DATA SUMMARY REPORT

HORNET CANYON AND DIAMOND CREEK ORE SLURRY RELEASE

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DATE: August 12, 2024

1 INTRODUCTION

This data summary report (DSR) provides the initial summary of the spring 2024 surface water and sediment data collected, observations to date describing Hornet Canyon flows, potential transport of ore slurry material, and vegetation growth and wildlife use as required by the approved March 28, 2024, Phosphate Ore Slurry Release Monitoring Plan (Simplot 2024). In addition to the spring 2024 surface water and sediment data and observations, this DSR also provides the 2023 surface water, sediment, soil and vegetation data that were collected as part of the preliminary investigation, and the 2023 benthic invertebrate and substrate assessment.

2 BACKGROUND

Simplot owns and operates an 87-mile underground pipeline from the Smoky Canyon Mine to the fertilizer processing plant, referred to as the "Don Plant", in Pocatello, Idaho. In between these two endpoints is the Conda Pump Station. The pipeline carries slurried phosphate ore produced at Smoky Canyon to the Don Plant and traverses National Forest System land in the Caribou/Targhee National Forest. The material is pumped through the pipeline over the ridges to the west of the Smoky Canyon Mine to the Conda Pump Station located north of Soda Springs, Idaho where the pressure is boosted to continue delivery to the Don Plant.

In early May 2023, Simplot detected a small hole in the pipeline from which phosphate ore slurry was released. The release occurred sometime in early May 2023 near the headwaters of Hornet Creek on Dry Ridge in Hornet Canyon (Figure 1). At the time of the release, the area was covered with about 6 feet of snow and the extent of material released was unknown. Snowmelt runoff mobilized the released ore slurry deposit which traveled eastward overland approximately 0.5 miles down Hornet Canyon to Hornet Creek where it was transported downstream approximately 1.7 miles to the confluence with Diamond Creek. Within Hornet Canyon, the ore slurry was deposited within the narrow creek channel, in overbank areas immediately adjacent to the creek and in adjacent tree wells. The narrow higher gradient channels of Hornet Canyon transition to a lower gradient slow moving stream system that is dominated by beaver ponds in Diamond Creek which helped to limit the downstream movement of the ore slurry. The ore slurry

is estimated to have travelled between 0.2 and 0.5 miles downstream within Diamond Creek (Figure 1) as of November 2023. The "Site" referred to in this document encompasses the area from the pipeline where the slurry release occurred downslope to Hornet Canyon and downstream in Hornet Canyon and Diamond Creek to the northwestern extent of the ore slurry material in the Diamond Creek channel. The release event is documented in Simplot's August 2023 Phosphate Ore Slurry Release Report (Simplot 2023a).

As a follow-up to the 2023 Simplot Release Report, Simplot developed a Phosphate Ore Release Monitoring Plan (hereinafter referred to as Monitoring Plan) and submitted that plan to the agencies (US Forest Service [USFS] and Idaho Department of Environmental Quality [IDEQ]) for review in October 2023 (Simplot 2023b). Agency comments on the October 2023 Monitoring Plan were sent to Simplot in a January 25, 2024, letter from the USFS (USFS 2024a). Simplot subsequently revised the plan to address Agency comments and submitted a revised Monitoring Plan in March 2024 (Simplot 2024). The USFS provided a letter approving the revised Monitoring Plan dated April 17, 2024 (USFS 2024b). In June 2024, Simplot provided a Clean Up Work Plan to the USFS to outline their process for excavation and removal of remaining ore slurry deposits in Hornet Canyon, which was subsequently approved in July 2024.

3 SPRING 2024 DATA AND OBSERVATIONS

Beginning in April 2024, Simplot observed conditions in Hornet Canyon for those areas accessible and not covered by snow. These observations included wildlife use, vegetation growth, recreation use, and sediment trap condition and were conducted on the following dates:

- April 16 and 24, 2024
- May 2 and 23, 2024
- June 12, 2024
- July 11, 2024

Formation Environmental, on behalf of Simplot, collected surface water and sediment samples on May 15 and 16, 2024. Sample locations for surface water and sediment samples are listed in Table 1 and shown on Figure 2. Additional sample data for soil and vegetation will be collected in mid-August 2024, with a second round of surface water and sediment data collection planned for mid-October 2024.

3.1 2024 SURFACE WATER OBSERVATIONS AND FLOWS

Attachment A includes the monthly inspection reports and photos. Information provided in this section summarizes observations of flow conditions and water clarity from those reports together with the measured flow data collected in May.

April 16, 2024 – Winter conditions persisted with 100% of Hornet Canyon covered by a minimum of 1 foot of snow. Diamond Creek Road was only navigable via snowmobile. There had been significant snowmelt, but no runoff was observed. Hornet Canyon had no surface water present. Diamond Creek was mostly

covered in snow and ice with some pockets of open water. Where present, open water was clear, and flow was low. (See photos in Attachment A).

April 24, 2024 – Winter conditions persisted with 75% of Hornet Canyon covered by a minimum of 1 foot of snow. Snowless pockets were observed in tree wells and south slopes. Diamond Creek Road was only navigable via snowmobile. There had been significant snowmelt. Hornet Canyon had surface water flow present in some locations. The wood mulch sediment trap had no surface water flow; however, surface water was observed 50 yards upstream. Intermittent surface water flow was observed upstream in Hornet Canyon until snow cover impeded streambed observations. (See photos in Attachment A).

May 2, 2024 – Hornet Canyon had surface water flow present throughout the lower portion inspected. The stream flow was clear with no visual turbidity. (See photos in Attachment A).

May 15 and 16, 2024 – Flow was measured in Hornet Canyon at locations where water was present. From upstream to downstream, flows were measured at HCT3, LHC1, MHC1, MHC, and LHC (Table 2 and Figure 2). Consistent with observations made in late summer 2023, water presence and flows were more predominant in upper Hornet Canyon downstream of the two primary tributaries. The 2024 flow data suggest that lower Hornet Canyon is a losing reach as flows decrease by more than three times those observed in upper Hornet Canyon and 1.7 times those observed in middle Hornet Canyon. (See photos of locations in Attachment B).

May 23, 2024 – Winter conditions persisted with 50% of Hornet Canyon covered in snow. Diamond Creek road had been opened and plowed to support construction activities along the Simplot slurry pipeline. Access to the upper portions of Hornet Canyon would require snowshoes, therefore observation in the upper sections of Hornet Canyon were not conducted. Hornet Canyon had surface water flow present throughout the lower portion inspected. The stream flow was clear with no visual turbidity. No sediment or ore deposition was observed at the straw-mulch bale sediment trap along the lower portion of Hornet Canyon. (See photos in Attachment A).

June 11, 2024 – Hornet Canyon flows appeared turbid, and when an informal visual observation was performed, fines of native sediment and presumed ore settled in the container. A field observation approximately 1,600 feet downstream of the proposed cleanup terminus noted improved stream clarity. (see photos for June in Attachment A).

June 12, 2024 – Water clarity had improved along the lower reach of Hornet Canyon, and flow did not appear to be increasing. Peak flow was estimated to have occurred on or before June 11, 2024. Estimated flow downstream of the lowest sediment trap between MHC and LHC monitoring locations was estimated to be 4.4 cubic feet per second (cfs) (±20 percent), as calculated through a culvert downstream of the sediment trap using Manning's equation. (See photos of peak flow in Attachment A).

July 11, 2024 – Surface flows had subsided following the June peak flows, water clarity was high with minimal turbidity. (See photos in Attachment A).

3.2 2024 SURFACE WATER DATA

Water quality measurements were collected for dissolved oxygen (DO), temperature, specific conductivity, pH, oxidation reduction potential (ORP), and turbidity (Table 3). Measurement data were typical of mid-elevation mountain streams with DO greater than 6 milligrams per liter (mg/L) and pH within the acceptable range (6 to 9 SU). Water temperatures indicate cold water present below 13°C.

Chemicals in surface waters were compared to screening level values when available. Screening level values are protective thresholds for potential effects to aquatic life that can be used to evaluate if surface waters have concentrations of chemicals in excess that may pose a threat to aquatic life. These values differ from method detection limits (MDLs) which are the lowest values achievable for a specific analytical method. Screening level values used for comparison were chronic standards from Idaho's Water Quality Standards (IDAPA 58.01.02) when available, as they represent a lower conservative threshold for potential effects. When standards for the protection of aquatic life from Idaho's standards were not available, alternative values were utilized. A source of regularly updated screening values based on the Great Lakes Water Quality Initiative is the Michigan DEQ Rule 57 Water Quality Guidelines (MDEQ 2023). As noted in Table 4, screening values for parameters such as barium, vanadium, and sulfate provide reliable updated screening values for comparison to screening water parameter concentrations. As noted in Table 4 the barium value is a Tier 2 value as is the vanadium value. Michigan Tier 2 values are those that do not have sufficient data (studies) needed to warrant a Tier 1 status (i.e., equivalent to an ambient water quality criteria), therefore, the value has an added safety factor, lowering the threshold to account for the lack of study input data. This means that Tier 2 values are more conservative than Tier 1 values (e.g., those that could be used for ambient water quality criteria). Together with the Idaho standards, these values have been used in both the Smoky Canyon Mine and Conda/Woodall Mountain Mine ecological risk assessments for the Remedial Investigation/Feasibility Studies under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

Additional sources of screening values include US Environmental Protection Agency (EPA) water quality criteria for aluminum (EPA 2018), EPA's newly proposed surface water values for mercury published in 2024 (EPA 2024), and the Upper Blackfoot River Total Maximum Daily Load (TMDL) (IDEQ 2001) target for total phosphorus to control or minimize excessive nutrification.

Some metal parameters have hardness-based values that are derived based on the concentration of hardness in the water. Of the eleven metal parameters evaluated, six including aluminum, barium, cadmium, lead, silver, and zinc have hardness-based values. To screen the 2023 data, a hardness of 100 mg/L $CaCO_3$ was assumed to derive the hardness-based metal values. In 2024, calcium and magnesium data were collected and analyzed for each sample to derive a median hardness for Hornet Canyon and Diamond Creek which allowed for hardness-based screening levels for each parameter to be derived (Table 4).

Following sampling for surface water in 2023, it was noted that for some parameters, the MDL was too high for some parameters indicating that the concentrations less than their respective MDLs were still greater than their respective screening values (e.g., cadmium). For the 2024 sampling effort, lower MDLs

were requested from the analysis laboratory which proved effective except for mercury, where the method selected still had an MDL higher than the new Draft EPA proposed criteria (EPA 2024).

Eleven metal parameters were analyzed, including: aluminum, arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, vanadium, and zinc. In addition, the following general chemistry parameters were measured, including sulfate, total dissolved solids (TDS), total suspended solids (TSS), total phosphorus, and calcium and magnesium for hardness.

Surface water quality data were collected in 2024 at six Hornet Canyon locations (two tributary background locations and four main stem spill zone locations) (Figure 2 and Table 5). For aluminum, lead, mercury, and silver concentrations measured at all locations were less than their respective MDLs. While mercury was less than its respective MDL at all locations, the MDL was higher than the screening value (0.0000021 mg/L) which is extremely low. Concentrations of arsenic, barium, chromium, selenium, and zinc were all less than their respective screening values. Cadmium exceeded the screening value (0.00078 mg/L) only at the MHC location as did vanadium (0.027 mg/L). Ancillary data for sulfate, TDS and TSS solids are also shown in Table 5 together with total phosphorus. The screening value for total phosphorus was exceeded in mainstem Hornet Canyon spill zone samples, while total phosphorus concentrations from background samples were less than the screening level (0.1 mg/L).

Table 6 shows the surface water quality data collected at 13 Diamond Creek locations (six background locations upstream of Hornet Canyon and seven downstream of Hornet Canyon in the spill zone) (Figure 2 and Table 6). For cadmium, mercury, silver and zinc, concentrations for all samples were less than their respective MDLs. Similar to Hornet Canyon, mercury was less than its respective MDL, but the MDL exceeded the screening level value. Concentrations of arsenic, barium, chromium, lead, selenium, and vanadium were all less than their respective screening values. One sample had an elevated concentration of aluminum (LDCCAM-2) greater than its respective screening value. This particular sample was collected as a secondary sample for the LDCCAM location where the sediments were stirred up to mimic wildlife or cattle disturbing stream sediments. The undisturbed sample from this location had an aluminum concentration above background, but it was less than the screening value. Total phosphorus exceeded the screening value at several Diamond Creek locations, including background locations UDC2 and UDCBC, and downstream spill zone locations LDC1, LDC2 and the LDCCAM-2.

3.3 2024 SEDIMENT DATA

Samples were analyzed for 11 metal parameters including aluminum, arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, vanadium, and zinc together with organic carbon, pH, total phosphorus, and sulfate. There are no formal sediment criteria from which to make comparisons. Initial comparisons for sediment will be made against background location maximum concentrations until more data are collected and a statistically derived background concentration, as required by the Monitoring Plan, can be calculated.

Table 7 shows the sediment data collected from the Hornet Canyon wetted channel in 2024 at six background locations and five locations in the spill zone (Figure 2). Sediment results for aluminum, barium,

and lead at Hornet Canyon locations in the ore slurry spill zone were all less than their respective background maximum concentrations. Concentrations of arsenic, cadmium, chromium, mercury, selenium, silver, vanadium, zinc and total phosphorus all exceeded maximum background concentrations (Table 7).

Table 8 shows the sediment data collected from the Diamond Creek wetted channel in 2024 at six background locations and seven locations downstream of Hornet Canyon in the spill zone. Barium was the only parameter that did not exceed the maximum background concentration. Aluminum only exceeded the background concentration at the LDCYJC location and arsenic only at the LDC2 location. The maximum background concentration was exceeded at the LDC1 and LDC2 locations for cadmium, chromium, mercury, selenium, silver, vanadium, zinc and phosphorus. Chromium and zinc also exceeded background concentrations at the LDCOR location, while lead and mercury exceeded background at the LDCB location. The ore signature, based on concentrations of metals and phosphorus indicates that it is largely confined to LDC1 and LDC2 locations, with some residual that may be present at the LDCOR location, but elevated concentrations there do not reflect the same level of concentrations, nor the same suite of metal parameters associated with the high phosphorus ore slurry. Likewise, elevated concentrations of aluminum, lead, and mercury at the LDCB and LDCYJC locations do not appear to be associated with the ore slurry spill.

3.4 2024 OBSERVATIONS

3.4.1 ORE SLURRY DEPOSITS – MONITORING POSTS

In 2023, five ore slurry deposits inaccessible during the fall 2023 ore cleanup were identified as monitoring points to assess ore slurry erosion and deposition (Figure 3). Photos of these deposits are shown in Attachment C for September 2023 and June 2024. At these locations, a rod was placed in the deposit with tape marking the height of the ore; additionally, a measurement was recorded from the top of the post to the top of the ore deposit. These five monitoring points were revisited post-runoff in July 2024. During the July 2024 visit, measurements were taken once again from the top of the post to the top of the deposit. Figure 3 shows the ore slurry monitoring post locations and summarizes the ore slurry deposit heights from 2023 compared to 2024 together with photos from 2024 of each monitoring post.

The Agency-approved Monitoring Plan describes quantifying volumes of material within the five ore slurry deposits using survey instruments prior to spring runoff and post runoff in 2024 and 2025. In 2024, spring surveys of the ore slurry deposits were not feasible due to simultaneous runoff and snow coverage in Hornet Canyon throughout May. Following runoff, the Agencies approved the June 2024 Clean Up Work Plan to remove ore slurry deposits from Hornet Canyon in summer 2024. As such, these deposits would only be surveyed once before removal resulting in insufficient data to discern any transport distances or ore slurry deposit movement. However, rod monitoring point heights above each ore slurry pile are provided (Figure 3) to illustrate the changes in each pile since 2023.

After comparing the ore slurry monitoring point data from 2023 and 2024, the average percent change in rod height measurements was six percent. Ore slurry deposit movements were not uniform and percent

changes in rod height are not comparable to percent change in overall volume of these deposits. Ore slurry deposits were not impacted by precipitation; this was expected as the ore slurry had been deposited in tree wells that are sheltered by the limbs above. Overall, changes were minimal and likely resulted in ongoing sluffing from spring runoff.

Deposits with sluffing along the stream bank were observed in 2024 at Monitoring Points MP-01, MP-02, MP-03, and MP-04; this sluffing was evident in the 2023 photos as well (Figure 3 and Attachment A). Visually, the ore slurry deposit that had the most change in profile from 2023 to 2024 was MP-02. The 2024 photo shows a reduction in deposit size from 2023. Additionally, transport of this deposit downstream is evident by the three logs immediately downstream becoming more imbedded in ore slurry compared to the 2023 photo. Farther downstream of MP-02, no changes to the stream or sediment deposits were noted. The percent change in rod height at MP-05 was the result of the ore slurry deposit settling around the rod. The overall profile of MP-05 appeared similar to 2023 observations.

3.4.2 WILDLIFE, VEGETATION, AND RECREATION USE OBSERVATIONS

From April through mid-May 2024, new vegetative growth was not observed nor were there signs of wildlife use. Snow cover was still heavy, limiting observations for vegetative growth.

June 11 and 12, 2024 – By mid-June, recent vegetative growth was observed. Vegetation growth was prominent with many annual and perennial forbs budded or flowering. Graminoids (herbaceous plants) were at shin height and trees/shrubs had leafed out. Moose tracks were observed; various migratory birds were present and were observed audibly. Also, during the mid-June inspection, dirt bike tracks were observed along the lower reaches of Hornet Canyon above the boulder deterrents. USFS has posted no camping signs in the area.

July 11, 2024 – Vegetation growth was prominent throughout. There was no observed vegetation with characteristic signs of stress observed along deposits of ore. No vegetation appeared diseased or infested with insects. No noxious weeds were observed. Moose tracks were observed in ore deposits at the uppermost tree sediment trap (Figure 3). Additionally, deer tracks were observed at the lowermost tree sediment trap. No other wildlife or wildlife sign was observed. No sign of recreation or grazing activities were observed in Hornet Canyon.

3.4.3 SEDIMENT TRAPS

The locations of best management practice (BMP) sediment traps installed to capture transported ore slurry are shown in Figure 3 and photos are included in Attachment C. During the 2024 observation period, sediment traps were checked to evaluate their ability to slow water and aid in sediment/ore slurry deposition. Information recorded during those observations is provided below.

May 2, 2024 – Hornet Canyon had surface water flow present throughout the lower portion inspected. The stream flow was clear with no visual turbidity. No sediment or ore slurry deposition was observed at the straw mulch bale sediment trap along the lower portion of Hornet Canyon.

June 11 and 12, 2024 – Deposition of ore slurry was observed along bank edges in recent vegetation growth as well as immediately downstream of logs and rocks. Silt composed of native sediment mixed with ore slurry was observed above sediment traps with depths exceeding 6 inches at the uppermost tree sediment trap.

On June 12, 2024 – Additional straw mulch bales were installed. Nineteen bales were installed above and below the uppermost tree sediment trap to improve water retention and filtration as well as deflect the flow away from the access road. Two additional bales were placed along the wood mulch sediment trap at the bottom of Hornet Canyon.

July 11, 2024 – Ore slurry deposition was observed at the sediment traps placed at the lower reaches of Hornet Canyon. New deposits of ore slurry were evident above these BMPs. The lowest sediment trap constructed entirely of straw mulch bales proved effective in reducing the downstream transport of ore slurry with sediment deposits mostly occurring upstream of the trap. These straw mulch bales have captured sediment within the bales, significantly reducing water flow and pooling water upstream.

The three sediment traps successfully captured ore slurry material flowing downstream. Photos in Attachment C provide a qualitative metric to showcase sediment capture at these traps. In June 2024, straw mulch bales were added to the tree sediment traps to further slow water velocity to increase deposition upstream as well as filter suspended sediment. The results from implementation of these BMPs (sediment traps and straw mulch bales) are evident from the bank deposits of ore slurry upstream, as well as the sediment captured in the wood and straw mulch bales. Based on the results of these BMPs, the transport of additional ore slurry downstream to Diamond Creek was likely minimal.

4 2023 DATA

Figure 4 shows the locations sampled in 2023 for surface water and sediments. Table 9 shows the dates when samples were collected and if the samples were background or spill zone samples. Surface water data were collected in August and September, while sediment data were collected in August, October, and November. Soil samples were collected in August, October, and November while the vegetation samples were collected in September and October (Table 9, Figure 5).

In September 2023, biological samples for benthic invertebrate communities were collected at one upstream background Diamond Creek location and one downstream spill zone location (Figure 6). The report for this effort is included as Attachment D.

4.1 2023 SURFACE WATER AND SEDIMENT DATA

Table 10 includes the surface water results from 2023 for Hornet Canyon and Diamond Creek. In Hornet Canyon, a single background location was sampled while three samples were collected in the spill zone. In Diamond Creek, one background and one spill zone location were sampled initially. Follow up samples for phosphorus only included two background sample locations and one spill zone sample location. Eleven metal parameters were analyzed together with sulfate, total dissolved solids, total suspended solids, total

phosphorus, and calcium and magnesium for hardness. All metal parameters and total phosphorus in Hornet Canyon and Diamond Creek were either less than their respective MDLs or less than the screening values. Cadmium, mercury, and phosphorus MDLs were greater than their respective screening values. In 2023, concentrations of cadmium and mercury were all less than their respective MDL, but the MDLs for each were higher than the screening value. For total phosphorus, follow up samples in Diamond Creek were collected during the benthic invertebrate assessment using lower MDLs which resulted in concentrations less than the screening value for phosphorus.

Sediment data collected from within the wetted channel during 2023 are shown in Table 11. No Hornet Canyon background samples for sediments were collected in the 2023 initial investigation, while two spill zone sample locations were sampled. In the Hornet Canyon spill zone, aluminum and lead were less than the 2024 Hornet Canyon background (Table 7), while arsenic, barium, cadmium, chromium, mercury, selenium, silver, vanadium, zinc, and total phosphorus were all greater than background.

In Diamond Creek during the 2023 sampling period, two background locations and four spill zone locations were sampled for sediments. Ore signature indicators, such as cadmium, chromium, selenium, vanadium and zinc together with total phosphorus indicate that the LDC1 and LDC3 locations were similar to sediments in the Hornet Canyon spill zone. At LDC-OR and LDC4 (in the spill zone), concentrations declined significantly, and while some parameter concentrations were greater than background, they did not resemble those concentrations measured at LDC1 and LDC3.

4.2 2023 SOIL AND VEGETATION DATA

Soil data collected in 2023 from Hornet Canyon are shown in Table 12 at locations shown on Figure 5. Soil data were collected from eight background locations and seven spill zone locations in Hornet Canyon. In the spill zone, aluminum, barium, and lead were all less than the background maximum concentration, while arsenic, cadmium, chromium, mercury, selenium, silver, vanadium, and zinc all exceeded their respective background concentrations.

Soil data collected in 2023 from Diamond Creek are shown in Table 13 at locations shown on Figure 5. In Diamond Creek, a single background location was sampled in 2023, while four spill zone locations were sampled. Lower Diamond Creek soils in the spill zone were greater than the background sample for all metal parameters and total phosphorus. Similar to sediments, the ore signature metals, and total phosphorus were predominant at the LDC/LDC1 and LDC3 locations, while concentrations of the ore signature metals, and total phosphorus were significantly reduced at LDC4 and LDC-B.

Vegetation sample data collected in 2023 in Hornet Canyon are shown in Table 14 for seven background locations and eight locations within the spill zone (Figure 5). Vegetation samples were comprised of predominantly grass with intermixed forbs, estimated at about 80% grass and 20% forbs. The willow samples were 100% willow (i.e., no other shrub vegetation was included). Aluminum, barium, and mercury in vegetation from the Hornet Canyon spill zone did not exceed background and only one zinc sample (O Willow) and one lead sample (O5) exceeded background. Arsenic, cadmium, chromium, selenium, silver, vanadium, and total phosphorus exceeded background concentrations in multiple samples.

Vegetation sample data collected in 2023 in Diamond Creek are shown in Table 15 for a single background sample and two samples from the downstream spill zone (Figure 5). The downstream spill zone samples varied widely with almost all of the parameters measured at LDC-OR being less than background and almost all of the parameters measured at LDC B being greater than background.

4.3 2023 BENTHIC INVERTEBRATE AND SUBSTRATE DATA

Attachment D includes a Technical Memorandum, September 2023 Benthic Community Evaluation – Diamond Creek (Benthic Report) that was provided to IDEQ and USFS describing the results of evaluating the benthic community and substrates on Diamond Creek upstream and downstream of Hornet Canyon (Figure 6). These same locations will be sampled again in 2024 and 2025. A brief synopsis of that report is provided below.

4.3.1 BENTHIC INVERTEBRATES

Characterization of the in-stream conditions was completed through collecting surface water samples for total phosphorus, measuring substrate types and size classes (Wolman Pebble Counts), visually assessing substrate embeddedness, and collecting quantitative benthic macroinvertebrate community samples at three riffles at each Diamond Creek location.

A summary of the benthic community data is presented in the Benthic Report (Attachment D). Overall species composition was within the range of what is seasonally and biogeographically expected for a stream of this size in the area. The lower site (LDC-BC), within the potential zone of the ore slurry release, had significantly higher diversity with total taxa numbers of 22 individual species compared to only 16 at the upstream location (UDC-BC). That represents approximately 27% more species. Overall abundances between the two locations were more similar, but again higher at the lower site with 1,080 individual organisms per square meter (organisms/m^2), compared to the higher site with 900 organisms/m^2. As expected, the two locations were relatively similar in species composition, with approximately 46% of the species found at both locations. Taxa numbers and density can be directly proportional to habitat quality. Diamond Creek within the area is relatively low gradient, with very little stable open riffle habitat.

The Stream Macroinvertebrate Index (SMI) is a multi-metric index that incorporates structure and function metrics. It integrates benthic community characteristics to allow for a condition and scoring evaluation to assess aquatic community conditions based on the health of the benthic community. Scores are compared to reference conditions to arrive at condition rankings. Both the LDC and UDC locations received SMI condition ratings of 1, placing them at less than the 10th percentile of reference condition. The low SMI scores suggest potentially impacted conditions present at both locations.

4.3.2 SUBSTRATE COMPOSITION

Physical substrate data based on Wolman Pebble counts and embeddedness observations are shown in the Benthic Report (Attachment D). Embeddedness observations were 25% and 40% at UDC-BC and LDC-BC transects, respectively. These observations result in embeddedness scores of 15 and 12 at UDC-BC and LDC-BC locations, respectively, indicating a higher percentage of fines surrounding larger substrates

at the LDC-BC location. Based on the pebble count data, the percent fines were determined to be 11% and 18% at UDC-BC and LDC-BC, respectively, indicating a higher percentage of fine substrates at the LDC-BC location compared to the UDC-BC location. Both the qualitative and quantitative substrate measures indicated a higher percentage of fines at the LDC-BC location; however, the quantitative assessment indicates a much smaller difference in percent fines than does the qualitative visual assessment.

5 SUMMARY

In 2024, additional surface water and sediment chemistry data were collected in Hornet Canyon, both upstream of the spill zone and within the spill zone as well as in Diamond Creek upstream of the spill zone and downstream within the spill zone. In surface waters, there were few exceedances of the screening values in 2023 and 2024 for Hornet Canyon or Diamond Creek, except for total phosphorus. Mercury detection limits exceeded the new EPA proposed criteria and future analyses may require even lower detection limits, even though mercury was undetectable across all locations.

Sediment data from 2024 tended to show lower concentrations of parameters compared to 2023 data and elevated concentrations of signature ore slurry parameters are evident in the Hornet Canyon spill zone and Diamond Creek downstream of Hornet Canyon. However, in the Diamond Creek spill zone, it appears that most of the ore slurry spill is confined to the upper reach of Diamond Creek just downstream of Hornet Canyon as downstream sample locations such as LDC4 have parameter concentrations trending toward background and LDCB parameter concentrations in sediments resemble background. Sediment concentrations of parameters from 2023 were typically higher for most parameters compared to 2024. Similarities of the 2023 and 2024 data indicate that the ore slurry present in sediments appears to be confined to Hornet Canyon in the spill zone and lower Diamond Creek immediately downstream of Hornet Canyon.

Measurement data from the monitoring posts indicate some ore slurry movement in Hornet Canyon ranging from 1 to 14%. These measurement data do not reflect the volume of ore slurry material moved, rather they reflect the change in height of the ore slurry deposits from 2023 to 2024 where monitoring posts were deployed. Observations of BMPs indicate they were effective in slowing water flows and allowing sediments to deposit, particularly the straw mulch bale treatment BMP located at the downstream end of Hornet Canyon.

The 2023 data for soil and vegetation are presented herein according to the Monitoring Work Plan indicating elevated metal and phosphorus concentrations in the Hornet Canyon spill zone and in Diamond Creek immediately downstream of Hornet Canyon.

5.1 CURRENT AND UPCOMING WORK IN 2024

The effort to remove ore slurry material in Hornet Canyon will continue into fall. Additional soil and vegetation samples will be collected in August 2024 according to the approved Monitoring Plan. Further comparisons of soil and vegetation sample data will be completed in a second 2024 DSR. The benthic

community and substrate data will be collected in September 2024 in Diamond Creek, and surface water and sediment data will be collected in October. The second 2024 DSR will be provided to the Agencies near the end of the year, after receipt of the data from the laboratory and evaluation of those data to develop a report.

6 REFERENCES

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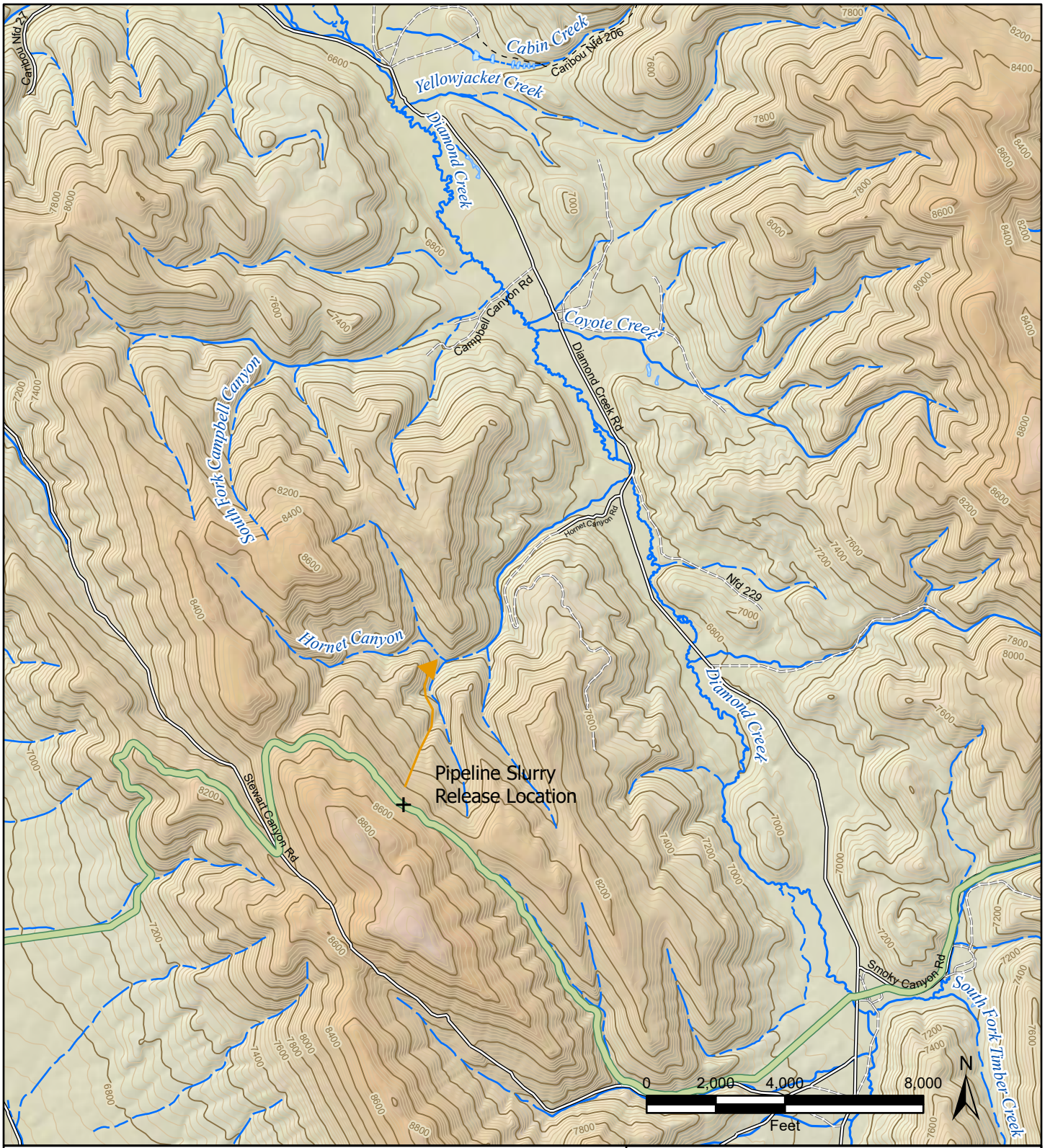

Legend

- Slurry Pipeline
- Stream/River: Perennial
- Stream/River: Intermittent
- Contour - Index (200 ft)
- Contour - Intermediate (20 ft)

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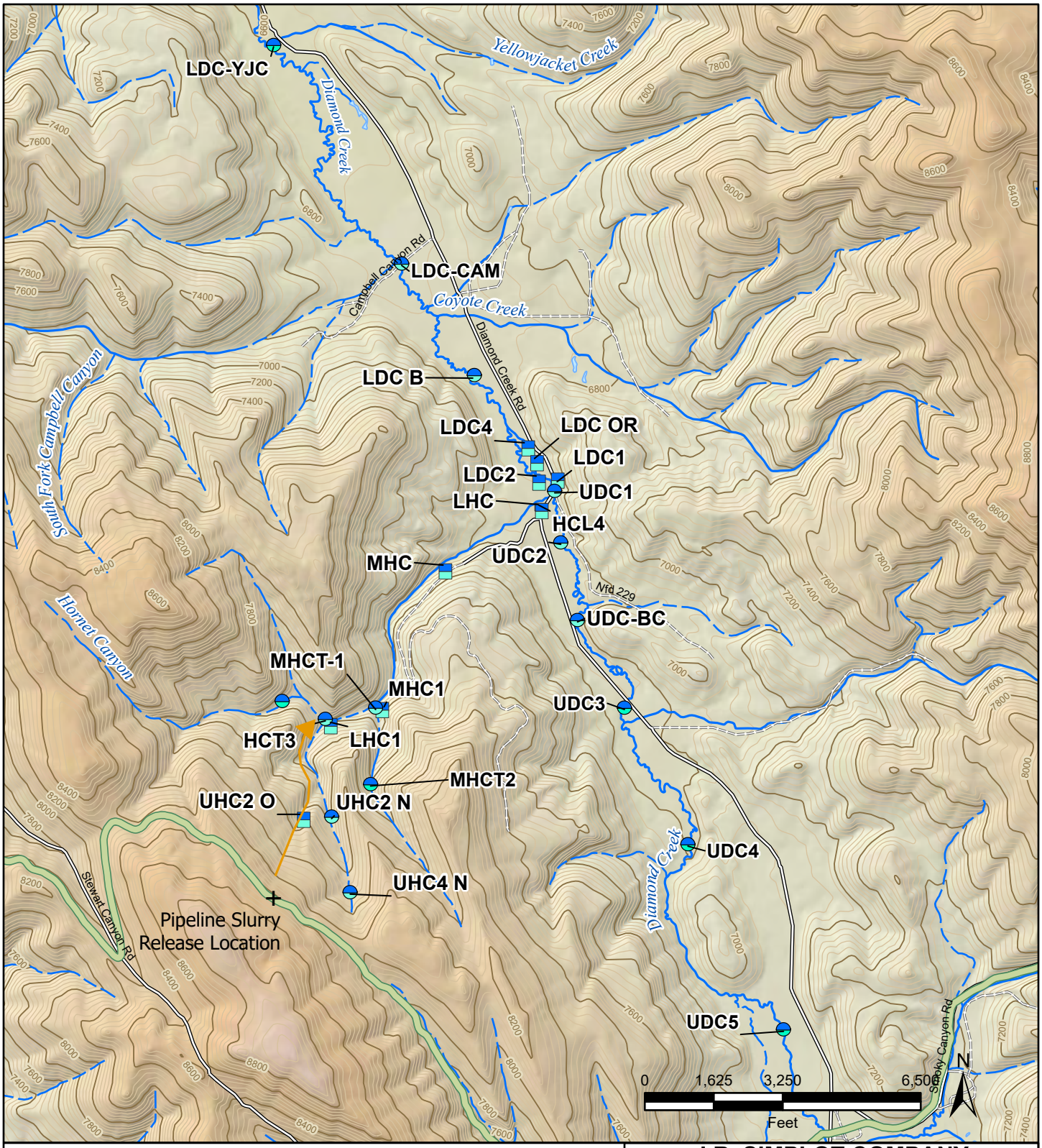
DATA SUMMARY REPORT

FIGURE 1

HORNET CANYON AND DIMAOND CREEK SITE OVERVIEW

DATE: AUG 08, 2024	FORMATION ENVIRONMENTAL
By: CRL	For: SMC

S:\GIS\a5\DiamondCreek\plt\DataSummReport\HC_DataSummReport.aprx | Fig_01_Overview



Legend

- Background - Surface Water Sample Location
- Background - Sediment Sample Location
- Impact - Surface Water Sample Location
- Impact - Sediment Sample Location
- Slurry Pipeline
- Stream/River: Perennial
- Stream/River: Intermittent
- Contour - Index (200 ft)
- Contour - Intermediate (20 ft)

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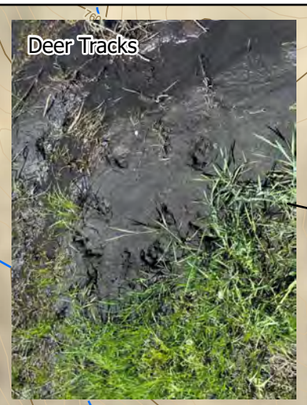
HORNET CANYON
DATA SUMMARY REPORT

FIGURE 2

2024 SURFACE WATER AND SEDIMENT SAMPLE LOCATIONS

DATE: AUG 15, 2024	FORMATION ENVIRONMENTAL
By: CRL	For: SMC

S:\GIS\a5\DiamondCreek\plt\DataSummReport\HC_DataSummReport.aprx | Fig_02_Results_2024



ST_StrawBale

ST_LowerTree

ST_UpperTree

MP_01

MP_02

MP_03

MP_04

MP_05

Hornet Canyon

Hornet Canyon Rd

Nfd 229

Diamond Creek

Diamond Creek Rd

6800

7000

7400

7600

8400

8600

8800

Pipeline Slurry
Release Location

Legend

- Rod Point
- Sediment Trap

Monitoring Point	2023 Rod Height (Inches)	2024 Rod Height (inches)	Percent Change
MP-1	21	21.5	2%
MP-2	9.75	10.625	8%
MP-3	6.75	7.875	14%
MP-4	19.25	19.5	1%
MP-5	22.75	24	5%

0 500 1,000 2,000
Feet

N

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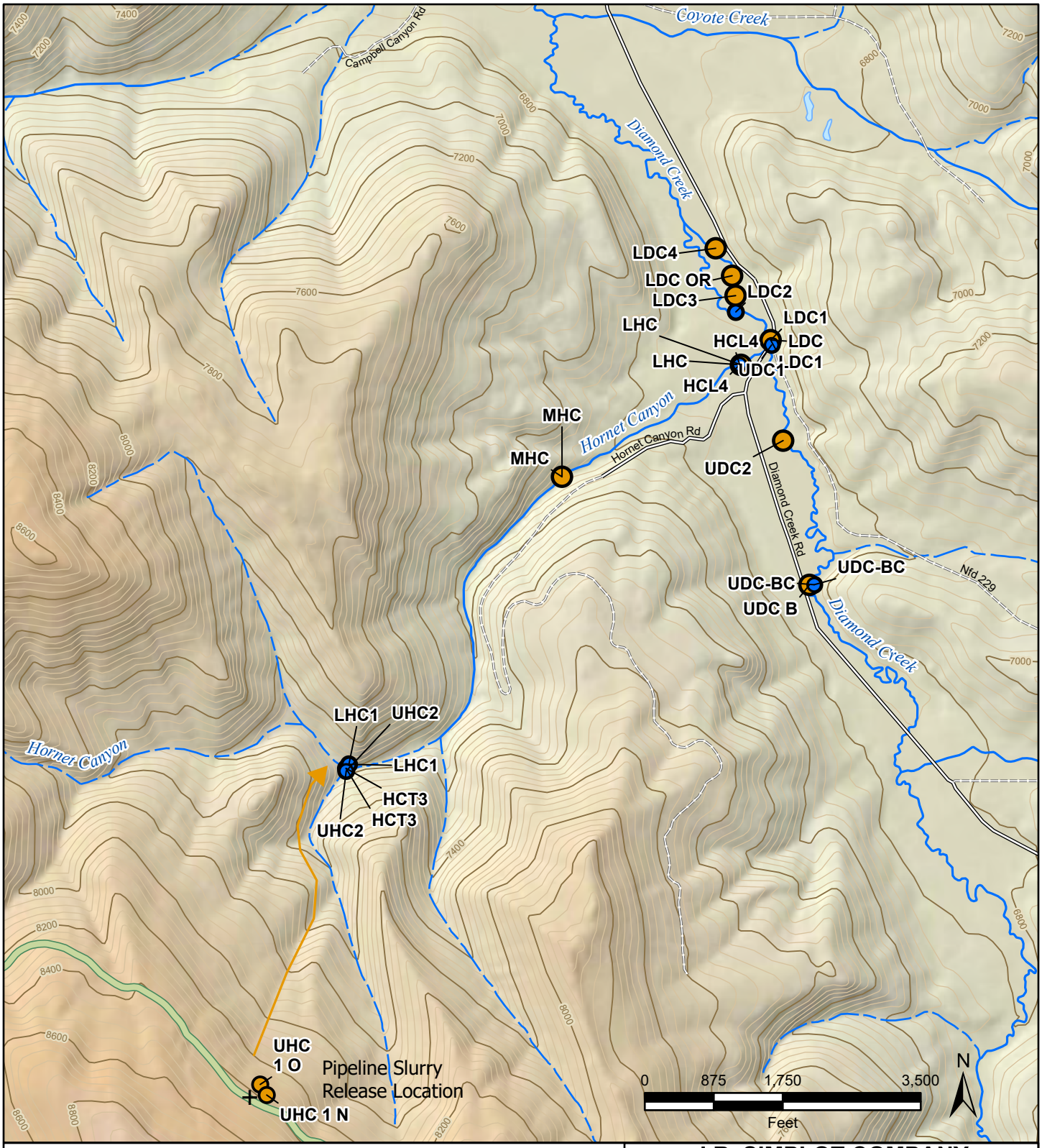
FIGURE 3

LOCATION OF ORE SLURRY DEPOSIT MONITORING POSTS AND SEDIMENT TRAPS

DATE: AUG 12, 2024
By: CRL | For: SMC

FORMATION ENVIRONMENTAL

S:\GIS\a5\DiamondCreek\plt\DataSummReport\HC_DataSummReport.aprx | Fig_03_Proposed_SedTraps



Legend

- Sediment Sample Location
- Surface Water Sample Location
- Slurry Pipeline
- Stream/River: Perennial
- Stream/River: Intermittent
- Contour - Index (200 ft)
- Contour - Intermediate (20 ft)

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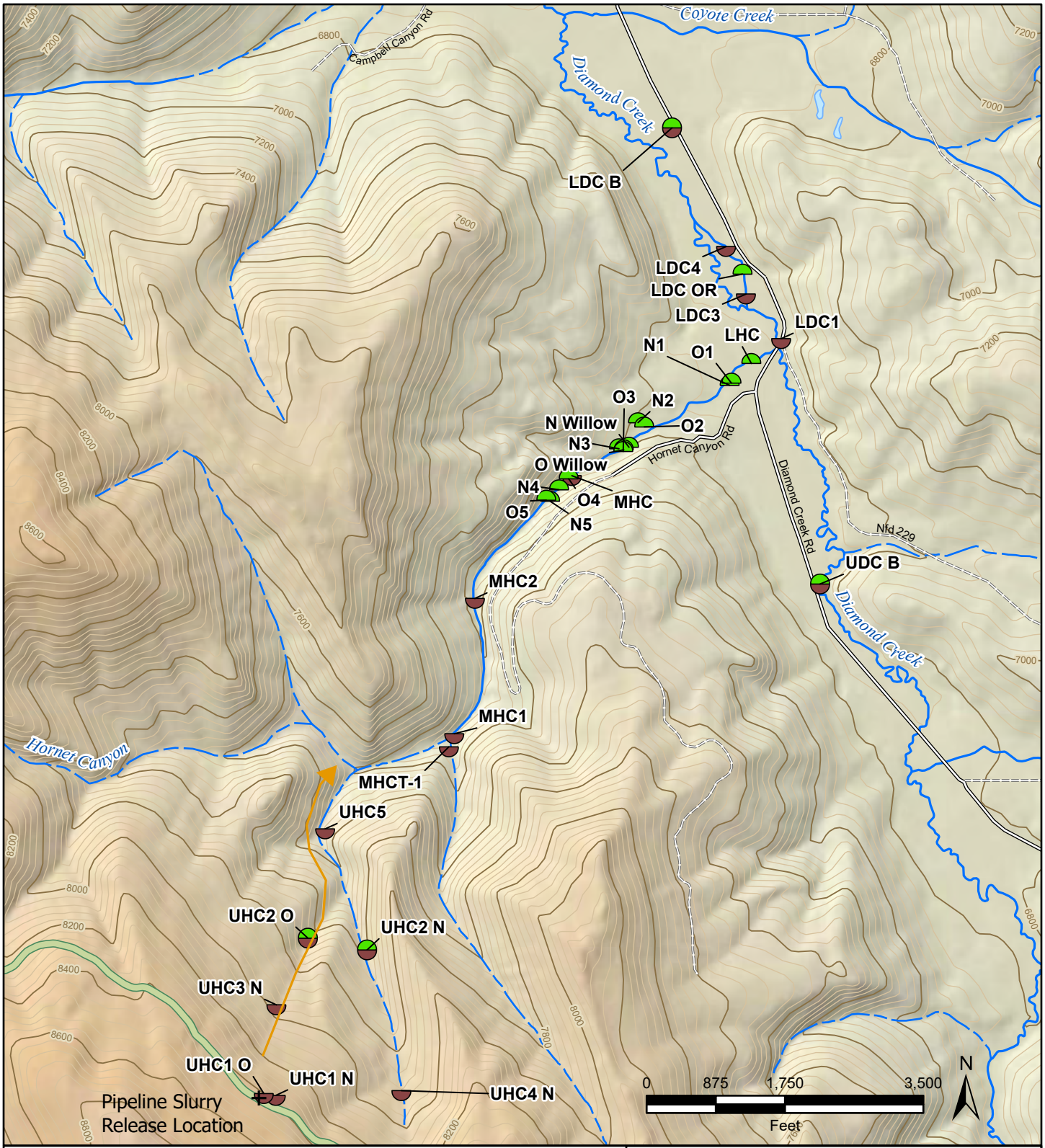
DATA SUMMARY REPORT

FIGURE 4

2023 SURFACE WATER AND SEDIMENT SAMPLE LOCATIONS

DATE: AUG 08, 2024	FORMATION ENVIRONMENTAL
By: CRL	For: SMC

S:\GIS\a5\DiamondCreek\plt\DataSummReport\HC_DataSummReport.aprx | Fig_04_SD_SW



Legend

- Vegetation Sample Location
- Soil Sample Location
- Slurry Pipeline
- Stream/River: Perennial
- Stream/River: Intermittent
- Contour - Index (200 ft)
- Contour - Intermediate (20 ft)

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HORNET CANYON, ID

FIGURE 5

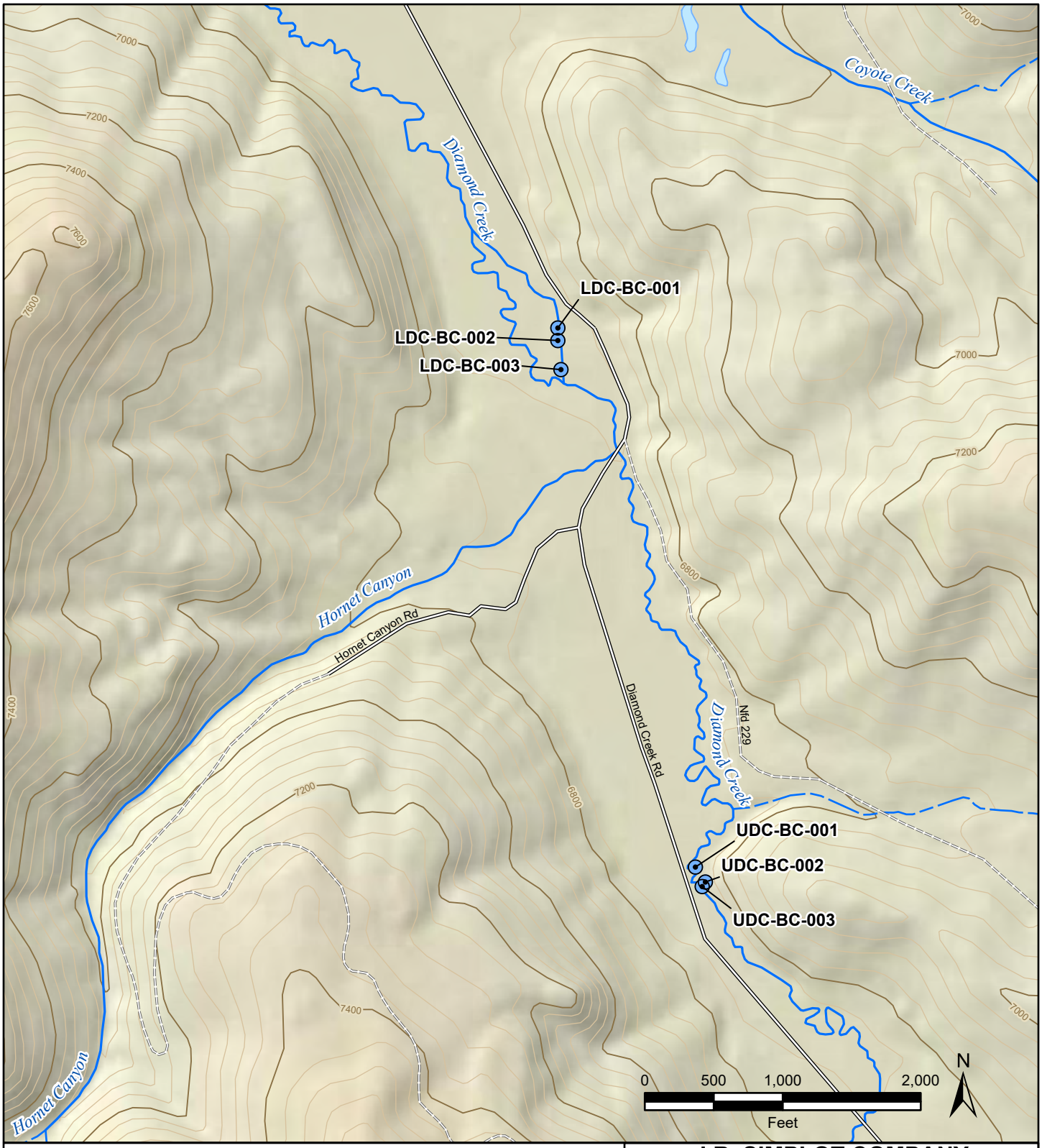
2023 SOIL AND VEGETATION SAMPLE LOCATIONS

DATE: AUG 08, 2024

By: CRL | For: SMC

FORMATION ENVIRONMENTAL

S:\GIS\a5\DiamondCreek\plt\DataSummReport\HC_DataSummReport.aprx Fig_05_SL_VG



Legend

- Benthic Sample Location
- Slurry Pipeline
- Stream/River: Perennial
- Stream/River: Intermittent
- Contour - Index (200 ft)
- Contour - Intermediate (20 ft)

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HORNET CANYON
DATA SUMMARY REPORT

FIGURE 6

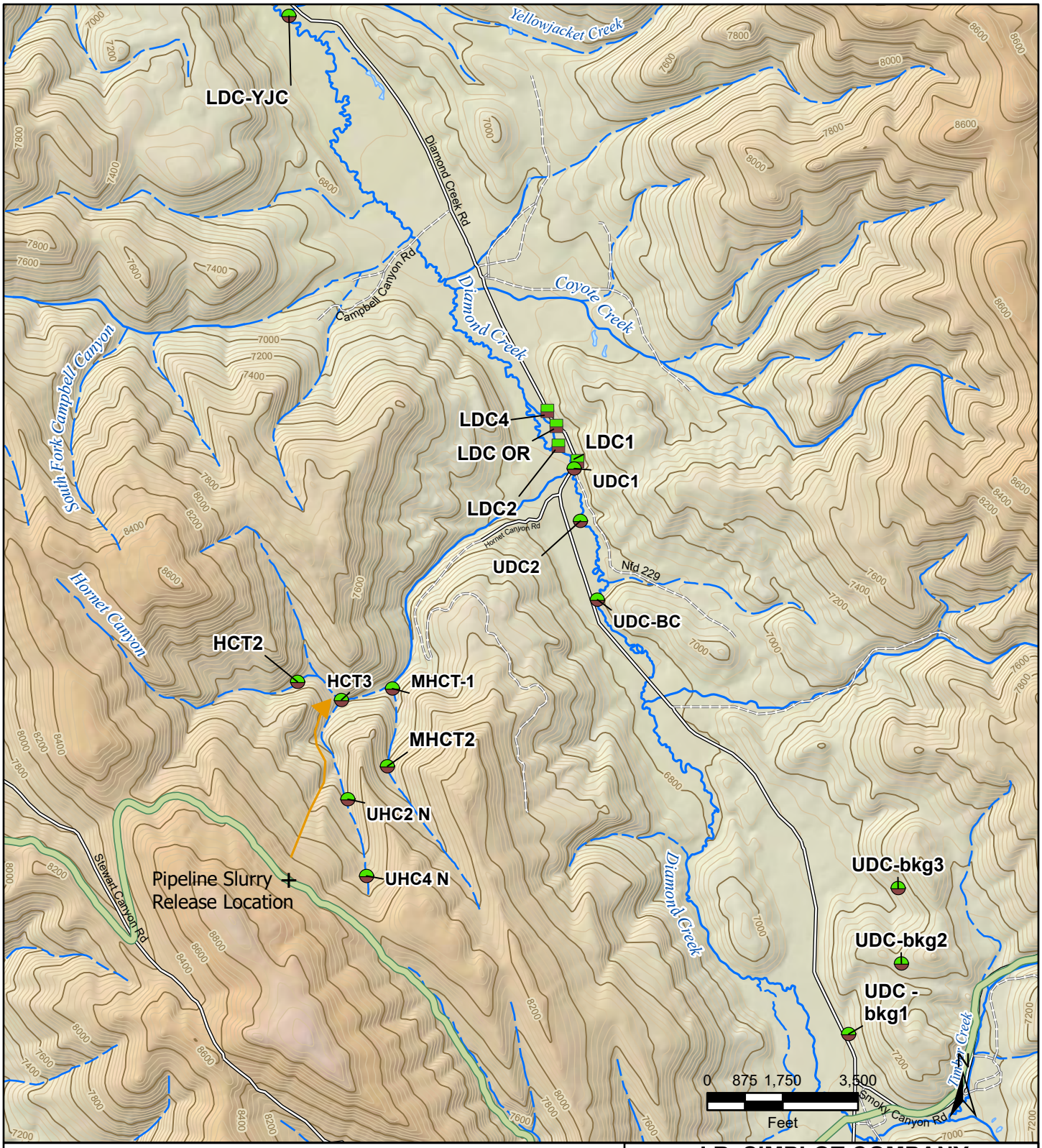
2023 - 2025 BENTHIC COMMUNITY SAMPLE LOCATIONS

DATE: AUG 08, 2024

By: CRL | For: SMC

FORMATION ENVIRONMENTAL

S:\GIS\a5\DiamondCreek\plt\DataSummReport\HC_DataSummReport.aprx | Fig_06_Benthic



Legend

- Background - Vegetation Sample Location
- Background - Soil Sample Location
- Impact - Vegetation Sample Location
- Impact - Soil Sample Location
- Slurry Pipeline
- Stream/River: Perennial
- Stream/River: Intermittent
- Contour - Index (200 ft)
- Contour - Intermediate (20 ft)

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DATA SUMMARY REPORT

FIGURE 7

2024 - 2025 PROPOSED SOIL AND VEGETATION SAMPLING LOCATIONS

DATE: AUG 15, 2024	FORMATION ENVIRONMENTAL
By: KAM	For: SMC

S:\GIS\a5\DiamondCreek\plt\DataSummReport\HC_DataSummReport.aprx Fig_07_SL_VG

Table 1. Sample Collection and Monitoring Locations 2024 and 2025.

Sample Location	Waterbody	Description	Sample Type	Previously Sampled	Media or sample type					
					Surface Water	Sediment	Soil	Vegetation	Benthic Invertebrate	Flow
HCT3	Hornet	tributary unaffected	Background	Yes	X	X	X	X		
HCT2	Hornet	tributary unaffected	Background	No	X	X	X	X		
MHCT1	Hornet	tributary unaffected	Background	Yes	X	X	X	X		
MHCT2	Hornet	tributary unaffected	Background	No	X	X	X	X		
UHC-2 N	Hornet	headwater upstream of ore slurry	Background	Yes	X	X	X	X		
UHC-4 N	Hornet	headwater upstream of ore slurry	Background	Yes	X	X	X	X		
UDC1	Diamond	upstream of Hornet Canyon	Background	Yes	X	X	X	X		
UDC2	Diamond	upstream of Hornet Canyon	Background	Yes	X	X	X	X		
UDCBC	Diamond	upstream of Hornet Canyon	Background	Yes	X	X	X	X	X	
UDC bkg1	Diamond	upstream of Hornet Canyon	Background	No			X	X		
UDC bkg2	Diamond	upstream of Hornet Canyon	Background	No			X	X		
UDC bkg2	Diamond	upstream of Hornet Canyon	Background	No			X	X		
UDC3	Diamond	upstream of Hornet Canyon	Background	No	X	X				
UDC4	Diamond	upstream of Hornet Canyon	Background	No	X	X				
UDC5	Diamond	upstream of Hornet Canyon	Background	No	X	X				
UHC2 O	Hornet	Hornet Canyon d/s of release	spill zone	Yes	X	X				
LHC1	Hornet	Hornet Canyon d/s of release	spill zone	Yes	X	X				X
MHC1	Hornet	Hornet Canyon d/s of release	spill zone	Yes	X	X				X
MHC	Hornet	Hornet Canyon d/s of release	spill zone	Yes	Y	X				X
HCL4/LHC	Hornet	Hornet Canyon d/s of release	spill zone	Yes	X	X				X
LDC1	Diamond	Diamond Creek d/s of Hornet Canyon	spill zone	Yes	X	X	X	X		
LDC2	Diamond	Diamond Creek d/s of Hornet Canyon	spill zone	Yes	X	X	X	X		
LDC-OR	Diamond	Diamond Creek d/s of Hornet Canyon	spill zone	Yes	X	X	X	X	X	
LDC-4	Diamond	Diamond Creek d/s of Hornet Canyon	spill zone	Yes	X	X	X	X		
LDC-B	Diamond	Diamond Creek u/s of Coyote Creek	Background	Yes	X	X				
LDC-YJC	Diamond	Diamond Creek d/s of Yellow Jacket Creek	Background	No	X	X	X	X		

Notes:

d/s - downstream

u/s - upstream

X - sampled or planned sampling

Table 2. Flow Data for Hornet Canyon, Spring 2024.

Location	Description	Flow (cfs)
HCT3	Unaffected upper tributary in upper Hornet Canyon	0.27
LHC1	Mainstem Hornet Canyon immediately downstream of the confluence of the upper tributary	0.75
MHC1	Mainstem Hornet Canyon downstream of the lower tributary	0.99
MHC	Middle Hornet Canyon downstream of the 5 ore slurry monitoring locations	0.47
LHC	Mouth of Hornet Canyon prior to discharge to Diamond Creek	0.27

Table 3. In-Situ Water Quality Measurement Data, Spring 2024

Location	DO	ORP	pH	SC	Temp	Turbidity
	mg/L	mV	SU	µS/cm	°C	NTU
Hornet Canyon Background						
UHC4 N	Buried in several feet of snow. No water present under snow.					
UHC2 N	Buried in several feet of snow. No water present under snow.					
HCT2	9.72	198.8	8.1	355.4	4	0.07
HCT3	9.62	204.3	8.14	338.9	4.5	2.74
Hornet Canyon Spill Zone						
UHC2 O	Buried in several feet of snow. No water present under snow.					
MHCT-1	Dry					
MHCT-2	Dry					
UHC2 (LHC1)	9.87	194.5	8.22	307.1	3.6	8.43
MHC1	9.7	203.5	8.31	320.8	3.2	3.62
MHC	9.39	190.2	8.27	334.6	3	24.9
HLC4/LHC	8.68	170.4	8.42	303.8	11.9	3.06
Diamond Creek Background						
UDC5	9.63	169.8	8.42	281.7	5.8	10.8
UDC4	9.52	161.5	8.56	282.3	7.3	9.33
UDC3	9.46	162.7	8.33	293.9	5.8	21.1
UDC-BC	9.49	159.8	8.35	297.1	6	7.02
UDC2	9.67	154.4	8.4	296.5	5.7	11.1
UDC1	9.86	152.3	8.38	300.6	5.3	8.98
Diamond Creek Spill Zone						
LDC1	9.78	124.4	8.38	300.6	5.2	8.39
LDC2	9.96	147.3	8.38	301	4.7	8.54
LDC OR	9.83	147	8.35	301.8	4.7	7.6
LDC4	9.8	142.5	8.38	301.4	5	6.66
LDC B	8.08	138.2	7.92	312.8	5.9	8.64
LDC-CAM	9.5	126.3	8.19	316	4.8	5.77
LDC-YJC	9.34	137.5	8.1	330.9	5	7.15

Notes:

Dissolved oxygen (DO) is reported in milligrams/Liter (mg/L).

Oxidation reduction potential (ORP) is reported in millivolts (mV).

Log hydrogen ion concentration (pH) is reported as standard units (SU).

Specific conductivity (SC) is reported in microsiemens per centimeter (µS/cm).

Temperature (Temp) is reported in degrees Celsius (°C).

Turbidity is reported in nephelometric turbidity units (NTU).

Table 4. Screening Values for Surface Water

Parameter	Form	Hornet Canyon Screening Values mg/L	Diamond Creek Screening Values mg/L	Type	Source	Notes
Aluminum[1]	T	1.3	1.3	chronic value	EPA 2018[2]	Derived based on pH, DOC, and Hardness
Arsenic	D	0.15	0.15	chronic value	IDAPA 2024[3]	Idaho water quality standard
Barium*	T	0.78	0.71	chronic value	MDEQ 2023[4]	Tier 2 value, updated 2020
Cadmium*	D	0.00078	0.00074	chronic value	IDAPA 2024[3]	Idaho water quality standard
Chromium (VI)	D	0.011	0.011	chronic value	IDAPA 2024[3]	Idaho water quality standard, Cr (VI) used as more sensitive measure
Lead*	D	0.0045	0.0041	chronic value	IDAPA 2024[3]	Idaho water quality standard
Mercury	T	0.0000021	0.0000021	chronic value	EPA 2024[5]	EPA proposed WQS value for Idaho
Selenium	D	0.0031	0.0031	chronic value	IDAPA 2024[3]	Idaho water quality standard
Silver*	D	0.0082	0.0069	acute value	IDAPA 2024[3]	Idaho water quality standard, only acute value available
Vanadium	T	0.027	0.027	chronic value	MDEQ 2023[4]	Tier 2 value, updated 2009
Zinc*	D	0.19	0.17	chronic value	IDAPA 2024[3]	Idaho water quality standard
Sulfate as SO4	T	370	370	chronic value	MDEQ 2023[4]	Tier 1 value, updated 2019
Total Diss. Solids	D	NA	NA			
Total Susp. Solids	T	NA	NA			
Phosphorus	T	0.1	0.1	chronic value	IDEQ 2001[6]	UBR TMDL target

Notes:

D = dissolved (filtered), T = total (unfiltered), NA = not available

*Hardness-based metal criteria derived from drainage median hardness. Median hardness derived for each of Hornet Canyon and Diamond Creek surface waters from the calcium and magnesium data.

Hornet Canyon (mg/L CaCO3)	171.74
Diamond Creek (mg/L CaCO3)	156.13

[1] Aluminum screening value derived based on pH, DOC, and hardness. Values used: 8.2 pH, 1 mg/L DOC, hardness.

[2] EPA, 2018. Final Aquatic Life Ambient Water Quality Criteria For Aluminum - 2018. U.S. Environmental Protection Agency, EPA 822-R-18-001.

[3] Idaho Administrative Procedures Act (IDAPA) 58.01.02 water quality standards - IDAPA Numeric Criteria For Toxic Substances For Waters Designated For Aquatic Life, Recreation, Or Domestic Water Supply Use (IDAPA 2024).

[4] Michigan Department of Environmental Quality (MDEQ). 2023. Freshwater Chronic Values (FCV) from Rule 57 Water Quality Values, Surface Water Assessment Section, Michigan EGLE. https://www.michigan.gov/egle/about/organization/water-resources/glwarm/rule-57-water-quality-values.

[5] EPA, 2024. DRAFT Aquatic Life Water Quality Criterion for Mercury in Idaho. U.S. Environmental Protection Agency, EPA-820-D-24-001.

[6] IDEQ, 2001. Blackfoot River TMDL, Waterbody Assessment and Total Maximum Daily Load. Idaho Department of Environmental Quality, Pocatello, Idaho.

Table 5. Hornet Canyon Surface Water Data, 2024

Parameter	Form	Hornet Canyon Background				Hornet Canyon Spill Zone							
		HCT2		HCT3		UHC5		MHC1		MHC		HLC4LHC	
		mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q
Aluminum	D	0.054	U	0.054	U	0.054	U	0.054	U	0.054	U	0.054	U
	T	0.054	U	0.054	U	0.149	J	0.054	U	0.391		0.07	J
Arsenic	D	0.00021	U	0.00021	U	0.00023	J	0.00022	J	0.00037	J	0.00026	J
	T	0.00021	U	0.00021	U	0.00039	J	0.00022	J	0.00122		0.00029	J
Barium	D	0.0271		0.0272		0.0249		0.0248		0.0229		0.0322	
	T	0.029		0.0293		0.0284		0.0274		0.0275		0.0317	
Cadmium	D	0.000063	U	0.000063	U	0.000391		0.000243		0.00137		0.000309	
	T	0.000063	U	0.000063	U	0.00132		0.000371		0.00429		0.000394	
Chromium	D	0.00021	J	0.00025	J	0.0003	J	0.00027	J	0.00128		0.00032	J
	T	0.00019	J	0.00026	J	0.00378		0.00078	J	0.0212		0.00083	J
Lead	D	0.00014	U	0.00014	U	0.00014	U	0.00014	U	0.00014	U	0.00014	U
	T	0.00014	U	0.00014	U	0.00014	J	0.00014	U	0.00045		0.00014	U
Mercury	D	0.000093	U	0.000093	U	0.000093	U	0.000093	U	0.000093	U	0.000093	U
	T	0.000093	U	0.000093	U	0.000093	U	0.000093	U	0.000093	U	0.000093	U
Selenium	D	0.00024	U	0.00024	U	0.0003	J	0.00024	J	0.00194		0.00065	J
	T	0.00024	U	0.00024	U	0.0004	J	0.00024	U	0.00283		0.00067	J
Silver	D	0.000061	U	0.000061	U	0.000061	U	0.000061	U	0.000061	U	0.000061	U
	T	0.000061	U	0.000061	U	0.000061	U	0.000061	U	0.000198		0.000061	U
Vanadium	D	0.00019	J	0.00018	J	0.00052	J	0.00043	J	0.00226		0.00084	J
	T	0.00014	U	0.00014	U	0.00643		0.00122		0.0347		0.00153	
Zinc	D	0.002	U	0.002	U	0.0025	J	0.002	U	0.0097		0.002	U
	T	0.002	U	0.002	U	0.0125		0.0039	J	0.0547		0.0035	J
Sulfate as SO4	T	8.8		7.83		7.48		7.73		23.7		7.5	
Total Diss. Solids	D	217		206		185		200		194		188	
Total Susp. Solids	T	5	U	5	U	5	U	5	U	5	U	5	U
Phosphorus	T	0.0175		0.0213		5.48		1.03		7.54		0.184	
Hardness	T	186.0363		175.15282		165.8896		168.3357		189.8941		164.7942	

Notes:

Q - Qualifier

D = dissolved (filtered), T = total (unfiltered)

U - less than detection

J - estimated

Yellow highlighted cells exceed screening values.

Median hardness
Hornet Canyon (mg/L CaCO3) - 171.74

Aluminum - 8.2 pH, 1 mg/L DOC, hardness.

Table 6. Diamond Creek Surface Water Data, 2024

		Upper Diamond Creek Background														Lower Diamond Creek Spill Zone																			
		UDC1		UDC2		UDC3		UDC4		UDC5		UDCBC		UDCBC-Dup		LDC1		LDC2		LDC2-Dup		LDCOR		LDC4		LDCB		LDCCAM		LDCCAM-2		LDCYJC	
Parameter	Form	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q
Aluminum	D	0.054	U	0.054	U	0.054	U	0.054	U	0.054	U	0.054	U	0.054	U	0.054	U	0.054	U	0.054	U	0.054	U	0.054	U	0.054	U	0.054	U	0.054	U	0.054	U	0.054	U
	T	0.633		0.727		0.477		0.418		0.427		0.848		0.551		0.418		0.584		1.02		0.406		0.315		0.054	U	0.422		14.1		0.29			
Arsenic	D	0.00026	J	0.00024	J	0.00024	J	0.00023	J	0.00022	J	0.00028	J	0.00027	J	0.00024	J	0.00024	J	0.00023	J	0.00027	J	0.00028	J	0.00025	J	0.00026	J	0.00029	J	0.00026	J		
	T	0.00024	J	0.00024	J	0.00033	J	0.00032	J	0.00035	J	0.00023	J	0.00021	U	0.0003	J	0.00033	J	0.00043	J	0.00021	U	0.00021	U	0.00021	U	0.00021	U	0.00385		0.00021	U		
Barium	D	0.024		0.0239		0.026		0.0234		0.0209		0.0247		0.0239		0.0252		0.025		0.026		0.0241		0.0245		0.0245		0.0248		0.0171		0.0254			
	T	0.0301		0.03		0.028		0.0255		0.0251		0.0297		0.0281		0.0266		0.0283		0.0314		0.028		0.0262		0.0248		0.029		0.111		0.0279			
Cadmium	D	0.000063	U	0.000063	U	0.000063	U	0.000063	U	0.000063	U	0.000063	U	0.000063	U	0.000063	U	0.000063	U	0.000063	U	0.000063	U	0.000063	U	0.000063	U	0.000063	U	0.000063	U	0.000063	U		
	T	0.000063	U	0.000063	U	0.000063	U	0.000063	U	0.000063	U	0.000063	U	0.000063	U	0.000063	U	0.000087	J	0.000153		0.00008	J	0.000063	U	0.000063	U	0.000066	J	0.000276		0.000063	U		
Chromium	D	0.00019	J	0.00021	J	0.00017	U	0.00017	U	0.00017	U	0.00021	J	0.00022	J	0.00017	U	0.00017	U	0.00017	U	0.00022	J	0.0002	J	0.00017	U	0.00018	J	0.00021	J	0.00018	J		
	T	0.00079	J	0.00088	J	0.00086	J	0.00082	J	0.00136		0.00072	J	0.00044	J	0.00072	J	0.00105		0.00178		0.00047	J	0.00045	J	0.00017	U	0.00049	J	0.0141		0.00023	J		
Lead	D	0.00014	U	0.00014	U	0.00014	U	0.00014	U	0.00014	U	0.00031		0.00014	U	0.00014	U	0.00014	U	0.00014	U	0.00014	U	0.00014	U	0.00014	U	0.00014	U	0.00014	U	0.00014	U		
	T	0.00034		0.00041		0.00022		0.00017	J	0.00033		0.00033		0.0003		0.00018	J	0.00026		0.00044		0.00024		0.00017	J	0.00014	U	0.00027		0.00564		0.0002			
Mercury	D	0.000093	U	0.000093	U	0.000093	U	0.000093	U	0.000093	U	0.000093	U	0.000093	U	0.000093	U	0.000093	U	0.000093	U	0.000093	U	0.000093	U	0.000093	U	0.000093	U	0.000093	U	0.000093	U		
	T	0.000093	U	0.000093	U	0.000093	U	0.000093	U	0.000093	U	0.000093	U	0.000093	U	0.000093	U	0.000093	U	0.000093	U	0.000093	U	0.000093	U	0.000093	U	0.000093	U	0.000093	U	0.000093	U		
Selenium	D	0.00031	J	0.0003	J	0.00035	J	0.00024	U	0.00024	U	0.00035	J	0.00031	J	0.00024	U	0.00024	J	0.00024	U	0.00034	J	0.00032	J	0.00031	J	0.00034	J	0.00036	J	0.00033	J		
	T	0.00045	J	0.00044	J	0.00025	J	0.00027	J	0.00028	J	0.00082	J	0.00037	J	0.00027	J	0.00029	J	0.0003	J	0.00086	J	0.00083	J	0.00077	J	0.00057	J	0.00038	J	0.00057	J		
Silver	D	0.000061	U	0.000061	U	0.000061	U	0.000061	U	0.000061	U	0.000061	U	0.000061	U	0.000061	U	0.000061	U	0.000061	U	0.000061	U	0.000061	U	0.000061	U	0.000061	U	0.000061	U	0.000061	U		
	T	0.000061	U	0.000061	U	0.000061	U	0.000061	U	0.000061	U	0.000061	U	0.000061	U	0.000061	U	0.000061	U	0.000061	U	0.000061	U	0.000061	U	0.000061	U	0.000061	U	0.000061	U	0.000061	U		
Vanadium	D	0.00057	J	0.00058	J	0.00044	J	0.00043	J	0.00046	J	0.00056	J	0.00054	J	0.00046	J	0.00043	J	0.0005	J	0.00057	J	0.00061	J	0.00065	J	0.00063	J	0.00073	J	0.00056	J		
	T	0.0007	J	0.00085	J	0.00117		0.00107		0.00143		0.00072	J	0.00054	J	0.00097	J	0.00135		0.0022		0.00058	J	0.00033	J	0.00014	U	0.0005	J	0.0216		0.00026	J		
Zinc	D	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U		
	T	0.0024	J	0.0026	J	0.0023	J	0.0028	J	0.0035	J	0.0032	J	0.003	J	0.002	U	0.0028	J	0.005		0.002	U	0.002	U	0.002	U	0.002	U	0.0425		0.002	U		
Sulfate as SO4	T	6.55		6.66		6.61		6.37		6.44		6.61		6.6		6.5		6.52		6.59		6.59		6.59		7.15		7.36		7.63		7.55			
Total Diss. Solids	D	174		178		176		169		166		179		176		166		161		185		179		174		183		179		209		190			
Total Susp. Solids	T	5	U	7		6		5	U	5	U	5	U	5	U	11		5	U	14		5	U	5		5	U	5	U	28		5	U		
Phosphorus	T	0.0654		0.107		0.0692		0.0692		0.0903		0.104		0.102		0.138		0.0788		0.253		0.0692		0.0577		0.0539		0.0864		0.801		0.0501			
Hardness	T	155.09		157.45		149.57		145.17		145.56		154.51		153.05		157.45		156.25		157.12		156.00		153.26		162.53		164.68		190.73		169.18			

Notes:

Q - Qualifier

D = dissolved (filtered), T = total (unfiltered)

U - less than detection

J - estimated

Yellow highlighted cells exceed screening values.

Median hardness

Diamond Creek 156.13

(mg/L CaCO3)

Aluminum - 8.2 pH, 1 mg/L DOC, hardness.

Table 7. Hornet Canyon Sediment Data, 2024.

		Hornet Canyon Background														Hornet Canyon Spill Zone									
		UHC4N		UHC4N-Dup		UHC2N		HCT2		HCT3		MHCT1		MHCT2		UHC2O		UHC5		MHC1		MHC		HCL4LHC	
Parameter	units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	mg/kg dw	**10300**		8780		8210		4570		4620		7670		6420		1820		4200		5320		2910		4060	
Arsenic	mg/kg dw	**3.87**	J	3.02	J	2.1	J	1.32	J	1.87	J	0.83	J	1.89	J	3.05	J	5.39	J	4.17	J	4.04	J	4.9	J
Barium	mg/kg dw	**111**		98.2		95.3		59.9		81.9		95.2		56.6		21.7		43.7		53.7		25.5		48.4	
Cadmium	mg/kg dw	**3.6**	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	23		47.9		37.4		34.7		62.4	
Chromium	mg/kg dw	**12**		8.88	J	9.51	J	4.74	J	5.89	J	1.7	U	4.29	J	110		194		150		101		173	
Lead	mg/kg dw	**10.9**		9.41		8.44		5.2	U	6.29	J	8.65		8.59		5.2	U	6.11	J	6.18	J	5.2	U	6.23	J
Mercury	mg/kg dw	0.015	J	0.011	J	0.019	J	0.011	U	0.011	U	**0.04**		0.014	J	0.13		0.154		0.094		0.174		0.206	
Selenium	mg/kg dw	**2.42**	J	1.2	U	1.75	J	1.92	J	1.2	U	1.2	U	1.2	U	5.78	J	12		8.03	J	7.69	J	13.5	
Silver	mg/kg dw	**0.5**	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.88		1.65		1.37		1.3		2.35	
Vanadium	mg/kg dw	23.1		**23.7**		15.7		6.18	J	7.17	J	3.26	J	8.77	J	187		293		244		173		294	
Zinc	mg/kg dw	**92.8**		80.5		51.1		32	U	32	U	33.4	J	32	U	301		524		428		348		607	
Organic Carbon	%	2.47		2.62		5.4		**6.55**		4.22		6.51		6.27		3.69		3.27		3.65		2.43		2.55	
pH	SU	6.59		6.53		7.24		**7.5**		7.43		6.35		6.56		7.39		7.55		7.52		7.85		7.91	
Phosphorus	mg/kg dw	**1140**		880		532		657		534		995		1110		15200		38700		36200		68100		81600	
Sulfate as SO4	mg/kg dw	3.2		3.3		5.8		6.6		8.6		5.1		4.1		13.9		20		15.2		55.8		19.4	

Notes:
Yellow highlighted cells exceed background.
Q - Qualifier
U - less than detection
J - estimated
Bold values are maximum concentrations for background.

Table 8. Diamond Creek Sediment Data, 2024.

		Upper Diamond Creek Background														Lower Diamond Creek Spill Zone													
		UDC1		UDC2		UDC2-SD201		UDC3		UDC4		UDC5		UDCBC		LDC1		LDC2		LDCOR		LDC4		LDCB		LDCCAM		LDCYJC	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	mg/kg dw	9570		6380		5840		7350		4860		**10200**		5940		6960		4840		7710		7830		7700		5100		10600	
Arsenic	mg/kg dw	**2.39**	J	0.9	J	0.59	U	1.43	J	0.59	U	1.15	J	0.59	U	2.49	J	3.91	J	1.56	J	1.41	J	0.59	U	0.59	U	0.59	U
Barium	mg/kg dw	65.9		50.6		26.6		51.4		37.7		**71.2**		33.4		51.4		41.4		63.2		64.6		46.3		43.7		47.9	
Cadmium	mg/kg dw	**3.6**	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	27.4		49.8		3.6	U	3.6	U	3.6	U	3.6	U	3.6	U
Chromium	mg/kg dw	**21.4**		12.4		4.97	J	9.55	J	4.68	J	9.65	J	5.94	J	70.7		137		22.5		12.9		11.4		5.47	J	11.2	
Lead	mg/kg dw	**7.77**	J	5.83	J	5.2	U	6.08	J	5.2	U	5.2	U	5.2	U	6.18	J	5.8	J	6.66	J	6.44	J	14.5		5.2	U	5.96	J
Mercury	mg/kg dw	0.014	J	0.011	U	0.011	U	**0.042**		0.011	U	0.013	J	0.011	U	0.083		0.113		0.018	J	0.011	U	0.057		0.011	U	0.011	U
Selenium	mg/kg dw	**4.97**	J	1.2	U	1.2	U	1.28	J	1.92	J	3.08	J	3.29	J	8.46	J	8.41	J	2.34	J	1.2	U	2.37	J	1.2	U	2.22	J
Silver	mg/kg dw	**0.5**	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.9		1.71		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Vanadium	mg/kg dw	**23.4**		11.3		4.62	J	10.8		5.37	J	9.44	J	5.27	J	134		236		22.7		11.9		9.89	J	6.39	J	8.44	J
Zinc	mg/kg dw	**76.4**		49.6		32	U	44.8		32	U	51.5		32	U	278		476		89.3		58.3		47.4		32	U	44	
Organic Carbon	%	1.44		1.82		2.05		1.71		1.75		2.05		1.75		2.36		2.62		2.85		3.08		3.76		2.6		2.17	
pH	SU	7.65		7.43		7.33		**7.77**		7.45		7.68		7.47		7.44		7.65		7.13		7.35		6.87		7.23		7.52	
Phosphorus	mg/kg dw	**4290**		1650		971		1930		1310		1380		2270		35900		74100		3400		3370		875		1080		982	
Sulfate as SO4	mg/kg dw	8.5		8.8		4.6		5.3		6.6		5.4		6.1		5.6		9.8		8		5.2		46.1		3.7		7.3	

Notes:

Yellow highlighted cells exceed background.

Q - Qualifier

U - less than detection

J - estimated

Bold values are maximum concentrations for background.

Table 9. Summary of Samples Collected in 2023.

Sampling Date	Locations Sampled	
	Spill Zone	Background
Soil/Dry Sediment Samples		
8/8/2023	LDC1* MHC	None
10/10/2023	LDC B LDC* LHC UHC1 O UHC2 O	UDC B UHC 1 N UHC 2 N
11/6/2023	LDC3 LDC4 MHC1 O MHC2 O UHC5 O	MHC1 N MHC2 N MHCT-1 UHC3 UHC4 UHC5 N
Vegetation Samples		
9/19/2023	O Willow O1 O2 O3 O4 O5	N Willow N1 N2 N3 N4 N5
10/10/2023	LDC B LDC OR LHC UHC 2 O	UDC B UHC 2 N
Surface Water Samples		
8/7/2023	HCL4 LDC2 LHC1 UHC2	UDC1 HCT3
9/14/2023[1]	LDC2	UDC-BC UDC1
Wet Sediments		
8/8/2023	LDC1 MHC	None
10/10/2023	LDC OR	UDC B
11/6/2023	LDC3 LDC4	UDC2

Notes:

[1] - The 9/14/2023 surface water samples were only analyzed for Phosphorous (total and dissolved)

See Figures for locations and types of samples

* LDC1 and LDC are at the same location

Table 10. Hornet Canyon and Diamond Creek Surface Water Data, 2023.

		Hornet Canyon Background		Hornet Canyon Spill Zone						Upper Diamond Creek Background				Lower Diamond Creek Spill Zone	
		HCT3		UHC2		HCL4		LHC1		UDC1		UDC BC		LDC2	
Parameter	Form	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q	mg/L	Q
Aluminum	D	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	NS		0.001	U
	T	0.006		0.033		0.012		0.033		0.059		NS		0.066	
Arsenic	D	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	NS		0.001	U
	T	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	NS		0.001	U
Barium	D	0.026		0.029		0.032		0.027		0.028		NS		0.029	
	T	0.029		0.031	U	0.035		0.032		0.031		NS		0.032	
Cadmium	D	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	NS		0.001	U
	T	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	NS		0.001	U
Chromium	D	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	NS		0.001	U
	T	0.001		0.001		0.002		0.001		0.001	U	NS		0.001	U
Lead	D	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	NS		0.001	U
	T	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	NS		0.001	U
Mercury	D	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	NS		0.001	U
	T	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	NS		0.0002	U
Selenium	D	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	NS		0.001	U
	T	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	NS		0.001	U
Silver	D	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	NS		0.001	U
	T	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	NS		0.001	U
Vanadium	D	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	NS		0.001	U
	T	0.001	U	0.002		0.003		0.002		0.001		NS		0.001	
Zinc	D	0.001		0.002		0.004		0.002		0.002		NS		0.001	
	T	0.001	U	0.003		0.005		0.002		0.001	U	NS		0.002	
Sulfate	T	4		6		5		6		7		NS		7	
Total Dissolved Solids	D	100		104		96		92		120		NS		156	
Total Suspended Solids	T	2	U	2	U	2	U	2	U	2	U	NS		2	U
Phosphorus as P	D	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	NS		0.5	U
	T	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	NS		0.5	U
Phsophorus as P	D									0.0261		0.0308		0.0272	
	T									0.032		0.0462		0.0264	

Notes:

Median hardness 171.74 156.13

Q - Qualifier;

U - less than detection

NS - Not Sampled

D = dissolved (filtered), T = total (unfiltered)

Yellow highlighted cells exceed screening values.

Table 11. Hornet Canyon and Diamond Creek Sediment Data, 2023.

		Hornet Canyon Spill Zone				Diamond Creek Background				Diamond Creek Spill Zone							
		MHC		LHC		UDC2		UDC-B		LDC1		LDC3		LDC-OR		LDC4	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum, Total	mg/kg dw	6448.31		4580		9720		10700		4988.76		9600		6550		17000	
Arsenic, Total	mg/kg dw	7.61		9.82		3.06		3.76		7.64		5.99		2.99		4.02	
Barium, Total	mg/kg dw	95.55		69.5		78.8		118		85.26		90.6		56.1		156	
Cadmium, Total	mg/kg dw	94.76		102		1.49		1.67		95.38		45.2		5.9		3.69	
Chromium, Total	mg/kg dw	223.92		322		21.9		22.8		257.69		141		38.9		36.8	
Lead, Total	mg/kg dw	8.68		8.35		8.7		9.14		8.48		8.29		4.89		16.7	
Mercury, Total	mg/kg dw	0.21		0.274		0.015		0.015		0.22		0.119		0.037		0.032	
Selenium, Total	mg/kg dw	16.35		21		0.8		0.8		18.11		10.8		4		1.8	
Silver, Total	mg/kg dw	3.62		4.05		0.098		0.109		3.93		1.76		0.235		0.215	
Vanadium, Total	mg/kg dw	433.02		528		24.3		26.7		450.62		260		37.6		41.8	
Zinc, Total	mg/kg dw	835.79		965		72.5		88.9		814.4		444		139		167	
TOC	%			4.02		1.55		2.34				3.31		1.6		3.8	
pH	SU	7.5		7.84		7.1		7.45		7.7		7.37		7.3		6.73	
Phosphorus as P, Total	mg/kg dw	115600		127000		7200		3080		116700		46500		10300		3190	
Sulfate	mg/kg dw	33		245		42.8		42.2		30		20.8		120		36.2	

Notes:

Q - Qualifier

Results in dry weight (milligrams per kilogram [mg/kg])

Diamond Creek locations downstream of Hornet Canyon arranged by increasing distance from Hornet Canyon.

Yellow highlighted cells exceed background.

Table 12. Hornet Canyon Soil Data, 2023.

		Hornet Canyon Background																Hornet Canyon Spill Zone													
		UHC1 N		UHC3 N		UHC4 N		UHC2 N		UHC5 N		MHC1 N		MHC2 N		MHCT-1		UHC1 O		UHC2 O		UHC5 O		MHC1 O		MHC2 O		MHC		LHC	
Parameters	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	mg/kg dw	11200		16500		**18200**		14200		13200		11500		11300		9590		5630		5390		5010		3830		4040		4149.36		4580	
Arsenic	mg/kg dw	4.36		6.62		**9.42**		8.56		5.25		4.62		4.67		5.81		13.4		12.5		13.5		9.61		11		9.39		9.82	
Barium	mg/kg dw	189		207		**291**		170		202		229		230		107		57.8		59.1		60.1		62.2		60		67.88		69.5	
Cadmium	mg/kg dw	1.19		0.378		0.764		1.83		0.449		0.707		0.53		**2.49**		108		105		116		115		111		106.67		102	
Chromium	mg/kg dw	14.5		**26.9**		23		22.9		18.7		16.2		16.1		15.6		444		427		427		286		352		345.53		322	
Lead	mg/kg dw	18.5		17.1		18.3		15.1		15.1		12.9		16.8		**21.4**		8.91		8.38		9.09		8.55		8.62		8.54		8.35	
Mercury	mg/kg dw	**0.051**		0.026		0.049		0.029		0.011		0.018		0.025		0.034		0.305		0.298		0.279		0.29		0.236		0.28		0.274	
Selenium	mg/kg dw	0.5		0.21		0.4		**1.1**		0.25		0.3		0.3		0.6		20.3		15.3		21.6		16.6		20.8		30.859		21	
Silver	mg/kg dw	**0.075**		0.025		0.052		0.055		0.035		0.046		0.045		0.042		4.16		3.92		4.59		4.36		4.53		4.75		4.05	
Vanadium	mg/kg dw	21.5		28.4		29.1		**51.8**		25.3		22.8		21.9		25.7		778		683		733		549		662		530.72		528	
Zinc	mg/kg dw	65		83.5		96		**124**		55.8		69.9		52.2		80.4		1190		1100		1070		942		1020		922.92		965	
TOC	%	**12.2**		1.62		0.76		3.84		1.21		2.35		3.51		5.6		4.13		3.66		3.71		4.04		3.85				4.02	
pH	SU	5.83		**7.45**		6.42		7.42		6.33		6.83		6.45		6.35		7.74		7.56		7.49		7.93		7.58		8.6		7.84	
Phosphorus	mg/kg dw	1150		1080		1100		1320		1700		**2730**		1400		1330		122000		116000		124000		173000		129000		126400		127000	
Sulfate	mg/kg dw	2.6		1.5		1.4	U	10.6		4.3		2		6		**12.4**		174		105		1440		108		684		374*		245	

Notes:

Q - Qualifier

U - less than detection

*Extractable Sulfate

Yellow highlighted cells exceed background.

Bold values are maximum concentrations for background.

Table 13. Diamond Creek Soil Data, 2023.

Parameter	Units	Upper Diamond Creek Background		Lower Diamond Creek Spill Zone									
		UDC B		LDC[a]		LDC1[a]		LDC3		LDC4		LDC B	
		Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	mg/kg dw	12700		4560		4748.39		7040		13800		13800	
Arsenic	mg/kg dw	4.63		8.83		7.87		7.77		6.28		5.92	
Barium	mg/kg dw	121		66.7		80.79		74.6		201		170	
Cadmium	mg/kg dw	1.8		96.8		93.79		67.2		2.21		0.812	
Chromium	mg/kg dw	24.9		298		251.78		216		24.7		22.1	
Lead	mg/kg dw	9.91		8.25		8.24		8.07		14.7		12.6	
Mercury	mg/kg dw	0.017		0.298		0.23		0.203		0.019		0.024	
Selenium	mg/kg dw	0.5		21.5		18.115		16.6		0.5		0.7	
Silver	mg/kg dw	0.122		3.85		3.91		2.48		0.11		0.052	
Vanadium	mg/kg dw	29.1		494		435.64		377		32.2		27	
Zinc	mg/kg dw	106		902		798.89		625		127		105	
TOC	%	1.71		4.28				3.55		2.61		4	
pH	SU	7.64		7.96		7.8		7.35		7.51		7.09	
Phosphorus	mg/kg dw	3340		122000		113500		38900		2050		1640	
Sulfate	mg/kg dw	1.1	U	91.4		40*		28		9.5		7.4	

Notes:

[a] LDC and LDC1 were at the same location, with LDC being sampled in October 2023, and LDC1 being sampled in August 2023.

Yellow highlighted cells exceed background.

Q - Qualifier

u - less than detection

*Extractable Sulfate

Table 14. Hornet Canyon Vegetation Monitoring Data, 2023.

		Hornet Canyon Background														Hornet Canyon Spill Zone															
		UHC2 N		N5		N4		N3		N Willow		N2		N1		UHC2 O		O5		O4		O3		O Willow		O2		O1		LHC	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	mg/kg dw	94		113		178		349		42.5		519		**648**		134		564		104		203		31.7		170		202		105	
Arsenic	mg/kg dw	0.03	U	0.06		0.06		0.09		0.03	U	**0.16**		0.14		0.03		0.58		0.14		0.21		0.03	U	0.34		0.13		0.16	
Barium	mg/kg dw	9.91		54.7		34.6		46.6		10.3		**60.6**		29.6		16.8		26.3		15.7		21.1		4.87		27.5		19.9		29.4	
Cadmium	mg/kg dw	0.031		0.194		0.118		0.124		**0.414**		0.203		0.048		0.044		5.42		1.55		2.33		5.88		1.57		0.886		2.12	
Chromium	mg/kg dw	0.78		0.57		0.92		1.49		0.52		1.89		**2.4**		0.75		21.5		5.25		6.19		0.36		4.2		2.86		4.13	
Lead	mg/kg dw	0.047		0.128		0.116		0.18		0.05		0.229		**0.284**		0.067		0.42		0.109		0.158		0.041		0.142		0.132		0.1	
Mercury	mg/kg dw	0.004	U	0.024		0.017		0.01		**0.027**		0.014		0.013		0.004	U	0.024		0.012		0.012		0.022		0.014		0.013		0.004	U
Selenium	mg/kg dw	**0.21**		0.09		0.04		0.08		0.1		0.07		0.06		0.29		1.42		0.95		0.6		0.35		0.51		0.51		0.57	
Silver	mg/kg dw	0.002	U	0.003		0.003		0.002		0.003		**0.007**		0.002	U	0.002	U	0.182		0.042		0.056		0.004		0.046		0.026		0.036	
Vanadium	mg/kg dw	0.34		0.3		0.65		0.72		0.22		**1.32**		1.25		0.53		30.3		6.56		7.88		0.35		5.08		3.21		5.18	
Zinc	mg/kg dw	14.7		24.5		17.8		20.1		**88.8**		17.6		15.2		21.1		88.4		33		53.2		129		30.3		36.7		42.6	
Phosphorus	mg/kg dw	2050		**2540**		2280		1790		1510		1750		1690		3850		8850		2830		4400		2160		3350		3630		3850	

Notes:

U - less than detection

Q - Qualifier

All results are shown on a dry weight basis.

Yellow highlighted cells exceed background.

Table 15. Diamond Creek Vegetation Monitoring Data, 2023.

		Upper Diamond Creek Background		Lower Diamond Creek Spill Zone			
		UDC B		LDC OR		LDC B	
Parameter	Units	Result	Q	Result	Q	Result	Q
Aluminum	mg/kg dw	159		42.9		228	
Arsenic	mg/kg dw	0.05		0.04		0.06	
Barium	mg/kg dw	21		4.77		25	
Cadmium	mg/kg dw	0.107		0.069		0.154	
Chromium	mg/kg dw	1.1		0.47		1.34	
Lead	mg/kg dw	0.088		0.023		0.102	
Mercury	mg/kg dw	0.004	U	0.004	U	0.004	U
Selenium	mg/kg dw	0.19		0.1		0.28	
Silver	mg/kg dw	0.002	U	0.002	U	0.003	
Vanadium	mg/kg dw	0.44		0.18		0.54	
Zinc	mg/kg dw	14		7.44		24	
Phosphorus	mg/kg dw	1960		929		2540	

Notes:

Q - Qualifier

U - less than detection

Yellow highlighted cells exceed background.

ATTACHMENT A

HORNET CANYON WEEKLY INSPECTIONS

Date: **4/16/2024**	*Field Personnel:* **DPS, KW**
Weather: **Sunny & Snow Covered**	*Purpose: Document visual observations of ore slurry deposition and movement, growth or stress of vegetation in areas affected by the ore slurry, observations of wildlife activity or sign, and evidence of recreation or grazing activities.*

Site Conditions

Winter conditions persist with 100% of Hornet Canyon covered by a minimum foot of snow. Diamond Creek road is only navigable via snowmobile. There has been significant snow melt, but no runoff was observed.

AREA OBSERVATIONS

Erosion Features (ore deposition & movement)	None observed
Stream Characteristics	Hornet Canyon has no surface water present. Diamond Creek is mostly covered in snow and ice with some pockets of open water. Water is clear and flow is low.
Vegetation Characteristics (Including any noxious weeds observed)	None observed
Wildlife Observations	None observed
Recreational or Grazing Activity	None observed

PHOTOS

POINT (if applicable)	*Description*	*PHOTO ID*
ST_UpperTree	Uppermost cleanup area tree sediment trap	240416_Photo-3
ST_LowerTree	Lower cleanup area tree sediment trap	240416_Photo-2
ST_Strawbale	Lower cleanup area wood straw sediment near NFD Road 229	240416_Photo-1

Uppermost cleanup area tree sediment trap

Uppermost cleanup area tree sediment trap

Uppermost cleanup area tree sediment trap

HORNET CANYON WEEKLY INSPECTIONS

Date: **4/24/2024**	*Field Personnel:* **DPS, EZH**
Weather: **Sunny**	*Purpose: Document visual observations of ore slurry deposition and movement, growth or stress of vegetation in areas affected by the ore slurry, observations of wildlife activity or sign, and evidence of recreation or grazing activities.*

Site Conditions

Winter conditions persist with 75% of Hornet Canyon covered by a minimum foot of snow. Snowless pockets are observed in tree wells and south slopes. Diamond Creek road is only navigable via snowmobile. There has been significant snow melt.

AREA OBSERVATIONS

Erosion Features (ore deposition & movement)	None observed
Stream Characteristics	Hornet Canyon has surface water flow present in some locations. The wood mulch sediment trap had no surface water flow; however, surface water was observed 50 yards upstream. Intermittent surface water flow was observed upstream in Hornet Canyon until snow covered impeded streambed observations.
Vegetation Characteristics (Including any noxious weeds observed)	None observed
Wildlife Observations	None observed
Recreational or Grazing Activity	None observed

PHOTOS

POINT	*Description*
ST_UpperTree	Uppermost cleanup area tree sediment trap
ST_LowerTree	Lower cleanup area tree sediment trap
ST_Strawbale	Lower cleanup area wood straw sediment near NFD Road 229
Water_Observation_1	Lowest Elevation surface flow on Hornet Canyon; approximately 100 yards upstream on the mulch bale sediment trap.

Uppermost cleanup area tree sediment trap

Lower cleanup area tree sediment trap

Lower cleanup area wood straw sediment near NFD Road 229

Lowest Elevation surface flow on Hornet Canyon; approximately 100 yards upstream on the mulch bale sediment trap.

HORNET CANYON WEEKLY INSPECTIONS

Date: **5/02/2024**	*Field Personnel:* **DPS**
Weather: **Cloudy**	*Purpose: Document visual observations of ore slurry deposition and movement, growth or stress of vegetation in areas affected by the ore slurry, observations of wildlife activity or sign, and evidence of recreation or grazing activities.*

Site Conditions

Winter conditions persist with 50% of Hornet Canyon covered in snow. Diamond Creek road has been opened and plowed to support construction activities along the Simplot slurry pipeline. Access to the upper portions of Hornet Canyon would require snowshoes.

AREA OBSERVATIONS

Erosion Features (ore deposition & movement)	None observed
Stream Characteristics	Hornet Canyon has surface water flow present throughout the lower portion inspected. The stream flow is clear with no visual turbidity. No sediment or ore deposition was observed at the straw-mulch bale sediment trap along the lower portion of Hornet Canyon.
Vegetation Characteristics (Including any noxious weeds observed)	None observed
Wildlife Observations	None observed
Recreational or Grazing Activity	None observed

PHOTOS

POINT (if applicable)	*Description*	*Photo ID*
ST_Strawbale	Lower cleanup area wood straw sediment near NFD Road 229	240502_Photo-2
Water_Observation	Lowest Elevation surface flow on Hornet Canyon	240502_Photo-1

Lowest Elevation surface flow on Hornet Canyon

Lower cleanup area wood straw sediment near NFD Road 229

May 15, 2024 Photos for Best Management Practices (BMPs)

Lower straw bale BMP

Lower Tree BMP

HORNET CANYON WEEKLY INSPECTIONS

Date: **5/23/2024**	*Field Personnel:* **DPS**
Weather: **Cloudy**	*Purpose: Document visual observations of ore slurry deposition and movement, growth or stress of vegetation in areas affected by the ore slurry, observations of wildlife activity or sign, and evidence of recreation or grazing activities.*

Site Conditions

Snowpack remains in the upper reaches of the north slope along the upper reaches of Hornet Canyon. New snowfall covers 100% of the area in depths ranging from 4" to 12". Conditions are cold and snowy with clear, warm weather anticipated in the coming days.

AREA OBSERVATIONS

Erosion Features (ore deposition & movement)	None observed
Stream Characteristics	Hornet Canyon has surface water flow present. Flow has increased at the lower reaches (ST_Strawbale and Water_Observation) and flows appear similar farther upstream at the two tree sediment traps. Water clarity is high.
Vegetation Characteristics (Including any noxious weeds observed)	None observed
Wildlife Observations	None observed
Recreational or Grazing Activity	None observed

PHOTOS

POINT (if applicable)	*Description*	*Photo ID*
ST_Strawbale	Lower cleanup area wood straw sediment near NFD Road 229	240523_Photo-1
Water_Observation	Lowest Elevation surface flow on Hornet Canyon	240523_Photo-2
ST-LowerTree	Lowermost tree sediment trap	240523_Photo-3
ST-UpperTree	Uppermost tree sediment trap	240523_Photo-4 & 240523_Photo-5

Lower cleanup area wood straw sediment near NFD Road 229

Lowest Elevation surface flow on Hornet Canyon

Lowermost tree sediment trap

Uppermost tree sediment trap

Uppermost tree sediment trap

HORNET CANYON WEEKLY INSPECTIONS

Date: ***6/12/2024***	*Field Personnel:* **DPS**
Weather: **Cloudy**	*Purpose: Document visual observations of ore slurry deposition and movement, growth or stress of vegetation in areas affected by the ore slurry, observations of wildlife activity or sign, and evidence of recreation or grazing activities.*

Site Conditions

Snow is absent through the lower reaches of Hornet Canyon and is likely absent throughout, with some snow drifts persisting along the north aspect of ridge tops.

AREA OBSERVATIONS

Erosion Features (ore deposition & movement)	Deposition of ore was observed along bank edges in recent vegetation growth as well as immediately downstream of logs and rocks. Silt composed of native sediment and ore was observed depositing above sediment traps with depths exceeding 6" at the uppermost tree sediment trap. On 6/12/2024, additional straw mulch bales were installed. 19 bales were installed above and below the Uppermost tree sediment trap to improve water retention and filtration as well as deflect the flow away from the access road. Two additional bales were placed along the wood mulch sediment trap at the bottom of Hornet Canyon.
Stream Characteristics	Hornet Canyon peak flow was likely on 6/11/2024 or soon before. When observed on 6/12/2024, stream clarity was improved from the day prior, with no visual indication of increased flow. An estimated 4.4 cfs (+/- 20%) peak flow was calculated through a culvert near the wood mulch sediment trap using Mannings Equation. 6/11/2024, water appeared turbid, and when an informal visual observation was performed, fines of native sediment and presumed ore settled in the container. A field observation approximately 1600 ft downstream of the proposed cleanup terminus noted improved stream clarity, see photo 240611_Photo-3 attached. 6/12/2024, some improved water clarity along the lower reach of Hornet Canyon, flow did not appear to be increased.
Vegetation Characteristics (Including any noxious weeds observed)	Vegetation growth is prominent with many annual and perennial forbs budded or flowering. Graminoids are at shin height and trees/shrubs have leafed out.
Wildlife Observations	Moose tracks were observed; various migratory birds were present and were observed audibly.
Recreational or Grazing Activity	Dirt bike tracks were observed along the lower reaches of Hornet Canyon above the boulder deterrents. USFS has posted no camping signs in the area.

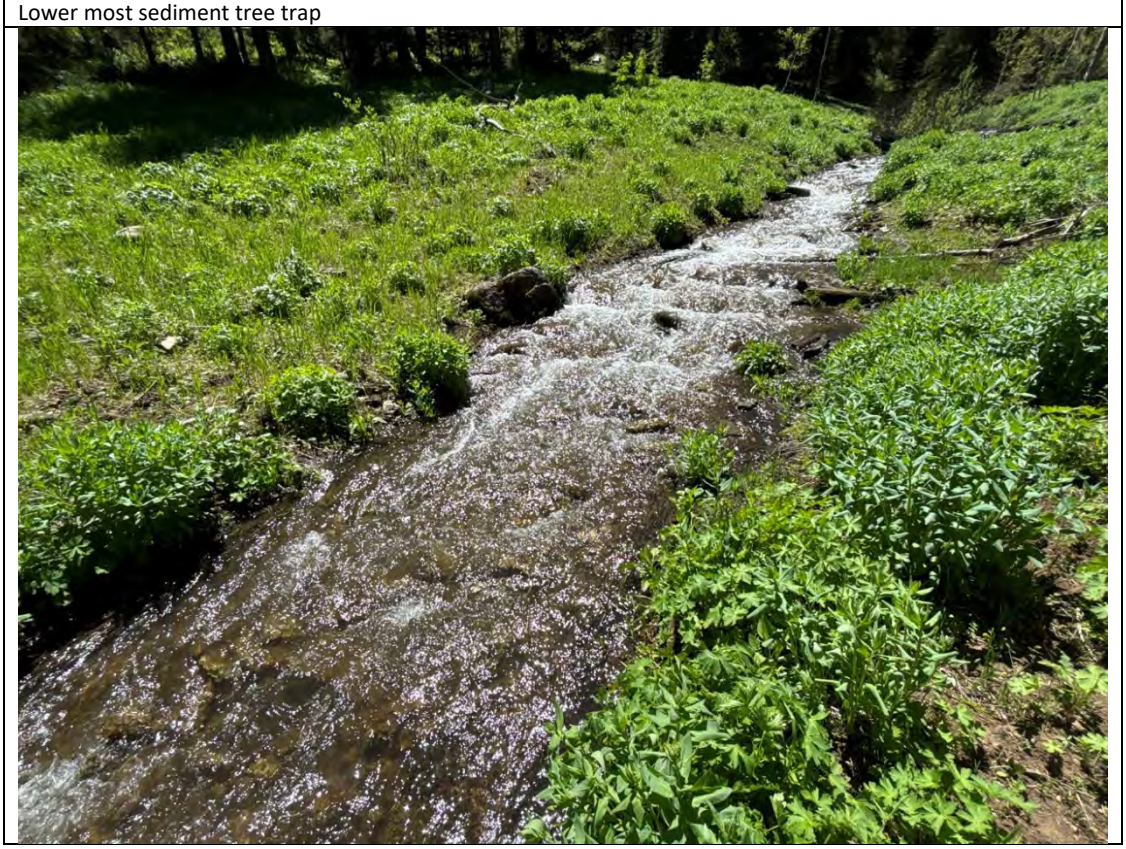
PHOTOS

POINT (if applicable)	*Description*	*Photo ID*
ST_Strawbale	Wood mulch sediment trap	240611_Photo-1
HC_observation1	Observation of improved water clarity	240611_Photo-3
ST-LowerTree	Lower most sediment tree trap	240611_Photo-2
ST-UpperTree	Upper most sediment tree trap after additional wood bales were installed	240612_Photo-2
ST-UpperTree	Immediately downstream of the upper most sediment tree trap after wood bales were installed to deflect flow onto the access road	240612_Photo-3

Wood mulch sediment trap

Observation of improved water clarity

Lower most sediment tree trap



Upper most sediment tree trap after additional wood bales were installed

Immediately downstream of the upper most sediment tree trap after wood bales were installed to deflect flow onto the access road

HORNET CANYON WEEKLY INSPECTIONS

Date: **7/11/2024**	*Field Personnel:* **DPS**
Weather: **Sunny**	*Purpose: Document visual observations of ore slurry deposition and movement, growth or stress of vegetation in areas affected by the ore slurry, observations of wildlife activity or sign, and evidence of recreation or grazing activities.*

Site Conditions

Hornet Canyon flow has receded since peaking in June; water clarity is high, and velocity is visibly lower. Vegetation is green and lush, no evidence of drought stress was observed in the area.

AREA OBSERVATIONS

Erosion Features (ore deposition & movement)	Deposition of ore has been observed at the sediment traps placed on the lower reaches of Hornet Canyon. New banks of ore were deposited above these BMPs. The lowest sediment trap composed of straw mulch bales deposited mostly sediment upstream of the trap. These straw mulch bales have captured sediment within the bales, significantly reducing water flow and pooling water upstream.
Stream Characteristics	The stream in Hornet Canyon is clear, flow has subsided.
Vegetation Characteristics (Including any noxious weeds observed)	Vegetation growth is prominent throughout. There was no observed vegetation with characteristic signs of stress observed along deposits of ore. No vegetation appeared diseased or infested with insects. No noxious weeds were observed.
Wildlife Observations	Moose tracks were observed in ore deposits at the uppermost tree sediment trap. Additionally, deer tracks were observed at the lowermost tree sediment trap. No other wildlife or wildlife sign was observed.
Recreational or Grazing Activity	No sign of recreation or grazing activities were observed in Hornet Canyon.

PHOTOS

POINT (if applicable)	*Description*	*Photo ID*
ST_Strawbale	Wood mulch sediment trap	240711_Photo-1
ST-LowerTree	Lowermost Sediment Trap with ore settling upstream	240711_Photo-2
Moose Tracks	Moose traps in ore at uppermost sediment trap	240711_Photo-3
Deer Tracks	Deer traps in ore at lowermost sediment trap	240711_Photo-4

Wood mulch sediment trap

Lowermost Sediment Trap with ore settling upstream

Moose traps in ore at uppermost sediment trap

Deer traps in ore at lowermost sediment trap

ATTACHMENT B

Photo 1: LDC-YJC

Photo 2: LDC-CAM Upstream

Photo 3: LDC-CAM Downstream

Photo 4: LDC B Upstream

Photo 5: LDC B Downstream

Photo 6: LDC4 Upstream

Photo 7: LDC4 Downstream

Photo 8: LDC OR Downstream

Photo 9: LDC OR Upstream

Photo 10: LDC2 Downstream

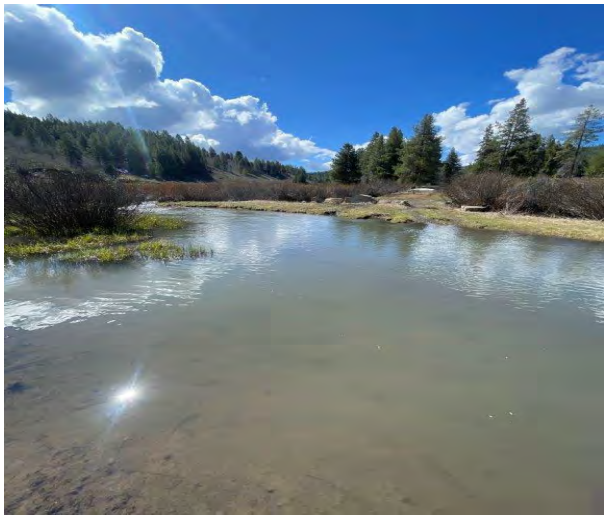


Photo 11: LDC2 Upstream

Photo 12: LDC1

Photo 13: UDC2 Downstream

Photo 14: UDC2 Upstream

Photo 15: UDC-BC Upstream

Photo 16: UDC-BC Downstream

Photo 17: UDC3 Upstream (06/2024)

Photo 18: UDC3 Downstream (06/2024)

Photo 19: UDC4

Photo 20: UDC5 Upstream

Photo 21: UDC5 Downstream

Photo 1: HCL4/LHC Upstream

Photo 2: HCL4/LHC Downstream

Photo 3: MHC Upstream

Photo 4: MHC Downstream

Photo 5: HCT3 Downstream

Photo 6: HCT3 Upstream

Photo 7: HCT2 snow cover

Photo 8: HCT2 stream access

Photo 9: MHCT2 snow cover

Photo 10: MHCT2 stream access

Photo 11: Road access snow cover

Photo 12: Sediment trap

Photo 13: Sediment trap

Photo 14: UHC2 O stream access

Photo 15: UHC2 O stream access

Photo 16: UHC2 O stream access

Photo 17: UHC2 O stream access

Photo 18: UHC2 N snow cover

Photo 19: UHC2 N snow cover

Photo 20: UHC2 N stream access

Photo 21: UHC2 Upstream

Photo 22: UHC2 Downstream

Photo 23: UHC4 N Downstream

Photo 24: UHC4 N Upstream

ATTACHMENT C

Monitoring Point 1	
9/14/2023	06/11/2024
	
Monitoring Point 2	
9/14/2023	06/11/2024
	
Monitoring Point 3	
9/14/2023	06/11/2024
	

Monitoring Point 4	
9/14/2023	06/11/2024
	
Monitoring Point 5	
9/14/2023	06/11/2024
	

Straw Mulch Sediment Trap	
9/14/2023	07/11/2024
	
Lowermost Tree Sediment Trap	
9/14/2023	07/11/2024
	
Uppermost Tree Sediment Trap	
9/14/2023	06/11/2024
	

ATTACHMENT D

TECHNICAL MEMORANDUM

SEPTEMBER 2023 BENTHIC COMMUNITY EVALUATION – DIAMOND CREEK

PREPARED FOR: Lori Lusty, J.R. Simplot Company

PREPARED BY: Formation Environmental, LLC

DATE: 11/30/2023

1 BACKGROUND

On September 14, 2023, site investigations were completed in response to a phosphate ore slurry release in Hornet Canyon that occurred during the winter of 2023. A wet weather drainage within Hornet Canyon runs along the north side of Hornet Canyon Road and eventually drains to Diamond Creek at a road crossing with Diamond Creek Road (1102). During the spring runoff, slurried phosphate ore was transported down Hornet Canyon into Diamond Creek. Idaho Department of Environmental Quality (IDEQ) requested additional sampling be conducted, consistent with their Beneficial Use Reconnaissance Protocol (BURP) to assess the potential impacts of the ore release to the Diamond Creek benthic community. Sampling locations in the closest available riffle habitats were established upstream of the ore release, Upper Diamond Creek (UDC-BC) and downstream within the potential zone of influence, Lower Diamond Creek (LDC-BC) (Figure 1). Consistent with the BURP protocol, the in-stream conditions were characterized, including collecting surface water samples, measuring substrate types and size classes (Wolman Pebble Counts), visually assessing substrate embeddedness, and collecting quantitative benthic macroinvertebrate community samples at three riffles per Diamond Creek location. The following narrative provides methods and results for this assessment.

2 SAMPLING AND RESULTS

2.1 SURFACE WATER

As requested by IDEQ, surface water samples for total and dissolved phosphorus were collected at the locations shown on Figure 1 in Diamond Creek. Bulk water samples were collected using a 1-L cubitainer filled directly from the stream. The bulk water samples were post processed using a peristaltic pump and new tubing to pump water from the cubitainer into sample bottles for each location. Approximately 100 ml volume of water was pumped through the tubing before samples bottles were filled. The total sample bottle was filled, labeled and placed on ice in a sample transport cooler. For the dissolved sample, a 0.45 um filter (new) was attached to the tubing, filled with sample water via pumping allow approximately 100 ml of volume to be pumped through the filter, then the sample bottle was filled with filtered water from the bulk container, labeled, and

placed on ice in a sample transport cooler. Samples were shipped to SVL under chain of custody seal.

Figure 1. Diamond Creek Sampling Locations

Concentrations of total and dissolved phosphorus shown in Table 1 below indicate that both total and dissolved phosphorus in the LDC2 sample downstream of Hornet Canyon were lower than the upstream sample collected at UDCBC in Diamond Creek. The surface water data indicate no increase in the concentrations of phosphorus in water due to the slurried ore release.

Table 1. Total and dissolved phosphorus in surface water.

Location	Total (mg/L)	Dissolved (mg/L)
UDCBC	0.0462	0.0308
LDC2	0.0264	0.0272

2.2 IN STREAM HABITAT

Stream embeddedness is a measure of fine sediment deposition on the stream substrate. The embeddedness value relates to the suitability of a stream channel for fish spawning, egg incubation, fish cover, and macroinvertebrate habitat. Embeddedness was determined visually and rated on a scale from 0 to 20 (0 being not embedded and 20 being heavily embedded) based on the observed percentage of gravel, rubble, and boulder substrate covered by fine sediment. Embeddedness observation locations were approached from downstream, and ratings were determined prior to macroinvertebrate collection so as not to disturb stream sediments.

The Wolman Pebble Count is a direct measure of substrate particle sizes in a stream. At each of the riffles where benthic macroinvertebrate samples were collected, 50 individual in-stream substrate particles were measured with a metric ruler. These data are tabulated into size classes including silts, sands, gravels, cobbles, and boulders.

Physical substrate data are shown in Table 2. Embeddedness observations were 25 and 40% at UDC-BC and LDC-BC transects, respectively. These observations result in embeddedness scores of 15 and 12 at UDC-BC and LDC-BC locations, respectively, indicating a higher percentage of fines surrounding larger substrates at the LDC-BC location. Based on the pebble count data, the % fines were determined to 11 and 18% at UDC-BC and LDC-BC, respectively, indicating a higher percentage of fine substrates at the LDC-BC location compared to the UDC-BC location. Both the qualitative and quantitative substrate measures indicated a higher percentage of fines at the LDC-BC location.

Table 2. Diamond Creek Substrate Characteristics

	UDC-BC					LDC-BC				
	T-001	**T-002**	**T-003**	**total**	**%**	**T-001**	**T-002**	**T-003**	**total**	**%**
Class description and size										
Silt / Clay <1mm	0	5	2	7	4.67	2	5	7	14	9.33
Sand <2.5 mm	0	1	1	2	1.33	0	1	3	4	2.67
Very Fine Pebble <6 mm	3	1	4	8	5.33	0	5	4	9	6.00
Pebble <16 mm	4	6	3	13	8.67	2	25	8	35	23.33
Coarse Pebble <32 mm	5	6	3	14	9.33	24	13	17	54	36.00
Very Coarse Pebble <64 mm	15	11	17	43	28.67	16	1	10	27	18.00
Small Cobble <128 mm	18	19	18	55	36.67	6	0	1	7	4.67
Large Cobble <256 mm	5	1	2	8	5.33	0	0	0	0	0.00
Small Boulder <512 mm	0	0	0	0	0.00	0	0	0	0	0.00
Medium Boulder <1024 mm	0	0	0	0	0.00	0	0	0	0	0.00
Large Boulder >1024 mm	0	0	0	0	0.00	0	0	0	0	0.00
Total	50	50	50			50	50	50		
% fines (<6 mm)					**11.33**					**18.00**
D(50) median					**54**					**20**
Embeddeddness					**25%**					**40%**
Embeddeddness score					**15**					**12**

2.3 BENTHIC MACROINVERTBRATES

Three replicate macroinvertebrate samples were collected at each sampling location using a Surber square-bottom sampler (12x12") with a 500-micron net. The sampler was secured on the undisturbed substrate bottom for each transect sample. Debris and rocks from within the sampler frame were washed with a gloved hand in the mouth of the net to dislodge invertebrates, and then substrate sediments were agitated to a depth of about 10 cm to dislodge buried invertebrates. The sampler was lifted, and the sides of the net washed to move all captured material to the bottom of the net. Net contents were transferred to a sample container by washing the net bottom into the sample container and using forceps to remove any invertebrates clinging to the net. Samples from each location were fixated with 10% buffered formalin and preserved with isopropyl alcohol.

Samples were packed in a hard sided cooler and shipped to a benthic taxonomist for processing. Upon receipt the samples were checked in, assessed for condition and preservation. For initial processing the preservative was decanted from the sample and each sample was rinsed with tap water in 500-micron sieve and transferred to a plastic sorting pan. A benthic taxonomist using forceps removed the benthic organisms from the organic debris and sediments and placed them in a glass vial with isopropyl alcohol. A wide field stereomicroscope was used to further examine the remaining sample debris for missed invertebrates. Each invertebrate was identified to the lowest practical taxonomic level (generally genus/species), counted, and recorded on laboratory bench sheets.

The following metrics were calculated: number of taxa, mean density (and standard deviation over three replicates), relative abundance, Shannon-Weiner community diversity index, and Evenness. In addition, IDEQ's Small Stream Ecological Assessment Framework: An Integrated Approach (Grafe 2002; Jessup and Gerritsen 2000) provides documentation and methods for deriving a Stream Macroinvertebrate Index (SMI). The nine metrics calculated from the benthic community samples in order to derive the SMI are total taxa, Ephemeroptera taxa, Plecoptera taxa, percent Plecoptera, Trichoptera taxa, Hilsenhoff Biotic Index (HBI), percentage of five dominant taxa, scraper taxa, and clinger taxa. Location SMI scores were compared to ecoregion reference scores to rank the condition of each location within the appropriate ecoregion.

Benthic community data are presented in Table 3. Overall species composition was within the range of what is seasonally and biogeographically expected for a stream of this size in the area. The lower site (LDC-BC), within the potential zone of the slurried ore release, had significantly higher diversity with total taxa numbers of 22 individual species compared to only 16 at the upstream location (UDC-BC). That represents approximately 27% more species. Overall abundances between the two locations were more similar, but again higher at the lower site with 1080 individual organisms per square meter (organisms/m^2), compared to 900 organisms/m^2. As expected, the two locations were relatively similar in species composition, with approximately 46% of the species found at both locations. Taxa numbers and density can be directly proportional to habitat quality. Diamond Creek within the area is relatively low gradient, with very little stable

open riffle habitat. This is evident in both locations receiving SMI condition ratings of 1, placing them at less than the 10th percentile of reference condition (Table 4). The low SMI scores suggest potentially impacted conditions present at both locations.

2.4 SUMMARY

Sampling of surface water, substrate characteristics, and benthic community composition in Diamond Creek following the slurried ore release near the top of Hornet Canyon does not reveal any negative impacts to the benthic community in Diamond Creek downstream of Hornet Canyon. Surface water data indicates no increased phosphorus in Diamond Creek downstream of Hornet Canyon. Evidence of ore was present and an increase in fine substrates was observed at the downstream Diamond Creek location compared to the upstream location. Considering the benthic community data, including composition, abundance, and SMI scores, the benthic community data suggests both upper and lower Diamond Creek sites are likely impacted, but not apparently due to the slurried ore release. If either the fine materials from the slurried ore or chemical makeup of the ore were contributing to benthic community effects, a high presence of fines and significant shift in the benthic community composition would be expected at the lower Diamond Creek location; however, this was not observed.

2.5 REFERENCES

Grafe, C.S., ed. 2002. Idaho Small Stream Ecological Assessment Framework: An Integrated Approach. Idaho Department of Environmental Quality; Boise, Idaho.

Jessup, B and J. Gerritsen. 2000. Development of a Multimetric Index for Biological Assessement of Idaho Streams Using Benthic Macroinvertebrates. Prepared for the Idaho Department of Environmental Quality. Tetra Tech, Inc. Owings Mills, Maryland. 43 pp.

Table 3. Benthic Macroinvertebrate Data – Diamond Creek

Order	Genus	Habitat/ Behavior	Functional Feeding Groups	Tolerance	Voltinism	Stream	Diamond Creek				Diamond Creek			
						Location	LDC				UDC			
						Sample ID	LDC-BC001	LDC-BC002	LDC-BC003	Composite	UDC-BC001	UDC-BC002	UDC-BC003	Composite
						Date	09/14/23	09/14/23	09/14/23	09/14/23	09/14/23	09/14/23	09/14/23	09/14/23
Ephemeroptera	*Ameletus sp.*	CN/SW	SC/CG	4	uni				3	3				0
	Baetis tricaudatus	CN/SW	SC/CG	7	semi		21	18	11	50	61	38	4	103
	Drunella grandis	CN/SP	CG/SC/P	6	uni		1			1				0
	Ephemerella dorothea infrequens	CN/SW	CG	7	uni					0	1			1
Plecoptera	*Hesperoperla pacifica*	CN	P	6	semi					0	8	4	8	20
	Malenka sp.	CN	SH	6	uni				1	1	4	3		7
	Skwala sp.	CN	P	6	uni			4	5	9	2	1		3
	Sweltsa sp.	CN	P	5	semi		3	1	13	17	1	3	11	15
Trichoptera	*Dicosmoecus sp.*	SP	SC/SH	1	semi			3		3	6			6
	Homophylax sp.	CN	SH	2	uni				2	2				0
	Rhyacophila sp.	CN	P	4	uni				1	1		1		1
Coleoptera	*Brychius sp.*	CB	SC	9	multi					0	16	1		17
	Haliplus sp.	CN	SH	9	multi		1	1		2				0
	Optioservus quadrimaculatus	CN	CG/SC	7	semi		8	3	6	17	8	7	9	24
	Zaitzevia paravula	CN	CG/SC	7	semi		1			1				0
Diptera	*Atherix sp.*	SP/BU	P	7	semi				1	1				0
	Hexatoma sp.	BU	P	4	uni				3	3	1			1
	Muscidae	BU	P	8	multi		1			1				0
	Probezzia sp.	BU	P	6	multi					0			1	1
	Simulium sp.	CN	F	6	multi		10	2	3	15	14	1	4	19
	Tipula sp.	BU	SH	6	semi			1		1				0
Chironomidae (family)	Chironomidae	BU/SP	CG/SH/P	6	uni/multi		29	28	56	113	18	2		20
Oligochaeta (class)	Oligochaeta	BU	CG	6			6	3	33	42	4	8		12
Bivalvia (class)	*Pisidium sp.*	BU	F	5				1	3	4		1		1
Gastropoda	*Physella sp.*	CN	SC	9				11	2	13				0
	Fossaria sp.	CN	SC	5				1		1				0
						% Subsampled	**100**	**100**	**100**	**--**	**100**	**100**	**100**	**--**
						Total Abundance	**81**	**77**	**143**	**301**	**144**	**70**	**37**	**251**
						Total taxa	**10**	**13**	**15**	**22**	**13**	**12**	**6**	**16**
						Density (#/1m^2)	**872**	**829**	**1539**	**1080.0**	**1550**	**753**	**398**	**900.6**
						Mean Density (#/1m^2)				**1080.0**				**900.6**
						Standard Deviation				*398.3*				*589.8*
						Shannon-Weiner Diversity Index-H'				**2.07**				**0.52**
						Eveness				**0.67**				**0.19**

Functional Feeding Groups (FFG): CG = Collector-Gatherer, SC = Scraper, F = Filterer, P = Predator, PA = Parasite, SH = Shredder, OM = Omnivore **Habitat/Behavior (Hab/Beh):** BU = Burrower, SW = Swimmer, CN = Clinger, CB = Climber, SP = Sprawler, DV = Diver

Table 4. Stream Macroinvertebrate Index

Metrics	**Metric Scoring Formulas**	**UDC**	**LDC**
Total Taxa	100*(Total Taxa)/95th	43.24	56.76
Ephemeroptera Taxa	100*(Ephemeroptera Taxa)/95th	20.00	30.00
Plecoptera Taxa	100*(Plecoptera Taxa)/95th	50.00	37.50
Trichoptera Taxa	100*(Trichoptera Taxa)/95th	22.22	33.33
Percent Plecoptera	100*(%Plectoptera)/95th	71.71	36.00
Hilsenhoff Biotic Index (HBI)	100*(10 - HBI)/(10 - 5th)	43.58	47.25
Percent 5 Dominant Taxa	100*(100 -%5dom)/(100 - 5th)	55.10	43.26
Scraper Taxa	100*(Scraper Taxa)/95th	37.50	62.50
Clinger Taxa	100*(Clinger Taxa)/95th	47.37	68.42
	Total	**43.41**	**46.11**
	Condition Rating	**1**	**1**