida	| Order: Trombidiformes	0	0	0	0	0	0	20	3	0	0	0	20	0
	| Family: Aturidae	0	0	0	0	0	0	0	0	0	0	0	0	0
	Aturus	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Feltriidae	0	0	0	0	0	0	0	0	0	0	0	0	0
	Feltria sp.	0	0	0	0	0	0	40	0	0	0	0	0	20
	| Family: Hydryphantidae	0	0	0	0	0	0	0	0	0	0	0	0	0
	Albertathyas	0	0	0	0	0	0	20	0	0	0	0	0	0
	| Family: Hygrobatidae	0	0	0	0	0	0	0	0	0	0	0	0	0
	Atractides	0	0	0	0	0	0	0	0	0	9	0	0	0
	| Family: Lebertiidae	0	0	0	0	0	0	0	0	0	0	0	0	0
	Lebertia	0	40	0	17	0	0	0	33	54	91	0	0	20
	| Family: Sperchontidae	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sperchon	0	20	0	0	0	0	260	0	8	9	43	100	120
	| Family: Stygothrombiidae	0	0	0	0	0	0	0	0	0	0	0	0	0
	Stygothrombium sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Torrenticolidae	0	0	0	0	0	0	0	0	0	0	0	0	0
	Testudacarus sp.	0	0	0	0	0	0	0	3	15	0	0	0	0
	Torrenticola	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Order: Oribatei	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Oribatidae	0	0	0	0	0	0	0	0	0	0	0	0	0
	Oribatida	0	0	0	0	0	0	20	0	0	0	0	0	20
	| Order: Sarcoptiformes	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Hydrozetidae	0	20	0	0	0	0	0	0	0	0	0	0	0
Bivalve Molluscs	| Class: Bivalvia	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Order: Veneroida	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Pisidiidae	0	0	0	0	0	0	0	0	0	0	0	0	0
Oligochaete Worms	Phylum: Annelida	0	0	0	0	0	0	0	0	0	0	0	0	0
	Subphylum: Clitellata	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Class: Oligochaeta	0	20	0	0	0	0	0	0	0	0	0	60	0
	| Order: Lumbriculida	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Lumbriculidae	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Order: Tubificida	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Naididae	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Abundance		**8,600**	**13,240**	**6,320**	**5,286**	**5,733**	**17,680**	**19,080**	**797**	**2416**	**2825**	**4,600**	**18,000**	**13,280**
Taxa present but not included [c]														
Terrestrials		0	0	0	0	0	0	0	0	0	0	0	0	0
Insects	Phylum: Arthropoda	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Class: Entognatha	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Order: Collembola	0	0	0	50	17	0	0	0	0	0	0	0	0
Crustacea	| Class: Ostracoda	0	0	0	0	0	0	4,000	3	8	0	71	20	0
	| Class: Branchiopoda	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Order: Cladocera	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Class: Copepoda	0	0	0	0	0	0	0	0	0	0	0	0	0
Nematodes	Phylum: Nemata	0	20	0	33	0	0	0	0	0	27	0	20	0
Platyhelminthes	| Class: Turbellaria	40	40	60	133	100	0	0	0	8	0	143	300	0
Total Abundance		**40**	**60**	**60**	**216**	**117**	**0**	**4,000**	**3**	**16**	**27**	**214**	**340**	**0**

[a] One of three replicates from site ELKR-75. Rep-2 was used for data analysis.
[b] One of three replicates from site HARM1-50. Rep-2 was used for data analysis.
[c] Some taxa were not included in the analysis, as per CABIN protocol (Environment Canada 2012).

Table C.3: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference and mine-exposed areas based on lowest practical level of taxonomy, September 2014.

	Species	Mine-exposed													
		FO29	FORD7-25	FORD7-50	GRAV1-25	GRAV1-50	GRAV1-75	GREE1-75	GREE3-25	GREE3-75	GREE4-25	GREE4-75	HARM1-50-1[b]	HARM1-50-2[b]	HARM1-50-3[b]
Insects	| Order: Ephemeroptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Ameletidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Ameletus	0	20	20	0	20	20	0	0	0	0	0	120	20	20
	| Family: Baetidae	0	0	20	0	20	40	0	0	0	0	0	0	20	0
	Acentrella sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Baetis	250	60	80	520	60	480	20	0	0	2	0	420	420	220
	Baetis bicaudatus	200	0	0	0	140	20	0	10	50	4	0	540	580	580
	Baetis tricaudatus group	33	40	20	60	180	120	0	0	0	0	0	20	380	120
	Diphetor hageni	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Ephemerellidae	100	260	220	1,000	700	900	0	20	0	0	40	6,140	5,680	5,560
	Caudatella sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Drunella coloradensis	0	0	0	0	20	0	0	0	0	0	0	20	0	0
	Drunella doddsii	67	40	120	20	80	80	0	0	0	0	0	20	80	20
	Drunella grandis group	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Drunella sp.	0	0	0	0	0	20	0	0	0	0	0	0	0	0
	Drunella spinifera	17	0	100	0	0	0	0	0	0	0	0	0	0	40
	Ephemerella	0	0	0	0	0	20	0	0	0	0	0	0	0	0
	Ephemerella velmae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Serratella	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Heptageniidae	1,383	1,480	1,180	240	200	1,080	0	60	25	12	80	1,100	680	1,400
	Cinygmula sp.	17	0	0	0	0	0	0	0	0	0	0	0	0	0
	Epeorus deceptivus	0	0	0	0	0	20	0	0	0	0	0	0	0	0
	Epeorus grandis group	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Epeorus longimanus	0	0	0	0	0	140	0	0	0	0	0	0	0	0
	Epeorus sp.	67	200	300	60	160	280	0	0	0	0	0	60	60	20
	Rhithrogena	33	0	0	40	20	40	0	0	0	0	0	20	0	20
	| Family: Leptophlebiidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Paraleptophlebia	0	0	0	20	0	0	0	0	0	0	0	0	0	0
	| Order: Plecoptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Capniidae	0	0	0	20	40	0	0	180	775	78	700	0	0	0
	| Family: Chloroperlidae	0	20	20	0	20	0	0	0	0	2	0	60	60	60
	Haploperla sp.	33	0	0	0	0	0	0	0	0	0	0	0	0	0
	Paraperla sp.	17	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sweltsa sp.	67	20	80	180	140	60	80	0	0	1	0	500	300	120
	| Family: Leuctridae	0	0	0	0	0	0	0	0	0	0	0	0	20	20
	| Family: Nemouridae	0	0	0	0	60	360	0	0	0	2	0	0	0	0
	Amphinemura sp.	0	0	0	0	0	0	0	0	0	0	0	40	0	0
	Visoka cataractae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Zapada	50	960	560	540	780	1,020	120	130	575	0	400	1,020	1,200	880
	Zapada cinctipes	0	40	80	0	460	20	300	70	225	2	100	200	140	280
	Zapada columbiana	0	60	0	300	60	160	0	20	150	2	60	60	80	20
	Zapada oregonensis group	67	380	160	0	120	300	0	20	0	0	0	120	280	140
	| Family: Peltoperlidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Yoraperla sp.	0	0	0	0	0	0	20	0	0	1	0	20	0	0
	| Family: Perlidae	17	240	240	0	0	0	0	0	0	0	0	0	0	0
	Claassenia sabulosa	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Hesperoperla sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Perlodidae	183	1,400	1,280	100	20	240	0	10	75	7	60	500	340	380
	Diura sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Megarcys sp.	83	160	360	40	40	160	0	10	50	0	0	280	40	100
	Setvena sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Skwala	0	0	0	0	0	0	20	0	0	0	0	0	0	0
	| Family: Pteronarcyidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pteronarcella sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Taeniopterygidae	833	1,500	320	0	1,340	1,300	0	50	563	14	240	940	680	2,160
	Taenionema	0	0	0	3,420	0	1,400	0	0	0	0	0	0	0	0
	| Order: Trichoptera	17	20	0	20	20	0	0	0	0	0	0	20	0	20
	| Family: Apataniidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Apatania	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Brachycentridae	17	0	0	0	0	2,060	0	0	0	0	0	0	0	0
	Brachycentrus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Micrasema	0	0	0	0	0	0	40	0	13	0	0	0	0	0
	| Family: Glossosomatidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Glossosoma	0	100	20	20	20	0	0	0	0	0	0	0	0	0
	| Family: Hydropsychidae	33	500	160	0	120	0	0	0	113	0	40	180	220	380
	Arctopsyche grandis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Arctopsyche sp.	0	40	0	0	0	0	0	0	0	0	0	0	0	0
	Parapsyche sp.	0	0	0	40	40	100	0	0	0	0	0	20	0	0
	| Family: Hydroptilidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Ochrotrichia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Lepidostomatidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Lepidostoma	0	0	0	0	0	0	60	0	0	0	0	0	0	0
	| Family: Limnephilidae	0	20	20	0	0	0	0	10	0	6	0	0	0	0
	Homophylax sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Rhyacophilidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rhyacophila	150	100	420	0	320	540	640	0	0	7	0	460	800	1,160
	Rhyacophila atrata complex	0	0	0	0	40	0	0	0	0	0	0	0	20	0
	Rhyacophila betteni group	0	0	0	520	40	80	0	0	0	0	0	0	0	220
	Rhyacophila brunnea/vemna group	50	20	60	60	0	20	940	10	0	1	0	200	0	160
	Rhyacophila hyalinata group	0	40	20	20	0	100	0	0	0	0	0	20	220	0
	Rhyacophila malkini	0	0	0	0	0	0	0	0	0	0	0	0	0	40
	Rhyacophila vofixa group	0	0	0	0	0	0	0	0	0	0	0	0	0	20
	| Family: Uenoidae	0	0	0	0	0	0	0	0	0	0	0	200	800	1,660
	Neothremma sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Oligophlebodes	0	0	0	720	260	0	0	0	0	0	0	0	0	40
	| Order: Coleoptera	0	0	0	0	0	0	0	0	0	1	0	0	0	0
	| Family: Dytiscidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Elmidae	0	0	60	0	120	20	0	0	0	0	0	340	220	100
	Heterlimnius corpulentus	17	160	300	0	20	0	0	0	0	0	0	0	0	0
	Heterlimnius sp.	17	60	20	240	220	160	0	0	0	0	0	280	320	300
	| Family: Hydrophilidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Ametor sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Order: Diptera	0	0	0	0	0	0	0	10	0	1	0	0	0	0
	| Family: Athericidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Atherix	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Ceratopogonidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Atrichopogon sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Bezzia/ Palpomyia	0	0	0	0	20	0	0	0	0	0	0	0	0	0
	Probezzia	0	20	0	0	0	0	0	0	0	1	0	0	0	0
	| Family: Chironomidae	133	340	180	220	0	80	40	120	50	11	260	0	0	0
	| Subfamily: Chironominae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Tribe: Tanytarsini	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Micropsectra	0	0	0	0	0	0	20	10	13	5	300	0	20	0
	Rheotanytarsus	0	0	0	0	0	0	740	0	13	0	0	0	0	0
	Stempellina sp.	0	0	0	0	0	0	0	0	0	0	20	0	0	0
	Tanytarsus	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table C.3: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference and mine-exposed areas based on lowest practical level of taxonomy, September 2014.

Species		Mine-exposed													
		FO29	FORD7-25	FORD7-50	GRAV1-25	GRAV1-50	GRAV1-75	GREE1-75	GREE3-25	GREE3-75	GREE4-25	GREE4-75	HARM1-50-1[b]	HARM1-50-2[b]	HARM1-50-3[b]
Insects	| Subfamily: Diamesinae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Tribe: Diamesini	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diamesa	0	0	0	520	40	0	60	320	225	322	1,320	0	0	0
	Pagastia	33	80	120	0	0	60	20	50	0	0	40	100	340	260
	Pseudodiamesa sp.	0	0	0	0	0	0	0	0	13	2	40	0	0	0
	| Subfamily: Orthocladiinae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Brillia sp.	33	0	0	0	0	20	0	0	0	3	20	0	0	0
	Eukiefferiella	917	220	140	140	20	0	60	1,090	588	25	0	520	760	420
	Heleniella sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Hydrobaenus	0	20	300	0	20	20	0	0	88	0	20	240	0	0
	Krenosmittia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Metriocnemus sp.	0	20	0	0	0	0	0	0	0	0	0	0	0	0
	Orthocladius complex	733	1,040	700	0	0	0	40	690	475	81	2,520	0	0	0
	Orthocladius lignicola	0	0	0	0	20	0	0	0	0	0	0	0	0	0
	Orthocladius sp.	0	0	0	0	0	0	0	0	0	0	0	1,140	1,180	700
	Parakiefferiella	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Parametriocnemus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Paraphaenocladius sp.	0	0	0	0	0	0	40	20	0	0	0	0	0	0
	Rheocricotopus	33	0	40	60	20	100	0	0	0	0	0	1,200	900	160
	Synorthocladius	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Tvetenia	150	120	100	100	0	60	0	0	38	6	160	0	0	500
	| Tribe: Corynoneurini	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Corynoneura	0	0	0	0	0	0	0	0	0	0	0	0	20	0
	Thienemanniella	0	0	0	0	0	0	0	0	0	0	20	0	0	0
	| Tribe: Orthocladiini	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Chaetocladius	0	0	40	0	0	0	0	0	0	0	20	0	0	0
	| Subfamily: Tanypodinae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Labrundinia sp.	0	0	0	0	0	0	60	0	0	0	0	0	0	0
	| Tribe: Pentaneuriini	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Thienemannimyia group	0	0	0	0	0	0	20	0	0	0	0	0	0	0
	| Family: Dixidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Dixa sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Empididae	17	20	0	20	0	0	20	20	0	3	0	0	20	0
	Chelifera/ Metachela	17	20	180	20	20	40	240	0	25	1	0	0	60	80
	Clinocera sp.	0	0	0	0	0	0	0	0	0	1	0	0	0	0
	| Family: Muscidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Limnophora sp.	0	0	0	0	0	0	0	10	0	0	220	0	0	0
	| Family: Pelecorhynchidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Glutops sp.	0	0	0	40	0	0	0	0	0	0	0	0	20	0
	| Family: Psychodidae	0	0	0	0	0	20	0	0	0	0	0	0	0	0
	Pericoma/Telmatoscopus sp.	133	60	140	540	1,180	440	1,520	60	75	7	120	700	580	900
	Psychoda sp.	0	0	0	0	0	0	0	0	0	1	0	0	0	0
	| Family: Simuliidae	0	60	0	0	0	0	0	0	13	3	0	0	0	0
	Gymnopais sp.	0	0	0	0	0	0	0	0	0	1	0	0	0	0
	Prosimulium	0	20	60	0	0	0	0	0	0	1	0	0	0	20
	Simulium	17	0	20	40	20	0	840	140	38	13	0	0	0	0
	| Family: Tipulidae	0	0	0	0	20	0	0	0	0	0	0	0	0	0
	Antocha sp.	0	0	0	0	0	0	40	0	0	0	0	0	20	0
	Dicranota	0	0	40	20	0	0	140	10	100	7	60	20	0	60
	Hexatoma sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Limnophila sp.	0	0	0	0	0	0	0	0	0	0	0	20	0	0
	Molophilus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Tipula	0	0	0	0	0	0	20	0	0	0	0	0	0	0
	| Order: Odonata	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Coenagrionidae	0	0	0	0	20	0	0	0	0	0	0	0	0	0
Crustacea	| Class: Malacostraca	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Order: Amphipoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Hyalellidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Hyalella	0	0	0	0	0	0	20	0	0	0	0	0	0	0
	| Order: Isopoda	0	0	0	0	20	0	0	0	0	0	0	0	0	0
Arachnida	| Order: Trombidiformes	0	0	0	0	0	180	0	0	0	0	0	0	0	0
	| Family: Aturidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Aturus	0	0	0	0	0	0	0	0	0	0	0	20	0	60
	| Family: Feltriidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Feltria sp.	0	0	0	0	0	0	80	0	0	0	0	20	20	20
	| Family: Hydryphantidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Albertathyas	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Hygrobatidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Atractides	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Lebertiidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Lebertia	17	80	100	40	0	0	20	0	0	1	20	80	20	40
	| Family: Sperchontidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sperchon	0	20	40	0	20	0	0	0	0	1	0	0	0	20
	| Family: Stygothrombiidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Stygothrombium sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Torrenticolidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Testudacarus sp.	0	0	20	0	0	0	0	0	0	0	0	0	0	0
	Torrenticola	0	0	20	0	0	0	0	0	0	0	0	0	0	0
	| Order: Oribatei	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Oribatidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Oribatida	0	0	0	0	0	0	0	0	0	0	20	0	0	20
	| Order: Sarcoptiformes	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Hydrozetidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bivalve Molluscs	| Class: Bivalvia	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Order: Veneroida	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Pisidiidae	0	0	0	0	0	0	0	0	0	0	0	0	0	20
Oligochaete Worms	Phylum: Annelida	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Subphylum: Clitellata	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Class: Oligochaeta	0	0	20	0	0	0	180	0	50	0	20	0	0	0
	| Order: Lumbriculida	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Lumbriculidae	0	0	0	0	80	0	0	0	0	0	0	0	0	0
	| Order: Tubificida	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Family: Naididae	0	0	0	0	0	0	0	0	0	0	0	0	20	0
Total Abundance		**6,051**	**10,080**	**8,500**	**9,960**	**7,420**	**12,380**	**6,460**	**3,150**	**4,418**	**639**	**6,920**	**17,980**	**17,640**	**19,540**
Taxa present but not included [c]															
Terrestrials		0	0	0	0	0	0	0	0	13	1	0	0	0	0
Insects	Phylum: Arthropoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Class: Entognatha	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Order: Collembola	0	0	0	0	0	0	20	0	0	2	0	0	0	0
Crustacea	| Class: Ostracoda	17	0	0	0	20	0	20	10	0	10	0	4,000	600	0
	| Class: Branchiopoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	| Order: Cladocera	0	0	0	220	0	0	40	0	0	0	0	0	0	0
	| Class: Copepoda	0	0	0	0	0	0	20	0	0	0	20	0	0	0
Nematodes	Phylum: Nemata	0	0	0	0	0	0	0	10	0	0	20	100	0	0
Platyhelminthes	| Class: Turbellaria	0	0	0	100	360	80	20	0	13	0	0	0	600	1,060
Total Abundance		**17**	**0**	**0**	**320**	**380**	**80**	**120**	**20**	**26**	**13**	**40**			

[a] One of three replicates from site ELKR-75. Rep-2 was used for data analysis.
[b] One of three replicates from site HARM1-50. Rep-2 was used for data analysis.
[c] Some taxa were not included in the analysis, as per CABIN protocol (Environment Canada 2012).

Table C.3: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference and mine-exposed areas based on lowest practical level of taxonomy, September 2014.

	Species	Mine-exposed								
		HARM1-75	HARM5-25	LIDSL	LILC3	LI8	MICH1-25	NTHO1-25	NTHO1-50	PORT1-0
Insects	| Order: Ephemeroptera	0	0	0	0	0	0	0	0	0
	| Family: Ameletidae	0	0	0	0	0	0	0	0	0
	Ameletus	0	120	0	0	0	15	0	0	0
	| Family: Baetidae	280	0	20	120	0	25	0	0	0
	Acentrella sp.	0	0	0	0	0	85	0	0	0
	Baetis	340	20	140	140	260	60	0	0	0
	Baetis bicaudatus	60	40	0	0	20	35	0	0	40
	Baetis tricaudatus group	100	0	20	60	20	45	0	0	0
	Diphetor hageni	0	0	0	0	0	0	0	0	0
	| Family: Ephemerellidae	2,880	1,180	180	240	200	165	0	0	0
	Caudatella sp.	0	0	0	0	0	0	0	0	0
	Drunella coloradensis	0	0	0	0	0	0	0	0	0
	Drunella doddsii	40	20	0	0	40	30	0	0	0
	Drunella grandis group	0	0	0	0	0	0	0	0	0
	Drunella sp.	0	0	0	0	0	0	0	0	0
	Drunella spinifera	20	0	0	0	0	25	0	0	0
	Ephemerella	0	0	0	0	0	0	0	0	0
	Ephemerella velmae	0	0	0	0	0	0	0	0	0
	Serratella	20	0	0	0	0	0	0	0	0
	| Family: Heptageniidae	2,080	6,060	720	200	880	110	0	20	0
	Cinygmula sp.	0	100	0	0	0	0	0	0	0
	Epeorus deceptivus	0	0	0	0	0	0	0	0	0
	Epeorus grandis group	0	0	0	0	0	0	0	0	0
	Epeorus longimanus	0	0	0	0	0	0	0	0	0
	Epeorus sp.	120	1,020	220	0	140	55	0	0	0
	Rhithrogena	0	0	20	0	40	15	0	0	0
	| Family: Leptophlebiidae	0	0	0	0	0	0	0	0	0
	Paraleptophlebia	0	0	0	0	0	0	0	0	0
	| Order: Plecoptera	0	0	0	0	0	0	0	0	0
	| Family: Capniidae	0	0	0	0	0	15	340	20	60
	| Family: Chloroperlidae	0	0	20	60	20	0	0	0	20
	Haploperla sp.	0	0	0	0	0	0	0	0	0
	Paraperla sp.	0	0	40	0	0	0	0	0	0
	Sweltsa sp.	60	260	120	140	60	45	0	0	0
	| Family: Leuctridae	0	20	0	0	0	0	0	0	0
	| Family: Nemouridae	0	0	0	160	0	0	0	0	40
	Amphinemura sp.	0	0	0	0	0	0	0	0	0
	Visoka cataractae	0	0	0	0	0	0	0	0	0
	Zapada	740	260	880	220	820	105	1,540	720	1,060
	Zapada cinctipes	260	0	0	0	0	5	2,160	280	520
	Zapada columbiana	860	320	40	440	40	0	0	0	300
	Zapada oregonensis group	4,880	80	540	0	360	10	0	0	380
	| Family: Peltoperlidae	0	0	0	0	0	0	0	0	0
	Yoraperla sp.	0	3,220	0	20	0	15	20	0	0
	| Family: Perlidae	0	0	0	0	0	30	0	0	0
	Claassenia sabulosa	0	0	0	0	0	0	0	0	0
	Hesperoperla sp.	0	0	0	0	0	5	0	0	0
	| Family: Perlodidae	360	160	60	320	60	15	0	0	920
	Diura sp.	0	0	0	60	0	0	0	0	0
	Megarcys sp.	80	140	100	100	180	25	0	0	220
	Setvena sp.	0	40	0	0	0	0	0	0	0
	Skwala	0	0	0	0	0	15	0	0	0
	| Family: Pteronarcyidae	0	0	0	0	0	0	0	0	0
	Pteronarcella sp.	0	0	0	0	0	0	0	0	0
	| Family: Taeniopterygidae	60	2,500	1,220	220	3,160	215	0	20	20
	Taenionema	0	0	0	0	0	0	0	0	0
	| Order: Trichoptera	0	0	0	0	40	0	0	0	0
	| Family: Apataniidae	0	0	0	0	0	0	0	0	0
	Apatania	0	0	0	0	0	700	0	40	0
	| Family: Brachycentridae	0	0	20	60	0	0	0	0	0
	Brachycentrus sp.	0	0	0	0	0	5	0	0	0
	Micrasema	0	0	0	0	0	0	0	0	0
	| Family: Glossosomatidae	0	0	0	0	0	0	0	0	0
	Glossosoma	0	80	0	0	0	145	0	0	20
	| Family: Hydropsychidae	200	60	200	240	160	20	20	0	0
	Arctopsyche grandis	0	0	0	0	0	20	0	0	0
	Arctopsyche sp.	100	0	40	0	0	0	0	0	0
	Parapsyche sp.	0	0	20	140	20	0	0	0	0
	| Family: Hydroptilidae	0	0	0	0	0	0	20	0	0
	Ochrotrichia sp.	0	0	0	0	0	0	20	0	0
	| Family: Lepidostomatidae	0	0	0	0	0	0	0	0	0
	Lepidostoma	0	0	0	40	0	0	0	0	0
	| Family: Limnephilidae	3,200	260	700	20	1,040	0	0	20	520
	Homophylax sp.	0	0	0	0	0	0	0	0	0
	| Family: Rhyacophilidae	0	0	0	0	0	0	0	0	0
	Rhyacophila	460	300	40	100	180	5	0	0	160
	Rhyacophila atrata complex	0	0	0	0	0	0	0	0	0
	Rhyacophila betteni group	0	0	0	0	0	0	0	0	0
	Rhyacophila brunnea/vemna group	300	100	0	0	0	0	0	0	540
	Rhyacophila hyalinata group	100	0	0	20	0	0	0	0	0
	Rhyacophila malkini	0	0	0	0	0	0	0	0	0
	Rhyacophila vofixa group	20	0	0	0	20	0	0	0	0
	| Family: Uenoidae	0	0	0	0	0	0	0	0	0
	Neothremma sp.	0	40	0	0	0	0	0	0	0
	Oligophlebodes	0	0	0	0	0	0	0	0	0
	| Order: Coleoptera	0	0	0	0	0	0	0	0	20
	| Family: Dytiscidae	0	0	0	0	0	5	0	0	0
	| Family: Elmidae	20	0	0	0	0	0	40	0	80
	Heterlimnius corpulentus	20	0	0	0	0	0	0	0	20
	Heterlimnius sp.	80	40	0	0	0	10	20	0	160
	| Family: Hydrophilidae	0	0	0	0	0	0	0	0	0
	Ametor sp.	0	0	0	0	0	0	20	0	0
	| Order: Diptera	0	0	0	0	0	0	0	0	0
	| Family: Athericidae	0	0	0	0	0	0	0	0	0
	Atherix	0	0	0	0	0	0	0	0	0
	| Family: Ceratopogonidae	0	0	0	0	0	0	0	0	0
	Atrichopogon sp.	0	0	0	0	0	0	0	20	0
	Bezzia/ Palpomyia	0	0	0	0	0	0	0	20	0
	Probezzia	0	0	0	0	0	25	40	40	0
	| Family: Chironomidae	700	60	880	3,360	420	55	20	260	760
	| Subfamily: Chironominae	0	0	0	0	0	0	0	0	0
	| Tribe: Tanytarsini	0	0	0	0	0	0	0	0	0
	Micropsectra	200	20	0	200	0	20	0	60	1,120
	Rheotanytarsus	0	0	0	0	0	0	0	0	0
	Stempellina sp.	0	0	0	0	0	0	0	0	0
	Tanytarsus	0	0	0	0	0	0	0	0	0

Table C.3: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference and mine-exposed areas based on lowest practical level of taxonomy, September 2014.

Species		Mine-exposed								
		HARM1-75	HARM5-25	LIDSL	LILC3	LI8	MICH1-25	NTHO1-25	NTHO1-50	PORT1-0
Insects	| Subfamily: Diamesinae	0	0	0	0	0	0	0	0	0
	| Tribe: Diamesini	0	0	0	0	0	0	0	0	0
	Diamesa	400	0	180	2,000	0	10	620	1,860	100
	Pagastia	480	100	40	580	0	15	40	20	560
	Pseudodiamesa sp.	20	0	0	40	0	0	0	0	0
	| Subfamily: Orthocladiinae	0	0	0	0	0	0	0	0	0
	Brillia sp.	0	0	0	0	80	0	0	0	20
	Eukiefferiella	1,220	360	140	2,680	0	45	360	0	1,240
	Heleniella sp.	20	0	0	0	20	0	0	0	0
	Hydrobaenus	120	20	20	0	0	0	0	40	0
	Krenosmittia sp.	0	0	0	0	0	0	0	0	0
	Metriocnemus sp.	0	0	0	0	0	0	0	60	0
	Orthocladius complex	2,120	200	80	5,300	20	195	900	680	740
	Orthocladius lignicola	0	0	0	0	0	0	0	0	0
	Orthocladius sp.	0	0	0	0	0	0	0	0	0
	Parakiefferiella	0	0	0	0	0	0	0	0	0
	Parametriocnemus	0	0	0	0	0	0	0	0	0
	Paraphaenocladius sp.	0	0	0	0	0	0	0	0	0
	Rheocricotopus	580	0	1,000	520	280	35	0	0	0
	Synorthocladius	0	0	0	0	0	0	0	0	0
	Tvetenia	240	0	0	440	0	15	80	80	740
	| Tribe: Corynoneurini	0	0	0	0	0	0	0	0	0
	Corynoneura	0	0	0	0	0	0	0	0	0
	Thienemanniella	0	0	0	0	0	0	0	0	0
	| Tribe: Orthocladiini	0	0	0	0	0	0	0	0	0
	Chaetocladius	0	0	0	0	0	0	0	40	0
	| Subfamily: Tanypodinae	0	0	0	0	0	0	0	0	0
	Labrundinia sp.	0	0	0	0	0	0	0	0	0
	| Tribe: Pentaneuriini	0	0	0	0	0	0	0	0	0
	Thienemannimyia group	0	0	0	0	0	0	0	0	0
	| Family: Dixidae	0	0	0	0	0	0	0	0	0
	Dixa sp.	0	0	0	0	0	0	20	0	0
	| Family: Empididae	0	0	20	40	20	0	0	20	0
	Chelifera/ Metachela	0	40	0	0	0	25	0	0	180
	Clinocera sp.	0	0	0	0	0	0	0	0	0
	| Family: Muscidae	0	0	0	0	0	0	0	0	0
	Limnophora sp.	0	0	0	0	0	0	0	60	0
	| Family: Pelecorhynchidae	0	0	0	0	0	0	0	0	0
	Glutops sp.	0	20	0	0	0	0	0	0	20
	| Family: Psychodidae	0	0	0	0	0	0	0	0	0
	Pericoma/Telmatoscopus sp.	0	40	0	0	140	85	2,080	2,300	500
	Psychoda sp.	0	0	0	0	0	0	0	0	0
	| Family: Simuliidae	0	40	20	0	0	0	20	120	0
	Gymnopais sp.	0	0	0	0	0	0	0	0	0
	Prosimulium	0	0	0	0	0	0	0	0	0
	Simulium	40	0	0	0	0	0	340	620	140
	| Family: Tipulidae	0	0	0	0	0	0	0	0	0
	Antocha sp.	160	0	0	0	0	0	0	0	0
	Dicranota	0	0	0	20	20	20	20	20	0
	Hexatoma sp.	0	0	0	20	0	10	0	0	0
	Limnophila sp.	0	0	0	0	0	0	0	0	0
	Molophilus sp.	0	0	0	0	0	0	0	0	0
	Tipula	0	0	0	0	0	0	0	0	0
	| *Order: Odonata*	0	0	0	0	0	0	0	0	0
	| *Family: Coenagrionidae*	0	0	0	0	0	0	0	0	0
Crustacea	| Class: Malacostraca	0	0	0	0	0	0	0	0	0
	| Order: Amphipoda	0	0	0	0	0	0	0	0	0
	| Family: Hyalellidae	0	0	0	0	0	0	0	0	0
	Hyalella	0	0	0	0	0	0	0	0	0
	| Order: Isopoda	0	0	0	0	0	0	0	0	0
Arachnida	| Order: Trombidiformes	0	0	0	0	0	0	0	0	0
	| Family: Aturidae	0	0	0	0	0	0	0	0	0
	Aturus	480	0	0	0	0	0	0	0	160
	| Family: Feltriidae	0	0	0	0	0	0	0	0	0
	Feltria sp.	100	0	0	160	0	0	20	80	20
	| Family: Hydryphantidae	0	0	0	0	0	0	0	0	0
	Albertathyas	0	0	0	0	0	0	0	0	20
	| Family: Hygrobatidae	0	0	0	0	0	0	0	0	0
	Atractides	0	0	0	0	0	0	0	0	0
	| Family: Lebertiidae	0	0	0	0	0	0	0	0	0
	Lebertia	20	20	20	160	120	125	0	0	60
	| Family: Sperchontidae	0	0	0	0	0	0	0	0	0
	Sperchon	20	0	100	1,040	160	5	60	0	420
	| Family: Stygothrombiidae	0	0	0	0	0	0	0	0	0
	Stygothrombium sp.	0	20	0	0	0	0	0	0	0
	| Family: Torrenticolidae	0	0	0	0	0	0	0	0	0
	Testudacarus sp.	20	0	0	0	0	0	0	0	0
	Torrenticola	0	0	0	0	0	35	0	0	0
	| Order: Oribatei	0	0	0	0	0	0	0	0	0
	| Family: Oribatidae	0	0	0	0	0	0	0	0	0
	Oribatida	0	0	0	0	0	0	20	0	0
	| Order: Sarcoptiformes	0	0	0	0	0	0	0	0	0
	| Family: Hydrozetidae	0	0	0	0	0	0	0	0	0
Bivalve Molluscs	| Class: Bivalvia	0	0	0	0	0	0	0	0	0
	| Order: Veneroida	0	0	0	0	0	0	0	0	0
	| Family: Pisidiidae	20	0	0	0	0	0	0	0	0
Oligochaete Worms	Phylum: Annelida	0	0	0	0	0	0	0	0	0
	Subphylum: Clitellata	0	0	0	0	0	0	0	0	0
	| Class: Oligochaeta	1,400	20	0	0	0	0	20	180	0
	| Order: Lumbriculida	0	0	0	0	0	0	0	0	0
	| Family: Lumbriculidae	0	0	0	0	0	0	0	0	0
	| Order: Tubificida	0	0	0	0	0	0	0	0	0
	| Family: Naididae	0	0	0	0	0	0	0	0	0
Total Abundance		**26,100**	**17,400**	**7,860**	**19,680**	**9,040**	**2,795**	**8,860**	**7,700**	**11,900**
Taxa present but not included [c]										
Terrestrials		0	20	0	0	0	0	0	0	0
Insects	Phylum: Arthropoda	0	0	0	0	0	0	0	0	0
	| Class: Entognatha	0	0	0	0	0	0	0	0	0
	| Order: Collembola	0	0	0	0	0	0	0	100	0
Crustacea	| Class: Ostracoda	0	0	0	20	0	0	0	3,000	1,000
	| Class: Branchiopoda	0	0	0	0	0	0	0	0	0
	| Order: Cladocera	0	0	0	0	0	0	0	0	0
	| Class: Copepoda	0	0	0	0	0	0	0	20	0
Nematodes	Phylum: Nemata	0	0	0	0	0	5	0	0	0
Platyhelminthes	| Class: Turbellaria	0	0	0	0	0	0	140	100	300
Total Abundance		**0**	**20**	**0**	**20**	**0**	**5**	**140**	**3,220**	**1,300**

[a] One of three replicates from site ELKR-75. Rep-2 was used for data analysis.
[b] One of three replicates from site HARM1-50. Rep-2 was used for data analysis.
[c] Some taxa were not included in the analysis, as per CABIN protocol (Environment Canada 20

Table C.4: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference and mine-exposed areas based on family level of taxonomy, September 2014.

Species		Reference							Mine-exposed	
		ALEX3-25	CHAU1-50	CHAU1-75	GRAC2-25	GRAC2-75	GRAV3-75	HARM6-25	ELKR8-75-1[a]	ELKR8-75-2[a]
Insects	Order Ephemeroptera	0	0	0	0	17	0	0	0	0
	Ameletidae	0	0	0	0	0	20	180	8	31
	Baetidae	800	1180	500	317	66	460	720	123	115
	Ephemerellidae	2,000	800	1,040	183	1,016	1,800	760	59	123
	Heptageniidae	2,220	5,380	1,900	1,500	1,450	5,460	5,020	220	1,300
	Leptophlebiidae	0	0	0	0	0	0	0	0	8
	Order Plecoptera	0	0	0	0	0	0	0	5	0
	Capniidae	0	0	0	150	283	720	0	0	0
	Chloroperlidae	80	40	20	67	234	1,700	320	40	23
	Leuctridae	0	0	20	0	0	80	80	0	0
	Nemouridae	640	460	180	1,085	683	1,620	820	16	108
	Peltoperlidae	0	20	0	83	117	100	7,740	0	0
	Perlidae	0	0	0	0	0	0	0	36	223
	Perlodidae	220	740	400	150	133	80	640	23	54
	Pteronarcyidae	0	0	0	0	0	0	0	33	31
	Taeniopterygidae	840	660	100	333	750	4980	760	33	8
	Order Trichoptera	0	0	0	0	0	0	0	0	0
	Apataniidae	0	0	0	0	0	0	0	0	0
	Brachycentridae	0	0	0	0	0	0	0	3	31
	Glossosomatidae	20	0	0	0	0	0	0	53	31
	Hydropsychidae	100	720	60	167	50	160	0	11	8
	Hydroptilidae	0	0	0	0	0	0	0	0	0
	Lepidostomatidae	0	0	0	0	0	0	0	0	0
	Limnephilidae	0	60	160	33	67	0	160	0	0
	Rhyacophilidae	260	560	120	183	300	80	240	3	0
	Uenoidae	0	0	0	550	283	220	640	0	0
	Order Coleoptera	0	0	0	0	0	0	0	0	0
	Dytiscidae	0	0	0	0	0	0	0	0	0
	Elmidae	320	0	0	17	33	20	0	0	8
	Hydrophilidae	0	0	0	0	0	0	0	0	0
	Order Diptera	0	0	0	0	0	0	0	0	0
	Athericidae	0	0	0	0	0	0	0	10	31
	Ceratopogonidae	0	0	0	0	0	0	0	0	0
	Chironomidae	460	1,620	1,280	367	134	100	600	30	137
	Dixidae	0	0	0	0	0	0	0	0	0
	Empididae	80	80	140	17	17	0	20	8	15
	Muscidae	0	0	20	0	0	0	0	0	0
	Pelecorhynchidae	0	0	0	0	17	0	0	0	0
	Psychodidae	480	340	360	50	83	20	0	3	8
	Simuliidae	60	20	0	0	0	0	0	3	0
	Tipulidae	20	40	20	17	0	60	20	38	46
	Order Odonata	0	0	0	0	0	0	0	0	0
	Coenagrionidae	0	0	0	0	0	0	0	0	0
Crustaceans	Order Amphipoda	0	0	0	0	0	0	0	0	0
	Hyalellidae	0	0	0	0	0	0	0	0	0
	Order Isopoda	0	0	0	0	0	0	0	0	0
Arachnids	Order Trombidiformes	0	0	0	0	0	0	20	3	0
	Aturidae	0	0	0	0	0	0	0	0	0
	Feltriidae	0	0	0	0	0	0	40	0	0
	Hydryphantidae	0	0	0	0	0	0	20	0	0
	Hygrobatidae	0	0	0	0	0	0	0	0	0
	Lebertiidae	0	40	0	17	0	0	0	33	54
	Sperchontidae	0	20	0	0	0	0	260	0	8
	Stygothrombiidae	0	0	0	0	0	0	0	0	0
	Torrenticolidae	0	0	0	0	0	0	0	3	15
	Order Oribatei	0	0	0	0	0	0	0	0	0
	Oribatidae	0	0	0	0	0	0	20	0	0
	Order Sarcoptiformes	0	0	0	0	0	0	0	0	0
	Hydrozetidae	0	20	0	0	0	0	0	0	0
Bivalve Molluscs	Pisidiidae	0	0	0	0	0	0	0	0	0
Oligochaete Worms	Class Oligochaeta	0	20	0	0	0	0	0	0	0
	Order Lumbriculida	0	0	0	0	0	0	0	0	0
	Lumbriculidae	0	0	0	0	0	0	0	0	0
	Order Tubificida	0	0	0	0	0	0	0	0	0
	Naididae	0	0	0	0	0	0	0	0	8
Total Abundance		**8,600**	**12,820**	**6,320**	**5,286**	**5,733**	**17,680**	**19,080**	**797**	**2,424**
Total Richness		**16**	**20**	**16**	**19**	**18**	**18**	**20**	**22**	**24**
Taxa present but not included[c]										
Terrestrials		0	0	0	0	0	0	0	0	0
Insects	Order Collembola	0	0	0	50	17	0	0	0	0
Crustaceans	Class Ostracoda	0	0	0	0	0	0	4,000	3	8
	Order Cladocera	0	0	0	0	0	0	0	0	0
	Class Copepoda	0	0	0	0	0	0	0	0	0
Nematodes	Phylum Nemata	0	20	0	33	0	0	0	0	0
Platyhelminthes	Class Turbellaria	40	40	60	133	100	0	0	0	8
Total Abundance		**40**	**60**	**60**	**216**	**117**	**0**	**4,000**	**3**	**16**
Total Richness		**1**	**2**	**1**	**3**	**2**	**0**	**1**	**1**	**2**

[a] One of three replicates from site ELKR-75. Rep-2 was used for data analysis.
[b] One of three replicates from site HARM1-50. Rep-2 was used for data analysis.
[c] Some taxa were not included in the analysis, as per CABIN protocol (Environment Canada 2012).

Table C.4: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference and mine-exposed areas based on family level of taxonomy, September 2014.

Species		Mine-exposed								
		ELKR8-75-3[a]	ERIC2-0	ERIC4-25	ERIC4-75	FO29	FORD7-25	FORD7-50	GRAV1-25	GRAV1-50
Insects	Order Ephemeroptera	0	0	0	0	0	0	0	0	0
	Ameletidae	45	0	0	0	0	20	20	0	20
	Baetidae	136	0	0	0	483	100	120	580	400
	Ephemerellidae	119	14	80	0	184	300	440	1,020	800
	Heptageniidae	1,400	29	0	0	1,500	1,680	1,480	340	380
	Leptophlebiidae	0	0	0	0	0	0	0	20	0
	Order Plecoptera	27	0	0	0	0	0	0	0	0
	Capniidae	18	0	0	0	0	0	0	20	40
	Chloroperlidae	118	0	120	160	117	40	100	180	160
	Leuctridae	0	0	0	0	0	0	0	0	0
	Nemouridae	72	1,172	3,140	2,120	117	1440	800	840	1,480
	Peltoperlidae	0	2,257	10,580	8,020	0	0	0	0	0
	Perlidae	200	0	0	0	17	240	240	0	0
	Perlodidae	18	671	220	340	266	1,560	1,640	140	60
	Pteronarcyidae	73	0	0	0	0	0	0	0	0
	Taeniopterygidae	164	0	100	0	833	1,500	320	3420	1,340
	Order Trichoptera	0	0	0	0	17	20	0	20	20
	Apataniidae	0	0	0	0	0	0	0	0	0
	Brachycentridae	36	0	0	0	17	0	0	0	0
	Glossosomatidae	145	0	60	80	0	100	20	20	20
	Hydropsychidae	18	14	0	0	33	540	160	40	160
	Hydroptilidae	0	0	0	0	0	0	0	0	0
	Lepidostomatidae	0	0	0	0	0	0	0	0	0
	Limnephilidae	0	0	40	140	0	20	20	0	0
	Rhyacophilidae	0	0	80	120	200	160	500	600	400
	Uenoidae	0	0	0	0	0	0	0	720	260
	Order Coleoptera	0	0	0	0	0	0	0	0	0
	Dytiscidae	0	0	0	0	0	0	0	0	0
	Elmidae	0	0	0	0	34	220	380	240	360
	Hydrophilidae	0	0	0	0	0	0	0	0	0
	Order Diptera	0	43	0	0	0	0	0	0	0
	Athericidae	18	0	0	0	0	0	0	0	0
	Ceratopogonidae	0	14	0	0	0	20	0	0	20
	Chironomidae	73	343	3,280	1,880	2,032	1,840	1,620	1,040	120
	Dixidae	0	0	0	0	0	0	0	0	0
	Empididae	9	0	80	120	34	40	180	40	20
	Muscidae	0	0	0	0	0	0	0	0	0
	Pelecorhynchidae	0	0	0	40	0	0	0	40	0
	Psychodidae	0	0	20	40	133	60	140	540	1,180
	Simuliidae	18	0	0	20	17	80	80	40	20
	Tipulidae	9	0	20	20	0	0	40	20	20
	Order Odonata	0	0	0	0	0	0	0	0	0
	Coenagrionidae	0	0	0	0	0	0	0	0	20
Crustaceans	Order Amphipoda	0	0	0	0	0	0	0	0	0
	Hyalellidae	0	0	0	0	0	0	0	0	0
	Order Isopoda	0	0	0	0	0	0	0	0	20
Arachnids	Order Trombidiformes	0	0	20	0	0	0	0	0	0
	Aturidae	0	0	0	0	0	0	0	0	0
	Feltriidae	0	0	0	20	0	0	0	0	0
	Hydryphantidae	0	0	0	0	0	0	0	0	0
	Hygrobatidae	9	0	0	0	0	0	0	0	0
	Lebertiidae	91	0	0	20	17	80	100	40	0
	Sperchontidae	9	43	100	120	0	20	40	0	20
	Stygothrombiidae	0	0	0	0	0	0	0	0	0
	Torrenticolidae	0	0	0	0	0	0	40	0	0
	Order Oribatei	0	0	0	0	0	0	0	0	0
	Oribatidae	0	0	0	20	0	0	0	0	0
	Order Sarcoptiformes	0	0	0	0	0	0	0	0	0
	Hydrozetidae	0	0	0	0	0	0	0	0	0
Bivalve Molluscs	Pisidiidae	0	0	0	0	0	0	0	0	0
Oligochaete Worms	Class Oligochaeta	0	0	60	0	0	0	20	0	0
	Order Lumbriculida	0	0	0	0	0	0	0	0	0
	Lumbriculidae	0	0	0	0	0	0	0	0	80
	Order Tubificida	0	0	0	0	0	0	0	0	0
	Naididae	0	0	0	0	0	0	0	0	0
Total Abundance		**2,825**	**4,600**	**18,000**	**13,280**	**6,051**	**10,080**	**8,500**	**9,960**	**7,420**
Total Richness		**22**	**9**	**15**	**17**	**17**	**21**	**23**	**21**	**24**
Taxa present but not included[c]										
Terrestrials		0	0	0	0	0	0	0	0	0
Insects	Order Collembola	0	0	0	0	0	0	0	0	0
Crustaceans	Class Ostracoda	0	71	20	0	17	0	0	0	20
	Order Cladocera	0	0	0	0	0	0	0	220	0
	Class Copepoda	0	0	0	0	0	0	0	0	0
Nematodes	Phylum Nemata	27	0	20	0	0	0	0	0	0
Platyhelminthes	Class Turbellaria	0	143	300	0	0	0	0	100	360
Total Abundance		**27**	**214**	**340**	**0**	**17**	**0**	**0**	**320**	**380**
Total Richness		**1**	**2**	**3**	**0**	**1**	**0**	**0**	**2**	**2**

[a] One of three replicates from site ELKR-75. Rep-2 was used for data analysis.
[b] One of three replicates from site HARM1-50. Rep-2 was used for data analysis.
[c] Some taxa were not included in the analysis, as per CABIN protocol (Environment Canada 2012).

Table C.4: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference and mine-exposed areas based on family level of taxonomy, September 2014.

Species		Mine-exposed								
		GRAV1-75	GREE1-75	GREE3-25	GREE3-75	GREE4-25	GREE4-75	HARM1-50-1[b]	HARM1-50-2[b]	HARM1-50-3[b]
Insects	Order Ephemeroptera	0	0	0	0	0	0	0	0	0
	Ameletidae	20	0	0	0	0	0	120	20	20
	Baetidae	660	20	10	50	6	0	980	1,400	920
	Ephemerellidae	1,020	0	20	0	0	40	6,180	5,760	5,620
	Heptageniidae	1,560	0	60	25	12	80	1,180	740	1,440
	Leptophlebiidae	0	0	0	0	0	0	0	0	0
	Order Plecoptera	0	0	0	0	0	0	0	0	0
	Capniidae	0	0	180	775	78	700	0	0	0
	Chloroperlidae	60	80	0	0	3	0	560	360	180
	Leuctridae	0	0	0	0	0	0	0	20	20
	Nemouridae	1,860	420	240	950	6	560	1,440	1,700	1,320
	Peltoperlidae	0	20	0	0	1	0	20	0	0
	Perlidae	0	0	0	0	0	0	0	0	0
	Perlodidae	400	20	20	125	7	60	780	380	480
	Pteronarcyidae	0	0	0	0	0	0	0	0	0
	Taeniopterygidae	2,700	0	50	563	14	240	940	680	2,160
	Order Trichoptera	0	0	0	0	0	0	20	0	20
	Apataniidae	0	0	0	0	0	0	0	0	0
	Brachycentridae	2,060	40	0	13	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0	0	0
	Hydropsychidae	100	0	0	113	0	40	200	220	380
	Hydroptilidae	0	0	0	0	0	0	0	0	0
	Lepidostomatidae	0	60	0	0	0	0	0	0	0
	Limnephilidae	0	0	10	0	6	0	0	0	0
	Rhyacophilidae	740	1,580	10	0	8	0	680	1,040	1,600
	Uenoidae	0	0	0	0	0	0	200	800	1,700
	Order Coleoptera	0	0	0	0	1	0	0	0	0
	Dytiscidae	0	0	0	0	0	0	0	0	0
	Elmidae	180	0	0	0	0	0	620	540	400
	Hydrophilidae	0	0	0	0	0	0	0	0	0
	Order Diptera	0	0	10	0	1	0	0	0	0
	Athericidae	0	0	0	0	0	0	0	0	0
	Ceratopogonidae	0	0	0	0	1	0	0	0	0
	Chironomidae	340	1,100	2,300	1,503	455	4,740	3,200	3,220	2,040
	Dixidae	0	0	0	0	0	0	0	0	0
	Empididae	40	260	20	25	5	0	0	80	80
	Muscidae	0	0	10	0	0	220	0	0	0
	Pelecorhynchidae	0	0	0	0	0	0	0	20	0
	Psychodidae	460	1,520	60	75	8	120	700	580	900
	Simuliidae	0	840	140	51	18	0	0	0	20
	Tipulidae	0	200	10	100	7	60	40	20	60
	Order Odonata	0	0	0	0	0	0	0	0	0
	Coenagrionidae	0	0	0	0	0	0	0	0	0
Crustaceans	Order Amphipoda	0	0	0	0	0	0	0	0	0
	Hyalellidae	0	20	0	0	0	0	0	0	0
	Order Isopoda	0	0	0	0	0	0	0	0	0
Arachnids	Order Trombidiformes	180	0	0	0	0	0	0	0	0
	Aturidae	0	0	0	0	0	0	20	0	60
	Feltriidae	0	80	0	0	0	0	20	20	20
	Hydryphantidae	0	0	0	0	0	0	0	0	0
	Hygrobatidae	0	0	0	0	0	0	0	0	0
	Lebertiidae	0	20	0	0	1	20	80	20	40
	Sperchontidae	0	0	0	0	1	0	0	0	20
	Stygothrombiidae	0	0	0	0	0	0	0	0	0
	Torrenticolidae	0	0	0	0	0	0	0	0	0
	Order Oribatei	0	0	0	0	0	0	0	0	0
	Oribatidae	0	0	0	0	0	20	0	0	20
	Order Sarcoptiformes	0	0	0	0	0	0	0	0	0
	Hydrozetidae	0	0	0	0	0	0	0	0	0
Bivalve Molluscs	Pisidiidae	0	0	0	0	0	0	0	0	20
Oligochaete Worms	Class Oligochaeta	0	180	0	50	0	20	0	0	0
	Order Lumbriculida	0	0	0	0	0	0	0	0	0
	Lumbriculidae	0	0	0	0	0	0	0	0	0
	Order Tubificida	0	0	0	0	0	0	0	0	0
	Naididae	0	0	0	0	0	0	0	20	0
Total Abundance		**12,380**	**6,460**	**3,150**	**4,418**	**639**	**6,920**	**17,980**	**17,640**	**19,540**
Total Richness		**16**	**17**	**15**	**14**	**19**	**14**	**19**	**21**	**24**
Taxa present but not included[c]										
Terrestrials		0	0	0	13	1	0	0	0	0
Insects	Order Collembola	0	20	0	0	2	0	0	0	0
Crustaceans	Class Ostracoda	0	20	10	0	10	0	4,000	600	0
	Order Cladocera	0	40	0	0	0	0	0	0	0
	Class Copepoda	0	20	0	0	0	20	0	0	0
Nematodes	Phylum Nemata	0	0	10	0	0	20	100	0	0
Platyhelminthes	Class Turbellaria	80	20	0	13	0	0	0	600	1,060
Total Abundance		**80**	**120**	**20**	**26**	**13**	**40**	**4,100**	**1,200**	**1,060**
Total Richness		**1**	**5**	**2**	**2**	**3**	**2**	**2**	**2**	**1**

[a] One of three replicates from site ELKR-75. Rep-2 was used for data analysis.
[b] One of three replicates from site HARM1-50. Rep-2 was used for data analysis.
[c] Some taxa were not included in the analysis, as per CABIN protocol (Environment Canada 2012).

Table C.4: Benthic invertebrate total abundance for 3-minute travelling kick samples collected at reference and mine-exposed areas based on family level of taxonomy, September 2014.

Species		Mine-exposed								
		HARM1-75	HARM5-25	LIDSL	LILC3	LI8	MICH1-25	NTHO1-25	NTHO1-50	PORT1-0
Insects	Order Ephemeroptera	0	0	0	0	0	0	0	0	0
	Ameletidae	0	120	0	0	0	15	0	0	0
	Baetidae	780	60	180	320	300	250	0	0	40
	Ephemerellidae	2,960	1,200	180	240	240	220	0	0	0
	Heptageniidae	2,200	7,180	960	200	1,060	180	0	20	0
	Leptophlebiidae	0	0	0	0	0	0	0	0	0
	Order Plecoptera	0	0	0	0	0	0	0	0	0
	Capniidae	0	0	0	0	0	15	340	20	60
	Chloroperlidae	60	260	180	200	80	45	0	0	20
	Leuctridae	0	20	0	0	0	0	0	0	0
	Nemouridae	6,740	660	1,460	820	1,220	120	3,700	1,000	2,300
	Peltoperlidae	0	3,220	0	20	0	15	20	0	0
	Perlidae	0	0	0	0	0	35	0	0	0
	Perlodidae	440	340	160	480	240	55	0	0	1,140
	Pteronarcyidae	0	0	0	0	0	0	0	0	0
	Taeniopterygidae	60	2,500	1,220	220	3,160	215	0	20	20
	Order Trichoptera	0	0	0	0	40	0	0	0	0
	Apataniidae	0	0	0	0	0	700	0	40	0
	Brachycentridae	0	0	20	60	0	5	0	0	0
	Glossosomatidae	0	80	0	0	0	145	0	0	20
	Hydropsychidae	300	60	260	380	180	40	20	0	0
	Hydroptilidae	0	0	0	0	0	0	40	0	0
	Lepidostomatidae	0	0	0	40	0	0	0	0	0
	Limnephilidae	3,200	260	700	20	1,040	0	0	20	520
	Rhyacophilidae	880	400	40	120	200	5	0	0	700
	Uenoidae	0	40	0	0	0	0	0	0	0
	Order Coleoptera	0	0	0	0	0	0	0	0	20
	Dytiscidae	0	0	0	0	0	5	0	0	0
	Elmidae	120	40	0	0	0	10	60	0	260
	Hydrophilidae	0	0	0	0	0	0	20	0	0
	Order Diptera	0	0	0	0	0	0	0	0	0
	Athericidae	0	0	0	0	0	0	0	0	0
	Ceratopogonidae	0	0	0	0	0	25	40	80	0
	Chironomidae	6,100	760	2,340	15,120	820	390	2,020	3,100	5,280
	Dixidae	0	0	0	0	0	0	20	0	0
	Empididae	0	40	20	40	20	25	0	20	180
	Muscidae	0	0	0	0	0	0	0	60	0
	Pelecorhynchidae	0	20	0	0	0	0	0	0	20
	Psychodidae	0	40	0	0	140	85	2,080	2,300	500
	Simuliidae	40	40	20	0	0	0	360	740	140
	Tipulidae	160	0	0	40	20	30	20	20	0
	Order Odonata	0	0	0	0	0	0	0	0	0
	Coenagrionidae	0	0	0	0	0	0	0	0	0
Crustaceans	Order Amphipoda	0	0	0	0	0	0	0	0	0
	Hyalellidae	0	0	0	0	0	0	0	0	0
	Order Isopoda	0	0	0	0	0	0	0	0	0
Arachnids	Order Trombidiformes	0	0	0	0	0	0	0	0	0
	Aturidae	480	0	0	0	0	0	0	0	160
	Feltriidae	100	0	0	160	0	0	20	80	20
	Hydryphantidae	0	0	0	0	0	0	0	0	20
	Hygrobatidae	0	0	0	0	0	0	0	0	0
	Lebertiidae	20	20	20	160	120	125	0	0	60
	Sperchontidae	20	0	100	1,040	160	5	60	0	420
	Stygothrombiidae	0	20	0	0	0	0	0	0	0
	Torrenticolidae	20	0	0	0	0	35	0	0	0
	Order Oribatei	0	0	0	0	0	0	0	0	0
	Oribatidae	0	0	0	0	0	0	20	0	0
	Order Sarcoptiformes	0	0	0	0	0	0	0	0	0
	Hydrozetidae	0	0	0	0	0	0	0	0	0
Bivalve Molluscs	Pisidiidae	20	0	0	0	0	0	0	0	0
Oligochaete Worms	Class Oligochaeta	1,400	20	0	0	0	0	20	180	0
	Order Lumbriculida	0	0	0	0	0	0	0	0	0
	Lumbriculidae	0	0	0	0	0	0	0	0	0
	Order Tubificida	0	0	0	0	0	0	0	0	0
	Naididae	0	0	0	0	0	0	0	0	0
Total Abundance		**26,100**	**17,400**	**7,860**	**19,680**	**9,040**	**2,795**	**8,860**	**7,700**	**11,900**
Total Richness		**21**	**24**	**16**	**19**	**16**	**26**	**17**	**15**	**20**
Taxa present but not included[c]										
Terrestrials		0	20	0	0	0	0	0	0	0
Insects	Order Collembola	0	0	0	0	0	0	0	100	0
Crustaceans	Class Ostracoda	0	0	0	20	0	0	0	3,000	1,000
	Order Cladocera	0	0	0	0	0	0	0	0	0
	Class Copepoda	0	0	0	0	0	0	0	20	0
Nematodes	Phylum Nemata	0	0	0	0	0	5	0	0	0
Platyhelminthes	Class Turbellaria	0	0	0	0	0	0	140	100	300
Total Abundance		**0**	**20**	**0**	**20**	**0**	**5**	**140**	**3,220**	**1,300**
Total Richness		**0**	**1**	**0**	**1**	**0**	**1**	**1**	**4**	**2**

[a] One of three replicates from site ELKR-75. Rep-2 was used for data analysis.
[b] One of three replicates from site HARM1-50. Rep-2 was used for data analysis.
[c] Some taxa were not included in the analysis, as per CABIN protocol (Environment Canada 2012).

Table C.5: Benthic invertebrate density (#/m^2) based on kick sampling over three areas of 1 m^2 for reference (n = 40) and mine-exposed (n = 74) stations based lowest practical level, September 2015.

Station	Reference		Mine-exposed												
	CHCK	GRUHA	CACK	FORD7-75	GHCKU	GRDS	GREE1-50	HACKDS	HARM5-25	KICK	KILM1-50	MI2	NTHO1-50	PORT3-25	SWIF2-75
Phylum: Arthropoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Hexapoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Insecta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Ephemeroptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Ameletidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ameletus	0	60	0	20	0	0	0	160	40	0	0	100	0	233	0
| Family: Baetidae	0	0	0	0	0	0	60	0	0	0	0	0	0	0	0
Acentrella sp.	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0
Acentrella turbida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Baetis	60	680	0	20	0	920	300	660	40	0	0	43	20	0	0
Baetis bicaudatus	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0
Baetis tricaudatus group	60	100	0	20	0	220	60	140	60	0	0	0	0	0	0
| Family: Ephemerellidae	1,300	160	0	540	10	480	0	660	340	0	0	71	0	0	0
Caudatella sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Drunella doddsii	840	320	0	120	0	40	0	40	40	0	1	114	0	0	0
Drunella flavilinea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Drunella grandis group	80	0	0	20	0	0	0	20	0	0	0	43	0	0	0
Drunella sp.	140	20	0	0	0	20	0	0	0	0	0	14	0	0	0
Drunella spinifera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ephemerella	20	0	0	0	0	0	0	0	0	0	0	186	0	0	0
| Family: Heptageniidae	4,220	1,120	0	720	40	480	0	1,100	5,020	0	1	914	60	33	0
Cinygmula sp.	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Epeorus	0	40	0	40	0	60	0	0	220	0	0	0	0	0	0
Rhithrogena	40	140	0	0	0	40	0	0	0	0	0	14	0	0	0
| Family: Leptophlebiidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Paraleptophlebia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Plecoptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Capniidae	0	20	25	0	15	40	0	20	0	0	0	71	20	50	1,080
Capnia sp.	0	0	5	0	0	0	0	0	0	0	0	0	0	0	940
Utacapnia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Chloroperlidae	20	0	0	0	0	20	0	0	0	0	0	14	0	0	0
Suwallia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sweltsa sp.	0	140	0	40	5	120	80	60	440	0	0	229	0	83	0
| Family: Leuctridae	0	40	0	0	0	20	0	0	40	0	0	0	0	33	0
Despaxia augusta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Paraleuctra sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Nemouridae	0	20	0	0	0	0	80	0	0	0	0	0	0	0	0
Amphinemura sp.	0	0	0	0	0	0	820	0	0	0	0	0	0	0	20
Visoka cataractae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Zapada	280	200	5	400	115	1,220	140	60	60	8	1	14	1,880	383	160
Zapada cinctipes	0	0	0	120	5	80	140	40	0	0	0	86	2,800	0	0
Zapada columbiana	60	240	0	0	0	300	0	340	500	0	0	0	0	467	300
Zapada oregonensis group	220	100	0	40	5	160	0	440	0	5	0	0	0	0	0
| Family: Peltoperlidae	20	20	0	0	0	0	0	0	260	0	0	0	20	3,100	0
Yoraperla sp.	0	60	0	0	0	0	0	0	3,220	0	0	0	0	1,467	40
| Family: Perlidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Calineuria californica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Claassenia sabulosa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Doroneuria sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hesperoperla sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Perlodidae	2,480	100	0	1,560	65	80	0	80	60	1	0	71	0	933	880
Isoperla sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Megarcys sp.	280	0	0	0	0	0	0	0	120	0	0	0	0	0	0
| Family: Pteronarcyidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pteronarcella sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pteronarcys	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Taeniopterygidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Taenionema	100	1,060	0	20	115	280	0	0	680	0	3	43	120	0	0
| Order: Trichoptera	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
| Family: Apataniidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apatania	0	0	0	0	0	0	0	0	0	0	0	2,557	0	0	0
Pedomoecus sierra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Brachycentridae	0	0	0	0	0	0	60	780	0	0	0	14	0	0	0
Brachycentrus americanus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brachycentrus occidentalis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brachycentrus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Micrasema	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0
| Family: Glossosomatidae	0	0	0	60	0	0	0	20	0	0	0	0	0	33	0
Glossosoma	80	1,020	0	120	0	180	0	0	40	0	0	43	0	0	0
| Family: Hydropsychidae	40	240	0	60	0	120	0	140	180	0	0	14	20	0	0
Arctopsyche sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cheumatopsyche	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydropsyche	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parapsyche sp.	220	0	0	20	0	20	0	0	20	0	0	0	20	0	0
| Family: Hydroptilidae	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0
Hydroptila	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lepidostomatidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lepidostoma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Leptoceridae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Limnephilidae	240	0	275	20	0	40	260	0	100	8	1	0	140	33	140
Clostoeca disjuncta	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dicosmoecus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ecclisomyia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hesperophylax sp.	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0
| Family: Rhyacophilidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rhyacophila	80	460	0	140	0	540	200	500	460	5	2	0	0	67	0
Rhyacophila brunnea/vemna group	160	20	0	240	5	20	20	60	140	0	0	0	0	17	0
Rhyacophila betteni group	0	20	0	0	0	20	0	0	0	0	0	0	0	0	0
Rhyacophila hyalinata group	80	0	0	0	0	20	0	40	0	5	0	0	0	0	0
Rhyacophila vofixa group	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Uenoidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Neothremma sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	183	0
Oligophlebodes	0	120	0	0	0	320	0	0	0	0	0	0	0	0	0
| Order: Coleoptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Curculionidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Dytiscidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Agabus sp.	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0
| Family: Elmidae	0	0	0	160	0	0	0	0	0	0	0	0	0	0	0
Heterlimnius sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Narpus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Optioservus sp.	0	40	0	260	0	360	320	60	20	0	0	0	0	0	0
| Family: Hydrophilidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ametor sp. (Adult)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Staphylinidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Diptera	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0
| Family: Athericidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Atherix	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Blephariceridae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Blepharicera sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Philorus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Ceratopogonidae	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0
Atrichopogon sp.	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Bezzia/ Palpomyia	60	0	0	0	0	0	0	0	0	2	0	0	60	0	0
Forcipomyia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Probezzia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Chironomidae	940	20	110	60	100	140	60	680	40	0	1	143	180	17	140
| Subfamily: Chironominae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Tribe: Chironomini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cryptochironomus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Microtendipes pedellus group	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Paracladopelma sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Paratendipes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phaenopsectra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polypedilum sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stictochironomus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Tribe: Tanytarsini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cladotanytarsus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table C.5: Benthic invertebrate density (#/m^2) based on kick sampling over three areas of 1 m^2 for reference (n = 40) and mine-exposed (n = 74) stations based lowest practical level, September 2015.

Station	Reference		Mine-exposed												
	CHCK	GRUHA	CACK	FORD7-75	GHCKU	GRDS	GREE1-50	HACKDS	HARM5-25	KICK	KILM1-50	MI2	NTHO1-50	PORT3-25	SWIF2-75
Micropsectra	1,300	0	255	0	0	0	180	100	60	12	3	171	1,040	33	40
Rheotanytarsus	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0
Stempellina sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stempellinella sp.	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0
Sublettea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Subfamily: Diamesinae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Tribe: Boreoheptagyiini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Boreoheptagyia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Tribe: Diamesini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diamesa	20	0	5	0	0	0	0	100	0	28	0	0	0	33	0
Pagastia	260	0	10	100	65	0	0	60	60	38	9	14	0	17	0
Potthastia longimana group	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pseudodiamesa sp.	0	0	0	0	0	0	0	0	0	16	1	0	0	0	620
| Subfamily: Orthocladiinae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brillia sp.	20	40	0	0	0	0	0	0	0	0	0	0	0	0	0
Corynoneura	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cricotopus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cricotopus (Nostococladius)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eukiefferiella	0	0	70	0	30	60	0	0	40	0	0	0	60	0	1,300
Heleniella sp.	0	0	0	0	0	0	0	0	0	0	0	0	60	0	0
Heterotrissocladius sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Heterotrissocladius marcidus group.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydrobaenus	160	0	40	0	0	160	0	40	0	0	0	14	0	17	580
Krenosmittia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Limnophyes sp.	0	0	0	0	0	0	0	0	0	0	0	0	20	0	120
Orthocladius	460	0	925	1,100	1,205	520	0	3,240	0	21	44	57	180	67	180
Orthocladius lignicola	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parametriocnemus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parorthocladius sp.	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0
Psectrocladius	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pseudosmittia sp.	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0
Rheocricotopus	180	20	0	0	0	20	0	220	0	0	0	129	0	17	0
Synorthocladius	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thienemanniella	0	0	30	40	0	0	40	20	0	1	0	14	20	0	0
Tvetenia	0	0	0	0	0	0	0	80	0	0	0	0	0	0	0
Tvetenia bavarica group	60	20	0	0	50	0	0	0	80	0	0	0	260	0	0
| Subfamily: Prodiamesinae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Odontomesa sp.	0	0	0	0	0	0	0	0	0	0	0	0	80	0	0
| Subfamily: Tanypodinae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Tribe: Pentaneurini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pentaneura sp.	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0
Thienemannimyia group	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0
| Tribe: Procladiini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Procladius	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0
| Family: Dixidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dixa sp.	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0
| Family: Empididae	80	0	0	40	35	20	20	0	20	0	1	0	40	0	0
Chelifera/ Metachela	60	0	0	220	10	40	0	0	60	0	0	14	40	0	0
Clinocera sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hemerodromia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oreogeton sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wiedemannia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Muscidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Limnophora sp.	0	0	25	0	0	0	0	0	0	18	5	0	0	0	20
| Family: Pelecorhynchidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glutops sp.	0	0	0	0	0	0	100	0	40	0	0	0	0	33	0
| Family: Psychodidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pericoma/Telmatoscopus sp.	2,420	40	0	260	20	1,540	3,460	0	0	0	0	57	1,420	67	1,420
Psychoda sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Simuliidae	60	0	0	0	0	0	20	0	0	0	0	14	0	33	0
Simulium	0	0	0	0	10	0	60	20	40	0	0	0	340	0	0
| Family: Stratiomyidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Euparyphus sp.	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Tabanidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tabanus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Tipulidae	0	20	0	0	0	20	0	0	0	3	0	14	40	0	20
Antocha sp.	0	0	0	0	5	0	0	320	0	0	0	0	0	0	0
Dicranota	0	20	0	0	5	0	40	0	0	0	0	0	20	0	200
Hesperoconopa sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hexatoma sp.	0	0	0	0	0	0	0	0	0	0	0	57	0	0	0
Limnophila sp.	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0
Tipula	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Hemiptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Corixidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sigara	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Lepidoptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Megaloptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Sialidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sialis sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Odonata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Aeshnidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aeshna sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Crustacea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Malacostraca	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Amphipoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Gammaridae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gammarus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hyalellidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hyalella	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Chelicerata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Arachnida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Trombidiformes	20	0	0	0	0	0	0	0	0	0	0	0	20	50	0
| Family: Aturidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aturus	0	0	0	0	0	40	0	180	20	0	0	0	0	0	0
| Family: Feltriidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Feltria sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hydryphantidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Protzia sp.	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hygrobatidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Atractides	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hygrobates	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lebertiidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lebertia	60	0	5	160	5	20	20	0	0	25	4	114	0	17	0
| Family: Mideopsidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mideopsis sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Sperchontidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sperchon	40	20	0	20	0	0	0	20	0	5	15	0	0	0	0
Sperchonopsis sp.	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0
| Family: Stygothrombiidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stygothrombium sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Torrenticolidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Testudacarus sp.	0	0	0	0	0	40	0	20	0	0	0	200	0	0	0
Torrenticola	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Oribatei	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Oribatidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oribatida	0	0	0	0	15	0	0	0	0	0	1	0	80	17	0
Phylum: Mollusca	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Bivalvia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Veneroida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Pisidiidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pisidium	0	0	0	0	0	0	180	0	0	0	0	0	0	0	0
| Class: Gastropoda	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0
| Order: Basommatophora	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lymnaeidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fossaria sp.	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0
| Family: Physidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Physa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table C.5: Benthic invertebrate density (#/m^2) based on kick sampling over three areas of 1 m^2 for reference (n = 40) and mine-exposed (n = 74) stations based lowest practical level, September 2015.

Station	Reference		Mine-exposed												
	CHCK	GRUHA	CACK	FORD7-75	GHCKU	GRDS	GREE1-50	HACKDS	HARM5-25	KICK	KILM1-50	MI2	NTHO1-50	PORT3-25	SWIF2-75
Phylum: Annelida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Clitellata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Oligochaeta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Lumbriculida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lumbriculidae	0	20	0	0	0	20	0	0	0	0	0	0	0	0	0
Rhynchelmis sp.	0	20	0	0	0	0	0	0	80	0	0	0	0	17	0
| Order: Tubificida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Enchytraeidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Enchytraeus	60	0	0	0	5	20	280	1,220	0	6	2	0	400	0	0
Fridericia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lumbricidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Naididae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nais	0	0	150	0	0	0	20	0	0	0	0	0	0	0	0
| Subfamily: Tubificinae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Density (#/m^2)	**17,440**	**6,860**	**1,945**	**6,800**	**1,940**	**9,020**	**7,100**	**11,760**	**12,680**	**208**	**95**	**5,695**	**9,680**	**7,567**	**8,200**

Table C.6: Benthic invertebrate density (#/m^2) for kick sampling over three areas of 1 m^2 collected at reference (n = 40) and mine-exposed (n = 74) areas based family level of taxonomy, September 2015.

Station	Reference		Mine-exposed												
	CHCK	GRUHA	CACK	FORD7-75	GHCKU	GRDS	GREE1-50	HACKDS	HARM5-25	KICK	KILM1-50	MI2	NTHO1-50	PORT3-25	SWIF2-75
Phylum: Arthropoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Hexapoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Insecta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Ephemeroptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Ameletidae	0	60	0	20	0	0	0	160	40	0	0	100	0	233	0
| Family: Baetidae	120	780	0	40	0	1,240	420	800	100	0	0	57	20	0	0
| Family: Ephemerellidae	2,380	500	0	680	10	540	0	720	380	0	1	428	0	0	0
| Family: Heptageniidae	4,300	1,300	0	760	40	580	0	1,100	5,240	0	1	928	60	33	0
| Family: Leptophlebiidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Plecoptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Capniidae	0	20	30	0	15	40	0	20	0	0	0	71	20	50	2,020
| Family: Chloroperlidae	20	140	0	40	5	140	80	60	440	0	0	243	0	83	0
| Family: Leuctridae	0	40	0	0	0	20	0	0	40	0	0	0	0	33	0
| Family: Nemouridae	560	560	5	560	125	1,760	1,180	880	560	13	1	100	4,680	850	480
| Family: Peltoperlidae	20	80	0	0	0	0	0	0	3,480	0	0	0	20	4,567	40
| Family: Perlidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Perlodidae	2,760	100	0	1,560	65	80	0	80	180	1	0	71	0	933	880
| Family: Pteronarcyidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Taeniopterygidae	100	1,060	0	20	115	280	0	0	680	0	3	43	120	0	0
| Order: Trichoptera	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
| Family: Apataniidae	0	0	0	0	0	0	0	0	0	0	0	2,557	0	0	0
| Family: Brachycentridae	0	0	0	20	0	0	60	780	0	0	0	14	0	0	0
| Family: Glossosomatidae	80	1,020	0	180	0	180	0	20	40	0	0	43	0	33	0
| Family: Hydropsychidae	260	240	0	80	0	140	0	140	200	0	0	14	40	0	0
| Family: Hydroptilidae	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0
| Family: Lepidostomatidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Leptoceridae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Limnephilidae	260	0	275	40	0	40	260	0	100	8	1	0	140	33	140
| Family: Rhyacophilidae	320	540	0	380	5	600	220	600	600	10	2	0	0	84	0
| Family: Uenoidae	0	120	0	0	0	320	0	0	0	0	0	0	0	183	0
| Order: Coleoptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Curculionidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Dytiscidae	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0
| Family: Elmidae	0	40	0	420	0	360	320	60	20	0	0	0	0	0	0
| Family: Hydrophilidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Staphylinidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Diptera	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0
| Family: Athericidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Blephariceridae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Ceratopogonidae	60	0	0	0	0	0	0	0	0	2	0	0	180	0	0
| Family: Chironomidae	3,400	100	1,450	1,300	1,450	940	360	4,560	300	116	58	542	1,900	201	2,980
| Family: Dixidae	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0
| Family: Empididae	140	0	0	260	45	60	20	0	80	0	1	14	80	0	0
| Family: Muscidae	0	0	25	0	0	0	0	0	0	18	5	0	0	0	20
| Family: Pelecorhynchidae	0	0	0	0	0	0	100	0	40	0	0	0	0	33	0
| Family: Psychodidae	2,420	40	0	260	20	1,540	3,460	0	0	0	0	57	1,420	67	1,420
| Family: Simuliidae	60	0	0	0	10	0	80	20	40	0	0	14	340	33	0
| Family: Stratiomyidae	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Tabanidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Tipulidae	0	40	0	0	10	20	40	320	0	3	0	85	60	0	220
| Order: Hemiptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Corixidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Lepidoptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Megaloptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Sialidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Odonata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Aeshnidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Crustacea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Malacostraca	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Amphipoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Gammaridae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hyalellidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Chelicerata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Arachnida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Trombidiformes	20	0	0	0	0	0	0	0	0	0	0	0	20	50	0
| Family: Aturidae	0	0	0	0	0	40	0	180	20	0	0	0	0	0	0
| Family: Feltriidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hydryphantidae	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Hygrobatidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lebertiidae	60	0	5	160	5	20	20	0	0	25	4	114	0	17	0
| Family: Mideopsidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Sperchontidae	40	20	0	20	0	0	0	20	20	5	15	0	0	0	0
| Family: Stygothrombiidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Torrenticolidae	0	0	0	0	0	40	0	20	0	0	0	200	0	0	0
| Order: Oribatei	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Oribatidae	0	0	0	0	15	0	0	0	0	0	1	0	80	17	0
Phylum: Mollusca	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Bivalvia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Veneroida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Pisidiidae	0	0	0	0	0	0	180	0	0	0	0	0	0	0	0
| Class: Gastropoda	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0
| Order: Basommatophora	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lymnaeidae	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0
| Family: Physidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phylum: Annelida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subphylum: Clitellata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Class: Oligochaeta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Order: Lumbriculida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Lumbriculidae	0	40	0	0	0	20	0	0	80	0	0	0	0	17	0
| Order: Tubificida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Enchytraeidae	60	0	0	0	5	20	280	1,220	0	6	2	0	400	0	0
| Family: Lumbricidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
| Family: Naididae	0	0	150	0	0	0	20	0	0	0	0	0	0	0	0
| Family: Tubificidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Individuals	**17,440**	**6,860**	**1,945**	**6,800**	**1,940**	**9,020**	**7,100**	**11,760**	**12,680**	**208**	**95**	**5,695**	**9,680**	**7,567**	**8,200**

Table C.7: Values of individual benthic invertebrate endpoints considered in evaluation of calcite effects (3-minute kick samples collected in 2015).

		HBI (Family)	HBI (LPL)	Simpson's Diversity (Family)	Evenness (Family)	Simpson's Diversity (LPL)	Evenness (LPL)	Abundance	Total Family Richness	Total LPL Richness	EPT		EPT Richness	
											Total	%	Family Richness	LPL Richness
Reference	AGCK	2.70	3.18	0.55	0.16	0.73	0.17	7,180	14	22	6,980	97.21	11	15
	AL4	3.38	3.56	0.85	0.36	0.84	0.22	10,960	19	28	8,980	81.93	10	14
	ALUSM	3.39	2.60	0.83	0.29	0.84	0.19	8,900	21	34	6,100	68.54	12	16
	BU2	2.52	2.46	0.76	0.18	0.86	0.27	1,515	23	28	1,395	92.08	14	17
	BU40	3.58	3.80	0.90	0.45	0.93	0.43	3,440	22	34	2,080	60.47	14	19
	BUUQ	2.84	3.11	0.84	0.30	0.88	0.28	3,070	20	29	2,540	82.74	16	17
	CADCK	3.10	3.17	0.75	0.21	0.87	0.26	11,200	19	28	9,660	86.25	13	17
	CHCK	3.48	3.48	0.81	0.25	0.93	0.43	13,360	21	32	9,280	69.46	15	20
	CRUKO	2.63	2.61	0.78	0.28	0.69	0.13	541	16	23	527	97.41	12	18
	DACK	3.26	3.54	0.86	0.34	0.87	0.21	9,840	21	34	8,120	82.52	15	19
	DUCK	3.85	4.07	0.76	0.18	0.90	0.26	5,951	24	37	2,666	44.80	14	19
	EL12	3.36	3.68	0.82	0.25	0.87	0.24	8,740	22	32	7,420	84.90	15	20
	ELUGH	2.87	2.98	0.80	0.32	0.84	0.27	4,044	16	22	3,711	91.77	13	15
	EWCK	2.54	2.79	0.82	0.35	0.92	0.39	6,060	16	31	5,300	87.46	12	18
	FLAD	4.34	4.79	0.72	0.15	0.88	0.23	12,740	24	39	4,500	35.32	13	17
	FLAU	3.46	3.78	0.84	0.30	0.90	0.34	6,520	21	31	4,100	62.88	12	14
	FLRU	3.59	4.30	0.79	0.25	0.88	0.28	5,506	24	33	3,471	63.04	14	18
	FO26	2.97	3.52	0.83	0.25	0.89	0.26	9,400	19	29	8,040	85.53	13	15
	GRUHA	2.77	3.05	0.84	0.27	0.84	0.19	4,891	23	32	4,673	95.54	16	20
	HENUP	2.67	3.06	0.58	0.17	0.61	0.12	7,500	14	20	7,200	96.00	12	14
	KO1	2.83	3.27	0.64	0.16	0.75	0.19	846	18	23	697	82.39	10	10
	KODCR	2.96	3.03	0.84	0.33	0.86	0.25	466	19	28	394	84.55	12	16
	KOUCR	2.96	2.91	0.88	0.45	0.89	0.30	489	19	29	398	81.39	13	18
	KOUVE	5.88	6.16	0.81	0.23	0.77	0.16	2,276	22	30	863	37.92	12	14
	LC_GRCK	2.66	2.66	0.87	0.40	0.88	0.34	6,760	19	26	6,260	92.60	14	17
	LI24	2.48	2.83	0.67	0.17	0.90	0.46	3,008	18	21	2,791	92.79	13	14
	MCCR	3.04	3.10	0.72	0.20	0.67	0.13	11,620	18	24	11,040	95.01	13	18
	MI25	2.52	2.88	0.87	0.37	0.88	0.27	7,140	20	31	5,980	83.75	15	17
	OLDDU	3.16	3.54	0.87	0.35	0.91	0.34	1,977	22	35	1,345	68.03	14	16
	OLDLI	2.49	2.45	0.74	0.20	0.87	0.27	6,086	19	28	5,729	94.13	13	17
	OLDLOW	3.21	3.34	0.83	0.29	0.90	0.35	3,523	20	30	2,934	83.28	13	17
	PADAL	2.41	2.63	0.86	0.34	0.88	0.25	557	21	33	518	93.00	15	21
	PAUKO	2.87	3.02	0.86	0.37	0.83	0.18	471	19	31	410	87.05	12	17
	RACK	2.98	3.07	0.82	0.21	0.94	0.42	3,210	26	40	2,500	77.88	16	20
	SLINE	2.55	2.57	0.78	0.26	0.93	0.50	6,505	17	27	6,137	94.34	14	21
	VEUKO	2.56	3.04	0.71	0.16	0.79	0.18	705	22	30	595	84.40	9	13
	VEUP	3.65	4.02	0.86	0.42	0.87	0.29	756	17	25	487	64.42	12	17
	VICK	3.32	3.84	0.87	0.41	0.89	0.27	8,520	18	32	5,860	68.78	12	16
	WWRL	2.78	3.00	0.84	0.36	0.82	0.25	4,856	17	23	3,785	77.94	11	12
	WWRU	2.21	1.82	0.77	0.25	0.73	0.16	777	17	23	728	93.69	11	14
Mine-exposed	BOCK	5.95	6.51	0.70	0.24	0.74	0.18	8,140	14	26	620	7.62	5	5
	CACK	5.19	5.95	0.40	0.17	0.82	0.36	4,030	10	18	464	11.51	2	2
	CATA2-25	5.57	6.22	0.38	0.20	0.70	0.28	1,990	8	13	101	5.08	3	3
	CATA2-75	7.50	7.94	0.55	0.32	0.62	0.22	3,540	7	14	140	3.95	3	3
	COCK	6.23	4.38	0.65	0.13	0.60	0.08	29,180	22	34	4,960	17.00	9	11
	EL1	2.90	3.08	0.79	0.22	0.83	0.19	7,720	22	32	5,420	70.21	15	20
	EL19	3.69	4.15	0.81	0.23	0.84	0.19	3,240	23	32	1,940	59.88	13	15
	EL20	2.60	2.71	0.84	0.33	0.87	0.29	6,218	19	29	5,718	91.96	14	19
	ELDEL	2.88	3.18	0.77	0.21	0.91	0.41	7,740	21	28	6,700	86.56	15	17
	ELDFE	2.50	2.62	0.62	0.12	0.82	0.17	17,160	21	33	12,540	73.08	12	15
	ELDGR	2.74	2.90	0.78	0.19	0.90	0.33	1,288	24	30	1,144	88.82	15	17
	ELELKO	2.98	2.36	0.72	0.23	0.80	0.23	7,880	16	22	7,240	91.88	13	15
	ELH93	5.12	5.66	0.64	0.20	0.74	0.18	2,858	14	23	630	22.04	11	11
	ELUEL	3.18	3.30	0.86	0.33	0.92	0.45	5,135	21	27	4,235	82.47	15	17
	ELUFE	3.04	3.22	0.72	0.18	0.80	0.17	11,000	20	32	6,660	60.55	11	15
	ELUFO	3.95	4.30	0.73	0.16	0.84	0.20	8,980	23	34	3,580	39.87	12	13
	ELUSP	3.36	3.78	0.85	0.33	0.88	0.33	6,460	20	25	4,420	68.42	12	13
	FO10-SP1	2.79	2.83	0.69	0.17	0.85	0.23	13,800	19	29	10,340	74.93	11	14
	FO22	2.88	2.90	0.81	0.24	0.91	0.34	21,140	22	30	13,840	65.47	12	14
	FO23	3.26	3.33	0.89	0.38	0.92	0.32	3,780	25	39	2,470	65.34	14	17
	FO29	3.82	4.01	0.85	0.27	0.94	0.40	8,580	25	37	4,840	56.41	15	19
	FO9	3.83	3.29	0.84	0.33	0.86	0.29	6,720	19	24	4,840	72.02	14	16
	FOBCP	2.94	2.91	0.84	0.29	0.91	0.44	4,260	21	27	3,305	77.58	11	13
	FOBKS	4.53	3.92	0.83	0.31	0.81	0.19	4,161	19	25	2,869	68.95	13	16
	FOBSC	4.57	3.98	0.87	0.34	0.85	0.25	2,923	22	26	1,825	62.44	14	16
	FODGH	2.96	2.98	0.89	0.38	0.89	0.29	10,980	23	28	8,600	78.32	12	14
	FODHE	3.01	3.53	0.79	0.25	0.85	0.25	17,060	19	27	13,240	77.61	13	15
	FODNGD	3.13	3.71	0.68	0.19	0.87	0.29	7,840	16	23	7,360	93.88	11	14
	FODPO	2.21	2.26	0.82	0.30	0.74	0.17	10,340	18	22	9,260	89.56	10	10
	FORD7	2.99	3.16	0.86	0.32	0.88	0.28	6,053	22	29	4,183	69.11	12	16
	FOUEW	2.92	3.11	0.84	0.33	0.86	0.28	7,720	19	25	5,480	70.98	12	14
	FOUKI	4.10	4.07	0.77	0.20	0.86	0.24	3,490	21	30	2,620	75.07	13	18
	FOUL	2.86	2.79	0.87	0.40	0.84	0.23	3,006	19	25	2,490	82.83	11	12
	FOUNGD	2.98	3.55	0.68	0.21	0.90	0.42	7,260	15	23	6,740	92.84	11	15
	FOUSH	3.80	4.32	0.75	0.19	0.84	0.22	7,320	21	28	6,300	86.07	12	13
	GHCKD	5.47	5.97	0.84	0.22	0.91	0.31	10,560	28	40	2,240	21.21	12	13
	GHCKU	4.33	4.61	0.55	0.15	0.68	0.13	774	15	24	194	25.06	8	9
	GRCK	2.79	2.68	0.89	0.43	0.93	0.40	7,740	22	33	6,760	87.34	14	20
	GRDS	3.56	3.20	0.89	0.42	0.90	0.34	8,400	22	30	6,360	75.71	16	20
	GREE1-50	5.58	4.05	0.76	0.20	0.75	0.16	6,320	21	26	2,302	36.42	9	9
	GREE3-75	4.16	4.64	0.57	0.13	0.70	0.13	804	18	28	249	30.97	12	12
	GREE4-25	4.19	4.48	0.61	0.18	0.73	0.17	2,322	14	23	764	32.90	7	7
	GREE4-75	4.23	4.31	0.74	0.19	0.85	0.25	302	20	28	80	26.49	9	9
	HACKDS	4.11	4.56	0.80	0.27	0.91	0.34	10,160	18	32	5,120	50.39	11	17
	HACKUS	2.82	2.90	0.89	0.41	0.89	0.24	15,540	23	35	13,140	84.56	15	19
	HARM1-50	3.99	4.39	0.79	0.26	0.90	0.31	14,020	18	31	8,660	61.77	10	14
	HARM5-25	1.91	2.32	0.75	0.18	0.78	0.16	13,280	22	26	12,840	96.69	15	15
	HENFO	2.63	3.13	0.71	0.19	0.89	0.29	13,820	18	29	11,580	83.79	13	18
	KICK	4.73	4.73	0.52	0.12	0.89	0.47	497	17	22	79	15.90	8	9
	KILM1-50	4.93	5.35	0.44	0.18	0.83	0.30	167	10	19	13	7.78	4	4
	LC_DC1	2.59	2.81	0.81	0.30	0.89	0.39	7,140	18	25	6,520	91.32	11	14
	LC_DCDS	2.37	2.64	0.79	0.25	0.85	0.22	7,640	19	27	6,980	91.36	14	17
	LC_FRUS	3.52	3.85	0.82	0.26	0.91	0.34	2,065	22	30	1,322	64.02	11	14
	LI8	2.59	2.75	0.86	0.35	0.85	0.22	3,390	21	29	2,940	86.73	13	17
	LIDSL	3.38	3.64	0.85	0.30	0.93	0.49	6,980	22	30	5,200	74.50	14	17
	LILC3	4.40	4.53	0.59	0.14	0.85	0.24	19,360	18	26	6,420	33.16	11	12
	MI2	3.08	3.26	0.89	0.39	0.93	0.40	6,119	23	33	4,486	73.31	15	18
	MI3	3.07	2.93	0.87	0.37	0.86	0.27	7,660	21	26	6,160	80.42	14	16
	MI5	2.83	2.85	0.80	0.27	0.74	0.18	7,120	19	22	6,160	86.52	13	14
	MIDAG	3.69	2.94	0.84	0.33	0.82	0.16	14,520	19	31	10,480	72.18	11	16
	MIDCO	4.03	3.17	0.85	0.31	0.87	0.24	12,360	21	32	6,360	51.46	14	17
	MIUCO	3.24	2.70	0.82	0.31	0.87	0.23	7,820	18	31	5,660	72.38	12	17
	MP1	3.55	3.99	0.79	0.21	0.90	0.31	5,470	23	32	3,818	69.80	14	17
	NGD1u	3.90	4.14	0.79	0.31	0.88	0.29	9,760	15	27	5,820	59.63	7	10
	NTHO1-25	4.82	3.90	0.75	0.31	0.83	0.29	16,100	13	20	5,200	32.30	6	6
	NTHO1-50	4.80	3.69	0.72	0.20	0.73	0.18	11,340	18	28	4,840	42.68	7	8
	OCNM	4.94	5.71	0.89	0.31	0.86	0.26	1,373	29	40	465	33.87	9	10
	POCK	4.57	5.39	0.45	0.08	0.78	0.16	22,160	23	30	4,160	18.77	9	11
	PORT3-25	1.25	1.25	0.68	0.22	0.79	0.24	4,657	14	20	4,257	91.41	7	7
	PORT3-50	2.33	2.40	0.72	0.24	0.79	0.20	2,608	15	22	1,959	75.12	8	8
	SWCK	4.27	4.73	0.59	0.16	0.83	0.27	6,214	15	24	1,771	28.50	5	6
	SWIF2-75	4.62	3.81	0.74	0.25	0.84	0.28	10,220	15	24	3,320	32.49	8	8
	THCK	5.16	5.40	0.74	0.21	0.71	0.14	2,412	18	25	415	17.21	7	9
	WOCK	4.25	4.12	0.81	0.26	0.90	0.38	1,244	20	30	476	38.26	10	10

Table C.7: Values of individual benthic invertebrate endpoints considered in evaluation of calcite effects (3-minute kick samples collected in 2015).

		Ephemeroptera				Baetidae		Baetis		Baetis Tricaudatus group		Ephemerellidae		*Drunella Doddsii* sp.		Heptageniidae		*Epeorus* sp.	
		Total	%	Family Richness	LPL Richness	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%
Reference	AGCK	4,900	68.25	4	6	60	0.84	40	0.01	0	0	80	1.11	40	0.56	4,580	63.79	20	0.28
	AL4	6,200	56.57	3	6	2,840	25.91	2,620	0.24	40	0.36	1,800	16.42	280	2.55	1,560	14.23	260	2.37
	ALUSM	3,620	40.67	3	6	260	2.92	220	0.02	40	0.45	2,660	29.89	160	1.80	700	7.87	60	0.67
	BU2	815	53.80	4	7	55	3.63	15	0.01	20	1.32	85	5.61	55	3.63	670	44.22	15	0.99
	BU40	1,190	34.59	4	7	250	7.27	160	0.05	0	0	400	11.63	30	0.87	530	15.41	0	0
	BUUQ	1,230	40.07	4	4	220	7.17	170	0.06	50	1.63	280	9.12	200	6.51	710	23.13	0	0
	CADCK	6,540	58.39	3	6	1,100	9.82	1,040	0.09	20	0.18	480	4.29	320	2.86	4,960	44.29	300	2.68
	CHCK	5,600	41.92	4	6	280	2.10	200	0.01	0	0	820	6.14	260	1.95	4,440	33.23	100	0.75
	CRUKO	261	48.24	4	9	57	10.54	54	0.10	1	0.18	43	7.95	4	0.74	157	29.02	28	5.18
	DACK	5,180	52.64	4	6	2,820	28.66	2,340	0.24	420	4.27	1,280	13.01	360	3.66	1,000	10.16	60	0.61
	DUCK	1,384	23.26	4	6	550	9.24	533	0.09	17	0.29	667	11.21	17	0.29	150	2.52	0	0
	EL12	5,220	59.73	5	9	1,620	18.54	1,480	0.17	100	1.14	560	6.41	160	1.83	2,980	34.10	0	0
	ELUGH	2,211	54.67	3	5	389	9.62	300	0.07	89	2.20	334	8.26	167	4.13	1,488	36.80	44	1.09
	EWCK	3,700	61.06	3	7	460	7.59	300	0.05	100	1.65	1,380	22.77	660	10.89	1,860	30.69	180	2.97
	FLAD	2,740	21.51	3	6	380	2.98	300	0.02	0	0	1,160	9.11	240	1.88	1,200	9.42	0	0
	FLAU	2,400	36.81	5	6	140	2.15	80	0.01	0	0	960	14.72	140	2.15	1,180	18.10	0	0
	FLRU	2,835	51.49	5	7	934	16.96	917	0.17	17	0.31	850	15.44	50	0.91	917	16.65	0	0
	FO26	6,340	67.45	4	5	1,280	13.62	1,280	0.14	0	0	1,320	14.04	360	3.83	3,660	38.94	40	0.43
	GRUHA	2,216	45.31	4	5	951	19.44	813	0.17	138	2.82	176	3.60	100	2.04	1,076	22.00	113	2.31
	HENUP	5,080	67.73	4	5	80	1.07	80	0.01	0	0	460	6.13	60	0.80	4,500	60.00	200	2.67
	KO1	625	73.88	4	4	8	0.95	3	0.00	5	0.59	16	1.89	0	0.00	476	56.26	0	0
	KODCR	314	67.38	4	8	101	21.67	94	0.20	6	1.29	23	4.94	3	0.64	112	24.03	5	1.07
	KOUCR	247	50.51	4	7	76	15.54	69	0.14	3	0.61	37	7.57	7	1.43	88	18.00	3	0.61
	KOUVE	687	30.18	4	6	137	6.02	131	0.06	6	0.26	68	2.99	31	1.36	338	14.85	0	0
	LC_GRCK	1,340	19.82	3	4	280	4.14	240	0.04	40	0.59	120	1.78	0	0.00	940	13.91	260	3.85
	LI24	1,901	63.20	3	4	0	0	0	0.00	0	0	73	2.43	9	0.30	1,664	55.32	0	0
	MCCR	2,820	24.27	3	7	1,460	12.56	1,160	0.10	280	2.41	680	5.85	300	2.58	680	5.85	80	0.69
	MI25	3,360	47.06	4	6	520	7.28	520	0.07	0	0	1,660	23.25	420	5.88	1,100	15.41	20	0.28
	OLDDU	719	36.37	4	6	206	10.42	156	0.08	50	2.53	157	7.94	44	2.23	306	15.48	0	0
	OLDLI	3,957	65.02	3	5	386	6.34	143	0.02	243	3.99	672	11.04	543	8.92	2,899	47.63	14	0.23
	OLDLOW	1,390	39.46	5	8	282	8.00	155	0.04	45	1.28	781	22.17	27	0.77	209	5.93	0	0
	PADAL	288	51.71	5	8	70	12.57	65	0.12	5	0.90	131	23.52	7	1.26	78	14.00	3	0.54
	PAUKO	219	46.50	4	7	69	14.65	64	0.14	5	1.06	59	12.53	8	1.70	86	18.26	0	0
	RACK	1,780	55.45	4	7	160	4.98	120	0.04	20	0.62	370	11.53	20	0.62	1,200	37.38	0	0
	SLINE	3,884	59.71	4	8	83	1.28	0	0.00	33	0.51	767	11.79	67	1.03	2,817	43.31	483	7.43
	VEUKO	504	71.49	4	7	5	0.71	3	0.00	2	0.28	48	6.81	0	0.00	344	48.79	2	0.28
	VEUP	254	33.60	4	7	96	12.70	55	0.07	5	0.66	36	4.76	0	0.00	110	14.55	12	1.59
	VICK	3,380	39.67	4	6	940	11.03	920	0.11	20	0.23	540	6.34	280	3.29	1,820	21.36	60	0.70
	WWRL	1,972	40.61	3	4	443	9.12	386	0.08	57	1.17	671	13.82	343	7.06	858	17.67	29	0.60
	WWRU	356	45.82	4	7	101	13.00	48	0.06	8	1.03	89	11.45	8	1.03	158	20.33	10	1.29
Mine-exposed	BOCK	0	0	0	0	0	0	0	0.00	0	0	0	0	0	0.00	0	0	0	0
	CACK	0	0	0	0	0	0	0	0.00	0	0	0	0	0	0.00	0	0	0	0
	CATA2-25	0	0	0	0	0	0	0	0.00	0	0	0	0	0	0.00	0	0	0	0
	CATA2-75	0	0	0	0	0	0	0	0.00	0	0	0	0	0	0.00	0	0	0	0
	COCK	0	0	0	0	0	0	0	0.00	0	0	0	0	0	0.00	0	0	0	0
	EL1	4,160	53.89	4	9	480	6.22	160	0.02	120	1.55	2,440	31.61	260	3.37	1,220	15.80	20	0.26
	EL19	950	29.32	3	5	380	11.73	310	0.10	40	1.23	130	4.01	70	2.16	440	13.58	0	0
	EL20	3,401	54.70	3	6	533	8.57	283	0.05	167	2.69	984	15.83	850	13.67	1,884	30.30	17	0.27
	ELDEL	4,700	60.72	3	5	440	5.68	380	0.05	60	0.78	880	11.37	540	6.98	3,380	43.67	40	0.52
	ELDFE	11,200	65.27	5	7	320	1.86	100	0.01	20	0.12	10,060	58.62	0	0.00	460	2.68	0	0
	ELDGR	828	64.29	4	6	124	9.63	92	0.07	32	2.48	148	11.49	68	5.28	544	42.24	0	0
	ELELKO	5,260	66.75	5	6	860	10.91	340	0.04	300	3.81	460	5.84	40	0.51	3,880	49.24	0	0
	ELH93	401	14.03	5	5	29	1.01	0	0.00	0	0	122	4.27	0	0.00	200	7.00	0	0
	ELUEL	2,834	55.19	4	6	633	12.33	433	0.08	200	3.89	551	10.73	200	3.89	1,567	30.52	0	0
	ELUFE	5,980	54.36	5	9	240	2.18	120	0.01	20	0.18	5,120	46.55	20	0.18	560	5.09	0	0
	ELUFO	1,520	16.93	5	6	280	3.12	280	0.03	0	0	1,000	11.14	20	0.22	180	2.00	0	0
	ELUSP	2,780	43.03	3	4	700	10.84	400	0.06	300	4.64	400	6.19	120	1.86	1,680	26.01	0	0
	FO10-SP1	860	6.23	3	5	20	0.14	0	0.00	20	0.14	260	1.88	60	0.43	580	4.20	0	0
	FO22	2,800	13.25	3	5	160	0.76	80	0.00	60	0.28	1,580	7.47	700	3.31	1,060	5.01	0	0
	FO23	790	20.90	4	6	270	7.14	210	0.06	50	1.32	250	6.61	40	1.06	240	6.35	0	0
	FO29	3,060	35.66	4	6	1,020	11.89	500	0.06	520	6.06	960	11.19	60	0.70	980	11.42	0	0
	FO9	2,660	39.58	4	5	420	6.25	280	0.04	140	2.08	140	2.08	80	1.19	2,080	30.95	0	0
	FOBCP	689	16.17	3	3	163	3.83	150	0.04	13	0.31	138	3.24	75	1.76	388	9.11	0	0
	FOBKS	1,965	47.22	3	5	801	19.25	363	0.09	438	10.53	126	3.03	13	0.31	1,038	24.95	38	0.91
	FOBSC	1,172	40.10	4	5	391	13.38	164	0.06	227	7.77	127	4.34	27	0.92	609	20.83	27	0.92
	FODGH	3,880	35.34	3	4	600	5.46	440	0.04	160	1.46	1,480	13.48	180	1.64	1,800	16.39	0	0
	FODHE	10,460	61.31	4	6	1,340	7.85	1,000	0.06	300	1.76	3,700	21.69	60	0.35	5,340	31.30	60	0.35
	FODNGD	6,000	76.53	3	5	1,360	17.35	680	0.09	680	8.67	480	6.12	20	0.26	4,160	53.06	80	1.02
	FODPO	820	7.93	2	2	0	0	0	0.00	0	0	140	1.35	20	0.19	680	6.58	0	0
	FORD7	982	16.22	3	5	133	2.20	83	0.01	33	0.55	183	3.02	33	0.55	666	11.00	33	0.55
	FOUEW	2,000	25.91	3	4	40	0.52	40	0.01	0	0	580	7.51	80	1.04	1,380	17.88	40	0.52
	FOUKI	2,270	65.04	4	7	540	15.47	250	0.07	290	8.31	190	5.44	10	0.29	1,480	42.41	10	0.29
	FOUL	909	30.24	3	3	263	8.75	218	0.07	45	1.50	128	4.26	64	2.13	518	17.23	0	0
	FOUNGD	5,420	74.66	4	6	860	11.85	500	0.07	360	4.96	600	8.26	80	1.10	3,900	53.72	60	0.83
	FOUSH	5,340	72.95	4	5	2,200	30.05	1,140	0.16	1,000	13.66	260	3.55	0	0.00	2,780	37.98	80	1.09
	GHCKD	680	6.44	4	4	560	5.30	480	0.05	80	0.76	40	0.38	0	0.00	40	0.38	0	0
	GHCKU	15	1.94	2	2	0	0	0	0.00	0	0	9	1.16	0	0.00	6	0.78	0	0
	GRCK	3,420	44.19	4	6	580	7.49	20	0.00	80	1.03	1,340	17.31	300	3.88	1,480	19.12	300	3.88
	GRDS	2,540	30.24	4	5	1,480	17.62	1,020	0.12	460	5.48	740	8.81	20	0.24	300	3.57	20	0.24
	GREE1-50	351	5.55	2	2	334	5.28	267	0.04	67	1.06	0	0	0	0.00	17	0.27	0	0
	GREE3-75	32	3.98	3	3	3	0.37	3	0.00	0	0	8	1.00	0	0.00	21	2.61	3	0.37
	GREE4-25	12	0.52	2	2	0	0	0	0.00	0	0	6	0.26	0	0.00	6	0.26	0	0
	GREE4-75	8	2.65	4	4	3	0.99	1	0.00	2	0.66	3	0.99	1	0.33	1	0.33	0	0
	HACKDS	2,960	29.13	4	5	1,120	11.02	760	0.07	300	2.95	580	5.71	0	0.00	1,240	12.20	0	0
	HACKUS	5,600	36.04	3	4	1,400	9.01	980	0.06	420	2.70	1,780	11.45	140	0.90	2,420	15.57	20	0.13
	HARM1-50	6,200	44.22	3	4	3,820	27.25	2,220	0.16	1,300	9.27	1,420	10.13	40	0.29	960	6.85	60	0.43
	HARM5-25	6,740	50.75	4	4	240	1.81	140	0.01	100	0.75	920	6.93	0	0.00	5,500	41.42	60	0.45
	HENFO	10,360	74.96	4	7	220	1.59	180	0.01	40	0.29	4,060	29.38	0	0.00	5,780	41.82	140	1.01
	KICK	2	0.40	2	2	0	0	0	0.00	0	0	1	0.20	0	0.00	1	0.20	0	0
	KILM1-50	0	0	0	0	0	0	0	0.00	0	0	0	0	0	0.00	0	0	0	0
	LC_DC1	3,880	54.34	3	4	120	1.68	120	0.02	0	0	1,300	18.21	220	3.08	2,460	34.45	40	0.56
	LC_DCDS	4,560	59.69	4	6	200	2.62	180	0.02	20	0.26	1,720	22.51	320	4.19	2,600	34.03	20	0.26
	LC_FRUS	815	39.47	4	6	134	6.49	87	0.04	33	1.60	114	5.52	7	0.34	560	27.12	0	0
	LI8	890	26.25	3	4	240	7.08	130	0.04	100	2.95	110	3.24	70	2.06	540	15.93	20	0.59
	LIDSL	2,660	38.11	4	5	420	6.02	220	0.03	200	2.87	220	3.15	80	1.15	1,960	28.08	80	1.15
	LILC3	1,640	8.47	3	3	300	1.55	140	0.01	160	0.83	360	1.86	200	1.03	980	5.06	0	0
	MI2	1,834	29.97	4	5	401	6.55	267	0.04	117	1.91	366	5.98	183	2.99	1,000	16.34	0	0
	MI3	2,900	37.86	4	6	620	8.09	360	0.05	260	3.39	600	7.83	140	1.83	1,660	21.67	20	0.26
	MI5	2,140	30.06	4	5	240	3.37	220	0.03	20	0.28	840	11.80	480	6.74	1,040	14.61	0	0
	MIDAG	6,220	42.84	4	8	260	1.79	180	0.01	60	0.41	2,620	18.04	800	5.51	3,320	22.87	80	0.55
	MIDCO	2,760	22.33	3	4	200	1.62	180	0.01	20	0.16	2,160	17.48	640	5.18	400	3.24	20	0.16
	MIUCO	4,160	53.20	4	7	460	5.88	320	0.04	100	1.28	2,720	34.78	740	9.46	960	12.28	0	0
	MP1	2,800	51.19	4	5	483	8.83	233	0.04	233	4.26	250	4.57	0	0.00	2,017	36.87	0	0
	NGD1u	2,760	28.28	2	2	1,700	17.42	1,680	0.17	0	0	0	0	0	0.00	1,060	10.86	0	0
	NTHO1-25	0	0	0	0	0	0	0	0.00	0	0	0	0	0	0.00	0	0	0	0
	NTHO1-50	20	0.18	1	1	0	0	0	0.00	0	0	20	0.18	0	0.00	0	0	0	0
	OCNM	29	2.11	2	2	0	0	0	0.00	0	0	11	0.80	0	0.00	0	0	0	0
	POCK	200	0.90	3	3	120	0.54	120	0.01	0	0	20	0.09	0	0.00	60	0.27	0	0
	PORT3-25	114	2.45	1	1	0	0	0	0.00	0	0	0	0	0	0.00	0	0	0	0
	PORT3-50	25	0.96	2	2	0	0	0	0.00	0	0	8	0.31	8	0.31	0	0	0	0
	SWCK	0	0	0	0	0	0	0	0.00	0	0	0	0	0	0.00	0	0	0	0
	SWIF2-75	40	0.39	2	2	0	0	0	0.00	0	0	20	0.20	20	0.20	20	0.20	0	0
	THCK	26	1.08	1	1	26	1.08	13	0.01	13	0.54	0	0	0	0.00	0	0	0	0
	WOCK	4	0.32	1	1	0	0	0	0.00	0	0	4	0.32	4	0.32	0	0	0	0

Table C.7: Values of individual benthic invertebrate endpoints considered in evaluation of calcite effects (3-minute kick samples collected in 2015).

		Rhithrogena sp.		Plecoptera				Chloroperlidae		*Sweltsa* sp.		Nemouridae		*Zapada* sp.		*Zapada Columbiana* sp.		Taeniopterygidae	
		Total	%	Total	%	Family Richness	LPL Richness	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%
Reference	AGCK	220	3.06	1,760	24.51	4	6	160	2.23	120	1.67	140	1.95	140	1.95	40	0.56	1,440	20.06
	AL4	0	0.00	1,880	17.15	4	5	200	1.82	120	1.09	240	2.19	240	2.19	20	0.18	1,160	10.58
	ALUSM	80	0.90	820	9.21	5	6	140	1.57	140	1.57	320	3.60	320	3.60	0	0.00	200	2.25
	BU2	190	12.54	285	18.81	6	6	75	4.95	30	1.98	20	1.32	15	0.99	0	0.00	150	9.90
	BU40	0	0.00	450	13.08	6	8	130	3.78	110	3.20	170	4.94	120	3.49	40	1.16	40	1.16
	BUUQ	100	3.26	1,100	35.83	7	8	20	0.65	20	0.65	180	5.86	180	5.86	140	4.56	790	25.73
	CADCK	860	7.68	2,860	25.54	5	6	180	1.61	60	0.54	220	1.96	100	0.89	20	0.18	1,640	14.64
	CHCK	0	0.00	3,020	22.60	6	8	80	0.60	80	0.60	860	6.44	460	3.44	140	1.05	180	1.35
	CRUKO	19	3.51	219	40.48	5	5	7	1.29	5	0.92	2	0.37	1	0.18	0	0.00	181	33.46
	DACK	120	1.22	2,100	21.34	7	9	300	3.05	240	2.44	1,000	10.16	1,000	10.16	160	1.63	240	2.44
	DUCK	17	0.29	616	10.35	7	9	50	0.84	50	0.84	216	3.63	216	3.63	17	0.29	33	0.55
	EL12	340	3.89	1,880	21.51	6	6	60	0.69	40	0.46	220	2.52	220	2.52	0	0.00	840	9.61
	ELUGH	111	2.74	1,289	31.87	7	7	155	3.83	133	3.29	78	1.93	78	1.93	0	0.00	767	18.97
	EWCK	60	0.99	940	15.51	5	7	220	3.63	60	0.99	340	5.61	340	5.61	0	0.00	280	4.62
	FLAD	0	0.00	900	7.06	6	6	540	4.24	520	4.08	140	1.10	140	1.10	0	0.00	60	0.47
	FLAU	0	0.00	840	12.88	4	5	160	2.45	0	0.00	480	7.36	140	2.15	0	0.00	40	0.61
	FLRU	17	0.31	318	5.78	5	6	67	1.22	50	0.91	150	2.72	150	2.72	17	0.31	17	0.31
	FO26	60	0.64	1,480	15.74	5	6	320	3.40	280	2.98	320	3.40	320	3.40	40	0.43	120	1.28
	GRUHA	50	1.02	1,867	38.17	7	8	76	1.55	38	0.78	476	9.73	476	9.73	138	2.82	1,188	24.29
	HENUP	200	2.67	2,020	26.93	5	6	40	0.53	40	0.53	160	2.13	160	2.13	60	0.80	1,760	23.47
	KO1	3	0.35	61	7.21	3	3	5	0.59	5	0.59	0	0	0	0	0	0.00	0	0.00
	KODCR	35	7.51	59	12.66	6	6	21	4.51	21	4.51	2	0.43	2	0.43	0	0.00	6	1.29
	KOUCR	18	3.68	118	24.13	7	9	24	4.91	16	3.27	5	1.02	5	1.02	1	0.20	12	2.45
	KOUVE	19	0.83	170	7.47	7	7	44	1.93	44	1.93	38	1.67	38	1.67	0	0.00	0	0.00
	LC_GRCK	40	0.59	2,180	32.25	6	8	120	1.78	40	0.59	1,620	23.96	1,620	23.96	560	8.28	20	0.30
	LI24	155	5.15	754	25.07	6	6	300	9.97	264	8.78	218	7.25	218	7.25	182	6.05	127	4.22
	MCCR	80	0.69	1,980	17.04	6	6	160	1.38	160	1.38	820	7.06	820	7.06	500	4.30	800	6.88
	MI25	0	0.00	2,260	31.65	7	7	300	4.20	240	3.36	380	5.32	380	5.32	0	0.00	1,040	14.57
	OLDDU	0	0.00	237	11.99	6	6	125	6.32	125	6.32	56	2.83	56	2.83	0	0.00	13	0.66
	OLDLI	771	12.67	1,473	24.20	7	8	743	12.21	743	12.21	58	0.95	58	0.95	0	0.00	343	5.64
	OLDLOW	0	0.00	390	11.07	5	6	82	2.33	64	1.82	18	0.51	18	0.51	0	0.00	9	0.26
	PADAL	1	0.18	208	37.34	5	7	17	3.05	12	2.15	42	7.54	42	7.54	9	1.62	46	8.26
	PAUKO	11	2.34	169	35.88	6	7	14	2.97	7	1.49	8	1.70	8	1.70	0	0.00	118	25.05
	RACK	180	5.61	520	16.20	7	8	260	8.10	260	8.10	110	3.43	110	3.43	60	1.87	60	1.87
	SLINE	200	3.07	1,319	20.28	6	8	200	3.07	200	3.07	501	7.70	501	7.70	217	3.34	267	4.10
	VEUKO	3	0.43	91	12.91	5	6	10	1.42	2	0.28	1	0.14	1	0.14	0	0.00	7	0.99
	VEUP	10	1.32	160	21.16	4	5	0	0	0	0.00	41	5.42	41	5.42	7	0.93	57	7.54
	VICK	60	0.70	2,260	26.53	5	7	240	2.82	240	2.82	1,140	13.38	1,140	13.38	80	0.94	360	4.23
	WWRL	0	0.00	356	7.33	4	4	57	1.17	57	1.17	71	1.46	71	1.46	0	0.00	157	3.23
	WWRU	123	15.83	54	6.95	4	4	21	2.70	18	2.32	10	1.29	10	1.29	0	0.00	13	1.67
Mine-exposed	BOCK	0	0.00	480	5.90	2	2	0	0	0	0.00	320	3.93	260	3.19	0	0.00	160	1.97
	CACK	0	0.00	26	0.65	1	1	0	0	0	0.00	0	0	0	0	0	0.00	0	0.00
	CATA2-25	0	0.00	29	1.46	2	2	0	0	0	0.00	0	0	0	0	0	0.00	0	0.00
	CATA2-75	0	0.00	40	1.13	2	2	0	0	0	0.00	0	0	0	0	0	0.00	0	0.00
	COCK	0	0.00	2,600	8.91	5	7	40	0.14	20	0.07	2,420	8.29	680	2.33	40	0.14	20	0.07
	EL1	180	2.33	920	11.92	6	6	140	1.81	140	1.81	40	0.52	40	0.52	0	0.00	140	1.81
	EL19	20	0.62	790	24.38	5	5	30	0.93	30	0.93	30	0.93	30	0.93	0	0.00	60	1.85
	EL20	300	4.82	1,517	24.40	6	7	133	2.14	133	2.14	50	0.80	50	0.80	17	0.27	984	15.83
	ELDEL	140	1.81	1,720	22.22	8	8	380	4.91	380	4.91	140	1.81	140	1.81	0	0.00	620	8.01
	ELDFE	0	0.00	1,080	6.29	5	5	60	0.35	60	0.35	60	0.35	60	0.35	0	0.00	0	0.00
	ELDGR	116	9.01	268	20.81	7	7	116	9.01	116	9.01	12	0.93	12	0.93	0	0.00	40	3.11
	ELELKO	2,200	27.92	1,200	15.23	6	6	340	4.31	340	4.31	60	0.76	40	0.51	0	0.00	120	1.52
	ELH93	0	0.00	107	3.74	4	4	0	0	0	0.00	7	0.24	7	0.24	0	0.00	7	0.24
	ELUEL	100	1.95	1,051	20.47	7	7	133	2.59	133	2.59	34	0.66	34	0.66	0	0.00	317	6.17
	ELUFE	20	0.18	580	5.27	3	3	0	0	0	0.00	20	0.18	20	0.18	0	0.00	0	0.00
	ELUFO	20	0.22	1,820	20.27	4	4	0	0	0	0.00	440	4.90	440	4.90	0	0.00	0	0.00
	ELUSP	120	1.86	1,120	17.34	5	5	220	3.41	220	3.41	0	0	0	0	0	0.00	100	1.55
	FO10-SP1	0	0.00	8,960	64.93	5	6	100	0.72	100	0.72	1,140	8.26	1,140	8.26	120	0.87	680	4.93
	FO22	0	0.00	9,440	44.65	5	5	120	0.57	80	0.38	1,340	6.34	1,340	6.34	0	0.00	520	2.46
	FO23	10	0.26	1,240	32.80	6	7	80	2.12	70	1.85	560	14.81	560	14.81	0	0.00	90	2.38
	FO29	0	0.00	1,420	16.55	6	8	60	0.70	60	0.70	980	11.42	980	11.42	20	0.23	60	0.70
	FO9	180	2.68	1,560	23.21	6	7	120	1.79	120	1.79	400	5.95	400	5.95	0	0.00	580	8.63
	FOBCP	0	0.00	2,376	55.77	5	5	0	0	0	0.00	650	15.26	650	15.26	0	0.00	238	5.59
	FOBKS	25	0.60	714	17.16	6	6	38	0.91	25	0.60	75	1.80	75	1.80	0	0.00	200	4.81
	FOBSC	0	0.00	509	17.41	6	6	9	0.31	9	0.31	91	3.11	91	3.11	0	0.00	91	3.11
	FODGH	60	0.55	3,940	35.88	4	5	60	0.55	60	0.55	2,020	18.40	2,020	18.40	0	0.00	960	8.74
	FODHE	60	0.35	2,700	15.83	6	6	40	0.23	40	0.23	1,720	10.08	1,720	10.08	0	0.00	180	1.06
	FODNGD	40	0.51	940	11.99	6	6	80	1.02	80	1.02	260	3.32	260	3.32	0	0.00	240	3.06
	FODPO	0	0.00	6,820	65.96	5	5	100	0.97	80	0.77	1,260	12.19	1,260	12.19	0	0.00	3,180	30.75
	FORD7	0	0.00	2,318	38.30	5	7	50	0.83	0	0.00	651	10.75	651	10.75	17	0.28	50	0.83
	FOUEW	0	0.00	2,500	32.38	4	5	0	0	0	0.00	640	8.29	640	8.29	0	0.00	40	0.52
	FOUKI	40	1.15	290	8.31	5	7	0	0	0	0.00	120	3.44	120	3.44	30	0.86	10	0.29
	FOUL	91	3.03	1,472	48.97	5	6	272	9.05	227	7.55	218	7.25	209	6.95	0	0.00	782	26.01
	FOUNGD	100	1.38	1,120	15.43	5	5	80	1.10	80	1.10	260	3.58	260	3.58	0	0.00	400	5.51
	FOUSH	0	0.00	820	11.20	5	5	60	0.82	60	0.82	280	3.83	280	3.83	0	0.00	160	2.19
	GHCKD	0	0.00	560	5.30	3	4	280	2.65	280	2.65	260	2.46	120	1.14	0	0.00	0	0.00
	GHCKU	2	0.26	173	22.35	4	5	0	0	0	0.00	73	9.43	73	9.43	11	1.42	67	8.66
	GRCK	0	0.00	1,800	23.26	5	7	180	2.33	140	1.81	780	10.08	780	10.08	140	1.81	360	4.65
	GRDS	80	0.95	2,160	25.71	7	9	180	2.14	180	2.14	1,300	15.48	1,300	15.48	120	1.43	300	3.57
	GREE1-50	0	0.00	1,300	20.57	3	3	50	0.79	50	0.79	1,233	19.51	1,150	18.20	0	0.00	0	0.00
	GREE3-75	0	0.00	188	23.38	5	5	13	1.62	13	1.62	38	4.73	38	4.73	0	0.00	98	12.19
	GREE4-25	0	0.00	746	32.13	4	4	6	0.26	6	0.26	329	14.17	329	14.17	0	0.00	0	0.00
	GREE4-75	0	0.00	71	23.51	4	4	1	0.33	1	0.33	7	2.32	2	0.66	0	0.00	3	0.99
	HACKDS	0	0.00	1,140	11.22	3	6	0	0	0	0.00	980	9.65	960	9.45	280	2.76	20	0.20
	HACKUS	0	0.00	5,780	37.19	6	8	260	1.67	260	1.67	2,460	15.83	2,460	15.83	220	1.42	2,380	15.32
	HARM1-50	0	0.00	1,960	13.98	4	7	80	0.57	60	0.43	1,420	10.13	1,380	9.84	340	2.43	80	0.57
	HARM5-25	0	0.00	4,940	37.20	6	6	380	2.86	380	2.86	700	5.27	700	5.27	280	2.11	440	3.31
	HENFO	20	0.14	1,080	7.81	5	7	40	0.29	40	0.29	340	2.46	340	2.46	80	0.58	600	4.34
	KICK	0	0.00	53	10.66	3	4	0	0	0	0.00	51	10.26	51	10.26	1	0.20	0	0.00
	KILM1-50	0	0.00	4	2.40	2	2	0	0	0	0.00	2	1.20	2	1.20	1	0.60	0	0.00
	LC_DC1	60	0.84	1,720	24.09	4	6	200	2.80	160	2.24	1,080	15.13	1,020	14.29	120	1.68	340	4.76
	LC_DCDS	20	0.26	2,100	27.49	6	7	380	4.97	380	4.97	1,300	17.02	1,300	17.02	120	1.57	280	3.66
	LC_FRUS	0	0.00	373	18.06	5	6	13	0.63	13	0.63	193	9.35	193	9.35	0	0.00	13	0.63
	LI8	0	0.00	950	28.02	5	6	20	0.59	20	0.59	450	13.27	450	13.27	20	0.59	390	11.50
	LIDSL	0	0.00	1,580	22.64	5	6	140	2.01	140	2.01	820	11.75	820	11.75	20	0.29	400	5.73
	LILC3	0	0.00	1,820	9.40	5	6	220	1.14	220	1.14	840	4.34	840	4.34	40	0.21	80	0.41
	MI2	17	0.28	1,851	30.25	5	6	267	4.36	267	4.36	750	12.26	750	12.26	0	0.00	717	11.72
	MI3	220	2.87	700	9.14	6	6	80	1.04	80	1.04	260	3.39	240	3.13	0	0.00	240	3.13
	MI5	60	0.84	480	6.74	6	6	120	1.69	120	1.69	80	1.12	80	1.12	0	0.00	120	1.69
	MIDAG	160	1.10	2,320	15.98	4	4	140	0.96	140	0.96	700	4.82	700	4.82	0	0.00	1,140	7.85
	MIDCO	0	0.00	2,540	20.55	6	7	220	1.78	160	1.29	1,820	14.72	1,820	14.72	0	0.00	300	2.43
	MIUCO	60	0.77	940	12.02	4	4	120	1.53	120	1.53	180	2.30	180	2.30	0	0.00	420	5.37
	MP1	0	0.00	768	14.04	7	8	17	0.31	17	0.31	417	7.62	417	7.62	17	0.31	50	0.91
	NGD1u	0	0.00	2,660	27.25	4	5	140	1.43	140	1.43	2,280	23.36	2,220	22.75	40	0.41	0	0.00
	NTHO1-25	0	0.00	4,920	30.56	2	2	0	0	0	0.00	4,800	29.81	4,800	29.81	0	0.00	0	0.00
	NTHO1-50	0	0.00	4,600	40.56	3	4	0	0	0	0.00	4,540	40.04	4,500	39.68	0	0.00	0	0.00
	OCNM	0	0.00	187	13.62	4	5	4	0.29	4	0.29	172	12.53	165	12.02	54	3.93	4	0.29
	POCK	0	0.00	2,740	12.36	3	5	0	0	0	0.00	2,460	11.10	2,460	11.10	20	0.09	0	0.00
	PORT3-25	0	0.00	4,100	88.04	4	4	0	0	0	0.00	1,029	22.10	1,029	22.10	386	8.29	14	0.30
	PORT3-50	0	0.00	1,859	71.28	5	5	17	0.65	17	0.65	1,150	44.10	1,150	44.10	242	9.28	0	0.00
	SWCK	0	0.00	1,514	24.36	3	4	0	0	0	0.00	1,314	21.15	1,014	16.32	0	0.00	0	0.00
	SWIF2-75	0	0.00	2,960	28.96	5	5	20	0.20	0	0.00	580	5.68	580	5.68	480	4.70	0	0.00
	THCK	0	0.00	194	8.04	2	4	7	0.29	7	0.29	187	7.75	160	6.63	7	0.29	0	0.00
	WOCK	0	0.00	440	35.37	6	6	4	0.32	4	0.32	268	21.54	248	19.94	0	0.00	4	0.32

Table C.7: Values of individual benthic invertebrate endpoints considered in evaluation of calcite effects (3-minute kick samples collected in 2015).

		Taenionema sp.		Trichoptera				Diptera				Chironomidae			*Micropsectra* sp.	
		Total	%	Total	%	Family Richness	LPL Richness	Total	%	Family Richness	LPL Richness	Total	%	LPL Richness	Total	%
Reference	AGCK	1,300	18.11	320	4.456825	3	3	180	2.51	2	6	140	1.95	5	20	0.28
	AL4	1,000	9.12	900	8.211679	3	3	1,880	17.15	6	11	1,160	10.58	6	60	0.55
	ALUSM	160	1.80	1,660	18.65169	4	4	2,580	28.99	5	14	500	5.62	10	100	1.12
	BU2	135	8.91	295	19.47195	4	4	60	3.96	3	5	35	2.31	3	0	0
	BU40	40	1.16	440	12.7907	4	4	950	27.62	3	10	660	19.19	8	10	0.29
	BUUQ	590	19.22	210	6.840391	5	5	500	16.29	3	11	470	15.31	9	30	0.98
	CADCK	1,640	14.64	260	2.321429	5	5	1,480	13.21	4	9	1,240	11.07	6	100	0.89
	CHCK	180	1.35	660	4.94012	5	6	3,860	28.89	4	10	2,740	20.51	7	400	2.99
	CRUKO	181	33.46	47	8.687616	3	4	9	1.66	2	3	2	0.37	2	0	0
	DACK	240	2.44	840	8.536585	4	4	1,480	15.04	4	13	1,100	11.18	8	80	0.81
	DUCK	33	0.55	666	11.1914	3	4	2,869	48.21	5	13	2,618	43.99	7	150	2.52
	EL12	840	9.61	320	3.661327	4	5	1,260	14.42	6	11	880	10.07	6	340	3.89
	ELUGH	767	18.97	211	5.217606	3	3	300	7.42	2	6	122	3.02	5	22	0.54
	EWCK	280	4.62	660	10.89109	4	4	740	12.21	3	12	700	11.55	10	20	0.33
	FLAD	60	0.47	860	6.750392	4	5	7,060	55.42	6	16	6,460	50.71	10	620	4.87
	FLAU	40	0.61	860	13.19018	3	3	2,260	34.66	4	12	1,800	27.61	9	300	4.60
	FLRU	17	0.31	318	5.775518	4	5	1,816	32.98	5	9	1,582	28.73	5	100	1.82
	FO26	120	1.28	220	2.340426	4	4	1,320	14.04	4	12	1,140	12.13	9	220	2.34
	GRUHA	1,188	24.29	590	12.06297	5	7	154	3.15	3	8	116	2.37	6	0	0
	HENUP	1,760	23.47	100	1.333333	3	3	300	4.00	2	6	280	3.73	5	40	0.53
	KO1	0	0.00	11	1.300236	3	3	118	13.95	4	10	104	12.29	7	3	0.35
	KODCR	6	1.29	21	4.506438	2	2	66	14.16	4	9	60	12.88	5	1	0.21
	KOUCR	12	2.45	33	6.748466	2	2	86	17.59	4	9	78	15.95	6	0	0
	KOUVE	0	0.00	6	0.26362	1	1	538	23.64	4	10	413	18.15	6	25	1.10
	LC_GRCK	20	0.30	2,740	40.53254	5	5	480	7.10	4	8	420	6.21	5	0	0
	LI24	127	4.22	136	4.521277	4	4	172	5.72	2	4	118	3.92	3	0	0
	MCCR	800	6.88	6,240	53.70052	4	5	500	4.30	3	4	320	2.75	2	0	0
	MI25	1,040	14.57	360	5.042017	4	4	1,120	15.69	4	13	1,020	14.29	10	60	0.84
	OLDDU	13	0.66	389	19.67628	4	4	507	25.64	3	14	457	23.12	11	0	0
	OLDLI	343	5.64	299	4.912915	3	4	329	5.41	4	9	229	3.76	4	0	0
	OLDLOW	9	0.26	1,154	32.75617	3	3	462	13.11	3	9	362	10.28	7	18	0.51
	PADAL	46	8.26	22	3.949731	5	6	35	6.28	4	10	21	3.77	6	0	0
	PAUKO	118	25.05	22	4.670913	2	3	51	10.83	5	12	22	4.67	8	0	0
	RACK	60	1.87	200	6.23053	5	5	510	15.89	4	13	350	10.90	9	30	0.93
	SLINE	267	4.10	934	14.35819	4	5	351	5.40	2	5	151	2.32	4	0	0
	VEUKO	7	0.99	0	0	0	0	101	14.33	7	11	87	12.34	5	0	0
	VEUP	57	7.54	73	9.656085	4	5	219	28.97	3	6	212	28.04	4	0	0
	VICK	360	4.23	220	2.58216	3	3	2,140	25.12	3	13	1,820	21.36	10	60	0.70
	WWRL	157	3.23	1,457	30.00412	4	4	1,028	21.17	4	9	986	20.30	6	0	0
	WWRU	13	1.67	318	40.92664	3	3	28	3.60	3	6	22	2.83	4	0	0
Mine-exposed	BOCK	160	1.97	140	1.719902	3	3	6,140	75.43	5	16	3,140	38.57	12	2,240	27.52
	CACK	0	0.00	438	10.86849	1	1	3,278	81.34	6	14	3,051	75.71	8	1,000	24.81
	CATA2-25	0	0.00	72	3.61809	1	1	1,622	81.51	3	8	1,544	77.59	6	172	8.64
	CATA2-75	0	0.00	100	2.824859	1	1	1,570	44.35	3	9	1,510	42.66	7	130	3.67
	COCK	20	0.07	2,360	8.087731	4	4	22,880	78.41	7	16	7,160	24.54	10	2,180	7.47
	EL1	140	1.81	340	4.404145	5	5	2,220	28.76	5	10	2,100	27.20	5	20	0.26
	EL19	60	1.85	200	6.17284	5	5	1,190	36.73	6	13	1,080	33.33	7	150	4.63
	EL20	917	14.75	800	12.86587	5	6	483	7.77	4	9	333	5.36	6	50	0.80
	ELDEL	620	8.01	280	3.617571	4	4	980	12.66	4	9	660	8.53	6	140	1.81
	ELDFE	0	0.00	260	1.515152	2	3	3,400	19.81	4	13	3,140	18.30	9	60	0.35
	ELDGR	40	3.11	48	3.726708	4	4	124	9.63	6	10	84	6.52	5	8	0.62
	ELELKO	120	1.52	780	9.898477	2	3	640	8.12	3	7	320	4.06	5	20	0.25
	ELH93	7	0.24	122	4.268719	2	2	1,557	54.48	1	10	1,557	54.48	10	186	6.51
	ELUEL	317	6.17	350	6.815969	4	4	800	15.58	3	7	450	8.76	5	100	1.95
	ELUFE	0	0.00	100	0.909091	3	3	2,920	26.55	5	13	2,540	23.09	8	120	1.09
	ELUFO	0	0.00	240	2.672606	3	3	4,720	52.56	5	14	4,380	48.78	8	340	3.79
	ELUSP	100	1.55	520	8.049536	4	4	1,820	28.17	5	9	1,540	23.84	5	20	0.31
	FO10-SP1	680	4.93	520	3.768116	3	3	3,200	23.19	5	12	2,960	21.45	8	40	0.29
	FO22	520	2.46	1,600	7.56859	4	4	4,700	22.23	6	12	3,880	18.35	6	320	1.51
	FO23	90	2.38	440	11.64021	4	4	1,140	30.16	5	16	790	20.90	9	10	0.26
	FO29	60	0.70	360	4.195804	5	5	3,060	35.66	4	12	2,580	30.07	9	400	4.66
	FO9	580	8.63	620	9.22619	4	4	1,620	24.11	3	6	280	4.17	4	60	0.89
	FOBCP	238	5.59	240	5.633803	3	5	878	20.61	6	10	652	15.31	5	13	0.31
	FOBKS	200	4.81	190	4.56621	4	5	1,178	28.31	3	6	202	4.85	4	25	0.60
	FOBSC	91	3.11	144	4.926445	4	5	926	31.68	5	7	108	3.69	3	45	1.54
	FODGH	960	8.74	780	7.103825	5	5	1,960	17.85	4	8	1,280	11.66	5	160	1.46
	FODHE	180	1.06	80	0.468933	3	3	3,780	22.16	4	10	3,680	21.57	7	1,600	9.38
	FODNGD	240	3.06	420	5.357143	2	3	420	5.36	4	8	160	2.04	4	20	0.26
	FODPO	3,180	30.75	1,620	15.66731	3	3	1,020	9.86	6	10	860	8.32	5	60	0.58
	FORD7	50	0.83	883	14.58781	4	4	1,435	23.71	5	8	1,084	17.91	4	0	0
	FOUEW	40	0.52	980	12.6943	5	5	1,840	23.83	4	8	1,720	22.28	5	20	0.26
	FOUKI	10	0.29	60	1.719198	4	4	730	20.92	4	8	200	5.73	4	20	0.57
	FOUL	782	26.01	109	3.626081	3	3	453	15.07	5	10	163	5.42	5	36	1.20
	FOUNGD	400	5.51	200	2.754821	2	4	520	7.16	4	8	280	3.86	4	40	0.55
	FOUSH	160	2.19	140	1.912568	3	3	860	11.75	6	12	520	7.10	6	80	1.09
	GHCKD	0	0.00	1,000	9.469697	5	5	5,680	53.79	7	17	3,540	33.52	10	1,720	16.29
	GHCKU	67	8.66	6	0.775194	2	2	576	74.42	5	13	506	65.37	9	9	1.16
	GRCK	360	4.65	1,540	19.89664	5	7	820	10.59	3	8	400	5.17	6	0	0
	GRDS	300	3.57	1,660	19.7619	5	6	1,760	20.95	3	7	620	7.38	5	20	0.24
	GREE1-50	0	0.00	651	10.30063	4	4	3,368	53.29	6	11	352	5.57	5	117	1.85
	GREE3-75	98	12.19	29	3.606965	4	4	547	68.03	5	15	510	63.43	11	15	1.87
	GREE4-25	0	0.00	6	0.258398	1	1	1,522	65.55	4	13	1,358	58.48	10	0	0
	GREE4-75	3	0.99	1	0.331126	1	1	213	70.53	6	14	134	44.37	8	1	0.33
	HACKDS	20	0.20	1,020	10.03937	4	6	4,080	40.16	2	10	3,980	39.17	9	0	0
	HACKUS	2,380	15.32	1,760	11.32561	6	7	1,940	12.48	4	12	1,140	7.34	9	20	0.13
	HARM1-50	80	0.57	500	3.566334	3	3	4,960	35.38	5	14	4,640	33.10	9	60	0.43
	HARM5-25	440	3.31	1,160	8.73494	5	5	320	2.41	5	9	180	1.36	4	40	0.30
	HENFO	600	4.34	140	1.013025	4	4	2,140	15.48	3	9	2,080	15.05	7	900	6.51
	KICK	0	0.00	24	4.828974	3	3	381	76.66	5	9	338	68.01	5	17	3.42
	KILM1-50	0	0.00	9	5.389222	2	2	131	78.44	3	12	124	74.25	10	6	3.59
	LC_DC1	340	4.76	920	12.88515	4	4	540	7.56	5	9	260	3.64	5	60	0.84
	LC_DCDS	280	3.66	320	4.188482	4	4	620	8.12	3	8	580	7.59	6	100	1.31
	LC_FRUS	13	0.63	134	6.489104	2	2	649	31.43	5	10	575	27.85	6	20	0.97
	LI8	390	11.50	1,100	32.44838	5	7	280	8.26	4	8	220	6.49	5	0	0
	LIDSL	400	5.73	960	13.75358	5	6	1,540	22.06	5	10	1,420	20.34	6	0	0
	LILC3	80	0.41	2,960	15.28926	3	3	12,100	62.50	4	11	11,860	61.26	8	0	0
	MI2	717	11.72	801	13.09037	6	7	1,550	25.33	5	12	1,217	19.89	8	300	4.90
	MI3	220	2.87	2,560	33.42037	4	4	1,300	16.97	3	6	740	9.66	4	160	2.09
	MI5	120	1.69	3,540	49.7191	3	3	680	9.55	4	6	360	5.06	3	140	1.97
	MIDAG	1,140	7.85	1,940	13.36088	3	4	3,780	26.03	4	11	320	2.20	7	20	0.14
	MIDCO	300	2.43	1,060	8.576052	5	6	5,580	45.15	4	12	2,540	20.55	7	40	0.32
	MIUCO	420	5.37	560	7.161125	4	6	1,800	23.02	4	12	340	4.35	8	20	0.26
	MP1	50	0.91	250	4.570384	3	4	1,518	27.75	5	11	1,284	23.47	7	50	0.91
	NGD1u	0	0.00	400	4.098361	1	3	3,800	38.93	5	14	3,260	33.40	10	580	5.94
	NTHO1-25	0	0.00	280	1.73913	4	4	10,560	65.59	5	11	5,260	32.67	7	400	2.48
	NTHO1-50	0	0.00	220	1.940035	3	3	6,060	53.44	8	17	2,000	17.64	9	940	8.29
	OCNM	4	0.29	249	18.13547	3	3	307	22.36	8	18	202	14.71	11	7	0.51
	POCK	0	0.00	1,220	5.505415	3	3	16,400	74.01	6	11	16,000	72.20	6	5,160	23.29
	PORT3-25	14	0.30	43	0.923341	2	2	357	7.67	5	11	271	5.82	7	0	0
	PORT3-50	0	0.00	75	2.875767	1	1	625	23.96	5	12	550	21.09	8	75	2.88
	SWCK	0	0.00	257	4.135822	2	2	4,272	68.75	7	15	3,744	60.25	9	829	13.34
	SWIF2-75	0	0.00	320	3.131115	1	1	6,820	66.73	4	13	4,440	43.44	10	20	0.20
	THCK	0	0.00	195	8.084577	4	4	1,350	55.97	6	11	195	8.08	6	47	1.95
	WOCK	4	0.32	32	2.572347	3	3	636	51.13	6	16	412	33.12	11	12	0.96

Table C.7: Values of individual benthic invertebrate endpoints considered in evaluation of calcite effects (3-minute kick samples collected in 2015).

		Orthocladius sp.		Muscidae		*Limnophora* sp.		Psychodidae		*Pericoma/ Telmatoscopus* sp.		Oligochaeta				Enchytraeidae		*Enchytraeus* sp.	
		Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Family Richness	LPL Richness	Total	%	Total	%
Reference	AGCK	20	0.28	0	0	0	0	40	0.56	40	0.56	0	0	0	0	0	0	0	0
	AL4	800	7.30	0	0	0	0	540	4.93	540	4.93	20	0.18	1	1	0	0	0	0
	ALUSM	100	1.12	0	0	0	0	1,900	21.35	1,900	21.35	120	1.35	1	1	0	0	0	0
	BU2	20	1.32	0	0	0	0	0	0	0	0	25	1.65	2	2	15	0.99	15	0.99
	BU40	410	11.92	0	0	0	0	0	0	0	0	20	0.58	1	1	20	0.58	20	0.58
	BUUQ	200	6.51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	CADCK	300	2.68	0	0	0	0	140	1.25	140	1.25	60	0.54	2	2	0	0	0	0
	CHCK	100	0.75	0	0	0	0	1,000	7.49	1,000	7.49	0	0	0	0	0	0	0	0
	CRUKO	0	0	0	0	0	0	0	0	0	0	4	0.74	1	1	0	0	0	0
	DACK	540	5.49	0	0	0	0	200	2.03	200	2.03	0	0	0	0	0	0	0	0
	DUCK	1,017	17.09	0	0	0	0	150	2.52	150	2.52	84	1.41	2	2	67	1.13	67	1.13
	EL12	200	2.29	0	0	0	0	300	3.43	300	3.43	0	0	0	0	0	0	0	0
	ELUGH	56	1.38	0	0	0	0	178	4.40	178	4.40	0	0	0	0	0	0	0	0
	EWCK	240	3.96	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	FLAD	3,060	24.02	0	0	0	0	140	1.10	140	1.10	1060	8.32	2	2	800	6.28	800	6.28
	FLAU	800	12.27	0	0	0	0	280	4.29	280	4.29	0	0	0	0	0	0	0	0
	FLRU	233	4.23	0	0	0	0	67	1.22	67	1.22	17	0.31	1	1	0	0	0	0
	FO26	360	3.83	0	0	0	0	20	0.21	20	0.21	0	0	0	0	0	0	0	0
	GRUHA	51	1.04	0	0	0	0	13	0.27	13	0.27	0	0	0	0	0	0	0	0
	HENUP	60	0.80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	KO1	23	2.72	0	0	0	0	0	0	0	0	3	0.35	1	1	0	0	0	0
	KODCR	45	9.66	0	0	0	0	0	0	0	0	4	0.86	2	2	0	0	0	0
	KOUCR	33	6.75	0	0	0	0	0	0	0	0	1	0.20	1	1	1	0.20	1	0.20
	KOUVE	256	11.25	0	0	0	0	25	1.10	25	1.10	832	36.56	3	3	813	35.72	813	35.72
	LC_GRCK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	LI24	9	0.30	0	0	0	0	0	0	0	0	18	0.60	1	1	18	0.60	18	0.60
	MCCR	0	0	0	0	0	0	160	1.38	160	1.38	20	0.17	1	1	0	0	0	0
	MI25	60	0.84	0	0	0	0	20	0.28	20	0.28	0	0	0	0	0	0	0	0
	OLDDU	181	9.16	0	0	0	0	0	0	0	0	88	4.45	2	2	13	0.66	13	0.66
	OLDLI	14	0.23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	OLDLOW	127	3.60	0	0	0	0	0	0	0	0	18	0.51	1	1	0	0	0	0
	PADAL	5	0.90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PAUKO	8	1.70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RACK	80	2.49	0	0	0	0	100	3.12	100	3.12	20	0.62	2	2	10	0.31	10	0.31
	SLINE	67	1.03	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VEUKO	16	2.27	1	0.14	1	0.14	1	0.14	1	0.14	0	0	0	0	0	0	0	0
	VEUP	167	22.09	0	0	0	0	0	0	0	0	5	0.66	1	1	5	0.66	5	0.66
	VICK	60	0.70	0	0	0	0	220	2.58	220	2.58	0	0	0	0	0	0	0	0
	WWRL	357	7.35	14	0.29	14	0.29	14	0.29	14	0.29	0	0	0	0	0	0	0	0
	WWRU	3	0.39	0	0	0	0	3	0.39	3	0.39	5	0.64	1	1	0	0	0	0
Mine-exposed	BOCK	20	0.25	40	0.49	40	0.49	20	0.25	20	0.25	1360	16.71	3	4	1180	14.50	1100	13.51
	CACK	1,088	27.00	100	2.48	100	2.48	51	1.27	38	0.94	288	7.15	2	2	275	6.82	275	6.82
	CATA2-25	978	49.15	67	3.37	67	3.37	0	0	0	0	261	13.12	1	1	261	13.12	261	13.12
	CATA2-75	890	25.14	50	1.41	50	1.41	0	0	0	0	1830	51.69	1	2	1830	51.69	1760	49.72
	COCK	2,580	8.84	40	0.14	40	0.14	15,480	53.05	15,480	53.05	600	2.06	2	2	560	1.92	560	1.92
	EL1	1,360	17.62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	EL19	730	22.53	0	0	0	0	30	0.93	30	0.93	20	0.62	1	1	20	0.62	20	0.62
	EL20	100	1.61	0	0	0	0	100	1.61	100	1.61	17	0.27	1	1	0	0	0	0
	ELDEL	120	1.55	0	0	0	0	220	2.84	220	2.84	0	0	0	0	0	0	0	0
	ELDFE	2,160	12.59	0	0	0	0	0	0	0	0	600	3.50	1	1	600	3.50	600	3.50
	ELDGR	52	4.04	0	0	0	0	8	0.62	8	0.62	0	0	0	0	0	0	0	0
	ELELKO	80	1.02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ELH93	971	33.97	0	0	0	0	0	0	0	0	664	23.23	1	1	0	0	0	0
	ELUEL	83	1.62	0	0	0	0	300	5.84	300	5.84	50	0.97	2	2	33	0.64	33	0.64
	ELUFE	1,900	17.27	0	0	0	0	20	0.18	20	0.18	460	4.18	1	1	0	0	0	0
	ELUFO	1,960	21.83	0	0	0	0	40	0.45	40	0.45	320	3.56	2	3	80	0.89	40	0.45
	ELUSP	1,100	17.03	0	0	0	0	40	0.62	40	0.62	0	0	0	0	0	0	0	0
	FO10-SP1	1,680	12.17	0	0	0	0	100	0.72	100	0.72	60	0.43	2	2	40	0.29	40	0.29
	FO22	1,660	7.85	0	0	0	0	220	1.04	220	1.04	60	0.28	1	1	60	0.28	60	0.28
	FO23	390	10.32	0	0	0	0	150	3.97	150	3.97	30	0.79	1	1	30	0.79	30	0.79
	FO29	580	6.76	0	0	0	0	380	4.43	380	4.43	220	2.56	1	1	0	0	0	0
	FO9	40	0.60	0	0	0	0	1,320	19.64	1,320	19.64	40	0.60	1	1	0	0	0	0
	FOBCP	238	5.59	0	0	0	0	100	2.35	100	2.35	26	0.61	2	2	13	0.31	13	0.31
	FOBKS	0	0	0	0	0	0	963	23.14	963	23.14	88	2.11	1	1	88	2.11	88	2.11
	FOBSC	0	0	0	0	0	0	664	22.72	664	22.72	109	3.73	1	1	109	3.73	109	3.73
	FODGH	420	3.83	0	0	0	0	480	4.37	480	4.37	120	1.09	3	3	80	0.73	80	0.73
	FODHE	900	5.28	0	0	0	0	40	0.23	40	0.23	20	0.12	1	1	20	0.12	20	0.12
	FODNGD	20	0.26	0	0	0	0	100	1.28	100	1.28	0	0	0	0	0	0	0	0
	FODPO	420	4.06	0	0	0	0	20	0.19	20	0.19	0	0	0	0	0	0	0	0
	FORD7	783	12.94	0	0	0	0	83	1.37	83	1.37	67	1.11	2	2	17	0.28	17	0.28
	FOUEW	1,080	13.99	0	0	0	0	80	1.04	80	1.04	0	0	0	0	0	0	0	0
	FOUKI	50	1.43	0	0	0	0	480	13.75	480	13.75	100	2.87	2	2	80	2.29	80	2.29
	FOUL	45	1.50	0	0	0	0	145	4.82	145	4.82	0	0	0	0	0	0	0	0
	FOUNGD	160	2.20	0	0	0	0	40	0.55	40	0.55	0	0	0	0	0	0	0	0
	FOUSH	120	1.64	20	0.27	20	0.27	240	3.28	240	3.28	60	0.82	1	1	60	0.82	60	0.82
	GHCKD	120	1.14	0	0	0	0	880	8.33	880	8.33	1680	15.91	2	3	360	3.41	360	3.41
	GHCKU	364	47.03	0	0	0	0	29	3.75	29	3.75	0	0	0	0	0	0	0	0
	GRCK	220	2.84	0	0	0	0	380	4.91	380	4.91	20	0.26	1	1	0	0	0	0
	GRDS	360	4.29	0	0	0	0	1,120	13.33	1,120	13.33	0	0	0	0	0	0	0	0
	GREE1-50	17	0.27	0	0	0	0	2,750	43.51	2,750	43.51	350	5.54	2	2	133	2.10	133	2.10
	GREE3-75	370	46.02	0	0	0	0	3	0.37	3	0.37	8	1.00	1	1	8	1.00	8	1.00
	GREE4-25	1,029	44.32	76	3.27	76	3.27	82	3.53	82	3.53	24	1.03	2	2	18	0.78	18	0.78
	GREE4-75	67	22.19	0	0	0	0	7	2.32	7	2.32	2	0.66	2	2	1	0.33	1	0.33
	HACKDS	1,320	12.99	0	0	0	0	0	0	0	0	800	7.87	1	1	0	0	0	0
	HACKUS	360	2.32	0	0	0	0	620	3.99	620	3.99	40	0.26	1	1	0	0	0	0
	HARM1-50	1,300	9.27	0	0	0	0	60	0.43	60	0.43	200	1.43	1	1	0	0	0	0
	HARM5-25	40	0.30	0	0	0	0	20	0.15	20	0.15	60	0.45	1	1	0	0	0	0
	HENFO	460	3.33	0	0	0	0	20	0.14	20	0.14	0	0	0	0	0	0	0	0
	KICK	30	6.04	35	7.04	35	7.04	5	1.01	5	1.01	7	1.41	2	2	0	0	0	0
	KILM1-50	11	6.59	5	2.99	5	2.99	0	0	0	0	0	0	0	0	0	0	0	0
	LC_DC1	0	0	0	0	0	0	120	1.68	120	1.68	60	0.84	1	1	0	0	0	0
	LC_DCDS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	LC_FRUS	247	11.96	0	0	0	0	47	2.28	47	2.28	0	0	0	0	0	0	0	0
	LI8	60	1.77	0	0	0	0	0	0	0	0	100	2.95	2	2	10	0.29	10	0.29
	LIDSL	500	7.16	0	0	0	0	60	0.86	60	0.86	20	0.29	1	1	0	0	0	0
	LILC3	3,620	18.70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MI2	300	4.90	0	0	0	0	133	2.17	133	2.17	0	0	0	0	0	0	0	0
	MI3	20	0.26	0	0	0	0	480	6.27	480	6.27	20	0.26	1	1	0	0	0	0
	MI5	0	0	0	0	0	0	280	3.93	280	3.93	0	0	0	0	0	0	0	0
	MIDAG	0	0	0	0	0	0	3,340	23.00	3,340	23.00	60	0.41	2	2	20	0.14	20	0.14
	MIDCO	1,300	10.52	0	0	0	0	2,820	22.82	2,820	22.82	60	0.49	1	1	0	0	0	0
	MIUCO	60	0.77	0	0	0	0	1,380	17.65	1,380	17.65	0	0	0	0	0	0	0	0
	MP1	700	12.80	0	0	0	0	150	2.74	150	2.74	0	0	0	0	0	0	0	0
	NGD1u	440	4.51	0	0	0	0	120	1.23	120	1.23	120	1.23	2	2	40	0.41	40	0.41
	NTHO1-25	220	1.37	60	0.37	60	0.37	2,800	17.39	2,800	17.39	340	2.11	2	3	300	1.86	300	1.86
	NTHO1-50	320	2.82	0	0	0	0	3,280	28.92	3,280	28.92	300	2.65	1	1	300	2.65	300	2.65
	OCNM	0	0	0	0	0	0	7	0.51	7	0.51	214	15.59	2	2	0	0	0	0
	POCK	8,040	36.28	0	0	0	0	140	0.63	140	0.63	480	2.17	3	3	100	0.45	100	0.45
	PORT3-25	14	0.30	0	0	0	0	29	0.62	29	0.62	14	0.30	1	1	0	0	0	0
	PORT3-50	83	3.18	0	0	0	0	33	1.27	33	1.27	0	0	0	0	0	0	0	0
	SWCK	286	4.60	0	0	0	0	271	4.36	271	4.36	43	0.69	1	1	43	0.69	43	0.69
	SWIF2-75	100	0.98	0	0	0	0	2,100	20.55	2,100	20.55	20	0.20	1	1	0	0	0	0
	THCK	0	0	0	0	0	0	7	0.29	7	0.29	200	8.29	2	2	33	1.37	33	1.37
	WOCK	88	7.07	0	0	0	0	52	4.18	52	4.18	24	1.93	1	1	24	1.93	24	1.93

Table C.8: Values of individual benthic invertebrate endpoints considered in evaluation of calcite effects, 2014.

		HBI (Family)	HBI (LPL)	Simpson's Diversity (Family)	Evenness (Family)	Simpson's Diversity (LPL)	Evenness (LPL)	Abundance	Total Family Richness	Total LPL Richness	EPT		EPT Richness		Ephemeroptera				Baetidae		*Baetis*	
											Total	%	Family Richness	LPL Richness	Total	%	Family Richness	LPL Richness	Total	%	Total	%
Reference	ALEX3-25	2.91	2.75	0.85	0.41	0.87	0.26	8,600	17	29	7,180	83.49	10	17	5,020	58.37	3	7	800	9.30	360	0.04
	CHAU1-50	3.22	3.07	0.79	0.25	0.93	0.43	13,240	20	36	11,040	83.38	11	19	7,780	58.76	3	7	1,180	8.91	640	0.05
	CHAU1-75	3.44	3.14	0.83	0.36	0.91	0.51	6,320	17	24	4,500	71.20	11	13	3,440	54.43	3	4	500	7.91	260	0.04
	GRAC2-25	2.81	2.29	0.85	0.35	0.89	0.32	5,286	20	30	4,801	90.82	13	18	2,000	37.84	3	5	317	6.00	217	0.04
	GRAC2-75	2.20	1.69	0.86	0.40	0.92	0.54	5,733	19	24	5,449	95.05	13	17	2,549	44.46	3	4	66	1.15	33	0.01
	GRAV3-75	2.13	1.67	0.79	0.27	0.87	0.31	17,680	19	25	17,480	98.87	14	19	7,740	43.78	4	6	460	2.60	20	0.00
	HARM6-25	1.66	1.14	0.76	0.20	0.63	0.10	19,080	21	26	18,080	94.76	13	17	6,680	35.01	4	6	720	3.77	460	0.02
Mine-exposed	ELKR8-75	2.87	2.73	0.87	0.36	0.94	0.50	797	23	31	666	83.56	14	19	410	51.44	4	7	123	15.43	50	0.06
	ERIC2-0	1.29	1.32	0.66	0.33	0.59	0.30	4,600	9	10	4,157	90.37	5	6	43	0.93	1	2	0	0	0	0.00
	ERIC4-25	1.39	1.27	0.59	0.17	0.58	0.13	18,000	14	22	14,420	80.11	8	11	80	0.44	0	1	0	0	0	0.00
	ERIC4-75	1.31	1.16	0.59	0.14	0.56	0.12	13,280	18	20	10,980	82.68	7	9	0	0	0	0	0	0	0	0.00
	FO29	3.59	3.61	0.79	0.29	0.86	0.25	6,051	18	28	3,784	62.54	11	18	2,167	35.81	3	7	483	7.98	250	0.04
	FORD7-25	2.96	2.90	0.87	0.36	0.87	0.25	10,080	22	29	7,720	76.59	13	17	2,100	20.83	4	4	100	0.99	60	0.01
	FORD7-50	3.09	3.05	0.87	0.36	0.93	0.44	8,500	23	34	5,860	68.94	13	17	2,060	24.24	4	5	120	1.41	80	0.01
	GRAV1-25	2.83	2.60	0.84	0.29	0.80	0.17	9,960	22	26	7,960	79.92	13	15	1,960	19.68	4	5	580	5.82	520	0.05
	GRAV1-50	3.31	2.64	0.88	0.35	0.89	0.25	7,420	24	33	5,540	74.66	13	19	1,600	21.56	4	7	400	5.39	60	0.01
	GRAV1-75	2.33	2.10	0.87	0.50	0.89	0.30	12,380	16	26	11,180	90.31	11	19	3,260	26.33	4	8	660	5.33	480	0.04
	GREE1-75	4.50	3.67	0.82	0.35	0.87	0.27	6,460	17	27	2,240	34.67	8	9	20	0.31	1	1	20	0.31	20	0.00
	GREE3-25	4.55	4.29	0.45	0.12	0.77	0.24	3,150	15	22	600	19.05	8	11	90	2.86	2	3	10	0.32	0	0.00
	GREE3-75	3.32	3.34	0.78	0.36	0.87	0.40	4,418	14	22	2,614	59.17	8	9	75	1.70	2	2	50	1.13	0	0.00
	GREE4-25	4.42	4.50	0.47	0.11	0.65	0.11	639	19	29	141	22.07	10	11	18	2.82	2	2	6	0.94	2	0.00
	GREE4-75	4.34	4.72	0.51	0.16	0.77	0.21	6,920	13	25	1,720	24.86	6	8	120	1.73	1	2	0	0	0	0.00
	HARM1-50	2.67	2.65	0.83	0.30	0.92	0.39	17,980	20	31	13,300	73.97	12	20	8,460	47.05	4	7	980	5.45	420	0.02
	HARM1-75	3.05	3.32	0.82	0.28	0.85	0.18	26,100	21	37	17,620	67.51	10	18	5,940	22.76	3	6	780	2.99	340	0.01
	HARM5-25	2.11	1.34	0.76	0.18	0.76	0.14	17,400	24	31	16,400	94.25	15	19	8,560	49.20	4	5	60	0.34	20	0.00
	LI8	2.81	2.73	0.82	0.34	0.88	0.38	9,040	17	22	7,760	85.84	10	14	1,600	17.70	3	5	300	3.32	260	0.03
	LIDSL	3.24	3.28	0.83	0.36	0.85	0.31	7,860	16	24	5,360	68.19	10	15	1,320	16.79	2	4	180	2.29	140	0.02
	LILC3	4.64	4.68	0.40	0.09	0.81	0.21	19,680	19	28	3,120	15.85	12	15	760	3.86	2	3	320	1.63	140	0.01
	MICH1-25	3.36	3.17	0.88	0.33	0.87	0.19	2,795	27	39	2,060	73.70	16	22	665	23.79	4	8	250	8.94	60	0.02
	NTHO1-25	4.35	3.42	0.71	0.22	0.83	0.29	8,860	17	21	4,120	46.50	5	5	0	0	0	0	0	0	0	0.00
	NTHO1-50	5.61	4.49	0.71	0.25	0.79	0.24	7,700	15	24	1,120	14.55	6	6	20	0.26	1	1	0	0	0	0.00
	PORT1-0	3.96	3.68	0.75	0.20	0.93	0.48	11,900	21	28	4,820	40.50	9	11	40	0.34	1	1	40	0.34	0	0.00

Table C.8: Values of individual benthic invertebrate endpoints considered in evaluation of calcite effects, 2014.

		Baetis tricaudatus group		Ephemerellidae		*Drunella Doddsii*		Heptageniidae		*Epeorus*		*Rhithrogena*		Plecoptera				Chloroperlidae		*Sweltsa*		Nemouridae	
		Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Family Richness	LPL Richness	Total	%	Total	%	Total	%
Reference	ALEX3-25	60	0.70	2,000	23.26	60	0.70	2,220	25.81	1,180	13.72	0	0.00	1,780	20.70	4	5	80	0.93	80	0.93	640	7.44
	CHAU1-50	40	0.30	1,220	9.21	180	1.36	5,380	40.63	640	4.83	140	1.06	1,920	14.50	5	8	40	0.30	20	0.15	460	3.47
	CHAU1-75	0	0	1,040	16.46	80	1.27	1,900	30.06	300	4.75	40	0.63	720	11.39	5	6	20	0.32	0	0.00	180	2.85
	GRAC2-25	0	0	183	3.46	33	0.62	1,500	28.38	750	14.19	50	0.95	1,868	35.34	6	9	67	1.27	67	1.27	1,085	20.53
	GRAC2-75	0	0	1,016	17.72	283	4.94	1,450	25.29	250	4.36	117	2.04	2,200	38.37	6	9	234	4.08	117	2.04	683	11.91
	GRAV3-75	80	0.45	1,800	10.18	100	0.57	5,460	30.88	100	0.57	620	3.51	9,280	52.49	7	10	1,700	9.62	20	0.11	1,620	9.16
	HARM6-25	0	0	760	3.98	220	1.15	5,020	26.31	800	4.19	60	0.31	10,360	54.30	6	8	320	1.68	280	1.47	820	4.30
Mine-exposed	ELKR8-75	33	4.14	59	7.40	20	2.51	220	27.60	0	0	5	0.63	186	23.34	6	8	40	5.02	30	3.76	16	2.01
	ERIC2-0	0	0	14	0.30	0	0.00	29	0.63	0	0	0	0.00	4,100	89.13	3	3	0	0	0	0.00	1,172	25.48
	ERIC4-25	0	0	80	0.44	0	0.00	0	0	0	0	0	0.00	14,160	78.67	5	7	120	0.67	100	0.56	3,140	17.44
	ERIC4-75	0	0	0	0	0	0.00	0	0	0	0	0	0.00	10,640	80.12	4	6	160	1.20	140	1.05	2,120	15.96
	FO29	33	0.55	184	3.04	67	1.11	1,500	24.79	67	1.11	33	0.55	1,350	22.31	5	8	117	1.93	67	1.11	117	1.93
	FORD7-25	40	0.40	300	2.98	40	0.40	1,680	16.67	200	1.98	0	0.00	4,780	47.42	5	8	40	0.40	20	0.20	1,440	14.29
	FORD7-50	20	0.24	440	5.18	120	1.41	1,480	17.41	300	3.53	0	0.00	3,100	36.47	5	7	100	1.18	80	0.94	800	9.41
	GRAV1-25	60	0.60	1,020	10.24	20	0.20	340	3.41	60	0.60	40	0.40	4,600	46.18	5	5	180	1.81	180	1.81	840	8.43
	GRAV1-50	180	2.43	800	10.78	80	1.08	380	5.12	160	2.16	20	0.27	3,080	41.51	5	7	160	2.16	140	1.89	1,480	19.95
	GRAV1-75	120	0.97	1,020	8.24	80	0.65	1,560	12.60	440	3.55	40	0.32	5,020	40.55	4	7	60	0.48	60	0.48	1,860	15.02
	GREE1-75	0	0	0	0	0	0.00	0	0	0	0	0	0.00	540	8.36	4	5	80	1.24	80	1.24	420	6.50
	GREE3-25	0	0	20	0.63	0	0.00	60	1.90	0	0	0	0.00	490	15.56	4	6	0	0	0	0.00	240	7.62
	GREE3-75	0	0	0	0	0	0.00	25	0.57	0	0	0	0.00	2,413	54.62	4	5	0	0	0	0.00	950	21.50
	GREE4-25	0	0	0	0	0	0.00	12	1.88	0	0	0	0.00	109	17.06	6	7	3	0.47	1	0.16	6	0.94
	GREE4-75	0	0	40	0.58	0	0.00	80	1.16	0	0	0	0.00	1,560	22.54	4	5	0	0	0	0.00	560	8.09
	HARM1-50	20	0.11	6,180	34.37	20	0.11	1,180	6.56	60	0.33	20	0.11	3,740	20.80	5	9	560	3.11	500	2.78	1,440	8.01
	HARM1-75	100	0.38	2,960	11.34	40	0.15	2,200	8.43	120	0.46	0	0.00	7,300	27.97	4	7	60	0.23	60	0.23	6,740	25.82
	HARM5-25	0	0	1,200	6.90	20	0.11	7,180	41.26	1,020	5.86	0	0.00	7,000	40.23	6	9	260	1.49	260	1.49	660	3.79
	LI8	20	0.22	240	2.65	40	0.44	1,060	11.73	140	1.55	40	0.44	4,700	51.99	4	6	80	0.88	60	0.66	1,220	13.50
	LIDSL	20	0.25	180	2.29	0	0.00	960	12.21	220	2.80	20	0.25	3,020	38.42	4	7	180	2.29	120	1.53	1,460	18.58
	LILC3	60	0.30	240	1.22	0	0.00	200	1.02	0	0	0	0.00	1,740	8.84	5	7	200	1.02	140	0.71	820	4.17
	MICH1-25	45	1.61	220	7.87	30	1.07	180	6.44	55	1.97	15	0.54	500	17.89	7	9	45	1.61	45	1.61	120	4.29
	NTHO1-25	0	0	0	0	0	0.00	0	0	0	0	0	0.00	4,060	45.82	3	3	0	0	0	0.00	3,700	41.76
	NTHO1-50	0	0	0	0	0	0.00	20	0.26	0	0	0	0.00	1,040	13.51	3	3	0	0	0	0.00	1,000	12.99
	PORT1-0	0	0	0	0	0	0.00	0	0	0	0	0	0.00	3,540	29.75	5	7	20	0.17	0	0.00	2,300	19.33

Table C.8: Values of individual benthic invertebrate endpoints considered in evaluation of calcite effects, 2014.

		Zapada sp.		*Zapada Columbiana*		*Taeniopterygidae*		*Taenionema*		Trichoptera				Diptera				Chironomidae			*Micropsectra* sp.	
		Total	%	Total	%	Total	%	Total	%	Total	%	Family Richness	LPL Richness	Total	%	Family Richness	LPL Richness	Total	%	LPL Richness	Total	%
Reference	ALEX3-25	460	5.35	240	2.79	840	9.77	0	0.00	380	4.4186047	3	5	1,100	12.79	5	12	460	5.35	8	0	0
	CHAU1-50	460	3.47	0	0.00	660	4.98	0	0.00	1,340	10.120846	3	4	2,100	15.86	5	14	1,620	12.24	10	20	0.15
	CHAU1-75	180	2.85	0	0.00	100	1.58	0	0.00	340	5.3797468	3	3	1,820	28.80	5	12	1,280	20.25	8	20	0.32
	GRAC2-25	1,068	20.20	517	9.78	333	6.30	0	0.00	933	17.650397	4	4	451	8.53	4	10	367	6.94	7	17	0.32
	GRAC2-75	583	10.17	300	5.23	750	13.08	0	0.00	700	12.210012	4	4	251	4.38	4	6	134	2.34	3	0	0
	GRAV3-75	1,540	8.71	1,000	5.66	4,980	28.17	0	0.00	460	2.60181	3	3	180	1.02	3	5	100	0.57	3	0	0
	HARM6-25	820	4.30	680	3.56	760	3.98	0	0.00	1,040	5.4507338	3	3	640	3.35	3	6	600	3.14	4	20	0.10
Mine-exposed	ELKR8-75	13	1.63	0	0.00	33	4.14	33	4.14	70	8.782936	4	4	92	11.54	6	11	30	3.76	5	0	0
	ERIC2-0	1,172	25.48	629	13.67	0	0.00	0	0.00	14	0.3043478	1	1	400	8.70	2	3	343	7.46	2	0	0
	ERIC4-25	3,140	17.44	1,200	6.67	100	0.56	0	0.00	180	1	3	3	3,400	18.89	4	10	3,280	18.22	7	40	0.22
	ERIC4-75	2,120	15.96	1,080	8.13	0	0.00	0	0.00	340	2.560241	3	3	2,120	15.96	6	8	1,880	14.16	3	0	0
	FO29	117	1.93	0	0.00	833	13.77	0	0.00	267	4.4124938	3	3	2,216	36.62	4	9	2,032	33.58	6	0	0
	FORD7-25	1,440	14.29	60	0.60	1,500	14.88	0	0.00	840	8.3333333	4	5	2,040	20.24	5	10	1,840	18.25	6	0	0
	FORD7-50	800	9.41	0	0.00	320	3.76	0	0.00	700	8.2352941	4	5	2,060	24.24	5	12	1,620	19.06	7	0	0
	GRAV1-25	840	8.43	300	3.01	3,420	34.34	3,420	34.34	1,400	14.056225	4	5	1,720	17.27	6	9	1,040	10.44	4	0	0
	GRAV1-50	1,420	19.14	60	0.81	1,340	18.06	0	0.00	860	11.590296	4	5	1,380	18.60	6	10	120	1.62	5	0	0
	GRAV1-75	1,500	12.12	160	1.29	2,700	21.81	1,400	11.31	2,900	23.424879	3	4	840	6.79	3	7	340	2.75	5	0	0
	GREE1-75	420	6.50	0	0.00	0	0.00	0	0.00	1,680	26.006192	3	3	3,920	60.68	5	15	1,100	17.03	9	20	0.31
	GREE3-25	240	7.62	20	0.63	50	1.59	0	0.00	20	0.6349206	2	2	2,550	80.95	6	11	2,300	73.02	6	10	0.32
	GREE3-75	950	21.50	150	3.40	563	12.74	0	0.00	126	2.8519692	2	2	1,754	39.70	5	12	1,503	34.02	8	13	0.29
	GREE4-25	4	0.63	2	0.31	14	2.19	0	0.00	14	2.1909233	2	2	495	77.46	6	16	455	71.21	7	5	0.78
	GREE4-75	560	8.09	60	0.87	240	3.47	0	0.00	40	0.5780347	1	1	5,140	74.28	4	14	4,740	68.50	11	300	4.34
	HARM1-50	1,400	7.79	60	0.33	940	5.23	0	0.00	1,100	6.1179088	3	4	3,940	21.91	3	8	3,200	17.80	5	0	0
	HARM1-75	6,740	25.82	860	3.30	60	0.23	0	0.00	4,380	16.781609	3	5	6,300	24.14	3	12	6,100	23.37	10	200	0.77
	HARM5-25	660	3.79	320	1.84	2,500	14.37	0	0.00	840	4.8275862	5	5	900	5.17	5	9	760	4.37	5	20	0.11
	LI8	1,220	13.50	40	0.44	3,160	34.96	0	0.00	1,460	16.150442	3	3	1,000	11.06	4	7	820	9.07	4	0	0
	LIDSL	1,460	18.58	40	0.51	1,220	15.52	0	0.00	1,020	12.977099	4	4	2,380	30.28	3	8	2,340	29.77	6	0	0
	LILC3	660	3.35	440	2.24	220	1.12	0	0.00	620	3.1504065	5	5	15,200	77.24	3	11	15,120	76.83	8	200	1.02
	MICH1-25	120	4.29	0	0.00	215	7.69	0	0.00	895	32.021467	5	5	555	19.86	5	12	390	13.95	7	20	0.72
	NTHO1-25	3,700	41.76	0	0.00	0	0.00	0	0.00	60	0.6772009	2	2	4,540	51.24	6	10	2,020	22.80	5	0	0
	NTHO1-50	1,000	12.99	0	0.00	20	0.26	0	0.00	60	0.7792208	2	2	6,320	82.08	7	16	3,100	40.26	8	60	0.78
	PORT1-0	2,260	18.99	300	2.52	20	0.17	0	0.00	1,240	10.420168	3	3	6,120	51.43	5	11	5,280	44.37	7	1,120	9.41

Table C.8: Values of individual benthic invertebrate endpoints considered in evaluation of calcite effects, 2014.

		Orthocladius sp.		Muscidae		*Limnophora* sp.		Psychodidae		*Pericoma/ Telmatoscopus* sp.		Oligochaeta				Enchytraeidae		*Enchytraeus* sp.	
		Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Family Richness	LPL Richness	Total	%	Total	%
Reference	ALEX3-25	20	0.23	0	0	0	0	480	5.58	480	5.58	0	0	1	0	0	0	0	0
	CHAU1-50	180	1.36	0	0	0	0	340	2.57	340	2.57	20	0.15	1	1	0	0	0	0
	CHAU1-75	520	8.23	20	0.32	20	0.32	360	5.70	360	5.70	0	0	1	0	0	0	0	0
	GRAC2-25	17	0.32	0	0	0	0	50	0.95	50	0.95	0	0	1	0	0	0	0	0
	GRAC2-75	0	0	0	0	0	0	83	1.45	83	1.45	0	0	1	0	0	0	0	0
	GRAV3-75	0	0	0	0	0	0	20	0.11	20	0.11	0	0	1	0	0	0	0	0
	HARM6-25	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Mine-exposed	ELKR8-75	18	2.26	0	0	0	0	3	0.38	3	0.38	0	0	1	0	0	0	0	0
	ERIC2-0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
	ERIC4-25	0	0	0	0	0	0	20	0.11	20	0.11	60	0.33	1	1	0	0	0	0
	ERIC4-75	0	0	0	0	0	0	40	0.30	40	0.30	0	0	1	0	0	0	0	0
	FO29	733	12.11	0	0	0	0	133	2.20	133	2.20	0	0	1	0	0	0	0	0
	FORD7-25	1,040	10.32	0	0	0	0	60	0.60	60	0.60	0	0	1	0	0	0	0	0
	FORD7-50	700	8.24	0	0	0	0	140	1.65	140	1.65	20	0.24	1	1	0	0	0	0
	GRAV1-25	0	0	0	0	0	0	540	5.42	540	5.42	0	0	1	0	0	0	0	0
	GRAV1-50	20	0.27	0	0	0	0	1,180	15.90	1,180	15.90	80	1.08	2	1	0	0	0	0
	GRAV1-75	0	0	0	0	0	0	460	3.72	440	3.55	0	0	1	0	0	0	0	0
	GREE1-75	40	0.62	0	0	0	0	1,520	23.53	1,520	23.53	180	2.79	1	1	0	0	0	0
	GREE3-25	690	21.90	10	0.32	10	0.32	60	1.90	60	1.90	0	0	1	0	0	0	0	0
	GREE3-75	475	10.75	0	0	0	0	75	1.70	75	1.70	50	1.13	1	1	0	0	0	0
	GREE4-25	81	12.68	0	0	0	0	8	1.25	7	1.10	0	0	1	0	0	0	0	0
	GREE4-75	2,520	36.42	220	3.18	220	3.18	120	1.73	120	1.73	20	0.29	1	1	0	0	0	0
	HARM1-50	1,140	6.34	0	0	0	0	700	3.89	700	3.89	0	0	1	0	0	0	0	0
	HARM1-75	2,120	8.12	0	0	0	0	0	0	0	0	1,400	5.36	1	1	0	0	0	0
	HARM5-25	200	1.15	0	0	0	0	40	0.23	40	0.23	20	0.11	1	1	0	0	0	0
	LI8	20	0.22	0	0	0	0	140	1.55	140	1.55	0	0	1	0	0	0	0	0
	LIDSL	80	1.02	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
	LILC3	5,300	26.93	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
	MICH1-25	195	6.98	0	0	0	0	85	3.04	85	3.04	0	0	1	0	0	0	0	0
	NTHO1-25	900	10.16	0	0	0	0	2,080	23.48	2,080	23.48	20	0.23	1	1	0	0	0	0
	NTHO1-50	680	8.83	60	0.78	60	0.78	2,300	29.87	2,300	29.87	180	2.34	1	1	0	0	0	0
	PORT1-0	740	6.22	0	0	0	0	500	4.20	500	4.20	0	0	1	0	0	0	0	0

Table C.9: Number and percent of mine-exposed areas sampled in 2015 (n = 74 areas) having benthic invertebrate characteristics outside normal (reference area) range.

Endpoint		Units	5th and 95th Percentiles of 2015 Reference Area Distribution		# of Mine-exposed Areas		% of Mine-exposed Areas		2.5th and 97.5th Percentiles of 2015 Reference Area Distribution		# of Mine-exposed Areas		% of Mine-exposed Areas	
			Lower (P_5)	Upper (P_{95})	< P_5	> P_{95}	< P_5	> P_{95}	Lower ($P_{2.5}$)	Upper ($P_{97.5}$)	< Normal Range	> Normal Range	< Normal Range	> Normal Range
HBI (Family)		unitless	2.5	3.9	5	31	6.8	42	2.4	4.4	5	19	6.8	26
HBI (LPL)		unitless	2.4	4.5	5	14	6.8	19	2.3	4.7	2	11	2.7	15
Simpson's Diversity (Family)		unitless	0.64	0.87	12	7	16	9.5	0.58	0.88	7	7	9.5	9.5
Evenness (Family)		unitless	0.16	0.42	7	1	9.5	1.4	0.16	0.45	7	0	9.5	0
Simpson's Diversity (LPL)		unitless	0.70	0.93	3	4	4.1	5.4	0.67	0.93	2	1	2.7	1.4
Evenness (LPL)		unitless	0.13	0.44	3	4	4.1	5.4	0.13	0.46	1	1	1.4	1.4
Total Abundance		#/sample	488	11,676	2	14	2.7	19	471	12,756	2	13	2.7	18
Total Family Richness		#/sample	16	24	15	4	20	5.4	14	24	5	4	6.8	5.4
Total LPL Richness		#/sample	22	37	6	3	8.1	4.1	21	39	6	2	8.1	2.7
EPT		#/sample	409	9,299	7	8	9.5	11	398	9,695	7	8	9.5	11
EPT Family Richness		#/sample	10	16	21	0	28	0	10	16	21	0	28	0
EPT LPL Richness		#/sample	13	20	27	0	36	0	12	21	24	0	32	0
Ephemeroptera	Order: Ephemeroptera	#/sample	254	6,207	21	5	28	6.8	246	6,345	21	4	28	5.4
	Ephemeroptera Family Richness	#/sample	3	5	21	0	28	0	3	5	21	0	28	0
	Ephemeroptera LPL Richness	#/sample	4	8.1	26	2	35	2.7	4	9	26	0	35	0
	Family: Baetidae	#/sample	7.9	1,680	20	3	27	4.1	4.9	2,821	20	1	27	1.4
	Genus: *Baetis*	#/sample	2.9	1,523	21	2	28	2.7	0	2,347	0	0	0	0
	Genus: *Baetis tricaudatus* group	#/sample	0	245	0	14	0	19	0	284	0	13	0	18
	Family: Ephemerellidae	#/sample	35	1,667	23	10	31	14	23	1,822	23	8	31	11
	Drunella doddsii	#/sample	0	426	0	7	0	9.5	0	546	0	5	0	6.8
	Family: Heptageniidae	#/sample	88	4,504	23	3	31	4.1	86	4,590	23	3	31	4.1
	Genus: *Epeorus*	#/sample	0	262	0	1	0	1.4	0	305	0	0	0	0
	Genus: *Rhithrogena*	#/sample	0	362	0	1	0	1.4	0	773	0	1	0	1.4
Plecoptera	Order: Plecoptera	#/sample	61	2,290	5	19	6.8	26	59	2,864	5	10	6.8	14
	Plecoptera Family Richness	#/sample	4	7	15	1	20	1.4	4	7	15	1	20	1.4
	Plecoptera LPL Richness	#/sample	4	9	8	0	11	0	4	9	8	0	11	0
	Family: Chloroperlidae	#/sample	6.9	331	23	4	31	5.4	4.9	545	22	0	30	0
	Genus: *Sweltsa*	#/sample	1.9	292	22	4	30	5.4	0	526	0	0	0	0
	Family: Nemouridae	#/sample	2	1,007	5	20	6.8	27	0.98	1,152	4	16	5.4	22
	Genus: *Zapada*	#/sample	1	1,007	4	19	5.4	26	0.98	1,152	4	13	5.4	18
	Zapada columbiana	#/sample	0	231	0	6	0	8.1	0	502	0	0	0	0
	Family: Taeniopterygidae	#/sample	5.7	1,450	22	2	30	2.7	0	1,643	0	2	0	2.7
	Genus: *Taenionema*	#/sample	5.7	1,317	22	2	30	2.7	0	1,643	0	2	0	2.7
Order: Trichoptera		#/sample	11	1,714	4	6	5.4	8.1	5.9	2,827	2	2	2.7	2.7
Trichoptera Family Richness		#/sample	2	5	8	2	11	2.7	0.98	5	0	2	0	2.7
Trichoptera LPL Richness		#/sample	2	6	7	4	9.5	5.4	0.98	6	0	4	0	5.4
Diptera	Order: Diptera	#/sample	35	2,919	0	23	0	31	28	3,940	0	14	0	19
	Diptera Family Richness	#/sample	2	6	1	5	1.4	6.8	2	6	1	5	1.4	6.8
	Diptera LPL Richness	#/sample	4	14	0	9	0	12	4	14	0	9	0	12
	Family: Chironomidae	#/sample	22	2,624	0	17	0	23	21	2,833	0	17	0	23
	Chironomidae LPL Richness	#/sample	3	10	0	4	0	5.4	2	10	0	4	0	5.4
	Genus: *Micropsectra*	#/sample	0	343	0	12	0	16	0	406	0	10	0	14
	Genus: *Orthocladius*	#/sample	0	811	0	20	0	27	0	1,068	0	15	0	20
	Family: Muscidae	#/sample	0	0.05	0	10	0	14	0	1.3	0	10	0	14
	Genus: *Limnophora*	#/sample	0	0.05	0	10	0	14	0	1.3	0	10	0	14
	Family: Psychodidae	#/sample	0	563	0	14	0	19	0	1,023	0	10	0	14
	Genus: *Pericoma/Telmatoscopus*	#/sample	0	563	0	14	0	19	0	1,023	0	10	0	14
Oligochaeta	Class: Oligochaeta	#/sample	0	156	0	19	0	26	0	838	0	3	0	4.1
	Oligochaeta Family Richness	#/sample	0	2	0	3	0	4.1	0	2	0	3	0	4.1
	Oligochaeta LPL Richness	#/sample	0	2	0	6	0	8.1	0	2	0	6	0	8.1
	Family: Enchytraeidae	#/sample	0	104	0	11	0	15	0	800	0	2	0	2.7
	Genus: *Enchytraeus*	#/sample	0	104	0	11	0	15	0	800	0	2	0	2.7
EPT		%	44	96	24	1	32	1.4	38	97	21	0	28	0
Ephemeroptera	Order: Ephemeroptera	%	23	68	33	4	45	5.4	21	72	32	4	43	5.4
	Family: Baetidae	%	0.83	22	23	2	31	2.7	0.69	26	22	2	30	2.7
	Genus: *Baetis*	%	0.34	20	22	0	30	0	0	24	0	0	0	0
	Genus: *Baetis tricaudatus* group	%	0	2.9	0	16	0	22	0	4	0	11	0	15
	Family: Ephemerellidae	%	1.9	23	27	5	36	6.8	1.8	24	25	5	34	6.8
	Drunella doddsii	%	0	7.2	0	2	0	2.7	0	9	0	2	0	2.7
	Family: Heptageniidae	%	5.9	56	31	0	42	0	5.8	60	31	0	42	0
	Genus: *Epeorus*	%	0	3.9	0	0	0	0	0	5.2	0	0	0	0
	Genus: *Rhithrogena*	%	0	13	0	1	0	1.4	0	13	0	1	0	1.4
Plecoptera	Order: Plecoptera	%	7.1	37	10	9	14	12	6.9	38	10	9	14	12
	Family: Chloroperlidae	%	0.59	8.2	34	2	46	2.7	0.52	10	31	0	42	0
	Genus: *Sweltsa*	%	0.27	8.1	24	1	32	1.4	0	8.9	0	1	0	1.4
	Family: Nemouridae	%	0.36	10	7	25	9.5	34	0.14	14	4	17	5.4	23
	Genus: *Zapada*	%	0.18	10	5	25	6.8	34	0.14	14	4	17	5.4	23
	Zapada columbiana	%	0	4.6	0	3	0	4.1	0	6.1	0	2	0	2.7
	Family: Taeniopterygidae	%	0.24	25	20	2	27	2.7	0	26	0	2	0	2.7
	Genus: *Taenionema*	%	0.24	24	20	2	27	2.7	0	25	0	2	0	2.7
Order: Trichoptera		%	1.2	41	7	1	9.5	1.4	0.26	41	0	1	0	1.4
Diptera	Order: Diptera	%	3.1	35	1	29	1.4	39	2.5	48	1	22	1.4	30
	Family: Chironomidae	%	2.3	29	3	24	4.1	32	1.9	44	1	13	1.4	18
	Genus: *Micropsectra*	%	0	3.9	0	15	0	20	0	4.6	0	15	0	20
	Genus: *Orthocladius*	%	0	17	0	14	0	19	0	22	0	11	0	15
	Family: Muscidae	%	0	0.01	0	10	0	14	0	0.15	0	9	0	12
	Genus: *Limnophora*	%	0	0.01	0	10	0	14	0	0.15	0	9	0	12
	Family: Psychodidae	%	0	5.1	0	16	0	22	0	7.8	0	14	0	19
	Genus: *Pericoma/Telmatoscopus*	%	0	5.1	0	16	0	22	0	7.8	0	14	0	19
Oligo-chaeta	Class: Oligochaeta	%	0	4.6	0	10	0	14	0	9	0	6	0	8.1
	Family: Enchytraeidae	%	0	1.4	0	15	0	20	0	7	0	3	0	4.1
	Genus: *Enchytraeus*	%	0	1.4	0	15	0	20	0	7	0	3	0	4.1

percentage > 10%.

Table C.10: Comparison of indicators endpoints to the normal range for mine-exposed (n = 74) areas associated with the RAEMP and Calcite studies, September 2015.

Area	Univariate Endpoints Selected as Indicators of Potential Calcite Effects							Multivariate Indicators											
									Mahalanobis Distance for Family-Level NMDS						Mahalanobis Distance for LPL-Level NMDS					
Normal Range	EPT Family Richness	EPT LPL Richness	Ephemeroptera LPL Richness	% EPT	% Ephemeroptera	% Diptera	% Chironomidae	6 Endpoint Mahalanobis Distance[a]	2-D Ordination (Presence/Absense)	2-D Ordination (Relative Abundance/fourth root transformed)	2-D Ordination (Relative Abundance/ untransformed)	2-D Ordination (Abundance/log transformed)	2-D Ordination (Abundance/ untransformed)	2-D Ordination (Presence/Absense)	2-D Ordination (Relative Abundance/fourth root transformed)	3-D Ordination (Relative Abundance/ untransformed)	3-D Ordination (Abundance/log transformed)	3-D Ordination (Abundance/ untransformed)
$P_{2.5}$	10	12	4	38	21	2.5	1.9	D Critical Value											
$P_{97.5}$	16	21	9	97	72	48	44	3.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.8	2.8	2.8
BOCK	5	5	0	8	0	75	39	8.1	9.8	9.6	4.4	9.6	4.3	6.7	7.1	6.9	7.0	7.2
CACK	2	2	0	12	0	81	76	9.0	11	11	4.6	11	4.4	7.9	8.1	5.5	8.2	5.3
CATA2-25	3	3	0	5	0	82	78	8.8	12	11	4.7	11	4.5	9.0	9.0	5.6	9.3	5.0
CATA2-75	3	3	0	4	0	44	43	13	12	11	4.8	11	4.9	8.5	8.3	5.3	8.6	5.1
COCK	9	11	0	17	0	78	25	8.1	5.0	6.1	4.0	6.1	4.1	4.0	4.8	6.1	4.6	5.4
EL1	15	20	9	70	54	29	27	2.4	0.9	0.6	1.2	0.6	1.1	1.2	0.9	1.5	1.8	1.4
EL19	13	15	5	60	29	37	33	2.2	1.2	1.4	1.7	1.4	1.5	1.3	1.4	1.8	1.5	1.7
EL20	14	19	6	92	55	7.8	5.4	1.3	1.5	1.0	0.7	1.0	0.8	0.4	0.3	0.7	1.0	0.8
ELDEL	15	17	5	87	61	13	9	2.3	0.5	0.3	0.5	0.3	0.8	0.9	0.6	0.9	0.8	0.9
ELDFE	12	15	7	73	65	20	18	2.0	1.7	2.5	3.2	2.5	2.2	2.2	2.5	3.8	2.9	3.6
ELDGR	15	17	6	89	64	10	6.5	2.4	0.6	0.4	0.7	0.4	0.9	0.9	0.6	0.4	0.7	0.8
ELELKO	13	15	6	92	67	8.1	4.1	2.3	2.2	2.4	1.3	2.4	1.6	2.3	2.2	1.7	2.4	2.0
ELH93	11	11	5	22	14	54	54	4.2	3.1	3.3	3.3	3.3	2.9	3.6	3.7	3.7	3.8	3.3
ELUEL	15	17	6	82	55	16	8.8	2.5	1.6	0.5	0.3	0.5	0.4	0.9	0.6	0.7	0.8	0.4
ELUFE	11	15	9	61	54	27	23	2.3	3.2	2.9	2.9	2.9	1.9	2.2	2.3	3.4	2.8	3.0
ELUFO	12	13	6	40	17	53	49	3.2	2.6	2.8	2.7	2.8	2.4	2.4	2.7	3.2	2.7	3.0
ELUSP	12	13	4	68	43	28	24	2.0	2.1	1.1	0.7	1.1	0.7	1.0	0.8	0.9	1.5	1.0
FO10-SP1	11	14	5	75	6	23	21	4.2	2.1	2.4	2.8	2.4	2.4	2.1	2.4	3.2	2.5	2.7
FO22	12	14	5	65	13	22	18	3.0	2.2	2.3	2.3	2.3	2.0	1.5	1.8	2.7	1.7	2.3
FO23	14	17	6	65	21	30	21	2.3	0.6	1.4	1.7	1.4	1.5	1.0	1.2	2.1	1.2	1.9
FO29	15	19	6	56	36	36	30	1.8	0.8	1.0	1.4	1.0	1.4	1.6	1.7	1.8	1.6	1.6
FO9	14	16	5	72	40	24	4.2	5.5	0.4	0.3	0.7	0.3	0.6	0.7	0.6	1.8	0.6	1.3
FOBCP	11	13	3	78	16	21	15	3.5	1.8	1.9	1.7	1.9	1.6	2.0	2.0	2.4	2.0	2.3
FOBKS	13	16	5	69	47	28	4.9	5.5	1.3	0.8	1.2	0.8	0.3	0.5	0.5	2.1	0.5	1.3
FOBSC	14	16	5	62	40	32	3.7	7.0	1.3	1.3	1.4	1.3	0.3	1.1	1.2	2.3	1.3	1.7
FODGH	12	14	4	78	35	18	12	1.9	1.3	1.3	0.9	1.3	1.1	1.3	1.3	1.5	1.3	1.4
FODHE	13	15	6	78	61	22	22	2.0	1.9	0.5	0.6	0.5	1.6	0.1	0.8	0.9	0.8	1.7
FODNGD	11	14	5	94	77	5.4	2.0	2.6	2.1	0.7	1.1	0.7	1.4	1.2	0.9	1.1	1.1	1.2
FODPO	10	10	2	90	8	10	8.3	5.2	2.4	2.4	2.7	2.4	1.5	2.3	2.3	2.6	2.4	2.7
FORD7	12	16	5	69	16	24	18	2.6	1.7	2.1	1.9	2.1	1.7	1.7	2.0	2.4	1.9	2.3
FOUEW	12	14	4	71	26	24	22	2.3	0.8	1.5	1.4	1.5	1.4	1.6	1.7	1.5	1.6	1.4
FOUKI	13	18	7	75	65	21	5.7	3.9	1.4	1.3	0.7	1.3	0.3	1.0	0.9	1.7	1.2	0.4
FOUL	11	12	3	83	30	15	5.4	3.9	2.0	1.7	1.3	1.7	0.3	1.2	1.0	2.1	1.5	0.9
FOUNGD	11	15	6	93	75	7.2	3.9	2.2	2.3	1.1	0.9	1.1	1.2	0.8	0.5	0.8	0.8	1.1
FOUSH	12	13	5	86	73	12	7.1	2.6	2.0	1.2	0.6	1.2	0.8	1.7	1.3	1.1	1.6	0.9
GHCKD	12	13	4	21	6	54	34	4.6	3.4	4.7	3.3	4.7	3.1	3.6	4.0	5.8	3.6	5.5
GHCKU	8	9	2	25	2	74	65	5.9	2.6	3.4	3.2	3.4	3.3	3.2	3.6	3.8	5.0	3.8
GRCK	14	20	6	87	44	11	5.2	1.9	1.5	0.9	0.7	0.9	0.7	0.9	1.1	1.4	1.4	1.3
GRDS	16	20	5	76	30	21	7.4	3.3	1.8	1.3	2.0	1.3	1.2	0.4	0.8	2.7	1.0	2.4
GREE1-50	9	9	2	36	6	53	5.6	9.4	4.5	5.6	4.1	5.6	3.5	4.2	4.7	6.6	4.1	5.9
GREE3-75	12	12	3	31	4	68	63	4.7	2.0	2.5	3.1	2.5	3.0	2.7	3.0	3.3	4.3	3.4
GREE4-25	7	7	2	33	1	66	58	6.2	5.6	6.5	3.8	6.5	3.6	5.5	5.9	4.7	6.8	4.3
GREE4-75	9	9	4	26	3	71	44	5.8	3.2	4.5	3.9	4.5	4.1	3.0	3.8	4.6	6.3	4.7
HACKDS	11	17	5	50	29	40	39	3.2	3.8	2.4	1.9	2.4	1.7	2.7	2.7	1.9	2.2	1.9
HACKUS	15	19	4	85	36	12	7.3	1.6	1.0	1.0	0.9	1.0	1.3	1.6	1.5	1.3	1.7	1.5
HARM1-50	10	14	4	62	44	35	33	2.6	1.9	1.8	1.8	1.8	1.8	2.0	2.0	1.8	1.9	1.9
HARM5-25	15	15	4	97	51	2.4	1.4	3.6	1.4	1.6	1.5	1.6	2.1	1.8	1.6	1.7	1.9	1.9
HENFO	13	18	7	84	75	15	15	2.6	0.8	0.9	1.0	0.9	1.5	0.7	0.9	1.1	1.2	1.9
KICK	8	9	2	16	0	77	68	5.6	4.0	5.6	3.9	5.6	4.0	4.4	5.4	4.9	7.6	5.8
KILM1-50	6	6	2	9	2	67	61	7.0	9.6	9.5	4.5	9.5	4.7	7.2	7.7	5.5	9.5	6.5
LC_DC1	11	14	4	91	54	7.6	3.6	1.9	1.0	1.1	0.6	1.1	1.0	1.4	1.2	1.1	1.4	1.1
LC_DCDS	14	17	6	91	60	8.1	7.6	1.5	0.6	0.3	0.4	0.3	0.8	0.9	0.9	1.1	1.1	1.1
LC_FRUS	11	14	6	64	39	31	28	1.9	1.2	0.9	1.0	0.9	1.2	1.1	1.5	1.2	1.6	1.2
LI8	13	17	4	87	26	8.3	6.5	2.1	1.6	1.3	1.6	1.3	0.3	1.3	1.3	1.5	1.6	1.5
LIDSL	14	17	5	74	38	22	20	1.3	0.9	0.8	0.7	0.8	0.9	1.3	1.3	0.7	1.4	0.7
LILC3	11	12	3	33	8	63	61	4.1	1.2	2.0	3.1	2.0	2.5	1.9	2.3	3.2	2.3	2.7
MI2	15	18	5	73	30	25	20	2.0	1.2	1.0	0.9	1.0	0.9	0.9	1.0	1.4	1.1	1.2
MI3	14	16	6	80	38	17	10	2.1	2.1	1.5	0.6	1.5	0.6	1.9	1.5	2.0	2.4	1.2
MI5	13	14	5	87	30	10	5.1	2.9	1.8	1.9	2.2	1.9	1.3	1.8	1.5	2.6	2.3	1.8
MIDAG	11	16	8	72	43	26	2.2	6.9	1.6	1.5	1.1	1.5	1.7	0.7	0.2	2.1	1.2	1.7
MIDCO	14	17	4	51	22	45	21	3.5	1.1	1.8	2.2	1.8	1.9	1.4	1.8	3.2	1.5	2.7
MIUCO	12	17	7	72	53	23	4	4.7	1.1	1.0	1.4	1.0	1.0	0.1	0.1	2.3	1.2	1.6
MP1	14	17	5	70	51	28	23	1.5	0.6	1.1	0.7	1.1	0.8	1.6	1.6	1.1	1.7	0.9
NGD1u	7	10	2	60	28	39	33	4.7	3.9	3.5	2.1	3.5	2.0	3.8	3.7	3.3	3.9	2.9
NTHO1-25	6	6	0	32	0	66	33	7.3	9.0	8.9	4.0	8.9	4.1	6.4	6.5	6.7	6.8	6.2
NTHO1-50	7	8	1	43	0	53	18	7.3	7.0	7.5	4.2	7.5	3.9	5.6	5.9	6.4	6.1	5.7
OCNM	9	10	2	34	2	22	15	6.6	4.1	5.2	4.0	5.2	3.8	5.0	5.7	6.8	7.2	6.7
POCK	9	11	3	19	1	74	72	5.0	3.3	4.7	3.8	4.7	3.6	3.0	3.9	4.5	3.6	4.5
PORT3-25	7	7	1	91	2	7.7	5.8	6.6	6.1	6.5	4.9	6.5	4.6	6.4	6.6	5.4	7.1	6.1
PORT3-50	8	8	2	75	1	24	21	6.0	3.8	5.1	3.7	5.1	3.5	5.1	5.4	5.3	6.3	5.6
SWCK	5	6	0	29	0	69	60	7.2	6.8	6.8	3.7	6.8	3.3	5.5	6.0	5.8	6.2	5.4
SWIF2-75	8	8	2	32	0	67	43	6.2	4.8	6.0	3.6	6.0	3.4	5.2	6.1	6.5	6.5	6.0
THCK	7	9	1	17	1	56	8.1	9.3	4.1	5.9	5.0	5.9	4.8	4.6	5.3	7.5	5.5	7.7
WOCK	10	10	1	38	0	51	33	4.9	3.2	5.1	3.6	5.1	3.6	3.8	4.7	5.4	5.7	5.3

value > upper limit ($P_{97.5}$) of the normal range
value < lower limit ($P_{2.5}$) of the normal range
value > critical D (i.e., is beyond the limits of the multivariate normal range)

[a] Multivariate endpoint contains: EPT Family Richness, % Ephemeroptera, % EPT, EPT LPL Richness, % Diptera, % Chironomidae (Ephemeroptera LPL Richness was excluded because this endpoint could not be normalized even after data transformation)

Table C.11: Correlation of endpoints for reference (n = 40) and mine-exposed (n = 74) areas sampled in September 2015.

Variables		HBI (Family)	HBI (LPL)	Total Abundance	EPT Family Richness	EPT LPL Richness	Ephemeroptera Family Richness	Ephemeroptera LPL Richness	Plecoptera Family Richness	Plecoptera LPL Richness	Diptera LPL Richness	% EPT	% Ephemeroptera	% Baetidae	% Baetis tricaudatus group	% Ephemerellidae	% Heptageniidae	% Plecoptera	% Chloroperlidae	% Nemouridae	% Zapada	% Diptera	% Chironomidae	% Micropsectra	% Orthocladius	% Muscidae	% Limnophora sp.	% Psychodidae	% Pericoma/Telmatoscopus sp.
HBI (Family)	Pearson Correlation	-	0.896	0.065	-0.559	-0.556	-0.509	-0.535	-0.492	-0.439	-0.285	-0.890	-0.594	-0.166	-0.022	-0.394	-0.508	-0.467	-0.382	-0.001	-0.036	0.794	0.598	0.484	0.397	0.345	0.345	0.399	0.398
	P-value (2-tailed)	-	<0.001	0.493	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	0.078	0.816	<0.001	<0.001	<0.001	<0.001	0.991	0.706	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
HBI (LPL)	Pearson Correlation	0.896	-	-0.034	-0.559	-0.544	-0.439	-0.478	-0.509	-0.445	-0.329	-0.825	-0.507	-0.117	-0.024	-0.392	-0.420	-0.512	-0.361	-0.095	-0.117	0.708	0.667	0.552	0.498	0.359	0.359	0.032	0.031
	P-value (2-tailed)	<0.001	-	0.721	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.214	0.797	<0.001	<0.001	<0.001	<0.001	0.317	0.216	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.737	0.743
Total Abundance	Pearson Correlation	0.065	-0.034	-	0.047	0.064	-0.071	-0.064	-0.036	0.066	0.206	-0.056	-0.054	-0.080	-0.026	0.207	-0.114	-0.004	-0.199	0.150	0.124	0.111	0.019	0.230	-0.065	-0.203	-0.203	0.336	0.336
	P-value (2-tailed)	0.493	0.721	-	0.622	0.502	0.455	0.500	0.705	0.484	0.028	0.552	0.569	0.399	0.787	0.027	0.226	0.964	0.034	0.111	0.188	0.241	0.838	0.014	0.493	0.030	0.030	<0.001	<0.001
EPT Family Richness	Pearson Correlation	-0.559	-0.559	0.047	-	0.931	0.782	0.729	0.821	0.793	0.667	0.660	0.592	0.397	0.277	0.373	0.443	0.065	0.418	-0.212	-0.192	-0.640	-0.571	-0.453	-0.333	-0.470	-0.470	-0.085	-0.084
	P-value (2-tailed)	<0.001	<0.001	0.622	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	<0.001	<0.001	0.491	<0.001	0.023	0.041	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.369	0.375
EPT LPL Richness	Pearson Correlation	-0.556	-0.544	0.064	0.931	-	0.768	0.838	0.733	0.806	0.683	0.675	0.648	0.460	0.262	0.458	0.442	0.000	0.367	-0.234	-0.215	-0.656	-0.582	-0.449	-0.352	-0.454	-0.454	-0.098	-0.097
	P-value (2-tailed)	<0.001	<0.001	0.502	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.005	<0.001	<0.001	0.999	<0.001	0.012	0.022	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.300	0.304
Ephemeroptera Family Richness	Pearson Correlation	-0.509	-0.439	-0.071	0.782	0.768	-	0.869	0.522	0.498	0.316	0.571	0.656	0.381	0.204	0.476	0.446	-0.119	0.256	-0.378	-0.351	-0.571	-0.426	-0.400	-0.169	-0.400	-0.400	-0.243	-0.242
	P-value (2-tailed)	<0.001	<0.001	0.455	<0.001	<0.001	-	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	0.029	<0.001	<0.001	0.207	0.006	<0.001	<0.001	<0.001	<0.001	<0.001	0.073	<0.001	<0.001	0.009	0.009
Ephemeroptera LPL Richness	Pearson Correlation	-0.535	-0.478	-0.064	0.729	0.838	0.869	-	0.527	0.499	0.316	0.627	0.728	0.422	0.168	0.585	0.465	-0.161	0.292	-0.450	-0.423	-0.627	-0.498	-0.410	-0.231	-0.376	-0.376	-0.216	-0.215
	P-value (2-tailed)	<0.001	<0.001	0.500	<0.001	<0.001	<0.001	-	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	0.074	<0.001	<0.001	0.086	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.013	<0.001	<0.001	0.021	0.021
Plecoptera Family Richness	Pearson Correlation	-0.492	-0.509	-0.036	0.821	0.733	0.522	0.527	-	0.866	0.325	0.601	0.494	0.363	0.273	0.190	0.416	0.184	0.487	-0.149	-0.130	-0.574	-0.501	-0.464	-0.294	-0.391	-0.391	-0.067	-0.066
	P-value (2-tailed)	<0.001	<0.001	0.705	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	0.043	<0.001	0.050	<0.001	0.115	0.167	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	0.478	0.484
Plecoptera LPL Richness	Pearson Correlation	-0.439	-0.445	0.066	0.793	0.806	0.498	0.499	0.866	-	0.428	0.542	0.451	0.384	0.256	0.179	0.359	0.149	0.411	-0.027	-0.021	-0.513	-0.454	-0.411	-0.301	-0.390	-0.390	-0.054	-0.053
	P-value (2-tailed)	<0.001	<0.001	0.484	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	0.006	0.056	<0.001	0.114	<0.001	0.773	0.821	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	0.569	0.576
Diptera LPL Richness	Pearson Correlation	-0.285	-0.329	0.206	0.667	0.683	0.316	0.316	0.325	0.428	-	0.370	0.240	0.242	0.207	0.217	0.156	0.080	0.145	0.048	0.055	-0.347	-0.401	-0.201	-0.319	-0.289	-0.289	0.111	0.111
	P-value (2-tailed)	0.002	<0.001	0.028	<0.001	<0.001	0.001	0.001	<0.001	<0.001	-	<0.001	0.010	0.009	0.027	0.020	0.098	0.396	0.124	0.613	0.559	<0.001	<0.001	0.032	0.001	0.002	0.002	0.242	0.239
% EPT	Pearson Correlation	-0.890	-0.825	-0.056	0.660	0.675	0.571	0.627	0.601	0.542	0.370	-	0.771	0.400	0.254	0.341	0.686	0.349	0.423	-0.084	-0.051	-0.953	-0.833	-0.548	-0.582	-0.442	-0.442	-0.232	-0.231
	P-value (2-tailed)	<0.001	<0.001	0.552	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	0.006	<0.001	<0.001	<0.001	<0.001	0.373	0.592	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.013	0.013
% Ephemeroptera	Pearson Correlation	-0.594	-0.507	-0.054	0.592	0.648	0.656	0.728	0.494	0.451	0.240	0.771	-	0.492	0.371	0.499	0.850	-0.198	0.418	-0.439	-0.413	-0.752	-0.638	-0.380	-0.429	-0.327	-0.327	-0.214	-0.213
	P-value (2-tailed)	<0.001	<0.001	0.569	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.010	<0.001	-	<0.001	<0.001	<0.001	<0.001	0.035	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.022	0.023
% Baetidae	Pearson Correlation	-0.166	-0.117	-0.080	0.397	0.460	0.381	0.422	0.363	0.384	0.242	0.400	0.492	-	0.664	0.089	0.212	-0.119	0.151	-0.189	-0.167	-0.381	-0.338	-0.232	-0.238	-0.212	-0.212	-0.065	-0.064
	P-value (2-tailed)	0.078	0.214	0.399	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.009	<0.001	<0.001	-	<0.001	0.346	0.023	0.206	0.109	0.044	0.075	<0.001	<0.001	0.013	0.011	0.024	0.024	0.494	0.496
% Baetis tricaudatus group	Pearson Correlation	-0.022	-0.024	-0.026	0.277	0.262	0.204	0.168	0.273	0.256	0.207	0.254	0.371	0.664	-	-0.042	0.279	-0.145	0.028	-0.130	-0.112	-0.239	-0.276	-0.177	-0.209	-0.126	-0.126	0.104	0.104
	P-value (2-tailed)	0.816	0.797	0.787	0.003	0.005	0.029	0.074	0.003	0.006	0.027	0.006	<0.001	<0.001	-	0.660	0.003	0.124	0.771	0.168	0.236	0.010	0.003	0.060	0.025	0.181	0.181	0.273	0.272
% Ephemerellidae	Pearson Correlation	-0.394	-0.392	0.207	0.373	0.458	0.476	0.585	0.190	0.179	0.217	0.341	0.499	0.089	-0.042	-	0.087	-0.217	0.121	-0.256	-0.242	-0.335	-0.277	-0.199	-0.125	-0.197	-0.197	-0.074	-0.073
	P-value (2-tailed)	<0.001	<0.001	0.027	<0.001	<0.001	<0.001	<0.001	0.043	0.056	0.020	<0.001	<0.001	0.346	0.660	-	0.357	0.020	0.200	0.006	0.010	<0.001	0.003	0.034	0.185	0.036	0.036	0.435	0.437
% Heptageniidae	Pearson Correlation	-0.508	-0.420	-0.114	0.443	0.442	0.446	0.465	0.416	0.359	0.156	0.686	0.850	0.212	0.279	0.087	-	-0.081	0.427	-0.352	-0.335	-0.665	-0.567	-0.299	-0.414	-0.242	-0.242	-0.205	-0.204
	P-value (2-tailed)	<0.001	<0.001	0.226	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.098	<0.001	<0.001	0.023	0.003	0.357	-	0.394	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.010	0.010	0.029	0.029
% Plecoptera	Pearson Correlation	-0.467	-0.512	-0.004	0.065	0.000	-0.119	-0.161	0.184	0.149	0.080	0.349	-0.198	-0.119	-0.145	-0.217	-0.081	-	0.044	0.561	0.576	-0.286	-0.272	-0.253	-0.194	-0.185	-0.185	-0.045	-0.044
	P-value (2-tailed)	<0.001	<0.001	0.964	0.491	0.999	0.207	0.086	0.050	0.114	0.396	<0.001	0.035	0.206	0.124	0.020	0.394	-	0.642	<0.001	<0.001	0.002	0.003	0.007	0.038	0.049	0.049	0.637	0.641
% Chloroperlidae	Pearson Correlation	-0.382	-0.361	-0.199	0.418	0.367	0.256	0.292	0.487	0.411	0.145	0.423	0.418	0.151	0.028	0.121	0.427	0.044	-	-0.204	-0.193	-0.421	-0.362	-0.223	-0.253	-0.183	-0.183	-0.171	-0.170
	P-value (2-tailed)	<0.001	<0.001	0.034	<0.001	<0.001	0.006	0.002	<0.001	<0.001	0.124	<0.001	<0.001	0.109	0.771	0.200	<0.001	0.642	-	0.030	0.040	<0.001	<0.001	0.017	0.007	0.051	0.051	0.070	0.070
% Nemouridae	Pearson Correlation	-0.001	-0.095	0.150	-0.212	-0.234	-0.378	-0.450	-0.149	-0.027	0.048	-0.084	-0.439	-0.189	-0.130	-0.256	-0.352	0.561	-0.204	-	0.993	0.135	0.024	0.046	-0.125	-0.033	-0.033	0.231	0.231
	P-value (2-tailed)	0.991	0.317	0.111	0.023	0.012	<0.001	<0.001	0.115	0.773	0.613	0.373	<0.001	0.044	0.168	0.006	<0.001	<0.001	0.030	-	<0.001	0.152	0.797	0.627	0.185	0.731	0.731	0.014	0.013
% Zapada	Pearson Correlation	-0.036	-0.117	0.124	-0.192	-0.215	-0.351	-0.423	-0.130	-0.021	0.055	-0.051	-0.413	-0.167	-0.112	-0.242	-0.335	0.576	-0.193	0.993	-	0.098	0.008	0.016	-0.122	-0.026	-0.026	0.188	0.188
	P-value (2-tailed)	0.706	0.216	0.188	0.041	0.022	<0.001	<0.001	0.167	0.821	0.559	0.592	<0.001	0.075	0.236	0.010	<0.001	<0.001	0.040	<0.001	-	0.298	0.929	0.864	0.195	0.785	0.785	0.045	0.045
% Diptera	Pearson Correlation	0.794	0.708	0.111	-0.640	-0.656	-0.571	-0.627	-0.574	-0.513	-0.347	-0.953	-0.752	-0.381	-0.239	-0.335	-0.665	-0.286	-0.421	0.135	0.098	-	0.878	0.558	0.608	0.458	0.458	0.287	0.286
	P-value (2-tailed)	<0.001	<0.001	0.241	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.010	<0.001	<0.001	0.002	<0.001	0.152	0.298	-	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	0.002
% Chironomidae	Pearson Correlation	0.598	0.667	0.019	-0.571	-0.582	-0.426	-0.498	-0.501	-0.454	-0.401	-0.833	-0.638	-0.338	-0.276	-0.277	-0.567	-0.272	-0.362	0.024	0.008	0.878	-	0.513	0.769	0.525	0.525	-0.115	-0.116
	P-value (2-tailed)	<0.001	<0.001	0.838	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	0.003	<0.001	0.003	<0.001	0.797	0.929	<0.001	-	<0.001	<0.001	<0.001	<0.001	0.225	0.221
% Micropsectra	Pearson Correlation	0.484	0.552	0.230	-0.453	-0.449	-0.400	-0.410	-0.464	-0.411	-0.201	-0.548	-0.380	-0.232	-0.177	-0.199	-0.299	-0.253	-0.223	0.046	0.016	0.558	0.513	-	0.241	0.209	0.209	0.047	0.045
	P-value (2-tailed)	<0.001	<0.001	0.014	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.032	<0.001	<0.001	0.013	0.060	0.034	0.001	0.007	0.017	0.627	0.864	<0.001	<0.001	-	0.010	0.026	0.026	0.622	0.634
% Orthocladius	Pearson Correlation	0.397	0.498	-0.065	-0.333	-0.352	-0.169	-0.231	-0.294	-0.301	-0.319	-0.582	-0.429	-0.238	-0.209	-0.125	-0.414	-0.194	-0.253	-0.125	-0.122	0.608	0.769	0.241	-	0.295	0.295	-0.168	-0.168
	P-value (2-tailed)	<0.001	<0.001	0.493	<0.001	<0.001	0.073	0.013	0.001	0.001	0.001	<0.001	<0.001	0.011	0.025	0.185	<0.001	0.038	0.007	0.185	0.195	<0.001	<0.001	0.010	-	0.001	0.001	0.074	0.073
% Muscidae	Pearson Correlation	0.345	0.359	-0.203	-0.470	-0.454	-0.400	-0.376	-0.391	-0.390	-0.289	-0.442	-0.327	-0.212	-0.126	-0.197	-0.242	-0.185	-0.183	-0.033	-0.026	0.458	0.525	0.209	0.295	-	1.000	-0.070	-0.071
	P-value (2-tailed)	<0.001	<0.001	0.030	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	0.024	0.181	0.036	0.010	0.049	0.051	0.731	0.785	<0.001	<0.001	0.026	0.001	-	<0.001	0.459	0.453
% Limnophora sp.	Pearson Correlation	0.345	0.359	-0.203	-0.470	-0.454	-0.400	-0.376	-0.391	-0.390	-0.289	-0.442	-0.327	-0.212	-0.126	-0.197	-0.242	-0.185	-0.183	-0.033	-0.026	0.458	0.525	0.209	0.295	1.000	-	-0.070	-0.071
	P-value (2-tailed)	<0.001	<0.001	0.030	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	0.024	0.181	0.036	0.010	0.049	0.051	0.731	0.785	<0.001	<0.001	0.026	0.001	<0.001	-	0.459	0.453
% Psychodidae	Pearson Correlation	0.399	0.032	0.336	-0.085	-0.098	-0.243	-0.216	-0.067	-0.054	0.111	-0.232	-0.214	-0.065	0.104	-0.074	-0.205	-0.045	-0.171	0.231	0.188	0.287	-0.115	0.047	-0.168	-0.070	-0.070	-	1.000
	P-value (2-tailed)	<0.001	0.737	<0.001	0.369	0.300	0.009	0.021	0.478	0.569	0.242	0.013	0.022	0.494	0.273	0.435	0.029	0.637	0.070	0.014	0.045	0.002	0.225	0.622	0.074	0.459	0.459	-	<0.001
% Pericoma/Telmatoscopus sp.	Pearson Correlation	0.398	0.031	0.336	-0.084	-0.097	-0.242	-0.215	-0.066	-0.053	0.111	-0.231	-0.213	-0.064	0.104	-0.073	-0.204	-0.044	-0.170	0.231	0.188	0.286	-0.116	0.045	-0.168	-0.071	-0.071	1.000	-
	P-value (2-tailed)	<0.001	0.743	<0.001	0.375	0.304	0.009	0.021	0.484	0.576	0.239	0.013	0.023	0.496	0.272	0.437	0.029	0.641	0.070	0.013	0.045	0.002	0.221	0.634	0.073	0.453	0.453	<0.001	-

p-value < 0.05.

Table C.12: List of mean skewness and kurtosis values for various transformations of the benthic invertebrate lowest practical level abundance matrix for reference (n = 40) and mine-influenced (n = 74) areas, September 2015.

Transformation	Endpoint	Skewness (mean)	Kurtosis (mean)
None	Area\Row	6.512	49.957
	Taxa\Col	6.078	46.734
Log_{10}	Area\Row	1.508	1.399
	Taxa\Col	2.614	13.601
Square root	Area\Row	3.544	16.401
	Taxa\Col	3.893	22.934
Fourth root	Area\Row	1.67	2.425
	Taxa\Col	2.679	13.566
Power 2	Area\Row	8.582	79.428
	Taxa\Col	8.089	73.109
Power 4	Area\Row	9.598	95.508
	Taxa\Col	9.373	92.367

- indicates lowest mean skewness and kurtosis value of area by taxa matrix.

Table C.13: List of mean skewness and kurtosis values for various transformations of the benthic invertebrate lowest practical level proportional matrix for reference (n = 40) and mine-influenced (n = 74) areas, September 2015.

Transformation	Endpoint	Skewness (mean)	Kurtosis (mean)
None	Area\Row	6.512	49.957
	Taxa\Col	5.621	40.804
Log_{10}	Area\Row	6.244	46.137
	Taxa\Col	5.525	39.7
Square root	Area\Row	3.544	16.401
	Taxa\Col	3.601	20.364
Fourth root	Area\Row	1.67	2.425
	Taxa\Col	2.532	12.815
Power 2	Area\Row	8.582	79.428
	Taxa\Col	7.807	68.989
Power 4	Area\Row	9.598	95.508
	Taxa\Col	9.319	91.694

- indicates lowest mean skewness and kurtosis value of area by taxa matrix.

Table C.14: NMS results of the non-transformed abundance matrix of the benthic community structure at lowest practical level for reference (n = 40) and mine-influenced (n = 74) areas. Percent variance explained, Monte Carlo randomized p-values of axis significance, and station scores, September 2015.

Axis		NMS-1	NMS-2
% Variance explained		37.7	31.8
Monte Carlo P		0.004	0.004
Reference	AGCK	0.310	-0.986
	AL4	0.506	-0.167
	ALUSM	0.342	-0.044
	BU2	-0.747	-0.650
	BU40	-0.305	-0.039
	BUUQ	-0.358	-0.299
	CADCK	0.518	-0.604
	CHCK	0.710	-0.323
	CRUKO	-1.278	-0.808
	DACK	0.349	-0.039
	DUCK	0.166	0.332
	EL12	0.364	-0.336
	ELUGH	-0.047	-0.543
	EWCK	0.117	-0.473
	FLAD	0.459	0.168
	FLAU	0.146	0.023
	FO26	0.433	-0.421
	FLRU	-0.080	-0.358
	GRUHA	-0.012	-0.535
	HENUP	0.328	-0.911
	KO1	-1.061	-0.611
	KODCR	-1.529	-0.267
	KOUCR	-1.510	-0.150
	KOUVE	-0.656	0.256
	LC_GRCK	0.143	-0.158
	LI24	-0.259	-0.748
	MCCR	0.478	-0.603
	MI25	0.241	-0.410
	OLDDU	-0.726	-0.112
	OLDLI	0.069	-0.879
	OLDLOW	-0.313	-0.292
	PADAL	-1.336	-0.477
	PAUKO	-1.493	-0.422
	RACK	-0.306	-0.384
	SLINE	0.234	-0.699
	VEUKO	-1.196	-0.525
	VEUP	-1.180	0.133
	VICK	0.320	-0.339
	WWRL	-0.122	-0.300
	WWRU	-1.269	-0.811

Table C.14: NMS results of the non-transformed abundance matrix of the benthic community structure at lowest practical level for reference (n = 40) and mine-influenced (n = 74) areas. Percent variance explained, Monte Carlo randomized p-values of axis significance, and station scores, September 2015.

Axis		NMS-1	NMS-2
% Variance explained		37.7	31.8
Monte Carlo P		0.004	0.004
Mine-influenced	BOCK	0.354	1.718
	CACK	0.225	1.335
	CATA2-25	-0.171	1.211
	CATA2-75	-0.012	1.250
	COCK	1.200	1.237
	EL19	-0.282	0.175
	EL1	0.235	-0.195
	EL20	0.066	-0.571
	ELDFE	0.643	0.129
	ELELKO	0.195	-0.789
	ELH93	-0.319	0.502
	ELUEL	0.033	-0.383
	ELUFE	0.445	0.046
	ELUFO	0.438	0.466
	ELUSP	0.133	-0.215
	FO19-SP1	0.822	0.375
	FO22	0.928	0.150
	FO23	-0.196	0.198
	FO29	0.280	0.077
	FO9	0.197	-0.310
	FOBCP	-0.134	0.193
	FOBKS	-0.053	-0.275
	FOBSC	-0.291	-0.104
	FODGH	0.450	-0.113
	FODHE	0.810	-0.213
	FODPO	0.606	-0.020
	FORD7-75	0.109	0.316
	FOUEW	0.307	-0.007
	FOUKI	-0.141	-0.418
	FOUL	-0.391	-0.371
	FOUNGD	0.307	-0.570
	FOUSH	0.264	-0.466
	GHCKD	0.337	1.012
	GHCKU	-0.956	0.784
	GRCK	0.323	-0.223
	GRDS	0.384	0.086
	GREE1-50	0.467	0.842
	GREE3-75	-0.984	0.654
	GREE4-25	-0.226	1.011
	GREE4-75	-1.578	0.938

Table C.14: NMS results of the non-transformed abundance matrix of the benthic community structure at lowest practical level for reference (n = 40) and mine-influenced (n = 74) areas. Percent variance explained, Monte Carlo randomized p-values of axis significance, and station scores, September 2015.

Axis		NMS-1	NMS-2
% Variance explained		37.7	31.8
Monte Carlo P		0.004	0.004
Mine-influenced	HACKDS	0.473	-0.116
	HACKUS	0.626	-0.244
	HARM1-50	0.631	0.072
	HARM5-25	0.724	-0.739
	HENFO	0.678	-0.484
	KICK	-1.501	1.029
	KILM1-50	-2.051	1.243
	LC_DC1	0.368	-0.528
	LC_DCDS	0.437	-0.507
	LC_FRUS	-0.502	-0.006
	LI8	-0.347	-0.395
	LIDSL	0.149	-0.212
	LILC3	0.802	0.110
	M12	0.046	-0.103
	M13	0.191	-0.588
	M15	0.078	-0.664
	MIDAG	0.698	-0.432
	MIDCO	0.587	0.298
	MIUCO	0.349	-0.314
	MP1	0.101	-0.104
	FODNGD	0.403	-0.610
	NTHO1-25	0.880	1.203
	NTHO1-50	0.792	1.108
	OCNM	-0.971	0.556
	POCK	1.022	0.982
	PORT3-25	0.343	0.329
	PORT3-50	-0.192	0.590
	SWCK	0.383	1.162
	SWIF2-75	0.851	0.810
	THCK	-0.403	1.345
	WOCK	-0.858	1.087
	ELDGR	-0.758	-0.428
	ELDEL	0.238	-0.510
	NGD1u	0.460	0.407

Table C.15: Pearson correlation of NMS community structure axes (derived from lowest practical level taxonomy using non-transformed abundance matrix) with benthic taxa for reference (n = 40) and mine-influenced (n = 74) areas, September 2015.

Category	Variable	NMS-1		NMS-2	
		r	p	r	p
Benthic Family	Ameletus	0.038	0.687	-0.321	0.001
	Baetidae	0.134	0.155	-0.053	0.572
	Acentrella sp.	0.080	0.395	-0.114	0.226
	Baetis	0.309	0.001	-0.210	0.025
	Baetis bicaudatus	0.119	0.208	-0.082	0.388
	Baetis tricaudatus group	0.231	0.013	-0.222	0.017
	Ephemerellidae	0.316	0.001	-0.125	0.185
	Drunella doddsii	0.295	0.001	-0.332	0.000
	Drunella flavilinea	0.041	0.665	-0.172	0.068
	Drunella grandis group	0.203	0.030	0.014	0.879
	Drunella sp.	0.169	0.073	-0.082	0.386
	Ephemerella	0.081	0.393	-0.068	0.471
	Heptageniidae	0.420	0.000	-0.560	0.000
	Cinygmula sp.	0.067	0.478	-0.240	0.010
	Epeorus	0.211	0.024	-0.317	0.001
	Rhithrogena	0.070	0.462	-0.317	0.001
	Leptophlebiidae	0.078	0.410	-0.030	0.752
	Capniidae	0.137	0.147	0.164	0.082
	Chloroperlidae	0.135	0.153	-0.171	0.069
	Sweltsa sp.	0.274	0.003	-0.384	0.000
	Leuctridae	0.157	0.095	-0.133	0.159
	Nemouridae	0.204	0.030	0.182	0.052
	Amphinemura sp.	0.086	0.363	0.258	0.006
	Zapada	0.418	0.000	0.225	0.016
	Zapada cinctipes	0.270	0.004	0.313	0.001
	Zapada columbiana	0.256	0.006	-0.089	0.346
	Zapada oregonensis group	0.280	0.003	-0.118	0.211
	Peltoperlidae	0.082	0.385	0.024	0.802
	Yoraperla sp.	0.121	0.200	-0.097	0.307
	Perlidae	0.076	0.419	-0.020	0.833
	Hesperoperla sp.	0.010	0.919	-0.141	0.136
	Perlodidae	0.287	0.002	0.039	0.678
	Megarcys sp.	0.325	0.000	-0.236	0.012
	Pteronarcella sp.	0.041	0.668	-0.115	0.224
	Taeniopterygidae	0.031	0.747	-0.148	0.117
	Taenionema	0.286	0.002	-0.348	0.000
	Apataniidae	0.106	0.260	-0.143	0.129
	Brachycentridae	0.131	0.165	-0.050	0.596
	Glossosomatidae	0.114	0.227	-0.185	0.048
	Hydropsychidae	0.144	0.126	-0.089	0.348
	Arctopsyche sp.	-0.052	0.581	-0.210	0.025
	Hydropsyche	-0.006	0.952	-0.122	0.196
	Parapsyche sp.	0.187	0.046	-0.021	0.825
	Lepidostoma	0.090	0.343	-0.130	0.169
	Limnephilidae	0.221	0.018	0.178	0.059
	Rhyacophila	0.405	0.000	0.017	0.858
	Rhyacophila brunnea/vemna group	0.400	0.000	0.218	0.020
	Rhyacophila betteni group	0.091	0.336	-0.030	0.750
	Rhyacophila hyalinata group	0.233	0.013	-0.107	0.257
	Uenoidae	0.099	0.294	-0.110	0.243

Table C.15: Pearson correlation of NMS community structure axes (derived from lowest practical level taxonomy using non-transformed abundance matrix) with benthic taxa for reference (n = 40) and mine-influenced (n = 74) areas, September 2015.

Category	Variable	NMS-1		NMS-2	
		r	p	r	p
Benthic Family	Elmidae	0.235	0.012	0.119	0.208
	Optioservus sp.	0.202	0.031	0.030	0.753
	Atherix	0.130	0.168	0.031	0.740
	Bezzia/ Palpomyia	0.157	0.095	-0.046	0.630
	Probezzia	0.089	0.348	-0.055	0.558
	Cryptochironomus	-0.140	0.138	0.086	0.365
	Microtendipes pedellus group	-0.059	0.536	0.082	0.385
	Paracladopelma sp.	0.009	0.924	0.054	0.569
	Paratendipes	-0.140	0.138	0.086	0.365
	Phaenopsectra	0.049	0.602	-0.071	0.451
	Stictochironomus	0.050	0.596	-0.048	0.610
	Cladotanytarsus	-0.052	0.586	-0.046	0.626
	Stempellina sp.	0.082	0.383	-0.066	0.487
	Sublettea	0.111	0.239	0.019	0.840
	Boreoheptagyia sp.	0.017	0.854	0.016	0.865
	Potthastia longimana group	-0.046	0.628	0.077	0.414
	Corynoneura	0.029	0.759	0.336	0.000
	Cricotopus	0.192	0.041	0.257	0.006
	Heterotrissocladius marcidus group.	0.035	0.708	0.024	0.802
	Krenosmittia sp.	-0.153	0.105	-0.094	0.319
	Polypedilum sp.	0.057	0.546	-0.015	0.876
	Micropsectra	0.331	0.000	0.392	0.000
	Rheotanytarsus	0.093	0.325	-0.006	0.947
	Stempellinella sp.	0.108	0.252	0.239	0.010
	Diamesa	0.134	0.156	0.270	0.004
	Pagastia	0.369	0.000	0.168	0.075
	Pseudodiamesa sp.	0.140	0.137	0.229	0.014
	Brillia sp.	0.047	0.620	0.089	0.346
	Cricotopus (Nostococladius)	0.046	0.630	-0.098	0.298
	Eukiefferiella	0.318	0.001	0.228	0.015
	Heleniella sp.	0.166	0.077	0.262	0.005
	Hydrobaenus	0.184	0.050	0.201	0.032
	Limnophyes sp.	0.073	0.438	0.311	0.001
	Orthocladius	0.370	0.000	0.295	0.001
	Parametriocnemus	0.068	0.474	0.213	0.023
	Rheocricotopus	0.190	0.043	-0.027	0.772
	Thienemanniella	0.079	0.401	0.219	0.019
	Tvetenia bavarica group	0.336	0.000	0.235	0.012
	Thienemannimyia group	0.065	0.493	0.194	0.039
	Empididae	0.142	0.132	0.142	0.131
	Chelifera/ Metachela	0.282	0.002	0.108	0.252
	Limnophora sp.	0.040	0.672	0.515	0.000
	Glutops sp.	0.128	0.175	0.075	0.431
	Pericoma/Telmatoscopus sp.	0.305	0.001	0.254	0.006
	Simuliidae	0.142	0.133	0.421	0.000
	Tipulidae	0.139	0.140	0.166	0.077
	Antocha sp.	0.104	0.269	-0.046	0.626

Table C.15: Pearson correlation of NMS community structure axes (derived from lowest practical level taxonomy using non-transformed abundance matrix) with benthic taxa for reference (n = 40) and mine-influenced (n = 74) areas, September 2015.

Category	Variable	NMS-1		NMS-2	
		r	p	r	p
Benthic Family	Dicranota	0.420	0.000	0.197	0.036
	Hexatoma sp.	-0.010	0.914	-0.136	0.150
	Limnophila sp.	0.111	0.240	-0.121	0.199
	Trombidiformes	0.258	0.006	0.202	0.032
	Aturus	0.213	0.023	0.215	0.022
	Lebertia	0.236	0.011	0.019	0.839
	Sperchon	0.124	0.188	0.030	0.754
	Sperchonopsis sp.	0.070	0.462	0.045	0.632
	Testudacarus sp.	0.083	0.378	0.059	0.532
	Torrenticola	0.044	0.645	-0.124	0.187
	Oribatida	0.154	0.102	0.239	0.010
	Pisidium	0.020	0.831	0.212	0.023
	Lumbriculidae	0.163	0.083	0.016	0.870
	Rhynchelmis sp.	0.088	0.354	-0.120	0.203
	Enchytraeus	0.124	0.190	0.446	0.000
	Nais	0.142	0.131	0.109	0.250
	Tubificinae	0.033	0.726	0.216	0.021

indicates absolute r-value greater than 0.60.
indicates a p-value below 0.05.

Table C.16: NMS results of the log_{10} transformed abundance matrix of the benthic community structure at lowest practical level for reference (n = 40) and mine-influenced (n = 74) areas. Percent variance explained, Monte Carlo randomized p-values of axis significance, and station scores, September 2015.

Axis		NMS-1	NMS-2	NMS-3
% Variance explained		57.5	20.9	12.3
Monte Carlo P		0.004	0.004	0.004
Reference	AGCK	-0.683	-0.201	-0.504
	AL4	-0.135	0.321	-0.308
	ALUSM	-0.314	0.285	-0.040
	BU2	-0.749	-0.557	0.054
	BU40	-0.234	0.015	0.448
	BUUQ	-0.312	-0.147	-0.094
	CADCK	-0.592	0.326	-0.281
	CHCK	-0.191	0.529	-0.317
	CRUKO	-1.212	-0.979	-0.211
	DACK	-0.237	0.303	-0.123
	DUCK	-0.024	0.276	0.011
	EL12	-0.087	0.304	0.170
	ELUGH	-0.628	-0.102	0.204
	EWCK	-0.681	0.200	-0.179
	FLAD	-0.109	0.490	0.620
	FLAU	-0.090	0.792	0.545
	FO26	-0.191	-0.025	-0.376
	FLRU	-0.408	0.551	0.600
	GRUHA	-0.526	0.052	-0.337
	HENUP	-0.612	-0.264	-0.496
	KO1	-0.033	-1.607	0.296
	KODCR	-0.611	-1.304	0.352
	KOUCR	-0.483	-1.108	0.253
	KOUVE	0.190	-0.323	0.577
	LC_GRCK	-0.476	0.183	-0.818
	LI24	-0.405	-0.533	-0.607
	MCCR	-0.740	0.245	-0.417
	MI25	-0.363	-0.047	-0.229
	OLDDU	-0.115	-0.446	0.519
	OLDLI	-0.924	-0.015	0.142
	OLDLOW	-0.391	-0.177	0.813
	PADAL	-0.766	-0.972	-0.160
	PAUKO	-0.746	-1.119	0.178
	RACK	-0.285	-0.073	0.377
	SLINE	-0.714	0.090	-0.602
	VEUKO	-0.377	-1.556	-0.007
	VEUP	-0.285	-0.845	-0.357
	VICK	-0.305	0.218	-0.074
	WWRL	-0.586	0.051	0.002
	WWRU	-1.167	-0.757	0.132

Table C.16: NMS results of the log_{10} transformed abundance matrix of the benthic community structure at lowest practical level for reference (n = 40) and mine-influenced (n = 74) areas. Percent variance explained, Monte Carlo randomized p-values of axis significance, and station scores, September 2015.

Axis		NMS-1	NMS-2	NMS-3
Mine-influenced	BOCK	1.691	0.436	0.697
	CACK	1.971	-0.114	0.605
	CATA2-25	2.159	-0.616	0.459
	CATA2-75	1.987	-0.489	0.362
	COCK	0.940	0.647	0.082
	EL19	-0.022	0.020	0.362
	EL1	-0.597	0.221	0.408
	EL20	-0.474	0.198	0.183
	ELDFE	-0.197	0.099	1.085
	ELELKO	-0.705	-0.277	0.718
	ELH93	0.137	-0.739	1.405
	ELUEL	-0.284	0.064	0.219
	ELUFE	-0.227	0.119	1.033
	ELUFO	0.188	0.448	0.800
	ELUSP	-0.463	0.146	0.441
	FO19-SP1	0.219	0.111	-0.215
	FO22	0.016	0.475	-0.017
	FO23	-0.087	0.146	0.199
	FO29	-0.003	0.445	0.054
	FO9	-0.289	0.052	0.142
	FOBCP	0.175	0.056	0.114
	FOBKS	-0.301	-0.149	0.042
	FOBSC	-0.071	-0.140	-0.043
	FODGH	-0.122	0.328	-0.076
	FODHE	-0.267	0.052	-0.114
	FODPO	0.185	0.182	-0.247
	FORD7-75	0.059	0.413	-0.169
	FOUEW	-0.042	0.386	-0.128
	FOUKI	-0.118	-0.274	0.036
	FOUL	-0.298	0.170	0.491
	FOUNGD	-0.479	0.036	-0.269
	FOUSH	0.029	0.030	0.047
	GHCKD	0.638	0.936	0.352
	GHCKU	0.852	-0.704	-0.009
	GRCK	-0.433	0.461	-0.386
	GRDS	-0.395	0.374	-0.169
	GREE1-50	0.740	1.198	0.268
	GREE3-75	0.666	-0.560	-0.079
	GREE4-25	1.391	-0.358	-0.080
	GREE4-75	1.203	-1.154	0.418
	HACKDS	-0.260	1.013	-0.376
	HACKUS	-0.137	0.391	-0.344
	HARM1-50	-0.025	0.638	-0.217
	HARM5-25	-0.396	0.371	-0.653
	HENFO	-0.185	-0.055	-0.206
	KICK	1.222	-1.150	-0.700

Table C.16: NMS results of the log_{10} transformed abundance matrix of the benthic community structure at lowest practical level for reference (n = 40) and mine-influenced (n = 74) areas. Percent variance explained, Monte Carlo randomized p-values of axis significance, and station scores, September 2015.

Axis		NMS-1	NMS-2	NMS-3
Mine-influenced	KILM1-50	1.707	-1.689	-0.525
	LC_DC1	-0.486	0.233	-0.492
	LC_DCDS	-0.543	-0.032	-0.430
	LC_FRUS	0.058	-0.083	0.142
	LI8	-0.437	0.063	-0.584
	LIDSL	-0.155	0.128	-0.300
	LILC3	0.007	0.300	-0.500
	M12	-0.261	0.324	0.252
	M13	-0.817	0.310	0.359
	M15	-0.879	0.286	0.193
	MIDAG	-0.430	0.457	0.026
	MIDCO	-0.084	0.509	0.037
	MIUCO	-0.542	0.376	-0.019
	MP1	0.036	0.133	-0.062
	FODNGD	-0.146	0.051	-0.065
	NTHO1-25	1.566	0.448	0.220
	NTHO1-50	1.346	0.221	0.112
	OCNM	0.763	-0.476	-1.598
	POCK	0.622	0.528	-0.014
	PORT3-25	0.980	0.212	-1.409
	PORT3-50	0.905	-0.139	-1.011
	SWCK	1.289	0.443	-0.231
	SWIF2-75	1.121	0.134	-0.778
	THCK	1.157	1.335	0.046
	WOCK	1.146	-0.186	-0.026
	ELDGR	-0.363	-0.369	0.237
	ELDEL	-0.255	0.147	0.124
	NGD1u	0.698	0.376	0.016

Table C.17: Pearson correlation of NMS community structure axes (derived from lowest practical level taxonomy using log_{10} transformed density matrix) with benthic taxa for reference (n = 40) and mine-influenced (n = 74) areas, September 2015.

Category	Variable	NMS-1		NMS-2		NMS-3	
		r	p	r	p	r	p
Benthic Family	Ameletus	-0.329	0.000	-0.162	0.084	0.049	0.602
	Baetidae	-0.163	0.084	0.152	0.107	0.182	0.052
	Acentrella sp.	-0.159	0.090	-0.007	0.945	0.474	0.000
	Baetis	-0.647	0.000	0.385	0.000	0.133	0.159
	Baetis bicaudatus	-0.239	0.010	0.169	0.071	-0.157	0.095
	Baetis tricaudatus group	-0.503	0.000	0.305	0.001	0.055	0.561
	Ephemerellidae	-0.691	0.000	0.280	0.003	0.045	0.635
	Drunella doddsii	-0.606	0.000	0.302	0.001	-0.004	0.965
	Drunella flavilinea	-0.179	0.057	-0.033	0.728	-0.153	0.104
	Drunella grandis group	-0.157	0.096	0.190	0.043	0.261	0.005
	Drunella sp.	-0.173	0.065	0.220	0.019	-0.024	0.803
	Ephemerella	-0.309	0.001	-0.052	0.580	0.433	0.000
	Heptageniidae	-0.803	0.000	0.228	0.015	0.032	0.733
	Cinygmula sp.	-0.255	0.006	-0.053	0.572	-0.202	0.031
	Epeorus	-0.483	0.000	0.104	0.269	-0.366	0.000
	Rhithrogena	-0.606	0.000	-0.064	0.497	0.064	0.496
	Leptophlebiidae	-0.135	0.152	0.083	0.383	0.423	0.000
	Capniidae	0.194	0.039	-0.212	0.024	0.020	0.835
	Chloroperlidae	-0.257	0.006	0.097	0.303	-0.097	0.306
	Sweltsa sp.	-0.594	0.000	0.276	0.003	-0.038	0.691
	Leuctridae	-0.226	0.016	0.129	0.170	-0.110	0.245
	Nemouridae	0.126	0.183	0.296	0.001	0.128	0.174
	Amphinemura sp.	0.267	0.004	0.279	0.003	-0.089	0.349
	Zapada	-0.024	0.798	0.437	0.000	-0.441	0.000
	Zapada cinctipes	0.077	0.418	0.523	0.000	0.298	0.001
	Zapada columbiana	-0.094	0.319	0.218	0.020	-0.620	0.000
	Zapada oregonensis group	-0.266	0.004	0.287	0.002	-0.363	0.000
	Peltoperlidae	0.087	0.357	0.088	0.353	-0.441	0.000
	Yoraperla sp.	-0.008	0.934	0.120	0.202	-0.471	0.000
	Perlidae	-0.259	0.005	0.159	0.091	0.416	0.000
	Hesperoperla sp.	-0.204	0.030	0.042	0.658	0.348	0.000
	Perlodidae	-0.279	0.003	0.279	0.003	-0.121	0.201
	Megarcys sp.	-0.297	0.001	0.169	0.073	-0.393	0.000
	Pteronarcella sp.	-0.068	0.469	0.053	0.578	0.267	0.004
	Taeniopterygidae	-0.164	0.082	0.018	0.849	-0.051	0.591
	Taenionema	-0.645	0.000	0.192	0.041	-0.216	0.021
	Apataniidae	-0.176	0.061	0.172	0.067	0.022	0.813
	Brachycentridae	-0.147	0.120	0.351	0.000	0.221	0.018
	Glossosomatidae	-0.431	0.000	0.259	0.005	-0.060	0.527
	Hydropsychidae	-0.361	0.000	0.167	0.076	-0.162	0.084
	Arctopsyche sp.	-0.299	0.001	-0.133	0.160	0.309	0.001
	Hydropsyche	-0.161	0.087	-0.088	0.350	0.346	0.000
	Parapsyche sp.	-0.211	0.024	0.235	0.012	-0.235	0.012
	Lepidostoma	-0.153	0.104	-0.037	0.699	0.204	0.029
	Limnephilidae	0.326	0.000	0.322	0.000	-0.121	0.200
	Rhyacophila	-0.237	0.011	0.509	0.000	-0.263	0.005
	Rhyacophila brunnea/vemna group	-0.022	0.815	0.506	0.000	-0.112	0.236
	Rhyacophila betteni group	-0.015	0.873	0.218	0.020	0.007	0.937
	Rhyacophila hyalinata group	-0.146	0.120	0.195	0.037	-0.217	0.020
	Uenoidae	-0.232	0.013	0.189	0.044	-0.331	0.000
	Elmidae	0.034	0.719	0.389	0.000	-0.047	0.616
	Optioservus sp.	-0.110	0.242	0.480	0.000	0.016	0.868
	Atherix	-0.084	0.372	0.046	0.627	0.407	0.000
	Bezzia/ Palpomyia	-0.045	0.637	0.219	0.019	0.054	0.569
	Probezzia	-0.136	0.150	0.051	0.592	0.021	0.826
	Cryptochironomus	0.102	0.280	-0.082	0.386	-0.331	0.000
	Microtendipes pedellus group	0.028	0.767	-0.139	0.140	0.315	0.001
	Paracladopelma sp.	0.000	0.998	-0.110	0.242	0.296	0.001
	Paratendipes	0.102	0.280	-0.082	0.386	-0.331	0.000
	Phaenopsectra	-0.039	0.684	0.000	0.997	-0.150	0.110

Table C.17: Pearson correlation of NMS community structure axes (derived from lowest practical level taxonomy using log_{10} transformed density matrix) with benthic taxa for reference (n = 40) and mine-influenced (n = 74) areas, September 2015.

Category	Variable	NMS-1		NMS-2		NMS-3	
		r	p	r	p	r	p
Benthic Family	Stictochironomus	-0.072	0.443	0.065	0.494	-0.004	0.967
	Cladotanytarsus	-0.042	0.659	-0.025	0.789	-0.019	0.837
	Stempellina sp.	-0.077	0.414	0.108	0.251	0.049	0.605
	Sublettea	-0.040	0.670	0.027	0.778	0.312	0.001
	Boreoheptagyia sp.	0.041	0.667	-0.033	0.726	-0.012	0.901
	Potthastia longimana group	0.018	0.847	-0.127	0.177	0.291	0.002
	Corynoneura	0.445	0.000	-0.091	0.337	0.164	0.081
	Cricotopus	0.203	0.030	0.131	0.165	0.215	0.022
	Heterotrissocladius marcidus group.	0.021	0.826	-0.020	0.831	0.035	0.715
	Krenosmittia sp.	-0.004	0.962	-0.277	0.003	0.061	0.516
	Polypedilum sp.	-0.142	0.131	0.041	0.668	0.344	0.000
	Micropsectra	0.347	0.000	0.466	0.000	0.313	0.001
	Rheotanytarsus	0.006	0.951	0.091	0.336	-0.034	0.721
	Stempellinella sp.	0.297	0.001	0.004	0.965	-0.014	0.882
	Diamesa	0.380	0.000	0.008	0.932	-0.019	0.841
	Pagastia	-0.001	0.992	0.330	0.000	-0.256	0.006
	Pseudodiamesa sp.	0.431	0.000	0.021	0.828	-0.034	0.723
	Brillia sp.	-0.049	0.606	-0.062	0.513	-0.168	0.074
	Cricotopus (Nostococladius)	-0.168	0.074	0.076	0.422	0.141	0.135
	Eukiefferiella	0.268	0.004	0.399	0.000	0.059	0.531
	Heleniella sp.	0.199	0.034	0.129	0.173	0.295	0.001
	Hydrobaenus	0.329	0.000	0.074	0.434	-0.246	0.008
	Limnophyes sp.	0.325	0.000	-0.050	0.598	0.006	0.947
	Orthocladius	0.244	0.009	0.268	0.004	0.321	0.000
	Parametriocnemus	0.262	0.005	0.062	0.514	-0.248	0.008
	Rheocricotopus	-0.314	0.001	0.339	0.000	-0.066	0.488
	Thienemanniella	0.406	0.000	0.237	0.011	-0.145	0.125
	Tvetenia bavarica group	0.071	0.450	0.348	0.000	0.137	0.145
	Thienemannimyia group	0.118	0.211	0.229	0.014	0.186	0.048
	Empididae	0.127	0.177	0.175	0.062	0.226	0.016
	Chelifera/ Metachela	0.032	0.734	0.333	0.000	0.060	0.525
	Limnophora sp.	0.614	0.000	-0.128	0.174	0.111	0.240
	Glutops sp.	0.134	0.156	0.192	0.040	-0.305	0.001
	Pericoma/Telmatoscopus sp.	0.143	0.129	0.578	0.000	-0.011	0.910
	Simuliidae	0.388	0.000	0.309	0.001	0.116	0.218
	Tipulidae	0.044	0.640	-0.087	0.357	-0.193	0.040
	Antocha sp.	-0.121	0.198	0.271	0.003	0.238	0.011
	Dicranota	0.311	0.001	0.344	0.000	-0.161	0.087
	Hexatoma sp.	-0.209	0.025	0.028	0.770	0.218	0.020
	Limnophila sp.	-0.204	0.029	-0.010	0.919	0.154	0.102
	Trombidiformes	0.085	0.371	0.182	0.052	-0.034	0.722
	Aturus	0.148	0.116	0.356	0.000	-0.033	0.726
	Lebertia	-0.176	0.061	0.226	0.016	0.172	0.068
	Sperchon	-0.089	0.345	-0.067	0.477	-0.018	0.852
	Sperchonopsis sp.	-0.026	0.785	0.022	0.818	0.159	0.091
	Testudacarus sp.	-0.099	0.294	0.136	0.150	0.396	0.000
	Torrenticola	-0.156	0.098	0.222	0.018	0.193	0.040
	Oribatida	0.318	0.001	0.132	0.161	-0.063	0.505
	Pisidium	0.176	0.061	0.276	0.003	-0.095	0.313
	Lumbriculidae	-0.060	0.527	0.069	0.467	-0.147	0.119
	Rhynchelmis sp.	-0.163	0.083	0.073	0.438	-0.187	0.047
	Enchytraeus	0.526	0.000	0.178	0.059	0.332	0.000
	Nais	0.098	0.299	0.216	0.021	0.320	0.001
	Tubificinae	0.298	0.001	0.291	0.002	-0.133	0.159

indicates absolute r-value greater than 0.60.
indicates a p-value below 0.05.

Table C.18: NMS results of the non-transformed proportional matrix of the benthic community structure at lowest practical level for reference (n = 40) and mine-influenced (n = 74) areas. Percent variance explained, Monte Carlo randomized p-values of axis significance, and station scores, September 2015.

Axis		NMS-1	NMS-2	NMS-3
% Variance explained		54.7	18.4	11.3
Monte Carlo P		0.004	0.004	0.004
Reference	AGCK	1.039	-0.077	0.550
	AL4	0.238	0.056	-0.294
	ALUSM	0.057	-0.761	-0.029
	BU2	0.930	-0.003	0.084
	BU40	0.088	0.458	-0.037
	BUUQ	0.481	0.168	-0.100
	CADCK	0.656	0.121	0.213
	CHCK	0.250	-0.168	0.359
	CRUKO	0.945	0.102	-0.160
	DACK	0.113	-0.027	-0.261
	DUCK	-0.456	0.326	-0.194
	EL12	0.369	-0.002	0.191
	ELUGH	0.670	-0.044	0.153
	EWCK	0.602	0.052	-0.055
	FLAD	-0.423	0.574	0.127
	FLAU	-0.142	0.299	0.466
	FO26	0.485	0.176	0.172
	FLRU	0.198	0.362	0.719
	GRUHA	0.695	-0.151	-0.273
	HENUP	1.032	-0.047	0.361
	KO1	0.839	0.263	0.819
	KODCR	0.432	0.693	0.317
	KOUCR	0.365	0.591	0.120
	KOUVE	-0.147	0.631	0.458
	LC_GRCK	0.189	-0.729	-0.738
	LI24	0.882	-0.041	0.603
	MCCR	0.667	-0.530	-0.835
	MI25	0.531	-0.021	-0.285
	OLDDU	0.334	0.558	-0.171
	OLDLI	0.997	0.074	0.318
	OLDLOW	0.345	0.687	-0.735
	PADAL	0.616	0.137	-0.457
	PAUKO	0.746	0.253	-0.179
	RACK	0.431	0.051	0.481
	SLINE	0.819	-0.150	0.182
	VEUKO	0.815	0.297	0.671
	VEUP	-0.063	0.423	-0.226
	VICK	0.392	-0.300	-0.078
	WWRL	0.454	0.277	-0.259
	WWRU	1.006	0.269	-0.849

Table C.18: NMS results of the non-transformed proportional matrix of the benthic community structure at lowest practical level for reference (n = 40) and mine-influenced (n = 74) areas. Percent variance explained, Monte Carlo randomized p-values of axis significance, and station scores, September 2015.

Axis		NMS-1	NMS-2	NMS-3
% Variance explained		54.7	18.4	11.3
Monte Carlo P		0.004	0.004	0.004
Mine-influenced	BOCK	-1.455	-0.181	1.429
	CACK	-1.616	0.764	0.382
	CATA2-25	-1.660	0.919	0.045
	CATA2-75	-1.478	1.115	0.126
	COCK	-1.341	-0.575	0.509
	EL19	-0.207	0.459	0.091
	EL1	0.157	0.532	-0.182
	EL20	0.737	0.011	0.014
	ELDFE	-0.181	1.198	-0.561
	ELELKO	0.899	0.449	0.208
	ELH93	-0.677	1.116	-0.007
	ELUEL	0.455	-0.037	0.169
	ELUFE	-0.210	1.096	-0.369
	ELUFO	-0.683	0.740	-0.072
	ELUSP	0.214	0.361	0.070
	FO19-SP1	-0.463	0.071	-0.933
	FO22	-0.284	-0.109	-0.744
	FO23	-0.270	-0.050	-0.208
	FO29	-0.143	-0.043	-0.064
	FO9	0.338	-0.370	0.182
	FOBCP	-0.210	-0.226	-0.430
	FOBKS	0.312	-0.429	0.286
	FOBSC	0.134	-0.420	0.264
	FODGH	0.111	-0.195	-0.169
	FODHE	0.207	0.036	0.167
	FODPO	0.109	-0.315	-0.915
	FORD7-75	-0.324	0.011	-0.563
	FOUEW	0.016	0.170	-0.435
	FOUKI	0.439	-0.180	0.496
	FOUL	0.358	-0.358	0.450
	FOUNGD	0.666	-0.014	0.220
	FOUSH	0.480	-0.016	0.409
	GHCKD	-0.823	-0.682	1.012
	GHCKU	-1.017	0.461	-0.147
	GRCK	0.355	-0.252	-0.363
	GRDS	-0.057	-0.540	-0.300
	GREE1-50	-0.747	-1.227	0.768
	GREE3-75	-0.822	0.463	-0.283
	GREE4-25	-1.358	0.329	-0.466
	GREE4-75	-1.307	0.626	0.042
	HACKDS	0.019	0.605	-0.331
	HACKUS	0.267	-0.222	-0.229
	HARM1-50	-0.066	0.338	-0.438
	HARM5-25	0.891	-0.311	0.272
	HENFO	0.564	0.224	0.466

Table C.18: NMS results of the non-transformed proportional matrix of the benthic community structure at lowest practical level for reference (n = 40) and mine-influenced (n = 74) areas. Percent variance explained, Monte Carlo randomized p-values of axis significance, and station scores, September 2015.

Axis		NMS-1	NMS-2	NMS-3
% Variance explained		54.7	18.4	11.3
Monte Carlo P		0.004	0.004	0.004
Mine-influenced	KICK	-1.233	-0.131	-0.819
	KILM1-50	-1.444	0.715	0.870
	LC_DC1	0.611	-0.261	-0.100
	LC_DCDS	0.639	-0.248	-0.049
	LC_FRUS	0.045	0.153	0.159
	LI8	0.565	-0.239	-0.513
	LIDSL	0.240	0.050	-0.006
	LILC3	-0.551	0.769	-0.516
	M12	0.098	-0.154	-0.018
	M13	0.599	-0.483	0.207
	M15	0.743	-0.757	-0.099
	MIDAG	0.424	-0.534	0.083
	MIDCO	-0.452	-0.398	-0.099
	MIUCO	0.327	-0.581	-0.068
	MP1	0.093	0.092	0.149
	FODNGD	0.678	-0.109	0.298
	NTHO1-25	-1.151	-1.135	0.292
	NTHO1-50	-1.192	-0.995	0.117
	OCNM	-0.643	-1.669	-0.536
	POCK	-1.281	0.303	-0.190
	PORT3-25	-0.620	-0.919	-1.469
	PORT3-50	-0.862	-0.872	-0.996
	SWCK	-1.412	-0.548	-0.240
	SWIF2-75	-1.197	-1.130	-0.222
	THCK	-1.102	-0.853	1.496
	WOCK	-1.356	-0.188	0.376
	ELDGR	0.554	0.157	0.186
	ELDEL	0.559	-0.032	0.289
	NGD1u	-0.483	-0.192	0.406

Table C.19: Pearson correlation of NMS community structure axes (derived from lowest practical level taxonomy using non-transformed proportional matrix) with benthic taxa for reference (n = 40) and mine-influenced (n = 74) areas, September 2015.

Category	Variable	NMS-1		NMS-2		NMS-3	
		r	p	r	p	r	p
Benthic Family	Ameletus	0.247	0.008	0.193	0.040	0.235	0.012
	Baetidae	0.061	0.516	0.226	0.016	-0.017	0.861
	Acentrella sp.	0.121	0.201	0.283	0.002	-0.060	0.526
	Baetis	0.370	0.000	0.094	0.318	0.011	0.910
	Baetis bicaudatus	0.146	0.122	0.053	0.576	-0.190	0.043
	Baetis tricaudatus group	0.293	0.002	-0.051	0.589	0.083	0.382
	Ephemerellidae	0.238	0.011	0.227	0.015	-0.186	0.047
	Drunella doddsii	0.417	0.000	-0.071	0.455	-0.051	0.587
	Drunella flavilinea	0.144	0.128	0.068	0.469	-0.069	0.463
	Drunella grandis group	0.020	0.829	0.132	0.161	0.004	0.966
	Drunella sp.	0.129	0.172	0.023	0.810	-0.028	0.771
	Ephemerella	0.132	0.162	0.279	0.003	0.130	0.167
	Heptageniidae	0.752	0.000	0.039	0.677	0.366	0.000
	Cinygmula sp.	0.186	0.047	0.003	0.979	0.160	0.088
	Epeorus	0.366	0.000	-0.067	0.482	-0.066	0.483
	Rhithrogena	0.411	0.000	0.112	0.237	0.079	0.406
	Leptophlebiidae	0.014	0.880	0.169	0.072	-0.078	0.412
	Capniidae	-0.263	0.005	0.073	0.442	0.024	0.804
	Chloroperlidae	0.290	0.002	0.041	0.667	0.010	0.913
	Sweltsa sp.	0.436	0.000	0.043	0.647	0.161	0.087
	Leuctridae	0.216	0.021	-0.046	0.628	0.011	0.905
	Nemouridae	-0.190	0.043	-0.069	0.467	0.234	0.012
	Amphinemura sp.	-0.246	0.008	-0.187	0.047	0.035	0.714
	Zapada	-0.264	0.004	-0.454	0.000	-0.377	0.000
	Zapada cinctipes	-0.298	0.001	-0.261	0.005	0.265	0.004
	Zapada columbiana	0.013	0.889	-0.347	0.000	-0.365	0.000
	Zapada oregonensis group	0.149	0.115	0.040	0.673	-0.245	0.009
	Peltoperlidae	-0.095	0.316	-0.217	0.021	-0.334	0.000
	Yoraperla sp.	0.011	0.905	-0.202	0.031	-0.197	0.036
	Perlidae	0.021	0.826	0.156	0.097	0.020	0.833
	Hesperoperla sp.	0.124	0.188	0.096	0.308	0.111	0.241
	Perlodidae	-0.017	0.860	-0.044	0.643	-0.436	0.000
	Megarcys sp.	0.290	0.002	-0.040	0.674	-0.025	0.788
	Pteronarcella sp.	0.114	0.226	0.108	0.251	0.059	0.532
	Taeniopterygidae	0.138	0.144	0.015	0.877	0.004	0.969
	Taenionema	0.437	0.000	-0.069	0.466	-0.091	0.337
	Apataniidae	0.129	0.172	-0.202	0.031	-0.009	0.921
	Brachycentridae	0.123	0.192	0.020	0.837	0.148	0.116
	Glossosomatidae	0.264	0.005	-0.035	0.708	-0.247	0.008
	Hydropsychidae	0.064	0.496	-0.025	0.793	-0.221	0.018
	Arctopsyche sp.	0.196	0.037	0.194	0.039	0.022	0.820
	Hydropsyche	0.095	0.317	0.183	0.052	-0.114	0.227
	Parapsyche sp.	0.056	0.557	0.123	0.191	-0.137	0.145
	Lepidostoma	0.121	0.201	0.123	0.192	-0.006	0.953
	Limnephilidae	-0.266	0.004	-0.063	0.503	0.162	0.085
	Rhyacophila	0.053	0.576	-0.170	0.070	-0.215	0.021
	Rhyacophila brunnea/vemna group	-0.116	0.220	-0.223	0.017	-0.017	0.854
	Rhyacophila betteni group	0.009	0.925	-0.005	0.954	0.089	0.344
	Rhyacophila hyalinata group	0.077	0.415	-0.096	0.307	-0.069	0.467
	Uenoidae	0.117	0.214	-0.157	0.095	-0.239	0.011
	Elmidae	-0.177	0.059	-0.113	0.231	-0.034	0.717
	Optioservus sp.	-0.076	0.421	-0.225	0.016	0.155	0.100
	Atherix	-0.025	0.792	0.331	0.000	-0.025	0.791
	Bezzia/ Palpomyia	-0.037	0.697	0.020	0.830	0.201	0.032
	Probezzia	0.113	0.231	-0.051	0.593	-0.003	0.972
	Cryptochironomus	-0.085	0.371	-0.304	0.001	-0.107	0.256
	Microtendipes pedellus group	-0.091	0.335	0.221	0.018	0.014	0.879
	Paracladopelma sp.	-0.021	0.822	0.215	0.022	0.099	0.295
	Paratendipes	-0.085	0.371	-0.304	0.001	-0.107	0.256
	Phaenopsectra	0.041	0.668	-0.171	0.069	-0.053	0.578

Table C.19: Pearson correlation of NMS community structure axes (derived from lowest practical level taxonomy using non-transformed proportional matrix) with benthic taxa for reference (n = 40) and mine-influenced (n = 74) areas, September 2015.

Category	Variable	NMS-1		NMS-2		NMS-3	
		r	p	r	p	r	p
Benthic Family	Stictochironomus	0.043	0.650	-0.106	0.262	-0.014	0.886
	Cladotanytarsus	0.063	0.505	0.031	0.746	-0.020	0.833
	Stempellina sp.	0.072	0.448	-0.091	0.335	0.016	0.868
	Sublettea	-0.036	0.702	0.287	0.002	-0.123	0.191
	Boreoheptagyia sp.	-0.176	0.061	0.128	0.175	-0.054	0.566
	Potthastia longimana group	-0.089	0.347	0.203	0.030	-0.001	0.988
	Corynoneura	-0.290	0.002	0.231	0.013	0.046	0.629
	Cricotopus	-0.272	0.003	0.174	0.065	0.094	0.319
	Heterotrissocladius marcidus group.	-0.087	0.359	-0.153	0.105	-0.131	0.166
	Krenosmittia sp.	0.110	0.243	0.048	0.612	0.164	0.081
	Polypedilum sp.	0.043	0.650	0.208	0.026	0.034	0.720
	Micropsectra	-0.523	0.000	0.035	0.709	0.318	0.001
	Rheotanytarsus	-0.177	0.060	0.168	0.073	0.128	0.175
	Stempellinella sp.	-0.327	0.000	0.106	0.261	0.225	0.016
	Diamesa	-0.371	0.000	0.034	0.720	0.076	0.421
	Pagastia	-0.206	0.028	0.085	0.366	-0.106	0.263
	Pseudodiamesa sp.	-0.375	0.000	-0.003	0.972	-0.068	0.471
	Brillia sp.	-0.013	0.888	-0.094	0.321	-0.021	0.823
	Cricotopus (Nostococladius)	0.089	0.347	0.005	0.959	0.056	0.552
	Eukiefferiella	-0.400	0.000	0.108	0.252	-0.061	0.522
	Heleniella sp.	-0.029	0.755	0.049	0.605	0.101	0.287
	Hydrobaenus	-0.272	0.003	0.023	0.806	-0.012	0.903
	Limnophyes sp.	-0.222	0.018	0.041	0.666	0.066	0.488
	Orthocladius	-0.550	0.000	0.583	0.000	-0.146	0.120
	Parametriocnemus	-0.168	0.074	-0.201	0.032	-0.182	0.052
	Rheocricotopus	0.043	0.653	0.183	0.052	-0.097	0.303
	Thienemanniella	-0.232	0.013	-0.131	0.165	-0.029	0.757
	Tvetenia bavarica group	-0.265	0.004	0.050	0.600	-0.014	0.883
	Thienemannimyia group	-0.146	0.120	-0.261	0.005	0.065	0.490
	Empididae	-0.241	0.010	0.091	0.335	0.162	0.084
	Chelifera/ Metachela	-0.077	0.413	0.158	0.093	-0.089	0.345
	Limnophora sp.	-0.427	0.000	0.165	0.079	-0.052	0.585
	Glutops sp.	-0.139	0.141	-0.307	0.001	-0.203	0.030
	Pericoma/Telmatoscopus sp.	-0.231	0.013	-0.507	0.000	0.197	0.035
	Simuliidae	-0.324	0.000	-0.223	0.017	0.447	0.000
	Tipulidae	-0.046	0.625	-0.135	0.152	0.011	0.911
	Antocha sp.	0.037	0.695	0.183	0.051	0.016	0.862
	Dicranota	-0.297	0.001	0.034	0.716	0.013	0.891
	Hexatoma sp.	0.153	0.103	-0.015	0.877	0.021	0.822
	Limnophila sp.	0.184	0.049	0.089	0.346	-0.068	0.470
	Trombidiformes	-0.041	0.667	0.048	0.610	0.049	0.607
	Aturus	-0.241	0.010	0.008	0.932	0.036	0.706
	Lebertia	-0.100	0.288	0.224	0.017	-0.089	0.347
	Sperchon	-0.159	0.092	0.179	0.056	0.020	0.829
	Sperchonopsis sp.	-0.003	0.972	0.103	0.274	-0.118	0.212
	Testudacarus sp.	-0.049	0.607	0.215	0.022	0.014	0.881
	Torrenticola	0.101	0.287	-0.027	0.772	0.126	0.182
	Oribatida	-0.253	0.007	-0.114	0.227	0.020	0.835
	Pisidium	-0.143	0.129	-0.371	0.000	0.022	0.820
	Lumbriculidae	0.076	0.424	-0.152	0.106	-0.117	0.216
	Rhynchelmis sp.	0.149	0.114	-0.068	0.472	-0.112	0.237
	Enchytraeus	-0.312	0.001	0.250	0.007	0.173	0.066
	Nais	-0.116	0.218	0.298	0.001	-0.050	0.596
	Tubificinae	-0.194	0.039	-0.389	0.000	0.166	0.078

indicates absolute r-value greater than 0.60.

indicates a p-value below 0.05.

Table C.20: NMS results of the fourthroot transformed proportional matrix of the benthic community structure at lowest practical level for reference (n = 40) and mine-influenced (n = 74) areas. Percent variance explained, Monte Carlo randomized p-values of axis significance, and station scores, September 2015.

Axis		NMS-1	NMS-2
% Variance explained		66.4	19.4
Monte Carlo P		0.004	0.004
Reference	AGCK	0.898	0.565
	AL4	0.134	0.274
	ALUSM	0.282	0.055
	BU2	0.904	0.029
	BU40	0.274	-0.388
	BUUQ	0.352	0.114
	CADCK	0.578	0.348
	CHCK	0.111	0.384
	CRUKO	1.221	0.288
	DACK	0.227	0.109
	DUCK	-0.033	0.017
	EL12	0.139	-0.093
	ELUGH	0.699	-0.134
	EWCK	0.697	0.260
	FLAD	-0.010	-0.665
	FLAU	-0.069	-0.870
	FO26	0.308	0.345
	FLRU	0.353	-0.770
	GRUHA	0.529	0.372
	HENUP	0.870	0.607
	KO1	0.835	-1.156
	KODCR	0.827	-0.496
	KOUCR	0.737	-0.318
	KOUVE	-0.144	-0.601
	LC_GRCK	0.468	0.939
	LI24	0.749	0.772
	MCCR	0.726	0.559
	MI25	0.470	0.220
	OLDDU	0.214	-0.611
	OLDLI	1.027	-0.087
	OLDLOW	0.515	-0.829
	PADAL	0.798	0.156
	PAUKO	0.879	-0.126
	RACK	0.339	-0.381
	SLINE	0.789	0.642
	VEUKO	1.368	0.030
	VEUP	0.301	0.711
	VICK	0.333	0.066
	WWRL	0.579	0.098
	WWRU	1.099	-0.111

Table C.20: NMS results of the fourthroot transformed proportional matrix of the benthic community structure at lowest practical level for reference (n = 40) and mine-influenced (n = 74) areas. Percent variance explained, Monte Carlo randomized p-values of axis significance, and station scores, September 2015.

Axis		NMS-1	NMS-2
% Variance explained		66.4	19.4
Monte Carlo P		0.004	0.004
Mine-influenced	BOCK	-2.067	-0.880
	CACK	-2.402	-0.488
	CATA2-25	-2.686	-0.135
	CATA2-75	-2.453	-0.037
	COCK	-1.222	-0.249
	EL19	0.029	-0.306
	EL1	0.607	-0.398
	EL20	0.493	-0.134
	ELDFE	0.345	-1.204
	ELELKO	1.031	-0.694
	ELH93	0.133	-1.805
	ELUEL	0.329	-0.204
	ELUFE	0.336	-1.125
	ELUFO	-0.337	-0.831
	ELUSP	0.488	-0.403
	FO19-SP1	-0.275	0.238
	FO22	-0.116	0.041
	FO23	0.084	-0.174
	FO29	-0.071	-0.061
	FO9	0.313	-0.140
	FOBCP	-0.189	-0.099
	FOBKS	0.349	-0.024
	FOBSC	0.109	0.013
	FODGH	0.091	0.089
	FODHE	0.302	0.145
	FODPO	-0.217	0.319
	FORD7-75	-0.135	0.209
	FOUEW	-0.033	0.178
	FOUKI	0.214	-0.078
	FOUL	0.287	-0.446
	FOUNGD	0.560	0.268
	FOUSH	0.074	-0.060
	GHCKD	-0.902	-0.868
	GHCKU	-0.716	0.191
	GRCK	0.413	0.473
	GRDS	0.350	0.266
	GREE1-50	-1.111	-1.115
	GREE3-75	-0.502	0.136
	GREE4-25	-1.515	0.253
	GREE4-75	-0.872	-0.349
	HACKDS	0.061	1.020
	HACKUS	0.115	0.318

Table C.20: NMS results of the fourthroot transformed proportional matrix of the benthic community structure at lowest practical level for reference (n = 40) and mine-influenced (n = 74) areas. Percent variance explained, Monte Carlo randomized p-values of axis significance, and station scores, September 2015.

Axis		NMS-1	NMS-2
% Variance explained		66.4	19.4
Monte Carlo P		0.004	0.004
Mine-influenced	HARM1-50	-0.078	0.325
	HARM5-25	0.446	0.765
	HENFO	0.296	0.237
	KICK	-1.164	0.803
	KILM1-50	-2.001	0.849
	LC_DC1	0.477	0.543
	LC_DCDS	0.619	0.454
	LC_FRUS	-0.004	-0.112
	LI8	0.404	0.592
	LIDSL	0.166	0.318
	LILC3	-0.102	0.530
	M12	0.190	-0.252
	M13	0.917	-0.399
	M15	0.994	-0.286
	MIDAG	0.470	0.009
	MIDCO	-0.130	-0.019
	MIUCO	0.552	0.033
	MP1	-0.032	0.075
	FODNGD	0.220	0.069
	NTHO1-25	-1.857	-0.440
	NTHO1-50	-1.604	-0.127
	OCNM	-0.829	1.689
	POCK	-0.851	-0.003
	PORT3-25	-1.187	1.685
	PORT3-50	-1.047	1.108
	SWCK	-1.582	0.119
	SWIF2-75	-1.376	0.898
	THCK	-1.335	-1.289
	WOCK	-1.134	0.036
	ELDGR	0.352	-0.203
	ELDEL	0.327	-0.116
	NGD1u	-0.781	-0.066

Table C.21: Pearson correlation of NMS community structure axes (derived from lowest practical level taxonomy using fourthroot transformed proportional matrix) with benthic taxa for reference (n = 40) and mine-influenced (n = 74) areas, September 2015.

Category	Variable	NMS-1		NMS-2	
		r	p	r	p
Benthic Family	Ameletus	0.423	0.000	-0.099	0.296
	Baetidae	0.173	0.065	-0.145	0.125
	Acentrella sp.	0.182	0.053	-0.402	0.000
	Baetis	0.632	0.000	-0.152	0.108
	Baetis bicaudatus	0.232	0.013	0.192	0.040
	Baetis tricaudatus group	0.523	0.000	-0.102	0.279
	Ephemerellidae	0.717	0.000	-0.015	0.877
	Drunella doddsii	0.601	0.000	0.009	0.924
	Drunella flavilinea	0.175	0.063	0.159	0.091
	Drunella grandis group	0.188	0.045	-0.218	0.020
	Drunella sp.	0.185	0.049	0.019	0.840
	Ephemerella	0.370	0.000	-0.421	0.000
	Heptageniidae	0.858	0.000	-0.001	0.991
	Cinygmula sp.	0.326	0.000	0.197	0.036
	Epeorus	0.506	0.000	0.342	0.000
	Rhithrogena	0.631	0.000	-0.042	0.657
	Leptophlebiidae	0.137	0.147	-0.350	0.000
	Capniidae	-0.144	0.127	0.003	0.973
	Chloroperlidae	0.322	0.000	0.075	0.429
	Sweltsa sp.	0.621	0.000	-0.039	0.680
	Leuctridae	0.229	0.014	0.089	0.345
	Nemouridae	-0.145	0.124	-0.225	0.016
	Amphinemura sp.	-0.301	0.001	0.018	0.852
	Zapada	-0.087	0.360	0.473	0.000
	Zapada cinctipes	-0.129	0.171	-0.367	0.000
	Zapada columbiana	0.024	0.797	0.627	0.000
	Zapada oregonensis group	0.263	0.005	0.369	0.000
	Peltoperlidae	-0.129	0.172	0.420	0.000
	Yoraperla sp.	-0.035	0.715	0.446	0.000
	Perlidae	0.248	0.008	-0.339	0.000
	Hesperoperla sp.	0.208	0.026	-0.289	0.002
	Perlodidae	0.267	0.004	0.208	0.027
	Megarcys sp.	0.310	0.001	0.373	0.000
	Pteronarcella sp.	0.086	0.364	-0.259	0.005
	Taeniopterygidae	0.164	0.082	0.048	0.613
	Taenionema	0.639	0.000	0.251	0.007
	Apataniidae	0.162	0.086	-0.034	0.717
	Brachycentridae	0.121	0.201	-0.195	0.038
	Glossosomatidae	0.378	0.000	0.068	0.472
	Hydropsychidae	0.315	0.001	0.130	0.169
	Arctopsyche sp.	0.322	0.000	-0.218	0.020
	Hydropsyche	0.195	0.038	-0.267	0.004
	Parapsyche sp.	0.210	0.025	0.261	0.005
	Lepidostoma	0.187	0.046	-0.226	0.015
	Limnephilidae	-0.423	0.000	0.086	0.361
	Rhyacophila	0.194	0.038	0.222	0.018
	Rhyacophila brunnea/vemna group	-0.028	0.769	0.085	0.367
	Rhyacophila betteni group	-0.007	0.943	-0.061	0.522
	Rhyacophila hyalinata group	0.101	0.285	0.237	0.011
	Uenoidae	0.206	0.028	0.331	0.000
	Elmidae	-0.089	0.345	-0.015	0.875
	Optioservus sp.	0.062	0.512	-0.123	0.193

Table C.21: Pearson correlation of NMS community structure axes (derived from lowest practical level taxonomy using fourthroot transformed proportional matrix) with benthic taxa for reference (n = 40) and mine-influenced (n = 74) areas, September 2015.

Category	Variable	NMS-1		NMS-2	
		r	p	r	p
Benthic Family	Atherix	0.119	0.208	-0.361	0.000
	Bezzia/ Palpomyia	-0.049	0.605	-0.080	0.398
	Probezzia	0.173	0.066	-0.005	0.959
	Cryptochironomus	-0.094	0.319	0.283	0.002
	Microtendipes pedellus group	0.004	0.968	-0.310	0.001
	Paracladopelma sp.	0.066	0.485	-0.367	0.000
	Paratendipes	-0.094	0.319	0.283	0.002
	Phaenopsectra	0.006	0.946	0.180	0.056
	Stictochironomus	0.063	0.507	0.006	0.953
	Cladotanytarsus	0.040	0.673	0.019	0.839
	Stempellina sp.	0.068	0.470	-0.039	0.676
	Sublettea	0.055	0.562	-0.277	0.003
	Boreoheptagyia sp.	-0.081	0.393	-0.011	0.905
	Potthastia longimana group	0.015	0.873	-0.303	0.001
	Corynoneura	-0.428	0.000	-0.130	0.168
	Cricotopus	-0.247	0.008	-0.188	0.045
	Heterotrissocladius marcidus group.	-0.045	0.633	0.087	0.359
	Krenosmittia sp.	0.095	0.316	-0.194	0.039
	Polypedilum sp.	0.137	0.145	-0.316	0.001
	Micropsectra	-0.526	0.000	-0.369	0.000
	Rheotanytarsus	-0.108	0.251	0.142	0.131
	Stempellinella sp.	-0.349	0.000	0.044	0.643
	Diamesa	-0.451	0.000	0.087	0.356
	Pagastia	-0.082	0.385	0.317	0.001
	Pseudodiamesa sp.	-0.498	0.000	0.139	0.141
	Brillia sp.	0.071	0.453	0.150	0.111
	Cricotopus (Nostococladius)	0.170	0.071	-0.151	0.109
	Eukiefferiella	-0.368	0.000	0.010	0.918
	Heleniella sp.	-0.152	0.107	-0.299	0.001
	Hydrobaenus	-0.325	0.000	0.230	0.014
	Limnophyes sp.	-0.228	0.015	0.015	0.877
	Orthocladius	-0.329	0.000	-0.235	0.012
	Parametriocnemus	-0.274	0.003	0.239	0.010
	Rheocricotopus	0.288	0.002	0.113	0.231
	Thienemanniella	-0.430	0.000	0.020	0.830
	Tvetenia bavarica group	-0.076	0.420	-0.151	0.109
	Thienemannimyia group	-0.120	0.202	-0.270	0.004
	Empididae	-0.109	0.249	-0.271	0.004
	Chelifera/ Metachela	-0.052	0.585	-0.036	0.700
	Limnophora sp.	-0.590	0.000	0.035	0.712
	Glutops sp.	-0.180	0.055	0.194	0.038
	Pericoma/Telmatoscopus sp.	-0.241	0.010	-0.059	0.532
	Simuliidae	-0.404	0.000	-0.254	0.006
	Tipulidae	0.036	0.701	0.137	0.146
	Antocha sp.	0.090	0.339	-0.199	0.034
	Dicranota	-0.374	0.000	0.058	0.543
	Hexatoma sp.	0.241	0.010	-0.148	0.115
	Limnophila sp.	0.238	0.011	-0.109	0.249

Table C.21: Pearson correlation of NMS community structure axes (derived from lowest practical level taxonomy using fourthroot transformed proportional matrix) with benthic taxa for reference (n = 40) and mine-influenced (n = 74) areas, September 2015.

Category	Variable	NMS-1		NMS-2	
		r	p	r	p
Benthic Family	Trombidiformes	-0.071	0.450	0.003	0.971
	Aturus	-0.158	0.093	-0.037	0.693
	Lebertia	0.139	0.141	-0.159	0.090
	Sperchon	0.102	0.278	0.079	0.405
	Sperchonopsis sp.	0.069	0.464	-0.091	0.338
	Testudacarus sp.	0.098	0.302	-0.296	0.001
	Torrenticola	0.121	0.199	-0.164	0.081
	Oribatida	-0.291	0.002	0.014	0.884
	Pisidium	-0.204	0.029	-0.012	0.901
	Lumbriculidae	0.025	0.789	0.173	0.066
	Rhynchelmis sp.	0.169	0.072	0.125	0.184
	Enchytraeus	-0.554	0.000	-0.319	0.001
	Nais	-0.097	0.302	-0.297	0.001
	Tubificinae	-0.303	0.001	-0.042	0.660

indicates absolute r-value greater than 0.60.
indicates a p-value below 0.05.

Table C.22: NMS results of the presence/absence matrix of the benthic community structure at lowest practical level for reference (n = 40) and mine-influenced (n = 74) areas. Percent variance explained, Monte Carlo randomized p-values of axis significance, and station scores, September 2015.

Axis		NMS-1	NMS-2
% Variance explained		61.4	20.0
Monte Carlo P		0.004	0.004
Reference	AGCK	0.669	-0.677
	AL4	0.007	-0.358
	ALUSM	0.327	-0.120
	BU2	0.965	-0.133
	BU40	0.391	0.334
	BUUQ	0.249	-0.070
	CADCK	0.626	-0.515
	CHCK	0.103	-0.463
	CRUKO	1.280	-0.490
	DACK	0.244	-0.179
	DUCK	0.158	-0.116
	EL12	-0.115	0.274
	ELUGH	0.738	0.165
	EWCK	0.690	-0.370
	FLAD	0.171	0.730
	FLAU	-0.083	0.927
	FO26	0.156	-0.525
	FLRU	0.538	0.707
	GRUHA	0.475	-0.400
	HENUP	0.601	-0.935
	KO1	0.455	1.414
	KODCR	0.853	0.442
	KOUCR	0.778	0.254
	KOUVE	-0.022	0.757
	LC_GRCK	0.410	-0.925
	LI24	0.491	-0.817
	MCCR	0.802	-0.666
	MI25	0.371	-0.337
	OLDDU	0.013	0.602
	OLDLI	1.005	0.024
	OLDLOW	0.569	0.797
	PADAL	0.788	-0.140
	PAUKO	0.977	0.136
	RACK	0.368	0.413
	SLINE	0.798	-0.741
	VEUKO	1.412	-0.171
	VEUP	0.257	-0.900
	VICK	0.275	-0.048
	WWRL	0.685	-0.170
	WWRU	1.116	0.036

Table C.22: NMS results of the presence/absence matrix of the benthic community structure at lowest practical level for reference (n = 40) and mine-influenced (n = 74) areas. Percent variance explained, Monte Carlo randomized p-values of axis significance, and station scores, September 2015.

Axis		NMS-1	NMS-2
% Variance explained		61.4	20.0
Monte Carlo P		0.004	0.004
Mine-influenced	BOCK	-1.992	0.784
	CACK	-2.430	0.607
	CATA2-25	-2.810	0.106
	CATA2-75	-2.604	0.091
	COCK	-0.974	0.118
	EL19	0.075	0.346
	EL1	0.707	0.450
	EL20	0.422	0.155
	ELDFE	0.494	1.162
	ELELKO	0.923	0.961
	ELH93	0.320	1.946
	ELUEL	0.248	0.289
	ELUFE	0.588	1.101
	ELUFO	-0.229	0.872
	ELUSP	0.527	0.515
	FO19-SP1	-0.223	-0.159
	FO22	-0.060	0.040
	FO23	0.160	0.204
	FO29	-0.075	0.053
	FO9	0.297	0.211
	FOBCP	-0.219	0.210
	FOBKS	0.325	0.003
	FOBSC	0.104	-0.028
	FODGH	0.046	-0.117
	FODHE	0.491	-0.033
	FODPO	-0.306	-0.121
	FORD7-75	-0.067	-0.223
	FOUEW	-0.070	-0.089
	FOUKI	0.168	-0.212
	FOUL	0.225	0.553
	FOUNGD	0.528	-0.482
	FOUSH	-0.136	0.106
	GHCKD	-0.797	0.729
	GHCKU	-0.634	-0.269
	GRCK	0.433	-0.507
	GRDS	0.441	-0.228
	GREE1-50	-0.966	1.108
	GREE3-75	-0.484	-0.093
	GREE4-25	-1.493	-0.093
	GREE4-75	-0.602	0.328

Table C.22: NMS results of the presence/absence matrix of the benthic community structure at lowest practical level for reference (n = 40) and mine-influenced (n = 74) areas. Percent variance explained, Monte Carlo randomized p-values of axis significance, and station scores, September 2015.

Axis		NMS-1	NMS-2
% Variance explained		61.4	20.0
Monte Carlo P		0.004	0.004
Mine-influenced	HACKDS	0.075	-1.242
	HACKUS	-0.020	-0.325
	HARM1-50	-0.164	-0.300
	HARM5-25	0.152	-0.792
	HENFO	0.300	-0.233
	KICK	-0.860	-0.953
	KILM1-50	-1.989	-0.801
	LC_DC1	0.276	-0.645
	LC_DCDS	0.575	-0.577
	LC_FRUS	0.107	0.164
	LI8	0.382	-0.680
	LIDSL	0.102	-0.351
	LILC3	-0.072	-0.457
	M12	0.269	0.358
	M13	0.998	0.574
	M15	1.079	0.353
	MIDAG	0.239	0.032
	MIDCO	0.004	0.003
	MIUCO	0.539	-0.132
	MP1	-0.047	-0.116
	FODNGD	0.053	0.019
	NTHO1-25	-1.875	0.445
	NTHO1-50	-1.563	0.156
	OCNM	-0.891	-1.433
	POCK	-0.604	0.042
	PORT3-25	-1.504	-1.313
	PORT3-50	-1.187	-0.806
	SWCK	-1.517	0.037
	SWIF2-75	-1.283	-0.651
	THCK	-1.161	1.087
	WOCK	-0.899	0.011
	ELDGR	0.237	0.267
	ELDEL	0.182	0.158
	NGD1u	-0.869	-0.035

Table C.23: Pearson correlation of NMS community structure axes (derived from lowest practical level taxonomy using presence/absence matrix) with benthic taxa for reference (n = 40) and mine-influenced (n = 74) areas, September 2015.

Category	Variable	NMS-1		NMS-2	
		r	p	r	p
Benthic Family	Ameletus	0.392	0.000	0.062	0.513
	Baetidae	0.218	0.020	0.094	0.318
	Acentrella sp.	0.205	0.028	0.411	0.000
	Baetis	0.691	0.000	0.149	0.114
	Baetis bicaudatus	0.218	0.020	-0.250	0.007
	Baetis tricaudatus group	0.601	0.000	0.128	0.174
	Ephemerellidae	0.759	0.000	-0.114	0.228
	Drunella doddsii	0.587	0.000	-0.020	0.836
	Drunella flavilinea	0.174	0.063	-0.183	0.051
	Drunella grandis group	0.238	0.011	0.205	0.029
	Drunella sp.	0.186	0.048	-0.036	0.701
	Ephemerella	0.417	0.000	0.349	0.000
	Heptageniidae	0.765	0.000	0.042	0.656
	Cinygmula sp.	0.326	0.000	-0.229	0.014
	Epeorus	0.482	0.000	-0.386	0.000
	Rhithrogena	0.611	0.000	0.005	0.955
	Leptophlebiidae	0.186	0.048	0.397	0.000
	Capniidae	-0.136	0.149	0.069	0.467
	Chloroperlidae	0.282	0.002	-0.105	0.266
	Sweltsa sp.	0.560	0.000	-0.025	0.788
	Leuctridae	0.226	0.016	-0.110	0.243
	Nemouridae	-0.078	0.408	0.202	0.032
	Amphinemura sp.	-0.269	0.004	-0.061	0.518
	Zapada	0.095	0.314	-0.320	0.001
	Zapada cinctipes	0.067	0.482	0.338	0.000
	Zapada columbiana	-0.003	0.979	-0.571	0.000
	Zapada oregonensis group	0.294	0.001	-0.383	0.000
	Peltoperlidae	-0.117	0.216	-0.306	0.001
	Yoraperla sp.	-0.008	0.930	-0.391	0.000
	Perlidae	0.304	0.001	0.312	0.001
	Hesperoperla sp.	0.254	0.006	0.336	0.000
	Perlodidae	0.309	0.001	-0.192	0.041
	Megarcys sp.	0.276	0.003	-0.431	0.000
	Pteronarcella sp.	0.061	0.522	0.293	0.002
	Taeniopterygidae	0.163	0.084	-0.040	0.674
	Taenionema	0.629	0.000	-0.250	0.007
	Apataniidae	0.143	0.130	0.031	0.747
	Brachycentridae	0.130	0.168	0.130	0.167
	Glossosomatidae	0.347	0.000	-0.117	0.213
	Hydropsychidae	0.337	0.000	-0.066	0.484
	Arctopsyche sp.	0.335	0.000	0.250	0.007
	Hydropsyche	0.221	0.018	0.214	0.023
	Parapsyche sp.	0.179	0.057	-0.336	0.000
	Lepidostoma	0.188	0.045	0.270	0.004
	Limnephilidae	-0.381	0.000	-0.074	0.432
	Rhyacophila	0.239	0.011	-0.193	0.039
	Rhyacophila brunnea/vemna group	0.022	0.814	-0.093	0.323
	Rhyacophila betteni group	-0.005	0.962	0.025	0.794
	Rhyacophila hyalinata group	0.106	0.260	-0.300	0.001
	Uenoidae	0.186	0.048	-0.343	0.000
	Elmidae	-0.020	0.834	-0.021	0.824

Table C.23: Pearson correlation of NMS community structure axes (derived from lowest practical level taxonomy using presence/absence matrix) with benthic taxa for reference (n = 40) and mine-influenced (n = 74) areas, September 2015.

Category	Variable	NMS-1		NMS-2	
		r	p	r	p
Benthic Family	Optioservus sp.	0.097	0.306	0.074	0.431
	Atherix	0.152	0.107	0.376	0.000
	Bezzia/ Palpomyia	-0.026	0.784	0.048	0.610
	Probezzia	0.188	0.046	-0.009	0.925
	Cryptochironomus	-0.103	0.278	-0.234	0.012
	Microtendipes pedellus group	0.024	0.797	0.313	0.001
	Paracladopelma sp.	0.063	0.503	0.389	0.000
	Paratendipes	-0.103	0.278	-0.234	0.012
	Phaenopsectra	-0.003	0.974	-0.157	0.095
	Stictochironomus	0.062	0.512	-0.022	0.820
	Cladotanytarsus	0.029	0.762	-0.011	0.904
	Stempellina sp.	0.065	0.493	0.060	0.526
	Sublettea	0.088	0.349	0.262	0.005
	Boreoheptagyia sp.	-0.056	0.551	0.005	0.956
	Potthastia longimana group	0.037	0.697	0.318	0.001
	Corynoneura	-0.394	0.000	0.151	0.108
	Cricotopus	-0.202	0.031	0.193	0.040
	Heterotrissocladius marcidus group.	-0.025	0.794	-0.038	0.685
	Krenosmittia sp.	0.052	0.580	0.231	0.013
	Polypedilum sp.	0.175	0.062	0.296	0.001
	Micropsectra	-0.266	0.004	0.350	0.000
	Rheotanytarsus	-0.025	0.794	-0.037	0.699
	Stempellinella sp.	-0.250	0.007	-0.006	0.946
	Diamesa	-0.419	0.000	-0.130	0.170
	Pagastia	-0.013	0.891	-0.368	0.000
	Pseudodiamesa sp.	-0.453	0.000	-0.085	0.366
	Brillia sp.	0.111	0.238	-0.170	0.070
	Cricotopus (Nostococladius)	0.204	0.029	0.165	0.079
	Eukiefferiella	-0.207	0.027	0.127	0.177
	Heleniella sp.	-0.175	0.063	0.295	0.001
	Hydrobaenus	-0.261	0.005	-0.231	0.013
	Limnophyes sp.	-0.216	0.021	-0.015	0.872
	Orthocladius	-0.111	0.242	0.170	0.071
	Parametriocnemus	-0.262	0.005	-0.176	0.062
	Rheocricotopus	0.299	0.001	-0.141	0.134
	Thienemanniella	-0.390	0.000	0.041	0.666
	Tvetenia bavarica group	0.060	0.529	0.135	0.154
	Thienemannimyia group	-0.089	0.346	0.314	0.001
	Empididae	-0.045	0.632	0.265	0.004
	Chelifera/ Metachela	-0.046	0.625	0.041	0.666
	Limnophora sp.	-0.527	0.000	0.004	0.971
	Glutops sp.	-0.191	0.042	-0.144	0.126
	Limnophora sp.	-0.187	0.047	0.020	0.836
	Simuliidae	-0.282	0.002	0.204	0.030
	Tipulidae	0.056	0.551	-0.143	0.128
	Antocha sp.	0.116	0.220	0.187	0.047
	Dicranota	-0.379	0.000	-0.061	0.519
	Hexatoma sp.	0.277	0.003	0.130	0.169

Table C.23: Pearson correlation of NMS community structure axes (derived from lowest practical level taxonomy using presence/absence matrix) with benthic taxa for reference (n = 40) and mine-influenced (n = 74) areas, September 2015.

Category	Variable	NMS-1		NMS-2	
		r	p	r	p
Benthic Family	Limnophila sp.	0.226	0.016	0.112	0.236
	Trombidiformes	-0.070	0.457	-0.014	0.886
	Aturus	-0.096	0.308	0.013	0.893
	Lebertia	0.224	0.016	0.154	0.101
	Sperchon	0.177	0.060	-0.080	0.397
	Sperchonopsis sp.	0.091	0.335	0.118	0.210
	Testudacarus sp.	0.142	0.132	0.301	0.001
	Torrenticola	0.143	0.128	0.168	0.074
	Oribatida	-0.273	0.003	0.011	0.910
	Pisidium	-0.166	0.078	0.030	0.755
	Lumbriculidae	0.030	0.755	-0.177	0.060
	Rhynchelmis sp.	0.158	0.093	-0.159	0.092
	Enchytraeus	-0.403	0.000	0.261	0.005
	Nais	-0.105	0.265	0.252	0.007
	Tubificinae	-0.334	0.000	0.040	0.669

indicates absolute r-value greater than 0.60.
indicates a p-value below 0.05.

Table C.24: List of mean skewness and kurtosis values for various transformations of the benthic invertebrate family abundance matrix for reference (n = 40) and mine-influenced (n = 74) areas, September 2015.

Transformation	Endpoint	Skewness (mean)	Kurtosis (mean)
None	Area\Row	4.376	21.785
	Taxa\Col	5.541	40.726
Log_{10}	Area\Row	0.999	-0.03
	Taxa\Col	1.67	6.405
Square root	Area\Row	2.674	8.571
	Taxa\Col	3.19	15.956
Fourth root	Area\Row	1.233	0.965
	Taxa\Col	1.841	6.618
Power 2	Area\Row	5.568	33.139
	Taxa\Col	7.763	68.817
Power 4	Area\Row	6.208	39.797
	Taxa\Col	9.25	90.694

- indicates lowest mean skewness and kurtosis value of area by taxa matrix.

Table C.25: List of mean skewness and kurtosis values for various transformations of the benthic invertebrate family proportional matrix for reference (n = 40) and mine-influenced (n = 74) areas, September 2015.

Transformation	Endpoint	Skewness (mean)	Kurtosis (mean)
None	Area\Row	4.376	21.785
	Taxa\Col	5.015	34.112
Log_{10}	Area\Row	4.185	19.969
	Taxa\Col	4.862	32.441
Square root	Area\Row	2.674	8.571
	Taxa\Col	2.871	13.103
Fourth root	Area\Row	1.233	0.965
	Taxa\Col	1.662	6.005
Power 2	Area\Row	5.568	33.139
	Taxa\Col	7.362	63.679
Power 4	Area\Row	6.208	39.797
	Taxa\Col	8.956	86.571

- indicates lowest mean skewness and kurtosis value of area by taxa matrix.

Table C.26: NMS results of the non-transformed density matrix of the benthic community structure at family level for reference (n = 40) and mine-influenced (n = 74) areas. Percent variance explained, Monte Carlo randomized p-values of axis significance, and station scores, September 2015.

Axis		NMS-1	NMS-2
% Variance explained		51.3	28.6
Monte Carlo P		0.004	0.004
Reference	AGCK	0.123	1.130
	AL4	-0.408	0.419
	ALUSM	-0.474	0.473
	BU2	0.993	0.598
	BU40	0.317	-0.062
	BUUQ	0.428	0.133
	CADCK	-0.347	0.651
	CHCK	-0.614	0.258
	CRUKO	1.650	0.766
	DACK	-0.377	0.196
	DUCK	-0.356	-0.279
	EL12	-0.171	0.474
	ELUGH	0.302	0.614
	EWCK	-0.023	0.362
	FLAD	-0.761	-0.008
	FLAU	-0.255	-0.053
	FLRU	-0.144	-0.012
	FO26	-0.304	0.471
	GRUHA	0.242	0.598
	HENUP	0.074	1.009
	KO1	1.409	0.074
	KODCR	1.816	-0.046
	KOUCR	1.730	-0.185
	KOUVE	0.774	-0.425
	LC_GRCK	-0.001	-0.157
	LI24	0.532	0.563
	MCCR	-0.422	0.975
	MI25	-0.150	0.254
	OLDDU	0.717	-0.141
	OLDLI	0.122	0.744
	OLDLOW	0.597	-0.044
	PADAL	1.611	0.289
	PAUKO	1.783	0.287
	RACK	0.358	0.202
	SLINE	-0.007	0.711
	VEUKO	1.513	0.037
	VEUP	1.280	-0.351
	VICK	-0.297	0.135
	WWRL	0.127	0.109
	WWRU	1.615	0.593

Table C.26: NMS results of the non-transformed density matrix of the benthic community structure at family level for reference (n = 40) and mine-influenced (n = 74) areas. Percent variance explained, Monte Carlo randomized p-values of axis significance, and station scores, September 2015.

Axis		NMS-1	NMS-2
% Variance explained		51.3	28.6
Monte Carlo P		0.004	0.004
Mine-influenced	BOCK	-1.000	-1.057
	CACK	-0.854	-1.150
	CATA2-25	-0.341	-1.320
	CATA2-75	-0.564	-1.427
	COCK	-1.825	-0.624
	EL19	0.289	-0.285
	EL1	-0.340	0.132
	EL20	0.085	0.588
	ELDEL	-0.072	0.543
	ELDFE	-1.277	0.195
	ELDGR	1.019	0.323
	ELELKO	0.004	0.890
	ELH93	0.102	-0.776
	ELUEL	0.135	0.374
	ELUFE	-0.974	0.115
	ELUFO	-0.704	-0.347
	ELUSP	-0.095	0.168
	FO19-SP1	-0.938	-0.217
	FO22	-1.080	0.187
	FO23	0.152	-0.249
	FO29	-0.396	-0.008
	FO9	0.029	0.490
	FOBCP	0.130	-0.268
	FOBKS	0.287	0.381
	FOBSC	0.555	0.178
	FODGH	-0.417	0.246
	FODHE	-0.825	0.361
	FODPO	-0.788	0.485
	FORD7	-0.160	-0.266
	FOUEW	-0.339	-0.057
	FOUKI	0.341	0.393
	FOUL	0.565	0.337
	FOUNGD	-0.050	0.733
	FOUSH	-0.026	0.529
	GHCKD	-0.877	-0.588
	GHCKU	0.844	-0.962
	GRCK	-0.182	0.378
	GRDS	-0.443	0.135
	GREE1-50	-0.567	-0.854
	GREE3-75	0.933	-0.858
	GREE4-25	-0.124	-1.023

Table C.26: NMS results of the non-transformed density matrix of the benthic community structure at family level for reference (n = 40) and mine-influenced (n = 74) areas. Percent variance explained, Monte Carlo randomized p-values of axis significance, and station scores, September 2015.

Axis		NMS-1	NMS-2
% Variance explained		51.3	28.6
Monte Carlo P		0.004	0.004
Mine-influenced	GREE4-75	1.709	-1.228
	HACKDS	-0.607	-0.049
	HACKUS	-0.585	0.476
	HARM1-50	-0.790	0.035
	HARM5-25	-0.336	1.043
	HENFO	-0.634	0.653
	KICK	1.074	-1.265
	KILM1	1.895	-1.479
	LC_DC1	-0.132	0.589
	LC_DCDS	-0.198	0.425
	LC_FRUS	0.489	-0.180
	LI8	0.564	0.224
	LIDSL	-0.134	0.120
	LILC3	-1.213	-0.097
	M12	-0.062	0.065
	M13	-0.043	0.390
	M15	0.276	0.777
	MIDAG	-0.547	0.820
	MIDCO	-0.754	-0.102
	MIUCO	-0.267	0.570
	MP1	-0.047	0.105
	NGD1	-0.095	0.819
	NGD1u	-0.642	-0.186
	NTHO1-25	-1.455	-0.830
	NTHO1-50	-1.211	-0.827
	OCNM	1.015	-1.174
	POCK	-1.593	-0.509
	PORT3-25	-0.082	-1.382
	PORT3-50	0.067	-0.997
	SWCK	-0.841	-0.725
	SWIF2-75	-1.121	-0.642
	THCK	0.493	-1.546
	WOCK	0.597	-1.078

Table C.27: Pearson correlation of NMS community structure axes (derived from family level taxonomy using non-transformed density matrix) with benthic taxa for reference (n = 40) and mine-influenced (n = 74) areas, September 2015.

Category	Variable	NMS-1		NMS-2	
		r	p	r	p
Benthic Family	Ameletidae	0.060	0.527	0.258	0.006
	Baetidae	-0.238	0.011	0.326	0.000
	Ephemerellidae	-0.356	0.000	0.285	0.002
	Heptageniidae	-0.197	0.035	0.662	0.000
	Leptophlebiidae	-0.134	0.156	0.033	0.729
	Capniidae	-0.155	0.100	-0.124	0.188
	Chloroperlidae	-0.181	0.054	0.463	0.000
	Leuctridae	-0.115	0.224	0.182	0.053
	Nemouridae	-0.563	0.000	-0.135	0.152
	Peltoperlidae	-0.046	0.630	-0.002	0.987
	Perlidae	-0.079	0.404	0.047	0.619
	Perlodidae	-0.280	0.003	0.047	0.617
	Pteronarcyidae	-0.021	0.828	0.135	0.151
	Taeniopterygidae	-0.156	0.098	0.465	0.000
	Apataniidae	-0.044	0.642	0.188	0.045
	Brachycentridae	-0.138	0.142	0.084	0.375
	Glossosomatidae	-0.072	0.447	0.216	0.021
	Hydropsychidae	-0.136	0.148	0.089	0.345
	Hydroptilidae	-0.272	0.003	-0.139	0.140
	Lepidostomatidae	-0.081	0.392	0.137	0.147
	Limnephilidae	-0.253	0.007	-0.120	0.202
	Rhyacophilidae	-0.421	0.000	0.116	0.218
	Uenoidae	-0.070	0.462	0.159	0.091
	Dytiscidae	0.117	0.214	-0.146	0.121
	Elmidae	-0.226	0.016	0.014	0.880
	Athericidae	-0.206	0.028	0.018	0.853
	Ceratopogonidae	-0.250	0.007	-0.003	0.978
	Chironomidae	-0.627	0.000	-0.218	0.020
	Empididae	-0.339	0.000	-0.050	0.600
	Muscidae	-0.209	0.026	-0.445	0.000
	Pelecorhynchidae	-0.093	0.326	-0.097	0.307
	Psychodidae	-0.350	0.000	-0.100	0.288
	Simuliidae	-0.238	0.011	-0.285	0.002
	Stratiomyidae	-0.121	0.198	-0.165	0.080
	Tipulidae	-0.468	0.000	0.027	0.779
	Aturidae	-0.277	0.003	-0.113	0.232
	Hydryphantidae	0.018	0.847	0.047	0.619
	Hygrobatidae	0.042	0.660	0.029	0.758
	Lebertiidae	-0.299	0.001	0.063	0.503
	Sperchontidae	-0.182	0.053	-0.027	0.778
	Torrenticolidae	-0.133	0.158	-0.003	0.974

Table C.27: Pearson correlation of NMS community structure axes (derived from family level taxonomy using non-transformed density matrix) with benthic taxa for reference (n = 40) and mine-influenced (n = 74) areas, September 2015.

Category	Variable	NMS-1		NMS-2	
		r	p	r	p
Benthic Family	Oribatidae	-0.178	0.058	-0.236	0.011
	Pisidiidae	-0.079	0.402	-0.179	0.056
	Lumbriculidae	-0.123	0.191	0.167	0.076
	Enchytraeidae	-0.268	0.004	-0.348	0.000
	Naididae	-0.211	0.025	-0.095	0.315
	Tubificidae	-0.093	0.327	-0.168	0.074

indicates absolute r-value greater than 0.60.
indicates a p-value below 0.05.

Table C.28: NMS results of the log_{10} transformed density matrix of the benthic community structure at family level for reference (n = 40) and mine-influenced (n = 74) areas. Percent variance explained, Monte Carlo randomized p-values of axis significance, and station scores, September 2015.

Axis		NMS-1	NMS-2
% Variance explained		67.5	21.1
Monte Carlo P		0.004	0.004
Reference	AGCK	0.323	0.428
	AL4	0.110	-0.314
	ALUSM	0.229	-0.320
	BU2	0.473	0.529
	BU40	0.374	0.111
	BUUQ	0.273	0.239
	CADCK	0.470	-0.112
	CHCK	0.285	-0.342
	CRUKO	1.017	1.155
	DACK	0.246	-0.256
	DUCK	0.173	-0.217
	EL12	0.183	-0.137
	ELUGH	0.579	0.192
	EWCK	0.760	0.052
	FLAD	0.344	-0.472
	FLAU	0.362	-0.790
	FLRU	0.345	-0.562
	FO26	0.566	0.053
	GRUHA	0.660	0.104
	HENUP	0.452	0.417
	KO1	0.091	1.578
	KODCR	0.336	1.353
	KOUCR	0.260	1.080
	KOUVE	-0.265	0.516
	LC_GRCK	0.074	-0.435
	LI24	0.007	0.461
	MCCR	0.521	-0.263
	MI25	0.391	0.035
	OLDDU	0.315	0.323
	OLDLI	0.461	0.083
	OLDLOW	0.538	0.429
	PADAL	0.355	0.815
	PAUKO	0.294	0.972
	RACK	0.132	-0.008
	SLINE	0.761	0.198
	VEUKO	-0.022	1.359
	VEUP	0.160	0.825
	VICK	0.321	-0.185
	WWRL	0.254	0.059
	WWRU	0.623	0.931

Table C.28: NMS results of the log_{10} transformed density matrix of the benthic community structure at family level for reference (n = 40) and mine-influenced (n = 74) areas. Percent variance explained, Monte Carlo randomized p-values of axis significance, and station scores, September 2015.

Axis		NMS-1	NMS-2
% Variance explained		67.5	21.1
Monte Carlo P		0.004	0.004
Mine-influenced	BOCK	-1.937	-0.990
	CACK	-2.465	-0.366
	CATA2-25	-2.808	0.249
	CATA2-75	-2.728	0.239
	COCK	-0.834	-1.002
	EL19	0.099	0.062
	EL1	0.653	-0.075
	EL20	0.596	-0.172
	ELDEL	0.306	-0.124
	ELDFE	1.078	-0.096
	ELDGR	0.224	0.393
	ELELKO	0.877	0.449
	ELH93	0.684	1.246
	ELUEL	0.586	-0.098
	ELUFE	1.239	-0.185
	ELUFO	0.608	-0.846
	ELUSP	0.824	-0.196
	FO19-SP1	-0.154	-0.202
	FO22	-0.028	-0.499
	FO23	0.143	-0.115
	FO29	0.374	-0.319
	FO9	0.369	-0.026
	FOBCP	-0.046	-0.048
	FOBKS	0.139	0.098
	FOBSC	0.012	0.087
	FODGH	0.177	-0.379
	FODHE	0.537	-0.091
	FODPO	-0.149	-0.283
	FORD7	-0.006	-0.327
	FOUEW	0.186	-0.290
	FOUKI	-0.047	0.094
	FOUL	-0.024	-0.170
	FOUNGD	0.585	0.012
	FOUSH	0.005	0.028
	GHCKD	-0.233	-1.170
	GHCKU	-0.818	0.697
	GRCK	0.571	-0.259
	GRDS	0.591	-0.321
	GREE1-50	-0.536	-1.276
	GREE3-75	-0.569	0.592
	GREE4-25	-1.512	0.130
	GREE4-75	-1.364	1.304

Table C.28: NMS results of the log_{10} transformed density matrix of the benthic community structure at family level for reference (n = 40) and mine-influenced (n = 74) areas. Percent variance explained, Monte Carlo randomized p-values of axis significance, and station scores, September 2015.

Axis		NMS-1	NMS-2
% Variance explained		67.5	21.1
Monte Carlo P		0.004	0.004
Mine-influenced	HACKDS	0.891	-0.631
	HACKUS	0.317	-0.419
	HARM1-50	0.207	-0.559
	HARM5-25	0.549	-0.401
	HENFO	0.392	0.237
	KICK	-1.696	1.110
	KILM1	-2.368	2.106
	LC_DC1	0.500	-0.165
	LC_DCDS	0.403	0.154
	LC_FRUS	0.163	0.201
	LI8	0.614	0.168
	LIDSL	0.213	-0.021
	LILC3	0.046	-0.192
	M12	0.286	-0.249
	M13	0.628	-0.408
	M15	0.522	-0.485
	MIDAG	0.441	-0.490
	MIDCO	0.208	-0.401
	MIUCO	0.489	-0.221
	MP1	0.140	-0.047
	NGD1	0.046	-0.050
	NGD1u	-0.446	-0.333
	NTHO1-25	-1.821	-0.860
	NTHO1-50	-1.447	-0.635
	OCNM	-1.243	0.670
	POCK	-0.488	-0.684
	PORT3-25	-0.952	-1.510
	PORT3-50	-1.022	0.425
	SWCK	-1.247	-0.730
	SWIF2-75	-1.075	-0.359
	THCK	-1.094	-0.977
	WOCK	-1.186	0.110

Table C.29: Pearson correlation of NMS community structure axes (derived from family level taxonomy using log_{10} transformed proportional matrix) with benthic taxa for reference (n = 40) and mine-influenced (n = 74) areas, September 2015.

Category	Variable	NMS-1		NMS-2	
		r	p	r	p
Benthic Family	Ameletidae	0.389	0.000	0.186	0.047
	Baetidae	0.770	0.000	-0.209	0.026
	Ephemerellidae	0.825	0.000	-0.123	0.192
	Heptageniidae	0.845	0.000	-0.039	0.679
	Leptophlebiidae	0.233	0.013	-0.051	0.590
	Capniidae	-0.241	0.010	0.140	0.139
	Chloroperlidae	0.579	0.000	-0.174	0.064
	Leuctridae	0.232	0.013	-0.077	0.414
	Nemouridae	0.125	0.186	-0.670	0.000
	Peltoperlidae	0.016	0.869	-0.174	0.065
	Perlidae	0.368	0.000	-0.130	0.169
	Perlodidae	0.466	0.000	-0.238	0.011
	Pteronarcyidae	0.180	0.056	-0.065	0.492
	Taeniopterygidae	0.568	0.000	-0.079	0.401
	Apataniidae	0.153	0.105	-0.153	0.104
	Brachycentridae	0.272	0.003	-0.293	0.002
	Glossosomatidae	0.396	0.000	-0.224	0.017
	Hydropsychidae	0.484	0.000	0.006	0.949
	Hydroptilidae	-0.285	0.002	-0.355	0.000
	Lepidostomatidae	0.263	0.005	0.105	0.264
	Limnephilidae	-0.358	0.000	-0.382	0.000
	Rhyacophilidae	0.279	0.003	-0.425	0.000
	Uenoidae	0.223	0.017	-0.136	0.150
	Dytiscidae	-0.114	0.225	0.141	0.134
	Elmidae	0.139	0.139	-0.500	0.000
	Athericidae	0.233	0.013	-0.062	0.511
	Ceratopogonidae	-0.007	0.940	-0.246	0.008
	Chironomidae	-0.180	0.056	-0.608	0.000
	Empididae	0.057	0.546	-0.352	0.000
	Muscidae	-0.680	0.000	-0.015	0.874
	Pelecorhynchidae	-0.092	0.330	-0.257	0.006
	Psychodidae	-0.063	0.508	-0.610	0.000
	Simuliidae	-0.345	0.000	-0.332	0.000
	Stratiomyidae	-0.255	0.006	-0.039	0.683
	Tipulidae	0.005	0.955	-0.457	0.000
	Aturidae	-0.053	0.575	-0.342	0.000
	Hydryphantidae	0.112	0.234	0.041	0.666
	Hygrobatidae	0.042	0.656	0.050	0.596
	Lebertiidae	0.288	0.002	-0.139	0.140
	Sperchontidae	0.170	0.071	0.103	0.274
	Torrenticolidae	0.274	0.003	-0.203	0.030
	Oribatidae	-0.284	0.002	-0.243	0.009
	Pisidiidae	-0.102	0.280	-0.221	0.018
	Lumbriculidae	0.128	0.175	-0.064	0.500
	Enchytraeidae	-0.457	0.000	-0.307	0.001
	Naididae	0.071	0.452	-0.184	0.050
	Tubificidae	-0.253	0.007	-0.323	0.000

indicates absolute r-value greater than 0.60.
indicates a p-value below 0.05.

Table C.30: NMS results of the non-transformed proportional matrix of the benthic community structure at family level for reference (n = 40) and mine-influenced (n = 74) areas. Percent variance explained, Monte Carlo randomized p-values of axis significance, and station scores, September 2015.

Axis		NMS-1	NMS-2
% Variance explained		61.7	18.9
Monte Carlo P		0.004	0.004
Reference	AGCK	1.485	0.285
	AL4	0.387	-0.321
	ALUSM	0.432	0.902
	BU2	1.156	0.154
	BU40	0.034	0.047
	BUUQ	0.370	0.015
	CADCK	0.735	0.064
	CHCK	0.171	0.165
	CRUKO	1.231	-0.167
	DACK	0.130	-0.428
	DUCK	-0.608	0.022
	EL12	0.594	-0.057
	ELUGH	0.959	-0.067
	EWCK	0.537	0.141
	FLAD	-0.657	0.233
	FLAU	-0.194	0.105
	FLRU	-0.093	-0.075
	FO26	0.591	0.074
	GRUHA	0.834	-0.458
	HENUP	1.341	0.213
	KO1	1.026	0.715
	KODCR	0.655	-0.377
	KOUCR	0.282	-0.202
	KOUVE	-0.111	0.808
	LC_GRCK	0.224	0.921
	LI24	1.119	0.375
	MCCR	0.648	-1.175
	MI25	0.307	0.016
	OLDDU	0.017	0.184
	OLDLI	1.046	0.129
	OLDLOW	0.227	-0.974
	PADAL	0.541	-0.354
	PAUKO	0.797	-0.343
	RACK	0.559	0.126
	SLINE	0.928	0.206
	VEUKO	0.877	0.548
	VEUP	-0.093	-0.022
	VICK	0.082	-0.069
	WWRL	0.197	0.297
	WWRU	1.106	-0.472

Table C.30: NMS results of the non-transformed proportional matrix of the benthic community structure at family level for reference (n = 40) and mine-influenced (n = 74) areas. Percent variance explained, Monte Carlo randomized p-values of axis significance, and station scores, September 2015.

Axis		NMS-1	NMS-2
% Variance explained		61.7	18.9
Monte Carlo P		0.004	0.004
Mine-influenced	BOCK	-1.736	-0.158
	CACK	-1.846	0.408
	CATA2-25	-1.881	0.456
	CATA2-75	-1.837	0.733
	COCK	-1.285	-0.769
	EL19	-0.346	0.004
	EL1	-0.002	0.337
	EL20	0.845	-0.024
	ELDEL	0.748	0.109
	ELDFE	-0.318	1.252
	ELDGR	0.824	0.095
	ELELKO	1.154	0.019
	ELH93	-1.074	0.548
	ELUEL	0.638	-0.060
	ELUFE	-0.375	1.055
	ELUFO	-0.854	0.241
	ELUSP	0.193	0.196
	FO19-SP1	-0.621	0.787
	FO22	-0.405	0.666
	FO23	-0.292	-0.255
	FO29	-0.219	-0.054
	FO9	0.726	-0.216
	FOBCP	-0.260	0.381
	FOBKS	0.688	-0.475
	FOBSC	0.507	-0.570
	FODGH	0.154	-0.189
	FODHE	0.228	0.130
	FODPO	0.203	1.156
	FORD7-75	-0.359	0.390
	FOUEW	-0.144	0.315
	FOUKI	0.819	-0.117
	FOUL	0.616	-0.543
	FOUNGD	0.963	0.055
	FOUSH	0.776	-0.117
	GHCKD	-1.093	-0.434
	GHCKU	-1.142	0.143
	GRCK	0.447	-0.266
	GRDS	0.063	-0.762
	GREE1-50	-0.631	-1.438
	GREE3-75	-1.063	0.243
	GREE4-25	-1.462	0.128

Table C.30: NMS results of the non-transformed proportional matrix of the benthic community structure at family level for reference (n = 40) and mine-influenced (n = 74) areas. Percent variance explained, Monte Carlo randomized p-values of axis significance, and station scores, September 2015.

Axis		NMS-1	NMS-2
% Variance explained		61.7	18.9
Monte Carlo P		0.004	0.004
Mine-influenced	GREE4-75	-1.505	0.064
	HACKDS	-0.447	-0.025
	HACKUS	0.320	-0.321
	HARM1-50	-0.401	-0.132
	HARM5-25	1.191	0.252
	HENFO	0.633	0.424
	KICK	-1.464	0.294
	KILM1-50	-1.763	0.438
	LC_DC1	0.747	0.189
	LC_DCDS	0.604	0.186
	LC_FRUS	-0.031	0.036
	LI8	0.412	-0.633
	LIDSL	0.143	0.013
	LILC3	-1.059	0.295
	M12	0.055	-0.123
	M13	0.525	0.267
	M15	0.927	-0.876
	MIDAG	0.845	0.385
	MIDCO	-0.431	-0.466
	MIUCO	0.574	0.646
	MP1	0.159	0.072
	FODNGD	1.037	-0.018
	NGD1u	-0.542	-0.232
	NTHO1-25	-1.412	-0.489
	NTHO1-50	-1.247	-0.952
	OCNM	-0.971	-1.149
	POCK	-1.422	0.248
	PORT3-25	-0.527	-1.884
	PORT3-50	-1.086	0.923
	SWCK	-1.385	0.035
	SWIF2-75	-1.325	-0.099
	THCK	-1.060	-1.644
	WOCK	-1.310	-0.309

Table C.31: Pearson correlation of NMS community structure axes (derived from family level taxonomy using non-transformed proportional matrix) with benthic taxa for reference (n = 40) and mine-influenced (n = 74) areas, September 2015.

Category	Variable	NMS-1		NMS-2	
		r	p	r	p
Benthic Family	Ameletidae	0.250	0.007	0.092	0.332
	Baetidae	0.416	0.000	-0.275	0.003
	Ephemerellidae	0.310	0.001	0.270	0.004
	Heptageniidae	0.823	0.000	0.165	0.079
	Leptophlebiidae	-0.035	0.715	-0.077	0.416
	Capniidae	-0.235	0.012	0.032	0.733
	Chloroperlidae	0.468	0.000	-0.005	0.959
	Leuctridae	0.212	0.023	-0.012	0.896
	Nemouridae	-0.322	0.000	-0.222	0.017
	Peltoperlidae	-0.030	0.752	-0.210	0.025
	Perlidae	0.029	0.757	0.008	0.935
	Perlodidae	-0.003	0.974	0.184	0.050
	Pteronarcyidae	0.129	0.172	0.019	0.840
	Taeniopterygidae	0.454	0.000	-0.013	0.895
	Apataniidae	0.140	0.138	-0.119	0.209
	Brachycentridae	0.113	0.230	-0.053	0.578
	Glossosomatidae	0.222	0.018	0.010	0.917
	Hydropsychidae	0.071	0.452	-0.204	0.029
	Hydroptilidae	-0.263	0.005	-0.180	0.056
	Lepidostomatidae	0.096	0.311	0.084	0.374
	Limnephilidae	-0.233	0.013	0.102	0.278
	Rhyacophilidae	0.037	0.695	-0.111	0.241
	Uenoidae	0.099	0.297	-0.174	0.064
	Dytiscidae	-0.156	0.097	-0.148	0.116
	Elmidae	-0.103	0.276	-0.201	0.032
	Athericidae	-0.050	0.601	0.233	0.013
	Ceratopogonidae	-0.063	0.509	-0.040	0.670
	Chironomidae	-0.834	0.000	0.234	0.012
	Empididae	-0.207	0.027	0.078	0.407
	Muscidae	-0.418	0.000	0.138	0.143
	Pelecorhynchidae	-0.122	0.196	-0.153	0.104
	Psychodidae	-0.130	0.169	-0.318	0.001
	Simuliidae	-0.299	0.001	-0.316	0.001
	Stratiomyidae	-0.216	0.021	-0.180	0.055
	Tipulidae	-0.169	0.073	-0.061	0.520
	Aturidae	-0.243	0.009	-0.025	0.788
	Hydryphantidae	0.077	0.416	-0.076	0.422
	Hygrobatidae	0.111	0.238	0.120	0.203
	Lebertiidae	-0.112	0.233	0.238	0.011
	Sperchontidae	-0.173	0.066	-0.008	0.931
	Torrenticolidae	-0.026	0.781	0.047	0.623
	Pisidiidae	-0.163	0.083	-0.281	0.002
	Lumbriculidae	0.149	0.114	-0.061	0.521
	Enchytraeidae	-0.308	0.001	0.177	0.060
	Naididae	-0.169	0.073	0.134	0.155
	Tubificidae	-0.204	0.029	-0.342	0.000
	Oribatidae	-0.235	0.012	-0.259	0.005

indicates absolute r-value greater than 0.60.

indicates a p-value below 0.05.

Table C.32: NMS results of the fourthroot transformed proportional matrix of the benthic community structure at family level for reference (n = 40) and mine-influenced (n = 74) areas. Percent variance explained, Monte Carlo randomized p-values of axis significance, and station scores, September 2015.

Axis		NMS-1	NMS-2
% Variance explained		74.0	13.9
Monte Carlo P		0.004	0.004
Reference	AGCK	-1.015	-0.129
	AL4	-0.182	-0.264
	ALUSM	-0.228	-0.379
	BU2	-0.728	0.201
	BU40	-0.342	0.321
	BUUQ	-0.406	0.089
	CADCK	-0.580	-0.021
	CHCK	-0.193	-0.161
	CRUKO	-1.098	0.135
	DACK	-0.250	-0.221
	DUCK	-0.002	-0.075
	EL12	-0.256	0.080
	ELUGH	-0.795	0.082
	EWCK	-0.871	0.025
	FLAD	0.024	0.200
	FLAU	-0.087	-0.760
	FLRU	-0.142	-0.507
	FO26	-0.637	0.178
	GRUHA	-0.827	-0.194
	HENUP	-0.943	0.190
	KO1	-0.595	1.110
	KODCR	-0.674	0.490
	KOUCR	-0.416	0.477
	KOUVE	0.137	0.747
	LC_GRCK	-0.340	-0.700
	LI24	-0.226	0.546
	MCCR	-0.660	-0.473
	MI25	-0.446	0.078
	OLDDU	-0.322	0.271
	OLDLI	-0.634	0.014
	OLDLOW	-0.562	0.617
	PADAL	-0.440	0.105
	PAUKO	-0.490	0.308
	RACK	-0.183	0.009
	SLINE	-0.986	-0.018
	VEUKO	-0.236	0.745
	VEUP	-0.228	0.401
	VICK	-0.287	-0.096
	WWRL	-0.387	-0.220
	WWRU	-0.630	-0.300

Table C.32: NMS results of the fourthroot transformed proportional matrix of the benthic community structure at family level for reference (n = 40) and mine-influenced (n = 74) areas. Percent variance explained, Monte Carlo randomized p-values of axis significance, and station scores, September 2015.

Axis		NMS-1	NMS-2
% Variance explained		74.0	13.9
Monte Carlo P		0.004	0.004
Mine-influenced	BOCK	2.421	-0.673
	CACK	2.761	0.318
	CATA2-25	2.906	0.823
	CATA2-75	2.864	0.931
	COCK	1.364	-0.523
	EL19	-0.050	0.140
	EL1	-0.519	0.297
	EL20	-0.708	-0.152
	ELDEL	-0.453	-0.031
	ELDFE	-0.293	1.038
	ELDGR	-0.354	0.139
	ELELKO	-1.120	0.488
	ELH93	-0.741	1.317
	ELUEL	-0.595	0.154
	ELUFE	-0.465	1.190
	ELUFO	0.108	0.854
	ELUSP	-0.724	0.343
	FO19-SP1	0.282	-0.036
	FO22	0.184	-0.272
	FO23	-0.028	0.012
	FO29	-0.171	-0.093
	FO9	-0.427	-0.026
	FOBCP	0.119	0.109
	FOBKS	-0.215	0.081
	FOBSC	-0.062	0.085
	FODGH	-0.086	-0.155
	FODHE	-0.509	0.245
	FODPO	0.181	-0.437
	FORD7-75	0.156	-0.169
	FOUEW	-0.059	-0.201
	FOUKI	-0.064	-0.035
	FOUL	-0.076	-0.403
	FOUNGD	-0.765	-0.103
	FOUSH	-0.099	0.202
	GHCKD	0.808	-0.868
	GHCKU	0.584	0.187
	GRCK	-0.565	-0.255
	GRDS	-0.536	-0.416
	GREE1-50	0.928	-1.274
	GREE3-75	0.314	0.020
	GREE4-25	1.500	0.251

Table C.32: NMS results of the fourthroot transformed proportional matrix of the benthic community structure at family level for reference (n = 40) and mine-influenced (n = 74) areas. Percent variance explained, Monte Carlo randomized p-values of axis significance, and station scores, September 2015.

Axis		NMS-1	NMS-2
% Variance explained		74.0	13.9
Monte Carlo P		0.004	0.004
Mine-influenced	GREE4-75	0.870	0.481
	HACKDS	-0.703	-0.816
	HACKUS	-0.329	-0.294
	HARM1-50	-0.018	-0.365
	HARM5-25	-0.703	-0.470
	HENFO	-0.552	0.409
	KICK	1.203	0.491
	KILM1-50	2.153	1.534
	LC_DC1	-0.595	-0.291
	LC_DCDS	-0.556	0.075
	LC_FRUS	-0.202	-0.060
	LI8	-0.726	-0.304
	LIDSL	-0.213	0.051
	LILC3	0.111	0.366
	M12	-0.242	-0.190
	M13	-0.554	-0.482
	M15	-0.551	-0.666
	MIDAG	-0.440	-0.501
	MIDCO	0.016	-0.293
	MIUCO	-0.503	-0.323
	MP1	-0.116	0.053
	FODNGD	-0.276	-0.054
	NGD1u	0.607	0.046
	NTHO1-25	2.218	-0.446
	NTHO1-50	1.808	-0.437
	OCNM	0.873	-1.089
	POCK	0.955	-0.124
	PORT3-25	0.740	-1.974
	PORT3-50	0.964	0.852
	SWCK	1.606	-0.280
	SWIF2-75	1.370	0.236
	THCK	1.061	-1.178
	WOCK	1.089	0.040

Table C.33: Pearson correlation of NMS community structure axes (derived from family level taxonomy using fourthroot transformed proportional matrix) with benthic taxa for reference (n = 40) and mine-influenced (n = 74) areas, September 2015.

Category	Variable	NMS-1		NMS-2	
		r	p	r	p
Benthic Family	Ameletidae	-0.398	0.000	0.283	0.002
	Baetidae	-0.722	0.000	-0.049	0.607
	Ephemerellidae	-0.803	0.000	0.138	0.144
	Heptageniidae	-0.872	0.000	0.117	0.215
	Leptophlebiidae	-0.130	0.168	0.106	0.260
	Capniidae	0.228	0.015	0.385	0.000
	Chloroperlidae	-0.609	0.000	-0.084	0.372
	Leuctridae	-0.239	0.010	-0.052	0.584
	Nemouridae	0.070	0.461	-0.517	0.000
	Peltoperlidae	-0.021	0.826	-0.242	0.010
	Perlidae	-0.284	0.002	0.169	0.073
	Perlodidae	-0.383	0.000	0.102	0.282
	Pteronarcyidae	-0.148	0.116	0.136	0.149
	Taeniopterygidae	-0.635	0.000	-0.171	0.069
	Apataniidae	-0.136	0.150	-0.177	0.060
	Brachycentridae	-0.193	0.040	-0.074	0.437
	Glossosomatidae	-0.367	0.000	-0.245	0.009
	Hydropsychidae	-0.476	0.000	0.052	0.586
	Hydroptilidae	0.386	0.000	-0.274	0.003
	Lepidostomatidae	-0.236	0.011	0.278	0.003
	Limnephilidae	0.449	0.000	-0.230	0.014
	Rhyacophilidae	-0.232	0.013	-0.329	0.000
	Uenoidae	-0.233	0.013	-0.215	0.021
	Dytiscidae	0.093	0.325	-0.011	0.906
	Elmidae	-0.026	0.785	-0.438	0.000
	Athericidae	-0.117	0.216	0.336	0.000
	Ceratopogonidae	0.104	0.272	-0.131	0.166
	Chironomidae	0.628	0.000	0.290	0.002
	Empididae	0.051	0.588	0.021	0.827
	Muscidae	0.662	0.000	0.249	0.008
	Pelecorhynchidae	0.118	0.210	-0.278	0.003
	Psychodidae	0.220	0.019	-0.427	0.000
	Simuliidae	0.415	0.000	-0.249	0.007
	Stratiomyidae	0.242	0.010	-0.138	0.143
	Tipulidae	0.122	0.195	-0.134	0.156
	Aturidae	0.148	0.115	-0.191	0.041
	Hydryphantidae	-0.131	0.166	0.061	0.522
	Hygrobatidae	-0.062	0.513	0.096	0.308
	Lebertiidae	-0.142	0.133	0.239	0.011
	Sperchontidae	-0.074	0.437	0.390	0.000
	Torrenticolidae	-0.154	0.101	0.033	0.724
	Pisidiidae	0.150	0.111	-0.392	0.000
	Lumbriculidae	-0.133	0.158	-0.114	0.228
	Enchytraeidae	0.593	0.000	0.111	0.238
	Naididae	0.025	0.791	0.183	0.052
	Tubificidae	0.270	0.004	-0.469	0.000
	Oribatidae	0.294	0.002	-0.233	0.012

indicates absolute r-value greater than 0.60.
indicates a p-value below 0.05.

Table C.34: NMS results of the presence/absence matrix of the benthic community structure at family level for reference (n = 40) and mine-influenced (n = 74) areas. Percent variance explained, Monte Carlo randomized p-values of axis significance, and station scores, September 2015.

Axis		NMS-1	NMS-2
% Variance explained		69.0	13.1
Monte Carlo P		0.004	0.004
Reference	AGCK	0.526	0.295
	AL4	-0.123	-0.232
	ALUSM	0.173	-0.195
	BU2	0.590	0.337
	BU40	0.427	0.279
	BUUQ	0.278	0.281
	CADCK	0.686	0.021
	CHCK	0.398	-0.401
	CRUKO	0.799	0.427
	DACK	0.124	-0.151
	DUCK	0.235	-0.151
	EL12	-0.038	0.008
	ELUGH	0.709	0.292
	EWCK	0.998	0.300
	FLAD	0.197	-0.284
	FLAU	0.492	-1.003
	FLRU	0.364	-0.740
	FO26	0.718	0.195
	GRUHA	0.869	0.269
	HENUP	0.585	0.560
	KO1	0.484	1.100
	KODCR	0.298	0.568
	KOUCR	0.114	0.483
	KOUVE	0.224	-0.970
	LC_GRCK	-0.015	0.380
	LI24	-0.031	0.673
	MCCR	0.658	-0.106
	MI25	0.408	0.193
	OLDDU	0.307	0.197
	OLDLI	0.366	0.049
	OLDLOW	0.371	0.580
	PADAL	0.134	0.311
	PAUKO	0.250	0.421
	RACK	0.165	-0.017
	SLINE	0.776	0.640
	VEUKO	-0.323	0.552
	VEUP	0.049	0.635
	VICK	0.348	-0.134
	WWRL	0.005	-0.278
	WWRU	0.272	-0.380

Table C.34: NMS results of the presence/absence matrix of the benthic community structure at family level for reference (n = 40) and mine-influenced (n = 74) areas. Percent variance explained, Monte Carlo randomized p-values of axis significance, and station scores, September 2015.

Axis		NMS-1	NMS-2
% Variance explained		69.0	13.1
Monte Carlo P		0.004	0.004
Mine-influenced	BOCK	-2.457	-1.151
	CACK	-2.913	-0.074
	CATA2-25	-3.168	0.701
	CATA2-75	-3.082	0.954
	COCK	-1.094	-0.404
	EL19	0.039	-0.140
	EL1	0.607	0.148
	EL20	0.356	-0.556
	ELDEL	0.238	-0.049
	ELDFE	0.439	0.897
	ELDGR	0.173	0.109
	ELELKO	0.697	1.003
	ELH93	1.015	1.165
	ELUEL	0.751	-0.193
	ELUFE	1.294	0.382
	ELUFO	0.785	-0.751
	ELUSP	0.924	-0.064
	FO19-SP1	-0.273	-0.070
	FO22	-0.281	-0.234
	FO23	0.190	-0.012
	FO29	0.405	-0.232
	FO9	0.454	0.056
	FOBCP	-0.182	0.152
	FOBKS	-0.019	0.188
	FOBSC	-0.032	0.114
	FODGH	0.047	-0.301
	FODHE	0.643	-0.545
	FODPO	-0.346	-0.174
	FORD7-75	-0.114	-0.277
	FOUEW	0.255	-0.200
	FOUKI	-0.033	-0.119
	FOUL	-0.172	-0.406
	FOUNGD	0.924	-0.274
	FOUSH	-0.217	0.259
	GHCKD	-0.357	-1.034
	GHCKU	-0.395	0.345
	GRCK	0.711	-0.154
	GRDS	0.788	-0.244
	GREE1-50	-0.643	-1.365
	GREE3-75	-0.233	-0.028
	GREE4-25	-1.295	0.145
	GREE4-75	-0.602	-0.133
	HACKDS	1.386	-0.345

Table C.34: NMS results of the presence/absence matrix of the benthic community structure at family level for reference (n = 40) and mine-influenced (n = 74) areas. Percent variance explained, Monte Carlo randomized p-values of axis significance, and station scores, September 2015.

Axis		NMS-1	NMS-2
% Variance explained		69.0	13.1
Monte Carlo P		0.004	0.004
Mine-influenced	HACKUS	0.055	0.064
	HARM1-50	-0.002	-0.579
	HARM5-25	0.485	-0.440
	HENFO	0.411	0.487
	KICK	-0.740	0.600
	KILM1-50	-2.094	1.853
	LC_DC1	0.569	-0.136
	LC_DCDS	0.394	0.408
	LC_FRUS	0.556	-0.287
	LI8	0.799	0.122
	LIDSL	0.076	0.147
	LILC3	0.022	0.299
	M12	0.170	-0.352
	M13	0.706	-0.603
	M15	0.361	-0.679
	MIDAG	0.211	-0.571
	MIDCO	0.064	-0.196
	MIUCO	0.548	-0.208
	MP1	0.170	0.057
	FODNGD	-0.259	0.069
	NGD1u	-0.792	0.266
	NTHO1-25	-2.300	-0.332
	NTHO1-50	-1.707	-0.107
	OCNM	-0.764	-0.750
	POCK	-0.594	-0.252
	PORT3-25	-1.045	-1.758
	PORT3-50	-0.492	1.139
	SWCK	-1.656	-0.390
	SWIF2-75	-0.935	0.773
	THCK	-0.705	-0.952
	WOCK	-0.593	0.214

Table C.35: Pearson correlation of NMS community structure axes (derived from family level taxonomy using presence/absence matrix) with benthic taxa for reference (n = 40) and mine-influenced (n = 74) areas, September 2015.

Category	Variable	NMS-1		NMS-3	
		r	p	r	p
Benthic Family	Ameletidae	0.441	0.000	0.118	0.210
	Baetidae	0.758	0.000	-0.099	0.297
	Ephemerellidae	0.745	0.000	0.140	0.136
	Heptageniidae	0.764	0.000	0.052	0.580
	Leptophlebiidae	0.205	0.029	-0.002	0.987
	Capniidae	-0.280	0.003	0.464	0.000
	Chloroperlidae	0.482	0.000	-0.056	0.555
	Leuctridae	0.254	0.006	-0.078	0.411
	Nemouridae	0.395	0.000	-0.208	0.027
	Peltoperlidae	0.101	0.284	0.061	0.516
	Perlidae	0.351	0.000	-0.113	0.229
	Perlodidae	0.409	0.000	0.273	0.003
	Pteronarcyidae	0.149	0.113	-0.133	0.158
	Taeniopterygidae	0.544	0.000	-0.108	0.251
	Apataniidae	0.124	0.190	-0.121	0.200
	Brachycentridae	0.277	0.003	-0.208	0.027
	Glossosomatidae	0.355	0.000	-0.269	0.004
	Hydropsychidae	0.456	0.000	0.153	0.105
	Hydroptilidae	-0.346	0.000	-0.294	0.002
	Lepidostomatidae	0.278	0.003	0.322	0.000
	Limnephilidae	-0.450	0.000	-0.215	0.022
	Rhyacophilidae	0.279	0.003	-0.088	0.349
	Uenoidae	0.222	0.017	0.008	0.936
	Dytiscidae	-0.085	0.370	-0.030	0.749
	Elmidae	0.113	0.232	-0.452	0.000
	Athericidae	0.191	0.042	0.104	0.269
	Ceratopogonidae	-0.092	0.331	-0.124	0.190
	Empididae	0.026	0.784	-0.130	0.168
	Muscidae	-0.668	0.000	0.150	0.112
	Pelecorhynchidae	-0.085	0.370	-0.215	0.022
	Psychodidae	-0.091	0.337	-0.576	0.000
	Simuliidae	-0.335	0.000	-0.231	0.013
	Stratiomyidae	-0.199	0.033	-0.065	0.490
	Tipulidae	-0.134	0.155	-0.156	0.098
	Aturidae	-0.037	0.697	-0.241	0.010
	Hydryphantidae	0.121	0.199	0.104	0.269
	Hygrobatidae	0.058	0.538	0.006	0.950
	Lebertiidae	0.256	0.006	0.046	0.628
	Sperchontidae	0.160	0.090	0.393	0.000
	Torrenticolidae	0.270	0.004	-0.166	0.078
	Pisidiidae	-0.005	0.955	-0.336	0.000
	Lumbriculidae	0.109	0.247	-0.119	0.206
	Enchytraeidae	-0.410	0.000	-0.142	0.133
	Naididae	-0.011	0.911	-0.108	0.253
	Tubificidae	-0.260	0.005	-0.392	0.000
	Oribatidae	-0.287	0.002	-0.250	0.007

indicates absolute r-value greater than 0.60.
indicates a p-value below 0.05.

Table C.36: CCA results of non-transformed abundance matrix of the benthic community structure at LPL level of taxonomy for reference (n = 40) and mine-influenced (n = 74) areas. Eigen value, percent vaiance explained, Monte Carlo randomized p-values, and station scores, September 2015.

Axis		CCA-1	CCA-2	CCA-3
Eigen value		0.267	0.143	0.115
% Variance explained		5.1	2.7	2.2
Monte Carlo P (eigenvalue)		0.007		
Monte Carlo P (Species-Environment)		0.0871		
Reference	AGCK	-0.69898	-0.05251	-1.0943
	AL4	-0.43607	0.57281	0.84018
	ALUSM	-0.49658	0.44344	0.41007
	BU2	-0.65942	0.01427	-1.0418
	BU40	-0.52433	0.3375	0.06503
	BUUQ	-0.66172	-0.00302	-1.03555
	CADCK	-0.56518	0.28174	-0.11449
	CHCK	-0.54813	0.30815	-0.01546
	CRUKO	-0.70126	-0.03586	-1.06846
	DACK	-0.64896	0.02928	-1.03781
	DUCK	-0.71198	-0.02598	-1.08583
	EL12	-0.59006	0.23241	-0.27506
	ELUGH	-0.68075	0.02785	-0.92221
	EWCK	-0.52918	0.30223	-0.08438
	FLAD	-0.72201	-0.03218	-1.08797
	FLAU	-0.72196	-0.03195	-1.0879
	FLRU	-0.72066	-0.03084	-1.0867
	FO26	-0.41674	0.57188	0.77008
	GRUHA	-0.4279	0.5798	0.82351
	HENUP	-0.62297	0.05646	-0.77818
	KO1	-0.68754	-0.0229	-1.05902
	KODCR	-0.70105	-0.03629	-1.07171
	KOUCR	-0.7018	-0.03582	-1.07225
	KOUVE	-0.71552	-0.03703	-1.07993
	LC_GRCK	-0.66605	0.01822	-1.06197
	LI24	-0.66828	-0.00927	-1.07593
	MCCR	-0.41028	0.53274	0.6028
	MI25	-0.61066	0.1973	-0.37243
	OLDDU	-0.68332	0.00034	-1.06431
	OLDLI	-0.67765	0.00766	-1.05956
	OLDLOW	-0.67803	0.00789	-1.05735
	PADAL	-0.66804	-0.00865	-1.03971
	PAUKO	-0.67437	-0.0138	-1.04577
	RACK	-0.68871	-0.00413	-1.06349
	SLINE	-0.65327	0.00784	-1.05331
	VEUKO	-0.70099	-0.03733	-1.06866
	VEUP	-0.7087	-0.04349	-1.07534
	VICK	-0.68148	0.00326	-1.05383
	WWRL	-0.71636	-0.03601	-1.08431
	WWRU	-0.7219	-0.03361	-1.08808

Table C.36: CCA results of non-transformed abundance matrix of the benthic community structure at LPL level of taxonomy for reference (n = 40) and mine-influenced (n = 74) areas. Eigen value, percent vaiance explained, Monte Carlo randomized p-values, and station scores, September 2015.

Axis		CCA-1	CCA-2	CCA-3
Eigen value		0.267	0.143	0.115
% Variance explained		5.1	2.7	2.2
Monte Carlo P (eigenvalue)		0.007		
Monte Carlo P (Species-Environment)		0.0871		
Exposed	BOCK	1.18923	-3.52573	-0.7262
	CACK	4.18435	2.2277	-1.42825
	CATA2-25	4.25977	2.45218	-1.86111
	CATA2-75	4.246	2.40314	-1.79154
	COCK	0.51829	0.37028	1.97207
	EL19	-0.31483	0.30425	0.77289
	EL1	-0.45637	0.02575	-0.28804
	EL20	-0.46429	0.45411	0.50833
	ELDFE	-0.34274	0.34451	0.6411
	ELELKO	-0.60187	-0.20341	-1.16139
	ELH93	-0.34025	0.43482	0.80507
	ELUEL	-0.43362	0.52366	0.72267
	ELUFE	-0.33099	0.33457	0.67311
	ELUFO	-0.41106	0.57519	0.86671
	ELUSP	-0.38315	0.21959	0.3503
	FO10-SP1	-0.05517	-1.66251	-0.47483
	FO22	0.1967	-1.63562	-0.38168
	FO23	-0.08914	-0.40644	0.30793
	FO29	-0.0782	-0.47664	0.43542
	FO9	-0.11665	-0.6454	0.08783
	FOBCP	0.26099	-0.24356	0.71297
	FOBKS	-0.1354	-0.58702	0.41586
	FOBSC	0.00407	-0.41252	0.7743
	FODGH	-0.0415	-0.42803	0.43331
	FODHE	-0.3299	0.22201	0.55103
	FODPO	0.21082	-1.53637	-0.26086
	FORD7-75	0.15798	-1.36204	0.05587
	FOUEW	0.14854	-1.2614	0.04025
	FOUKI	-0.1194	-0.55482	0.54292
	FOUL	-0.34877	-1.06703	-1.51724
	FOUNGD	-0.19628	-0.78188	0.15633
	FOUSH	-0.12853	-0.60443	0.5234
	GHCKD	0.75575	1.38479	1.12683
	GHCKU	1.16831	1.99749	2.91497
	GRCK	-0.33637	0.46538	-0.34906
	GRDS	-0.20475	0.73926	0.67795
	GREE1-50	0.63263	1.13449	-0.06999

Table C.36: CCA results of non-transformed abundance matrix of the benthic community structure at LPL level of taxonomy for reference (n = 40) and mine-influenced (n = 74) areas. Eigen value, percent vaiance explained, Monte Carlo randomized p-values, and station scores, September 2015.

Axis		CCA-1	CCA-2	CCA-3
Eigen value		0.267	0.143	0.115
% Variance explained		5.1	2.7	2.2
Monte Carlo P (eigenvalue)		0.007		
Monte Carlo P (Species-Environment)		0.0871		
Exposed	GREE3-75	1.29418	2.11464	3.47903
	GREE4-25	6.39774	0.11909	6.60254
	GREE4-75	1.8528	2.11537	2.21775
	HACKDS	-0.10496	0.88328	0.6605
	HACKUS	-0.10605	0.81649	0.34356
	HARM1-50	-0.11786	0.85479	0.55822
	HARM5-25	-0.03154	0.87158	0.2694
	HENFO	-0.27401	0.14751	0.61363
	KICK	1.10226	-4.65085	1.71251
	KILM1-50	1.27263	-4.87639	2.59516
	LC_DC1	-0.71255	-0.02133	-1.09759
	LC_DCDS	-0.70858	-0.01533	-1.09654
	LC_FRUS	-0.06897	-0.53462	0.4183
	LI8	-0.32522	-0.86519	-1.38335
	LIDSL	-0.1048	-0.72551	-0.34771
	LILC3	0.17009	-1.01269	0.25426
	MI2	-0.40213	-0.01827	-0.33497
	MI3	-0.53589	0.23299	-0.23747
	MI5	-0.50516	0.2664	-0.07808
	MIDAG	-0.53182	0.16235	-0.35024
	MIDCO	-0.16113	0.24553	0.44715
	MIUCO	-0.46284	0.51945	0.63967
	MP1	-0.1452	-0.63921	0.51233
	FODNGD	-0.19533	-0.81925	0.14588
	NTHO1-25	2.27557	-3.08633	-0.51074
	NTHO1-50	2.60805	-2.27628	1.81887
	OCNM	-0.59511	0.21956	-0.31913
	POCK	0.28416	1.06502	0.56162
	PORT3-25	0.32261	1.29972	0.57938
	PORT3-50	0.2405	1.39389	1.32241
	SWCK	3.27393	1.8558	-3.03212
	SWIF2-75	3.79524	2.1173	-3.31282
	THCK	0.75623	0.14312	0.05132
	WOCK	1.59211	-4.39165	0.00547
	ELDGR	-0.51805	-0.1507	-0.69719
	ELDEL	-0.62972	0.08622	-0.68473
	NGD1u	-0.35783	0.51879	0.35354

Table C.37: CCA results of non-transformed abundance matrix of the benthic community structure at LPL level of taxonomy for reference (n = 40) and mine-influenced (n = 74) areas. Environmental variable and station scores, September 2015.

Axis		CCA-1	CCA-2	CCA-3
Environmental Variable	Cl	0.85796	0.09727	0.35918
	Nitrate	0.8395	-0.53292	-0.04422
	Sulfate	0.96061	0.0084	0.10892
	Selenium	0.90647	0.1284	-0.35327
Lowest Possible Level	Ameletus	-0.44068	0.08544	-0.289
	Baetidae	-0.48073	0.13516	-0.21652
	Acentrella sp.	-0.48591	0.10582	-0.23327
	Baetis	-0.37743	0.21216	0.04226
	Baetis bicaudatus	-0.3566	0.38693	0.01983
	Baetis tricaudatus group	-0.24835	-0.00196	0.17452
	Ephemerellidae	-0.37279	0.1948	0.16974
	Drunella doddsii	-0.44321	0.04412	-0.23248
	Drunella flavilinea	-0.48406	-0.02536	-0.41274
	Drunella grandis group	-0.21598	-0.20604	0.2488
	Drunella sp.	-0.4107	0.2074	0.03662
	Ephemerella	-0.52021	0.17965	-0.15699
	Heptageniidae	-0.40012	-0.01056	-0.1721
	Cinygmula sp.	-0.58894	0.09853	-0.53537
	Epeorus	-0.46608	0.11936	-0.2486
	Rhithrogena	-0.56245	0.00723	-0.62205
	Leptophlebiidae	-0.47508	0.26373	0.08282
	Capniidae	1.68099	0.44932	-0.66126
	Chloroperlidae	-0.4274	0.03638	-0.45379
	Sweltsa sp.	-0.42336	0.06751	-0.37916
	Leuctridae	-0.45339	0.22635	-0.27046
	Nemouridae	0.14209	0.22348	0.96979
	Amphinemura sp.	2.2461	1.27329	-1.28747
	Zapada	0.49693	-0.47704	0.15781
	Zapada cinctipes	0.32759	-0.31321	0.15749
	Zapada columbiana	0.03181	0.5548	-0.31798
	Zapada oregonensis group	-0.2205	-0.07613	-0.0266
	Peltoperlidae	0.23604	1.1424	0.4386
	Yoraperla sp.	0.03446	0.94916	0.34586
	Perlidae	-0.40339	0.13268	0.14606
	Hesperoperla sp.	-0.49707	0.00122	-0.40342
	Perlodidae	0.02488	-0.68437	-0.16769
	Megarcys sp.	-0.27844	-0.24833	-0.14563
	Pteronarcella sp.	-0.52634	-0.0196	-0.72221
	Taeniopterygidae	-0.57874	0.21297	-0.30498
	Taenionema	-0.3359	-0.10371	-0.17966
	Apataniidae	-0.43459	0.27021	-0.05448
	Brachycentridae	-0.28821	0.28553	0.18328
	Glossosomatidae	-0.3576	-0.22954	-0.32585
	Hydropsychidae	-0.2902	-0.20741	-0.2256
	Arctopsyche sp.	-0.53927	0.01679	-0.48576
	Hydropsyche	-0.59548	-0.038	-0.86286
	Parapsyche sp.	-0.0817	-0.35259	0.06247
	Lepidostoma	-0.5142	0.22856	-0.1065
	Limnephilidae	0.48294	0.3606	-0.61166
	Rhyacophila	-0.15553	0.01636	0.13053
	Rhyacophila brunnea/vemna group	0.05527	0.04112	0.28527
	Rhyacophila betteni group	-0.23087	0.07448	0.08393
	Rhyacophila hyalinata group	-0.24605	0.13797	0.20119
	Uenoidae	-0.41117	0.44223	0.20323
	Elmidae	0.12898	-0.44075	-0.00524
	Optioservus sp.	-0.05353	-0.32916	-0.096
	Atherix	-0.46268	0.22465	0.10539
	Bezzia/ Palpomyia	-0.26616	-0.24746	-0.035
	Probezzia	-0.5212	0.33684	0.12241
	Cryptochironomus	-0.59511	0.21956	-0.31913
	Microtendipes pedellus group	-0.3862	0.37704	0.57425
	Paracladopelma sp.	-0.57476	0.14527	-0.36934
	Paratendipes	-0.59511	0.21956	-0.31913

Table C.37: CCA results of non-transformed abundance matrix of the benthic community structure at LPL level of taxonomy for reference (n = 40) and mine-influenced (n = 74) areas. Environmental variable and station scores, September 2015.

Axis		CCA-1	CCA-2	CCA-3
Environmental Variable	Cl	0.85796	0.09727	0.35918
	Nitrate	0.8395	-0.53292	-0.04422
	Sulfate	0.96061	0.0084	0.10892
	Selenium	0.90647	0.1284	-0.35327
Lowest Possible Level	Phaenopsectra	-0.61769	-0.00244	-0.84176
	Stictochironomus	-0.46284	0.51945	0.63967
	Cladotanytarsus	-0.66172	-0.00302	-1.03555
	Stempellina sp.	-0.4616	0.24419	-0.04526
	Sublettea	-0.33686	0.33954	0.6571
	Boreoheptagyia sp.	-0.30182	0.37687	-0.33755
	Potthastia longimana group	-0.34024	0.43482	0.80507
	Corynoneura	3.33626	1.91645	-1.26379
	Cricotopus	0.80901	0.68212	0.35923
	Heterotrissocladius marcidus group	-0.37501	0.3154	0.50774
	Krenosmittia sp.	-0.68754	-0.0229	-1.05902
	Polypedilum sp.	-0.58261	0.16852	-0.38632
	Micropsectra	0.59591	0.10871	0.21202
	Rheotanytarsus	-0.08748	0.67331	0.62158
	Stempellinella sp.	1.22592	1.13693	0.22755
	Diamesa	0.67304	-0.82669	0.44316
	Pagastia	-0.06686	-0.16857	0.20985
	Pseudodiamesa sp.	1.76576	0.64832	-1.30318
	Brillia sp.	-0.05304	-0.7454	-0.80849
	Cricotopus (Nostococladius)	-0.58654	0.20716	-0.36869
	Eukiefferiella	0.68876	0.40131	-0.4571
	Heleniella sp.	0.59445	-0.71883	0.12748
	Hydrobaenus	1.90619	1.03447	-1.22437
	Limnophyes sp.	1.14262	-1.66055	0.02475
	Orthocladius	0.27208	0.19589	0.27192
	Parametriocnemus	1.42506	0.74061	-0.56189
	Rheocricotopus	-0.17657	-0.23348	-0.02098
	Thienemanniella	2.60481	1.40514	-2.14669
	Tvetenia bavarica group	0.377	-0.42519	-0.01518
	Thienemannimyia group	0.05695	0.67216	0.36252
	Empididae	0.09825	0.15133	-0.07169
	Chelifera/ Metachela	-0.17634	0.0036	0.12791
	Limnophora sp.	3.22607	0.01001	0.45476
	Glutops sp.	0.37563	0.76478	-0.41136
	Pericoma/Telmatoscopus sp.	0.53594	0.01899	0.62917
	Simuliidae	1.10613	-1.725	-0.19853
	Tipulidae	0.54159	0.00765	0.08862
	Antocha sp.	-0.29204	0.18387	0.15107
	Dicranota	0.60315	0.02207	-0.44102
	Hexatoma sp.	-0.52642	-0.05638	-0.65673
	Limnophila sp.	-0.4738	0.12875	-0.30902
	Trombidiformes	0.09594	0.22378	0.20514
	Aturus	0.30699	0.8417	0.52164
	Lebertia	-0.20223	-0.12895	0.27001
	Sperchon	-0.03773	-0.46398	0.04339
	Sperchonopsis sp.	-0.24105	0.10825	0.566
	Testudacarus sp.	-0.38958	0.24987	0.38911
	Torrenticola	-0.51933	0.20311	-0.34539
	Oribatida	0.46548	0.19141	0.2049
	Pisidium	0.432	1.01123	0.59109
	Lumbriculidae	-0.25987	0.14813	-0.01953

Table C.37: CCA results of non-transformed abundance matrix of the benthic community structure at LPL level of taxonomy for reference (n = 40) and mine-influenced (n = 74) areas. Environmental variable and station scores, September 2015.

Axis		CCA-1	CCA-2	CCA-3
Environmental Variable	Cl	0.85796	0.09727	0.35918
	Nitrate	0.8395	-0.53292	-0.04422
	Sulfate	0.96061	0.0084	0.10892
	Selenium	0.90647	0.1284	-0.35327
Lowest Possible Level	Rhynchelmis sp.	-0.30887	0.20382	-0.1503
	Enchytraeus	1.42401	0.09118	-0.48529
	Nais	-0.19548	0.41368	0.46161
	Tubificinae	0.63287	1.08272	0.68142

Table C.38: CCA results of Log_{10} transformed abundance matrix of the benthic community structure at LPL level of taxonomy for reference (n = 40) and mine-influenced (n = 74) areas. Eigen value, percent vaiance explained, Monte Carlo randomized p-values, and station scores, September 2015.

Axis		CCA-1	CCA-2	CCA-3
Eigen value		0.151	0.033	0.026
% Variance explained		6.4	1.4	1.1
Monte Carlo P (eigenvalue)		0.001		
Monte Carlo P (Species-Environment)		0.024		
Reference	AGCK	-0.69752	-0.69666	-0.80363
	AL4	-0.29363	0.43131	1.28334
	ALUSM	-0.38709	0.1716	0.82161
	BU2	-0.68103	-0.76118	-0.82839
	BU40	-0.45355	-0.06635	0.38957
	BUUQ	-0.68218	-0.74373	-0.83568
	CADCK	-0.49753	-0.1474	0.24629
	CHCK	-0.4738	-0.08818	0.34467
	CRUKO	-0.70429	-0.6993	-0.79504
	DACK	-0.67504	-0.7795	-0.83497
	DUCK	-0.71068	-0.70487	-0.77243
	EL12	-0.53281	-0.23911	0.08201
	ELUGH	-0.67146	-0.62044	-0.61479
	EWCK	-0.47117	-0.16856	0.22833
	FLAD	-0.71734	-0.69317	-0.76184
	FLAU	-0.71734	-0.69336	-0.76179
	FLRU	-0.71663	-0.69481	-0.76313
	FO26	-0.29663	0.33398	1.14419
	GRUHA	-0.29141	0.40169	1.25321
	HENUP	-0.61841	-0.56651	-0.55304
	KO1	-0.69647	-0.71662	-0.80799
	KODCR	-0.70364	-0.70021	-0.79509
	KOUCR	-0.70417	-0.7002	-0.79372
	KOUVE	-0.71322	-0.69152	-0.77455
	LC_GRCK	-0.68346	-0.76611	-0.81424
	LI24	-0.68083	-0.74754	-0.82435
	MCCR	-0.31929	0.18467	0.89512
	MI25	-0.55911	-0.28919	-0.01846
	OLDDU	-0.69453	-0.73985	-0.80017
	OLDLI	-0.69158	-0.74826	-0.80456
	OLDLOW	-0.6922	-0.74741	-0.80423
	PADAL	-0.68584	-0.73596	-0.82955
	PAUKO	-0.68927	-0.7292	-0.82287
	RACK	-0.6983	-0.732	-0.79538
	SLINE	-0.67426	-0.76464	-0.83867
	VEUKO	-0.70394	-0.69841	-0.79618
	VEUP	-0.70823	-0.69003	-0.78809
	VICK	-0.69488	-0.73999	-0.80258
	WWRL	-0.71332	-0.69317	-0.7722
	WWRU	-0.71712	-0.69216	-0.76277

Table C.38: CCA results of Log_{10} transformed abundance matrix of the benthic community structure at LPL level of taxonomy for reference (n = 40) and mine-influenced (n = 74) areas. Eigen value, percent vaiance explained, Monte Carlo randomized p-values, and station scores, September 2015.

Axis		CCA-1	CCA-2	CCA-3
Eigen value		0.151	0.033	0.026
% Variance explained		6.4	1.4	1.1
Monte Carlo P (eigenvalue)		0.001		
Monte Carlo P (Species-Environment)		0.024		
Exposed	BOCK	1.47933	1.88051	-3.0171
	CACK	4.44257	-2.71587	1.11051
	CATA2-25	4.54137	-3.09539	1.19364
	CATA2-75	4.52535	-3.02296	1.17538
	COCK	0.48317	0.70553	0.62574
	EL19	-0.16013	0.55174	1.02668
	EL1	-0.38636	-0.12228	-0.09156
	EL20	-0.35054	0.23147	0.89059
	ELDFE	-0.20931	0.4016	0.91184
	ELELKO	-0.60271	-0.67376	-1.00997
	ELH93	-0.1947	0.47909	1.12886
	ELUEL	-0.30391	0.35671	1.1232
	ELUFE	-0.193	0.43583	0.93568
	ELUFO	-0.27365	0.43098	1.26997
	ELUSP	-0.26406	0.26577	0.60018
	FO10-SP1	0.27858	1.26728	-0.67113
	FO22	0.4568	1.09997	-0.98964
	FO23	0.09699	0.70207	0.2263
	FO29	0.13587	0.88544	0.34509
	FO9	0.06708	0.70406	-0.10664
	FOBCP	0.48845	0.88497	0.67411
	FOBKS	0.05615	0.90182	0.1467
	FOBSC	0.22567	1.06568	0.58334
	FODGH	0.15956	0.81901	0.32231
	FODHE	-0.19842	0.41033	0.74256
	FODPO	0.47456	1.12336	-0.82592
	FORD7-75	0.41907	1.22806	-0.50888
	FOUEW	0.41119	1.16264	-0.41391
	FOUKI	0.08008	0.97862	0.26995
	FOUL	-0.29026	-0.30549	-1.78137
	FOUNGD	0.00391	0.88255	-0.10728
	FOUSH	0.09111	1.04164	0.3064
	GHCKD	0.72218	-0.49705	1.1042
	GHCKU	1.29768	0.56139	3.16968
	GRCK	-0.31399	-0.55461	0.04539
	GRDS	-0.10654	0.08297	1.10575
	GREE1-50	0.52998	-1.24568	0.01093

Table C.38: CCA results of Log_{10} transformed abundance matrix of the benthic community structure at LPL level of taxonomy for reference (n = 40) and mine-influenced (n = 74) areas. Eigen value, percent vaiance explained, Monte Carlo randomized p-values, and station scores, September 2015.

Axis		CCA-1	CCA-2	CCA-3
Eigen value		0.151	0.033	0.026
% Variance explained		6.4	1.4	1.1
Monte Carlo P (eigenvalue)		0.001		
Monte Carlo P (Species-Environment)		0.024		
Exposed	GREE3-75	1.44908	0.88566	3.63647
	GREE4-25	5.09238	-0.10439	-4.42807
	GREE4-75	1.92543	-0.22261	2.52098
	HACKDS	-0.00892	-0.04003	1.197
	HACKUS	-0.03548	-0.25997	0.86745
	HARM1-50	-0.02891	-0.10184	1.09227
	HARM5-25	0.02607	-0.38441	0.8067
	HENFO	-0.12653	0.51922	0.76167
	KICK	1.91407	5.28907	-0.52807
	KILM1-50	2.19693	6.2062	0.15257
	LC_DC1	-0.70983	-0.71206	-0.76739
	LC_DCDS	-0.70752	-0.71941	-0.76965
	LC_FRUS	0.14464	0.90642	0.27865
	LI8	-0.28686	-0.38917	-1.62432
	LIDSL	0.02452	0.34982	-0.63834
	LILC3	0.38689	1.04695	-0.28834
	MI2	-0.34945	-0.17479	-0.24549
	MI3	-0.49363	-0.25875	0.02103
	MI5	-0.45109	-0.15632	0.17482
	MIDAG	-0.49997	-0.3126	-0.1468
	MIDCO	-0.16311	0.00424	0.0787
	MIUCO	-0.33949	0.29764	1.05759
	MP1	0.07225	1.05404	0.26303
	FODNGD	0.0038	0.89582	-0.15197
	NTHO1-25	2.50547	1.40416	-3.03531
	NTHO1-50	3.00947	2.72871	-0.46532
	OCNM	-0.54432	-0.27291	0.02105
	POCK	0.30785	-0.44977	0.90112
	PORT3-25	0.31427	-0.65721	0.97558
	PORT3-50	0.3304	-0.00294	1.88231
	SWCK	3.5085	-3.39618	0.0988
	SWIF2-75	4.12846	-3.626	0.51765
	THCK	0.7508	-0.3832	-0.44644
	WOCK	1.90618	2.8461	-3.45429
	ELDGR	-0.47404	-0.32466	-0.55547
	ELDEL	-0.60651	-0.48204	-0.39523
	NGD1u	-0.25993	0.03633	0.7788

Table C.39: CCA results of Log_{10} transformed abundance matrix of the benthic community structure at LPL level of taxonomy for reference (n = 40) and mine-influenced (n = 74) areas. Environmental variable and station scores, September 2015.

Axis		CCA-1	CCA-2	CCA-3
Environmental Variable	Cl	0.87049	0.24219	0.42081
	Nitrate	0.86048	0.34716	-0.33965
	Sulfate	0.89591	-0.11916	-0.17332
	Selenium	0.90316	-0.31788	0.03806
Lowest Possible Level	Ameletus	-0.35718	-0.15846	-0.01556
	Baetidae	-0.38372	-0.11901	-0.0575
	Acentrella sp.	-0.42435	-0.12474	0.06249
	Baetis	-0.28246	-0.03748	0.04177
	Baetis bicaudatus	-0.33414	-0.05119	0.15443
	Baetis tricaudatus group	-0.21758	0.06172	0.05443
	Ephemerellidae	-0.26432	0.03302	0.04301
	Drunella doddsii	-0.28527	-0.06212	-0.09965
	Drunella flavilinea	-0.43603	-0.21872	-0.33236
	Drunella grandis group	-0.08656	0.33651	0.09094
	Drunella sp.	-0.31267	-0.04081	0.034
	Ephemerella	-0.44421	-0.13768	-0.06322
	Heptageniidae	-0.25015	-0.02709	-0.03697
	Cinygmula sp.	-0.50633	-0.24995	-0.13092
	Epeorus	-0.35051	-0.08997	-0.03756
	Rhithrogena	-0.45032	-0.19971	-0.15458
	Leptophlebiidae	-0.43509	-0.09488	0.21618
	Capniidae	0.44965	-0.1327	-0.19462
	Chloroperlidae	-0.2789	-0.27411	-0.25487
	Sweltsa sp.	-0.2645	-0.09007	-0.09259
	Leuctridae	-0.40036	-0.28157	-0.03646
	Nemouridae	0.05923	-0.00855	-0.24309
	Amphinemura sp.	1.40394	-0.54263	0.38482
	Zapada	0.1317	0.10424	-0.08991
	Zapada cinctipes	0.06478	0.21893	-0.02729
	Zapada columbiana	-0.09377	-0.20857	0.15116
	Zapada oregonensis group	-0.18868	0.12218	-0.10092
	Peltoperlidae	0.36028	-0.5658	0.3388
	Yoraperla sp.	0.11159	-0.50185	0.63297
	Perlidae	-0.30348	0.06911	-0.01907
	Hesperoperla sp.	-0.39005	-0.09892	-0.11015
	Perlodidae	0.01887	0.02493	0.07582
	Megarcys sp.	-0.19268	0.14951	-0.07481
	Pteronarcella sp.	-0.35274	-0.28228	0.04713
	Taeniopterygidae	-0.51126	-0.22296	0.09244
	Taenionema	-0.23762	0.03118	-0.06248
	Apataniidae	-0.29567	-0.0297	0.2471
	Brachycentridae	-0.16599	0.09797	0.20057
	Glossosomatidae	-0.27233	-0.02462	-0.03778
	Hydropsychidae	-0.2855	-0.08381	-0.03338
	Arctopsyche sp.	-0.44494	-0.20799	-0.2279
	Hydropsyche	-0.48032	-0.2643	-0.13197
	Parapsyche sp.	-0.11986	0.11183	-0.05092
	Lepidostoma	-0.4248	-0.06336	0.26051
	Limnephilidae	0.5228	-0.09969	-0.1312
	Rhyacophila	-0.10032	0.07421	0.03227
	Rhyacophila brunnea/vemna group	0.01687	0.14499	0.16503
	Rhyacophila betteni group	-0.10396	0.08014	0.22134
	Rhyacophila hyalinata group	-0.14507	0.24483	0.2344
	Uenoidae	-0.30628	-0.22524	-0.03473
	Elmidae	0.09851	0.01761	0.05921
	Optioservus sp.	0.04617	-0.0458	0.05208
	Atherix	-0.35785	0.07577	0.38181
	Bezzia/ Palpomyia	0.00625	0.49179	0.05242
	Probezzia	-0.50483	-0.21243	0.08192
	Cryptochironomus	-0.54432	-0.27291	0.02105
	Microtendipes pedellus group	-0.37079	0.08156	0.48247
	Paracladopelma sp.	-0.51503	-0.25304	-0.05359
	Paratendipes	-0.54432	-0.27291	0.02105

Table C.39: CCA results of Log_{10} transformed abundance matrix of the benthic community structure at LPL level of taxonomy for reference (n = 40) and mine-influenced (n = 74) areas. Environmental variable and station scores, September 2015.

Axis		CCA-1	CCA-2	CCA-3
Environmental Variable	Cl	0.87049	0.24219	0.42081
	Nitrate	0.86048	0.34716	-0.33965
	Sulfate	0.89591	-0.11916	-0.17332
	Selenium	0.90316	-0.31788	0.03806
Lowest Possible Level	Phaenopsectra	-0.54732	-0.43452	-0.4204
	Stictochironomus	-0.33949	0.29764	1.05759
	Cladotanytarsus	-0.68218	-0.74373	-0.83568
	Stempellina sp.	-0.39261	-0.13782	0.10981
	Sublettea	-0.20116	0.41872	0.92376
	Boreoheptagyia sp.	0.25142	-0.25365	0.82876
	Potthastia longimana group	-0.1947	0.47909	1.12886
	Corynoneura	2.66005	-1.84104	0.62931
	Cricotopus	0.96838	-0.54285	0.54593
	Heterotrissocladius marcidus group	-0.3145	0.19073	0.61938
	Krenosmittia sp.	-0.69647	-0.71662	-0.80799
	Polypedilum sp.	-0.55154	-0.35746	-0.17398
	Micropsectra	0.31084	0.03433	0.09987
	Rheotanytarsus	0.08887	0.54694	0.53471
	Stempellinella sp.	0.88525	0.17358	0.83762
	Diamesa	1.02404	0.54371	-0.28242
	Pagastia	0.06883	0.23761	0.05707
	Pseudodiamesa sp.	1.22912	-0.00697	0.02155
	Brillia sp.	-0.01478	-0.13573	-0.57199
	Cricotopus (Nostococladius)	-0.52943	-0.30953	-0.13964
	Eukiefferiella	0.32254	0.05372	0.07916
	Heleniella sp.	0.54609	0.40382	-0.68763
	Hydrobaenus	0.8443	-0.25684	0.16865
	Limnophyes sp.	1.16139	0.03177	-1.03266
	Orthocladius	0.2705	0.01894	0.06061
	Parametriocnemus	1.2109	-0.32541	0.08527
	Rheocricotopus	-0.21377	-0.10198	-0.13675
	Thienemanniella	1.1268	-0.48672	-0.20188
	Tvetenia bavarica group	0.17593	0.02412	-0.1261
	Thienemannimyia group	-0.04616	-0.26085	0.17823
	Empididae	0.23316	-0.01483	0.13527
	Chelifera/ Metachela	0.01273	0.13993	0.20211
	Limnophora sp.	2.6148	0.20571	-0.72003
	Glutops sp.	0.43519	-0.78518	0.23174
	Pericoma/Telmatoscopus sp.	0.25837	0.11399	0.05153
	Simuliidae	0.52761	0.2815	-0.20491
	Tipulidae	0.29462	0.03367	-0.11312
	Antocha sp.	-0.19951	0.07697	0.14668
	Dicranota	0.50318	-0.0633	-0.01343
	Hexatoma sp.	-0.54086	-0.44281	-0.55182
	Limnophila sp.	-0.41849	-0.28101	-0.18292
	Trombidiformes	0.13856	0.04314	0.0003
	Aturus	0.34702	-0.38167	0.27539
	Lebertia	-0.11313	0.27229	0.01295
	Sperchon	-0.03282	0.2223	-0.0593
	Sperchonopsis sp.	-0.16431	0.27762	0.66212
	Testudacarus sp.	-0.26437	0.20293	0.33337
	Torrenticola	-0.46998	-0.30787	-0.02546
	Oribatida	0.67561	-0.06675	0.20341
	Pisidium	0.26214	-0.23486	0.39247
	Lumbriculidae	-0.1946	0.15684	0.13069

Table C.39: CCA results of Log_{10} transformed abundance matrix of the benthic community structure at LPL level of taxonomy for reference (n = 40) and mine-influenced (n = 74) areas. Environmental variable and station scores, September 2015.

Axis		CCA-1	CCA-2	CCA-3
Environmental Variable	Cl	0.87049	0.24219	0.42081
	Nitrate	0.86048	0.34716	-0.33965
	Sulfate	0.89591	-0.11916	-0.17332
	Selenium	0.90316	-0.31788	0.03806
Lowest Possible Level	Rhynchelmis sp.	-0.26505	-0.23078	-0.0041
	Enchytraeus	0.885	-0.03024	-0.13126
	Nais	0.09561	0.2017	0.05816
	Tubificinae	0.84038	-0.61291	0.11773

Table C.40: CCA results of non-transformed proportion matrix of the benthic community structure at LPL level of taxonomy for reference (n = 40) and mine-influenced (n = 74) areas. Eigen value, percent vaiance explained, Monte Carlo randomized p-values, and station scores, September 2015.

Axis		CCA-1	CCA-2	CCA-3
Eigen value		0.318	0.159	0.092
% Variance explained		5.3	2.7	1.5
Monte Carlo P (eigenvalue)		0.001		
Monte Carlo P (Species-Environment)		0.0541		
Reference	AGCK	-0.79444	-0.40725	-0.67097
	AL4	-0.20351	0.29621	1.18855
	ALUSM	-0.33937	0.13223	0.77982
	BU2	-0.80272	-0.47055	-0.62585
	BU40	-0.45493	-0.02497	0.43297
	BUUQ	-0.80195	-0.45592	-0.63001
	CADCK	-0.50412	-0.06981	0.276
	CHCK	-0.47214	-0.0326	0.36636
	CRUKO	-0.80251	-0.41231	-0.64615
	DACK	-0.80265	-0.48731	-0.62105
	DUCK	-0.80394	-0.41496	-0.64571
	EL12	-0.55311	-0.12653	0.12529
	ELUGH	-0.75432	-0.36513	-0.49412
	EWCK	-0.49229	-0.09332	0.29144
	FLAD	-0.80557	-0.4042	-0.64509
	FLAU	-0.8056	-0.40438	-0.64495
	FLRU	-0.80561	-0.40581	-0.64434
	FO26	-0.23439	0.22148	1.10958
	GRUHA	-0.20931	0.27258	1.17258
	HENUP	-0.70912	-0.33933	-0.3915
	KO1	-0.80218	-0.42889	-0.64088
	KODCR	-0.80177	-0.41276	-0.64837
	KOUCR	-0.80197	-0.41267	-0.64806
	KOUVE	-0.80441	-0.40383	-0.64621
	LC_GRCK	-0.80151	-0.47246	-0.63218
	LI24	-0.79535	-0.45464	-0.65342
	MCCR	-0.29418	0.11551	0.9333
	MI25	-0.5859	-0.15577	0.03275
	OLDDU	-0.80347	-0.44874	-0.63406
	OLDLI	-0.8038	-0.45678	-0.63037
	OLDLOW	-0.80436	-0.45626	-0.62878
	PADAL	-0.80219	-0.44848	-0.63214
	PAUKO	-0.80215	-0.44172	-0.63513
	RACK	-0.80455	-0.4418	-0.63317
	SLINE	-0.79775	-0.4725	-0.63899
	VEUKO	-0.80217	-0.41152	-0.64716
	VEUP	-0.80226	-0.40324	-0.65034
	VICK	-0.80534	-0.45006	-0.62738
	WWRL	-0.80399	-0.40477	-0.64781
	WWRU	-0.8053	-0.40331	-0.64595

Table C.40: CCA results of non-transformed proportion matrix of the benthic community structure at LPL level of taxonomy for reference (n = 40) and mine-influenced (n = 74) areas. Eigen value, percent vaiance explained, Monte Carlo randomized p-values, and station scores, September 2015.

Axis		CCA-1	CCA-2	CCA-3
Eigen value		0.318	0.159	0.092
% Variance explained		5.3	2.7	1.5
Monte Carlo P (eigenvalue)		0.001		
Monte Carlo P (Species-Environment)		0.0541		
Exposed	BOCK	1.18117	1.68649	-2.67997
	CACK	3.34638	-2.47444	-0.49654
	CATA2-25	3.41602	-2.76107	-0.67035
	CATA2-75	3.40631	-2.70496	-0.64829
	COCK	0.27441	0.35927	1.46912
	EL19	-0.09447	0.40394	0.95965
	EL1	-0.42989	-0.03022	-0.02939
	EL20	-0.30031	0.16963	0.85386
	ELDFE	-0.16342	0.2931	0.87366
	ELELKO	-0.72997	-0.3828	-0.8374
	ELH93	-0.12797	0.33769	1.05892
	ELUEL	-0.23306	0.24767	1.06001
	ELUFE	-0.14402	0.31785	0.89259
	ELUFO	-0.1919	0.29166	1.19787
	ELUSP	-0.24049	0.21639	0.58265
	FO10-SP1	0.33851	1.16944	-1.01693
	FO22	0.40167	1.00488	-1.07082
	FO23	0.10028	0.58379	0.16844
	FO29	0.16819	0.72474	0.24425
	FO9	0.05949	0.61758	-0.13122
	FOBCP	0.46877	0.6652	0.5153
	FOBKS	0.08246	0.74869	0.15481
	FOBSC	0.26783	0.83312	0.51607
	FODGH	0.17219	0.66581	0.24967
	FODHE	-0.16365	0.31277	0.72911
	FODPO	0.42751	1.00784	-0.92301
	FORD7-75	0.40498	1.06117	-0.57727
	FOUEW	0.39969	1.00533	-0.52389
	FOUKI	0.11789	0.79759	0.27056
	FOUL	-0.45627	-0.02963	-1.62027
	FOUNGD	0.03381	0.76911	-0.12728
	FOUSH	0.14623	0.85378	0.24919
	GHCKD	0.39899	-0.60969	1.4103
	GHCKU	1.13285	0.04004	3.14084
	GRCK	-0.4295	-0.40629	0.11342
	GRDS	-0.12007	0.00198	1.06853
	GREE1-50	0.09645	-1.09515	0.35087

Table C.40: CCA results of non-transformed proportion matrix of the benthic community structure at LPL level of taxonomy for reference (n = 40) and mine-influenced (n = 74) areas. Eigen value, percent vaiance explained, Monte Carlo randomized p-values, and station scores, September 2015.

Axis		CCA-1	CCA-2	CCA-3
Eigen value		0.318	0.159	0.092
% Variance explained		5.3	2.7	1.5
Monte Carlo P (eigenvalue)		0.001		
Monte Carlo P (Species-Environment)		0.0541		
Exposed	GREE3-75	1.31399	0.24067	3.61555
	GREE4-25	2.73563	-1.13044	1.91946
	GREE4-75	1.49904	-0.59262	2.47708
	HACKDS	-0.04959	-0.11045	1.11567
	HACKUS	-0.11891	-0.259	0.81965
	HARM1-50	-0.07941	-0.14969	1.02024
	HARM5-25	-0.09121	-0.36187	0.76729
	HENFO	-0.08799	0.39556	0.73184
	KICK	2.2331	4.31289	-1.03728
	KILM1-50	2.62791	4.982	-0.46102
	LC_DC1	-0.8026	-0.41995	-0.64985
	LC_DCDS	-0.80253	-0.4266	-0.64815
	LC_FRUS	0.17307	0.74531	0.19402
	LI8	-0.46555	-0.12067	-1.42753
	LIDSL	-0.06096	0.36938	-0.55402
	LILC3	0.34779	0.87891	-0.2703
	MI2	-0.42367	-0.07095	-0.1212
	MI3	-0.53676	-0.1499	0.12418
	MI5	-0.48088	-0.08403	0.26437
	MIDAG	-0.56055	-0.18107	-0.01195
	MIDCO	-0.28589	-0.02359	0.49018
	MIUCO	-0.27253	0.20904	0.99805
	MP1	0.12883	0.86762	0.22209
	FODNGD	0.03184	0.78246	-0.15874
	NTHO1-25	1.90913	1.18091	-2.59091
	NTHO1-50	2.63598	1.99679	-0.31935
	OCNM	-0.57177	-0.14933	0.08024
	POCK	0.10654	-0.47258	0.98288
	PORT3-25	0.07888	-0.65696	1.09537
	PORT3-50	0.24734	-0.18643	1.81197
	SWCK	2.50227	-2.80605	-1.68196
	SWIF2-75	3.05678	-3.01691	-1.75799
	THCK	0.3742	-0.36565	-0.09188
	WOCK	1.57973	2.41992	-2.74802
	ELDGR	-0.55257	-0.14703	-0.44398
	ELDEL	-0.67375	-0.27937	-0.28507
	NGD1u	-0.25932	0.01347	0.73783

Table C.41: CCA results of non-transformed proportion matrix of the benthic community structure at LPL level of taxonomy for reference (n = 40) and mine-influenced (n = 74) areas. Environmental variable and station scores, September 2015.

Axis		CCA-1	CCA-2	CCA-3
Environmental Variable	Cl	0.93576	0.05762	0.34537
	Nitrate	0.8854	0.27283	-0.31697
	Sulfate	0.79661	-0.28215	0.05325
	Selenium	0.87527	-0.41525	-0.18678
Lowest Possible Level	Ameletus	-0.63349	-0.27329	-0.37033
	Baetidae	-0.51471	-0.11884	-0.02034
	Acentrella sp.	-0.50032	-0.10085	-0.02012
	Baetis	-0.3978	-0.02123	0.09585
	Baetis bicaudatus	-0.51001	-0.20897	-0.05321
	Baetis tricaudatus group	-0.17798	0.24623	0.15593
	Ephemerellidae	-0.36361	0.02917	0.21888
	Drunella doddsii	-0.47336	-0.08209	-0.032
	Drunella flavilinea	-0.64599	-0.25733	-0.47866
	Drunella grandis group	-0.15696	0.28877	0.21501
	Drunella sp.	-0.42539	-0.04459	0.11443
	Ephemerella	-0.57483	-0.16364	-0.07043
	Heptageniidae	-0.41647	0.0041	-0.11051
	Cinygmula sp.	-0.71315	-0.33396	-0.44146
	Epeorus	-0.51043	-0.13479	-0.12081
	Rhithrogena	-0.64993	-0.26229	-0.41486
	Leptophlebiidae	-0.50037	-0.08852	0.17683
	Capniidae	0.8511	-0.40812	0.02796
	Chloroperlidae	-0.57603	-0.22909	-0.35738
	Sweltsa sp.	-0.5117	-0.18743	-0.23346
	Leuctridae	-0.55104	-0.21962	-0.10516
	Nemouridae	-0.02743	0.06196	0.19238
	Amphinemura sp.	1.68363	-1.74575	-0.78799
	Zapada	0.40249	0.23606	0.00762
	Zapada cinctipes	0.28252	0.3122	-0.16173
	Zapada columbiana	-0.14886	-0.35478	0.20216
	Zapada oregonensis group	-0.20335	0.20173	-0.14563
	Peltoperlidae	0.09239	-0.52948	1.07847
	Yoraperla sp.	0.01394	-0.41133	1.03
	Perlidae	-0.27852	0.17174	0.28229
	Hesperoperla sp.	-0.44592	-0.02317	-0.16484
	Perlodidae	0.06765	0.334	-0.16629
	Megarcys sp.	-0.23356	0.17086	-0.08708
	Pteronarcella sp.	-0.59608	-0.2642	-0.39006
	Taeniopterygidae	-0.66771	-0.28299	-0.23571
	Taenionema	-0.35377	-0.00998	-0.083
	Apataniidae	-0.44632	-0.08816	0.24857
	Brachycentridae	-0.28404	0.03589	0.33536
	Glossosomatidae	-0.48382	-0.08517	-0.34967
	Hydropsychidae	-0.44424	-0.06195	-0.23813
	Arctopsyche sp.	-0.64913	-0.24691	-0.36168
	Hydropsyche	-0.69721	-0.33549	-0.48073
	Parapsyche sp.	-0.17701	0.18719	-0.07274
	Lepidostoma	-0.46292	-0.0488	0.26475
	Limnephilidae	0.56496	-0.39133	-0.38931
	Rhyacophila	-0.13673	0.1861	0.10884
	Rhyacophila brunnea/vemna group	0.03476	0.18592	0.16408
	Rhyacophila betteni group	-0.13069	0.10383	0.17407
	Rhyacophila hyalinata group	-0.03572	0.40937	0.25237
	Uenoidae	-0.41047	-0.10667	0.38813
	Elmidae	0.08096	-0.0095	-0.26228
	Optioservus sp.	-0.04921	0.01626	-0.05967
	Atherix	-0.37885	0.06147	0.32724
	Bezzia/ Palpomyia	0.12054	0.77515	-0.05629
	Probezzia	-0.52665	-0.10712	0.16554
	Cryptochironomus	-0.57177	-0.14933	0.08024
	Microtendipes pedellus group	-0.22882	0.22713	0.8047
	Paracladopelma sp.	-0.47292	-0.05005	0.18991
	Paratendipes	-0.57177	-0.14933	0.08024

Table C.41: CCA results of non-transformed proportion matrix of the benthic community structure at LPL level of taxonomy for reference (n = 40) and mine-influenced (n = 74) areas. Environmental variable and station scores, September 2015.

Axis		CCA-1	CCA-2	CCA-3
Environmental Variable	Cl	0.93576	0.05762	0.34537
	Nitrate	0.8854	0.27283	-0.31697
	Sulfate	0.79661	-0.28215	0.05325
	Selenium	0.87527	-0.41525	-0.18678
Lowest Possible Level	Phaenopsectra	-0.64894	-0.26767	-0.33543
	Stictochironomus	-0.27253	0.20904	0.99805
	Cladotanytarsus	-0.80195	-0.45592	-0.63001
	Stempellina sp.	-0.48255	-0.09477	0.23426
	Sublettea	-0.15159	0.30818	0.8852
	Boreoheptagyia sp.	0.90745	-0.22642	2.2513
	Potthastia longimana group	-0.12797	0.33769	1.05892
	Corynoneura	2.966	-2.44719	-0.61168
	Cricotopus	1.51822	-1.21021	0.04035
	Heterotrissocladius marcidus group	-0.4074	0.03019	0.3924
	Krenosmittia sp.	-0.80218	-0.42889	-0.64088
	Polypedilum sp.	-0.62194	-0.22642	-0.11119
	Micropsectra	0.8296	-0.15213	-0.12932
	Rheotanytarsus	1.68461	3.21887	0.02104
	Stempellinella sp.	1.85438	0.51228	0.15107
	Diamesa	1.35014	1.02096	-0.39827
	Pagastia	0.19774	0.6775	-0.02492
	Pseudodiamesa sp.	1.87766	1.748	-0.54797
	Brillia sp.	-0.21405	0.18409	-0.8045
	Cricotopus (Nostococladius)	-0.54956	-0.14074	0.12598
	Eukiefferiella	0.69971	-0.17987	-0.03595
	Heleniella sp.	-0.09273	0.05701	-0.42194
	Hydrobaenus	1.43047	-1.22167	-0.23158
	Limnophyes sp.	0.73036	-0.08618	-0.62242
	Orthocladius	0.60956	-0.20392	0.51249
	Parametriocnemus	0.68576	-0.34473	0.85559
	Rheocricotopus	-0.27505	0.03706	-0.08304
	Thienemanniella	1.92303	-1.87294	-1.12057
	Tvetenia bavarica group	0.25172	0.03482	-0.01661
	Thienemannimyia group	-0.28051	-0.22672	0.38701
	Empididae	0.3481	-0.03731	0.32787
	Chelifera/ Metachela	-0.11815	0.10273	0.29366
	Limnophora sp.	2.61231	1.06437	-0.40849
	Glutops sp.	0.21974	-0.6214	0.25716
	Pericoma/Telmatoscopus sp.	0.35963	0.10011	0.21554
	Simuliidae	0.72055	0.4636	-0.822
	Tipulidae	0.04393	-0.06376	-0.02253
	Antocha sp.	-0.28107	0.09079	0.26979
	Dicranota	0.80624	-0.33098	0.42333
	Hexatoma sp.	-0.61692	-0.23929	-0.5652
	Limnophila sp.	-0.62642	-0.25567	-0.34139
	Trombidiformes	-0.22762	-0.02312	-0.124
	Aturus	0.04394	-0.44956	0.59289
	Lebertia	0.13804	0.74787	0.04179
	Sperchon	0.26581	0.91989	-0.60737
	Sperchonopsis sp.	-0.26792	0.09257	0.33219
	Testudacarus sp.	-0.24685	0.21484	0.45791
	Torrenticola	-0.56783	-0.209	-0.06343
	Oribatida	0.52798	-0.36312	0.65597
	Pisidium	-0.20207	-0.32112	0.41585
	Lumbriculidae	-0.28794	0.13838	-0.10189

Table C.41: CCA results of non-transformed proportion matrix of the benthic community structure at LPL level of taxonomy for reference (n = 40) and mine-influenced (n = 74) areas. Environmental variable and station scores, September 2015.

Axis		CCA-1	CCA-2	CCA-3
Environmental Variable	Cl	0.93576	0.05762	0.34537
	Nitrate	0.8854	0.27283	-0.31697
	Sulfate	0.79661	-0.28215	0.05325
	Selenium	0.87527	-0.41525	-0.18678
Lowest Possible Level	Rhynchelmis sp.	-0.45143	-0.14685	-0.41078
	Enchytraeus	1.42969	-1.00821	-0.60244
	Nais	-0.11304	0.22413	0.66794
	Tubificinae	0.00001	-0.42979	0.49506

Table C.42: CCA results of fourth root transformed proportion matrix of the benthic community structure at LPL level of taxonomy for reference (n = 40) and mine-influenced (n = 74) areas. Eigen value, percent vaiance explained, Monte Carlo randomized p-values, and station scores, September 2015.

Axis		CCA-1	CCA-2	CCA-3
Eigen value		0.161	0.039	0.026
% Variance explained		6.6	1.6	1.1
Monte Carlo P (eigenvalue)		0.001		
Monte Carlo P (Species-Environment)		0.026		
Reference	AGCK	-0.70965	-0.62728	0.59656
	AL4	-0.25787	0.57247	-1.19457
	ALUSM	-0.36234	0.29853	-0.80013
	BU2	-0.70376	-0.68981	0.60527
	BU40	-0.44375	0.0439	-0.43293
	BUUQ	-0.70449	-0.6751	0.61412
	CADCK	-0.48724	-0.0395	-0.30827
	CHCK	-0.46157	0.02183	-0.39195
	CRUKO	-0.71771	-0.62785	0.58602
	DACK	-0.70003	-0.70762	0.60826
	DUCK	-0.72165	-0.62918	0.56573
	EL12	-0.52575	-0.13607	-0.1674
	ELUGH	-0.68049	-0.54037	0.42965
	EWCK	-0.46671	-0.06382	-0.29604
	FLAD	-0.72642	-0.61667	0.55788
	FLAU	-0.72643	-0.61683	0.5578
	FLRU	-0.72602	-0.61838	0.55872
	FO26	-0.2709	0.46969	-1.08144
	GRUHA	-0.25845	0.54229	-1.17117
	HENUP	-0.6325	-0.492	0.37663
	KO1	-0.71291	-0.6458	0.59459
	KODCR	-0.71692	-0.62873	0.58621
	KOUCR	-0.7173	-0.62849	0.58499
	KOUVE	-0.72368	-0.6173	0.56921
	LC_GRCK	-0.70416	-0.69208	0.59314
	LI24	-0.69987	-0.6771	0.60649
	MCCR	-0.30599	0.31009	-0.87297
	MI25	-0.55347	-0.18922	-0.08067
	OLDDU	-0.71188	-0.66568	0.58429
	OLDLI	-0.71027	-0.67407	0.58668
	OLDLOW	-0.71094	-0.6732	0.58631
	PADAL	-0.70678	-0.66698	0.60998
	PAUKO	-0.70875	-0.65972	0.60533
	RACK	-0.71471	-0.65767	0.58098
	SLINE	-0.69729	-0.69492	0.61524
	VEUKO	-0.71737	-0.62724	0.58723
	VEUP	-0.71991	-0.61826	0.58158
	VICK	-0.71313	-0.6661	0.58561
	WWRL	-0.72343	-0.61845	0.56716
	WWRU	-0.72619	-0.61592	0.5589

Table C.42: CCA results of fourth root transformed proportion matrix of the benthic community structure at LPL level of taxonomy for reference (n = 40) and mine-influenced (n = 74) areas. Eigen value, percent vaiance explained, Monte Carlo randomized p-values, and station scores, September 2015.

Axis		CCA-1	CCA-2	CCA-3
Eigen value		0.161	0.039	0.026
% Variance explained		6.6	1.6	1.1
Monte Carlo P (eigenvalue)		0.001		
Monte Carlo P (Species-Environment)		0.026		
Exposed	BOCK	1.40872	1.12169	3.13477
	CACK	4.21427	-2.81291	-1.04137
	CATA2-25	4.31797	-3.15001	-1.13889
	CATA2-75	4.3017	-3.08626	-1.11696
	COCK	0.3865	0.63594	-0.58877
	EL19	-0.13128	0.63189	-0.93045
	EL1	-0.38605	-0.07148	0.01881
	EL20	-0.326	0.35526	-0.85642
	ELDFE	-0.18654	0.49109	-0.84662
	ELELKO	-0.6243	-0.64355	0.79667
	ELH93	-0.16603	0.58401	-1.03872
	ELUEL	-0.27404	0.48836	-1.05592
	ELUFE	-0.16933	0.52227	-0.86341
	ELUFO	-0.24144	0.56799	-1.18319
	ELUSP	-0.24617	0.3402	-0.57317
	FO10-SP1	0.33204	1.01042	0.83018
	FO22	0.46543	0.80075	1.09313
	FO23	0.11294	0.63771	-0.13695
	FO29	0.16126	0.80978	-0.21925
	FO9	0.08073	0.60325	0.17492
	FOBCP	0.49883	0.80542	-0.50772
	FOBKS	0.07566	0.80986	-0.04383
	FOBSC	0.24992	0.98663	-0.42077
	FODGH	0.178	0.74513	-0.20802
	FODHE	-0.17889	0.47714	-0.68645
	FODPO	0.48505	0.83892	0.94309
	FORD7-75	0.43505	0.97622	0.64956
	FOUEW	0.42949	0.93079	0.55448
	FOUKI	0.10222	0.8897	-0.14887
	FOUL	-0.31743	-0.44791	1.59641
	FOUNGD	0.02801	0.76907	0.1953
	FOUSH	0.12093	0.94883	-0.16869
	GHCKD	0.61845	-0.39892	-1.13464
	GHCKU	1.23926	0.71606	-2.89445
	GRCK	-0.33537	-0.4471	-0.16528
	GRDS	-0.10221	0.21927	-1.06777
	GREE1-50	0.40229	-1.16909	-0.20737

Table C.42: CCA results of fourth root transformed proportion matrix of the benthic community structure at LPL level of taxonomy for reference (n = 40) and mine-influenced (n = 74) areas. Eigen value, percent vaiance explained, Monte Carlo randomized p-values, and station scores, September 2015.

Axis		CCA-1	CCA-2	CCA-3
Eigen value		0.161	0.039	0.026
% Variance explained		6.6	1.6	1.1
Monte Carlo P (eigenvalue)		0.001		
Monte Carlo P (Species-Environment)		0.026		
Exposed	GREE3-75	1.39458	1.04032	-3.28841
	GREE4-25	4.11718	-1.28356	3.78601
	GREE4-75	1.79737	-0.13335	-2.34653
	HACKDS	-0.01078	0.10938	-1.16111
	HACKUS	-0.0486	-0.12171	-0.88159
	HARM1-50	-0.03318	0.04454	-1.07168
	HARM5-25	0.00328	-0.24684	-0.83788
	HENFO	-0.10545	0.56709	-0.6848
	KICK	2.04221	4.38932	1.32753
	KILM1-50	2.35605	5.2487	0.82689
	LC_DC1	-0.72021	-0.635	0.56097
	LC_DCDS	-0.71873	-0.64209	0.56187
	LC_FRUS	0.16852	0.81926	-0.15452
	LI8	-0.32069	-0.50391	1.43253
	LIDSL	0.01454	0.23062	0.62036
	LILC3	0.38966	0.84561	0.40536
	MI2	-0.36009	-0.14126	0.15381
	MI3	-0.4959	-0.16591	-0.11611
	MI5	-0.45017	-0.06199	-0.24521
	MIDAG	-0.50758	-0.23304	0.03278
	MIDCO	-0.20598	0.03149	-0.15061
	MIUCO	-0.3103	0.43258	-1.00357
	MP1	0.10198	0.95688	-0.12847
	FODNGD	0.02699	0.77544	0.23818
	NTHO1-25	2.34232	0.57024	3.13205
	NTHO1-50	2.90419	1.98984	0.92009
	OCNM	-0.53964	-0.17196	-0.11614
	POCK	0.25332	-0.32892	-0.93396
	PORT3-25	0.24757	-0.5048	-1.03571
	PORT3-50	0.30989	0.18209	-1.79122
	SWCK	3.32545	-3.4201	-0.20023
	SWIF2-75	3.94887	-3.64758	-0.54542
	THCK	0.64084	-0.48697	0.35146
	WOCK	1.80933	1.87022	3.66236
	ELDGR	-0.48248	-0.29559	0.42357
	ELDEL	-0.61244	-0.39952	0.24361
	NGD1u	-0.24851	0.15788	-0.77067

Table C.43: CCA results of fourth root transformed proportion matrix of the benthic community structure at LPL level of taxonomy for reference (n = 40) and mine-influenced (n = 74) areas. Environmental variable and station scores, September 2015.

Axis		CCA-1	CCA-2	CCA-3
Environmental Variable	Cl	0.89146	0.25822	-0.35597
	Nitrate	0.86048	0.29297	0.40811
	Sulfate	0.85052	-0.21726	0.15636
	Selenium	0.89887	-0.34832	-0.05059
Lowest Possible Level	Ameletus	-0.3801	-0.16087	0.00473
	Baetidae	-0.4166	-0.1262	0.06365
	Acentrella sp.	-0.43346	-0.07783	-0.09882
	Baetis	-0.29776	-0.0256	-0.06719
	Baetis bicaudatus	-0.35607	-0.03311	-0.10777
	Baetis tricaudatus group	-0.23538	0.04343	-0.04342
	Ephemerellidae	-0.26727	0.0496	-0.08102
	Drunella doddsii	-0.29725	-0.06119	0.06927
	Drunella flavilinea	-0.48838	-0.27463	0.32741
	Drunella grandis group	-0.11678	0.22863	-0.00495
	Drunella sp.	-0.34836	-0.04557	-0.02724
	Ephemerella	-0.48511	-0.16201	0.07094
	Heptageniidae	-0.26773	-0.01468	0.01902
	Cinygmula sp.	-0.55301	-0.27988	0.16351
	Epeorus	-0.36789	-0.08359	0.01798
	Rhithrogena	-0.46885	-0.19366	0.11699
	Leptophlebiidae	-0.44793	-0.04654	-0.22023
	Capniidae	0.44685	-0.15206	0.16132
	Chloroperlidae	-0.35716	-0.29004	0.22273
	Sweltsa sp.	-0.27307	-0.10297	0.06997
	Leuctridae	-0.43935	-0.24354	0.01788
	Nemouridae	0.09016	-0.05837	0.21851
	Amphinemura sp.	1.24643	-0.70032	-0.30697
	Zapada	0.15103	0.10479	0.10474
	Zapada cinctipes	0.06634	0.18977	0.0346
	Zapada columbiana	-0.06787	-0.0612	-0.16104
	Zapada oregonensis group	-0.20364	0.1174	0.13817
	Peltoperlidae	0.33199	-0.38123	-0.31213
	Yoraperla sp.	0.08585	-0.35576	-0.73016
	Perlidae	-0.30965	0.07565	0.00501
	Hesperoperla sp.	-0.40768	-0.09305	0.10151
	Perlodidae	0.01753	0.02647	-0.04758
	Megarcys sp.	-0.1893	0.12237	0.02312
	Pteronarcella sp.	-0.402	-0.25846	-0.04329
	Taeniopterygidae	-0.52943	-0.18723	-0.08534
	Taenionema	-0.24132	0.01646	0.02339
	Apataniidae	-0.31421	0.02803	-0.27632
	Brachycentridae	-0.18122	0.11921	-0.19497
	Glossosomatidae	-0.28382	-0.02384	0.00313
	Hydropsychidae	-0.26951	-0.02188	0.0382
	Arctopsyche sp.	-0.4803	-0.22336	0.20377
	Hydropsyche	-0.52159	-0.27133	0.12905
	Parapsyche sp.	-0.16561	0.0792	0.06032
	Lepidostoma	-0.42731	0.00391	-0.28053
	Limnephilidae	0.53927	-0.1123	0.15544
	Rhyacophila	-0.08898	0.1111	-0.04641
	Rhyacophila brunnea/vemna group	0.00183	0.14494	-0.10223
	Rhyacophila betteni group	-0.08678	0.08878	-0.19612
	Rhyacophila hyalinata group	-0.06933	0.40397	-0.15476
	Uenoidae	-0.3523	-0.1996	-0.00587
	Elmidae	0.08594	-0.02177	-0.03966
	Optioservus sp.	0.02397	-0.07586	-0.00315
	Atherix	-0.38643	0.05814	-0.26156
	Bezzia/ Palpomyia	0.16168	0.73676	0.06288
	Probezzia	-0.53544	-0.20971	-0.02965
	Cryptochironomus	-0.53964	-0.17196	-0.11614
	Microtendipes pedellus group	-0.38509	0.1121	-0.40708
	Paracladopelma sp.	-0.51225	-0.17783	-0.02637
	Paratendipes	-0.53964	-0.17196	-0.11614

Table C.43: CCA results of fourth root transformed proportion matrix of the benthic community structure at LPL level of taxonomy for reference (n = 40) and mine-influenced (n = 74) areas. Environmental variable and station scores, September 2015.

Axis		CCA-1	CCA-2	CCA-3
Environmental Variable	Cl	0.89146	0.25822	-0.35597
	Nitrate	0.86048	0.29297	0.40811
	Sulfate	0.85052	-0.21726	0.15636
	Selenium	0.89887	-0.34832	-0.05059
Lowest Possible Level	Phaenopsectra	-0.5497	-0.33753	0.22187
	Stictochironomus	-0.3103	0.43257	-1.00357
	Cladotanytarsus	-0.70449	-0.6751	0.61412
	Stempellina sp.	-0.40774	-0.06274	-0.18846
	Sublettea	-0.17746	0.50755	-0.85548
	Boreoheptagyia sp.	0.89681	0.10707	-1.78231
	Potthastia longimana group	-0.16603	0.58401	-1.03872
	Corynoneura	2.50993	-2.00881	-0.58217
	Cricotopus	1.13948	-0.73223	-0.59264
	Heterotrissocladius marcidus group	-0.36539	0.15472	-0.46778
	Krenosmittia sp.	-0.71291	-0.6458	0.59459
	Polypedilum sp.	-0.56271	-0.29221	0.08268
	Micropsectra	0.38444	0.04408	-0.10401
	Rheotanytarsus	0.41583	1.21251	-0.20467
	Stempellinella sp.	0.98237	0.46272	-0.63735
	Diamesa	1.18104	0.52622	0.25393
	Pagastia	0.11361	0.30071	-0.00668
	Pseudodiamesa sp.	1.34293	0.25744	0.00802
	Brillia sp.	-0.06072	-0.02235	0.54951
	Cricotopus (Nostococladius)	-0.54344	-0.25975	0.07781
	Eukiefferiella	0.34503	0.03085	-0.08122
	Heleniella sp.	0.33392	0.11018	0.68847
	Hydrobaenus	0.81402	-0.36904	-0.18464
	Limnophyes sp.	0.83383	-0.51264	0.85817
	Orthocladius	0.30689	-0.00379	-0.07861
	Parametriocnemus	1.09993	-0.17491	-0.19149
	Rheocricotopus	-0.21992	-0.12459	0.12199
	Thienemanniella	1.01714	-0.39306	0.26823
	Tvetenia bavarica group	0.1496	-0.03884	0.09399
	Thienemannimyia group	-0.09224	-0.24214	-0.2005
	Empididae	0.21962	-0.03595	-0.15171
	Chelifera/ Metachela	0.02252	0.11706	-0.21072
	Limnophora sp.	2.45433	0.22674	0.78487
	Glutops sp.	0.45889	-0.6237	-0.44674
	Pericoma/Telmatoscopus sp.	0.28203	0.09547	-0.05879
	Simuliidae	0.50322	0.12928	0.20471
	Tipulidae	0.20079	0.01425	0.15615
	Antocha sp.	-0.21117	0.10777	-0.15123
	Dicranota	0.54813	-0.15295	-0.0535
	Hexatoma sp.	-0.57552	-0.43967	0.46129
	Limnophila sp.	-0.48152	-0.29834	0.2011
	Trombidiformes	0.07536	0.07178	0.12835
	Aturus	0.20936	-0.42887	-0.24635
	Lebertia	-0.05996	0.3161	0.02967
	Sperchon	-0.01107	0.29119	0.17513
	Sperchonopsis sp.	-0.27984	0.07561	-0.34875
	Testudacarus sp.	-0.2592	0.22156	-0.2583
	Torrenticola	-0.47863	-0.22134	-0.06323
	Oribatida	0.61263	-0.22786	-0.29008
	Pisidium	0.16292	-0.17951	-0.36751
	Lumbriculidae	-0.14198	0.30064	-0.01701
Lowest Possible Level	Rhynchelmis sp.	-0.34358	-0.24538	0.09676
	Enchytraeus	0.88961	-0.26341	0.11676
	Nais	0.11495	0.20076	-0.02512
	Tubificinae	0.59348	-0.58282	-0.22386

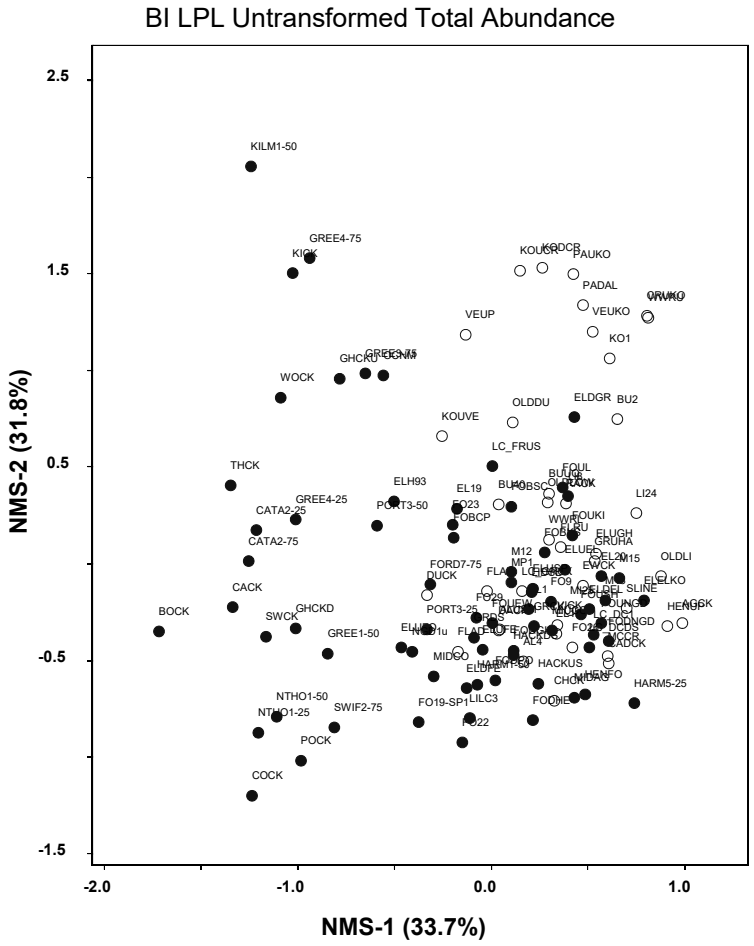


Figure C.1a: Nonmetric multidimensional scaling scatter plot of benthic invertebrate community structure at the lowest practical level (LPL) of taxonomy at 40 reference areas (open circles), and 74 mine-exposed areas (filled circles). Correlation vectors are displayed for taxa with area axis scores that have significant ($p < 0.05$) absolute Pearson's correlation coefficient (r) greater than 0.60 with either NMS-1 or NMS-2 (no vectors are displayed as no taxa met this criteria). A stable 2-dimensional solution was found with stress of 13.17.

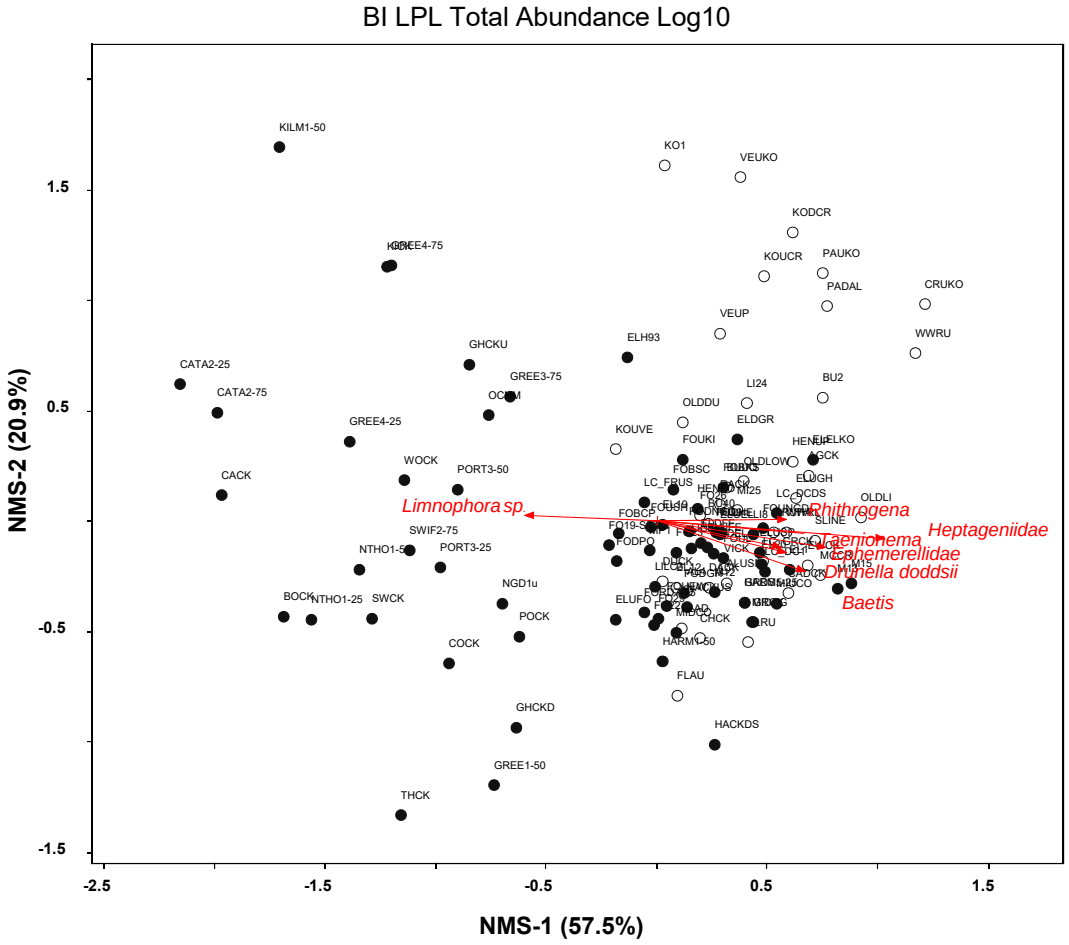


Figure C.1b: Nonmetric multidimensional scaling scatter plot of benthic invertebrate community structure at the lowest practical level (LPL) of taxonomy at 40 reference areas (open circles), and 74 mine-exposed areas (filled circles). Correlation vectors are displayed for taxa with area axis scores that have significant ($p < 0.05$) absolute Pearson's correlation coefficient (r) greater than 0.60 with either NMS-1 or NMS-2. Vector length is proportional to correlation strength. A stable 2-dimensional solution was found with stress of 13.44.

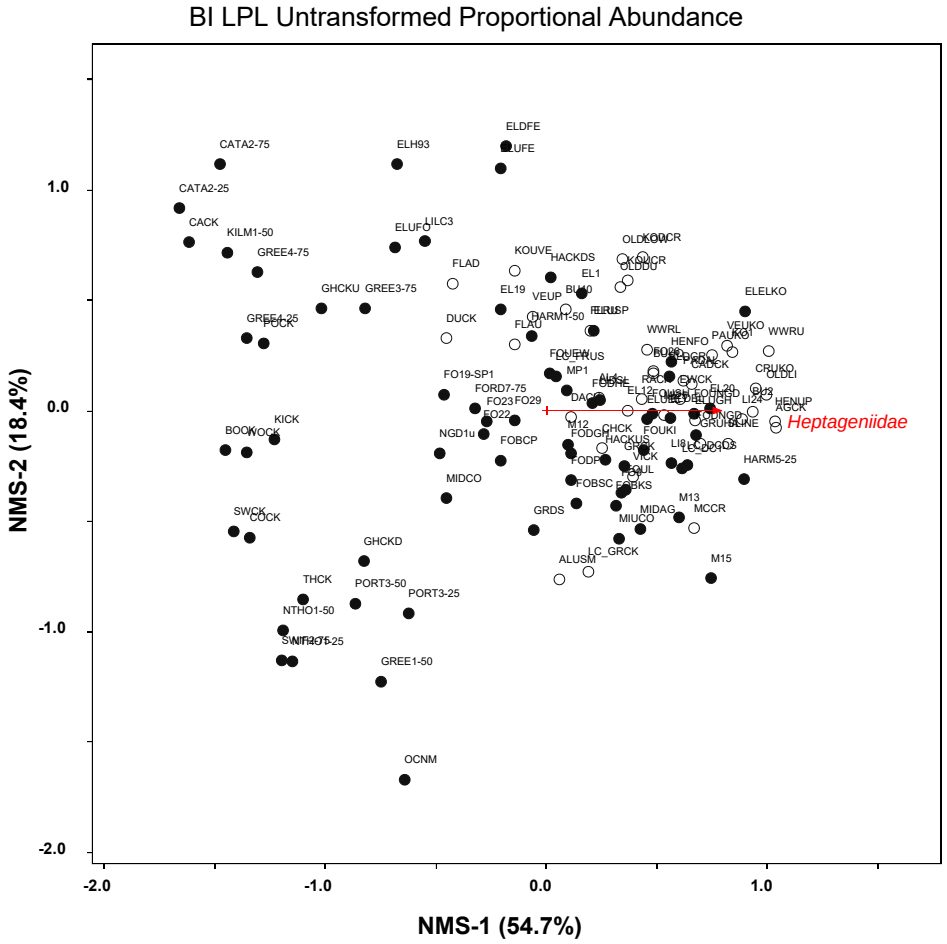


Figure C.2a: Nonmetric multidimensional scaling scatter plot of benthic invertebrate community structure at the lowest practical level (LPL) of taxonomy at 40 reference areas (open circles), and 74 mine-exposed areas (filled circles). Correlation vectors are displayed for taxa with area axis scores that have significant ($p < 0.05$) absolute Pearson's correlation coefficient (r) greater than 0.60 with either NMS-1 or NMS-2. Vector length is proportional to correlation strength. A stable 2-dimensional solution was found with stress of 15.02.

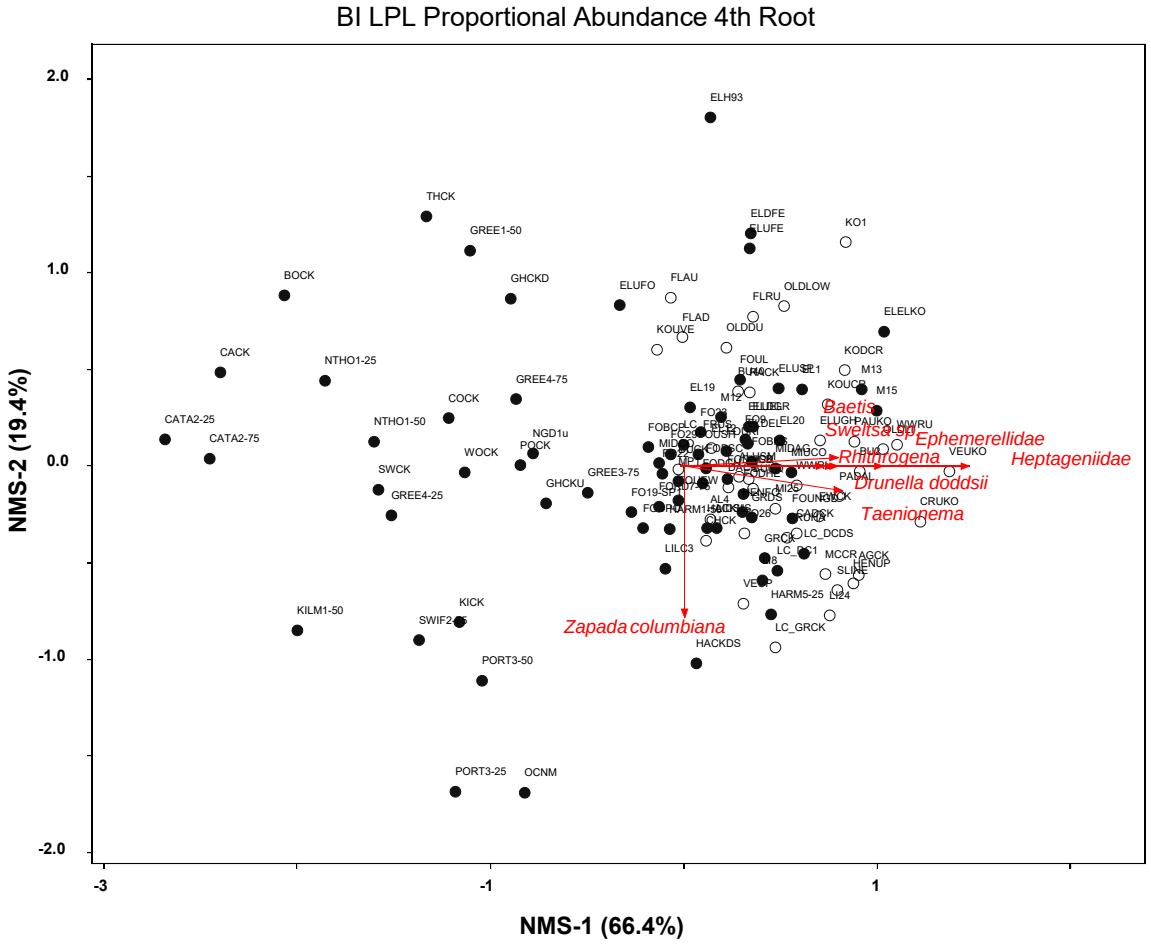


Figure C.2b: Nonmetric multidimensional scaling scatter plot of benthic invertebrate community structure at the lowest practical level (LPL) of taxonomy at 40 reference areas (open circles), and 74 mine-exposed areas (filled circles). Correlation vectors are displayed for taxa with area axis scores that have significant ($p < 0.05$) absolute Pearson's correlation coefficient (r) greater than 0.60 with either NMS-1 or NMS-2. Vector length is proportional to correlation strength. A stable 2-dimensional solution was found with stress of 18.91.

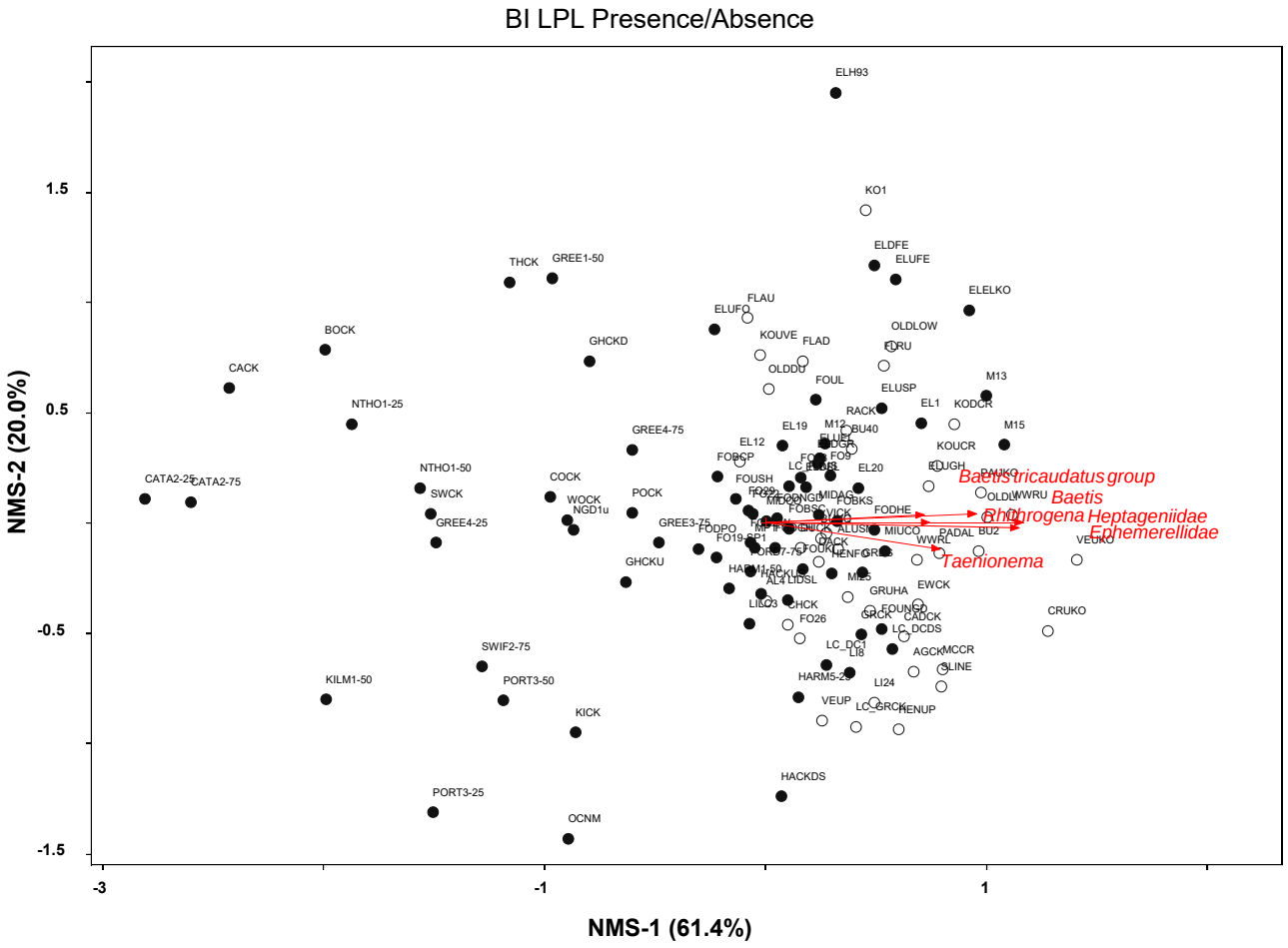


Figure C.3: Nonmetric multidimensional scaling scatter plot of benthic invertebrate community structure at the lowest practical level (LPL) of taxonomy at 40 reference areas (open circles), and 74 mine-exposed areas (filled circles). Correlation vectors are displayed for taxa with area axis scores that have significant ($p < 0.05$) absolute Pearson's correlation coefficient (r) greater than 0.60 with either NMS-1 or NMS-2. Vector length is proportional to correlation strength. A stable 2-dimensional solution was found with stress of 21.29.

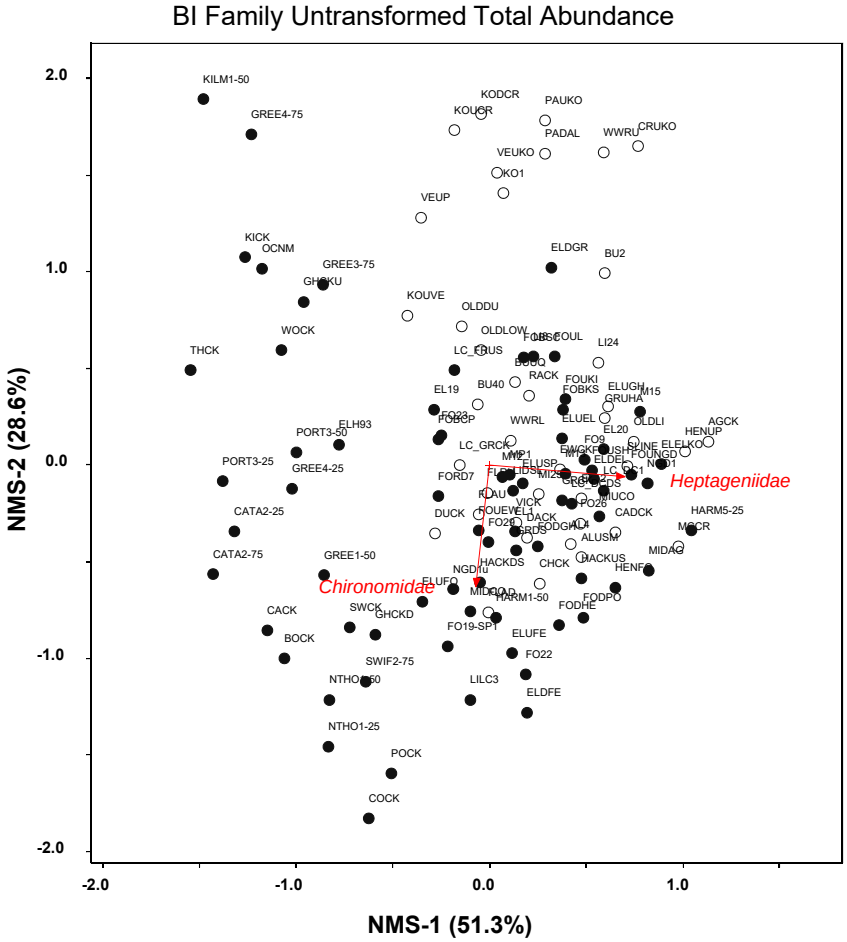


Figure C.4a: Nonmetric multidimensional scaling scatter plot of benthic invertebrate community structure at the family level of taxonomy at 40 reference areas (open circles), and 74 mine-exposed areas (filled circles). Correlation vectors are displayed for taxa with area axis scores that have significant ($p < 0.05$) absolute Pearson's correlation coefficient (r) greater than 0.60 with either NMS-1 or NMS-2. Vector length is proportional to correlation strength. A stable 2-dimensional solution was found with stress of 16.00.

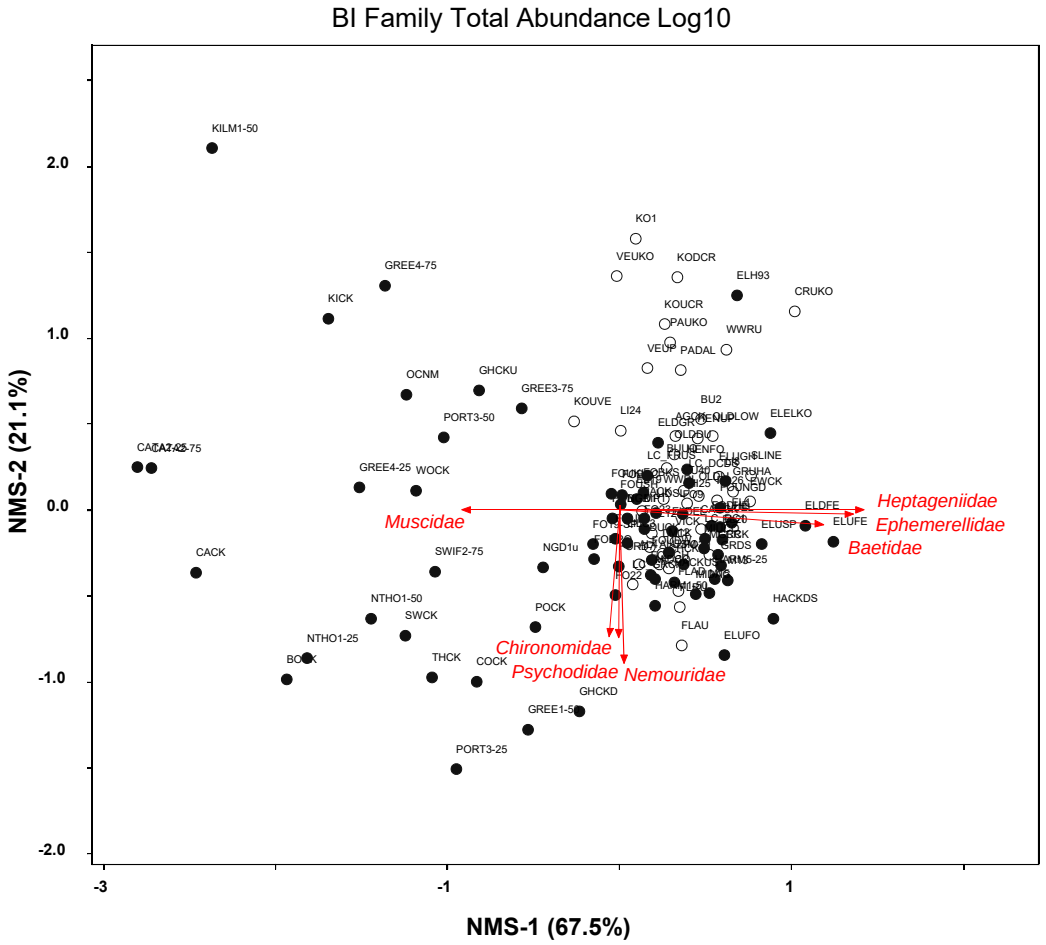


Figure C.4b: Nonmetric multidimensional scaling scatter plot of benthic invertebrate community structure at the family level of taxonomy at 40 reference areas (open circles), and 74 mine-exposed areas (filled circles). Correlation vectors are displayed for taxa with area axis scores that have significant ($p < 0.05$) absolute Pearson's correlation coefficient (r) greater than 0.60 with either NMS-1 or NMS-2. Vector length is proportional to correlation strength. A stable 2-dimensional solution was found with stress of 17.43.

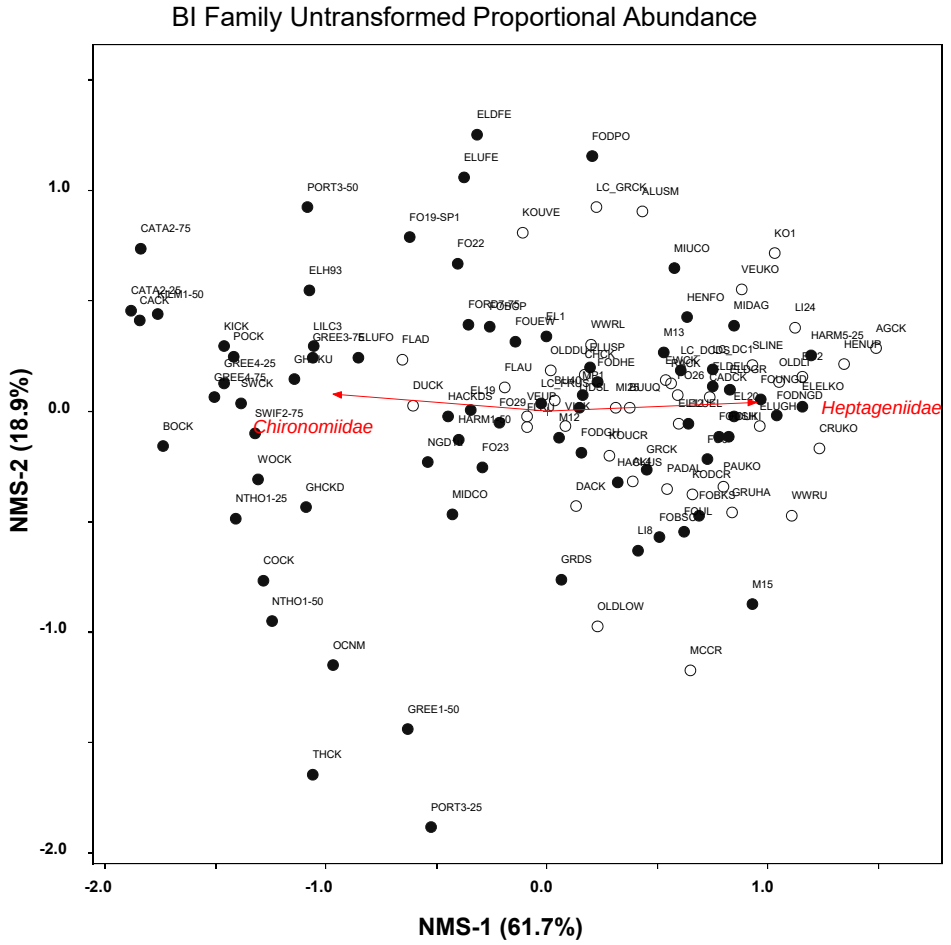


Figure C.5a: Nonmetric multidimensional scaling scatter plot of benthic invertebrate community structure at the family level of taxonomy at 40 reference areas (open circles), and 74 mine-exposed areas (filled circles). Correlation vectors are displayed for taxa with area axis scores that have significant ($p < 0.05$) absolute Pearson's correlation coefficient (r) greater than 0.60 with either NMS-1 or NMS-2. Vector length is proportional to correlation strength. A stable 2-dimensional solution was found with stress of 20.01.

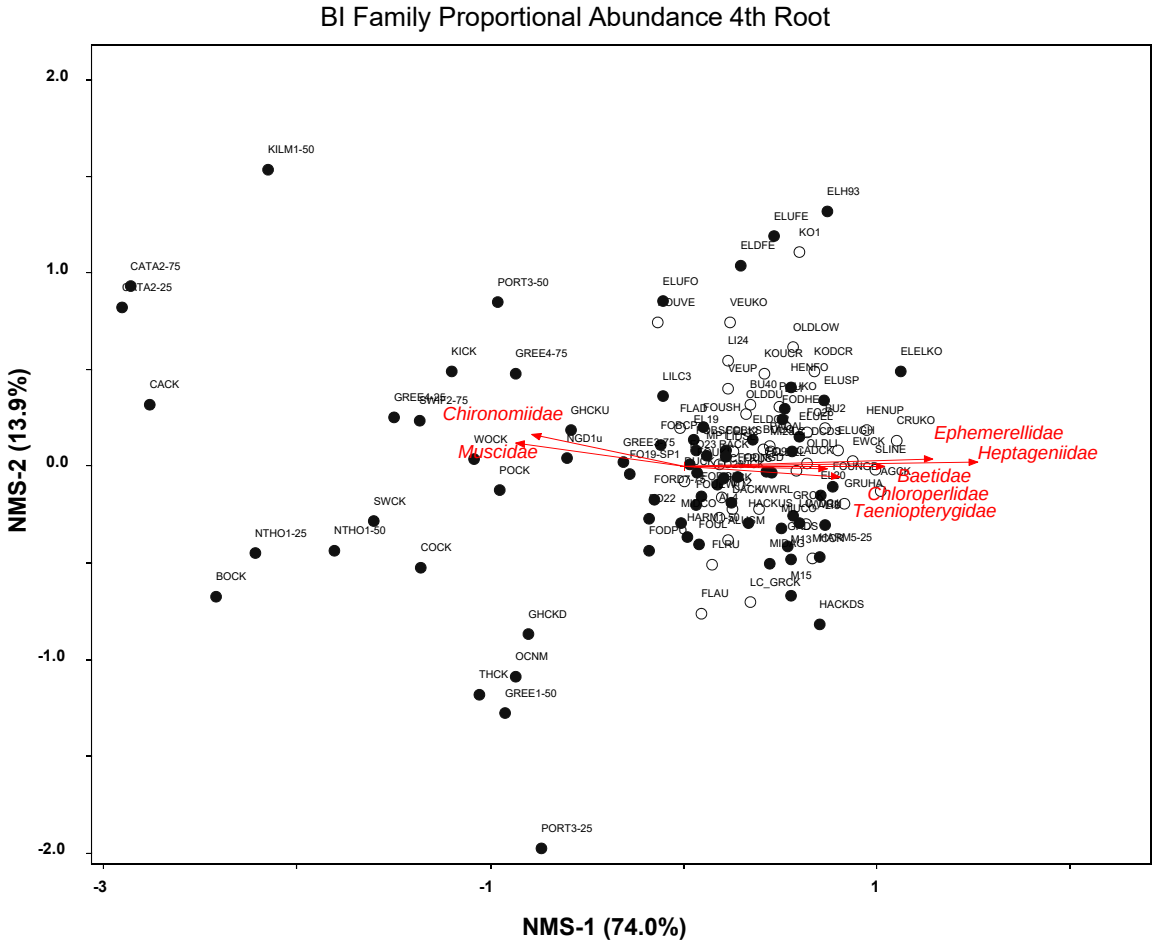


Figure C.5b: Nonmetric multidimensional scaling scatter plot of benthic invertebrate community structure at the family level of taxonomy at 40 reference areas (open circles), and 74 mine-exposed areas (filled circles). Correlation vectors are displayed for taxa with area axis scores that have significant ($p < 0.05$) absolute Pearson's correlation coefficient (r) greater than 0.60 with either NMS-1 or NMS-2. Vector length is proportional to correlation strength. A stable 2-dimensional solution was found with stress of 18.42.

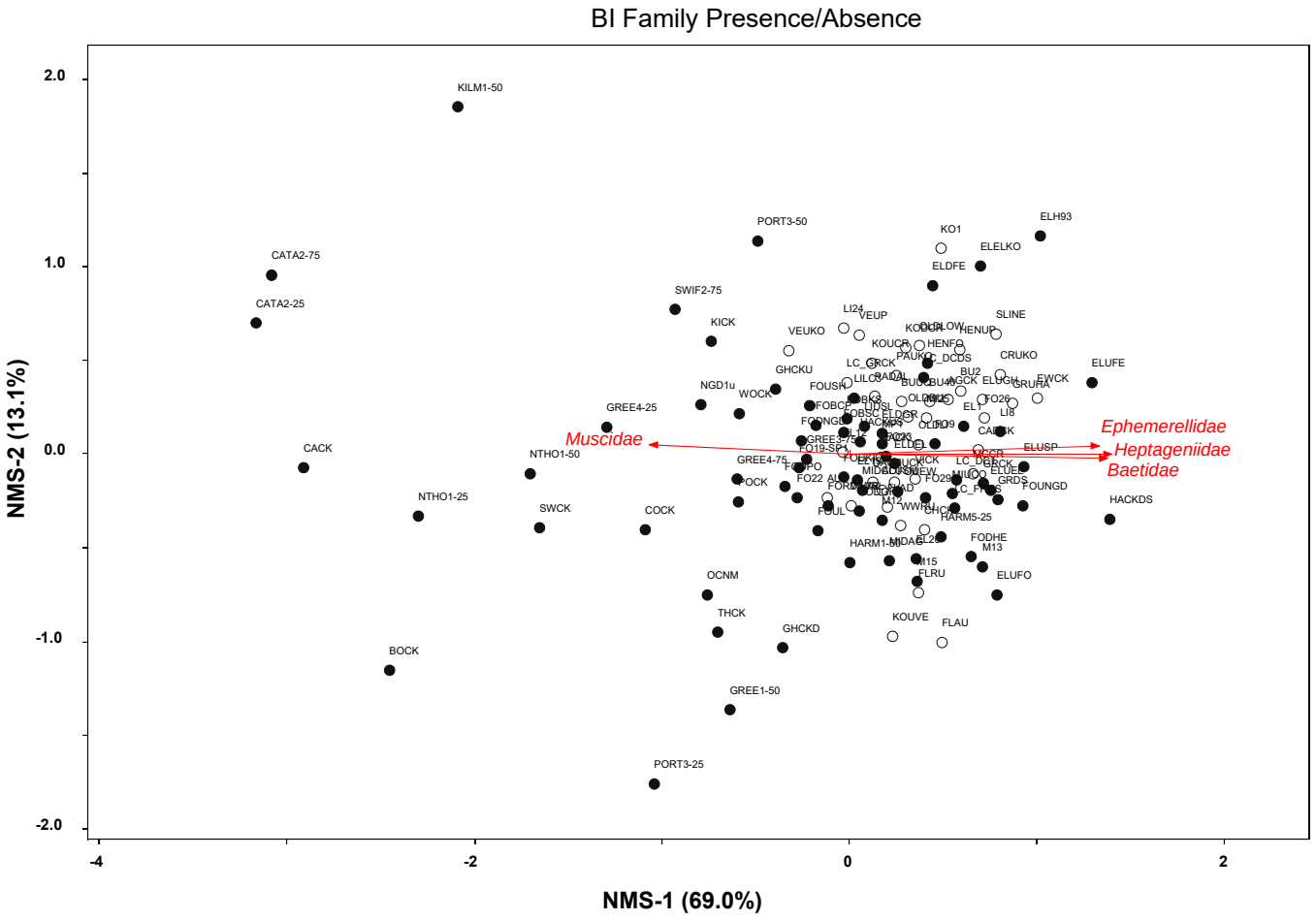


Figure C.6: Nonmetric multidimensional scaling scatter plot of benthic invertebrate community structure at the family level of taxonomy at 40 reference areas (open circles), and 74 mine-exposed areas (filled circles). Correlation vectors are displayed for taxa with area axis scores that have significant ($p < 0.05$) absolute Pearson's correlation coefficient (r) greater than 0.60 with either NMS-1 or NMS-2. Vector length is proportional to correlation strength. A stable 2-dimensional solution was found with stress of 21.29.

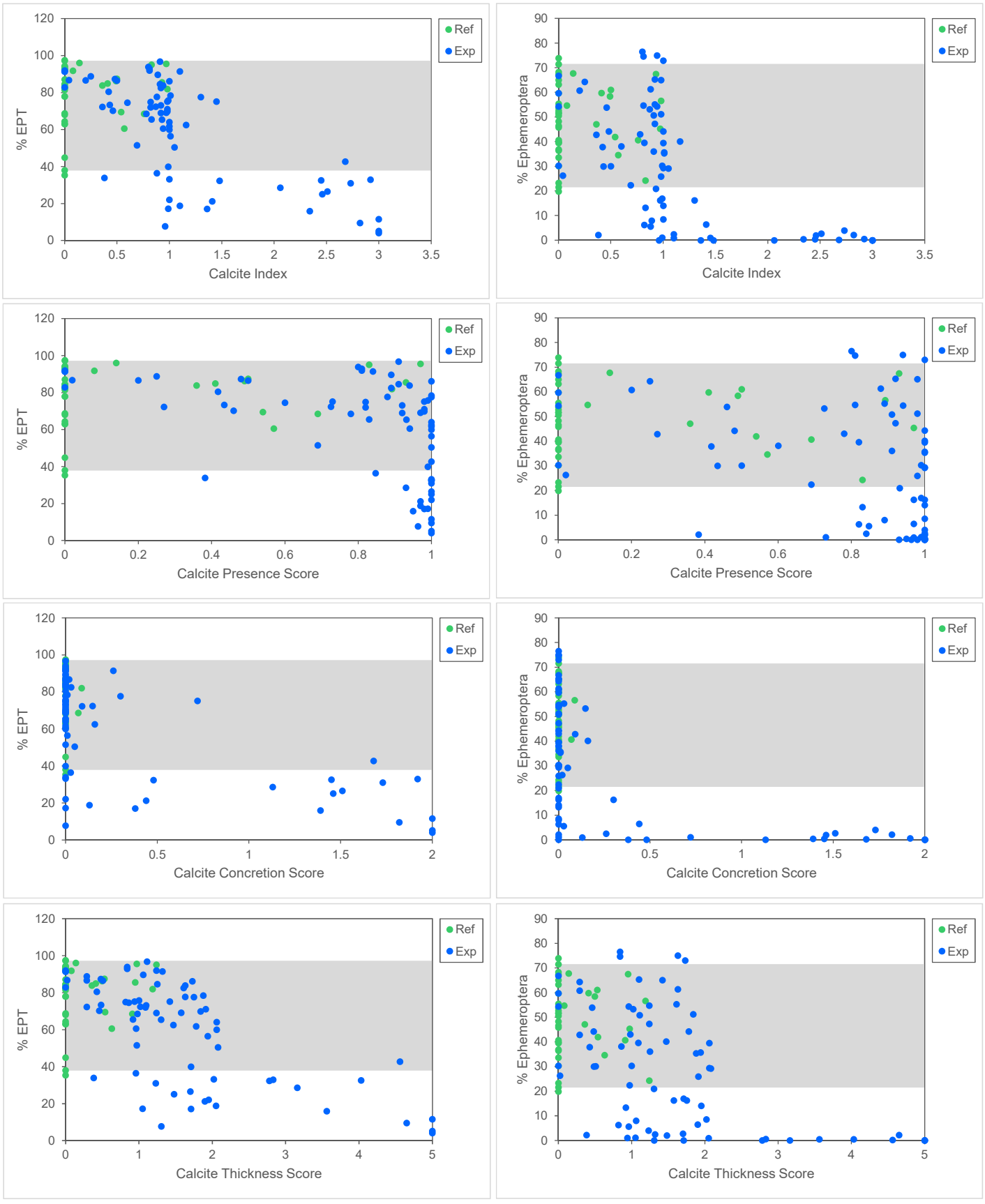


Figure C.7: Plots of benthic invertebrate endpoints with significant ($p < 0.05$) absolute Pearson's correlation coefficient (r) greater than 0.60 with calcite endpoints based on samples collected at reference (n = 40) and mine-exposed areas (n = 74), sampled in 2015. Shading represents the normal range defined as the 2.5th and 97.5th percentiles of the distribution of reference area values.

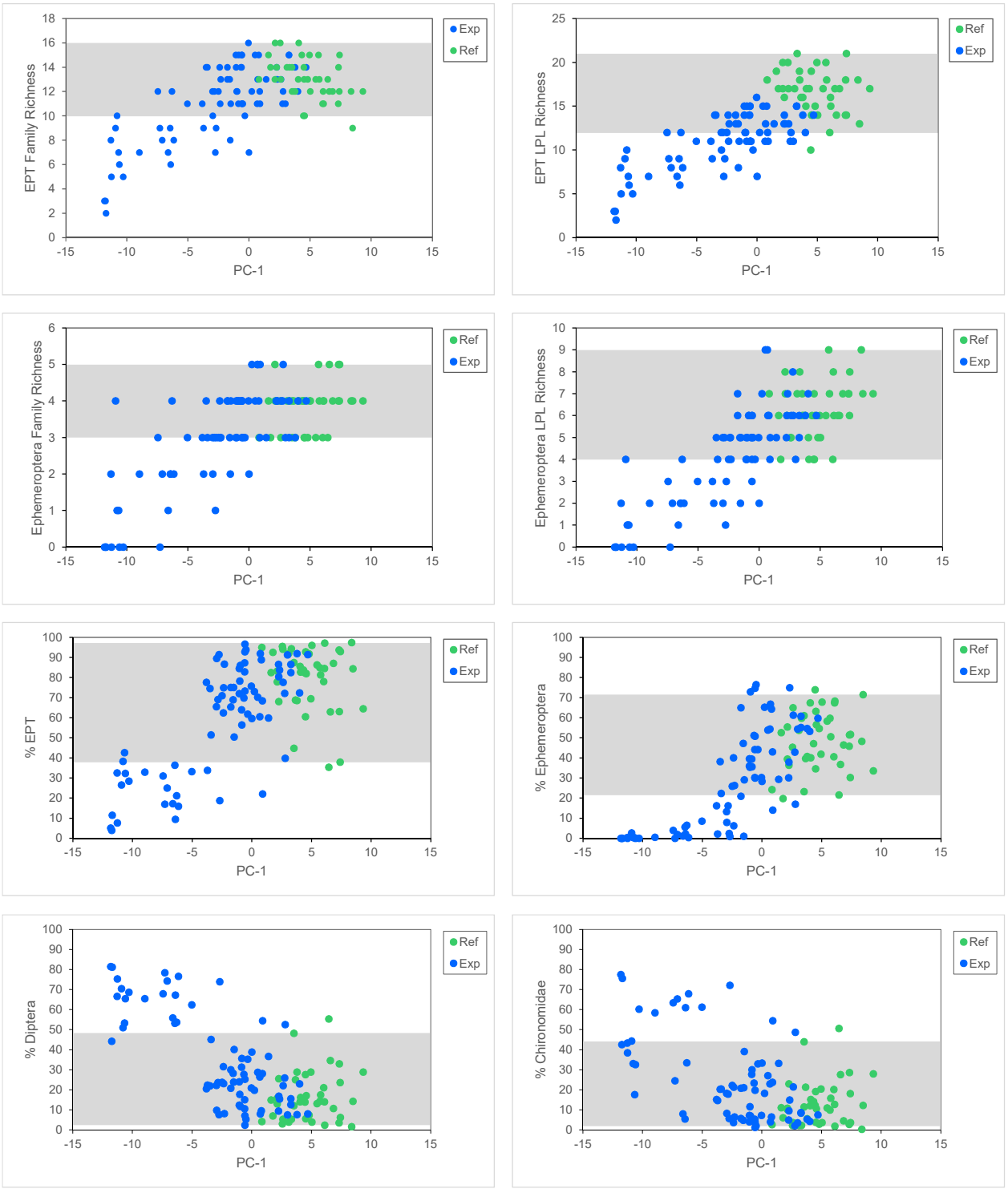


Figure C.8: Plots of benthic invertebrate endpoints with significant ($p < 0.05$) absolute Pearson's correlation coefficient (r) greater than 0.60 for reference (n = 40) and mine-exposed areas (n = 74) to PC-1 for water quality, September 2015. Gray shading represents the normal range defined as the 2.5th and 97.5th percentiles of the distribution of reference area values.

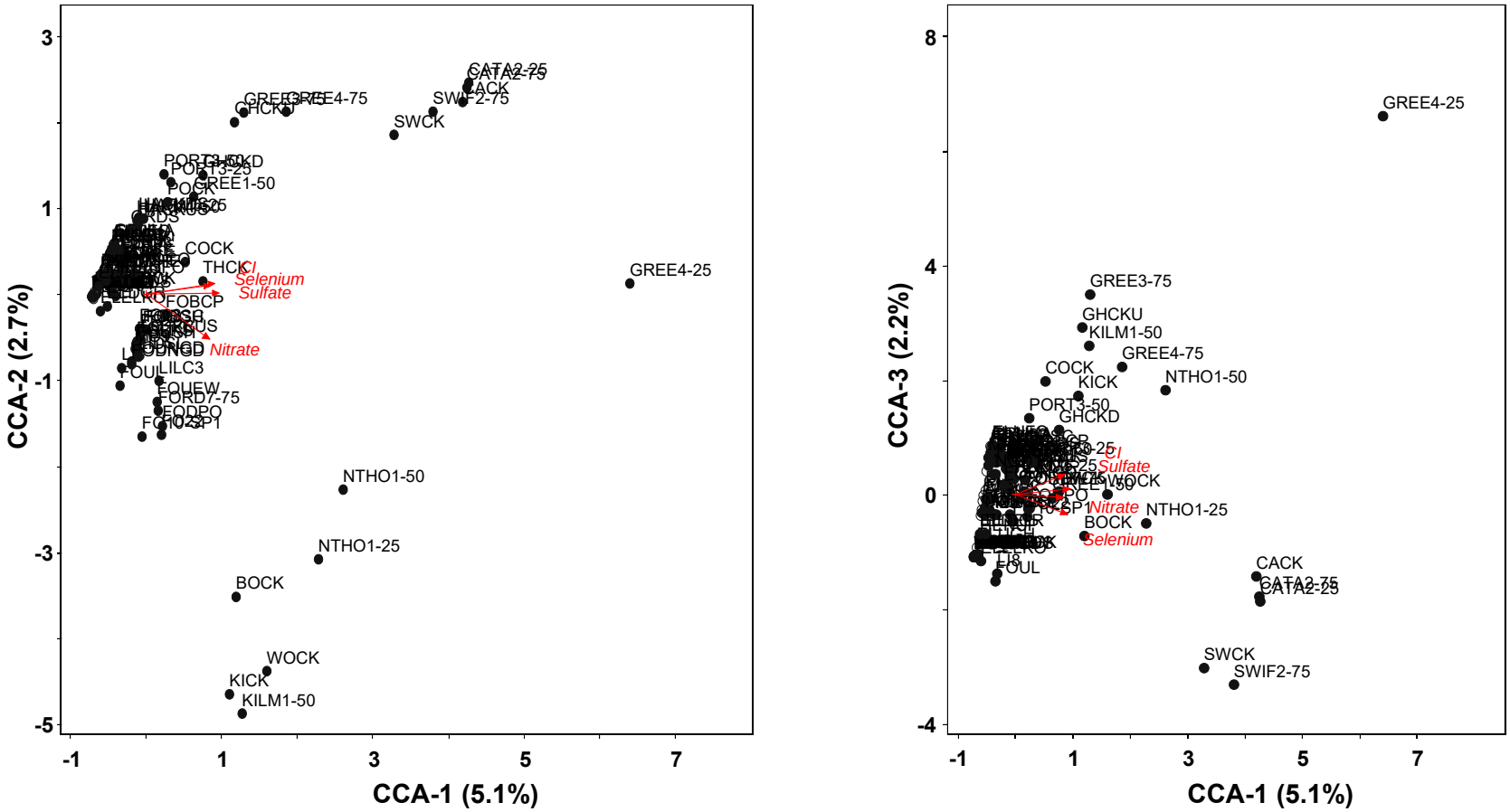


Figure C.9a: Canonical Correspondence Analysis scatter plot of benthic invertebrate community structure at the lowest practical level (LPL) of taxonomy using non-transformed abundance data of 40 reference areas and 74 mine-exposed areas (n =114) (areas displayed). Direct correlation vectors are displayed for constraining environmental variables. Vector length is proportional to correlation strength.

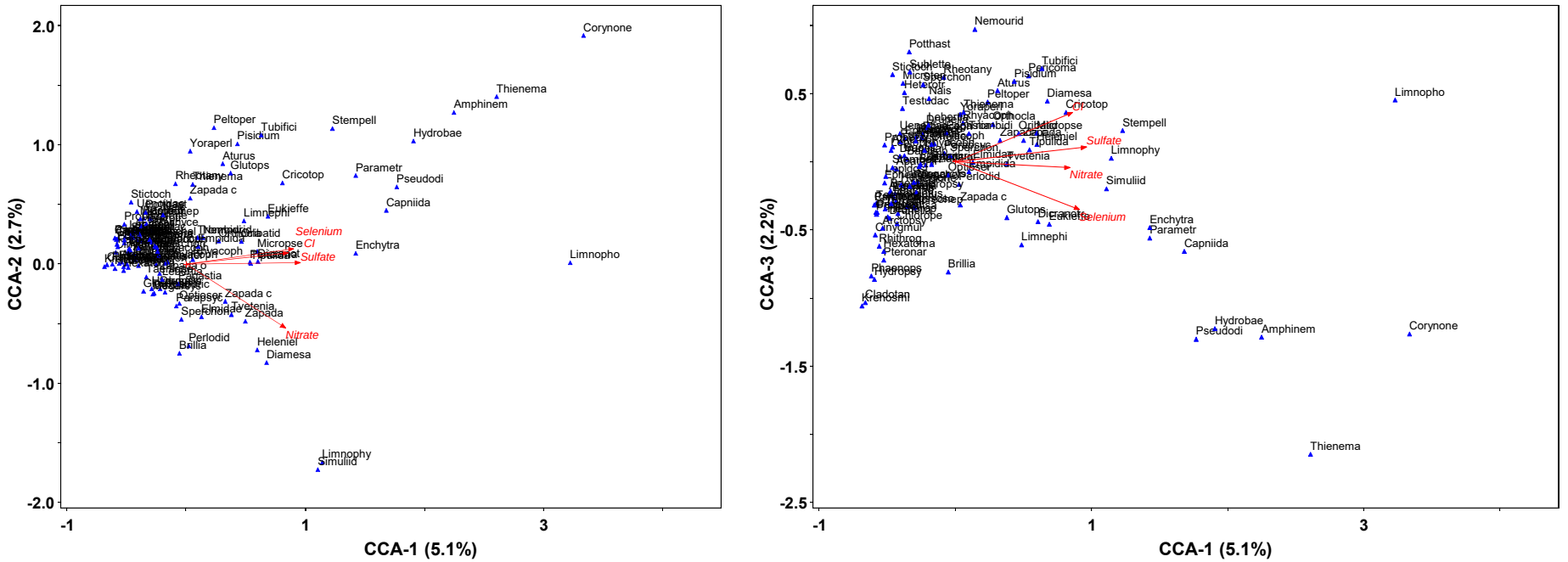


Figure C.9b: Canonical Correspondence Analysis scatter plot of benthic invertebrate community structure at the lowest practical level (LPL) of taxonomy using non-transformed abundance data of 40 reference areas and 74 mine-exposed areas (n =114) (taxa displayed). Direct correlation vectors are displayed for constraining environmental variables. Vector length is proportional to correlation strength.

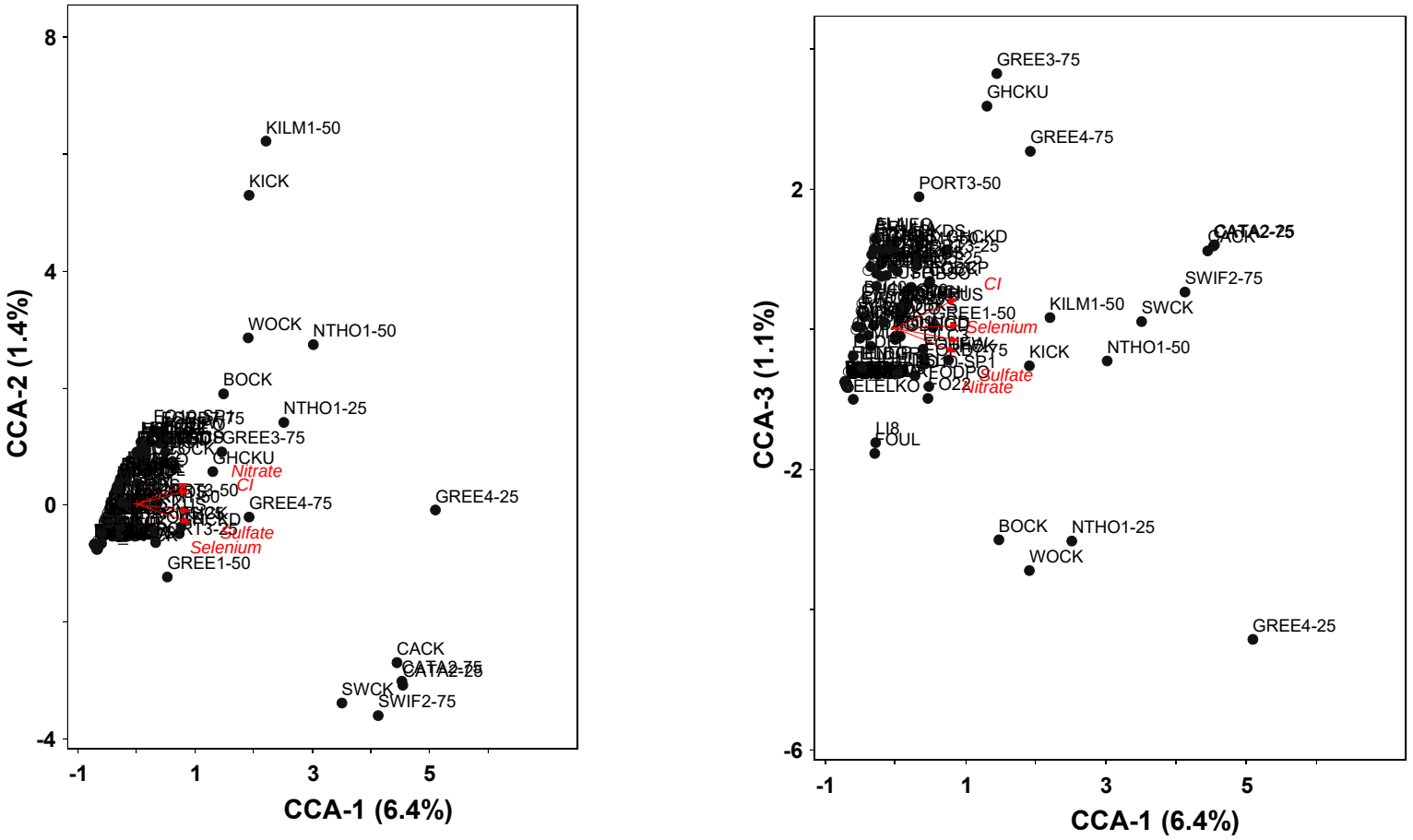
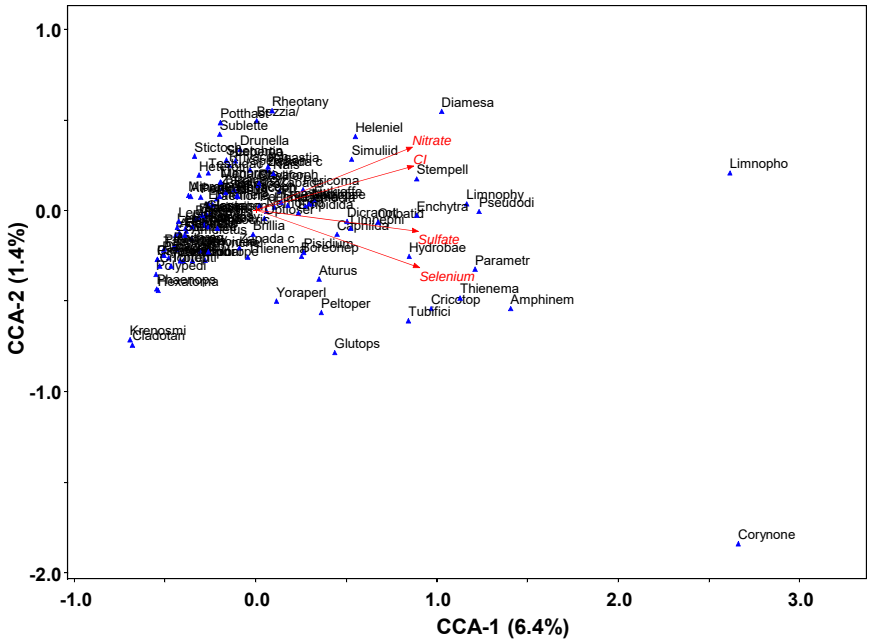


Figure C.10a: Canonical Correspondence Analysis scatter plot of benthic invertebrate community structure at the lowest practical level (LPL) of taxonomy using Log_{10} transformed abundance data of 40 reference areas and 74 mine-exposed areas (n =114) (areas displayed). Direct correlation vectors are displayed for constraining environmental variables. Vector length is proportional to correlation strength.



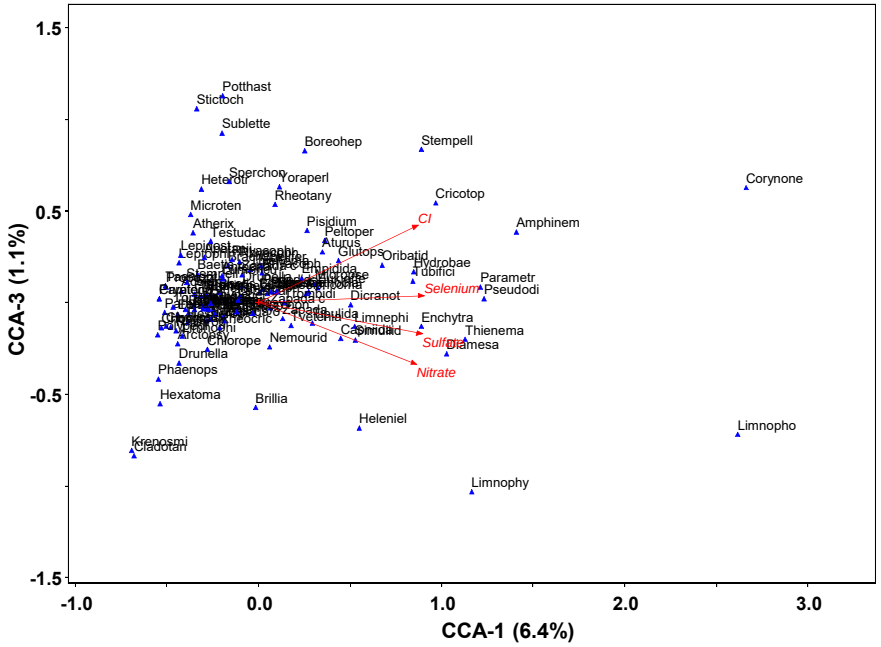


Figure C.10b: Canonical Correspondence Analysis scatter plot of benthic invertebrate community structure at the lowest practical level (LPL) of taxonomy using Log_{10} transformed abundance data of 40 reference areas and 74 mine-exposed areas (n =114) (taxa displayed). Direct correlation vectors are displayed for constraining environmental variables. Vector length is proportional to correlation strength.

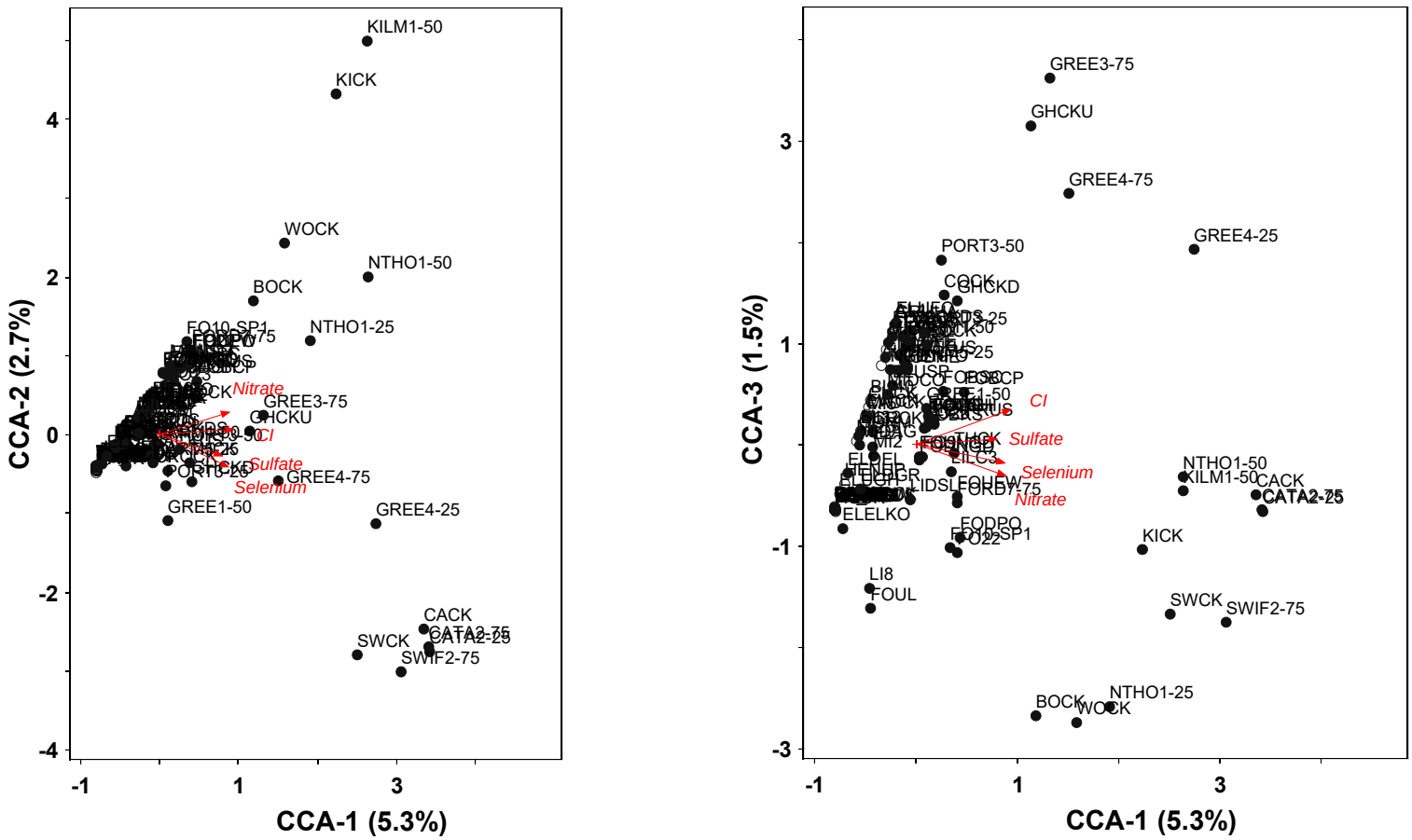


Figure C.11a: Canonical Correspondence Analysis scatter plot of benthic invertebrate community structure at the lowest practical level (LPL) of taxonomy using non-transformed proportional data of 40 reference areas and 74 mine-exposed areas (n =114) (areas displayed). Direct correlation vectors are displayed for constraining environmental variables. Vector length is proportional to correlation strength.

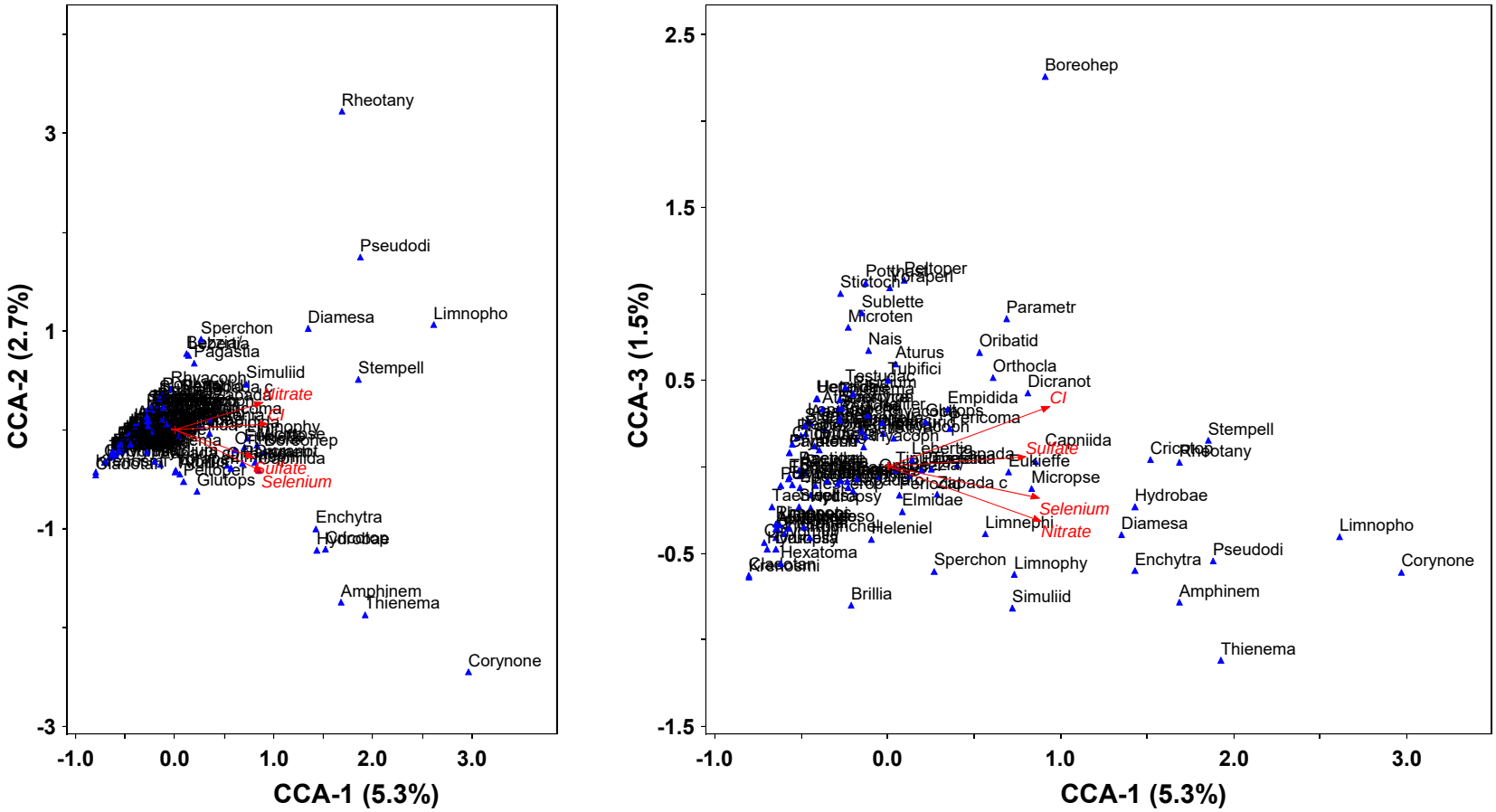


Figure C.11b: Canonical Correspondence Analysis scatter plot of benthic invertebrate community structure at the lowest practical level (LPL) of taxonomy using non-transformed proportional data of 40 reference areas and 74 mine-exposed areas (n =114) (taxa displayed). Direct correlation vectors are displayed for constraining environmental variables. Vector length is proportional to correlation strength.

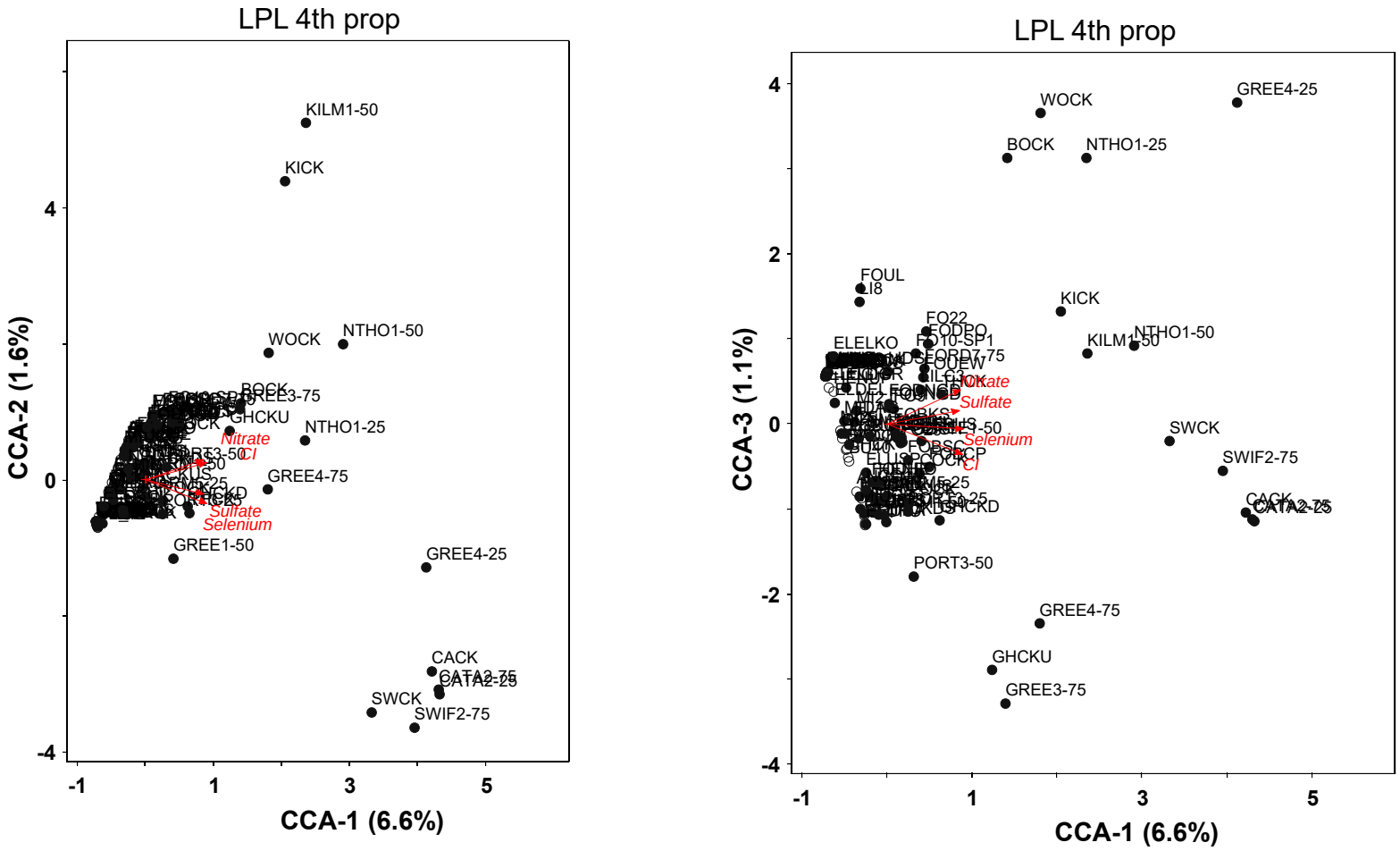


Figure C.12a: Canonical Correspondence Analysis scatter plot of benthic invertebrate community structure at the lowest practical level (LPL) of taxonomy using fourth root transformed proportional data of 40 reference areas and 74 mine-exposed areas (n =114) (areas displayed). Direct correlation vectors are displayed for constraining environmental variables. Vector length is proportional to correlation strength.

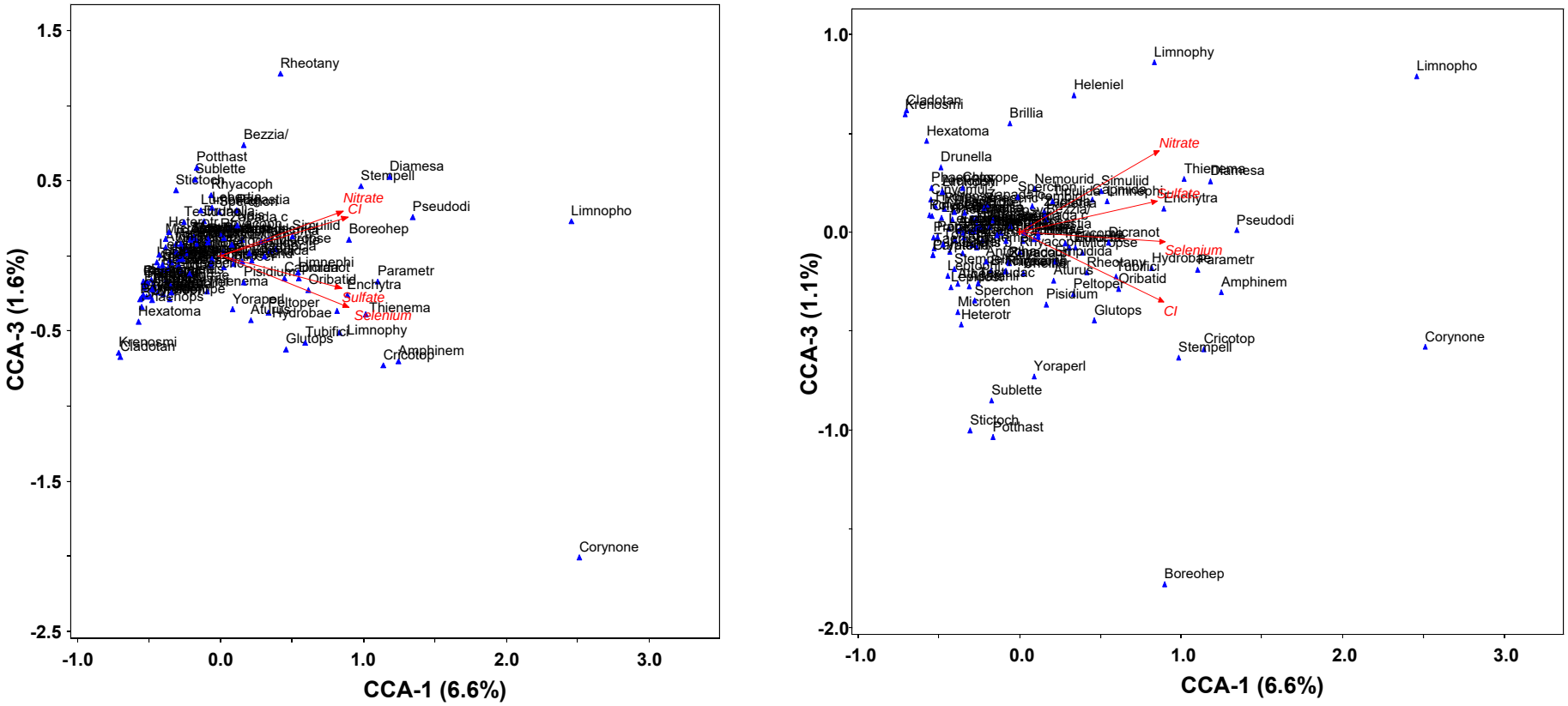


Figure C.12b: Canonical Correspondence Analysis scatter plot of benthic invertebrate community structure at the lowest practical level (LPL) of taxonomy using fourth root transformed proportional data of 40 reference areas and 74 mine-exposed areas (n =114) (taxa displayed). Direct correlation vectors are displayed for constraining environmental variables. Vector length is proportional to correlation strength.

APPENDIX D

Detailed Data Related to the Evaluation of Calcite Effects on Cutthroat Trout, June and September 2015

Table D.1: Calcite metrics from westslope cutthroat spawning and juvenile rearing sites, Elk Valley, June and September 2015.

	Station	Sampling Month	UTM Zone 11U		Calcite Index[a]	Calcite Presence[b]	Concreted Status[c]	Calcite Thickness[d]	Approximate No. of Redds Present During June Survey
			Easting	Northing					
Ref	EC-JR2	September	659254	5547169	0	0	0	0	-
Mine-influenced	CHC-JR1	September	655666	5552741	0.90	0.90	0	0.91	-
	CLC-SP1	June	650806	5564184	1.33	0.82	0.51	0.88	1
	CLC-SP1	September	650806	5564184	1.20	0.90	0.28	1.01	
	CLC-SP2	June	650819	5564217	0.76	0.76	0	0.84	
	DC-JR1	September	656266	5545039	0	0	0	0	-
	FO10-SP1	June	654248	5555299	0.12	0.12	0	0.12	3
	FO10-SP1	September	654245	5555299	0.82	0.82	0	0.82	
	FPC-SP1	June	650926	5564686	0.29	0.29	0	0.40	2
	FPC-SP1	September	650880	5564709	0.78	0.78	0	0.78	
	FO22/FR-SP3	June	654798	5553615	0.19	0.19	0	0.26	3
	FO22/FR-SP3	September	654794	5553614	0.83	0.83	0	0.92	
	FR-JR1	September	650808	5564699	0	0	0	0	-
	FR-JR10	September	652060	5567929	1.00	1.00	0	1.00	-
	FR-JR2	September	654490	5544144	0.24	0.24	0	0.24	-
	FR-JR6	September	653852	5555865	0.96	0.96	0	1.04	-
	FR-JR8	September	651091	5563174	0	0	0	0	-
	FR-JR8M	September	650923	5563667	0.09	0.09	0	0.09	-
	FR-JR8S	September	650879	5563749	0	0	0	0	-
	FR-SP1	June	653888	5555950	0	0	0	0	6
	FR-SP1	September	653889	5555952	0.88	0.88	0	0.95	
	FR-SP2	June	654859	5553996	0.07	0.07	0	0.13	3
	FR-SP2	September	654856	5553995	0.88	0.88	0	1.01	
	GHC-SP1	June	653327	5545478	0.65	0.65	0	0.85	3
	GHC-SP1	September	653327	5545478	0.98	0.98	0	1.63	
	GHC-SP2	June	653366	5545508	0.77	0.77	0	1.54	6
	GHC-SP2	September	653366	5545508	1.00	1.00	0	1.43	
	GREE1-25/GHC-SP3	June	653386	5545504	0.49	0.49	0	0.65	7
	GREE1-25/GHC-SP3	September	653386	5545504	0.30	0.30	0	0.30	
	GREE1-50/GHC-SP4	June	653478	5545551	0.35	0.35	0	0.36	4
	GREE1-50/GHC-SP4	September	653494	5545590	0.88	0.85	0.03	0.96	
	GHCKD/GHC-SP5	June	653533	5545721	0.76	0.66	0.10	1.64	1
	GHCKD/GHC-SP5	September	653536	5545715	1.41	0.97	0.44	1.90	
	HEC-JR1	September	651859	5566262	0.96	0.96	0	1.41	-
	HEC-JR3	September	653422	5566896	0.62	0.62	0	0.69	-
	LMC-JR1	September	650877	5563276	0	0	0	0	-

[a] Calcite Index: CI = (number of pebbles with calcite / number of pebbles counted) + (sum of pebble concretion score / number of pebbles counted).

[b] Calcite Presence: (0) absent, (1) present.

[c] Concreted Status: (0) substrate moved freely, (1) some resistance to movement due to initial calcite formation, (2) immovable substrate.

[d] Calcite Thickness: (0) absent, (1) up to 1 mm, (2) 1-5 mm, (3) 5-10 mm, (4) >10 mm, (5) too concreted to measure.

Table D.2: Pebble count and calcite measurements in mine-influenced westslope cutthroat trout spawing areas, June 2015.

GHC-SP1					GHC-SP2					GREE1-25/GH3-SP3					GREE1-50/GHC-SP4				
#	Concreted Status (0, 1, 2)	Calcite Presence (0 or 1)	Diameter (cm)	Calcite Thickness (1 to 5)	#	Concreted Status (0, 1, 2)	Calcite Presence (0 or 1)	Diameter (cm)	Calcite Thickness (1 to 5)	#	Concreted Status (0, 1, 2)	Calcite Presence (0 or 1)	Diameter (cm)	Calcite Thickness (1 to 5)	#	Concreted Status (0, 1, 2)	Calcite Presence (0 or 1)	Diameter (cm)	Calcite Thickness (1 to 5)
1	0	1	3.5	1	**1**	0	1	4.1	2	**1**	0	1	3.1	1	**1**	0	0	1.6	0
2	0	1	7.0	1	**2**	0	1	4.0	3	**2**	0	0	2.9	0	**2**	0	0	1.2	0
3	0	1	7.5	1	**3**	0	1	4.6	2	**3**	0	0	1.3	0	**3**	0	1	1.9	1
4	0	1	4.5	1	**4**	0	1	6.2	3	**4**	0	1	1.6	1	**4**	0	0	1.5	0
5	0	1	11.0	1	**5**	0	1	6.9	3	**5**	0	0	1.2	0	**5**	0	0	1.2	0
6	0	0	3.5	0	**6**	0	1	9.5	3	**6**	0	0	3.9	0	**6**	0	1	1.7	1
7	0	1	9.5	1	**7**	0	1	5.0	2	**7**	0	1	3.1	1	**7**	0	0	1.3	0
8	0	0	1.6	0	**8**	0	1	4.4	2	**8**	0	0	3.5	0	**8**	0	0	1.3	0
9	0	0	5.6	0	**9**	0	1	5.4	3	**9**	0	0	2.2	0	**9**	0	1	1.4	1
10	0	0	1.2	0	**10**	0	1	2.6	2	**10**	0	0	1.8	0	**10**	0	0	2.1	0
11	0	1	3.5	1	**11**	0	1	2.0	3	**11**	0	0	2.2	0	**11**	0	0	0.8	0
12	0	0	4.5	0	**12**	0	1	2.8	3	**12**	0	1	2.0	1	**12**	0	0	2.0	0
13	0	1	5.2	1	**13**	0	1	2.9	3	**13**	0	0	3.9	0	**13**	0	1	1.7	1
14	0	0	1.2	0	**14**	0	1	5.4	2	**14**	0	0	1.4	0	**14**	0	0	2.1	0
15	0	1	5.7	1	**15**	0	1	3.2	2	**15**	0	0	1.6	0	**15**	0	0	1.1	0
16	0	0	7.2	0	**16**	0	1	3.5	3	**16**	0	1	3.2	1	**16**	0	0	1.4	0
17	0	1	5.4	1	**17**	0	1	2.7	3	**17**	0	0	3.6	0	**17**	0	0	1.3	0
18	0	0	5.3	0	**18**	0	1	3.3	3	**18**	0	0	1.7	0	**18**	0	1	1.9	1
19	0	1	4.5	1	**19**	0	1	7.4	3	**19**	0	0	4.1	0	**19**	0	1	2.3	1
20	0	0	5.6	0	**20**	0	1	2.1	1	**20**	0	0	4.1	0	**20**	0	0	0.9	0
21	0	0	2.2	0	**21**	0	1	3.9	3	**21**	0	0	3.5	0	**21**	0	0	1.6	0
22	0	0	2.2	0	**22**	0	1	4.2	3	**22**	0	0	4.5	0	**22**	0	1	1.4	1
23	0	1	5.8	1	**23**	0	1	7.1	3	**23**	0	0	2.6	0	**23**	0	1	2.3	1
24	0	0	1.5	0	**24**	0	1	8.2	3	**24**	0	1	3.5	1	**24**	0	1	2.3	1
25	0	0	2.1	0	**25**	0	1	1.4	2	**25**	0	0	1.1	0	**25**	0	1	3.1	1
26	0	0	4.2	0	**26**	0	1	2.0	2	**26**	0	0	2.0	0	**26**	0	0	1.2	0
27	0	0	1.9	0	**27**	0	1	5.9	1	**27**	0	0	1.3	0	**27**	0	0	1.4	0
28	0	0	7.5	0	**28**	0	1	4.0	1	**28**	0	0	1.7	0	**28**	0	0	1.8	0
29	0	0	2.1	0	**29**	0	1	2.0	2	**29**	0	0	2.2	0	**29**	0	0	1.6	0
30	0	1	3.4	1	**30**	0	1	2.3	1	**30**	0	1	9.1	2	**30**	0	0	1.7	0
31	0	1	3.7	1	**31**	0	1	9.1	3	**31**	0	0	3.9	0	**31**	0	0	1.2	0
32	0	1	6.6	1	**32**	0	1	4.4	3	**32**	0	0	2.1	0	**32**	0	0	1.3	0
33	0	1	6.5	1	**33**	0	1	4.5	2	**33**	0	0	2.3	0	**33**	0	1	2.3	1
34	0	1	10.4	1	**34**	0	1	4.5	3	**34**	0	1	8.1	1	**34**	0	1	2.6	1
35	0	0	3.0	0	**35**	0	0	1.5	0	**35**	0	0	2.3	0	**35**	0	1	1.5	1
36	0	0	3.6	0	**36**	0	1	1.2	1	**36**	0	1	2.2	1	**36**	0	0	1.0	0
37	0	0	5.5	0	**37**	0	1	1.3	2	**37**	0	0	3.1	0	**37**	0	0	1.5	0
38	0	1	5.5	1	**38**	0	1	5.0	3	**38**	0	1	3.9	1	**38**	0	1	2.4	1
39	0	1	4.1	1	**39**	0	1	3.1	2	**39**	0	0	2.1	0	**39**	0	1	1.7	1
40	0	0	3.0	0	**40**	0	1	3.7	3	**40**	0	1	2.5	1	**40**	0	1	1.3	1
41	0	1	9.4	1	**41**	0	1	3.4	2	**41**	0	0	2.8	0	**41**	0	1	1.5	1
42	0	0	2.2	0	**42**	0	1	2.2	3	**42**	0	0	4.3	0	**42**	0	0	1.1	0
43	0	0	2.6	0	**43**	0	1	5.6	3	**43**	0	1	4.1	1	**43**	0	0	1.2	0
44	0	1	4.3	1	**44**	0	1	6.0	3	**44**	0	0	3.1	0	**44**	0	1	1.4	1
45	0	0	4.9	0	**45**	0	1	1.6	2	**45**	0	1	3.8	1	**45**	0	0	0.8	0
46	0	1	8.4	1	**46**	0	1	5.1	2	**46**	0	1	9.3	2	**46**	0	0	2.4	0
47	0	0	3.3	0	**47**	0	1	3.5	2	**47**	0	1	5.6	1	**47**	0	0	2.6	0
48	0	1	3.7	1	**48**	0	1	2.8	3	**48**	0	1	5.0	1	**48**	0	1	2.3	1
49	0	1	10.7	1	**49**	0	1	2.0	2	**49**	0	1	5.1	1	**49**	0	1	2.8	1
50	0	1	3.3	1	**50**	0	1	5.5	2	**50**	0	1	6.1	1	**50**	0	0	1.4	0
51	0	0	6.6	0	**51**	0	1	2.5	2	**51**	0	1	8.1	2	**51**	0	1	1.6	1
52	0	1	9.4	3	**52**	0	1	2.0	1	**52**	0	1	5.6	2	**52**	0	0	1.4	0
53	0	1	6.8	1	**53**	0	1	1.9	1	**53**	0	1	7.1	1	**53**	0	0	1.1	0
54	0	1	6.6	1	**54**	0	1	1.8	1	**54**	0	0	3.9	0	**54**	0	1	1.9	1
55	0	1	5.7	1	**55**	0	1	3.3	3	**55**	0	1	3.5	2	**55**	0	1	2.0	1
56	0	1	11.8	1	**56**	0	1	2.0	2	**56**	0	0	3.4	0	**56**	0	1	1.7	2
57	0	1	2.3	1	**57**	0	0	4.5	0	**57**	0	1	3.2	1	**57**	0	1	1.6	1
58	0	1	4.1	1	**58**	0	0	2.3	0	**58**	0	0	3.0	0	**58**	0	0	1.2	0
59	0	1	2.9	2	**59**	0	0	1.9	0	**59**	0	0	2.4	0	**59**	0	0	1.1	0
60	0	1	2.3	1	**60**	0	1	2.0	1	**60**	0	1	2.4	1	**60**	0	0	1.2	0
61	0	1	2.6	1	**61**	0	1	7.3	1	**61**	0	0	3.2	0	**61**	0	1	1.5	1
62	0	1	5.7	2	**62**	0	1	2.5	1	**62**	0	0	3.1	0	**62**	0	0	1.3	0
63	0	1	4.6	2	**63**	0	1	1.3	1	**63**	0	1	4.1	2	**63**	0	0	1.0	0
64	0	1	8.8	2	**64**	0	1	1.5	1	**64**	0	0	2.3	0	**64**	0	0	1.1	0
65	0	1	5.4	1	**65**	0	1	2.6	3	**65**	0	0	3.5	0	**65**	0	0	1.0	0
66	0	1	6.0	1	**66**	0	1	6.9	3	**66**	0	0	3.1	0	**66**	0	0	1.2	0
67	0	1	1.5	1	**67**	0	1	1.0	1	**67**	0	0	4.9	0	**67**	0	0	1.1	0
68	0	0	2.1	0	**68**	0	0	1.1	0	**68**	0	1	3.1	2	**68**	0	1	2.8	1
69	0	1	4.7	1	**69**	0	0	1.8	0	**69**	0	0	6.1	0	**69**	0	0	1.9	0
70	0	1	3.1	1	**70**	0	0	2.0	0	**70**	0	1	4.1	1	**70**	0	0	1.4	0
71	0	1	4.4	2	**71**	0	1	3.2	1	**71**	0	1	4.0	1	**71**	0	0	1.0	0
72	0	1	2.9	1	**72**	0	1	3.1	1	**72**	0	1	6.4	2	**72**	0	0	1.3	0
73	0	1	7.5	2	**73**	0	0	1.5	0	**73**	0	0	2.0	0	**73**	0	1	1.1	1
74	0	1	4.3	2	**74**	0	0	1.3	0	**74**	0	1	3.6	1	**74**	0	0	0.8	0
75	0	1	2.5	1	**75**	0	0	2.8	0	**75**	0	0	2.2	0	**75**	0	0	1.7	0
76	0	0	16.2	0	**76**	0	1	2.9	1	**76**	0	0	3.8	0	**76**	0	1	2.3	1
77	0	1	3.4	1	**77**	0	1	2.6	1	**77**	0	1	8.1	1	**77**	0	0	1.8	0
78	0	0	4.0	0	**78**	0	0	2.5	0	**78**	0	1	6.2	2	**78**	0	0	1.3	0
79	0	0	0.8	0	**79**	0	0	2.7	0	**79**	0	0	2.5	0	**79**	0	1	1.4	1
80	0	1	3.1	1	**80**	0	0	1.3	0	**80**	0	1	7.5	2	**80**	0	0	1.1	0
81	0	1	2.5	1	**81**	0	0	1.4	0	**81**	0	1	6.1	1	**81**	0	0	0.8	0
82	0	1	4.6	1	**82**	0	1	3.4	1	**82**	0	1	9.3	2	**82**	0	0	2.5	0
83	0	0	1.6	0	**83**	0	1	2.1	1	**83**	0	1	10.4	2	**83**	0	0	1.5	0
84	0	0	1.8	0	**84**	0	1	1.6	1	**84**	0	0	2.6	0	**84**	0	0	1.7	0
85	0	0	2.4	0	**85**	0	1	1.1	1	**85**	0	1	10.4	1	**85**	0	0	1.8	0
86	0	1	1.7	1	**86**	0	0	2.4	0	**86**	0	1	7.0	1	**86**	0	0	1.2	0
87	0	0	1.7	0	**87**	0	1	3.4	1	**87**	0	1	3.9	1	**87**	0	1	1.2	1
88	0	0	2.3	0	**88**	0	1	3.0	1	**88**	0	1	4.4	2	**88**	0	0	1.7	0
89	0	1	2.0	1	**89**	0	0	2.2	0	**89**	0	1	10.9	2	**89**	0	0	1.4	0
90	0	1	16.5	3	**90**	0	0	1.8	0	**90**	0	1	13.1	2	**90**	0	0	1.0	0
91	0	1	4.7	3	**91**	0	0	1.4	0	**91**	0	1	2.2	1	**91**	0	0	1.3	0
92	0	1	20.6	3	**92**	0	1	2.1	1	**92**	0	1	4.9	1	**92**	0	0	1.3	0
93	0	1	3.1	1	**93**	0	1	1.7	1	**93**	0	1	5.9	1	**93**	0	1	3.5	1
94	0	1	2.9	1	**94**	0	0	1.9	0	**94**	0	1	4.2	2	**94**	0	0	2.4	0
95	0	1	5.8	2	**95**	0	1	2.2	1	**95**	0	1	5.9	1	**95**	0	1	1.4	1
96	0	1	3.8	2	**96**	0	1	2.1	1	**96**	0	0	1.7	0	**96**	0	0	2.1	0
97	0	1	4.8	2	**97**	0	0	3.0	0	**97**	0	0	1.6	0	**97**	0	1	1.7	1
98	0	1	2.5	1	**98**	0	0	1.2	0	**98**	0	0	1.3	0	**98**	0	1	1.5	1
99	0	1	3.3	1	**99**	0	0	1.5	0	**99**	0	1	12.1	1	**99**	0	0	1.1	0
100	0	1	8.2	3	**100**	0	0	3.2	0	**100**	0	1	14.5	1	**100**	0	0	1.2	0
MEAN:	**0**	**0.65**	**4.9**	**0.85**	**MEAN:**	**0**	**0.77**	**3.2**	**1.54**	**MEAN:**	**0**	**0.49**	**4.2**	**0.65**	**MEAN:**	**0**	**0.35**	**1.6**	**0.36**
CALCITE INDEX: 0.65					**CALCITE INDEX: 0.77**					**CALCITE INDEX: 0.49**					**CALCITE INDEX: 0.35**				

Pebble collected from inside a redd.
Pebble collected adjacent to a redd.

Table D.2: Pebble count and calcite measurements in mine-influenced westslope cutthroat trout spawing areas, June 2015.

GHCKD					FPC_SP1					CLC-SP1					CLC-SP2				
#	Concreted Status (0, 1, 2)	Calcite Presence (0 or 1)	Diameter (cm)	Calcite Thickness (1 to 5)	#	Concreted Status (0, 1, 2)	Calcite Presence (0 or 1)	Diameter (cm)	Calcite Thickness (1 to 5)	#	Concreted Status (0, 1, 2)	Calcite Presence (0 or 1)	Diameter (cm)	Calcite Thickness (1 to 5)	#	Concreted Status (0, 1, 2)	Calcite Presence (0 or 1)	Diameter (cm)	Calcite Thickness (1 to 5)
1	0	1	17.1	5	1	0	0	12.4	0	1	0	1	6.2	1	1	0	1	4.9	1
2	0	0	3.7	0	2	0	0	7.2	0	2	0	0	2.7	0	2	0	1	2.2	1
3	0	1	15.0	4	3	0	0	5.2	0	3	0	1	3.6	1	3	0	0	4.1	0
4	0	1	3.6	4	4	0	0	62.0	0	4	0	1	10.1	1	4	0	1	2.4	1
5	0	1	10.6	4	5	0	0	25.0	0	5	0	1	2.4	1	5	0	1	2.8	1
6	0	1	6.4	1	6	0	0	26.2	0	6	0	1	4.6	1	6	0	1	2.3	1
7	0	1	2.5	1	7	0	0	10.1	0	7	0	1	10.5	1	7	0	1	4.5	2
8	0	1	2.8	1	8	0	0	3.8	0	8	0	1	4.2	1	8	0	1	1.2	1
9	0	1	16.5	1	9	0	0	8.3	0	9	0	1	5.1	1	9	0	1	2.6	1
10	0	1	4.4	1	10	0	0	26.5	0	10	0	1	2.7	1	10	0	1	3.8	1
11	0	1	3.2	1	11	0	0	25.3	0	11	0	1	3.5	1	11	0	1	4.6	2
12	0	1	2.1	1	12	0	0	13.6	0	12	0	1	2.7	1	12	0	1	2.9	1
13	0	1	7.0	1	13	0	0	2.7	0	13	0	1	2.5	1	13	0	1	2.6	1
14	0	1	3.7	1	14	0	0	3.2	0	14	0	1	1.8	1	14	0	1	2.7	1
15	0	1	6.0	1	15	0	0	2.1	0	15	0	1	3.3	1	15	0	1	2.6	1
16	0	1	7.2	1	16	0	0	1.9	0	16	0	0	1.5	0	16	0	1	6.6	1
17	0	1	4.8	1	17	0	0	1.7	0	17	0	1	2.6	1	17	0	1	7.1	1
18	0	1	2.8	1	18	0	0	1.5	0	18	0	0	2.0	0	18	0	0	1.5	0
19	0	1	11.6	5	19	0	0	1.6	0	19	0	0	1.1	0	19	0	1	8.8	1
20	0	0	2.6	0	20	0	0	1.2	0	20	0	1	2.2	1	20	0	1	4.4	1
21	0	1	5.7	3	21	0	0	1.8	0	21	0	0	1.4	0	21	0	0	1.4	0
22	0	1	3.7	1	22	0	0	4.2	0	22	0	1	2.7	1	22	0	0	1.2	0
23	0	1	7.5	3	23	0	0	3.4	0	23	0	0	1.9	0	23	0	0	1.9	0
24	0	1	6.8	1	24	0	0	4.8	0	24	0	1	2.7	1	24	0	0	1.8	0
25	0	1	8.1	3	25	0	0	2.1	0	25	0	1	2.9	1	25	0	1	2.6	1
26	0	1	15.2	1	26	0	0	2.5	0	26	0	0	1.0	0	26	Note: Add CLC-SP2 to CLC-SP1.			
27	0	1	14.2	1	27	0	0	2.8	0	27	1	1	1.6	1	27				
28	0	1	13.7	2	28	0	0	2.9	0	28	1	1	1.5	2	28				
29	0	1	2.6	2	29	0	0	1.3	0	29	1	1	2.8	1	29				
30	0	1	4.5	2	30	0	0	1.7	0	30	1	1	4.7	1	30				
31	0	1	10.1	2	31	0	0	2.6	0	31	0	1	2.3	1	31				
32	0	1	9.5	2	32	0	0	13.5	0	32	1	1	2.5	2	32				
33	1	1	12.1	5	33	0	0	5.3	0	33	0	1	1.6	1	33				
34	0	1	12.5	3	34	0	0	3.1	0	34	1	1	2.5	1	34				
35	0	1	13.6	3	35	0	0	2.7	0	35	1	1	3.2	2	35				
36	0	1	14.8	3	36	0	0	3.8	0	36	1	1	1.8	1	36				
37	0	1	7.4	3	37	0	0	2.5	0	37	0	1	1.1	1	37				
38	0	1	5.2	3	38	0	0	2.6	0	38	1	1	2.6	1	38				
39	0	1	19.5	3	39	0	0	1.5	0	39	1	1	2.7	1	39				
40	0	1	7.1	2	40	0	0	1.2	0	40	1	1	1.9	2	40				
41	0	1	5.0	2	41	0	0	5.7	0	41	1	1	2.4	1	41				
42	0	1	13.2	4	42	0	0	4.4	0	42	0	1	1.7	1	42				
43	0	1	4.2	2	43	0	0	3.6	0	43	0	1	3.8	1	43				
44	0	1	13.4	3	44	0	0	2.3	0	44	0	0	1.6	0	44				
45	0	1	3.1	3	45	0	0	2.3	0	45	0	1	4.1	1	45				
46	0	1	18.2	2	46	0	0	1.7	0	46	1	1	2.8	1	46				
47	0	1	9.2	2	47	0	0	1.3	0	47	0	1	3.1	1	47				
48	0	1	13.5	5	48	0	0	2.6	0	48	1	1	3.5	1	48				
49	0	1	4.1	2	49	0	0	1.7	0	49	1	1	1.9	1	49				
50	0	1	5.4	1	50	0	0	1.0	0	50	0	1	3.2	1	50				
51	0	0	4.2	0	51	0	0	5.5	0	51	1	1	2.4	1	51				
52	0	0	2.5	0	52	0	0	15.2	0	52	1	1	5.6	2	52				
53	0	0	2.7	0	53	0	0	7.1	0	53	1	1	3.1	1	53				
54	0	0	2.6	0	54	0	1	14.3	2	54	0	1	3.7	1	54				
55	0	0	2.4	0	55	0	1	7.4	1	55	0	1	3.3	1	55				
56	0	0	2.4	0	56	0	1	19.6	2	56	0	1	6.2	1	56				
57	0	0	1.6	0	57	0	1	5.9	1	57	1	1	3.7	1	57				
58	0	0	1.1	0	58	0	1	11.3	1	58	1	1	6.5	1	58				
59	0	1	5.3	1	59	0	1	9.1	1	59	0	0	2.9	0	59				
60	0	0	3.1	0	60	0	1	23.5	2	60	0	1	3.3	1	60				
61	0	1	2.6	2	61	0	1	17.5	2	61	0	0	2.7	0	61				
62	0	1	1.5	1	62	0	1	26.8	2	62	1	1	4.5	1	62				
63	0	0	1.8	0	63	0	1	2.4	1	63	1	1	4.6	2	63				
64	0	0	2.1	0	64	0	0	1.6	0	64	0	0	2.4	0	64				
65	0	0	2.7	0	65	0	0	1.6	0	65	0	0	1.4	0	65				
66	0	0	1.3	0	66	0	0	1.9	0	66	1	1	1.8	1	66				
67	0	0	1.5	0	67	0	1	4.8	2	67	1	1	5.1	1	67				
68	0	1	1.4	1	68	0	0	3.3	0	68	1	1	2.8	1	68				
69	0	0	1.7	0	69	0	0	2.5	0	69	1	1	1.8	1	69				
70	0	0	1.9	0	70	0	0	1.4	0	70	1	1	10.2	1	70				
71	0	0	1.8	0	71	0	0	3.6	0	71	1	1	9.5	1	71				
72	0	0	1.1	0	72	0	0	1.7	0	72	0	0	3.0	0	72				
73	0	0	1.4	0	73	0	1	6.1	1	73	1	1	3.2	1	73				
74	0	0	1.2	0	74	0	0	5.8	0	74	0	0	2.3	0	74				
75	0	1	2.2	2	75	0	0	2.8	0	75	1	1	2.9	1	75				
76	0	1	8.8	4	76	0	0	3.1	0	76	1	1	3.7	1	76				
77	0	1	10.4	5	77	0	0	2.4	0	77	1	1	3.5	1	77				
78	1	1	5.4	5	78	0	1	3.5	1	78	1	1	1.8	1	78				
79	1	1	7.7	5	79	0	1	9.9	1	79	1	1	7.5	1	79				
80	2	1	6.8	4	80	0	0	4.6	0	80	0	0	11.3	0	80				
81	2	1	3.5	5	81	0	0	8.0	0	81	1	1	3.1	1	81				
82	1	1	6.4	5	82	0	1	4.7	1	82	1	1	4.3	1	82				
83	1	1	5.9	5	83	0	0	2.2	0	83	0	0	3.1	0	83				
84	1	1	12.5	5	84	0	0	2.4	0	84	1	1	7.2	1	84				
85	0	1	4.2	2	85	0	0	1.3	0	85	1	1	7.3	1	85				
86	0	0	2.7	0	86	0	1	3.5	1	86	1	1	2.2	1	86				
87	0	1	2.4	1	87	0	1	5.9	1	87	1	1	2.6	1	87				
88	0	0	1.3	0	88	0	1	1.4	1	88	0	0	2.6	0	88				
89	0	1	2.8	1	89	0	0	10.8	0	89	1	1	4.5	1	89				
90	0	0	1.1	0	90	0	1	4.5	1	90	1	1	2.4	1	90				
91	0	0	1.5	0	91	0	1	3.4	1	91	1	1	3.6	1	91				
92	0	0	2.1	0	92	0	1	5.4	1	92	0	0	11.2	0	92				
93	0	0	2.7	0	93	0	1	11.9	2	93	1	1	13.5	1	93				
94	0	0	1.2	0	94	0	1	15.4	2	94	1	1	2.6	1	94				
95	0	0	1.2	0	95	0	1	4.8	1	95	1	1	12.5	1	95				
96	0	0	2.9	0	96	0	1	3.4	1	96	1	1	3.8	1	96				
97	0	0	1.0	0	97	0	1	2.9	1	97	1	1	4.0	1	97				
98	0	0	1.1	0	98	0	1	11.1	3	98	1	1	12.6	1	98				
99	0	0	2.8	0	99	0	1	8.5	2	99	1	1	6.9	1	99				
100	0	1	2.8	1	100	0	1	4.2	1	100	1	1	6.5	1	100				
MEAN:	0.1	0.66	5.7	1.6	MEAN:	0	0.29	6.8	0.40	MEAN:	0.51	0.82	3.9	0.88	MEAN:	0	0.76	3.3	0.84
CALCITE INDEX: 0.76					CALCITE INDEX: 0.29					CALCITE INDEX: 1.33					CALCITE INDEX: 0.76				

Pebble collected from inside a redd.
Pebble collected adjacent to a redd.

Table D.2: Pebble count and calcite measurements in mine-influenced westslope cutthroat trout spawing areas, June 2015.

FR-SP1					FO10-SP1					FR-SP2					FR-SP3				
#	Concreted Status (0, 1, 2)	Calcite Presence (0 or 1)	Diameter (cm)	Calcite Thickness (1 to 5)	#	Concreted Status (0, 1, 2)	Calcite Presence (0 or 1)	Diameter (cm)	Calcite Thickness (1 to 5)	#	Concreted Status (0, 1, 2)	Calcite Presence (0 or 1)	Diameter (cm)	Calcite Thickness (1 to 5)	#	Concreted Status (0, 1, 2)	Calcite Presence (0 or 1)	Diameter (cm)	Calcite Thickness (1 to 5)
1	0	0	3.5	0	1	0	0	4.7	0	1	0	0	1.7	0	1	0	0	2.7	0
2	0	0	2.4	0	2	0	0	2.7	0	2	0	0	1.3	0	2	0	0	1.9	0
3	0	0	2.1	0	3	0	0	2.2	0	3	0	0	2.8	0	3	0	0	1.2	0
4	0	0	2.7	0	4	0	0	1.7	0	4	0	0	2.1	0	4	0	0	6.9	0
5	0	0	2.8	0	5	0	0	2.0	0	5	0	0	1.5	0	5	0	0	4.1	0
6	0	0	1.2	0	6	0	0	2.5	0	6	0	0	1.2	0	6	0	0	2.0	0
7	0	0	1.3	0	7	0	0	1.7	0	7	0	0	1.1	0	7	0	0	1.2	0
8	0	0	1.6	0	8	0	0	2.1	0	8	0	0	2.5	0	8	0	0	3.5	0
9	0	0	1.5	0	9	0	0	1.9	0	9	0	0	1.8	0	9	0	0	3.5	0
10	0	0	1.8	0	10	0	0	1.7	0	10	0	0	2.4	0	10	0	0	4.1	0
11	0	0	2.8	0	11	0	0	1.1	0	11	0	0	1.6	0	11	0	0	1.4	0
12	0	0	3.0	0	12	0	0	1.2	0	12	0	0	1.7	0	12	0	0	1.1	0
13	0	0	6.1	0	13	0	0	5.7	0	13	0	0	2.2	0	13	0	0	2.3	0
14	0	0	5.1	0	14	0	0	2.7	0	14	0	0	2.7	0	14	0	0	3.3	0
15	0	0	12.1	0	15	0	0	3.7	0	15	0	0	1.3	0	15	0	0	1.5	0
16	0	0	3.2	0	16	0	0	5.2	0	16	0	0	0.9	0	16	0	0	1.8	0
17	0	0	4.9	0	17	0	0	1.8	0	17	0	0	3.1	0	17	0	0	5.2	0
18	0	0	5.1	0	18	0	0	2.4	0	18	0	0	2.6	0	18	0	0	1.6	0
19	0	0	4.2	0	19	0	0	1.5	0	19	0	0	3.1	0	19	0	0	2.4	0
20	0	0	2.2	0	20	0	0	1.5	0	20	0	0	2.9	0	20	0	1	4.0	1
21	0	0	4.3	0	21	0	0	5.5	0	21	0	0	1.6	0	21	0	0	3.5	0
22	0	0	7.2	0	22	0	0	3.5	0	22	0	0	1.2	0	22	0	1	3.7	2
23	0	0	2.8	0	23	0	0	1.5	0	23	0	0	3.8	0	23	0	0	4.5	0
24	0	0	3.2	0	24	0	0	2.1	0	24	0	0	3.9	0	24	0	0	3.8	0
25	0	0	5.1	0	25	0	0	1.7	0	25	0	0	2.8	0	25	0	0	2.0	0
26	0	0	1.8	0	26	0	0	2.5	0	26	0	0	1.8	0	26	0	1	2.5	1
27	0	0	3.2	0	27	0	0	3.9	0	27	0	0	2.3	0	27	0	0	1.9	0
28	0	0	3.4	0	28	0	0	2.6	0	28	0	0	3.0	0	28	0	0	1.1	0
29	0	0	3.3	0	29	0	0	3.0	0	29	0	0	3.5	0	29	0	0	0.9	0
30	0	0	3.2	0	30	0	0	2.3	0	30	0	0	1.2	0	30	0	1	10.5	2
31	0	0	4.0	0	31	0	0	5.2	0	31	0	0	1.7	0	31	0	1	1.9	1
32	0	0	4.0	0	32	0	0	1.7	0	32	0	0	2.7	0	32	0	0	4.5	0
33	0	0	5.1	0	33	0	0	1.1	0	33	0	0	1.3	0	33	0	0	2.1	0
34	0	0	3.8	0	34	0	0	3.2	0	34	0	0	1.3	0	34	0	0	2.9	0
35	0	0	4.7	0	35	0	0	0.8	0	35	0	0	1.4	0	35	0	0	2.2	0
36	0	0	3.5	0	36	0	0	7.1	0	36	0	0	1.1	0	36	0	0	2.0	0
37	0	0	1.7	0	37	0	0	1.3	0	37	0	0	1.8	0	37	0	0	3.4	0
38	0	0	1.9	0	38	0	0	2.5	0	38	0	0	3.2	0	38	0	0	0.9	0
39	0	0	2.5	0	39	0	0	1.7	0	39	0	0	2.7	0	39	0	0	1.3	0
40	0	0	1.2	0	40	0	0	3.5	0	40	0	0	3.7	0	40	0	1	2.8	1
41	0	0	1.1	0	41	0	0	3.1	0	41	0	0	3.4	0	41	0	0	2.4	0
42	0	0	2.7	0	42	0	0	1.9	0	42	0	0	1.6	0	42	0	0	2.6	0
43	0	0	4.5	0	43	0	0	2.2	0	43	0	0	1.7	0	43	0	0	1.6	0
44	0	0	2.2	0	44	0	0	3.2	0	44	0	0	2.2	0	44	0	0	1.8	0
45	0	0	2.6	0	45	0	0	3.0	0	45	0	0	1.7	0	45	0	0	2.0	0
46	0	0	2.6	0	46	0	0	0.8	0	46	0	0	1.5	0	46	0	0	1.7	0
47	0	0	1.9	0	47	0	0	1.1	0	47	0	0	1.7	0	47	0	0	1.1	0
48	0	0	3.8	0	48	0	0	1.5	0	48	0	0	1.5	0	48	0	0	1.2	0
49	0	0	4.8	0	49	0	0	0.9	0	49	0	0	2.2	0	49	0	0	5.5	0
50	0	0	4.5	0	50	0	0	3.5	0	50	0	0	2.8	0	50	0	0	2.9	0
51	0	0	2.5	0	51	0	0	2.5	0	51	0	0	1.8	0	51	0	0	1.2	0
52	0	0	3.1	0	52	0	0	2.0	0	52	0	0	2.5	0	52	0	0	1.9	0
53	0	0	1.9	0	53	0	0	2.7	0	53	0	0	3.4	0	53	0	0	2.6	0
54	0	0	1.2	0	54	0	1	3.4	1	54	0	0	3.2	0	54	0	0	2.3	0
55	0	0	1.8	0	55	0	1	7.5	1	55	0	0	1.6	0	55	0	1	2.5	2
56	0	0	1.2	0	56	0	0	2.0	0	56	0	0	1.5	0	56	0	0	2.1	0
57	0	0	2.2	0	57	0	0	2.7	0	57	0	0	1.5	0	57	0	0	1.2	0
58	0	0	4.4	0	58	0	0	2.4	0	58	0	0	3.2	0	58	0	0	0.8	0
59	0	0	1.2	0	59	0	0	3.1	0	59	0	0	2.9	0	59	0	0	1.2	0
60	0	0	2.6	0	60	0	1	2.1	1	60	0	0	2.4	0	60	0	1	3.4	1
61	0	0	1.9	0	61	0	0	2.7	0	61	0	0	1.7	0	61	0	0	2.5	0
62	0	0	2.7	0	62	0	0	1.9	0	62	0	0	1.4	0	62	0	0	1.2	0
63	0	0	1.8	0	63	0	0	2.3	0	63	0	0	2.0	0	63	0	0	2.1	0
64	0	0	2.1	0	64	0	0	2.2	0	64	0	0	1.5	0	64	0	1	1.9	1
65	0	0	2.3	0	65	0	0	1.7	0	65	0	0	1.4	0	65	0	0	2.1	0
66	0	0	2.5	0	66	0	0	1.8	0	66	0	0	1.4	0	66	0	0	0.9	0
67	0	0	3.5	0	67	0	0	1.7	0	67	0	0	4.7	0	67	0	0	1.3	0
68	0	0	1.4	0	68	0	0	1.1	0	68	0	0	4.3	0	68	0	1	5.2	1
69	0	0	1.7	0	69	0	0	1.7	0	69	0	0	4.4	0	69	0	1	6.6	2
70	0	0	1.8	0	70	0	1	3.3	1	70	0	0	2.7	0	70	0	1	4.5	2
71	0	0	1.6	0	71	0	0	2.2	0	71	0	1	3.2	2	71	0	1	5.5	2
72	0	0	1.5	0	72	0	0	2.2	0	72	0	1	4.2	2	72	0	1	5.2	2
73	0	0	2.7	0	73	0	0	2.4	0	73	0	0	1.5	0	73	0	0	2.3	0
74	0	0	1.3	0	74	0	0	2.9	0	74	0	0	2.1	0	74	0	0	1.8	0
75	0	0	1.9	0	75	0	1	1.8	1	75	0	1	1.8	1	75	0	0	1.2	0
76	0	0	1.4	0	76	0	1	1.7	1	76	0	1	5.0	2	76	0	0	3.5	0
77	0	0	1.7	0	77	0	0	2.3	0	77	0	0	2.2	0	77	0	0	1.9	0
78	0	0	2.9	0	78	0	0	1.1	0	78	0	0	1.9	0	78	0	0	1.6	0
79	0	0	2.0	0	79	0	0	0.9	0	79	0	0	3.7	0	79	0	0	1.5	0
80	0	0	1.9	0	80	0	1	3.1	1	80	0	0	1.6	0	80	0	0	2.0	0
81	0	0	1.2	0	81	0	0	1.8	0	81	0	0	2.4	0	81	0	1	3.8	1
82	0	0	1.7	0	82	0	0	1.2	0	82	0	0	3.8	0	82	0	1	3.1	1
83	0	0	1.9	0	83	0	0	2.3	0	83	0	0	2.0	0	83	0	1	3.5	1
84	0	0	2.4	0	84	0	1	1.7	1	84	0	0	1.1	0	84	0	0	2.2	0
85	0	0	1.8	0	85	0	0	2.0	0	85	0	1	1.8	1	85	0	0	2.1	0
86	0	0	1.7	0	86	0	0	2.1	0	86	0	0	1.7	0	86	0	0	2.7	0
87	0	0	2.7	0	87	0	0	2.0	0	87	0	0	1.9	0	87	0	0	1.3	0
88	0	0	4.0	0	88	0	0	1.7	0	88	0	0	2.4	0	88	0	0	1.1	0
89	0	0	2.1	0	89	0	0	1.9	0	89	0	0	1.7	0	89	0	0	1.8	0
90	0	0	1.2	0	90	0	0	2.1	0	90	0	0	1.0	0	90	0	0	1.8	0
91	0	0	5.5	0	91	0	1	1.2	1	91	0	0	4.2	0	91	0	0	3.5	0
92	0	0	4.1	0	92	0	0	1.5	0	92	0	0	2.8	0	92	0	1	2.7	1
93	0	0	3.0	0	93	0	1	1.8	1	93	0	0	3.2	0	93	0	0	3.8	0
94	0	0	3.9	0	94	0	0	1.5	0	94	0	1	7.1	2	94	0	0	1.8	0
95	0	0	2.1	0	95	0	0	1.7	0	95	0	0	1.4	0	95	0	1	1.5	1
96	0	0	2.5	0	96	0	0	2.8	0	96	0	0	6.8	0	96	0	0	2.5	0
97	0	0	7.4	0	97	0	1	1.8	1	97	0	0	5.1	0	97	0	0	1.6	0
98	0	0	4.8	0	98	0	0	11.2	0	98	0	0	3.1	0	98	0	0	2.0	0
99	0	0	1.8	0	99	0	1	5.1	1	99	0	0	1.0	0	99	0	0	1.7	0
100	0	0	2.1	0	100	0	0	1.8	0	100	0	1	7.2	3	100	0	0	1.1	0
MEAN:	0	0	2.9	0	MEAN:	0	0.12	2.5	0.12	MEAN:	0	0.07	2.5	0.13	MEAN:	0	0.19	2.6	0.26
CALCITE INDEX: 0					CALCITE INDEX: 0.12					CALCITE INDEX: 0.07					CALCITE INDEX: 0.19				

Pebble collected from inside a redd.
Pebble collected adjacent to a redd.

Table D.3: Pebble count and calcite measurements in westslope cutthroat trout spawing and juvenile rearing areas, September 2015.

CHC-JR1						CLC-SP1						DC-JR1					
Count	Concreted Status	Calcite Presence	Calcite Thickness	Intermediate Axis	Embed	Count	Concreted Status	Calcite Presence	Calcite Thickness	Intermediate Axis	Embed	Count	Concreted Status	Calcite Presence	Calcite Thickness	Intermediate Axis	Embed
1	0	1	1	9.2		**1**	0	1	1	7.4		**1**	0	0	0	8.3	
2	0	1	1	9.9		**2**	1	1	1	7.3		**2**	0	0	0	2.3	
3	0	1	1	11.7		**3**	0	1	1	10.1		**3**	0	0	0	6.5	
4	0	1	1	7.6		**4**	1	1	1	3.1		**4**	0	0	0	6.9	
5	0	1	1	11.0		**5**	1	1	1	3.2		**5**	0	0	0	4.2	
6	0	0	0	3.9		**6**	1	1	1	3.5		**6**	0	0	0	7.9	
7	0	0	0	6.1		**7**	1	1	1	11.5		**7**	0	0	0	10.3	
8	0	0	0	3.5		**8**	1	1	1	3.5		**8**	0	0	0	4.9	
9	0	1	1	8.7		**9**	1	1	1	2.1		**9**	0	0	0	11.6	
10	0	1	1	10.0	0.5	**10**	1	1	1	5.2	0.25	**10**	0	0	0	8.7	0.25
11	0	1	1	9.5		**11**	1	1	1	6.3		**11**	0	0	0	9.2	
12	0	0	0	7.1		**12**	0	1	1	8.2		**12**	0	0	0	7.0	
13	0	1	1	10.5		**13**	1	1	1	5.5		**13**	0	0	0	5.5	
14	0	1	1	6.3		**14**	0	1	1	4.3		**14**	0	0	0	12.0	
15	0	0	0	7.5		**15**	1	1	1	5.5		**15**	0	0	0	9.6	
16	0	1	1	12.6		**16**	1	1	1	2.2		**16**	0	0	0	3.7	
17	0	1	1	11.7		**17**	0	1	1	2.1		**17**	0	0	0	7.0	
18	0	1	1	12.0		**18**	0	1	1	2.5		**18**	0	0	0	8.0	
19	0	1	1	3.4		**19**	0	1	1	3.3		**19**	0	0	0	6.7	
20	0	1	1	14.5	0.25	**20**	0	0	0	2.3	0.75	**20**	0	0	0	7.1	0.5
21	0	1	1	7.0		**21**	0	0	0	2.8		**21**	0	0	0	8.5	
22	0	1	1	8.5		**22**	1	1	3	5.1		**22**	0	0	0	9.5	
23	0	0	0	6.2		**23**	0	1	1	5.9		**23**	0	0	0	7.8	
24	0	1	1	10.3		**24**	1	1	1	2.4		**24**	0	0	0	9.5	
25	0	1	1	26.0		**25**	0	1	1	2.4		**25**	0	0	0	4.9	
26	0	1	1	19.8		**26**	0	0	0	1.5		**26**	0	0	0	7.4	
27	0	1	1	10.5		**27**	1	1	1	3.5		**27**	0	0	0	3.9	
28	0	1	1	11.0		**28**	1	1	1	3.4		**28**	0	0	0	11.2	
29	0	1	1	18.5		**29**	1	1	1	2.5		**29**	0	0	0	8.1	
30	0	1	1	10.0	0.5	**30**	1	1	3	4.4	0.5	**30**	0	0	0	3.6	0
31	0	1	1	7.9		**31**	1	1	2	2.4		**31**	0	0	0	3.8	
32	0	1	1	10.4		**32**	1	1	2	7.9		**32**	0	0	0	4.0	
33	0	1	1	17.5		**33**	0	1	1	7.1		**33**	0	0	0	3.4	
34	0	1	1	5.5		**34**	0	1	1	3.4		**34**	0	0	0	6.3	
35	0	1	1	9.4		**35**	0	1	1	4.1		**35**	0	0	0	3.3	
36	0	1	1	19.0		**36**	0	1	1	3.4		**36**	0	0	0	8.5	
37	0	1	1	12.8		**37**	1	1	1	3.5		**37**	0	0	0	8.9	
38	0	1	1	15.8		**38**	0	1	1	3.5		**38**	0	0	0	3.7	
39	0	1	1	17.0		**39**	1	1	1	5.1		**39**	0	0	0	7.4	
40	0	1	1	15.0	0.25	**40**	0	0	0	5.5	0.5	**40**	0	0	0	6.1	0.5
41	0	1	1	11.9		**41**	1	1	1	3.3		**41**	0	0	0	3.3	
42	0	1	1	17.5		**42**	0	0	0	6.5		**42**	0	0	0	3.4	
43	0	1	1	13.5		**43**	0	1	1	2.5		**43**	0	0	0	5.5	
44	0	1	1	4.0		**44**	0	1	1	5.5		**44**	0	0	0	4.1	
45	0	1	1	14.7		**45**	0	1	1	3.4		**45**	0	0	0	9.7	
46	0	1	1	7.1		**46**	0	1	1	3.6		**46**	0	0	0	10.0	
47	0	1	1	12.6		**47**	0	1	1	5.4		**47**	0	0	0	5.0	
48	0	1	1	17.0		**48**	1	1	1	3.4		**48**	0	0	0	4.6	
49	0	1	1	6.8		**49**	0	1	1	4.5		**49**	0	0	0	8.0	
50	0	1	1	8.5	0.25	**50**	0	0	0	2.2	0.5	**50**	0	0	0	6.0	0.25
51	0	1	1	7.9		**51**	0	1	1	3.5		**51**	0	0	0	9.0	
52	0	1	1	5.5		**52**	0	1	1	3.1		**52**	0	0	0	3.3	
53	0	1	1	6.1		**53**	0	1	1	5.9		**53**	0	0	0	2.4	
54	0	1	1	5.7		**54**	0	0	0	3.4		**54**	0	0	0	1.8	
55	0	0	0	2.2		**55**	0	1	1	6.5		**55**	0	0	0	6.5	
56	0	1	1	7.5		**56**	0	1	1	9.4		**56**	0	0	0	3.0	
57	0	1	1	6.6		**57**	0	1	1	10.5		**57**	0	0	0	5.4	
58	0	1	1	7.0		**58**	0	1	1	6.6		**58**	0	0	0	4.6	
59	0	1	1	9.7		**59**	0	1	1	7.5		**59**	0	0	0	3.5	
60	0	1	1	6.6	0.5	**60**	0	1	1	8.5	0.25	**60**	0	0	0	7.2	0.25
61	0	1	1	5.8		**61**	0	1	1	9.2		**61**	0	0	0	10.3	
62	0	1	1	13.0		**62**	0	1	1	5.1		**62**	0	0	0	5.2	
63	0	1	1	5.0		**63**	0	1	1	3.1		**63**	0	0	0	9.8	
64	0	1	1	10.2		**64**	0	1	1	6.4		**64**	0	0	0	7.7	
65	0	1	1	14.1		**65**	0	1	1	4.2		**65**	0	0	0	9.0	
66	0	1	1	7.5		**66**	1	1	1	7.5		**66**	0	0	0	8.1	
67	0	1	1	17.2		**67**	0	1	1	4.5		**67**	0	0	0	8.1	
68	0	1	1	9.5		**68**	0	1	1	5.5		**68**	0	0	0	11.3	
69	0	1	1	8.2		**69**	0	1	1	3.4		**69**	0	0	0	9.4	
70	0	1	1	10.4	0.75	**70**	0	1	1	2.9	0.5	**70**	0	0	0	9.8	0.25
71	0	1	1	10.6		**71**	0	1	1	8.4		**71**	0	0	0	10.2	
72	0	1	2	20.4		**72**	0	1	1	4.6		**72**	0	0	0	6.3	
73	0	1	1	7.9		**73**	0	1	1	6.8		**73**	0	0	0	7.0	
74	0	1	1	9.9		**74**	0	1	1	1.9		**74**	0	0	0	7.7	
75	0	1	1	9.2		**75**	0	1	1	3.0		**75**	0	0	0	8.5	
76	0	1	1	8.3		**76**	0	1	1	3.4		**76**	0	0	0	5.7	
77	0	1	1	21.6		**77**	0	1	1	2.1		**77**	0	0	0	8.2	
78	0	1	1	13.0		**78**	0	1	1	5.3		**78**	0	0	0	6.1	
79	0	1	1	6.4		**79**	0	1	1	3.6		**79**	0	0	0	6.4	
80	0	1	1	15.0	0.5	**80**	0	1	1	3.8	0.5	**80**	0	0	0	12.5	0.5
81	0	1	1	7.8		**81**	0	1	1	5.2		**81**	0	0	0	8.2	
82	0	1	1	15.4		**82**	0	1	1	4.1		**82**	0	0	0	5.6	
83	0	1	1	6.2		**83**	0	1	1	3.3		**83**	0	0	0	5.7	
84	0	1	1	8.7		**84**	0	1	1	2.5		**84**	0	0	0	6.2	
85	0	1	1	12.0		**85**	0	1	1	6.4		**85**	0	0	0	5.2	
86	0	1	1	13.0		**86**	1	1	1	3.5		**86**	0	0	0	5.6	
87	0	0	0	7.1		**87**	0	1	2	4.2		**87**	0	0	0	7.0	
88	0	1	1	27.0		**88**	1	1	1	4.4		**88**	0	0	0	12.4	
89	0	1	1	6.2		**89**	0	1	1	2.8		**89**	0	0	0	3.5	
90	0	1	1	21.4	0.5	**90**	0	1	1	5.8	0.5	**90**	0	0	0	8.1	0
91	0	1	1	8.1		**91**	0	0	0	1.5		**91**	0	0	0	8.0	
92	0	1	1	7.1		**92**	0	1	1	2.0		**92**	0	0	0	5.0	
93	0	1	1	6.1		**93**	0	1	1	4.9		**93**	0	0	0	4.3	
94	0	0	0	6.5		**94**	0	1	1	2.1		**94**	0	0	0	8.2	
95	0	1	1	6.9		**95**	0	1	1	3.1		**95**	0	0	0	9.7	
96	0	1	1	8.9		**96**	0	1	1	4.5		**96**	0	0	0	9.6	
97	0	1	1	10.6		**97**	1	1	1	2.5		**97**	0	0	0	5.0	
98	0	1	1	6.8		**98**	0	1	1	6.1		**98**	0	0	0	5.9	
99	0	0	0	6.9		**99**	0	1	3	6.2		**99**	0	0	0	6.6	
100	0	1	1	7.2	0.25	**100**	0	1	1	5.1	0.5	**100**	0	0	0	10.2	0
101						**101**						**101**					
102						**102**						**102**					
103						**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.0**	**0.90**	**0.91**	**10.4**	**0.4**	**Mean**	**0.28**	**0.92**	**1.0**	**4.6**	**0.5**	**Mean**	**0.0**	**0.0**	**0.0**	**6.9**	**0.3**
CALCITE INDEX:		**0.90**				**CALCITE INDEX:**		**1.2**				**CALCITE INDEX:**		**0.0**			

Table D.3: Pebble count and calcite measurements in westslope cutthroat trout spawing and juvenile rearing areas, September 2015.

EC-JR2						FO10-SP1						FO22					
Count	Concreted Status	Calcite Presence	Calcite Thickness	Intermediate Axis	Embed	Count	Concreted Status	Calcite Presence	Calcite Thickness	Intermediate Axis	Embed	Count	Concreted Status	Calcite Presence	Calcite Thickness	Intermediate Axis	Embed
1	0	0	0	6.5		**1**	0	1	1	3.1		**1**	0	0	0	2.9	
2	0	0	0	8.0		**2**	0	0	0	1.8		**2**	0	1	1	2.1	
3	0	0	0	3.0		**3**	0	1	1	5.5		**3**	0	1	1	2.2	
4	0	0	0	6.5		**4**	0	1	1	3.2		**4**	0	1	2	4.8	
5	0	0	0	1.5		**5**	0	1	1	3.4		**5**	0	0	0	2.6	
6	0	0	0	10.0		**6**	0	0	0	2.7		**6**	0	0	0	2.5	
7	0	0	0	7.5		**7**	0	1	1	2.3		**7**	0	0	0	2.2	
8	0	0	0	2.0		**8**	0	1	1	2.4		**8**	0	0	0	2.8	
9	0	0	0	1.5		**9**	0	1	1	2.3		**9**	0	1	1	3.1	
10	0	0	0	3.0	0	**10**	0	0	0	2.5	0.5	**10**	0	0	0	2.7	0
11	0	0	0	6.5		**11**	0	1	1	4.4		**11**	0	1	1	2	
12	0	0	0	2.5		**12**	0	1	1	3.5		**12**	0	0	0	2.3	
13	0	0	0	5.0		**13**	0	1	1	2.7		**13**	0	1	1	2.9	
14	0	0	0	4.5		**14**	0	1	1	3.1		**14**	0	1	1	3.1	
15	0	0	0	5.5		**15**	0	0	0	1.9		**15**	0	1	1	2.5	
16	0	0	0	8.0		**16**	0	0	0	1.8		**16**	0	1	1	2.6	
17	0	0	0	6.0		**17**	0	1	1	3.6		**17**	0	0	0	3.5	
18	0	0	0	10.5		**18**	0	1	1	3.8		**18**	0	1	2	3.2	
19	0	0	0	10.0		**19**	0	1	1	2.6		**19**	0	0	0	3.5	
20	0	0	0	10.0		**20**	0	1	1	3.5	0.5	**20**	0	1	1	2.2	0
21	0	0	0	5.5		**21**	0	1	1	4.6		**21**	0	0	0	3.3	
22	0	0	0	4.5		**22**	0	1	1	2.5		**22**	0	1	1	2.2	
23	0	0	0	6.0		**23**	0	1	1	3.1		**23**	0	0	0	1.7	
24	0	0	0	9.5		**24**	0	1	1	3.4		**24**	0	1	1	2.1	
25	0	0	0	11.0		**25**	0	1	1	4.0		**25**	0	1	1	3.4	
26	0	0	0	6.5		**26**	0	1	1	3.5		**26**	0	1	1	2.9	
27	0	0	0	9.5		**27**	0	1	1	3.1		**27**	0	1	1	1.8	
28	0	0	0	4.5		**28**	0	1	1	1.8		**28**	0	1	1	2.2	
29	0	0	0	5.0		**29**	0	1	1	2.5		**29**	0	0	0	2.6	
30	0	0	0	9.5	0.25	**30**	0	1	1	4.5	0.75	**30**	0	1	1	3.1	0
31	0	0	0	8.5		**31**	0	1	1	4.0		**31**	0	1	1	3.7	
32	0	0	0	15.0		**32**	0	1	1	3.4		**32**	0	1	1	3.6	
33	0	0	0	11.0		**33**	0	1	1	4.7		**33**	0	1	1	3.5	
34	0	0	0	7.0		**34**	0	1	1	2.3		**34**	0	1	1	2.8	
35	0	0	0	7.5		**35**	0	1	1	2.4		**35**	0	1	1	2.3	
36	0	0	0	7.0		**36**	0	1	1	2.4		**36**	0	1	2	3	
37	0	0	0	6.0		**37**	0	1	1	2.5		**37**	0	1	1	2.8	
38	0	0	0	4.0		**38**	0	1	1	2.4		**38**	0	1	1	1.6	
39	0	0	0	7.0		**39**	0	1	1	2.5		**39**	0	1	2	3.2	
40	0	0	0	11.0	0.75	**40**	0	1	1	2.4	0.75	**40**	0	1	2	4.4	0.25
41	0	0	0	8.0		**41**	0	1	1	2.4		**41**	0	1	1	2	
42	0	0	0	10.0		**42**	0	1	1	2.1		**42**	0	1	1	1.6	
43	0	0	0	8.5		**43**	0	1	1	3.3		**43**	0	0	0	1.7	
44	0	0	0	7.5		**44**	0	1	1	2.2		**44**	0	1	1	2	
45	0	0	0	9.5		**45**	0	1	1	5.3		**45**	0	1	1	4.1	
46	0	0	0	9.0		**46**	0	1	1	4.9		**46**	0	1	1	2.6	
47	0	0	0	6.5		**47**	0	1	1	4.6		**47**	0	1	1	2.1	
48	0	0	0	5.5		**48**	0	0	0	3.9		**48**	0	1	1	3.6	
49	0	0	0	3.0		**49**	0	1	1	3.1		**49**	0	1	1	3.6	
50	0	0	0	7.0	0.25	**50**	0	0	0	2.2	0.25	**50**	0	1	1	2.8	0.25
51	0	0	0	12.0		**51**	0	0	0	2.3		**51**	0	1	1	3.6	
52	0	0	0	9.5		**52**	0	1	1	4.5		**52**	0	1	1	6.1	
53	0	0	0	10.0		**53**	0	0	0	3.2		**53**	0	1	2	3.4	
54	0	0	0	7.5		**54**	0	1	1	6.6		**54**	0	1	1	4.1	
55	0	0	0	5.5		**55**	0	1	1	3.5		**55**	0	1	1	2	
56	0	0	0	4.5		**56**	0	1	1	3.1		**56**	0	1	1	3.9	
57	0	0	0	6.0		**57**	0	1	1	4.5		**57**	0	1	1	6.9	
58	0	0	0	12.0		**58**	0	0	0	2.2		**58**	0	1	1	2.3	
59	0	0	0	9.0		**59**	0	1	1	5.4		**59**	0	1	1	4.1	
60	0	0	0	10.5	0.5	**60**	0	1	1	5.3	0.25	**60**	0	1	1	3.2	0.25
61	0	0	0	2.0		**61**	0	1	1	3.6		**61**	0	1	1	7.7	
62	0	0	0	7.5		**62**	0	0	0	4.4		**62**	0	1	2	3.5	
63	0	0	0	3.5		**63**	0	1	1	6.0		**63**	0	0	0	3.4	
64	0	0	0	9.5		**64**	0	1	1	3.5		**64**	0	1	1	5	
65	0	0	0	4.5		**65**	0	1	1	4.4		**65**	0	1	1	4	
66	0	0	0	9.5		**66**	0	0	0	5.3		**66**	0	1	2	4.5	
67	0	0	0	7.0		**67**	0	0	0	6.1		**67**	0	1	1	3.1	
68	0	0	0	10.5		**68**	0	0	0	3.0		**68**	0	0	0	1.5	
69	0	0	0	8.0		**69**	0	1	1	4.1		**69**	0	1	1	3.1	
70	0	0	0	7.5	0	**70**	0	0	0	2.5	0.5	**70**	0	1	1	4.8	0
71	0	0	0	4.0		**71**	0	0	0	4.9		**71**	0	1	1	3.3	
72	0	0	0	6.0		**72**	0	1	1	3.1		**72**	0	1	1	3.5	
73	0	0	0	2.5		**73**	0	1	1	4.5		**73**	0	1	2	2.9	
74	0	0	0	10.5		**74**	0	1	1	3.8		**74**	0	1	1	2.5	
75	0	0	0	6.0		**75**	0	1	1	5.6		**75**	0	0	0	1.9	
76	0	0	0	13.0		**76**	0	1	1	2.6		**76**	0	1	1	2.4	
77	0	0	0	6.5		**77**	0	1	1	4.4		**77**	0	1	1	2.5	
78	0	0	0	9.5		**78**	0	1	1	4.1		**78**	0	1	1	2.5	
79	0	0	0	3.0		**79**	0	1	1	3.9		**79**	0	1	1	2.9	
80	0	0	0	3.5	0	**80**	0	1	1	4.0	0.5	**80**	0	1	1	2.6	0
81	0	0	0	5.0		**81**	0	1	1	4.0		**81**	0	1	1	2.2	
82	0	0	0	8.0		**82**	0	1	1	2.5		**82**	0	1	1	5.1	
83	0	0	0	6.5		**83**	0	1	1	3.1		**83**	0	1	1	1.6	
84	0	0	0	10.5		**84**	0	0	0	1.9		**84**	0	1	1	8.2	
85	0	0	0	8.5		**85**	0	1	1	4.2		**85**	0	1	1	3.5	
86	0	0	0	4.5		**86**	0	1	1	5.1		**86**	0	1	1	2.3	
87	0	0	0	3.5		**87**	0	1	1	3.5		**87**	0	1	1	2.6	
88	0	0	0	10.0		**88**	0	1	1	4.5		**88**	0	1	1	2	
89	0	0	0	10.0		**89**	0	1	1	4.5		**89**	0	1	1	3.6	
90	0	0	0	5.0	0.25	**90**	0	1	1	3.6	0.5	**90**	0	1	1	3.3	0
91	0	0	0	8.0		**91**	0	1	1	5.9		**91**	0	1	1	2.1	
92	0	0	0	7.5		**92**	0	1	1	2.3		**92**	0	1	1	2.8	
93	0	0	0	6.5		**93**	0	1	1	3.1		**93**	0	1	1	3.8	
94	0	0	0	4.0		**94**	0	0	0	3.2		**94**	0	1	1	2.7	
95	0	0	0	5.0		**95**	0	1	1	1.6		**95**	0	1	1	3.3	
96	0	0	0	9.0		**96**	0	1	1	3.7		**96**	0	1	1	4.1	
97	0	0	0	3.5		**97**	0	1	1	2.3		**97**	0	1	1	2	
98	0	0	0	7.0		**98**	0	1	1	5.1		**98**	0	1	1	2.8	
99	0	0	0	5.0		**99**	0	1	1	3.2		**99**	0	1	1	4.7	
100	0	0	0	4.0	0.25	**100**	0	1	1	3.5	0.5	**100**	0	0	0	4.4	0.25
101						**101**						**101**					
102						**102**						**102**					
103						**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.0**	**0.0**	**0.0**	**7.0**	**0.3**	**Mean**	**0.0**	**0.82**	**0.82**	**3.5**	**0.5**	**Mean**	**0.0**	**0.83**	**0.92**	**3.1**	**0.1**
CALCITE INDEX:		**0.0**				**CALCITE INDEX:**		**0.82**				**CALCITE INDEX:**		**0.83**			

Table D.3: Pebble count and calcite measurements in westslope cutthroat trout spawing and juvenile rearing areas, September 2015.

FPC_SP1						FR-JR1						FR-JR2					
Count	Concreted Status	Calcite Presence	Calcite Thickness	Intermediate Axis	Embed	Count	Concreted Status	Calcite Presence	Calcite Thickness	Intermediate Axis	Embed	Count	Concreted Status	Calcite Presence	Calcite Thickness	Intermediate Axis	Embed
1	0	0	0	2.6		1	0	0	0	4.8		1	0	0	0	4.2	
2	0	0	0	4.7		2	0	0	0	5.7		2	0	0	0	5.1	
3	0	0	0	4.8		3	0	0	0	5.5		3	0	0	0	9.9	
4	0	0	0	2.5		4	0	0	0	8.8		4	0	0	0	4.4	
5	0	0	0	3.1		5	0	0	0	3.3		5	0	0	0	5.6	
6	0	0	0	3.5		6	0	0	0	10.9		6	0	0	0	11.1	
7	0	0	0	1.5		7	0	0	0	4.9		7	0	0	0	3.9	
8	0	0	0	5.9		8	0	0	0	5.8		8	0	0	0	2.8	
9	0	1	1	6.5		9	0	0	0	7.5		9	0	0	0	9.7	
10	0	1	1	5.9	0.25	10	0	0	0	5.9	0.25	10	0	0	0	7.9	0.25
11	0	0	0	5.1		11	0	0	0	10.9		11	0	0	0	4.4	
12	0	0	0	4.8		12	0	0	0	8.8		12	0	0	0	7.8	
13	0	0	0	3.2		13	0	0	0	1.8		13	0	0	0	3.9	
14	0	0	0	1.5		14	0	0	0	7.7		14	0	0	0	5.8	
15	0	0	0	3.4		15	0	0	0	11.0		15	0	0	0	6.4	
16	0	0	0	5.1		16	0	0	0	10.5		16	0	0	0	7.1	
17	0	0	0	6.2		17	0	0	0	8.9		17	0	0	0	2.9	
18	0	0	0	3.1		18	0	0	0	5.2		18	0	0	0	11.8	
19	0	1	1	11.9		19	0	0	0	5.1		19	0	0	0	7.3	
20	0	1	1	10.2	0.5	20	0	0	0	5.7	0.25	20	0	0	0	6.9	0.25
21	0	0	0	4.4		21	0	0	0	7.6		21	0	0	0	4.6	
22	0	0	0	4.1		22	0	0	0	20.1		22	0	0	0	4.5	
23	0	1	1	8.1		23	0	0	0	5.1		23	0	0	0	10.3	
24	0	0	0	2.4		24	0	0	0	4.8		24	0	0	0	4.6	
25	0	0	0	5.1		25	0	0	0	14.2		25	0	0	0	8.0	
26	0	0	0	2.9		26	0	0	0	3.6		26	0	0	0	4.0	
27	0	1	1	17.1		27	0	0	0	7.7		27	0	0	0	8.1	
28	0	1	1	11.5		28	0	0	0	4.7		28	0	0	0	2.8	
29	0	1	1	7.1		29	0	0	0	4.5		29	0	0	0	17.3	
30	0	1	1	11.5	0.5	30	0	0	0	4.0	0.25	30	0	0	0	4.4	0.75
31	0	1	1	5.5		31	0	0	0	9.5		31	0	0	0	12.2	
32	0	1	1	5.1		32	0	0	0	4.5		32	0	0	0	7.8	
33	0	1	1	15.1		33	0	0	0	9.3		33	0	0	0	5.7	
34	0	1	1	8.1		34	0	0	0	5.6		34	0	0	0	4.4	
35	0	1	1	19.1		35	0	0	0	5.8		35	0	0	0	12.2	
36	0	1	1	13.3		36	0	0	0	5.2		36	0	0	0	3.7	
37	0	1	1	7.4		37	0	0	0	5.3		37	0	0	0	2.7	
38	0	1	1	4.3		38	0	0	0	4.5		38	0	0	0	5.3	
39	0	1	1	8.2		39	0	0	0	9.9		39	0	0	0	11.7	
40	0	1	1	10.5	0.25	40	0	0	0	3.5	0.5	40	0	0	0	3.5	0.5
41	0	1	1	5.4		41	0	0	0	4.5		41	0	0	0	9.2	
42	0	1	1	3.1		42	0	0	0	11.1		42	0	0	0	3.4	
43	0	1	1	8.5		43	0	0	0	7.7		43	0	0	0	5.1	
44	0	1	1	8		44	0	0	0	5.6		44	0	0	0	5.1	
45	0	1	1	5.9		45	0	0	0	6.8		45	0	0	0	4.8	
46	0	1	1	10.5		46	0	0	0	8.2		46	0	0	0	3.0	
47	0	1	1	2.5		47	0	0	0	7.2		47	0	0	0	3.7	
48	0	1	1	11.4		48	0	0	0	4.5		48	0	0	0	6.4	
49	0	1	1	1.8		49	0	0	0	sand		49	0	0	0	4.6	
50	0	1	1	4.5	0.25	50	0	0	0	4.0	0.25	50	0	0	0	5.5	0.5
51	0	1	1	4.9		51	0	0	0	4.5		51	0	0	0	6.4	
52	0	1	1	1.9		52	0	0	0	9.9		52	0	0	0	5.5	
53	0	1	1	8.1		53	0	0	0	9.1		53	0	0	0	5.2	
54	0	1	1	5		54	0	0	0	10.5		54	0	0	0	4.5	
55	0	1	1	8.5		55	0	0	0	7.4		55	0	0	0	3.9	
56	0	1	1	6.5		56	0	0	0	8.8		56	0	0	0	8.8	
57	0	1	1	11.5		57	0	0	0	8.8		57	0	0	0	4.9	
58	0	1	1	4.8		58	0	0	0	9.0		58	0	0	0	7.5	
59	0	1	1	8.9		59	0	0	0	13.1		59	0	0	0	9.2	
60	0	0	0	5.4	0.25	60	0	0	0	5.5	0.25	60	0	0	0	10.7	0.75
61	0	1	1	10.6		61	0	0	0	8.3		61	0	0	0	4.5	
62	0	1	1	11.4		62	0	0	0	5.5		62	0	0	0	7.1	
63	0	1	1	1.8		63	0	0	0	4.9		63	0	0	0	4.2	
64	0	1	1	7		64	0	0	0	10.2		64	0	0	0	4.5	
65	0	1	1	7.8		65	0	0	0	3.5		65	0	0	0	4.2	
66	0	1	1	3.1		66	0	0	0	7.0		66	0	0	0	5.5	
67	0	1	1	1.7		67	0	0	0	8.6		67	0	0	0	4.5	
68	0	1	1	6.4		68	0	0	0	11.5		68	0	0	0	4.5	
69	0	1	1	4.3		69	0	0	0	3.9		69	0	0	0	6.4	
70	0	1	1	9.6	0.5	70	0	0	0	2.1	0.25	70	0	0	0	8.0	0.5
71	0	1	1	4.1		71	0	0	0	7.5		71	0	0	0	6.4	
72	0	1	1	1.8		72	0	0	0	3.8		72	0	0	0	4.8	
73	0	1	1	2.1		73	0	0	0	6.7		73	0	0	0	5.5	
74	0	1	1	1.9		74	0	0	0	11.0		74	0	0	0	3.5	
75	0	1	1	2.3		75	0	0	0	12.5		75	0	0	0	5.2	
76	0	1	1	1.2		76	0	0	0	3.9		76	0	0	0	3.9	
77	0	1	1	2.1		77	0	0	0	4.5		77	0	1	1	6.5	
78	0	1	1	5.3		78	0	0	0	5.5		78	0	1	1	5.4	
79	0	1	1	5.5		79	0	0	0	10.8		79	0	1	1	5.4	
80	0	1	1	5.6	0.25	80	0	0	0	6.1	0.5	80	0	1	1	7.9	0.75
81	0	1	1	5.1		81	0	0	0	12.0		81	0	1	1	11.8	
82	0	1	1	7.6		82	0	0	0	12.0		82	0	1	1	4.8	
83	0	1	1	1.8		83	0	0	0	12.2		83	0	1	1	7.7	
84	0	1	1	6.5		84	0	0	0	12.2		84	0	1	1	3.8	
85	0	1	1	5.4		85	0	0	0	4.9		85	0	1	1	5.7	
86	0	1	1	5.6		86	0	0	0	2.9		86	0	1	1	5.7	
87	0	1	1	3		87	0	0	0	8.3		87	0	1	1	8.2	
88	0	1	1	6.5		88	0	0	0	12.4		88	0	1	1	10.0	
89	0	1	1	5.5		89	0	0	0	4.6		89	0	1	1	3.2	
90	0	1	1	3.9	0.25	90	0	0	0	5.5	0.5	90	0	1	1	4.8	0.5
91	0	1	1	6.2		91	0	0	0	5.9		91	0	1	1	8.1	
92	0	1	1	4.5		92	0	0	0	8.3		92	0	1	1	6.5	
93	0	1	1	4		93	0	0	0	5.2		93	0	1	1	4.3	
94	0	1	1	4.1		94	0	0	0	8.1		94	0	1	1	4.7	
95	0	1	1	7.5		95	0	0	0	11.0		95	0	1	1	7.9	
96	0	1	1	6.5		96	0	0	0	7.5		96	0	1	1	6.6	
97	0	1	1	5.1		97	0	0	0	17.8		97	0	1	1	4.9	
98	0	1	1	6.1		98	0	0	0	6.4		98	0	1	1	6.5	
99	0	1	1	6.9		99	0	0	0	11.7		99	0	1	1	7.0	
100	0	1	1	4.4	0.25	100	0	0	0	10.2	0.25	100	0	1	1	4.2	0.75
101						101	0	0	0	4.8		101					
102						102						102					
103						103						103					
104						104						104					
105						105						105					
106						106						106					
107						107						107					
108						108						108					
109						109						109					
110						110						110					
Mean	0.0	0.78	0.78	6.0	0.3	Mean	0.0	0.0	0.0	7.5	0.3	Mean	0.0	0.24	0.24	6.2	0.6
CALCITE INDEX:		0.78				CALCITE INDEX:		0.0				CALCITE INDEX:		0.24			

Table D.3: Pebble count and calcite measurements in westslope cutthroat trout spawing and juvenile rearing areas, September 2015.

FR-JR6						FR-JR8						FR-JR8M					
Count	Concreted Status	Calcite Presence	Calcite Thickness	Intermediate Axis	Embed	Count	Concreted Status	Calcite Presence	Calcite Thickness	Intermediate Axis	Embed	Count	Concreted Status	Calcite Presence	Calcite Thickness	Intermediate Axis	Embed
1	0	1	1	9.6		**1**	0	0	0	8.1		**1**	0	1	1	12.1	
2	0	1	1	7.1		**2**	0	0	0	10.2		**2**	0	0	0	5.5	
3	0	1	1	6.6		**3**	0	0	0	8.4		**3**	0	0	0	6.5	
4	0	1	1	5.5		**4**	0	0	0	5.3		**4**	0	0	0	7.8	
5	0	1	1	7.2		**5**	0	0	0	8.5		**5**	0	1	1	13.6	
6	0	1	1	7.7		**6**	0	0	0	6.2		**6**	0	0	0	8.2	
7	0	1	1	4.0		**7**	0	0	0	7.4		**7**	0	0	0	9.1	
8	0	1	1	6.2		**8**	0	0	0	5.5		**8**	0	0	0	7.4	
9	0	1	1	9.8		**9**	0	0	0	12.1		**9**	0	0	0	8.9	
10	0	1	1	3.8	0.5	**10**	0	0	0	6.4	0.25	**10**	0	1	1	8.9	0.25
11	0	1	1	2.4		**11**	0	0	0	10.5		**11**	0	0	0	5.9	
12	0	1	1	5.5		**12**	0	0	0	4.5		**12**	0	1	1	7.9	
13	0	1	2	5.7		**13**	0	0	0	9.9		**13**	0	0	0	7.5	
14	0	1	1	3.9		**14**	0	0	0	48.0		**14**	0	0	0	4.9	
15	0	1	1	7.3		**15**	0	0	0	3.4		**15**	0	0	0	5.5	
16	0	1	2	4.5		**16**	0	0	0	5.8		**16**	0	0	0	8.2	
17	0	0	0	3.6		**17**	0	0	0	4.7		**17**	0	0	0	3.6	
18	0	1	1	6.5		**18**	0	0	0	5.0		**18**	0	0	0	7.3	
19	0	1	1	5.9		**19**	0	0	0	11.4		**19**	0	0	0	9.8	
20	0	1	1	4.6	0.25	**20**	0	0	0	5.0	0.5	**20**	0	1	1	10.5	0.25
21	0	1	1	4.1		**21**	0	0	0	5.0		**21**	0	1	1	6.5	
22	0	1	1	4.1		**22**	0	0	0	8.2		**22**	0	0	0	5.1	
23	0	1	1	5.4		**23**	0	0	0	10.1		**23**	0	0	0	4.1	
24	0	1	1	2.7		**24**	0	0	0	7.5		**24**	0	0	0	8.3	
25	0	1	1	5.3		**25**	0	0	0	9.0		**25**	0	0	0	9.3	
26	0	1	1	10.1		**26**	0	0	0	6.8		**26**	0	0	0	3.4	
27	0	1	2	6.3		**27**	0	0	0	sand		**27**	0	0	0	11.2	
28	0	1	2	11.5		**28**	0	0	0	5.9		**28**	0	0	0	2.1	
29	0	1	2	9.5		**29**	0	0	0	8.6		**29**	0	1	1	5.6	
30	0	1	1	13.2	0.5	**30**	0	0	0	11.0	0.25	**30**	0	0	0	5.4	0.25
31	0	1	1	5.4		**31**	0	0	0	4.8		**31**	0	0	0	4.5	
32	0	0	0	1.6		**32**	0	0	0	9.4		**32**	0	1	1	10.9	
33	0	1	2	13.0		**33**	0	0	0	7.5		**33**	0	0	0	7.2	
34	0	1	2	4.5		**34**	0	0	0	6.4		**34**	0	0	0	4.6	
35	0	1	1	6.8		**35**	0	0	0	4.8		**35**	0	0	0	6.5	
36	0	1	1	3.4		**36**	0	0	0	2.8		**36**	0	0	0	11.5	
37	0	1	1	4.5		**37**	0	0	0	5.5		**37**	0	0	0	3.7	
38	0	1	1	8.7		**38**	0	0	0	8.7		**38**	0	0	0	9.2	
39	0	1	1	8.2		**39**	0	0	0	11.5		**39**	0	0	0	9.6	
40	0	1	1	8.2	0.5	**40**	0	0	0	5.2	0.5	**40**	0	0	0	17.9	0.25
41	0	1	1	9.3		**41**	0	0	0	9.3		**41**	0	0	0	11.9	
42	0	1	1	9.0		**42**	0	0	0	5.3		**42**	0	0	0	15.0	
43	0	1	1	12.4		**43**	0	0	0	4.4		**43**	0	0	0	5.5	
44	0	1	1	6.2		**44**	0	0	0	10.4		**44**	0	1	1	8.5	
45	0	1	1	4.2		**45**	0	0	0	9.4		**45**	0	0	0	11.3	
46	0	1	1	5.8		**46**	0	0	0	11.0		**46**	0	0	0	4.2	
47	0	1	1	6.8		**47**	0	0	0	6.3		**47**	0	0	0	5.3	
48	0	1	1	8.5		**48**	0	0	0	7.4		**48**	0	0	0	7.0	
49	0	1	1	3.2		**49**	0	0	0	6.0		**49**	0	0	0	7.0	
50	0	1	1	5.3	0.5	**50**	0	0	0	3.0	0.25	**50**	0	0	0	3.6	0.75
51	0	1	1	4.1		**51**	0	0	0	5.2		**51**	0	0	0	7.2	
52	0	1	1	6.9		**52**	0	0	0	10.7		**52**	0	0	0	4.1	
53	0	1	1	4.8		**53**	0	0	0	12.5		**53**	0	0	0	5.2	
54	0	1	1	12.5		**54**	0	0	0	12.4		**54**	0	0	0	7.3	
55	0	1	1	3.1		**55**	0	0	0	9.0		**55**	0	0	0	5.2	
56	0	1	1	4.8		**56**	0	0	0	7.7		**56**	0	0	0	3.1	
57	0	1	1	7.8		**57**	0	0	0	6.9		**57**	0	0	0	8.5	
58	0	1	1	13.9		**58**	0	0	0	4.5		**58**	0	0	0	5.3	
59	0	1	1	4.6		**59**	0	0	0	6.4		**59**	0	0	0	3.6	
60	0	1	1	6.3	0.25	**60**	0	0	0	2.6	0.5	**60**	0	0	0	6.0	0.5
61	0	1	1	3.9		**61**	0	0	0	4.8		**61**	0	0	0	2.0	
62	0	1	1	10.2		**62**	0	0	0	7.5		**62**	0	0	0	1.8	
63	0	1	1	6.4		**63**	0	0	0	10.0		**63**	0	0	0	5.8	
64	0	1	1	9.5		**64**	0	0	0	7.3		**64**	0	0	0	8.1	
65	0	1	1	6.4		**65**	0	0	0	9.4		**65**	0	0	0	7.2	
66	0	1	1	10.3		**66**	0	0	0	14.2		**66**	0	0	0	3.6	
67	0	1	1	5.4		**67**	0	0	0	8.0		**67**	0	0	0	4.9	
68	0	1	1	10.3		**68**	0	0	0	4.7		**68**	0	0	0	5.5	
69	0	1	1	9.8		**69**	0	0	0	9.1		**69**	0	0	0	6.1	
70	0	1	1	13.5	0.25	**70**	0	0	0	12.0	0.5	**70**	0	0	0	6.5	0.75
71	0	1	1	10.9		**71**	0	0	0	7.8		**71**	0	0	0	5.5	
72	0	1	1	7.9		**72**	0	0	0	4.2		**72**	0	0	0	5.5	
73	0	1	1	11.8		**73**	0	0	0	8.3		**73**	0	0	0	4.0	
74	0	1	1	9.2		**74**	0	0	0	11.4		**74**	0	0	0	4.5	
75	0	1	1	5.9		**75**	0	0	0	8.1		**75**	0	0	0	5.1	
76	0	1	1	7.5		**76**	0	0	0	3.5		**76**	0	0	0	4.4	
77	0	1	1	8.1		**77**	0	0	0	11.2		**77**	0	0	0	4.3	
78	0	1	1	12.9		**78**	0	0	0	6.9		**78**	0	0	0	5.1	
79	0	1	1	8.0		**79**	0	0	0	9.9		**79**	0	0	0	5.6	
80	0	1	2	9.9	0.25	**80**	0	0	0	7.2	0.5	**80**	0	0	0	8.2	0.25
81	0	1	1	9.4		**81**	0	0	0	5.8		**81**	0	0	0	6.5	
82	0	1	1	5.3		**82**	0	0	0	3.0		**82**	0	0	0	4.8	
83	0	1	1	12.9		**83**	0	0	0	6.8		**83**	0	0	0	5.7	
84	0	1	1	9.9		**84**	0	0	0	14.1		**84**	0	0	0	4.5	
85	0	1	1	12.5		**85**	0	0	0	11.1		**85**	0	0	0	3.3	
86	0	1	1	7.5		**86**	0	0	0	10.7		**86**	0	0	0	5.3	
87	0	1	1	9.9		**87**	0	0	0	14.5		**87**	0	0	0	7.9	
88	0	1	1	4.1		**88**	0	0	0	16.6		**88**	0	0	0	4.3	
89	0	0	0	8.9		**89**	0	0	0	10.1		**89**	0	0	0	3.1	
90	0	0	0	6.5	0.5	**90**	0	0	0	8.2	0.25	**90**	0	0	0	5.5	0.25
91	0	1	1	5.5		**91**	0	0	0	25.0		**91**	0	0	0	1.9	
92	0	1	1	10.5		**92**	0	0	0	14.1		**92**	0	0	0	6.8	
93	0	1	1	8.4		**93**	0	0	0	10.6		**93**	0	0	0	6.6	
94	0	1	1	9.3		**94**	0	0	0	4.0		**94**	0	0	0	6.6	
95	0	1	1	14.1		**95**	0	0	0	8.9		**95**	0	0	0	6.1	
96	0	1	1	4.8		**96**	0	0	0	13.5		**96**	0	0	0	5.9	
97	0	1	1	4.2		**97**	0	0	0	9.5		**97**	0	0	0	4.9	
98	0	1	1	6.4		**98**	0	0	0	11.6		**98**	0	0	0	6.5	
99	0	1	1	4.5		**99**	0	0	0	5.4		**99**	0	0	0	4.2	
100	0	1	1	6.5	0.5	**100**	0	0	0	13.0	0.75	**100**	0	0	0	7.1	0.25
101						**101**	0	0	0	6.5		**101**					
102						**102**						**102**					
103						**103**						**103**					
104						**104**						**104**					
105						**105**						**105**					
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.0**	**0.96**	**1.0**	**7.3**	**0.4**	**Mean**	**0.0**	**0.0**	**0.0**	**8.6**	**0.4**	**Mean**	**0.0**	**0.09**	**0.09**	**6.5**	**0.4**
CALCITE INDEX:		**0.96**				**CALCITE INDEX:**		**0.0**				**CALCITE INDEX:**		**0.09**			

Table D.3: Pebble count and calcite measurements in westslope cutthroat trout spawing and juvenile rearing areas, September 2015.

FR-JR8S						FR-JR10						FR-SP1					
Count	Concreted Status	Calcite Presence	Calcite Thickness	Intermediate Axis	Embed	Count	Concreted Status	Calcite Presence	Calcite Thickness	Intermediate Axis	Embed	Count	Concreted Status	Calcite Presence	Calcite Thickness	Intermediate Axis	Embed
1	0	0	0	2.9		1	0	1	1	4.6		1	0	0	0	3.5	
2	0	0	0	4.5		2	0	1	1	8.9		2	0	1	1	9.6	
3	0	0	0	3.8		3	0	1	1	7.2		3	0	0	0	4.1	
4	0	0	0	1.8		4	0	1	1	3.2		4	0	1	1	4.5	
5	0	0	0	6.5		5	0	1	1	11.5		5	0	1	1	5.2	
6	0	0	0	5.5		6	0	1	1	7.0		6	0	1	1	6.3	
7	0	0	0	3.1		7	0	1	1	4.5		7	0	1	1	6.8	
8	0	0	0	2.3		8	0	1	1	9.4		8	0	0	0	4.6	
9	0	0	0	3.6		9	0	1	1	4.4		9	0	1	1	3.1	
10	0	0	0	6.9	0.25	10	0	1	1	8.1	0.75	10	0	1	1	6.8	0.5
11	0	0	0	5.0		11	0	1	1	4.6		11	0	1	2	4.9	
12	0	0	0	4.3		12	0	1	1	7.9		12	0	1	1	5.9	
13	0	0	0	4.1		13	0	1	1	6.9		13	0	1	1	4.6	
14	0	0	0	7.3		14	0	1	1	8.1		14	0	1	1	4.1	
15	0	0	0	3.2		15	0	1	1	9.5		15	0	1	1	5.1	
16	0	0	0	1.7		16	0	1	1	28.5		16	0	1	1	6.2	
17	0	0	0	4.3		17	0	1	1	5.4		17	0	1	1	4.9	
18	0	0	0	2.3		18	0	1	1	9.1		18	0	1	1	5.4	
19	0	0	0	1.2		19	0	1	1	18.5		19	0	1	1	3.9	
20	0	0	0	2.3	0.5	20	0	1	1	8.9	0.5	20	0	1	2	5.9	0.25
21	0	0	0	2.6		21	0	1	1	4.6		21	0	1	1	7.5	
22	0	0	0	3.6		22	0	1	1	10.7		22	0	1	2	6.2	
23	0	0	0	3.5		23	0	1	1	5.0		23	0	1	1	4.1	
24	0	0	0	2.9		24	0	1	1	2.3		24	0	0	0	3.6	
25	0	0	0	4.3		25	0	1	1	6.2		25	0	1	1	6.7	
26	0	0	0	4.8		26	0	1	1	2.5		26	0	1	1	4.4	
27	0	0	0	2.5		27	0	1	1	8.4		27	0	1	1	4.9	
28	0	0	0	1.8		28	0	1	1	6.7		28	0	1	1	5.0	
29	0	0	0	6.1		29	0	1	1	4.1		29	0	1	2	6.6	
30	0	0	0	2.7	0.5	30	0	1	1	6.1	0.25	30	0	1	1	3.2	0.5
31	0	0	0	5.5		31	0	1	1	9.9		31	0	1	1	2.9	
32	0	0	0	7.6		32	0	1	1	20.3		32	0	1	1	2.7	
33	0	0	0	6.0		33	0	1	1	s		33	0	1	1	2.5	
34	0	0	0	7.5		34	0	1	1	2.9		34	0	1	1	4.8	
35	0	0	0	2.0		35	0	1	1	22.5		35	0	1	1	4.3	
36	0	0	0	2.5		36	0	1	1	6.1		36	0	1	1	4.8	
37	0	0	0	3.3		37	0	1	1	8.9		37	0	1	1	3.3	
38	0	0	0	4.0		38	0	1	1	4.1		38	0	1	1	3.9	
39	0	0	0	2.9		39	0	1	1	8.9		39	0	1	1	3.5	
40	0	0	0	2.6	0.5	40	0	1	1	10.5	0.5	40	0	1	1	4.6	0.25
41	0	0	0	1.3		41	0	1	1	5.4		41	0	1	1	5.1	
42	0	0	0	2.9		42	0	1	1	8.6		42	0	1	1	4.3	
43	0	0	0	gravel		43	0	1	1	5.5		43	0	1	1	4.8	
44	0	0	0	1.5		44	0	1	1	5.1		44	0	1	1	6.1	
45	0	0	0	2.9		45	0	1	1	9.5		45	0	1	1	4.1	
46	0	0	0	1.7		46	0	1	1	15.1		46	0	1	1	51.0	
47	0	0	0	4.2		47	0	1	1	9.3		47	0	1	1	6.5	
48	0	0	0	3.5		48	0	1	1	8.6		48	0	1	1	2.8	
49	0	0	0	2.5		49	0	1	1	14.0		49	0	1	1	4.2	
50	0	0	0	3.0	0.5	50	0	1	1	10.2	0.25	50	0	1	1	3.6	0.25
51	0	0	0	3.5		51	0	1	1	3.0		51	0	1	1	2.8	
52	0	0	0	2.2		52	0	1	1	15.4		52	0	1	1	3.6	
53	0	0	0	3.2		53	0	1	1	5.5		53	0	1	1	3.1	
54	0	0	0	4.1		54	0	1	1	10.1		54	0	1	1	3.2	
55	0	0	0	4.5		55	0	1	1	4.4		55	0	1	1	4.2	
56	0	0	0	3.6		56	0	1	1	9.1		56	0	1	1	4.1	
57	0	0	0	2.5		57	0	1	1	3.0		57	0	1	1	1.9	
58	0	0	0	3.4		58	0	1	1	10.5		58	0	1	1	10.0	
59	0	0	0	2.1		59	0	1	1	7.4		59	0	1	1	3.5	
60	0	0	0	2.9	0.5	60	0	1	1	11.4	0.25	60	0	1	1	4.4	0.25
61	0	0	0	3.9		61	0	1	1	15.1		61	0	1	1	3.2	
62	0	0	0	3.5		62	0	1	1	6.3		62	0	1	1	4.4	
63	0	0	0	9.1		63	0	1	1	7.7		63	0	1	1	3.8	
64	0	0	0	1.6		64	0	1	1	7.8		64	0	1	1	4.6	
65	0	0	0	2.5		65	0	1	1	25.3		65	0	1	1	5.9	
66	0	0	0	5.4		66	0	1	1	21.9		66	0	1	1	3.1	
67	0	0	0	10.1		67	0	1	1	17.2		67	0	1	1	5.8	
68	0	0	0	5.0		68	0	1	1	4.4		68	0	1	1	6.5	
69	0	0	0	3.1		69	0	1	1	29.5		69	0	1	1	3.4	
70	0	0	0	4.5	0.25	70	0	1	1	7.4	0.25	70	0	1	1	1.9	0.5
71	0	0	0	3.8		71	0	1	1	12.5		71	0	1	1	4.1	
72	0	0	0	7.5		72	0	1	1	5.5		72	0	0	0	1.8	
73	0	0	0	4.1		73	0	1	1	7.9		73	0	0	0	2.4	
74	0	0	0	sand		74	0	1	1	4.5		74	0	0	0	1.8	
75	0	0	0	7.5		75	0	1	1	8.1		75	0	0	0	2.4	
76	0	0	0	3.2		76	0	1	1	4.2		76	0	0	0	1.6	
77	0	0	0	4.1		77	0	1	1	10.6		77	0	1	1	3.1	
78	0	0	0	1.9		78	0	1	1	7.3		78	0	1	1	4.5	
79	0	0	0	2.5		79	0	1	1	23.8		79	0	0	0	1.5	
80	0	0	0	8.5	0.75	80	0	1	1	16.1	0.75	80	0	1	1	8.3	0.25
81	0	0	0	4.4		81	0	1	1	8.5		81	0	0	0	2.8	
82	0	0	0	6.5		82	0	1	1	5.4		82	0	1	1	7.9	
83	0	0	0	4.9		83	0	1	1	7.1		83	0	1	1	3.5	
84	0	0	0	4.5		84	0	1	1	6.2		84	0	0	0	6.5	
85	0	0	0	6.1		85	0	1	1	9.5		85	0	1	1	7.5	
86	0	0	0	5.4		86	0	1	1	3.1		86	0	1	1	2.5	
87	0	0	0	1.8		87	0	1	1	s		87	0	1	1	2.4	
88	0	0	0	5.6		88	0	1	1	16.7		88	0	1	1	4.4	
89	0	0	0	17.4		89	0	1	1	6.8		89	0	1	1	4.8	
90	0	0	0	7.0	0.5	90	0	1	1	24.5	0.75	90	0	1	1	7.6	0.5
91	0	0	0	3.5		91	0	1	1	18.3		91	0	1	1	4.3	
92	0	0	0	4.2		92	0	1	1	6.5		92	0	1	1	4.7	
93	0	0	0	5.6		93	0	1	1	5.4		93	0	1	1	4.5	
94	0	0	0	7.3		94	0	1	1	9.6		94	0	1	1	3.2	
95	0	0	0	4.0		95	0	1	1	10.1		95	0	1	2	6.3	
96	0	0	0	2.0		96	0	1	1	5.3		96	0	1	2	5.3	
97	0	0	0	6.5		97	0	1	1	14.9		97	0	1	1	7.1	
98	0	0	0	5.4		98	0	1	1	6.8		98	0	1	2	7.4	
99	0	0	0	6.1		99	0	1	1	10.8		99	0	1	1	4.5	
100	0	0	0	2.5	0.75	100	0	1	1	4.4	0.75	100	0	1	1	3.1	0.25
101	0	0	0	4.7		101	0	1	1	16.0		101					
102	0	0	0	5.3		102						102					
103						103						103					
104						104						104					
105						105						105					
106						106						106					
107						107						107					
108						108						108					
109						109						109					
110						110						110					
Mean	0.0	0.0	0.0	4.2	0.5	Mean	0.0	1.0	1.0	9.5	0.5	Mean	0.0	0.88	0.95	5.0	0.4
CALCITE INDEX:		0.0				CALCITE INDEX:		1.0				CALCITE INDEX:		0.88			

Table D.3: Pebble count and calcite measurements in westslope cutthroat trout spawing and juvenile rearing areas, September 2015.

FR-SP2						GHC-SP1						GHC-SP2					
Count	Concreted Status	Calcite Presence	Calcite Thickness	Intermediate Axis	Embed	Count	Concreted Status	Calcite Presence	Calcite Thickness	Intermediate Axis	Embed	Count	Concreted Status	Calcite Presence	Calcite Thickness	Intermediate Axis	Embed
1	0	0	0	3.5		1	0	0	0	5.1		1	0	1	1	8.5	
2	0	0	0	3.6		2	0	0	0	4.5		2	0	1	1	9.6	
3	0	0	0	4.2		3	0	1	2	4.1		3	0	1	1	2.3	
4	0	1	1	4.1		4	0	1	1	4.4		4	0	1	1	5.6	
5	0	1	1	5.8		5	0	1	2	5.9		5	0	1	1	10.4	
6	0	1	1	4.3		6	0	1	2	7.2		6	0	1	2	9.5	
7	0	1	1	3.6		7	0	1	2	11.5		7	0	1	1	3.5	
8	0	1	1	4.3		8	0	1	2	8.6		8	0	1	1	2.1	
9	0	1	1	5.2		9	0	1	2	5.4		9	0	1	1	3.1	
10	0	1	1	4.9	0.25	10	0	1	2	10.0	0.25	10	0	1	1	1.8	0.75
11	0	0	0	1.8		11	0	1	2	5.3		11	0	1	1	1.2	
12	0	1	1	4.9		12	0	1	1	2.6		12	0	1	1	2.2	
13	0	0	0	4.4		13	0	1	2	3.8		13	0	1	2	6.0	
14	0	0	0	3.2		14	0	1	2	6.2		14	0	1	1	2.5	
15	0	0	0	3.5		15	0	1	2	6.2		15	0	1	3	13.2	
16	0	1	1	5.6		16	0	1	2	7.1		16	0	1	2	4.9	
17	0	1	1	4.1		17	0	1	1	3.4		17	0	1	2	3.9	
18	0	1	1	3.7		18	0	1	2	7.4		18	0	1	1	3.8	
19	0	0	0	3.8		19	0	1	2	5.4		19	0	1	2	8.0	
20	0	1	1	4.9	0.25	20	0	1	1	8.4	0.25	20	0	1	2	8.3	0.75
21	0	1	1	2.8		21	0	1	1	4.5		21	0	1	3	9.1	
22	0	1	1	2.3		22	0	1	1	4.8		22	0	1	2	3.5	
23	0	1	1	3.7		23	0	1	1	7.9		23	0	1	3	3.5	
24	0	1	1	4.5		24	0	1	2	4.6		24	0	1	1	1.6	
25	0	0	0	3.6		25	0	1	1	5.8		25	0	1	2	6.9	
26	0	1	1	4.9		26	0	1	2	5.8		26	0	1	1	1.5	
27	0	0	0	4.8		27	0	1	2	5.7		27	0	1	2	8.9	
28	0	1	1	5.0		28	0	1	2	4.3		28	0	1	1	2.0	
29	0	1	1	4.8		29	0	1	2	6.0		29	0	1	2	7.5	
30	0	0	0	2.4	0.25	30	0	1	1	8.2	0.5	30	0	1	2	7.6	0.25
31	0	1	1	7.0		31	0	1	1	4.1		31	0	1	2	7.8	
32	0	0	0	3.8		32	0	1	1	7.1		32	0	1	2	8.0	
33	0	1	1	7.1		33	0	1	1	3.5		33	0	1	1	9.0	
34	0	1	1	2.7		34	0	1	2	7.1		34	0	1	1	2.1	
35	0	1	1	5.3		35	0	1	2	5.5		35	0	1	1	8.6	
36	0	1	1	5.1		36	0	1	1	7.1		36	0	1	1	3.1	
37	0	1	1	3.1		37	0	1	1	7.8		37	0	1	1	10.0	
38	0	1	1	5.0		38	0	1	2	4.2		38	0	1	1	6.5	
39	0	1	1	3.5		39	0	1	2	7.4		39	0	1	1	8.3	
40	0	1	1	2.7	0.5	40	0	1	2	5.9	0.25	40	0	1	3	9.1	0.75
41	0	1	1	4.2		41	0	1	2	6.5		41	0	1	1	5.5	
42	0	1	1	3.4		42	0	1	2	10.4		42	0	1	2	6.6	
43	0	1	1	3.7		43	0	1	2	2.7		43	0	1	1	3.6	
44	0	1	1	4.7		44	0	1	2	7.3		44	0	1	1	1.9	
45	0	1	1	5.1		45	0	1	2	6.0		45	0	1	1	2.3	
46	0	1	1	4.0		46	0	1	2	6.2		46	0	1	2	12.5	
47	0	1	1	2.9		47	0	1	2	10.5		47	0	1	1	3.5	
48	0	1	1	5.6		48	0	1	2	3.5		48	0	1	1	3.9	
49	0	1	1	4.8		49	0	1	2	4.5		49	0	1	1	4.1	
50	0	1	1	5.0	0.25	50	0	1	2	6.0	0.25	50	0	1	1	3.1	0.25
51	0	1	1	3.4		51	0	1	2	4.8		51	0	1	3	9.9	
52	0	1	1	6.8		52	0	1	1	3.2		52	0	1	2	6.1	
53	0	1	2	5.9		53	0	1	2	3.1		53	0	1	1	2.1	
54	0	1	1	4.1		54	0	1	2	6.0		54	0	1	1	2.5	
55	0	1	2	4.8		55	0	1	2	6.1		55	0	1	1	1.7	
56	0	1	1	2.9		56	0	1	1	3.2		56	0	1	1	4.2	
57	0	1	2	4.6		57	0	1	2	6.1		57	0	1	2	7.3	
58	0	1	1	4.1		58	0	1	1	3.8		58	0	1	2	2.2	
59	0	1	2	5.8		59	0	1	1	2.2		59	0	1	2	4.2	
60	0	1	1	2.3	0.5	60	0	1	1	4.5	0.5	60	0	1	2	4.1	0.25
61	0	1	1	3.3		61	0	1	2	4.0		61	0	1	2	4.5	
62	0	1	2	6.1		62	0	1	1	3.4		62	0	1	1	8.6	
63	0	1	1	3.1		63	0	1	1	4.0		63	0	1	1	8.4	
64	0	1	1	5.8		64	0	1	1	4.9		64	0	1	2	6.5	
65	0	1	1	4.6		65	0	1	1	2.8		65	0	1	1	2.7	
66	0	1	1	3.8		66	0	1	1	3.8		66	0	1	2	4.8	
67	0	1	2	5.2		67	0	1	2	5.2		67	0	1	1	2.2	
68	0	1	2	5.8		68	0	1	2	3.5		68	0	1	1	3.3	
69	0	1	1	7.5		69	0	1	2	5.7		69	0	1	1	10.6	
70	0	1	2	4.3	0.25	70	0	1	2	3.5	0.25	70	0	1	1	8.6	0.75
71	0	1	1	3.3		71	0	1	2	6.5		71	0	1	1	8.1	
72	0	1	1	6.5		72	0	1	2	8.6		72	0	1	1	2.6	
73	0	1	1	1.9		73	0	1	2	10.9		73	0	1	1	8.2	
74	0	1	1	3.4		74	0	1	2	6.6		74	0	1	2	13.3	
75	0	1	1	5.3		75	0	1	2	7.1		75	0	1	1	10.0	
76	0	1	2	6.9		76	0	1	2	4.1		76	0	1	1	11.1	
77	0	1	1	3.7		77	0	1	2	6.5		77	0	1	2	8.1	
78	0	1	1	6.1		78	0	1	2	9.6		78	0	1	1	2.2	
79	0	1	2	3.4		79	0	1	1	9.1		79	0	1	1	1.5	
80	0	1	1	3.0	0.5	80	0	1	2	8.4	0	80	0	1	1	2.8	0.5
81	0	1	1	5.0		81	0	1	1	3.4		81	0	1	1	1.7	
82	0	1	2	7.8		82	0	1	1	9.8		82	0	1	1	7.2	
83	0	1	1	5.3		83	0	1	1	7.4		83	0	1	1	2.1	
84	0	1	1	4.1		84	0	1	1	9.9		84	0	1	1	4.1	
85	0	1	1	4.3		85	0	1	2	4.0		85	0	1	1	2.1	
86	0	1	1	4.1		86	0	1	1	11.4		86	0	1	1	1.5	
87	0	1	2	6.8		87	0	1	2	7.7		87	0	1	1	9.1	
88	0	1	2	3.7		88	0	1	1	5.3		88	0	1	1	7.1	
89	0	1	1	3.5		89	0	1	1	3.5		89	0	1	2	8.9	
90	0	1	1	4.9	0.25	90	0	1	2	2.5	0.25	90	0	1	1	6.7	0.25
91	0	1	1	4.5		91	0	1	2	7.0		91	0	1	3	10.2	
92	0	1	1	4.2		92	0	1	2	4.5		92	0	1	1	5.6	
93	0	1	1	2.9		93	0	1	2	7.4		93	0	1	1	3.6	
94	0	1	1	3.8		94	0	1	2	5.9		94	0	1	2	3.8	
95	0	1	1	6.0		95	0	1	2	8.5		95	0	1	1	3.3	
96	0	1	1	3.4		96	0	1	2	4.7		96	0	1	1	3.9	
97	0	1	1	2.3		97	0	1	2	11.0		97	0	1	2	4.8	
98	0	1	1	4.3		98	0	1	2	4.6		98	0	1	2	2.2	
99	0	1	1	4.2		99	0	1	2	7.1		99	0	1	2	2.3	
100	0	1	1	5.7	0.25	100	0	1	1	2.6	0.25	100	0	1	2	1.2	0.75
101						101						101					
102						102						102					
103						103						103					
104						104						104					
105						105						105					
106						106						106					
107						107						107					
108						108						108					
109						109						109					
110						110						110					
Mean	0.0	0.88	1.0	4.4	0.3	Mean	0.0	0.98	1.6	5.9	0.3	Mean	0.0	1.0	1.4	5.5	0.5
CALCITE INDEX:		0.88				CALCITE INDEX:		0.98				CALCITE INDEX:		1.0			

Table D.3: Pebble count and calcite measurements in westslope cutthroat trout spawing and juvenile rearing areas, September 2015.

GHCKD/GHC-SP5						GREE1-25/GH3-SP3						GREE1-50/GHC-SP4					
Count	Concreted Status	Calcite Presence	Calcite Thickness	Intermediate Axis	Embed	Count	Concreted Status	Calcite Presence	Calcite Thickness	Intermediate Axis	Embed	Count	Concreted Status	Calcite Presence	Calcite Thickness	Intermediate Axis	Embed
1	0	1	2	10.5		**1**	0	1	1	5.2		**1**	0	1	1	5.7	
2	1	1	2	9.3		**2**	0	1	1	2.2		**2**	0	1	1	2.3	
3	1	1	3	12.0		**3**	0	1	1	3.6		**3**	1	1	1	5.5	
4	0	1	2	5.6		**4**	0	1	1	10.5		**4**	0	1	1	7.3	
5	0	1	2	5.2		**5**	0	1	1	4.6		**5**	0	1	1	5.9	
6	0	1	2	6.1		**6**	0	1	1	9.5		**6**	0	1	1	9.8	
7	0	1	1	9.0		**7**	0	1	1	6.2		**7**	0	1	1	5.5	
8	1	1	3	10.8		**8**	0	1	1	2.4		**8**	0	1	1	7.6	
9	0	1	2	8.2		**9**	0	1	1	3.9		**9**	0	0	0	2.8	
10	1	1	3	11.5	0.25	**10**	0	1	1	2.0	1	**10**	0	1	1	7.5	0.25
11	0	1	2	8.1		**11**	0	0	0	3.7		**11**	1	1	1	3.8	
12	2	1	2	14.2		**12**	0	0	0	8.5		**12**	0	1	1	7.0	
13	0	1	1	10.2		**13**	0	0	0	5.1		**13**	0	1	1	5.4	
14	2	1	3	22.3		**14**	0	0	0	3.8		**14**	0	1	1	6.4	
15	0	1	2	6.9		**15**	0	1	1	11.1		**15**	0	1	1	4.3	
16	1	1	3	18.3		**16**	0	0	0	4.2		**16**	0	1	1	4.4	
17	0	1	1	4.1		**17**	0	1	1	9.8		**17**	0	1	1	9.5	
18	0	1	2	5.5		**18**	0	1	1	3.9		**18**	0	1	1	4.2	
19	0	1	1	5.4		**19**	0	0	0	2.6		**19**	0	1	1	11.8	
20	0	1	2	5.0	0.5	**20**	0	1	1	8.1	1	**20**	0	1	1	14.1	0.25
21	0	1	2	14.3		**21**	0	1	1	6.1		**21**	1	1	1	12.3	
22	0	1	1	7.5		**22**	0	1	1	3.0		**22**	0	1	1	14.9	
23	0	1	1	7.1		**23**	0	1	1	9.9		**23**	0	1	1	7.2	
24	0	0	0	7.5		**24**	0	0	0	1.5		**24**	0	1	1	12.8	
25	0	1	1	9.6		**25**	0	0	0	2.8		**25**	0	1	1	5.9	
26	0	0	0	11.5		**26**	0	0	0	6.4		**26**	0	0	0	6.0	
27	0	1	1	4.5		**27**	0	1	1	6.7		**27**	0	1	1	6.2	
28	0	1	2	12.2		**28**	0	1	1	9.9		**28**	0	1	1	10.1	
29	0	1	2	4.3		**29**	0	0	0	5.9		**29**	0	1	1	7.3	
30	0	1	1	9.0	0.25	**30**	0	1	1	9.5	1	**30**	0	0	0	6.8	0.25
31	1	1	2	15.3		**31**	0	0	0	2.4		**31**	0	1	1	7.9	
32	2	1	2	11.1		**32**	0	1	1	8.9		**32**	0	1	2	7.5	
33	0	1	2	4.8		**33**	0	1	1	12.0		**33**	0	1	1	6.3	
34	0	1	2	13.7		**34**	0	0	0	4.8		**34**	0	1	2	4.1	
35	0	1	2	8.1		**35**	0	0	0	5.2		**35**	0	1	1	8.0	
36	0	1	1	6.3		**36**	0	0	0	2.4		**36**	0	1	1	8.9	
37	0	1	2	10.6		**37**	0	0	0	2.5		**37**	0	1	1	5.2	
38	0	1	2	11.7		**38**	0	0	0	4.8		**38**	0	1	1	5.0	
39	0	1	1	11.8		**39**	0	0	0	2.6		**39**	0	1	1	6.9	
40	0	1	2	20.5	0.25	**40**	0	1	1	4.9	1	**40**	0	1	1	5.3	0.25
41	0	1	2	8.1		**41**	0	0	0	8.8		**41**	0	1	1	8.9	
42	0	1	3	10.1		**42**	0	0	0	2.2		**42**	0	1	1	5.5	
43	2	1	3	6.5		**43**	0	0	0	1.7		**43**	0	1	1	4.6	
44	0	1	1	5.1		**44**	0	0	0	8.1		**44**	0	1	1	9.1	
45	0	1	1	11.5		**45**	0	1	1	3.5		**45**	0	1	1	8.8	
46	0	1	2	5.6		**46**	0	0	0	6.2		**46**	0	1	1	7.5	
47	2	1	2	12.8		**47**	0	1	1	8.5		**47**	0	1	1	6.5	
48	0	1	1	8.0		**48**	0	0	0	5.2		**48**	0	1	1	3.3	
49	0	1	1	7.2		**49**	0	0	0	4.6		**49**	0	0		g	
50	0	1	1	7.5	0.25	**50**	0	0	0	1.4	1	**50**	0	1	1	6.7	0.25
51	0	1	3	15.0		**51**	0	0	0	4.5		**51**	0	1	1	7.2	
52	0	1	2	7.0		**52**	0	0	0	10.8		**52**	0	1	1	2.9	
53	0	1	1	4.1		**53**	0	0	0	4.2		**53**	0	1	2	5.8	
54	0	1	1	2.1		**54**	0	0	0	2.5		**54**	0	1	1	7.3	
55	1	1	2	12.1		**55**	0	0	0	5.4		**55**	0	1	1	6.2	
56	0	1	2	5.9		**56**	0	0	0	3.8		**56**	0	1	1	5.7	
57	0	1	3	7.3		**57**	0	0	0	3.2		**57**	0	1	1	2.3	
58	0	1	1	9.8		**58**	0	0	0	6.9		**58**	0	1	1	8.3	
59	0	1	2	10.0		**59**	0	0	0	2.4		**59**	0	1	2	7.5	
60	0	1	2	4.8	0.5	**60**	0	0	0	2.4	1	**60**	0	1	2	7.3	0.25
61	2	1	2	12.3		**61**	0	0	0	5.5		**61**	0	1	2	8.5	
62	0	1	1	3.5		**62**	0	0	0	8.1		**62**	0	1	2	9.2	
63	2	1	2	10.3		**63**	0	0	0	8.1		**63**	0	1	1	9.3	
64	1	1	2	7.1		**64**	0	0	0	3.1		**64**	0	1	1	6.8	
65	1	1	2	4.5		**65**	0	0	0	2.0		**65**	0	1	1	4.8	
66	1	1	1	7.1		**66**	0	0	0	1.8		**66**	0	1	1	2.8	
67	0	1	3	9.6		**67**	0	0	0	5.6		**67**	0	1	1	5.5	
68	2	1	3	7.1		**68**	0	0	0	3.1		**68**	0	1	1	5.3	
69	0	1	1	9.2		**69**	0	0	0	2.2		**69**	0	1	1	7.4	
70	0	1	3	16.2	0.5	**70**	0	0	0	3.9	1	**70**	0	1	1	4.1	0.25
71	1	1	3	4.9		**71**	0	0	0	2.3		**71**	0	0	0	2.3	
72	0	1	2	5.8		**72**	0	0	0	9.9		**72**	0	1	1	3.6	
73	1	1	2	5.3		**73**	0	0	0	3.1		**73**	0	0	0	4.2	
74	0	1	2	12.8		**74**	0	0	0	6.0		**74**	0	1	1	6.5	
75	0	1	1	3.6		**75**	0	0	0	1.6		**75**	0	1	1	6.8	
76	0	1	2	6.2		**76**	0	0	0	9.8		**76**	0	1	1	6.0	
77	0	1	1	4.5		**77**	0	0	0	8.5		**77**	0	0		g	
78	0	1	1	10.7		**78**	0	0	0	2.5		**78**	0	1	1	3.9	
79	0	1	2	5.4		**79**	0	0	0	5.9		**79**	0	1	1	7.8	
80	1	1	3	8.1	0.25	**80**	0	1	1	7.1	1	**80**	0	1	1	3.7	0.5
81	0	1	2	6.4		**81**	0	0	0	3.3		**81**	0	1	1	3.8	
82	2	1	2	10.3		**82**	0	0	0	6.8		**82**	0	1	1	4.2	
83	1	1	2	10.3		**83**	0	0	0	2.4		**83**	0	0		g	
84	1	1	3	9.9		**84**	0	0	0	3.3		**84**	0	1	1	3.5	
85	0	1	1	8.5		**85**	0	1	1	5.8		**85**	0	0	0	2.5	
86	0	1	1	9.5		**86**	0	1	1	9.1		**86**	0	1	1	4.6	
87	0	1	2	6.4		**87**	0	0	0	2.3		**87**	0	1	1	4.6	
88	0	1	3	14.8		**88**	0	0	0	6.2		**88**	0	1	1	4.9	
89	0	0	0	4.9		**89**	0	0	0	3.2		**89**	0	1	1	8.9	
90	1	1	3	6.3	0.5	**90**	0	0	0	8.1	1	**90**	0	1	1	4.3	0.5
91	0	1	4	6.4		**91**	0	0	0	9.1		**91**	0	1	1	4.1	
92	2	1	2	7.5		**92**	0	0	0	2.1		**92**	0	0	0	1.9	
93	2	1	2	6.9		**93**	0	0	0	2.4		**93**	0	0		g	
94	2	1	2	7.1		**94**	0	1	1	7.5		**94**	0	1	1	5.3	
95	0	1	2	7.5		**95**	0	0	0	3.6		**95**	0	1	1	5.6	
96	0	1	1	9.5		**96**	0	0	0	7.3		**96**	0	1	1	9.9	
97	0	1	2	6.4		**97**	0	1	1	10.3		**97**	0	0		g	
98	2	1	3	19.9		**98**	0	0	0	2.8		**98**	0	1	1	3.2	
99	1	1	4	9.8		**99**	0	0	0	3.8		**99**	0	0	0	3.3	
100	1	1	4	12.2	0.5	**100**	0	0	0	2.7	1	**100**	0	0	0	2.1	0.25
101						**101**						**101**	0	1	1	5.0	
102						**102**						**102**	0	1	1	5.5	
103						**103**						**103**	0	1	1	7.7	
104						**104**						**104**	0	0	0	5.5	
105						**105**						**105**	0	0	0	6.3	
106						**106**						**106**					
107						**107**						**107**					
108						**108**						**108**					
109						**109**						**109**					
110						**110**						**110**					
Mean	**0.44**	**0.97**	**1.9**	**8.8**	**0.4**	**Mean**	**0.0**	**0.30**	**0.30**	**5.2**	**1.0**	**Mean**	**0.03**	**0.85**	**0.96**	**6.2**	**0.3**
CALCITE INDEX:		**1.4**				**CALCITE INDEX:**		**0.30**				**CALCITE INDEX:**		**0.88**			

Table D.3: Pebble count and calcite measurements in westslope cutthroat trout spawing and juvenile rearing areas, September 2015.

HEC-JR1						HEC-JR3						LMC-JR1					
Count	Concreted Status	Calcite Presence	Calcite Thickness	Intermediate Axis	Embed	Count	Concreted Status	Calcite Presence	Calcite Thickness	Intermediate Axis	Embed	Count	Concreted Status	Calcite Presence	Calcite Thickness	Intermediate Axis	Embed
1	0	0	0	5.2		1	0	0	0	8.2		1	0	0	0	11.1	
2	0	0	0	9.6		2	0	0	0	3.9		2	0	0	0	7.4	
3	0	1	1	4.2		3	0	0	0	3.0		3	0	0	0	4.1	
4	0	1	1	9.9		4	0	1	1	13.8		4	0	0	0	7.6	
5	0	1	1	5.3		5	0	0	0	9.6		5	0	0	0	7.0	
6	0	1	1	4.6		6	0	1	2	11.1		6	0	0	0	4.6	
7	0	1	1	12.5		7	0	0	0	7.8		7	0	0	0	8.5	
8	0	1	1	7.2		8	0	1	2	13.7		8	0	0	0	4.0	
9	0	1	1	10.4		9	0	1	1	14.0		9	0	0	0	6.0	
10	0	1	1	11.1	0.25	10	0	1	1	17.6	0	10	0	0	0	8.5	0.5
11	0	1	2	7.2		11	0	1	1	7.8		11	0	0	0	4.5	
12	0	1	1	13.5		12	0	1	1	18.4		12	0	0	0	4.5	
13	0	1	1	5.0		13	0	1	1	9.2		13	0	0	0	8.5	
14	0	1	1	15.0		14	0	1	1	10.3		14	0	0	0	4.9	
15	0	1	1	7.5		15	0	1	1	7.6		15	0	0	0	11.0	
16	0	1	1	5.5		16	0	1	1	23.4		16	0	0	0	3.0	
17	0	1	2	7.4		17	0	1	1	20.3		17	0	0	0	7.5	
18	0	1	1	14.7		18	0	1	1	17.8		18	0	0	0	6.8	
19	0	0	0	4.5		19	0	1	2	11.2		19	0	0	0	5.8	
20	0	1	1	11.3	0.75	20	0	1	1	6.2	0.25	20	0	0	0	3.8	0.5
21	0	0	0	5.0		21	0	1	1	9.3		21	0	0	0	6.7	
22	0	1	1	9.3		22	0	1	1	5.7		22	0	0	0	5.3	
23	0	1	1	10.3		23	0	1	1	6.4		23	0	0	0	8.1	
24	0	1	2	12.5		24	0	1	1	10.9		24	0	0	0	12.9	
25	0	1	1	19.2		25	0	0	0	8.3		25	0	0	0	7.7	
26	0	1	1	9.1		26	0	0	0	5.7		26	0	0	0	12.9	
27	0	1	1	11.5		27	0	0	0	8.5		27	0	0	0	4.4	
28	0	1	2	8.0		28	0	0	0	3.9		28	0	0	0	7.1	
29	0	1	3	13.6		29	0	1	1	19.7		29	0	0	0	16.9	
30	0	1	2	14.4	0.25	30	0	1	1	15.0	0	30	0	0	0	7.9	0.25
31	0	1	1	6.2		31	0	1	1	4.9		31	0	0	0	4.5	
32	0	1	1	8.0		32	0	1	1	11.2		32	0	0	0	11.0	
33	0	1	1	20.4		33	0	1	1	10.7		33	0	0	0	7.4	
34	0	1	1	16.5		34	0	1	1	5.1		34	0	0	0	6.3	
35	0	1	1	9.9		35	0	1	1	22.2		35	0	0	0	7.9	
36	0	1	2	10.0		36	0	1	1	6.9		36	0	0	0	7.9	
37	0	1	2	8.9		37	0	1	2	10.3		37	0	0	0	1.8	
38	0	1	2	9.6		38	0	1	1	22.1		38	0	0	0	5.5	
39	0	1	2	14.6		39	0	1	1	6.7		39	0	0	0	4.3	
40	0	1	2	5.8	0.25	40	0	1	1	8.2	0	40	0	0	0	6.1	0.25
41	0	1	2	9.4		41	0	1	1	17.4		41	0	0	0	17.1	
42	0	1	2	9.9		42	0	1	1	4.6		42	0	0	0	9.5	
43	0	1	1	6.9		43	0	1	1	6.0		43	0	0	0	18.1	
44	0	1	2	8.9		44	0	0	0	8.4		44	0	0	0	4.1	
45	0	1	2	19.0		45	0	1	1	7.0		45	0	0	0	11.6	
46	0	1	2	4.7		46	0	1	1	12.2		46	0	0	0	3.2	
47	0	1	1	3.4		47	0	0	0	7.1		47	0	0	0	13.9	
48	0	1	1	12.0		48	0	1	1	12.2		48	0	0	0	8.1	
49	0	1	2	19.7		49	0	1	2	7.3		49	0	0	0	22.0	
50	0	1	2	9.9	0.25	50	0	1	1	8.2	0.25	50	0	0	0	20.0	0.25
51	0	1	1	4.8		51	0	0	0	4.8		51	0	0	0	16.2	
52	0	1	1	5.7		52	0	1	1	11.7		52	0	0	0	8.4	
53	0	1	1	18.0		53	0	1	2	8.5		53	0	0	0	9.5	
54	0	1	1	3.4		54	0	1	1	30.6		54	0	0	0	6.8	
55	0	1	2	9.0		55	0	0	0	9.4		55	0	0	0	8.5	
56	0	1	2	14.0		56	0	1	1	11.4		56	0	0	0	14.2	
57	0	1	2	9.2		57	0	0	0	6.9		57	0	0	0	8.1	
58	0	1	2	4.9		58	0	1	1	9.0		58	0	0	0	6.9	
59	0	1	1	9.5		59	0	1	1	8.7		59	0	0	0	13.3	
60	0	1	1	3.4	0.25	60	0	1	1	6.0	0.5	60	0	0	0	12.4	0.5
61	0	1	2	7.1		61	0	0	0	7.2		61	0	0	0	11.8	
62	0	1	1	5.7		62	0	0	0	7.2		62	0	0	0	9.4	
63	0	1	2	10.4		63	0	0	0	3.9		63	0	0	0	10.7	
64	0	1	2	10.1		64	0	0	0	4.2		64	0	0	0	5.2	
65	0	1	2	4.3		65	0	0	0	7.6		65	0	0	0	8.9	
66	0	1	1	14.1		66	0	0	0	12.2		66	0	0	0	6.4	
67	0	1	1	13.5		67	0	0	0	6.8		67	0	0	0	6.9	
68	0	1	2	8.3		68	0	0	0	15.1		68	0	0	0	5.1	
69	0	1	1	21.5		69	0	0	0	8.4		69	0	0	0	5.7	
70	0	1	2	11.0	0.25	70	0	0	0	9.8	0.5	70	0	0	0	10.3	0.5
71	0	1	1	8.2		71	0	0	0	11.6		71	0	0	0	18.6	
72	0	1	2	14.3		72	0	0	0	8.0		72	0	0	0	4.1	
73	0	1	2	20.4		73	0	1	1	13.9		73	0	0	0	3.1	
74	0	1	2	8.1		74	0	1	1	11.3		74	0	0	0	6.4	
75	0	1	2	6.0		75	0	1	1	12.3		75	0	0	0	10.3	
76	0	1	2	7.6		76	0	1	1	9.2		76	0	0	0	2.2	
77	0	1	1	18.5		77	0	1	1	13.5		77	0	0	0	7.1	
78	0	1	2	8.4		78	0	0	0	5.2		78	0	0	0	3.9	
79	0	1	2	11.5		79	0	0	0	8.0		79	0	0	0	6.5	
80	0	1	2	9.3	0	80	0	0	0	8.5	0.25	80	0	0	0	6.5	0.5
81	0	1	1	7.2		81	0	0	0	8.2		81	0	0	0	24.5	
82	0	1	2	5.9		82	0	0	0	4.5		82	0	0	0	15.1	
83	0	1	1	8.0		83	0	0	0	8.2		83	0	0	0	15.5	
84	0	1	2	8.0		84	0	0	0	7.7		84	0	0	0	21.0	
85	0	1	1	4.0		85	0	1	1	4.8		85	0	0	0	3.4	
86	0	1	2	16.0		86	0	0	0	10.7		86	0	0	0	9.9	
87	0	1	2	11.4		87	0	0	0	2.7		87	0	0	0	3.1	
88	0	1	1	15.0		88	0	0	0	2.6		88	0	0	0	12.1	
89	0	1	1	9.0		89	0	1	1	6.2		89	0	0	0	3.5	
90	0	1	1	17.2	0.5	90	0	1	1	8.7	0.25	90	0	0	0	12.4	0.25
91	0	1	1	14.6		91	0	1	1	11.2		91	0	0	0	18.7	
92	0	1	2	6.3		92	0	1	1	12.0		92	0	0	0	5.9	
93	0	1	2	6.9		93	0	1	1	6.5		93	0	0	0	7.1	
94	0	1	1	15.0		94	0	1	1	3.5		94	0	0	0	6.1	
95	0	1	2	14.2		95	0	0	0	4.4		95	0	0	0	23.5	
96	0	1	1	6.8		96	0	1	1	11.1		96	0	0	0	14.7	
97	0	1	1	6.0		97	0	1	1	9.3		97	0	0	0	5.5	
98	0	1	1	15.3		98	0	1	1	9.7		98	0	0	0	3.6	
99	0	1	2	16.2		99	0	0	0	4.2		99	0	0	0	16.5	
100	0	1	1	13.5	0	100	0	1	2	10.4	0.25	100	0	0	0	5.0	0.5
101						101						101					
102						102						102					
103						103						103					
104						104						104					
105						105						105					
106						106						106					
107						107						107					
108						108						108					
109						109						109					
110						110						110					
Mean	0.0	0.96	1.4	10.1	0.3	Mean	0.0	0.62	0.69	9.6	0.2	Mean	0.0	0.0	0.0	8.9	0.4
CALCITE INDEX:		0.96				CALCITE INDEX:		0.62				CALCITE INDEX:		0.0			

Photo Set D.1: Chauncey Creek at CHC-JR1, September 2015. Most rocks are coated in a thin, soft matrix of periphyton and calcite.

Photo Set D.2: Clode Creek at CLC-SP1, June 2015. Clockwise from the top left: view upstream from the creek facing the access road; a WCT redd; a handful of the substrate, which consists of cobble and silt, bound in a hardened silt/calcite matrix; and, a rock with calcite crust at the top.

Photo Set D.3: Fording River at station FO22/FR-SP3. Clockwise from the top left: view upstream of the river, a rock with a thick calcite crust, and a WCT redd.

Photo Set D.4: Fording River at FR-SP2. Most rocks were free of calcite in June (top photos), but by September most rocks had some degree of calcification (bottom photos).

Photo Set D.5: Greenhills Creek at GHC-SP2 showing calcification.

Photo Set D.6: Greenhills Creek at GREE1-50/GHC-SP4. Some sections were heavily calcified (bottom left photo), while others were not (bottom right photo).