Sampling Activities Report
2019 Pre-CERCLA Screening
July 2019 and September 2019
Final

Little Dora and North Star Mines
San Juan County, Colorado

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Acronym and Abbreviations List

BPMD	Bonita Peak Mining District
ºC	degrees Celsius
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cfs	cubic feet per second
COC	chain of custody
DM	dissolved metals
DO	dissolved oxygen
DOC	dissolved organic carbon
DRMS	Division of Reclamation, Mining and Safety
EDCD	electronic data collection device
EPA	United States Environmental Protection Agency
ESAT	Environmental Services Assistance Team
ESV	ecological screening value
GPS	Global Positioning System
HDPE	high density polyethylene
mg/L	milligrams per liter
mL	milliliter
PCS	Pre-CERCLA Screening
QA/QC	quality assurance/quality control
RPD	relative percent difference
SAP/QAPP	sampling and analysis plan/quality assurance project plan
SAR	sampling activities report
SOP	standard operating procedure
TU	Trout Unlimited
TRM	total recoverable metals
µS/cm	microsiemens per centimeter
µg/L	micrograms per liter
USFWS	U.S. Fish and Wildlife Service

1.0 Introduction

This Sampling Activities Report (SAR) describes fieldwork and laboratory-related activities associated with the 2019 Pre-Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Screening (PCS) project for the Little Dora and North Star mines. This SAR also provides sample collection documentation, field data, quality control summary, and analytical chemistry results associated with the 2019 PCS sampling activities. Surface water sampling, laboratory methods, and data reporting were completed in compliance with the U.S. Environmental Protection Agency (EPA) approved Little Dora and North Star mines Sampling and Analysis Plan/Quality Assurance Project Plans (SAP/QAPPs) and accompanying Standard Operating Procedures ([SOPs]; EPA, 2019c,d).

In July (high flow) and September (low flow) of 2019, the EPA Site Assessment Program, working in cooperation with the Colorado Division of Reclamation, Mining and Safety (DRMS), Colorado Department of Public Health and Environment (CDPHE), U.S. Fish and Wildlife Service (USFWS), and Trout Unlimited (TU), with assistance provided by EPA Region 8 Environmental Services Assessment Team (ESAT), conducted focused field events at the Little Dora and North Star mines in San Juan County outside of Silverton, Colorado. PCS and environmental sampling support objectives are documented in the high and low flow EPA SAP/QAPPs (EPA, 2019c,d). These objectives include: 1) determine seasonal loading and concentrations of metals and water chemistry/quality degradation stemming from Little Dora and North Star mines; 2) assessing potential for human health and environmental impacts; and 3) provide information to support cleanup decisions at the two mine sites.

The above objectives are addressed by conducting PCS sampling activities that include collecting the following information sources:

- Concentrations of metals, anions, and various water chemistry parameters in surface water samples collected at predetermined sampling locations in streams and adit discharges during high and low flow conditions;
- Real-time water quality parameter measurements collected at the same times and locations as surface water samples;
- Stream flow/discharge measurements at the same times and locations as surface water samples; and
- Site photographs and other supplemental observations collected at all sampling locations.

This SAR describes environmental sampling and field data collection methods and provides analytical chemistry and field data results obtained during the high and low flow PCS environmental sampling field events. It also provides relevant human health- and ecological-based water quality screening values that can be used to assess the relative impacts of mine site

contamination sources to surface waters. As an independent activity during the PCS field and analytical data collection, EPA-required PCS survey activities were also performed. While this SAR does not specifically describe or provide PCS survey activities or results, information provided herein can be used to complete the EPA PCS Checklist/Decision Forms and inform potential cleanup decisions for each mine.

The remainder of this SAR includes background information that justifies project implementation (Section 2.0), a summary of general site activities (Section 3.0), details on sampling and analyses (Section 4.0), sample quality control information (Section 5.0) and a description of SAP/QAPP deviations (Section 6.0). Cited references are provided in Section 7.0. Field sampling and analytical data are provided in a series of tables and appendices associated with this SAR.

2.0 Background

The Animas River watershed originates in the San Juan Mountains in San Juan County, Colorado. Many mine features are located throughout the upper Animas River watershed which includes Mineral and Cement creek watersheds near and above Silverton, Colorado. Combined, these watersheds make up the Bonita Peak Mining District (BPMD). Water and runoff from headwater reaches of the BPMD flows downriver into the mainstem Animas River through the City of Durango and eventually into the San Juan River in Farmington, New Mexico. Both Little Dora and North Star mines are adjacent to lower Mineral Creek near its confluence with the Animas River and the town of Silverton. As such, the two mines are close to the most downgradient sections of the BPMD.

Historical investigations have identified elevated concentrations of mine-related contaminants in the BPMD watershed; specifically, near mine waste areas, in adjacent surface waters, in floodplain soils, and in sediments (EPA, 2017a; 2019a). Such contaminants include, but are not limited to aluminum, arsenic, cadmium, copper, lead, manganese, and zinc. These contaminants have potential to impact recreational users, fish populations, benthic macroinvertebrates, aquatic dependent wildlife communities, and wetland biomes.

Rapid snowmelt or heavy rains may directly erode waste piles, thereby physically entraining metals contaminated soil particles into the adjacent waterbodies and depositing them into the substrate. Subsequent high flow conditions during the annual snowmelt may entrain these particles and move them further downstream or deposit them along the bottoms and banks of the waterways, depending on the local topography. Seasonal low flow conditions occur in late summer through fall and are typically sustained by groundwater outflow to surface water. These hydrological conditions can influence the concentrations of metals and water quality which can be very different than what occurs during snowmelt-dominated high flow conditions. As such, characterization of metals impacts to local waterbodies needs to consider changes in respective water sources and discharges that occur during high and low flow hydroperiods.

Adit and seep discharges from Little Dora and North Star mines may flow over and through mine workings and eventually into Mineral Creek and then the Animas River. Any ongoing releases

from these two mines have potential to release metals-laden water and other mine wastes into these downgradient surface water features. Various organizations have previously conducted some limited sampling at Little Dora and North Star mines; however, more recent and spatially extensive information is currently needed to thoroughly characterize current high and low flow discharges and associated impacts to downgradient surface water features. PCS surveys and respective sampling activities were implemented at the Little Dora and North Star mines during high and low flow conditions to obtain such information. It is intended that information on concentrations of metals, water quality impacts, and discharge rates collected throughout the two mines and receiving water features will support PCS activities and be the basis for on-going cleanup decisions.

3.0 Site Activities

PCS survey and sampling activities at the Little Dora and North Star mines were conducted July 24th and 25th, 2019 to characterize high flow conditions and September 23rd and 24th, 2019 to characterize low flow conditions. A total of 53 surface water samples were collected during these two events (**Table 3.1**). This total does not include field duplicate, field blank, or laboratory quality assurance/quality control samples. Three surface water field duplicate samples were collected during each high and low flow sampling event. A total of three field bank samples were collected. Approximate surface water sampling collection locations are provided in **Figure 3.1** for Little Dora Mine and **Figure 3.2** for North Star Mine. Coordinates and detailed sample location descriptions are provided in **Table 3.2**. Note that the map figures also show locations of waste pile soil composite samples that were collected at the two mines during BMPD-specific environmental monitoring 2019 field events. Waste pile sampling details and results are presented in the BMPD environmental monitoring SAR (EPA, 2020). However, respective waste pile sample analytical results are provided in **Attachment 1** this SAR.

Surface water sampling and analysis focused on locations that would best characterize heavy metals impacts of mine discharges to surface water features. Surface water and draining adit water sampling were also conducted to assess whether mine waste piles are impacting the adit drainage by absorbing/desorbing metals from/into mine adit drainage. When adit drainages were observed discharging across a waste pile, then two adit water grab samples were collected. One of these samples was collected at the point of discharge from the mine portal and the other at the base of a waste pile prior to discharging to an adjacent environment (vegetation/habitat or receiving water body). Adit water samples collected at the base of the waste pile are presumed to reflect fate and transport influences of metals on the adit discharges from mine wastes. Samples of the adit drainage after flowing across a pile at the base of the pile represent concentrations coming from the combined mine waste prior to discharging to a vegetation/habitat body or receiving water body.

Surface water grab samples were also collected from streams or other surface water features, up and downstream of the adit discharge and/or waste piles. Upstream surface water samples are not expected to be impacted by the respective mine waste materials or adit discharges. Surface water samples collected downgradient from each mine are expected to be impacted by heavy metals associated with respective mine features. Co-analysis of upstream and downstream surface water

sample results are used to assess the relative chemical impacts of heavy metals to receiving surface water features. **Table 3.2** describes attributes of all surface water sampling locations for the two mine sites.

All surface water samples were analyzed for dissolved metals (DM), total recoverable metals (TRM), and anions/alkalinity. These water chemistry attributes are known to be adversely affected by mine-related contamination sources. Specially, enrichment of metals, other anions, and sulfate and reduction in buffering capacity of surface waters (Church et al., 2007). Water samples were also analyzed for dissolved organic carbon (DOC) that can influence exposure and toxicity of aluminum to aquatic receptors (EPA, 2018a). Details regarding surface water sampling and analysis methods are summarized in Section 4.0 of this SAR.

Field water quality parameter measurements were collected at each surface water sampling location. Water quality parameters included temperature (degrees Celsius [ºC]), dissolved oxygen ([DO] in milligrams per liter [mg/L]), pH (standard units), and specific conductance (microsiemens per centimeter [µS/cm]). Similar to surface water sampling, water quality measurements were collected to assess mine-related impacts to local surface water features. Water quality results were also collected to assess whether surface waters could support aquatic life. For example, highly acidic waters or low DO levels are detrimental to aquatic organisms (Church et al., 2007; CDPHE, 2018b). In addition, pH is needed to calculate CDPHE (2018b) Regulation No. 31 chronic ecological screening values (ESV) standards for aluminum.

Flow measurements were taken (when possible) at each adit and receiving surface water feature near surface water grab sample locations. Adit and stream discharge (cubic feet per second [cfs]) were estimated from flume measurements per CDPHE (2016) guidance. Discharge estimates are useful when characterizing metals loading and relative mine impacts to surface waters.

A two mine waste samples were collected at Little Dora Mine and another six samples at North Star Mine to characterize concentrations of metals in areas potentially impacted by each mine. These samples were collected during the BPMD site monitoring program and only briefly described here. Mine waste samples are 30-point composites made from subsamples collected from mine waste piles and potential mill waste areas. Surficial mine waste materials were collected using a sample-dedicated plastic scoop and mixed in a new plastic bag before being divided into sample containers. Per the BPMD SAP/QAPP (EPA, 2019b), each mine waste sample was analyzed for TRM, *in vitro* bioaccessibility assay metals (arsenic and lead), acid-base accounting, and paste pH. More details on mine waste sampling and analyses are reported in the 2019 BPMD SAR (EPA, 2020). For reference, respective waste pile sample analytical results are provided for each mine in **Attachment 1** this SAR.

4.0 Sampling and Analysis Methods

Sampling and analyses of surface water followed the EPA (2019c,d) SAP/QAPPs, associated SOPs, and standard analytical methods. These methods are briefly described in this section.

Surface water grab samples were collected in accordance with the FLD-01.00 *Surface Water Sampling* SOP (EPA, 2012a). Specifically, by lowering the sample container into the middle of the water column at an approximate 45-degree angle facing upstream and allowing the container to fill. When water was too shallow to dip a sample bottle, a new certified pre-cleaned 60-milliliter (mL) syringe was used to transfer sampled water to sample bottles. Water samples for DM analysis were collected in a certified clean 250-mL high density polyethylene (HDPE) bottle after a triple rinse with water from the sample location. Collected water was then transferred and filtered through a 250-mL Nalgene™ filter bottle. The 250-mL HDPE bottle used to transfer the DMs sample was then refilled for TRM analysis. Samples for DM and TRM analyses were preserved with nitric acid in the field as soon after collection as possible in accordance with the FLD-03.00 *Sample Preservation* SOP (EPA, 2012b). Duplicate surface water grab samples were obtained by collecting two samples at a sample location at the same time using separate bottles and filters.

Surface water samples were analyzed for DM and TRM using EPA Methods 200.7/200.8 (EPA, 1994a,b). Water hardness was calculated from dissolved calcium and magnesium concentrations using the EPA Method 2340B (EPA, 1997) hardness equivalent equation. All surface water sample metals concentrations are reported as microgram per liter of water (µg/L) and hardness (calcium carbonate) in mg/L. All high flow surface water sample metals analytical results are provided in **Table 4.1** (DM results) and **Table 4.2** (TRM results). All low flow surface water sample metals analytical results are provided in **Table 4.3** (DM results) and **Table 4.4** (TRM results).

Wet chemistry samples were collected with TRM and DM samples at each surface water location. Sampling consisted of filling one 500-mL HDPE bottle for anions and alkalinity (unfiltered) and one 250-mL Nalgene™ filter bottle for DOC (filtered). Anions/alkalinity samples were not preserved but were cooled and kept at ≤4° C when in the field and laboratory. DOC samples were preserved using phosphoric acid in the field as soon after collection as possible. Anions samples were analyzed using EPA Method 300.0 (EPA, 1999), alkalinity using EPA Method 310.1 (EPA, 1978), and DOC using EPA Method 415.1 (EPA, 1974). All wet chemistry results are provided in **Table 4.5** (high flow) and **Table 4.6** (low flow).

All analytical and wet chemistry samples were placed in coolers with ice after collection and during transportation to the EPA Region 8 ESAT Laboratory in Denver, Colorado. When at the laboratory samples were stored at or just below 4ºC until analysis. Sample labels and chain of custody (COC) procedures were completed in accordance with the FLD-11.00 *Sample Custody and Labeling* SOP (EPA, 2012d). As such, all surface water samples were transferred from the field task lead to the EPA Region 8 ESAT Laboratory under strict COC procedures. Samples were either analyzed by the EPA Region 8 ESAT Laboratory or transferred, under COC, to an authorized EPA Region 8 Contract Laboratory Program laboratory for chemical analysis.

Water quality measurements were made at each surface water sampling location using *YSI© Professional Plus* handheld multiparameter water quality meter or a *YSI© EXO* handheld meter with a *YSI© EXO1* sonde to collect pH, temperature, DO, and specific conductance data. Water quality measurements were collected in accordance with manufacturer guidelines presented in

the *Professional Plus User Manual* (YSI, 2009) or the *EXO User Manual* (YSI, 2019). All water quality results were recorded in the field using an electronic data collection device (EDCD). All high and low flow sampling event water quality results are provided in **Table 4.7** and **Table 4.8**, respectively.

When possible, flow measurements were made at surface water sampling locations using a FlowTracker™ flow meter, Baski™ cutthroat flumes, or by timing how long it took to fill a graduated container. One-inch flumes were used for most flow measurements; however, larger flumes (up to 4-inch) were used when needed. The meter was used to measure flow when conditions precluded use of flumes in accordance with FLD-08.00 *Flow Tracker Operation* SOP (EPA, 2012c). The timed, graduated bucket or bag fill method was used when conditions precluded use of a flow meter or flume; specifically, when the sample location was extremely steep, complex, or had very little flow. When the graduated bucket and bag fill method was used, gallons per minute measurements were converted to cfs using a 0.002228 conversion factor in the field. Flow measurement results were recorded in the field using an EDCD and discharge estimates are provided in **Table 4.7** (high flow event) and **Table 4.8** (low flow event). FlowTraker™ discharge measurement summary reports for both sampling events are provided in **Appendix A.**

Sampling locations, water quality readings, photographs, and other pertinent information were recorded and documented in the field using EDCDs running the ESAT-designed Survey 123 application in accordance with *Survey123 for ArcGIS* SOP (EPA, 2017b). The complete photograph log for this project is provided in **Attachment 1** of this SAR. The remainder of EDCD field data not reported in **Tables 4.7** and **4.8**, including field conditions and sampling personnel, are provided in **Appendix B**.

Attachment 1 contains individual data packages for each mine. Each package contains all of the analytical chemistry, field water quality results, sampling photographs, and map figures for each mine. These data packages are used to individually document and disseminate all relevant information for each mine.

5.0 Sample Quality Control

This section details the quality control methods used in the field for activities performed during sampling. These include decontamination methods, field instrument calibration, duplicate sample collection, and blank sample collection. This section also summarizes analytical results obtained from duplicate and blank samples.

5.1 Decontamination Methods

New, disposable certified pre-cleaned water sample bottles and water filters were used to collect and store all surface water samples. Therefore, decontamination of these disposable materials was not necessary. No reusable field equipment that could contact or potentially contaminate environmental samples was used. Given that no decontamination was needed, no equipment rinsate blank samples were collected.

5.2 Field Instrument Calibration

Water quality meters were the only field instruments used throughout the 2019 sampling events.

Field water quality instrument calibration was conducted in accordance with manufacturer guidelines including *Professional Plus User Manual* (YSI, 2009). Water quality meters were calibrated daily for pH, DO, and specific conductance at the first sample location (initial calibration) and a calibration check was conducted at the end of each field day (post calibration). There was no appreciable difference between any initial and post calibration results throughout the course of this project.

5.3 Duplicate Sample Collection

Field duplicate surface water samples were collected with assessment samples throughout the course of the two sampling events. A total of six duplicate surface water samples were collected throughout both sampling events (rate of about 11%). This rate exceeds the minimum 10% rate of duplicate sample collection established in the approved SAP/QAPP (EPA, 2019c,d). All duplicate samples were collected and chemically analyzed as done for corresponding field samples. Duplicate sample results were compared to respective, co-located assessment sample results to derive relative percent difference (RPD) statistics.

Calculation of the RPD between assessment and corresponding duplicate samples provide a quantifiable means to evaluate sampling precision and correlation between samples. EPA *National Functional Guidance for Inorganic Superfund Methods Data Review* (EPA, 2017) recommends an RPD control limit of 20% for water matrices. Per standard guidance, RPD control limits are applicable when assessment and duplicate sample values are equal to or greater than five times the contract required quantitation limit. RPD values were calculated using the following equation:

RPD = 100*[ABS (Assessment Sample Result – Duplicate Sample Result)]/ [(0.5*(Assessment Sample Result + Duplicate Sample Result)]

Note: Absolute value (ABS)

RPD results are provided at the bottom of **Tables 4.1, 4.2, 4.3, 4.4, 4.5 and 4.6**. RPD results were generally within the SAP/QAPP-specified control limit of 20% when both assessment and corresponding duplicate samples results were ≥ five times respective contract required quantitation limits. Elevated RPD results were observed for dissolved iron (60%) at NS7_2_DM during the high flow sampling event (**Table 4.1**). This elevated RPD may be the result of relatively low iron concentrations measured in both samples and respective precision issues associated with analytical sensitivity since results were not within the ≥ five times the quantitation limit. All other RPD results were less than the specified ≤20% control limit.

5.4 Blanks

Field blank samples were collected to characterize any external contamination sources to surface water samples. A total of three field blank samples were collected among both sampling events. These samples were prepared using the same bottles and filters as field samples but used Region 8 ESAT Laboratory Millipore Milli-Q® prepared water instead of site surface water. Therefore, field blank samples are expected to be completely free of any metals. Blank samples were analyzed for DM, TRM, and wet chemistry parameters using the same methods as field samples. Results are provided in **Tables 4.1** through **4.6**. All but one measurement (total recoverable manganese) in one blank sample were less than the detection limits. Total recoverable manganese was measured (6.70 µg/L) just above the detection limit (<2.00 µg/L) in the blank sample collected on July 25, 2019 (**Table 4.2**). The source of manganese in this sample is unknown. However, the concentration is so low that any exogenous source(s) of manganese to corresponding assessment samples would have little impact to this study since most field sample results are an order of magnitude greater than the detected field blank sample concentration. The measured concentration is also lower than the human health or ecological surface water screening benchmarks (**Table 4.9** and **Table 4.10**).

6.0 Field Sampling Plan Deviations and Observations

This section summarizes deviations made in the field from what was prescribed in the EPA (2019c,d) SAP/QAPPs. Note that not all the SAP/QAPP-identified sampling locations were sampled. These are not considered deviations, since the SAP/QAPP clearly states that if drainage/water is not present, access is otherwise unavailable, or other on-site conditions cause unsafe conditions for any of the scheduled sample locations, attempts to sample at the given location will be aborted. The decision to not sample any of the prescribed locations was made in the field and approved by the field task lead. The following bullets provide descriptions and respective reasonings for each deviation.

<u>High flow sampling event deviations</u>:

- The SAP/QAPP *Table 3 North Star Mine Sample Locations and Descriptions*, specified that a duplicate surface water sample be collected at M34 during the high flow sampling event. However, a field duplicate sample was not collected at M34. The M34 duplicate sample was not collected because a duplicate was inadvertently collected at M38 prior to sampling M34. It was determined that the M38 duplicate would fulfill the M34 duplicate sampling requirements without adding more cost for sample analyses.

- The SAP/QAPP surface water sample locations tables specify sample location names/IDs for duplicate samples. However, all field data for duplicate samples were recorded with the parent sample since the Survey 123 application records field data for the parent sample and duplicate sample simultaneously in a single entry. Therefore, they were not named as described in the sample locations tables. Duplicate samples are identified in this SARs analytical results tables using the corresponding assessment sample location ID followed by a DUP designation. They are identified in SCRIBE using the ADDL_LOCATION_INFO

entries. The implications of this deviation on project objectives are minor to non-existent since duplicate samples can be readily identified from parent, assessment samples.

- Two opportunity samples not specified in the high flow SAP/QAPP were purposely collected; specifically, at LDM-SW-DNS-01 and NSM-SW-OPP-01 sampling locations. Sample LDM-SW-DNS-01 was collected in a wetland about 600 feet to the southeast of the Little Dora Mine waste pile during the high flow sampling event to characterize potential mine-related impacts to the area. The wetland was not sampled during the low flow sampling event because it was dry. Sample NSM-SW-OPP-01 was collected in the North Star Mine mill tailings area discharge channel just before entering Mineral Creek. This sample was collected to characterize surface water runoff impacts from North Star Mine to Mineral Creek. The same location was sampled during both high and low flow sampling events. The addition of the two sampling locations supports objectives by providing additional information that can be used to characterize surface water impacts stemming from Little Dora and North Star mines.

- At the request of the field task lead, location ID for sample LD_8_L was changed to LD_7_L in the field during the high flow sampling event. The name change was carried through to the low flow sampling event. Sampling locations LD_8_L (changed to LD_7_L) and LD_7_R are directly adjacent to each other on the left and right sides of one road below Little Dora Mine. Surface water was flowing down each side of the road which necessitated colleting both samples. The field task lead decided that LD_7_L was a more appropriate location ID and that LD_8_L was possibly a typographic error made when drafting the high flow SAP/QAPP. All SARs analytical results tables and respective SCRIBE entries reflect this change. This deviation should not affect any of the project objectives since no change was made to the actual sampling and analysis methods.

- The SAP/QAPP specifies that flow measurements be taken at all surface water sample locations to estimate discharge. During the high flow sampling, flow measurements were not taken at M32D during because the flow was braided up to the snow shelf; M32 because the stream was too deep/unsafe; A71B because the river was too braided; and LDM-SW-DNS-01 because the water was stagnant. Missing flow measurements may impact project objectives by limiting the scope of any planned discharge and metals loading analyses. Fortunately, flow was measured at other locations on respective surface water features.

- Two flow measurements were taken at two locations at the top of the Little Dora Mine waste pile to characterize discharge of mine adit water overflowing from the main adit flow path during the high flow sampling event. These locations and actions were not specified in the SAP/QAPP. Just below the LD_1_DM sampling location, a small proportion of the adit flow was overflowing and seeping out of the main flow path at the top of the waste pile. The overflowing surface water was migrating to both north and south sides of the waste pile before infiltrating into the pile substrate. The field task lead requested that flow be measured from both sides to estimate how much surface was infiltrating into the waste pile. Analytical samples were not collected since respective flows originated from the LD_1_DM sampling location, from which analytical samples were collected. Flow was measured from the top of

the north and south overflow channels using a timed bag fill method. The estimated discharge at the north and south overflow channels is 0.0037 and 0.0086 CFS, respectively. All surface water in the north and south overflow channels completely infiltrated in the waste pile substrates at about 70 and 100 feet below the locations were respective flows were measured. Flow measurements were not collected at these two locations during the low flow event because of insufficient flow.

- Sampling location Global Positioning System (GPS) coordinates were collected and recorded at all sampling locations. However, there was poor GPS accuracy at locations M32B and M32C that could not be remedied in the field at time of sample collection. As such, coordinates originally recorded for these two Belcher Creek locations were not accurate. The field data for these locations was revised using more accurate coordinates that were recorded at the same sampling locations during the low flow sampling event. Respective, corrected coordinates are provided in **Table 3.2**.

- As discussed in Section 4.0 a timed, graduated bucket or bag fill method was used to measure flow when conditions precluded use of a flow meter or flume. Specifically, when sample locations were extremely steep, complex, or had very little flow. This alternative flow measurement method is not described in the SAP/QAPP but was requested by the field task lead so that discharge could be estimated for as many of the sampling locations as possible. The graduated bucket or bag fill method was used to measure flow at two locations; specifically, NS7_2_DM and NS7_3_DM (**Table 4.7**). While these deviations were made to better support sampling objectives, respective discharge estimates may not be of the same quality as those prescribed in the SAP/QAPP.

<u>Low flow sampling event deviations</u>:

- Two sampling locations (A71B and M35) were not sampled due to other reasons not specified in the SAP/QAPP. The two locations were not sampled due to a miscommunication between two separate field sampling teams and events. The mainstem Animas River and Mineral Creek sampling locations were supposed to be included in the BPMD low flow field event that occurred during the same week as the Little Dora and North Star mines low flow event. However, A71B and M35 were not in the BPMD SAP/QAPP (EPA, 2019b) and samplers where unaware of their requirements to sample these two locations. Fortunately, other mainstem Animas River and Mineral Creek locations surrounding the two sites were sampled. Therefore, this deviation should have minimal impact to the overall Little Dora and North Star mines PCS project objectives.

- The low flow SAP/QAPP specified all sampling locations where duplicate surface water samples would be collected; specifically, at LD_2_DM, LD_12, M34, and NS7_2_DM. However, a field duplicate samples were not collected at any of the SAP/QAPP-prescribed locations. Field duplicate samples were collected at four other locations; specifically, at LD_1_DM, LD_10, NS7_1_DM, and M33. The originally proposed locations were not selected for duplicate sample collection because the first prescribed duplicate sample location

visited (LD_12) was dry. This changed the duplicate sampling strategy to select locations that would have the best chances of not being dry but would also have elevated metals concentrations. In all, the same number of duplicate samples were collected (n = 4); therefore, there is little to no impact of this deviation on project objectives.

- One opportunity sample not specified in the SAP/QAPP was purposely collected; specifically, at sample location LD_13. Location LD_13 samples were collected from the Little Dora Mine road dich/culvert flow path, just before entering Mineral Creek (**Table 3.2**). Samples were collected at this location to characterize surface water runoff impacts from Little Dora Mine to Mineral Creek. The addition of this one sampling location supports project objectives by providing additional information on surface water impacts stemming from the Little Dora Mine.

- The timed, graduated bucket or bag fill method was used to estimate discharge at 10 locations when conditions precluded use of a flow meter or flume. This alternative flow measurement method is not described in the SAP/QAPP but was requested by the field task lead so that discharge could be estimated for as many of the sampling locations as possible. These low flow locations are identified in **Table 4.8**. While these deviations support sampling objectives, respective discharge estimates may not be of the same quality as those prescribed in the SAP/QAPP.

- Lastly, a flow measurement was not collected at the mainstem Animas River location A72 during the low flow sampling event. Fortunately, there is a U.S. Geological Survey stream gage (No. 09359020) that measures discharge adjacent to the A72 sampling location. The 8:30 September 24, 2019 discharge estimate from this gage is reported in this SAR (**Table 4.8**).

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Tables

Table 3.1. Little Dora and North Star Mines 2019 Pre-CERCLA Screening Field Sample Collection Summary

Mine Name or Water Feature	DRMS Identifier	Dates Sampled	Numbers of Samples[1]	
			High Flow	Low Flow
Little Dora Mine	DRMS-111	Low Flow: 7/24-25/2019 High Flow: 9/23-24/2019	14	12
North Star Mine	DRMS-116		5	5
Mineral Creek	N/A		5	4
Belcher Gulch	N/A		3	2
Animas River	N/A		2	1

DRMS = Colorado Division of Reclamation, Mining and Safety; N/A = not available
CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act
Footnotes:
1 = Sample counts do not include field duplicate or field blanks

Table 3.2. Little Dora and North Star Mines 2019 Pre-CERCLA Screening Surface Water Sampling Area Descriptions. Photographs of sampling areas provided in Attachment 1.

Mine Name	Attributes Sampled	Location ID	Latitude	Longitude	Sample Area Location	Sample Point Area Description
Little Dora Mine	Adit drainage	LD_1_DM	37.801178	-107.673045	Flowing adit about 15 feet down from mine portal	Adit drainage pooled at portal/sampling location; adit flow path then splits into two streams at top of pile; one path flowed down the pile to the north and the other to the south; flow measurements taken just before the split; rust/orange stained substrate; clear and calm with mud and pebble substrate
		LD_2_DM	37.801104	-107.672047	Adit flow path at road cut about 350 feet down and south from mine portal	Flow path pools in a low spot on the road then trickles down off the road to a flat marshy area; water stained rust/orange; muddy substrate throughout; grasses and willow present
		LD_3_DM	37.801362	-107.672323	Seep area with pooled water at base of pile on mine road cut	Very shallow pool of seep water on road cut that flows down off road into a flat marshy area; muddy substrate; looks like this area may also drain towards LD_2_DM; seep substrate is yellow-orange; very sparsely vegetated
		LD_4_unk	37.801720	-107.672486	Seep area at base of pile just above mine road cut	Very mossy with pockets of clear water; no measurable flow; but seep water flows over and onto the mine road; except for green moss accumulations, no other vegetation present
		LD_5	37.802125	-107.673385	Flowing water on old/abandoned road about 340 feet north and down from mine portal; not directly connected to the LD_1_DM adit flow path	Clear flowing water; densely vegetated with moss, grass, and willows; course substrate with no signs of staining
		LD_6_SS	37.802223	-107.673462	Seep area on old/abandoned road cut about 20 feet down from LD_5	Very mossy with pockets of clear water; no measurable flow; yellow-white stained substrate along the base of the seep area when it intersects water flowing down the old/abandoned road
		LD_7_L	37.802788	-107.673740	Flowing water on old/abandoned road about 250 feet down from LD_5	Flow path split into two separate streams along the old/abandoned road; this is the left side stream location; water was clear but substrate was stained white and highly cemented; grasses present along the load and edge of flow path; water continues to flow down the road from this location
		LD_7_R	37.802801	-107.673719	Flowing water on old/abandoned road about 250 feet down from LD_5	Flow path split into two separate streams along the old/abandoned road; this is the right side stream location; water was clear and substrate was not stained as seen at LD_7_L; grasses and willow present along the load and edge of flow path; water flows down and off the road just down from sampling location
		LD_8A	37.802517	-107.672785	Flowing water on side of County Road 31	Road ditch that contains runoff from the mine site; water was clear and the substrate was not stained; some grass along the outside of the ditch; water flows down the road ditch to a culvert about 280 feet to the west of this location
		LD_9	37.802226	-107.672512	Water tricking down the main mine access road that leads to the waste rock pile	Sample location is at the bottom of the access road just before County Road 31 and roadside ditch; water was clear but substrate stained orange-red; flow originates from seeps at the top of road/base of waste rock pile
		LD_10	37.801976	-107.672163	Flowing water on side of County Road 31 - just above road culvert	Road ditch that contains runoff from the mine site; water was clear and the substrate was slightly stained; some grass in and along the outside of the ditch; water flows down the road ditch to a culvert a couple of feet down from this location
		LD_11	37.801914	-107.672171	Water flowing from the mill building area just above road culvert	Sample location is just above small pool that is dammed by a culvert that flows under County Road 31; water was clear and the substrate was slightly stained orange; dense grass and willow vegetation
		LD_12	37.800452	-107.670168	Water tricking along ditch on side of County Road 31	Road ditch that contains water that presumably seeped from mine area; about 800 feet down the road from LD_10; water was not flowing enough for a flow measurement and was dry during low-flow sampling event; slight orange staining; some grass and willows present on outside edge of ditch
		LD_13	37.802143	-107.671725	Road dich/culvert flow path just before entering Mineral Creek	Water flows under County Road 31 via culvert then into a wetlands area before narrowing into a small channel before discharging into Mineral Creek; substrate was slightly stained white; abundant willows and moss
		LDM-SW-DNS-01	37.800456	-107.670887	Wetland area about 600 feet to the southeast of the mine waste pile	Sample location just above wetland area between a mine access road and County Road 31; standing orange water with orange stained, marshy substrate; abundant willow and sedge
	Receiving SW feature: Animas River/Mineral Creek	A72	37.790009	-107.667536	Mainstem Animas River about 4,000 feet downriver from Mineral Creek confluence	Long term monitoring station just before the Animas River enters the canyon; at the USGS gauge station; water was clear but substrate stained orange
		A71B	37.799697	-107.668633	Mainstem Animas River about 350 feet downriver from Mineral Creek confluence	Clear water with orange stained cobble and larger size substrate; grass and willow present on the river banks
		M34	37.802841	-107.672713	Mainstem Mineral Creek at cable cart crossing about 380 feet upriver from LD_13	Long term monitoring station; clear water with orange stained cobble and gravel substrate; willow present on the river banks
		M35	37.802002	-107.67112	Mainstem Mineral Creek about 180 feet downriver from LD_13	Clear water with orange stained cobble and gravel substrate; willow present on the river banks
		M38	37.801128	-107.669254	Mainstem Mineral Creek about 800 feet downriver from LD_13 and 350 feet upriver from Animas River confluence	Clear water with orange stained cobble and gravel substrate; some willow present on the river banks
North Star Mine	Adit drainage	NS7_1_DM	37.807336	-107.682021	Flowing adit at mine portal	Adit drainage pooled at portal/sampling location via beaver dam(s); some of the adit flow overflowing on the opposite side of the rail tracks as the main flow path; orange stained muddy substrate; cloudy water; sparse vegetation
		NS7_2_DM	37.807647	-107.681093	Adit flow path at base of mine waste pile	Adit drainage originates from the overflowing adit pool (NS7_1_DM) sampling location; water flows down the side of the waste pile into a flat marshy mill area; heavily stained substrate with orange muddy precipitate accumulation; cloudy water; no vegetation except for evergreen tree just below sampling location
		NS7_3_ DM	37.808647	-107.682028	Adit flow path just before entering Mineral Creek	Seep/wetland area during high flow but was flowing during low flow because of a completely different adit flow path between sampling event; marshy and muddy; cloudy water; some grasses and willow
		NS7_4_ DM	37.808372	-107.682561	Main adit flow path about 250 feet before entering Mineral Creek	Main channel that is along the side of the large mine waste pile area; cloudy water with orange stained gravel and cobble substrate; willow and sedge throughout; note that approximately 30% of the total flow from the channel was flowing out of the channel over the waste pile toward NS7_3_DM during low-flow sampling event
		NSM-SW-OPP-01	37.807852	-107.678558	Mill area marsh discharge just before entering Mineral Creek	About 700 feet down from NS7_1_DM sampling location; Marshy and muddy orange stained substrate; some willows
	Receiving SW feature: Mineral Creek/Belcher Gulch	M32	37.809050	-107.682923	Mainstem Mineral Creek just above main adit ditch; upgradient from mine site	Long term monitoring station; clear water with orange stained cobble and gravel substrate; willow present on the river banks
		M33	37.808161	-107.679114	Mainstem Mineral Creek about 870 feet down river from NS7_3_DM; about 200 feet upgradient from NSM-SW-OPP-01 discharge point	Long term monitoring station; clear water with orange stained cobble and gravel substrate; willow present on the river banks
		M32B	37.808860	-107.684840	Belcher Gulch about 100 feet before entering Mineral Creek	Long term monitoring station; clear water with no substrate staining; in a dense stand of willows; was dry during low-flow sampling event
		M32C	37.805677	-107.686501	Belcher Gulch about 1,400 feet up from Mineral Creek	Sampling location just below first mine waste pile (North Star Level 4) located up Belcher Gulch; cascading clear water; orange stained substrate; willow, forb, and moss vegetation; gulch went dry just below this location during low-flow sampling event
		M32D	37.803404	-107.687806	Belcher Gulch about 800 feet up from M32C sampling location	Sampling location above North Star Mine Belcher Gulch waste piles; cascading clear water; no substrate staining; dense willow, forb, and moss vegetation

SW = surface water; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act

Table 4.1. Little Dora and North Star Mines 2019 Pre-CERCLA Screening July High Flow Surface Water Dissolved Metals Analytical Results.

Location ID	ANALYSIS	SUBMATRIX	SAMPLE DATE	SAMPLE TIME	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Hardness	Iron	Lead	Magnesium	Manganese	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Uranium	Vanadium	Zinc
					ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
LD_1_DM	Dissolved Metals	Surface Water	7/24/2019	13:38	35.5 J	<2.50 U	<2.50 U	<25.0 U	<2.00 U	13.7 D	143000	<5.00 U	18.0 D	41.8 D	434	<100 U	<0.500 U	19000	24100	<5.00 U	3.50 JD	252 J	<5.00 U	<2.50 U	3930	<5.00 U	30.2 D	<10.0 U	3000
LD_2_DM	Dissolved Metals	Surface Water	7/24/2019	13:30	101	<2.50 U	<2.50 U	<25.0 U	<2.00 U	12.8 D	139000	<5.00 U	15.7 D	34.3 D	427	<100 U	<0.500 U	19100	23500	<5.00 U	3.71 JD	316 J	<5.00 U	<2.50 U	4040	<5.00 U	20.7 D	<10.0 U	2670
LD_2_DM DUP	Dissolved Metals	Surface Water	7/24/2019	13:30	117	<2.50 U	<2.50 U	<25.0 U	<2.00 U	12.9	141000	<5.00 U	16	33.7	431	<100 U	<0.500 U	19300	23400	<5.00 U	3.98	293	<5.00 U	<2.50 U	4070	<5.00 U	20.3	<10.0 U	2660
LD_3_DM	Dissolved Metals	Surface Water	7/24/2019	13:15	195	<2.50 U	<2.50 U	<25.0 U	<2.00 U	11.7 D	145000	<5.00 U	18.4 D	54.7 D	445	<100 U	<0.500 U	20100	24800	<5.00 U	3.19 JD	331 J	<5.00 U	<2.50 U	4160	<5.00 U	25.8 D	<10.0 U	2170
LD_4_unk	Dissolved Metals	Surface Water	7/24/2019	12:16	5330	<2.50 U	<2.50 U	<25.0 U	2.50 J	17.5 D	161000	<5.00 U	18.9 D	1450 D	501	615	27.5 D	24000	21500	<5.00 U	9.37 D	466 J	<5.00 U	<2.50 U	5220	<5.00 U	23.1 D	<10.0 U	4030
LD_5	Dissolved Metals	Surface Water	7/24/2019	12:22	45.3 J	<0.500 U	<0.500 U	7.33 J	<2.00 U	0.300	52200	<1.00 U	<0.100 U	17.6	152	<100 U	<0.100 U	5160	151	3.12	<0.500 U	416 J	2.59 J	<0.500 U	2990	<1.00 U	11.6	<2.00 UJ	73.0
LD_6_SS	Dissolved Metals	Surface Water	7/24/2019	11:57	4320	<0.500 U	<0.500 U	18.9	<2.00 U	8.15	55300	<1.00 U	<0.100 U	1160	169	<100 U	<0.100 U	7550	4430	<1.00 U	5.09	1010	1.58 J	<0.500 U	7270	<1.00 U	4.01	<2.00 U	1500
LD_7_L	Dissolved Metals	Surface Water	7/24/2019	11:30	142	<0.500 U	<0.500 U	8.28 J	<2.00 U	0.439	52100	<1.00 U	<0.100 U	40.7	152	<100 U	<0.100 U	5210	191	2.95	<0.500 U	407 J	2.59 J	<0.500 U	3150	<1.00 U	11.0	<2.00 UJ	102
LD_7_R	Dissolved Metals	Surface Water	7/24/2019	11:20	28.0 J	<0.500 U	0.641 J	7.10 J	<2.00 U	0.185 J	52700	<1.00 U	<0.100 U	10.1	153	<100 U	<0.100 U	5150	54.0	3.13	<0.500 U	437 J	3.42 J	<0.500 U	2950	<1.00 U	11.6	<2.00 UJ	48.4
LD_8A	Dissolved Metals	Surface Water	7/24/2019	10:45	58.0	<0.500 U	<0.500 U	10.3	<2.00 U	0.293	50300	<1.00 U	<0.100 U	10.6	147	<100 U	<0.100 U	5240	81.5	2.27	<0.500 U	460 J	2.40 J	<0.500 U	3370	<1.00 U	8.14	<2.00 UJ	62.3
LD_09	Dissolved Metals	Surface Water	7/24/2019	10:41	1800	0.510 J	<0.500 U	23.2	<2.00 U	5.14	55600	<1.00 U	7.29	388	174	259	19.5	8580	5430	<1.00 U	1.90	388 J	1.58 J	<0.500 U	3560	<1.00 U	5.82	<2.00 U	1220
LD_10	Dissolved Metals	Surface Water	7/24/2019	10:10	158	1.27	<0.500 U	15.3	<2.00 U	0.679	50900	<1.00 U	0.738	36.5	150	<100 U	0.672	5570	619	1.76	<0.500 U	439 J	2.58 J	<0.500 U	3290	<1.00 U	6.50	<2.00 UJ	163
LD_11	Dissolved Metals	Surface Water	7/24/2019	10:01	8050	<2.50 U	<2.50 U	<25.0 U	3.04 J	17.2 D	145000	<5.00 U	41.1 D	1500 D	458	913	78.7 D	23500	26800	<5.00 U	12.7 D	383 J	<5.00 U	<2.50 U	5340	<5.00 U	27.7 D	<10.0 U	4220
LD_12	Dissolved Metals	Surface Water	7/24/2019	9:22	2800	<0.500 U	<0.500 U	28.1	<2.00 U	8.20	97300	<1.00 U	1.20	424	297	<100 U	4.06	13000	7280	<1.00 U	5.08	808 J	<1.00 U	<0.500 U	4740	<1.00 U	2.08	<2.00 U	2030
LDM-SW-DNS-01	Dissolved Metals	Surface Water	7/24/2019	9:25	1040	<2.50 U	<2.50 U	<25.0 U	<2.00 U	12.9 D	133000	<5.00 U	9.06 D	265 D	418	120 J	5.48 D	21000	18400	<5.00 U	7.06 D	310 J	<5.00 U	<2.50 U	4270	<5.00 U	4.62 D	<10.0 U	3490
A72	Dissolved Metals	Surface Water	7/24/2019	9:19	<20.0 U	<0.500 U	<0.500 U	18.7	<2.00 U	0.621	26100	<1.00 U	1.26	0.841 J	73	<100 U	<0.100 U	2020	366	<1.00 U	<0.500 U	420 J	<1.00 U	<0.500 U	1240	<1.00 U	<0.100 U	<2.00 U	199
A71B	Dissolved Metals	Surface Water	7/24/2019	10:19	38.4 J	<0.500 U	<0.500 U	19.2	<2.00 U	0.544	24600	<1.00 U	1.28	2.04	70	372	0.118 J	2010	270	<1.00 U	<0.500 U	403 J	<1.00 U	<0.500 U	1280	<1.00 U	<0.100 U	<2.00 U	150
M34	Dissolved Metals	Surface Water	7/24/2019	12:21	50.1	<0.500 U	<0.500 U	19.5	<2.00 U	0.202	21800	<1.00 U	1.30	0.948 J	62	285	0.118 J	1950	88.6	<1.00 U	<0.500 U	348 J	<1.00 U	<0.500 U	1230	<1.00 U	<0.100 U	<2.00 U	38.4
M35	Dissolved Metals	Surface Water	7/24/2019	11:45	48.8 J	<0.500 U	<0.500 U	19.7	<2.00 U	0.189 J	22200	<1.00 U	1.30	1.30	64	296	<0.100 U	1980	89.0	<1.00 U	<0.500 U	406 J	<1.00 U	<0.500 U	1290	<1.00 U	<0.100 U	<2.00 U	43.0
M38	Dissolved Metals	Surface Water	7/24/2019	10:33	47.1 J	<0.500 U	<0.500 U	19.1	<2.00 U	0.199 J	22000	<1.00 U	1.29	1.09	63	302	<0.100 U	1970	93.8	<1.00 U	<0.500 U	342 J	<1.00 U	<0.500 U	1250	<1.00 U	<0.100 U	<2.00 U	43.5
M38 DUP	Dissolved Metals	Surface Water	7/24/2019	10:33	40.7	<0.500 U	<0.500 U	19.7	<2.00 U	0.165	21800	<1.00 U	1.29	1.20	62	291	<0.100 U	1950	93.1	<1.00 U	<0.500 U	348	<1.00 U	<0.500 U	1250	<1.00 U	<0.100 U	<2.00 U	43.4
NS7_1_DM	Dissolved Metals	Surface Water	7/25/2019	10:27	51.2	<2.50 U	<2.50 U	<25.0 U	<2.00 U	3.70 D	156000	<5.00 U	9.16 D	26.3 D	494	2400	<0.500 U	25100	4700	<5.00 U	<2.50 U	823 J	<5.00 U	<2.50 U	5250	<5.00 U	13.3 D	<10.0 U	1040
NS7_2_DM	Dissolved Metals	Surface Water	7/25/2019	9:15	<20.0 U	<2.50 U	<2.50 U	<25.0 U	<2.00 U	3.26 D	153000	<5.00 U	8.74 D	5.39 D	484	575	<0.500 U	24700	4650	<5.00 U	<2.50 U	846 J	<5.00 U	<2.50 U	5240	<5.00 U	13.5 D	<10.0 U	878
NS7_2_DM DUP	Dissolved Metals	Surface Water	7/25/2019	9:15	<20.0 U	<2.50 U	<2.50 U	<25.0 U	<2.00 U	3.59	154000	<5.00 U	9	4.93	488	310	<0.500 U	24800	4670	<5.00 U	<2.50 U	791	<5.00 U	<2.50 U	5250	<5.00 U	13.8	<10.0 U	859
NS7_3_DM	Dissolved Metals	Surface Water	7/25/2019	9:27	83.3	<2.50 U	<2.50 U	<25.0 U	<2.00 U	1.14 D	116000	<5.00 U	1.79 D	5.88 D	363	<100 U	<0.500 U	17900	1140	<5.00 U	<2.50 U	740 J	<5.00 U	<2.50 U	4140	<5.00 U	3.31 D	<10.0 U	421
NS7_4_DM	Dissolved Metals	Surface Water	7/25/2019	9:48	<20.0 U	<2.50 U	<2.50 U	<25.0 U	<2.00 U	2.83 D	119000	<5.00 U	6.59 D	6.85 D	375	1050	<0.500 U	19100	3410	<5.00 U	<2.50 U	755 J	<5.00 U	<2.50 U	4240	<5.00 U	9.72 D	<10.0 U	791
NSM-SW-OPP-01	Dissolved Metals	Surface Water	7/24/2019	14:01	53.3	0.860 J	0.579 J	12.4	<2.00 U	3.79	139000	<1.00 U	6.27	16.1	439	<100 U	<0.100 U	22300	3390	1.48	<0.500 U	1060	<1.00 U	<0.500 U	5230	<1.00 U	5.97	<2.00 U	977
M32	Dissolved Metals	Surface Water	7/24/2019	14:48	67.9	<0.500 U	<0.500 U	20.0	<2.00 U	0.213	22100	<1.00 U	1.39	1.12	63	367	0.158 J	1940	85.9	<1.00 U	<0.500 U	336 J	<1.00 U	<0.500 U	1280	<1.00 U	<0.100 U	<2.00 U	39.5
M33	Dissolved Metals	Surface Water	7/24/2019	13:10	56.5	<0.500 U	<0.500 U	20.0	<2.00 U	0.206	22200	<1.00 U	1.31	0.974 J	63	319	0.148 J	1960	85.3	<1.00 U	<0.500 U	352 J	<1.00 U	<0.500 U	1270	<1.00 U	<0.100 U	<2.00 U	38.5
M32B	Dissolved Metals	Surface Water	7/25/2019	9:05	<20.0 U	<0.500 U	<0.500 U	10.4	<2.00 U	0.883	27600	<1.00 U	<0.100 U	1.86	86	<100 U	1.85	4150	14.2	1.07	<0.500 U	504 J	<1.00 U	<0.500 U	1550	<1.00 U	0.642	<2.00 U	236
M32C	Dissolved Metals	Surface Water	7/25/2019	9:12	<20.0 U	<0.500 U	<0.500 U	10.5	<2.00 U	0.885	27700	<1.00 U	<0.100 U	1.83	86	<100 U	2.42	4150	15.8	1.05	<0.500 U	490 J	<1.00 U	<0.500 U	1580	<1.00 U	0.655	<2.00 U	236
M32D	Dissolved Metals	Surface Water	7/25/2019	10:37	<20.0 U	<0.500 U	<0.500 U	10.9	<2.00 U	0.965	28500	<1.00 U	<0.100 U	1.33	89	<100 U	<0.100 U	4290	23.9	1.11	<0.500 U	475 J	<1.00 U	<0.500 U	1580	<1.00 U	0.800	<2.00 U	254
Blank	Dissolved Metals	Water	7/24/2019	16:56	<20.0 U	<0.500 U	<0.500 U	<5.00 U	<2.00 U	<0.100 U	159 J	<1.00 U	<0.100 U	<0.500 U	<2 U	<100 U	<0.100 U	<100 U	<2.00 U	<1.00 U	<0.500 U	<250 U	<1.00 U	<0.500 U	424 J	<1.00 U	<0.100 U	<2.00 U	<10.0 U
Blank	Dissolved Metals	Water	7/25/2019	11:50	<20.0 U	<0.500 U	<0.500 U	<5.00 U	<2.00 U	<0.100 U	103 J	<1.00 U	<0.100 U	<0.500 U	<2 U	<100 U	<0.100 U	<100 U	<2.00 U	<1.00 U	<0.500 U	<250 U	<1.00 U	<0.500 U	<250 U	<1.00 U	<0.100 U	<2.00 U	<10.0 U

Location ID	ANALYSIS	SUBMATRIX	SAMPLE DATE	SAMPLE TIME	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Hardness	Iron	Lead	Magnesium	Manganese	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Uranium	Vanadium	Zinc
					ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
LD_2_DM	Dissolved Metals	Surface Water	7/24/2019	13:30	101	<2.50 U	<2.50 U	<25.0 U	<2.00 U	12.8	139000	<5.00 U	15.7	34.3	427	<100 U	<0.500 U	19100	23500	<5.00 U	3.71	316	<5.00 U	<2.50 U	4040	<5.00 U	20.7	<10.0 U	2670
LD_2_DM DUP	Dissolved Metals	Surface Water	7/24/2019	13:30	117	<2.50 U	<2.50 U	<25.0 U	<2.00 U	12.9	141000	<5.00 U	16	33.7	431	<100 U	<0.500 U	19300	23400	<5.00 U	3.98	293	<5.00 U	<2.50 U	4070	<5.00 U	20.3	<10.0 U	2660
				RPD	**14.68%**	N/A	N/A	N/A	N/A	**0.78%**	**1.43%**	N/A	**1.89%**	**1.76%**	**0.93%**	N/A	N/A	**1.04%**	**0.43%**	N/A	**7.02%**	**7.55%**	N/A	N/A	**0.74%**	N/A	**1.95%**	N/A	**0.38%**

Location ID	ANALYSIS	SUBMATRIX	SAMPLE DATE	SAMPLE TIME	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Hardness	Iron	Lead	Magnesium	Manganese	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Uranium	Vanadium	Zinc
					ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
M38	Dissolved Metals	Surface Water	7/24/2019	10:33	47.1	<0.500 U	<0.500 U	19.1	<2.00 U	0.199	22000	<1.00 U	1.29	1.09	63	302	<0.100 U	1970	93.8	<1.00 U	<0.500 U	342	<1.00 U	<0.500 U	1250	<1.00 U	<0.100 U	<2.00 U	43.5
M38 DUP	Dissolved Metals	Surface Water	7/24/2019	10:33	40.7	<0.500 U	<0.500 U	19.7	<2.00 U	0.165	21800	<1.00 U	1.29	1.20	62	291	<0.100 U	1950	93.1	<1.00 U	<0.500 U	348	<1.00 U	<0.500 U	1250	<1.00 U	<0.100 U	<2.00 U	43.4
				RPD	**14.58%**	N/A	N/A	**3.09%**	N/A	**18.68%**	**0.91%**	N/A	**0.00%**	**9.61%**	**1.60%**	**3.71%**	N/A	**1.02%**	**0.75%**	N/A	N/A	**1.74%**	N/A	N/A	**0.00%**	N/A	N/A	N/A	**0.23%**

Location ID	ANALYSIS	SUBMATRIX	SAMPLE DATE	SAMPLE TIME	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Hardness	Iron	Lead	Magnesium	Manganese	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Uranium	Vanadium	Zinc
					ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
NS7_2_DM	Dissolved Metals	Surface Water	7/25/2019	9:15	<20.0 U	<2.50 U	<2.50 U	<25.0 U	<2.00 U	3.26	153000	<5.00 U	8.74	5.39	484	575	<0.500 U	24700	4650	<5.00 U	<2.50 U	846	<5.00 U	<2.50 U	5240	<5.00 U	13.5	<10.0 U	878
NS7_2_DM DUP	Dissolved Metals	Surface Water	7/25/2019	9:15	<20.0 U	<2.50 U	<2.50 U	<25.0 U	<2.00 U	3.59	154000	<5.00 U	9	4.93	488	310	<0.500 U	24800	4670	<5.00 U	<2.50 U	791	<5.00 U	<2.50 U	5250	<5.00 U	13.8	<10.0 U	859
				RPD	N/A	N/A	N/A	N/A	N/A	**9.64%**	**0.65%**	N/A	**2.93%**	**8.91%**	**0.82%**	**59.89%**	N/A	**0.40%**	**0.43%**	N/A	N/A	**6.72%**	N/A	N/A	**0.19%**	N/A	**2.20%**	N/A	**2.19%**

CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; RPD = relative percent difference

Note: Removed flags from values for RPD calculation

Note: Data Qualifier Definitions Listed Below:

D The analyte was diluted prior to analysis.

U The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

Table 4.2. Little Dora and North Star Mines 2019 Pre-CERCLA Screening July High Flow Surface Water Total Recoverable Metals Analytical Results.

Location ID	ANALYSIS	SUBMATRIX	SAMPLE DATE	SAMPLE TIME	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Uranium	Vanadium	Zinc
					ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
LD_1_DM	Total Recoverable Metals	Surface Water	7/24/2019	13:38	1590	<2.50 U	5.19 JD	<25.0 U	2.29 J	15.9 D	141000	<5.00 U	17.4 D	532 D	4510	23.8 D	18800	22700	<0.100 U	5.81 D	3.82 JD	275 J	<5.00 U	<2.50 U	3920	<5.00 U	41.9 D	<10.0 U	3200
LD_2_DM	Total Recoverable Metals	Surface Water	7/24/2019	13:30	2490	<2.50 U	7.05 JD	<25.0 U	2.78 J	13.5 D	140000	<5.00 U	14.6 D	705 D	7650	27.2 D	19100	22200	<0.100 U	<5.00 U	2.88 JD	306 J	<5.00 U	<2.50 U	3930	<5.00 U	35.1 D	<10.0 U	3250
LD_2_DM DUP	Total Recoverable Metals	Surface Water	7/24/2019	13:30	2220	<2.50 U	6.88 JD	<25.0 U	2.53 J	13.5 D	137000	<5.00 U	14.1 D	659 D	6750	26.4 D	18700	22200	<0.100 U	<5.00 U	3.29 JD	296 J	<5.00 U	<2.50 U	3900	<5.00 U	34.8 D	<10.0 U	3180
LD_3_DM	Total Recoverable Metals	Surface Water	7/24/2019	13:15	2170	<2.50 U	5.39 JD	46.5 JD	2.64 J	13.8 D	138000	<5.00 U	16.8 D	668 D	5010	49.4 D	19600	23800	<0.100 U	<5.00 U	3.06 JD	352 J	<5.00 U	<2.50 U	3870	<5.00 U	36.8 D	<10.0 U	3090
LD_4_unk	Total Recoverable Metals	Surface Water	7/24/2019	12:16	5290	<2.50 U	<2.50 U	<25.0 U	2.62 J	17.3 D	160000	<5.00 U	17.5 D	1330 D	662	27.3 D	23900	20500	<0.100 U	<5.00 U	8.41 D	543 J	<5.00 U	<2.50 U	5100	<5.00 U	23.3 D	<10.0 U	3890
LD_5	Total Recoverable Metals	Surface Water	7/24/2019	12:22	92.6	<2.50 U	<2.50 U	<25.0 U	<2.00 U	<0.500 U	51800	<5.00 U	<0.500 U	17.5 D	<100 U	<0.500 UJ	5090	147	<0.100 U	<5.00 U	<2.50 U	409 J	<5.00 U	<2.50 U	2930	<5.00 UJ	10.9 D	<10.0 U	73.1
LD_6_SS	Total Recoverable Metals	Surface Water	7/24/2019	11:57	4320	<2.50 U	<2.50 U	<25.0 U	<2.00 U	8.22 D	55000	<5.00 U	<0.500 U	1000 D	<100 U	<0.500 UJ	7510	4220	<0.100 U	<5.00 U	3.66 JD	952 J	<5.00 U	<2.50 U	7180	<5.00 UJ	3.49 D	<10.0 U	1420
LD_7_L	Total Recoverable Metals	Surface Water	7/24/2019	11:30	182	<2.50 U	<2.50 U	<25.0 U	<2.00 U	<0.500 U	51600	<5.00 U	<0.500 U	39.2 D	<100 U	<0.500 UJ	5140	182	<0.100 U	<5.00 U	<2.50 U	412 J	<5.00 U	<2.50 U	3070	<5.00 UJ	10.5 D	<10.0 U	101
LD_7_R	Total Recoverable Metals	Surface Water	7/24/2019	11:20	42.1 J	<2.50 U	<2.50 U	<25.0 U	<2.00 U	<0.500 U	51100	<5.00 U	<0.500 U	6.79 D	<100 U	<0.500 UJ	4980	51.2	<0.100 U	<5.00 U	<2.50 U	376 J	<5.00 U	<2.50 U	2820	<5.00 UJ	10.9 D	<10.0 U	46.3
LD_8A	Total Recoverable Metals	Surface Water	7/24/2019	10:45	132	<2.50 U	<2.50 U	<25.0 U	<2.00 U	<0.500 U	50200	<5.00 U	<0.500 U	9.42 D	114 J	0.678 JD	5230	79.6	<0.100 U	<5.00 U	<2.50 U	452 J	<5.00 U	<2.50 U	3320	<5.00 UJ	8.33 D	<10.0 U	60.5
LD_09	Total Recoverable Metals	Surface Water	7/24/2019	10:41	2940	2.78 JD	5.36 JD	126 JD	<2.00 U	4.80 D	55100	<5.00 U	7.67 D	383 D	7460	52.0 JD	8760	5380	<0.100 U	<5.00 U	<2.50 U	680 J	<5.00 U	<2.50 U	3540	<5.00 UJ	6.11 D	<10.0 U	1200
LD_10	Total Recoverable Metals	Surface Water	7/24/2019	10:10	227	<2.50 U	<2.50 U	<25.0 U	<2.00 U	0.655 JD	50600	<5.00 U	0.668 JD	38.9 D	162 J	2.53 D	5530	628	<0.100 U	<5.00 U	<2.50 U	408 J	<5.00 U	<2.50 U	3240	<5.00 U	6.22 D	<10.0 U	167
LD_11	Total Recoverable Metals	Surface Water	7/24/2019	10:01	8190	<2.50 U	<2.50 U	<25.0 U	3.15 J	17.9 D	144000	<5.00 U	37.9 D	1380 D	966	77.5 D	23300	26100	<0.100 U	<5.00 U	12.0 D	372 J	<5.00 U	<2.50 U	5370	<5.00 U	28.1 D	<10.0 U	4190
LD_12	Total Recoverable Metals	Surface Water	7/24/2019	9:22	2760	<2.50 U	<2.50 U	26.4 JD	<2.00 U	7.28 D	96600	<5.00 U	1.04 D	360 D	<100 U	3.62 D	13300	6860	<0.100 U	<5.00 U	4.24 JD	834 J	<5.00 U	<2.50 U	4650	<5.00 U	1.86 D	<10.0 U	1950
LDM-SW-DNS-01	Total Recoverable Metals	Surface Water	7/24/2019	9:25	1090	<2.50 U	<2.50 U	<25.0 UJ	<2.00 U	12.7 D	132000	<5.00 U	8.61 D	264 D	2020	10.4 JD	20800	17600	<0.100 U	<5.00 U	5.68 D	337 J	<5.00 U	<2.50 U	4220	<5.00 UJ	5.33 D	<10.0 U	3360
A72	Total Recoverable Metals	Surface Water	7/24/2019	9:19	419	<2.50 U	<2.50 U	<25.0 U	<2.00 U	0.560 JD	26000	<5.00 U	1.16 D	2.96 JD	711	2.88 D	2010	357	<0.100 U	<5.00 U	<2.50 U	430 J	<5.00 U	<2.50 U	1270	<5.00 U	<0.500 U	<10.0 U	210
A71B	Total Recoverable Metals	Surface Water	7/24/2019	10:19	457	<2.50 U	<2.50 U	<25.0 U	<2.00 U	1.57 D	24900	<5.00 U	2.31 D	3.34 JD	703	4.61 D	2030	282	<0.100 U	<5.00 U	<2.50 U	485 J	<5.00 U	<2.50 U	1320	<5.00 U	<0.500 U	<10.0 U	169
M34	Total Recoverable Metals	Surface Water	7/24/2019	12:21	511	<2.50 U	<2.50 U	<25.0 UJ	<2.00 U	<0.500 U	21800	<5.00 U	1.20 D	<2.50 U	580	1.18 JD	1960	86.2	<0.100 U	<5.00 U	<2.50 U	345 J	<5.00 U	<2.50 U	1250	<5.00 UJ	<0.500 U	<10.0 U	42.3
M35	Total Recoverable Metals	Surface Water	7/24/2019	11:45	501	<2.50 U	<2.50 U	<25.0 UJ	<2.00 U	<0.500 U	21700	<5.00 U	1.28 D	<2.50 U	575	1.10 JD	1930	88.1	<0.100 U	<5.00 U	<2.50 U	278 J	<5.00 U	<2.50 U	1240	<5.00 UJ	<0.500 U	<10.0 U	42.7
M38	Total Recoverable Metals	Surface Water	7/24/2019	10:33	500	<2.50 U	<2.50 U	<25.0 UJ	<2.00 U	<0.500 U	21500	<5.00 U	1.16 D	<2.50 U	579	1.09 JD	1950	91.9	<0.100 U	<5.00 U	<2.50 U	300 J	<5.00 U	<2.50 U	1240	<5.00 UJ	<0.500 U	<10.0 U	45.3
M38 DUP	Total Recoverable Metals	Surface Water	7/24/2019	10:33	495	<2.50 U	<2.50 U	<25.0 UJ	<2.00 U	<0.500 U	21300	<5.00 U	1.15 D	<2.50 U	574	1.08 JD	1930	91.9	<0.100 U	<5.00 U	<2.50 U	279 J	<5.00 U	<2.50 U	1230	<5.00 UJ	<0.500 U	<10.0 U	45.6
NS7_1_DM	Total Recoverable Metals	Surface Water	7/25/2019	10:27	855	<2.50 U	14.3 D	<25.0 UJ	<2.00 U	4.40 D	151000	<5.00 U	8.60 D	203 D	9620	11.1 JD	24300	4450	<0.100 U	<5.00 U	<2.50 U	780 J	<5.00 U	<2.50 U	5170	<5.00 UJ	21.6 D	<10.0 U	1050
NS7_2_DM	Total Recoverable Metals	Surface Water	7/25/2019	9:15	967	<2.50 U	16.2 D	<25.0 UJ	<2.00 U	4.34 D	151000	<5.00 U	8.69 D	211 D	10000	12.3 JD	24400	4450	<0.100 U	<5.00 U	<2.50 U	794 J	<5.00 U	<2.50 U	5150	<5.00 UJ	21.2 D	<10.0 U	1060
NS7_2_DM DUP	Total Recoverable Metals	Surface Water	7/25/2019	9:15	948	<2.50 U	14.6 D	<25.0 UJ	<2.00 U	4.09 D	151000	<5.00 U	7.99 D	201 D	9780	11.2 JD	24300	4450	<0.100 U	<5.00 U	<2.50 U	801 J	<5.00 U	<2.50 U	5160	<5.00 UJ	20.7 D	<10.0 U	1050
NS7_3_DM	Total Recoverable Metals	Surface Water	7/25/2019	9:27	167	<2.50 U	<2.50 U	<25.0 UJ	<2.00 U	1.12 D	113000	<5.00 U	1.92 D	18.8 D	839	0.693 JD	17600	1090	<0.100 U	<5.00 U	<2.50 U	696 J	<5.00 U	<2.50 U	4140	<5.00 UJ	3.95 D	<10.0 U	413
NS7_4_DM	Total Recoverable Metals	Surface Water	7/25/2019	9:48	597	<2.50 U	8.04 JD	<25.0 UJ	<2.00 U	3.05 D	117000	<5.00 U	5.90 D	132 D	6590	7.13 JD	18800	3240	<0.100 U	<5.00 U	<2.50 U	673 J	<5.00 U	<2.50 U	4220	<5.00 UJ	14.2 D	<10.0 U	827
NSM-SW-OPP-01	Total Recoverable Metals	Surface Water	7/24/2019	14:01	3300	<2.50 U	27.9 D	<25.0 UJ	<2.00 U	4.73 D	139000	<5.00 U	6.29 D	375 D	15200	58.1 JD	22300	3340	<0.100 U	<5.00 U	<2.50 U	998 J	<5.00 U	<2.50 U	5270	<5.00 UJ	23.0 D	<10.0 U	1270
M32	Total Recoverable Metals	Surface Water	7/24/2019	14:48	548	<2.50 U	<2.50 U	<25.0 UJ	<2.00 U	<0.500 U	21700	<5.00 U	1.28 D	<2.50 U	644	1.28 JD	1930	86.0	<0.100 U	<5.00 U	<2.50 U	359 J	<5.00 U	<2.50 U	1260	<5.00 UJ	<0.500 U	<10.0 U	41.5
M33	Total Recoverable Metals	Surface Water	7/24/2019	13:10	526	<2.50 U	<2.50 U	<25.0 UJ	<2.00 U	<0.500 U	21700	<5.00 U	1.21 D	<2.50 U	600	1.20 JD	1940	85.6	<0.100 U	<5.00 U	<2.50 U	329 J	<5.00 U	<2.50 U	1260	<5.00 UJ	<0.500 U	<10.0 U	41.0
M32B	Total Recoverable Metals	Surface Water	7/25/2019	9:05	27.5 J	<2.50 U	<2.50 U	<25.0 UJ	<2.00 U	0.762 JD	27600	<5.00 U	<0.500 U	<2.50 U	<100 U	6.30 JD	4110	20.0	<0.100 U	<5.00 U	<2.50 U	464 J	<5.00 U	<2.50 U	1550	<5.00 UJ	0.549 JD	<10.0 U	230
M32C	Total Recoverable Metals	Surface Water	7/25/2019	9:12	<20.0 U	<2.50 U	<2.50 U	<25.0 UJ	<2.00 U	0.905 JD	27200	<5.00 U	<0.500 U	<2.50 U	<100 U	6.67 JD	4120	21.1	<0.100 U	<5.00 U	<2.50 U	463 J	<5.00 U	<2.50 U	1540	<5.00 UJ	0.610 JD	<10.0 U	225
M32D	Total Recoverable Metals	Surface Water	7/25/2019	10:37	43.5 J	<2.50 U	<2.50 U	<25.0 UJ	<2.00 U	0.817 JD	28100	<5.00 U	<0.500 U	<2.50 U	<100 U	1.99 JD	4270	33.1	<0.100 U	<5.00 U	<2.50 U	489 J	<5.00 U	<2.50 U	1580	<5.00 UJ	0.702 JD	<10.0 U	250
Blank	Total Recoverable Metals	Water	7/24/2019	16:56	<20.0 U	<2.50 U	<2.50 U	<25.0 U	<2.00 U	<0.500 U	<100 U	<5.00 U	<0.500 U	<2.50 U	<100 U	<0.500 U	<100 U	<2.00 U	<0.100 U	<5.00 U	<2.50 U	<250 U	<5.00 U	<2.50 U	<250 U	<5.00 U	<0.500 U	<10.0 U	<10.0 U
Blank	Total Recoverable Metals	Water	7/25/2019	11:50	<20.0 U	<2.50 U	<2.50 U	<25.0 U	<2.00 U	<0.500 U	<100 U	<5.00 U	<0.500 U	<2.50 U	<100 U	<0.500 U	<100 U	6.70 J	<0.100 U	<5.00 U	<2.50 U	<250 U	<5.00 U	<2.50 U	<250 U	<5.00 U	<0.500 U	<10.0 U	<10.0 U

Location ID	ANALYSIS	SUBMATRIX	SAMPDATE	SAMPLETIME	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Uranium	Vanadium	Zinc
					ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
LD_2_DM	Total Recoverable Metals	Surface Water	7/24/2019	13:30	2490	<2.50 U	7.05	<25.0 U	2.78	13.5	140000	<5.00 U	14.6	705	7650	27.2	19100	22200	<0.100 U	<5.00 U	2.88	306	<5.00 U	<2.50 U	3930	<5.00 U	35.1	<10.0 U	3250
LD_2_DM DUP	Total Recoverable Metals	Surface Water	7/24/2019	13:30	2220	<2.50 U	6.88	<25.0 U	2.53	13.5	137000	<5.00 U	14.1	659	6750	26.4	18700	22200	<0.100 U	<5.00 U	3.29	296	<5.00 U	<2.50 U	3900	<5.00 U	34.8	<10.0 U	3180
				RPD	**11.46%**	N/A	**2.44%**	N/A	**9.42%**	**0.00%**	**2.17%**	N/A	**3.48%**	**6.74%**	**12.50%**	**2.99%**	**2.12%**	**0.00%**	N/A	N/A	**13.29%**	**3.32%**	N/A	N/A	**0.77%**	N/A	**0.86%**	N/A	**2.18%**

Location ID	ANALYSIS	SUBMATRIX	SAMPDATE	SAMPLETIME	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Uranium	Vanadium	Zinc
					ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
M38	Total Recoverable Metals	Surface Water	7/24/2019	10:33	500	<2.50 U	<2.50 U	<25.0 UJ	<2.00 U	<0.500 U	21500	<5.00 U	1.16	<2.50 U	579	1.09	1950	91.9	<0.100 U	<5.00 U	<2.50 U	300	<5.00 U	<2.50 U	1240	<5.00 UJ	<0.500 U	<10.0 U	45.3
M38 DUP	Total Recoverable Metals	Surface Water	7/24/2019	10:33	495	<2.50 U	<2.50 U	<25.0 UJ	<2.00 U	<0.500 U	21300	<5.00 U	1.15	<2.50 U	574	1.08	1930	91.9	<0.100 U	<5.00 U	<2.50 U	279	<5.00 U	<2.50 U	1230	<5.00 UJ	<0.500 U	<10.0 U	45.6
				RPD	**1.01%**	N/A	N/A	N/A	N/A	N/A	**0.93%**	N/A	**0.87%**	N/A	**0.87%**	**0.92%**	**1.03%**	**0.00%**	N/A	N/A	N/A	**7.25%**	N/A	N/A	**0.81%**	N/A	N/A	N/A	**0.66%**

Location ID	ANALYSIS	SUBMATRIX	SAMPDATE	SAMPLETIME	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Uranium	Vanadium	Zinc
					ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
NS7_2_DM	Total Recoverable Metals	Surface Water	7/25/2019	9:15	967	<2.50 U	16.2	<25.0 UJ	<2.00 U	4.34	151000	<5.00 U	8.69	211	10000	12.3	24400	4450	<0.100 U	<5.00 U	<2.50 U	794	<5.00 U	<2.50 U	5150	<5.00 UJ	21.2	<10.0 U	1060
NS7_2_DM DUP	Total Recoverable Metals	Surface Water	7/25/2019	9:15	948	<2.50 U	14.6	<25.0 UJ	<2.00 U	4.09	151000	<5.00 U	7.99	201	9780	11.2	24300	4450	<0.100 U	<5.00 U	<2.50 U	801	<5.00 U	<2.50 U	5160	<5.00 UJ	20.7	<10.0 U	1050
				RPD	**1.98%**	N/A	**10.39%**	N/A	N/A	**5.93%**	**0.00%**	N/A	**8.39%**	**4.85%**	**2.22%**	**9.36%**	**0.41%**	**0.00%**	N/A	N/A	N/A	**0.88%**	N/A	N/A	**0.19%**	N/A	**2.39%**	N/A	**0.95%**

CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; RPD = relative percent difference

Note: Removed flags from values for RPD calculation

Note: Data Qualifier Definitions Listed Below:

D The analyte was diluted prior to analysis.

U The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

Table 4.3. Little Dora and North Star Mines 2019 Pre-CERCLA Screening September Low Flow Surface Water Dissolved Metals Analytical Results

Location ID	ANALYSIS	SUBMATRIX	SAMPLE DATE	SAMPLE TIME	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Hardness	Iron	Lead	Magnesium	Manganese	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Uranium	Vanadium	Zinc
					ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
LD_1_DM	Dissolved Metals	Surface Water	9/23/2019	14:55	<20.0 U	<0.500 U	1.32 J	10.5	<2.00 U	8.52	180000	1.53 J	11.6	17	521	<100 U	<0.100 U	17300	15800	5.43	<0.500 U	<250 U	<1.00 U	<0.500 U	4850	<1.00 U	30.9	<2.00 U	2280
LD_1_DM DUP	Dissolved Metals	Surface Water	9/23/2019	14:55	26.6 J	<0.500 U	1.33 J	10.3	<2.00 U	8.55	179000	1.41 J	11.7	17.5	517	<100 U	<0.100 U	17200	15800	5.42	<0.500 U	<250 U	<1.00 U	<0.500 U	4750	<1.00 U	30.2	<2.00 U	2250
LD_2_DM	Dissolved Metals	Surface Water	9/23/2019	14:01	91.2	<0.500 U	0.85 J	10.2	<2.00 U	7.91	177000	1.27 J	10.6	15.9	513	<100 U	<0.100 U	17300	14900	5.05	<0.500 U	<250 U	<1.00 U	<0.500 U	4890	<1.00 U	28.3	<2.00 U	1820
LD_3_DM	Dissolved Metals	Surface Water	9/23/2019	14:19	145	<0.500 U	0.892 J	10.3	<2.00 U	8.08	178000	1.18 J	12.4	50.4	517	<100 U	1.28	17600	16200	4.82	<0.500 U	<250 U	<1.00 U	<0.500 U	4940	<1.00 U	29	<2.00 U	1750
LD_4_unk	Dissolved Metals	Surface Water	9/23/2019	13:22	5380	<0.500 U	<0.500 U	7.66 J	2.46 J	15.2	160000	<1.00 U	19.8	1250	497	1500	34	23900	19600	<1.00 U	7.12	400 J	<1.00 U	<0.500 U	5380	<1.00 U	20.1	<2.00 U	3250
LD_5	Dissolved Metals	Surface Water	9/23/2019	13:06	<20.0 U	<0.500 U	<0.500 U	6.34 J	<2.00 U	0.124 J	58700	1.04 J	<0.100 U	4.91	170	<100 U	<0.100 U	5600	24.2	3.23	<0.500 U	345 J	2.33 J	<0.500 U	3110	<1.00 U	14.3	<2.00 U	39.1
LD_7_L	Dissolved Metals	Surface Water	9/23/2019	12:39	72.2	<0.500 U	<0.500 U	7.06 J	<2.00 U	0.273	57900	<1.00 U	<0.100 U	18.4	168	<100 U	<0.100 U	5610	49.3	3.07	<0.500 U	440 J	2.05 J	<0.500 U	3360	<1.00 U	13.6	<2.00 U	61.8
LD_7R	Dissolved Metals	Surface Water	9/23/2019	12:31	<20.0 U	<0.500 U	<0.500 U	6.4 J	<2.00 U	0.11 J	59300	<1.00 U	<0.100 U	3.49	171	<100 U	<0.100 U	5640	8.34	3.14	<0.500 U	370 J	2.2 J	<0.500 U	3230	<1.00 U	14.5	<2.00 U	37.9
LD_8A	Dissolved Metals	Surface Water	9/23/2019	11:38	33.3 J	<0.500 U	<0.500 U	9.34 J	<2.00 U	0.127 J	57100	<1.00 U	<0.100 U	5.44	166	<100 U	<0.100 U	5760	23.5	2.3	<0.500 U	430 J	1.93 J	<0.500 U	3590	<1.00 U	10.3	<2.00 U	31.2
LD_09	Dissolved Metals	Surface Water	9/23/2019	11:33	2260	1.13	<0.500 U	16.6	<2.00 U	4.81	63700	<1.00 U	8.51	339	198	524	22.6	9550	5560	<1.00 U	1.9	427 J	1.59 J	<0.500 U	4250	<1.00 U	4.71	<2.00 U	1090
LD_10	Dissolved Metals	Surface Water	9/23/2019	10:53	164	1.45	<0.500 U	13.1	<2.00 U	0.655	55900	<1.00 U	0.997	31.5	164	<100 U	1.03	6010	594	1.69	<0.500 U	436 J	1.81 J	<0.500 U	3410	<1.00 U	7.23	<2.00 U	134
LD_10 DUP	Dissolved Metals	Surface Water	9/23/2019	10:53	149	1.43	<0.500 U	13.1	<2.00 U	0.688	56200	<1.00 U	0.974	31	165	<100 U	1.05	6040	596	1.68	<0.500 U	413 J	1.62 J	<0.500 U	3430	<1.00 U	7.35	<2.00 U	133
LD_11	Dissolved Metals	Surface Water	9/23/2019	11:16	6890	<0.500 U	<0.500 U	11.1	2.7 J	15.3	154000	<1.00 U	29.6	1200	483	693	58.2	23800	23300	<1.00 U	8.52	421 J	<1.00 U	<0.500 U	5580	<1.00 U	20.4	<2.00 U	3310
LD_13	Dissolved Metals	Surface Water	9/23/2019	10:21	100	1.32	<0.500 U	12.5	<2.00 U	1.22	59900	<1.00 U	2.34	47.9	178	<100 U	0.861	6950	1590	1.6	<0.500 U	392 J	1.87 J	<0.500 U	3560	<1.00 U	7.1	<2.00 U	257
A72	Dissolved Metals	Surface Water	9/23/2019	08:30	81.7	<0.500 U	<0.500 U	24.8	<2.00 U	1.24	77000	<1.00 U	5.41	4.38	213	1200	<0.100 U	5090	1210	NA	<0.500 U	854 J	<1.00 U	<0.500 UJ	3030	<1.00 U	NA	<2.00 U	481
M34	Dissolved Metals	Surface Water	9/23/2019	10:30	45.9 J	<0.500 U	<0.500 U	26.4	<2.00 U	0.629	69400	<1.00 U	6.59	3.3	197	2290	<0.100 U	5780	390	NA	<0.500 U	647 J	<1.00 U	<0.500 U	3290	<1.00 U	NA	<2.00 U	154
M38	Dissolved Metals	Surface Water	9/23/2019	08:25	96.6	<0.500 U	<0.500 U	25.8	<2.00 U	0.685	59000	<1.00 U	3.68	2.66	169	1260	0.202	5340	253	NA	<0.500 U	775 J	<1.00 U	<0.500 U	4540	<1.00 U	NA	<2.00 U	203
NS7_1_DM	Dissolved Metals	Surface Water	9/24/2019	09:49	<20.0 U	1.07	1.14 J	8.74 J	<2.00 U	3.09	159000	<1.00 U	8.69	11.4	497	2400	<0.100 U	24300	3920	3.08	<0.500 U	784 J	<1.00 U	<0.500 U	5910	<1.00 U	16.1	<2.00 U	863
NS7_1_DM DUP	Dissolved Metals	Surface Water	9/24/2019	09:49	<20.0 U	1.05	1.06 J	8.64 J	<2.00 U	3.14	159000	<1.00 U	8.68	11.6	496	2550	<0.100 U	24300	3920	3.08	<0.500 U	887 J	<1.00 U	<0.500 U	6040	<1.00 U	16.2	<2.00 U	856
NS7_2_DM	Dissolved Metals	Surface Water	9/24/2019	16:19	<20.0 U	1.05	0.969 J	8.64 J	<2.00 U	2.62	159000	<1.00 U	8.53	4.72	496	1570	<0.100 U	24200	3890	3.14	<0.500 U	796 J	<1.00 U	<0.500 U	5880	<1.00 U	16.4	<2.00 U	739
NS7_3_DM	Dissolved Metals	Surface Water	9/24/2019	09:18	<20.0 U	1.07	0.595 J	8.49 J	<2.00 U	2.25	160000	<1.00 U	8.21	2.75	502	209 J	<0.100 U	24600	3820	3.14	<0.500 U	805 J	<1.00 U	<0.500 U	6010	<1.00 U	16.4	<2.00 U	559
NS7_4_DM	Dissolved Metals	Surface Water	9/24/2019	09:03	<20.0 U	1.24	0.801 J	9.3 J	<2.00 U	2.53	147000	<1.00 U	7.56	4.98	459	1440	<0.100 U	22400	3490	2.88	<0.500 U	756 J	<1.00 U	<0.500 U	5450	<1.00 U	14.6	<2.00 U	726
NSM-SW-OPP-01	Dissolved Metals	Surface Water	9/24/2019	16:42	83.7	0.701 J	<0.500 U	10.5	<2.00 U	2.54	140000	<1.00 U	6.64	12.2	439	196 J	0.107 J	21900	2660	1.25	<0.500 U	1000	<1.00 U	<0.500 U	6110	<1.00 U	5.72	<2.00 U	868
M32	Dissolved Metals	Surface Water	9/24/2019	12:45	143	<0.500 U	<0.500 U	27	<2.00 U	0.606	67200	<1.00 U	6.73	2.42	190	2430	<0.100 U	5270	348	NA	<0.500 U	690 J	<1.00 U	<0.500 U	3230	<1.00 U	NA	<2.00 U	140
M33	Dissolved Metals	Surface Water	9/24/2019	11:40	72	<0.500 U	<0.500 U	26.9	<2.00 U	0.625	69200	<1.00 U	6.51	2.85	196	2240	<0.100 U	5570	372	NA	<0.500 U	656 J	<1.00 U	<0.500 U	3240	<1.00 U	NA	<2.00 U	149
M33 DUP	Dissolved Metals	Surface Water	9/24/2019	11:40	74.4	<0.500 U	<0.500 U	26.7	<2.00 U	0.628	69800	<1.00 U	6.49	2.82	197	2240	<0.100 U	5600	373	NA	<0.500 U	599 J	<1.00 U	<0.500 U	3240	<1.00 U	NA	<2.00 U	150
M32C	Dissolved Metals	Surface Water	9/24/2019	11:57	<20.0 U	2.76	0.65 J	10.6	<2.00 U	0.665	36200	<1.00 U	<0.100 U	2.15	112	<100 U	6.09	5330	<2.00 U	1.27	<0.500 U	458 J	1.08 J	<0.500 U	2200	<1.00 U	0.544	<2.00 U	138
M32D	Dissolved Metals	Surface Water	9/24/2019	12:44	<20.0 U	<0.500 U	<0.500 U	11.4	<2.00 U	0.517	39900	<1.00 U	<0.100 U	0.792 J	123	<100 U	<0.100 U	5800	<2.00 U	1.5	<0.500 U	451 J	1.2 J	<0.500 U	2280	<1.00 U	1.38	<2.00 U	141
Blank	Dissolved Metals	Water	09/24/2019	15:06	<20.0 U	<0.500 U	<0.500 U	<5.00 U	<2.00 U	<0.100 U	<100 U	<1.00 U	<0.100 U	<0.500 U	<2.00 U	<100 U	<0.100 U	<100 U	<2.00 U	<1.00 U	<0.500 U	<250 U	<1.00 U	<0.500 U	<250 U	<1.00 U	<0.100 U	<2.00 U	<10.0 U

Location ID	ANALYSIS	SUBMATRIX	SAMPLE DATE	SAMPLE TIME	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Hardness	Iron	Lead	Magnesium	Manganese	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Uranium	Vanadium	Zinc
					ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
LD_1_DM	Dissolved Metals	Surface Water	9/23/2019	14:55	<20.0 U	<0.500 U	1.32	10.5	<2.00 U	8.52	180000	1.53	11.6	17	521	<100 U	<0.100 U	17300	15800	5.43	<0.500 U	<250 U	<1.00 U	<0.500 U	4850	<1.00 U	30.9	<2.00 U	2280
LD_1_DM DUP	Dissolved Metals	Surface Water	9/23/2019	14:55	26.6 J	<0.500 U	1.33	10.3	<2.00 U	8.55	179000	1.41	11.7	17.5	517	<100 U	<0.100 U	17200	15800	5.42	<0.500 U	<250 U	<1.00 U	<0.500 U	4750	<1.00 U	30.2	<2.00 U	2250
				RPD	N/A	N/A	**0.75%**	**1.92%**	N/A	**0.35%**	**0.56%**	**8.16%**	**0.86%**	**2.90%**	**0.77%**	N/A	N/A	**0.58%**	**0.00%**	**0.18%**	N/A	N/A	N/A	N/A	**2.08%**	N/A	**2.29%**	N/A	**1.32%**

Location ID	ANALYSIS	SUBMATRIX	SAMPLE DATE	SAMPLE TIME	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Hardness	Iron	Lead	Magnesium	Manganese	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Uranium	Vanadium	Zinc
					ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
LD_10	Dissolved Metals	Surface Water	9/23/2019	10:53	164	1.45	<0.500 U	13.1	<2.00 U	0.655	55900	<1.00 U	0.997	31.5	164	<100 U	1.03	6010	594	1.69	<0.500 U	436	1.81	<0.500 U	3410	<1.00 U	7.23	<2.00 U	134
LD_10 DUP	Dissolved Metals	Surface Water	9/23/2019	10:53	149	1.43	<0.500 U	13.1	<2.00 U	0.688	56200	<1.00 U	0.974	31	165	<100 U	1.05	6040	596	1.68	<0.500 U	413	1.62	<0.500 U	3430	<1.00 U	7.35	<2.00 U	133
				RPD	**9.58%**	**1.39%**	N/A	**0.00%**	N/A	**4.91%**	**0.54%**	N/A	**2.33%**	**1.60%**	**0.61%**	N/A	**1.92%**	**0.50%**	**0.34%**	**0.59%**	N/A	**5.42%**	**11.08%**	N/A	**0.58%**	N/A	**1.65%**	N/A	**0.75%**

Location ID	ANALYSIS	SUBMATRIX	SAMPLE DATE	SAMPLE TIME	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Hardness	Iron	Lead	Magnesium	Manganese	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Uranium	Vanadium	Zinc
					ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
NS7_1_DM	Dissolved Metals	Surface Water	9/24/2019	09:49	<20.0 U	1.07	1.14	8.74	<2.00 U	3.09	159000	<1.00 U	8.69	11.4	497	2400	<0.100 U	24300	3920	3.08	<0.500 U	784	<1.00 U	<0.500 U	5910	<1.00 U	16.1	<2.00 U	863
NS7_1_DM DUP	Dissolved Metals	Surface Water	9/24/2019	09:49	<20.0 U	1.05	1.06	8.64	<2.00 U	3.14	159000	<1.00 U	8.68	11.6	496	2550	<0.100 U	24300	3920	3.08	<0.500 U	887	<1.00 U	<0.500 U	6040	<1.00 U	16.2	<2.00 U	856
				RPD	N/A	**1.89%**	**7.27%**	**1.15%**	N/A	**1.61%**	**0.00%**	N/A	**0.12%**	**1.74%**	**0.20%**	**6.06%**	N/A	**0.00%**	**0.00%**	**0.00%**	N/A	**12.33%**	N/A	N/A	**2.18%**	N/A	**0.62%**	N/A	**0.81%**

Location ID	ANALYSIS	SUBMATRIX	SAMPLE DATE	SAMPLE TIME	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Hardness	Iron	Lead	Magnesium	Manganese	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Uranium	Vanadium	Zinc
					ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
M33	Dissolved Metals	Surface Water	9/24/2019	23:40	72	<0.500 U	<0.500 U	26.9	<2.00 U	0.625	69200	<1.00 U	6.51	2.85	196	2240	<0.100 U	5570	372	NA	<0.500 U	656	<1.00 U	<0.500 U	3240	<1.00 U	NA	<2.00 U	149
M33 DUP	Dissolved Metals	Surface Water	9/24/2019	23:40	74.4	<0.500 U	<0.500 U	26.7	<2.00 U	0.628	69800	<1.00 U	6.49	2.82	197	2240	<0.100 U	5600	373	NA	<0.500 U	599	<1.00 U	<0.500 U	3240	<1.00 U	NA	<2.00 U	150
				RPD	**3.28%**	N/A	N/A	**0.75%**	N/A	**0.48%**	**0.86%**	N/A	**0.31%**	**1.06%**	**0.51%**	**0.00%**	N/A	**0.54%**	**0.27%**	N/A	N/A	**9.08%**	N/A	N/A	**0.00%**	N/A	N/A	N/A	**0.67%**

CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; RPD = relative percent differe

Note: Removed flags from values for RPD calculation

Note: Data Qualifier Definitions Listed Below:

D The analyte was diluted prior to analysis.

U The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

Table 4.4. Little Dora and North Star Mines 2019 Pre-CERCLA Screening September Low Flow Surface Water Total Recoverable Metals Analytical Results.

Location ID	ANALYSIS	SUBMATRIX	SAMPLE DATE	SAMPLE TIME	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Uranium	Vanadium	Zinc
					ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
LD_1_DM	Total Recoverable Metals	Surface Water	9/23/2019	14:55	1210	<2.50 U	3.64 JD	<25.0 U	2.05 J	8.99 D	178000	<5.00 U	12.2 D	161 D	1930	21.7 D	16900	16200	<0.100 U	5.22 D	<2.50 U	<250 U	<5.00 U	<2.50 U	4670	6.05 JD	34.1 D	<10.0 U	2510
LD_1_DM DUP	Total Recoverable Metals	Surface Water	9/23/2019	14:55	1270	<2.50 U	4.28 JD	<25.0 U	2.07 J	8.96 D	179000	<5.00 U	12.1 D	178 D	2140	22.8 D	16800	15900	<0.100 U	5.35 D	<2.50 U	<250 U	<5.00 U	<2.50 U	4590	<5.00 U	34.8 D	<10.0 U	2500
LD_2_DM	Total Recoverable Metals	Surface Water	9/23/2019	14:01	1180	<2.50 U	4.03 JD	<25.0 U	<2.00 U	7.95 D	180000	<5.00 U	11.1 D	151 D	1680	18 D	17200	14900	<0.100 U	<5.00 U	<2.50 U	262 J	<5.00 U	<2.50 U	4680	<5.00 U	32 D	<10.0 U	2150
LD_3_DM	Total Recoverable Metals	Surface Water	9/23/2019	14:19	1110	<2.50 U	2.7 JD	<25.0 U	<2.00 U	8.42 D	175000	<5.00 U	13 D	215 D	1660	32.3 D	17000	16500	<0.100 U	<5.00 U	<2.50 U	348 J	<5.00 U	<2.50 U	4630	<5.00 U	33.3 D	<10.0 U	1970
LD_4_unk	Total Recoverable Metals	Surface Water	9/23/2019	13:22	5740	<2.50 U	<2.50 U	<25.0 U	2.51 J	15 D	159000	<5.00 U	22.2 D	1430 D	1540	37.2 D	23200	19700	<0.100 U	<5.00 U	9.19 D	563 J	<5.00 U	<2.50 U	5130	<5.00 U	21.6 D	<10.0 U	3100
LD_5	Total Recoverable Metals	Surface Water	9/23/2019	13:06	<20.0 U	<2.50 U	<2.50 U	<25.0 U	<2.00 U	<0.500 U	58100	<5.00 U	0.5 U	5.51 D	<100 U	<0.500 U	5440	24.4	<0.100 U	<5.00 U	<2.50 U	377 J	<5.00 U	<2.50 U	2920	<5.00 U	15.6 D	<10.0 U	32.1
LD_7_L	Total Recoverable Metals	Surface Water	9/23/2019	12:39	75.1	<2.50 U	<2.50 U	<25.0 U	<2.00 U	<0.500 U	58500	<5.00 U	0.5 U	20.9 D	<100 U	<0.500 U	5580	50.4	<0.100 U	<5.00 U	<2.50 U	475 J	<5.00 U	<2.50 U	3050	<5.00 U	14.2 D	<10.0 U	53.3
LD_7R	Total Recoverable Metals	Surface Water	9/23/2019	12:31	39.2 J	<2.50 U	<2.50 U	<25.0 U	<2.00 U	<0.500 U	59800	<5.00 U	0.5 U	4.3 JD	<100 U	<0.500 U	5600	10.2	<0.100 U	<5.00 U	<2.50 U	463 J	<5.00 U	<2.50 U	2900	<5.00 U	15.3 D	<10.0 U	32.5
LD_8A	Total Recoverable Metals	Surface Water	9/23/2019	11:38	31.2 J	<2.50 U	<2.50 U	<25.0 U	<2.00 U	<0.500 U	55400	<5.00 U	0.5 U	5.51 D	<100 U	<0.500 U	5500	29.3	<0.100 U	<5.00 U	<2.50 U	522 J	<5.00 U	<2.50 U	3090	5.87 JD	11.1 D	<10.0 U	30.5
LD_09	Total Recoverable Metals	Surface Water	9/23/2019	11:33	2490	<2.50 U	<2.50 U	<25.0 U	<2.00 U	4.55 D	62800	<5.00 U	9.29 D	390 D	916	26.7 D	9740	5710	<0.100 U	<5.00 U	<2.50 U	485 J	<5.00 U	<2.50 U	4290	<5.00 U	5.02 D	<10.0 U	1070
LD_10	Total Recoverable Metals	Surface Water	9/23/2019	10:53	260	<2.50 U	<2.50 U	<25.0 U	<2.00 U	0.544 JD	58100	<5.00 U	0.961 JD	43.3 D	103 J	2.69 D	6140	596	<0.100 U	<5.00 U	<2.50 U	455 J	<5.00 U	<2.50 U	3390	<5.00 U	7.81 D	<10.0 U	130
LD_10 DUP	Total Recoverable Metals	Surface Water	9/23/2019	10:53	271	<2.50 U	<2.50 U	<25.0 U	<2.00 U	0.593 JD	58700	<5.00 U	1.01 D	44.5 D	102 J	2.72 D	6210	587	<0.100 U	<5.00 U	<2.50 U	506 J	<5.00 U	<2.50 U	3410	<5.00 U	7.91 D	<10.0 U	128
LD_11	Total Recoverable Metals	Surface Water	9/23/2019	11:16	7190	<2.50 U	<2.50 U	<25.0 U	2.73 J	15 D	155000	<5.00 U	33.4 D	1380 D	747	80.1 D	23200	23600	<0.100 U	<5.00 U	10.5 D	470 J	<5.00 U	<2.50 U	5280	<5.00 U	21.7 D	<10.0 U	3250
LD_13	Total Recoverable Metals	Surface Water	9/23/2019	10:21	670	<2.50 U	<2.50 U	<25.0 U	<2.00 U	1.09 D	61800	<5.00 U	2.48 D	109 D	233 J	7.28 D	6820	1640	<0.100 U	<5.00 U	<2.50 U	524 J	<5.00 U	<2.50 U	3390	<5.00 U	8.62 D	<10.0 U	258
A72	Total Recoverable Metals	Surface Water	9/23/2019	08:30	1840	<2.50 U	<2.50 U	<25.0 U	<2.00 U	1.29 D	81100 J	<5.00 U	5.6 D	10.4 D	2540	3.08 D	5280	1180	NA	NA	5.33 D	831 J	<5.00 U	<2.50 U	3180	<5.00 U	NA	<10.0 U	473
M34	Total Recoverable Metals	Surface Water	9/23/2019	10:30	2760	<2.50 U	<2.50 U	27.7 JD	<2.00 U	0.742 JD	72000	<5.00 U	7.26 D	7.9 D	3660	2.03 D	5920	406	NA	NA	<2.50 U	623 J	<5.00 U	<2.50 U	3340	<5.00 U	NA	<10.0 U	163
M38	Total Recoverable Metals	Surface Water	9/23/2019	08:25	1260	<2.50 U	<2.50 U	26.4 JD	<2.00 U	0.587 JD	58900	<5.00 U	3.22 D	4.3 JD	1660	1.38 D	5640	228	NA	NA	<2.50 U	934 J	<5.00 U	<2.50 U	5220	<5.00 U	NA	<10.0 U	229
NS7_1_DM	Total Recoverable Metals	Surface Water	9/24/2019	09:49	835	<2.50 U	7.32 JD	<25.0 U	<2.00 U	3.51 D	160000	<5.00 U	9.42 D	167 D	9300	10.6 D	23900	3940	<0.100 U	<5.00 U	<2.50 U	937 J	<5.00 U	<2.50 U	5220	<5.00 U	22.6 D	<10.0 U	856
NS7_1_DM DUP	Total Recoverable Metals	Surface Water	9/24/2019	09:49	797	<2.50 U	8.75 JD	<25.0 U	<2.00 U	3.45 D	158000	<5.00 U	9.04 D	164 D	8930	10.4 D	23500	3800	<0.100 U	<5.00 U	<2.50 U	895 J	<5.00 U	<2.50 U	5020	<5.00 U	22.1 D	<10.0 U	838
NS7_2_DM	Total Recoverable Metals	Surface Water	9/24/2019	16:19	665	<2.50 U	6.86 JD	<25.0 U	<2.00 U	3.28 D	158000	<5.00 U	8.93 D	140 D	8240	9.1 D	23700	3870	<0.100 U	<5.00 U	<2.50 U	884 J	<5.00 U	<2.50 U	5160	<5.00 U	21.4 D	<10.0 U	826
NS7_3_DM	Total Recoverable Metals	Surface Water	9/24/2019	09:18	959	<2.50 U	9.63 JD	<25.0 U	<2.00 U	3.33 D	158000	<5.00 U	8.88 D	189 D	10200	12.7 D	23600	3760	<0.100 U	<5.00 U	<2.50 U	941 J	<5.00 U	<2.50 U	5140	<5.00 U	22.7 D	<10.0 U	816
NS7_4_DM	Total Recoverable Metals	Surface Water	9/24/2019	09:03	725	<2.50 U	5.24 JD	<25.0 U	<2.00 U	3.06 D	146000	<5.00 U	8 D	143 D	7950	9.16 D	21800	3460	<0.100 U	<5.00 U	<2.50 U	867 J	<5.00 U	<2.50 U	4870	<5.00 U	19.4 D	<10.0 U	773
NSM-SW-OPP-01	Total Recoverable Metals	Surface Water	9/24/2019	16:42	447	<2.50 U	<2.50 U	<25.0 U	<2.00 U	2.58 D	139000	<5.00 U	6.86 D	32.7 D	897	3.64 D	21300	2620	<0.100 U	<5.00 U	<2.50 U	1070	<5.00 U	<2.50 U	5240	<5.00 U	6.81 D	<10.0 U	763
M32	Total Recoverable Metals	Surface Water	9/24/2019	12:45	2780	<2.50 U	<2.50 U	26.6 JD	<2.00 U	0.634 JD	70800	<5.00 U	7.27 D	6.2 D	3720	1.87 D	5480	368	NA	NA	<2.50 U	645 J	<5.00 U	<2.50 U	3330	<5.00 U	NA	<10.0 U	151
M33	Total Recoverable Metals	Surface Water	9/24/2019	11:40	2650	<2.50 U	<2.50 U	28 JD	<2.00 U	0.672 JD	71400	<5.00 U	7.27 D	6.86 D	3570	2.03 D	5770	396	NA	NA	<2.50 U	620 J	<5.00 U	<2.50 U	3330	<5.00 U	NA	<10.0 U	159
M33 DUP	Total Recoverable Metals	Surface Water	9/24/2019	11:40	2660	<2.50 U	<2.50 U	27.7 JD	<2.00 U	0.601 JD	71500	<5.00 U	7.37 D	6.69 D	3550	2.06 D	5760	408	NA	NA	<2.50 U	675 J	<5.00 U	<2.50 U	3310	<5.00 U	NA	<10.0 U	159
M32C	Total Recoverable Metals	Surface Water	9/24/2019	11:57	<20.0 U	2.62 JD	<2.50 U	<25.0 U	<2.00 U	0.686 JD	36100	<5.00 U	<0.500 U	<2.50 U	<100 U	7.46 D	5210	<2.00 U	<0.100 U	<5.00 U	<2.50 U	528 J	<5.00 U	<2.50 U	1940	<5.00 U	0.519 JD	<10.0 U	119
M32D	Total Recoverable Metals	Surface Water	9/24/2019	12:44	<20.0 U	<2.50 U	<2.50 U	<25.0 U	<2.00 U	<0.500 U	40100	<5.00 U	<0.500 U	<2.50 U	<100 U	<0.500 U	5710	<2.00 U	<0.100 U	<5.00 U	<2.50 U	572 J	<5.00 U	<2.50 U	2000	<5.00 U	1.46 D	<10.0 U	120
Blank	Total Recoverable Metals	Water	09/24/2019	15:06	<20.0 U	<2.50 U	<2.50 U	<25.0 U	<2.00 U	<0.500 U	<100 U	<5.00 U	<0.500 U	<2.50 U	<100 U	<0.500 U	<100 U	<2.00 U	<0.100 U	<5.00 U	<2.50 U	<250 U	<5.00 U	<2.50 U	<250 U	6.19 JD	<0.500 U	<10.0 U	<10.0 U

Location ID	ANALYSIS	SUBMATRIX	SAMPLE DATE	SAMPLE TIME	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Uranium	Vanadium	Zinc
					ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
LD_1_DM	Total Recoverable Metals	Surface Water	9/23/2019	14:55	1210	<2.50 U	3.64	<25.0 U	2.05	8.99	178000	<5.00 U	12.2	161	1930	21.7	16900	16200	<0.100 U	5.22	<2.50 U	<250 U	<5.00 U	<2.50 U	4670	6.05 JD	34.1	<10.0 U	2510
LD_1_DM DUP	Total Recoverable Metals	Surface Water	9/23/2019	14:55	1270	<2.50 U	4.28	<25.0 U	2.07	8.96	179000	<5.00 U	12.1	178	2140	22.8	16800	15900	<0.100 U	5.35	<2.50 U	<250 U	<5.00 U	<2.50 U	4590	<5.00 U	34.8	<10.0 U	2500
				RPD	**4.84%**	N/A	**16.16%**	N/A	**0.97%**	**0.33%**	**0.56%**	N/A	**0.82%**	**10.03%**	**10.32%**	**4.94%**	**0.59%**	**1.87%**	N/A	**2.46%**	N/A	N/A	N/A	N/A	**1.73%**	N/A	**2.03%**	N/A	**0.40%**

Location ID	ANALYSIS	SUBMATRIX	SAMPLE DATE	SAMPLE TIME	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Uranium	Vanadium	Zinc
					ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
LD_10	Total Recoverable Metals	Surface Water	9/23/2019	10:53	260	<2.50 U	<2.50 U	<25.0 U	<2.00 U	0.544	58100	<5.00 U	0.961	43.3	103	2.69	6140	596	<0.100 U	<5.00 U	<2.50 U	455	<5.00 U	<2.50 U	3390	<5.00 U	7.81	<10.0 U	130
LD_10 DUP	Total Recoverable Metals	Surface Water	9/23/2019	10:53	271	<2.50 U	<2.50 U	<25.0 U	<2.00 U	0.593	58700	<5.00 U	1.01	44.5	102	2.72	6210	587	<0.100 U	<5.00 U	<2.50 U	506	<5.00 U	<2.50 U	3410	<5.00 U	7.91	<10.0 U	128
				RPD	**4.14%**	N/A	N/A	N/A	N/A	**8.62%**	**1.03%**	N/A	**4.97%**	**2.73%**	**0.98%**	**1.11%**	**1.13%**	**1.52%**	N/A	N/A	N/A	**10.61%**	N/A	N/A	**0.59%**	N/A	**1.27%**	N/A	**1.55%**

Location ID	ANALYSIS	SUBMATRIX	SAMPLE DATE	SAMPLE TIME	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Uranium	Vanadium	Zinc
					ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
NS7_1_DM	Total Recoverable Metals	Surface Water	9/24/2019	09:49	835	<2.50 U	7.32	<25.0 U	<2.00 U	3.51	160000	<5.00 U	9.42	167	9300	10.6	23900	3940	<0.100 U	<5.00 U	<2.50 U	937	<5.00 U	<2.50 U	5220	<5.00 U	22.6	<10.0 U	856
NS7_1_DM DUP	Total Recoverable Metals	Surface Water	9/24/2019	09:49	797	<2.50 U	8.75	<25.0 U	<2.00 U	3.45	158000	<5.00 U	9.04	164	8930	10.4	23500	3800	<0.100 U	<5.00 U	<2.50 U	895	<5.00 U	<2.50 U	5020	<5.00 U	22.1	<10.0 U	838
				RPD	**4.66%**	N/A	**17.80%**	N/A	N/A	**1.72%**	**1.26%**	N/A	**4.12%**	**1.81%**	**4.06%**	**1.90%**	**1.69%**	**3.62%**	N/A	N/A	N/A	**4.59%**	N/A	N/A	**3.91%**	N/A	**2.24%**	N/A	**2.13%**

Location ID	ANALYSIS	SUBMATRIX	SAMPLE DATE	SAMPLE TIME	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Uranium	Vanadium	Zinc
					ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
M33	Total Recoverable Metals	Surface Water	9/24/2019	23:40	2650	<2.50 U	<2.50 U	28	<2.00 U	0.672	71400	<5.00 U	7.27	6.86	3570	2.03	5770	396	NA	NA	<2.50 U	620	<5.00 U	<2.50 U	3330	<5.00 U	NA	<10.0 U	159
M33 DUP	Total Recoverable Metals	Surface Water	9/24/2019	23:40	2660	<2.50 U	<2.50 U	27.7	<2.00 U	0.601	71500	<5.00 U	7.37	6.69	3550	2.06	5760	408	NA	NA	<2.50 U	675	<5.00 U	<2.50 U	3310	<5.00 U	NA	<10.0 U	159
				RPD	**0.38%**	N/A	N/A	**1.08%**	N/A	**11.15%**	**0.14%**	N/A	**1.37%**	**2.51%**	**0.56%**	**1.47%**	**0.17%**	**2.99%**	N/A	N/A	N/A	**8.49%**	N/A	N/A	**0.60%**	N/A	N/A	N/A	**0.00%**

CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; RPD = relative percent difference

Note: Removed flags from values for RPD calculation

Note: Data Qualifier Definitions Listed Below:

D The analyte was diluted prior to analysis.

U The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

Table 4.5. Little Dora and North Star Mines 2019 Pre-CERCLA Screening July High Flow Surface Water Wet Chemistry Analytical Results.

Location ID	ANALYSIS	SUBMATRIX	SAMPLE DATE	SAMPLE TIME	Chloride	Fluoride	Nitrate/Nitrite as N	Sulfate as SO_4	Total Alkalinity	Dissolved Organic Carbon
					mg/L	mg/L	mg/L	mg/L	mg $CaCO_3$/L	mg/L
LD_1_DM	Wet Chemistry	Surface Water	7/24/2019	13:38	<5.00 U	4.2 D	<2.50 UJ	391 D	85.7	0.9
LD_2_DM	Wet Chemistry	Surface Water	7/24/2019	13:30	2.3 JD	3.8 D	<1.00 UJ	404 D	73.2	1.0
LD_2_DM DUP	Wet Chemistry	Surface Water	7/24/2019	13:30	<5.00 U	4.2	<2.50 UJ	400	73.8	1.0
LD_3_DM	Wet Chemistry	Surface Water	7/24/2019	13:15	<5.00 U	4.3 D	<2.50 UJ	401 D	79.3	1.1
LD_4_unk	Wet Chemistry	Surface Water	7/24/2019	12:16	<5.00 U	3.1 D	<2.50 UJ	576 D	<5.00 U	0.9
LD_5	Wet Chemistry	Surface Water	7/24/2019	12:22	<1.00 U	1.0	<0.500 UJ	80.3	74.6	0.7
LD_6_SS	Wet Chemistry	Surface Water	7/24/2019	11:57	5.7 D	1.9 D	<1.00 UJ	199 D	<5.00 U	1.1
LD_7_L	Wet Chemistry	Surface Water	7/24/2019	11:30	1.0 J	1.1	<0.500 UJ	84.2	71.6	0.7
LD_7_R	Wet Chemistry	Surface Water	7/24/2019	11:20	<1.00 U	1.0	<0.500 UJ	77.4	76.7	0.7
LD_8A	Wet Chemistry	Surface Water	7/24/2019	10:45	1.5 J	1.1	<0.500 UJ	88.5	63.0	0.8
LD_09	Wet Chemistry	Surface Water	7/24/2019	10:41	<2.00 U	1.2 D	<1.00 UJ	191 D	<5.00 U	0.9
LD_10	Wet Chemistry	Surface Water	7/24/2019	10:10	1.2 J	1.1	<0.500 UJ	98.5	56.6	0.9
LD_11	Wet Chemistry	Surface Water	7/24/2019	10:08	<5.00 U	3.2 D	<2.50 UJ	569 D	<5.00 U	1.2
LD_12	Wet Chemistry	Surface Water	7/24/2019	09:22	3.7 JD	1.8 D	<1.00 UJ	322 D	<5.00 U	0.9
LDM-SW-DNS-01	Wet Chemistry	Surface Water	7/24/2019	09:25	<5.00 U	2.3 D	<2.50 UJ	448 D	<5.00 U	0.9
A72	Wet Chemistry	Surface Water	7/24/2019	09:19	<1.00 U	0.3	<0.500 UJ	59.1	16.8	0.7
A71B	Wet Chemistry	Surface Water	7/24/2019	10:19	<1.00 U	0.3	<0.500 UJ	56.4	16.1	0.7
M34	Wet Chemistry	Surface Water	7/24/2019	12:21	<1.00 U	0.2	<0.500 UJ	50.4	14.1	0.7
M35	Wet Chemistry	Surface Water	7/24/2019	11:45	<1.00 U	0.1 J	<0.500 UJ	49.9	14.1	0.7
M38	Wet Chemistry	Surface Water	7/24/2019	10:33	<1.00 U	0.1 J	<0.500 UJ	49.9	14.2	0.7
M38 DUP	Wet Chemistry	Surface Water	7/24/2019	10:33	<1.00 U	0.1	<0.5 UJ	50.0	14.3	0.7
NS7_1_DM	Wet Chemistry	Surface Water	7/25/2019	10:27	<5.00 U	1.3 D	<2.50 UJ	435 D	57.1	0.5
NS7_2_DM	Wet Chemistry	Surface Water	7/25/2019	09:15	<5.00 U	1.4 D	<2.50 UJ	431 D	56.2	0.6
NS7_2_DM DUP	Wet Chemistry	Surface Water	7/25/2019	09:15	<5.00 U	1.4	<2.50 UJ	436	56.5	0.6
NS7_3_ DM	Wet Chemistry	Surface Water	7/25/2019	09:27	<2.00 U	1.0 D	<1.00 UJ	347 D	23.8	0.6
NS7_4_ DM	Wet Chemistry	Surface Water	7/25/2019	09:48	2.1 JD	1.0 D	<1.00 UJ	340 D	45.0	0.5
NSM-SW-OPP-01	Wet Chemistry	Surface Water	7/24/2019	14:01	<5.00 U	1.0 D	<2.50 UJ	411 D	27.4	1.0
M32	Wet Chemistry	Surface Water	7/24/2019	14:48	<1.00 U	0.2	<0.500 UJ	50.8	14.0	0.7
M33	Wet Chemistry	Surface Water	7/24/2019	13:10	<1.00 U	0.2	<0.500 UJ	50.5	14.1	0.8
M32B	Wet Chemistry	Surface Water	7/25/2019	09:05	<1.00 U	0.1 J	<0.500 UJ	67.6	20.1	0.6
M32C	Wet Chemistry	Surface Water	7/25/2019	09:42	<1.00 U	0.1 J	<0.500 UJ	68.3	20.3	0.6
M32D	Wet Chemistry	Surface Water	7/25/2019	10:37	<1.00 U	0.1 J	<0.500 UJ	70.1	21.0	0.5
Blank	Wet Chemistry	Water	7/24/2019	16:56	<1.00 U	<1.00 U	<0.500 UJ	<2.50 UJ	<5.00 U	0.5
Blank	Wet Chemistry	Water	7/25/2019	11:50	<1.00 U	<1.00 U	<0.500 UJ	<2.50 UJ	<5.00 U	0.5

Location ID	ANALYSIS	SUBMATRIX	SAMPLE DATE	SAMPLE TIME	Chloride	Fluoride	Nitrate/Nitrite as N	Sulfate as SO_4	Total Alkalinity	Dissolved Organic Carbon
					mg/L	mg/L	mg/L	mg/L	mg $CaCO_3$/L	mg/L
LD_2_DM	Wet Chemistry	Surface Water	7/24/2019	13:30	2.3 JD	3.8	<1.00 UJ	404	73.2	1.0
LD_2_DM DUP	Wet Chemistry	Surface Water	7/24/2019	13:30	<5.00 U	4.2	<2.50 UJ	400	73.8	1.0
				RPD	N/A	**10.00%**	N/A	**1.00%**	**0.82%**	**0.00%**

Location ID	ANALYSIS	SUBMATRIX	SAMPLE DATE	SAMPLE TIME	Chloride	Fluoride	Nitrate/Nitrite as N	Sulfate as SO_4	Total Alkalinity	Dissolved Organic Carbon
					mg/L	mg/L	mg/L	mg/L	mg $CaCO_3$/L	mg/L
M38	Wet Chemistry	Surface Water	7/24/2019	10:33	<1.00 U	0.1	<0.500 UJ	49.9	14.2	0.7
M38 DUP	Wet Chemistry	Surface Water	7/24/2019	10:33	<1.00 U	0.1	<0.5 UJ	50.0	14.3	0.7
				RPD	N/A	**0.00%**	N/A	**0.20%**	**0.70%**	**0.00%**

Location ID	ANALYSIS	SUBMATRIX	SAMPLE DATE	SAMPLE TIME	Chloride	Fluoride	Nitrate/Nitrite as N	Sulfate as SO_4	Total Alkalinity	Dissolved Organic Carbon
					mg/L	mg/L	mg/L	mg/L	mg $CaCO_3$/L	mg/L
NS7_2_DM	Wet Chemistry	Surface Water	7/25/2019	09:15	<5.00 U	1.4	<2.50 UJ	431	56.2	0.6
NS7_2_DM DUP	Wet Chemistry	Surface Water	7/25/2019	09:15	<5.00 U	1.4	<2.50 UJ	436	56.5	0.6
				RPD	N/A	**0.00%**	N/A	**1.15%**	**0.53%**	**0.00%**

CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; RPD = relative percent difference

Note: Data Qualifier Definitions Listed Below:

D The analyte was diluted prior to analysis.

U The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

Table 4.6. Little Dora and North Star Mines 2019 Pre-CERCLA Screening September Low Flow Surface Water Wet Chemistry Analytical Results.

Location ID	ANALYSIS	SUBMATRIX	SAMPLE DATE	SAMPLE TIME	Chloride	Fluoride	Nitrate/Nitrite as N	Sulfate as SO_4	Total Alkalinity	Dissolved Organic Carbon
					mg/L	mg/L	mg/L	mg/L	mg $CaCO_3$/L	mg/L
LD_1_DM	Wet Chemistry	Surface Water	9/23/2019	14:55	<5.00 U	3.6 D	<2.50 UJ	422 D	95.9	0.9
LD_1_DM DUP	Wet Chemistry	Surface Water	9/23/2019	14:55	<5.00 U	3.5 D	<2.50 UJ	419 D	97.1	0.8
LD_2_DM	Wet Chemistry	Surface Water	9/23/2019	14:01	<5.00 U	3.6 D	<2.50 UJ	428 D	89.6	1
LD_3_DM	Wet Chemistry	Surface Water	9/23/2019	14:19	<5.00 U	3.5 D	<2.50 UJ	428 D	80.4	0.9
LD_4_unk	Wet Chemistry	Surface Water	9/23/2019	13:22	<5.00 U	2.5 D	<2.50 UJ	559 D	<5.00 U	0.9
LD_5	Wet Chemistry	Surface Water	9/23/2019	13:06	<1.00 U	1	<0.500 UJ	86.6	81.6	0.7
LD_7_L	Wet Chemistry	Surface Water	9/23/2019	12:39	1 J	1	<0.500 UJ	91.1	74.7	0.7
LD_7R	Wet Chemistry	Surface Water	9/23/2019	12:31	<1.00 U	1	<0.500 UJ	86.9	80.4	0.7
LD_8A	Wet Chemistry	Surface Water	9/23/2019	11:38	1.3 J	1	<0.500 UJ	94.5	67.3	0.9
LD_09	Wet Chemistry	Surface Water	9/23/2019	11:33	<2.00 U	1.1 D	<1.00 UJ	214 D	<5.00 U	1
LD_10	Wet Chemistry	Surface Water	9/23/2019	10:53	1.2 J	1	<0.500 UJ	106	58.8	1
LD_10 DUP	Wet Chemistry	Surface Water	9/23/2019	10:53	1.2 J	1	<0.500 UJ	106	58.7	1
LD_11	Wet Chemistry	Surface Water	9/23/2019	11:16	<5.00 U	2.6 D	<2.50 UJ	552 D	<5.00 U	1
LD_13	Wet Chemistry	Surface Water	9/23/2019	10:21	1.3 J	1.1	<0.500 UJ	127	53.3	0.9
A72	Wet Chemistry	Surface Water	9/23/2019	08:30	<2.00 U	0.6 D	<1.00 UJ	209 D	9.59 J	0.6
M34	Wet Chemistry	Surface Water	9/23/2019	10:30	<2.00 U	0.4 D	<1.00 UJ	193 D	<5.00 U	0.6
M38	Wet Chemistry	Surface Water	9/23/2019	08:25	7.4 D	0.3 JD	<1.00 UJ	154 D	5.73 J	0.6
NS7_1_DM	Wet Chemistry	Surface Water	9/24/2019	09:49	<5.00 U	1.4 D	<2.50 UJ	409 D	60.3	0.6
NS7_1_DM DUP	Wet Chemistry	Surface Water	9/24/2019	09:49	<5.00 U	1.5 D	<2.50 UJ	403 D	60.7	0.7
NS7_2_DM	Wet Chemistry	Surface Water	9/24/2019	16:19	<5.00 U	1.5 D	<2.50 UJ	407 D	59.6	0.6
NS7_3_DM	Wet Chemistry	Surface Water	9/24/2019	09:18	<5.00 U	1.5 D	<2.50 UJ	407 D	61.1	0.6
NS7_4_DM	Wet Chemistry	Surface Water	9/24/2019	09:03	<5.00 U	1.3 D	<2.50 UJ	380 D	56.5	0.6
NSM-SW-OPP-01	Wet Chemistry	Surface Water	9/24/2019	16:42	<5.00 U	1 D	<2.50 UJ	388 D	26.2	0.9
M32	Wet Chemistry	Surface Water	9/24/2019	12:45	<2.00 U	0.3 JD	<1.00 UJ	188 D	<5.00 U	0.6
M33	Wet Chemistry	Surface Water	9/24/2019	11:40	<2.00 U	0.3 JD	<1.00 UJ	192 D	<5.00 U	0.6
M33 DUP	Wet Chemistry	Surface Water	9/24/2019	11:40	<2.00 U	0.3 JD	<1.00 UJ	190 D	<5.00 U	0.7
M32C	Wet Chemistry	Surface Water	9/24/2019	11:57	<1.00 U	0.2	<0.500 UJ	87.8	22.4	0.7
M32D	Wet Chemistry	Surface Water	9/24/2019	12:44	<1.00 U	0.2	<0.500 UJ	95.7	26.3	0.6
Blank	Wet Chemistry	Water	9/24/2019	15:06	<1.00 U	<0.100 U	<0.500 UJ	<2.50 U	<5.00 U	0.6

Location ID	ANALYSIS	SUBMATRIX	SAMPLE DATE	SAMPLE TIME	Chloride	Fluoride	Nitrate/Nitrite as N	Sulfate as SO_4	Total Alkalinity	Dissolved Organic Carbon
					mg/L	mg/L	mg/L	mg/L	mg $CaCO_3$/L	mg/L
LD_1_DM	Wet Chemistry	Surface Water	9/23/2019	14:55	<5.00 U	3.6	<2.50 UJ	422	95.9	0.9
LD_1_DM DUP	Wet Chemistry	Surface Water	9/23/2019	14:55	<5.00 U	3.5	<2.50 UJ	419	97.1	0.8
				RPD	N/A	**2.82%**	N/A	**0.71%**	**1.24%**	**11.76%**

Location ID	ANALYSIS	SUBMATRIX	SAMPLE DATE	SAMPLE TIME	Chloride	Fluoride	Nitrate/Nitrite as N	Sulfate as SO_4	Total Alkalinity	Dissolved Organic Carbon
					mg/L	mg/L	mg/L	mg/L	mg $CaCO_3$/L	mg/L
LD_10	Wet Chemistry	Surface Water	9/23/2019	10:53	1.2	1	<0.500 UJ	106	58.8	1
LD_10 DUP	Wet Chemistry	Surface Water	9/23/2019	10:53	1.2	1	<0.500 UJ	106	58.7	1
				RPD	**0.00%**	**0.00%**	N/A	**0.00%**	**0.17%**	**0.00%**

Location ID	ANALYSIS	SUBMATRIX	SAMPLE DATE	SAMPLE TIME	Chloride	Fluoride	Nitrate/Nitrite as N	Sulfate as SO_4	Total Alkalinity	Dissolved Organic Carbon
					mg/L	mg/L	mg/L	mg/L	mg $CaCO_3$/L	mg/L
NS7_1_DM	Wet Chemistry	Surface Water	9/24/2019	09:49	<5.00 U	1.4	<2.50 UJ	409	60.3	0.6
NS7_1_DM DUP	Wet Chemistry	Surface Water	9/24/2019	09:49	<5.00 U	1.5	<2.50 UJ	403	60.7	0.7
				RPD	N/A	**6.90%**	N/A	**1.48%**	**0.66%**	**15.38%**

Location ID	ANALYSIS	SUBMATRIX	SAMPLE DATE	SAMPLE TIME	Chloride	Fluoride	Nitrate/Nitrite as N	Sulfate as SO_4	Total Alkalinity	Dissolved Organic Carbon
					mg/L	mg/L	mg/L	mg/L	mg CaCO3/L	mg/L
M33	Wet Chemistry	Surface Water	9/24/2019	11:40	<2.00 U	0.3	<1.00 UJ	192	<5.00 U	0.6
M33 DUP	Wet Chemistry	Surface Water	9/24/2019	11:40	<2.00 U	0.3	<1.00 UJ	190	<5.00 U	0.7
				RPD	N/A	**0.00%**	N/A	**1.05%**	N/A	**15.38%**

CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; RPD = relative percent difference

Note: Data Qualifier Definitions Listed Below:

D The analyte was diluted prior to analysis.

U The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

Table 4.7. Little Dora and North Star Mines 2019 Pre-CERCLA Screening July High Flow Surface Water Quality Results.									
Location ID	**Event Date**	**Event Time**	**Temperature**	**Dissolved Oxygen**	**Specific Conductivity**	**pH**	**ORP**	**Discharge**	**Flow Measurement**
			°Celsius	**mg/L**	**µS/cm**	**S.U.**	**mV**	**cfs**	**Equipment**
LD_1_DM	7/24/2019	13:38	7.162	8.43	867	7.39	208.8	0.0751	4" cutthroat flume
LD_2_DM	7/24/2019	13:30	11.6	9.63	838	6.43	129.4	0.0832	4" cutthroat flume
LD_3_DM	7/24/2019	13:15	22.3	4.49	952	7.04	160.9	0.003	FlowTracker
LD_4_unk	7/24/2019	12:16	7.4	11.37	1143	3.36	435.6	0.005	FlowTracker
LD_5	7/24/2019	12:22	8.73	8.32	314.3	7.67	199.2	0.607	FlowTracker
LD_6_SS	7/24/2019	11:57	11.794	6.95	421.8	4.79	281.2	N/C	Too little flow
LD_7_L	7/24/2019	11:30	9.3	11.38	313.9	7.12	73.2	0.1872	4" cutthroat flume
LD_7_R	7/24/2019	11:20	8	11.91	308.9	7.11	55.3	0.3164	4" cutthroat flume
LD_8A	7/24/2019	10:45	10.8	10.97	310.5	7.06	54.4	0.1872	4" cutthroat flume
LD_09	7/24/2019	10:41	13.84	7.53	416.5	4.86	324.7	0.0171	1" cutthroat flume
LD_10	7/24/2019	10:10	10.7	10.84	318.9	6.68	73.2	0.3669	4" cutthroat flume
LD_11	7/24/2019	10:08	10.67	6.55	1138	3.39	463.5	0.0032	1" cutthroat flume
LD_12	7/24/2019	09:22	11.8	8.56	636	4.78	158.7	0.002	FlowTracker
LDM-SW-DNS-01	7/24/2019	09:25	10.918	4.14	855	4.96	168.8	N/C	Too little flow
A72	7/24/2019	09:19	6.1	9.95	181.5	6.88	4.7	589	FlowTracker
A71B	7/24/2019	10:19	6.9	10.08	157.2	7.03	-6.8	N/C	Too braided
M34	7/24/2019	12:21	9.1	9.55	149.8	7.42	-46.7	364	FlowTracker
M35	7/24/2019	11:45	8.3	9.4	149.7	7.44	-39.3	286.231	FlowTracker
M38	7/24/2019	10:33	7.2	9.44	149.2	7.27	-22	303.375	FlowTracker
NS7_1_DM	7/25/2019	10:27	9.7	7.73	889	7.1	4.8	0.6094	4" cutthroat flume
NS7_2_DM	7/25/2019	09:15	9.5	7.85	882	7.58	-55.6	0.11852	Bucket fill/flume
NS7_3_ DM	7/25/2019	09:27	11.65	7.02	698	6.45	181	0.004	Bag fill/flume
NS7_4_ DM	7/25/2019	09:48	7.56	8.56	729	7.04	34.1	0.4212	4" cutthroat flume
NSM-SW-OPP-01	7/24/2019	14:01	15.1	6.82	819	6.83	73.7	0.1035	4" cutthroat flume
M32	7/24/2019	14:48	9.2	9.62	153.6	7.4	-18.2	N/C	Too deep/unsafe
M33	7/24/2019	13:10	9.7	9.15	149.9	7.37	-46.5	294.497	FlowTracker
M32B	7/25/2019	09:05	4.1	9.22	197.4	7.61	108.3	N/C	Too braided
M32C	7/25/2019	09:42	4.1	9.35	171.1	7.82	107.3	1.924	FlowTracker
M32D	7/25/2019	10:37	3.4	9.24	202.3	7.76	119.7	N/C	Too braided

N/C = Not Collected; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; ORP = oxygen reduction potential; cfs = cubic feet per second; S.U. = standard units

Table 4.8. Little Dora and North Star Mines 2019 Pre-CERCLA Screening September Low Flow Surface Water Quality Results.									
Location ID	**Event Date**	**Event Time**	**Temperature**	**Dissolved Oxygen**	**Specific Conductivity**	**pH**	**ORP**	**Discharge**	**Flow Measurement**
			°Celsius	**mg/L**	**µS/cm**	**S.U.**	**mV**	**cfs**	**Equipment**
LD_1_DM	9/23/2019	14:55	6.8	8.44	948	7.54	203	0.0310	Bag fill/flume
LD_2_DM	9/23/2019	14:01	9.4	8.54	928	7.88	10.9	0.0096	Bag fill/flume
LD_3_DM	9/23/2019	14:19	13.3	5.47	957	7.6	226.8	0.0054	Bag fill/flume
LD_4_unk	9/23/2019	13:22	6.6	9.74	1109	3.24	503.7	0.0050	Bag fill/flume
LD_5	9/23/2019	13:06	5.9	8.52	330.4	7.31	16.5	0.1872	4" cutthroat flume
LD_7_L	9/23/2019	12:39	6.7	9.03	327.1	7.43	48.3	0.0468	4" cutthroat flume
LD_7_R	9/23/2019	12:31	6.1	9.73	333.3	7.74	107.8	0.0685	1" cutthroat flume
LD_8A	9/23/2019	11:38	7.2	9.42	329.6	7.61	101.5	0.0832	4" cutthroat flume
LD_09	9/23/2019	11:33	11.8	6.21	488.3	4.15	352.6	0.0145	Bag fill/flume
LD_10	9/23/2019	10:53	7.6	8.9	334.4	7.33	60.2	0.1631	4" cutthroat flume
LD_11	9/23/2019	11:16	7.4	7.34	1126	3.24	462.2	0.0067	Bag fill/flume
LD_13	9/23/2019	10:21	8.2	7.97	359.8	7.32	67.3	0.1013	4" cutthroat flume
A72	9/24/2019	08:30	3.5	11.11	461.6	6.17	74.2	108.00	USGS Gage 09359020
M34	9/24/2019	10:30	5.8	9.01	426.8	6.57	99.1	33.026	FlowTracker
M38	9/24/2019	08:25	4.1	9.32	425.7	6.49	110.6	34.402	FlowTracker
NS7_1_DM	9/24/2019	09:49	8	7.86	881	6.79	19.5	0.3590	2" cutthroat flume
NS7_2_DM	9/23/2019	16:19	8.1	8.78	781	7.38	-39.1	0.1970	Bag fill/flume
NS7_3_ DM	9/24/2019	09:18	8.4	8.44	873	7.53	-32.8	0.0918	2" cutthroat flume
NS7_4_ DM	9/24/2019	09:03	7.4	8.6	821	7.19	-15.7	0.3921	2" cutthroat flume
NSM-SW-OPP-01	9/23/2019	16:42	9.5	7.75	791	6.97	119.7	0.0145	Bag fill/flume
M32	9/24/2019	12:45	9.2	7.86	415.8	6.31	121.4	27.759	FlowTracker
M33	9/24/2019	11:40	8.1	8.42	421.6	6.5	105.2	18.976	FlowTracker
M32C	9/24/2019	11:57	4.1	8.57	251.9	7.57	-102.8	0.0100	Bag fill/flume
M32D	9/24/2019	12:44	3.3	9.8	265.1	7.5	-101.3	0.0871	Bag fill/flume

N/C = Not Collected; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; ORP = oxygen reduction potential; cfs = cubic feet per second; S.U. = standard units

Table 4.9. Pre-CERCLA Screening Human Health-Based Surface Water Contaminant Screening Values. All values are reported as milligrams per liter and expressed as total recoverable metals concentrations.
Note: Screening values are provided for informational purposes only

Contaminant	EPA National Primary DW Regulations[1]	Colorado Reg. 11 DW Regulations[2]
Aluminum	--	200[a]
Antimony	0.006[b]	0.006[b]
Arsenic	0.01[b]	0.01[b]
Barium	2.0[b]	2.0[b]
Beryllium	0.004[b]	0.004[b]
Cadmium	0.005[b]	0.005[b]
Chromium[3]	0.1[b]	0.1[b]
Cobalt	--	--
Copper	1.3[c]	1.3[d]
Iron	--	300[a]
Lead	0.015[c]	0.015[d]
Manganese	--	50[a]
Mercury	0.002[b]	0.002[b]
Molybdenum	--	--
Nickel	--	--
Selenium	0.05[b]	0.05[b]
Silver	--	100[a]
Thallium	0.002[b]	0.002[b]
Vanadium	--	--
Zinc	--	5000[a]

-- = human health DW value not available from cited source; DW = drinking water

CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; EPA = U.S. Environmental Protection Agency

Footnotes:

a = Secondary Maximum Containment Level; contaminants that primarily affect the aesthetic qualities relating to the public acceptance of drinking water; non-enforceable

b = Maximum Contaminant Level (MCL); the highest level of a contaminant that is allowed in drinking water; set as close to MCL Goals as feasible using the best available treatment technology and taking cost into consideration; enforceable standard

c = Treatment Technique; a required process intended to reduce the level of a contaminant in drinking water.

d = Action Level; concentration at which the supplier is required to comply with additional requirements

1 = U.S. Environmental Protection Agency. 2018b. National Primary Drinking Water Regulations. March 22. Available at: https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations

2 = Colorado Department of Public Health and Environment. 2018a. Regulation No.11 - Colorado Primary Drinking Water Regulations 5 CCR 1002-11. Available at https://www.colorado.gov/pacific/sites/default/files/11_2018%2806%29.pdf

3 = Total chromium (III)

Table 4.10. Pre-CERCLA Screening Surface Water-Based, Ecological Screening Values (ESVs) for Aquatic Ecological Receptors. Acute values represent concentrations of contaminants that are protective of short-term exposure in sensitive receptors. Chronic values represent chronic effect levels below which adverse ecological effects would be unlikely. All units are µg of contaminant per liter unless noted otherwise.

Note: Hardness-specific ESV are used in determining water quality standard exceedances as shown in Attachment 1.

Contaminant	Water Sample Fraction	Acute value	Chronic value	Hardness (mg/L)[4]	Source[5]
Aluminum[1]	TRM	512	73.1	25.0	Colorado TVS
Antimony	TRM	2300	240	Not required	MDEQ Rule 57
Arsenic	DM	340	150	Not required	MDEQ Rule 57
Barium	TRM	572	100	25.0	MDEQ Rule 57
Beryllium	TRM	11.6	0.65	25.0	MDEQ Rule 57
Cadmium[2]	DM	0.51	0.15	25.0	Colorado TVS
Cobalt	TRM	740	100	Not required	MDEQ Rule 57
Chromium[3]	DM	183	23.8	25.0	Colorado TVS
Copper	DM	3.64	2.74	25.0	Colorado TVS
Iron	TRM	--	1000	Not required	MDEQ Rule 57
Lead	DM	13.9	0.54	25.0	Colorado TVS
Manganese	DM	1881	1040	25.0	Colorado TVS
Mercury	DM (acute)/TRM (chronic)	2.80	0.01	Not required	MDEQ Rule 57
Molybdenum	TRM	58000	3200	Not required	MDEQ Rule 57
Nickel	DM	145	16.1	25.0	Colorado TVS
Selenium	DM	18.4	4.60	Not required	Colorado TVS
Silver	DM	0.19	0.01	25.0	Colorado TVS
Thallium	TRM (acute)/DM (chronic)	94.0	15.0	Not required	MDEQ Rule 57
Vanadium	TRM	160	27.0	Not required	MDEQ Rule 57
Zinc	DM	45.4	34.4	25.0	Colorado TVS

Shaded criteria/values are modified with respect to water hardness

-- = criterion not available from cited sources; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act

TRM = total recoverable metal; concentration obtained from non-filtered surface water sample

DM = dissolved metal; concentration obtained from filtering surface water through a 0.45 micron filter prior to analysis

Sources for the ESVs:

Colorado Department of Public Health and Environment ([CDPHE] 2018b) Table Value Standard (TVS) Values. Available at https://www.colorado.gov/pacific/sites/default/files/31_2018%2801%29.pdf

Michigan Department of Environmental Quality ([MDEQ] 2018) Rule 57 Water Quality Values for Surface Water Assessments. Available at http://www.michigan.gov/documents/deq/wrd-swas-rule57_372470_7.pdf

Footnotes:

1 = The chronic aluminum criterion is dependent on pH; where the pH is equal to or greater than 7.0 in the receiving water after mixing, the chronic hardness-dependent equation will apply; where pH is less than 7.0 in the receiving water after mixing, either the 87 µg/l chronic total recoverable aluminum criterion or the criterion resulting from the chronic hardness-dependent equation will apply, whichever is more stringent.

2 = Cadmium criteria are for trout bearing waters

3 = Total chromium (III)

4 = Hardness-specific ESVs used to evaluate water quality standard exceedances for each site are modified using site-specific hardness values; for illustrative purposes only, respective ESVs in this table are based on a hardness of 25 mg of $CaCO_3$/Liter

5 = MDEQ (2018) Rule 57 values are provided for relative comparison in the absence of CDPHE (2018b) TVS values

Figures

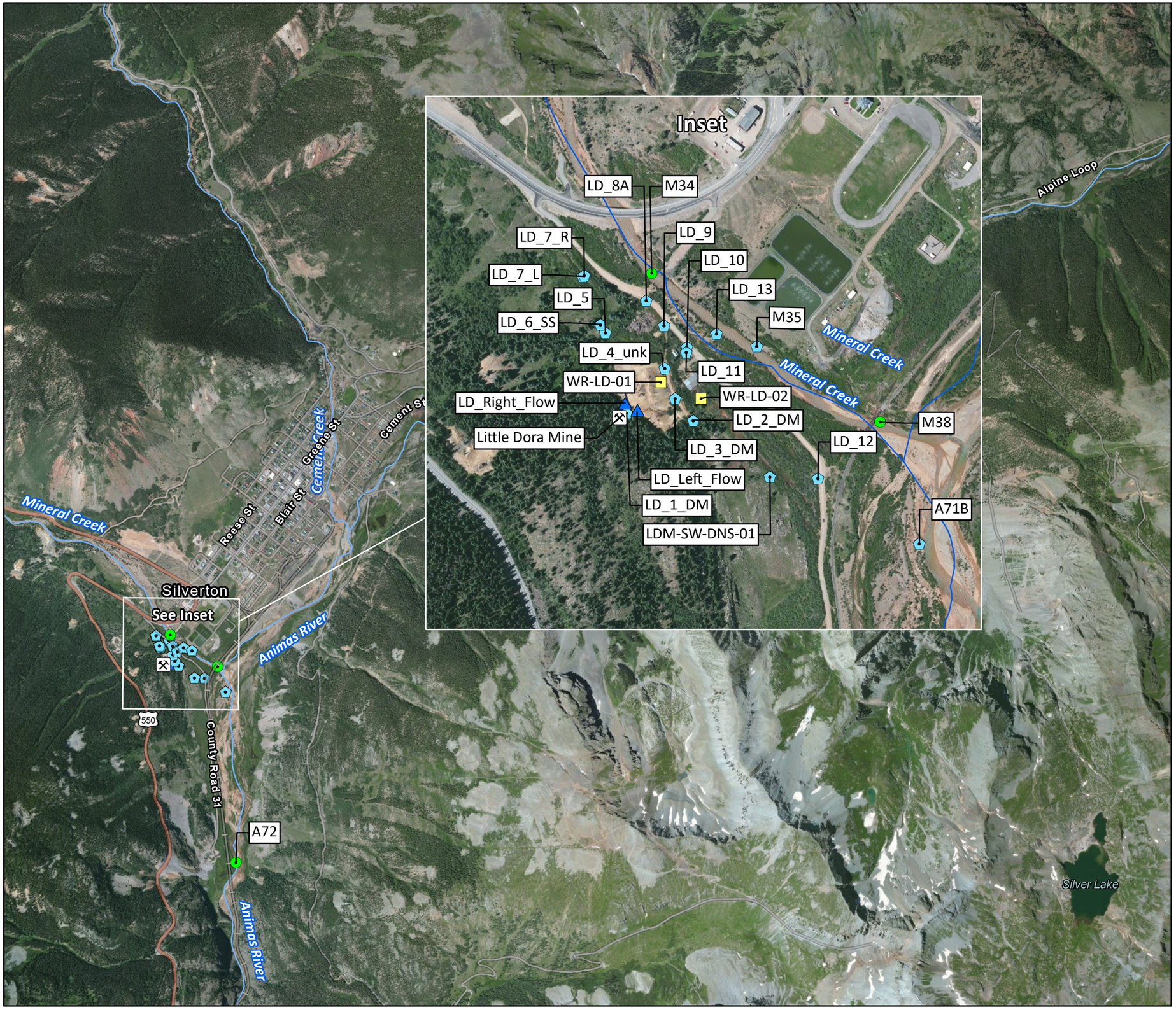


Figure 3.1

Little Dora Mine, Silverton

Mineral Creek and Animas River
San Juan County, Colorado

2019 Pre-CERCLA Screening
July and September 2019
Surface Water and Soil Sampling Locations

- Little Dora Mine
- Center of Soil Composite Sample Locations
- Surface Water Grab and Sediment Composite Sample Locations
- Approximate Flow Measurement Locations
- Surface Water Grab Sample Location
- Streams

Date: May 11, 2020

Map Projection: UTM Zone 13N, WGS84, Meters

Streams: *CDOW* (2004);
Sample & Measurement Locations: *U.S. EPA* (2019);
Base Map: *Esri World Imagery (Clarity) Web Service* (2020).

0 0.5 1 Miles

N

Area Enlarged

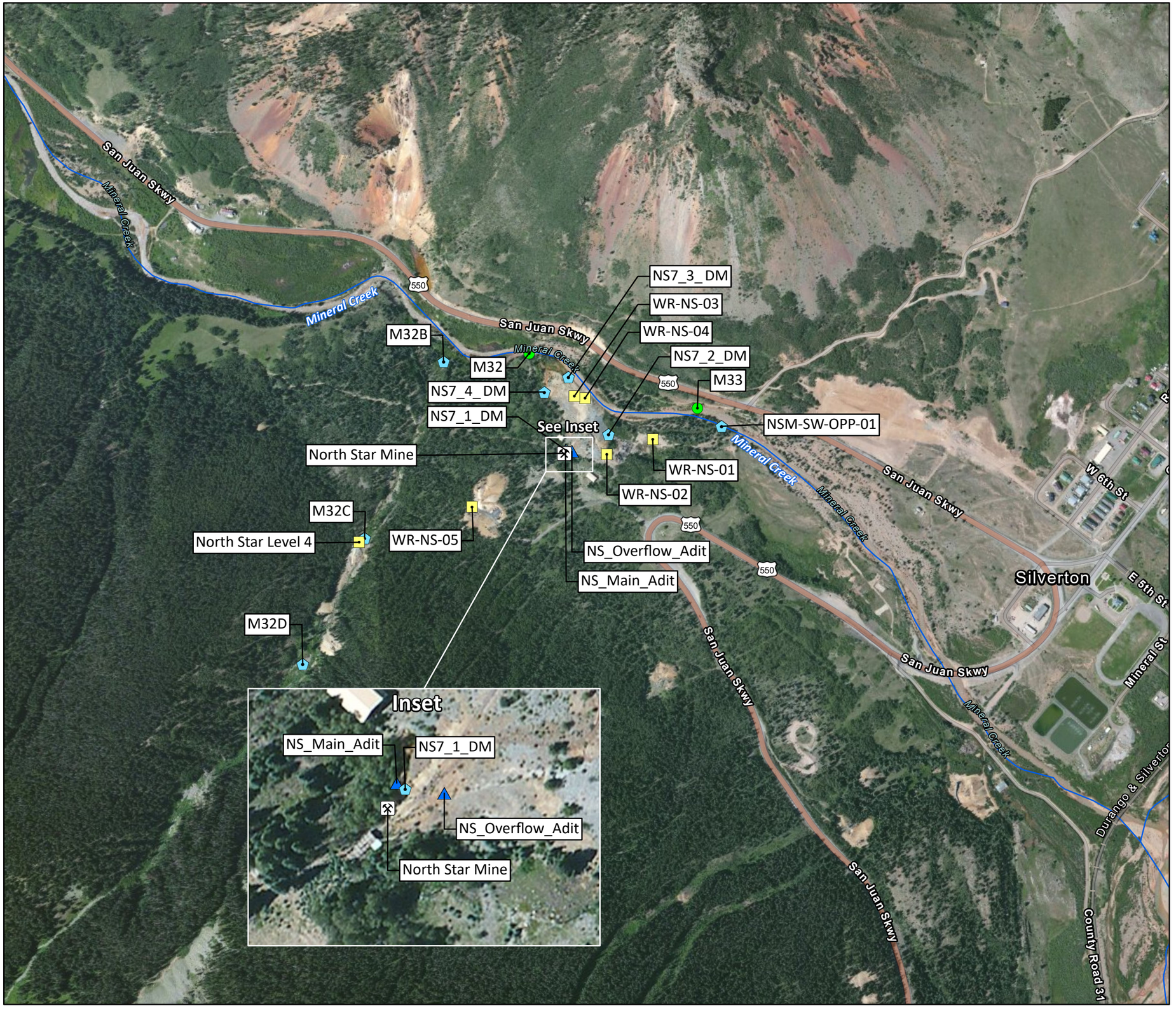


Figure 3.2

North Star Mine, Silverton

Mineral Creek and Animas River
San Juan County, Colorado

2019 Pre-CERCLA Screening
July and September 2019
Surface Water and Soil Sampling Locations

- North Star Mine
- Center of Soil Composite Sample Locations
- Surface Water Grab and Sediment Composite Sample Locations
- Approximate Flow Measurement Locations
- Surface Water Grab Sample Location
- Streams

Date: May 11, 2020

Map Projection: UTM Zone 13N, WGS84, Meters

Streams: *CDOW* (2004);
Sample & Measurement Locations: *U.S. EPA* (2019);
Base Map: *Esri World Imagery (Clarity) Web Service* (2020).

0 750 1,500 Feet

N

Area Enlarged

Appendix A
FlowTracker Discharge Reports

Discharge Measurement Summary

Date Generated: Mon Nov 4 2019

File Information

File Name	M32C.WAD
Start Date and Time	2019/07/25 09:04:22

Site Details

Site Name	M32C
Operator(s)	JBW

System Information

Sensor Type	FlowTracker
Serial #	P5878
CPU Firmware Version	3.9
Software Ver	2.30
Mounting Correction	0.0%

Units (English Units)

Distance	ft
Velocity	ft/s
Area	ft^2
Discharge	cfs

Discharge Uncertainty

Category	ISO	Stats
Accuracy	1.0%	1.0%
Depth	0.5%	4.8%
Velocity	11.2%	22.5%
Width	0.2%	0.2%
Method	2.7%	-
# Stations	3.6%	-
Overall	**12.2%**	**23.0%**

Summary

Averaging Int.	40	# Stations	14
Start Edge	LEW	Total Width	5.600
Mean SNR	46.0 dB	Total Area	2.090
Mean Temp	39.14 °F	Mean Depth	0.373
Disch. Equation	Mid-Section	Mean Velocity	0.9206
		Total Discharge	**1.9239**

Measurement Results

St	Clock	Loc	Method	Depth	%Dep	MeasD	Vel	CorrFact	MeanV	Area	Flow	%Q
0	09:04	4.40	None	0.000	0.0	0.0	0.0000	1.00	0.0000	0.000	0.0000	0.0
1	*09:04*	*4.70*	*0.6*	*0.350*	*0.6*	*0.140*	*-0.3668*	*1.00*	*-0.3668*	*0.105*	*-0.0385*	*-2.0*
2	09:05	5.00	0.6	0.400	0.6	0.160	0.2238	1.00	0.2238	0.120	0.0269	1.4
3	09:06	5.30	0.6	0.400	0.6	0.160	1.0689	1.00	1.0689	0.120	0.1283	6.7
4	*09:07*	*5.60*	*0.6*	*0.350*	*0.6*	*0.140*	*1.4245*	*1.00*	*1.4245*	*0.105*	*0.1497*	*7.8*
5	09:09	5.90	0.6	0.350	0.6	0.140	2.0289	1.00	2.0289	0.105	0.2132	11.1
6	*09:10*	*6.20*	*0.6*	*0.550*	*0.6*	*0.220*	*1.4738*	*1.00*	*1.4738*	*0.165*	*0.2433*	*12.6*
7	*09:12*	*6.50*	*0.6*	*0.550*	*0.6*	*0.220*	*1.5735*	*1.00*	*1.5735*	*0.165*	*0.2597*	*13.5*
8	*09:15*	*6.80*	*0.6*	*0.500*	*0.6*	*0.200*	*0.1119*	*1.00*	*0.1119*	*0.375*	*0.0419*	*2.2*
9	*09:17*	*8.00*	*0.6*	*0.300*	*0.6*	*0.120*	*0.7723*	*1.00*	*0.7723*	*0.255*	*0.1967*	*10.2*
10	*09:18*	*8.50*	*0.6*	*0.400*	*0.6*	*0.160*	*1.6289*	*1.00*	*1.6289*	*0.200*	*0.3257*	*16.9*
11	*09:19*	*9.00*	*0.6*	*0.400*	*0.6*	*0.160*	*0.2513*	*1.00*	*0.2513*	*0.200*	*0.0503*	*2.6*
12	*09:20*	*9.50*	*0.6*	*0.350*	*0.6*	*0.140*	*1.8668*	*1.00*	*1.8668*	*0.175*	*0.3268*	*17.0*
13	09:20	10.00	None	0.000	0.0	0.0	0.0000	1.00	0.0000	0.000	0.0000	0.0

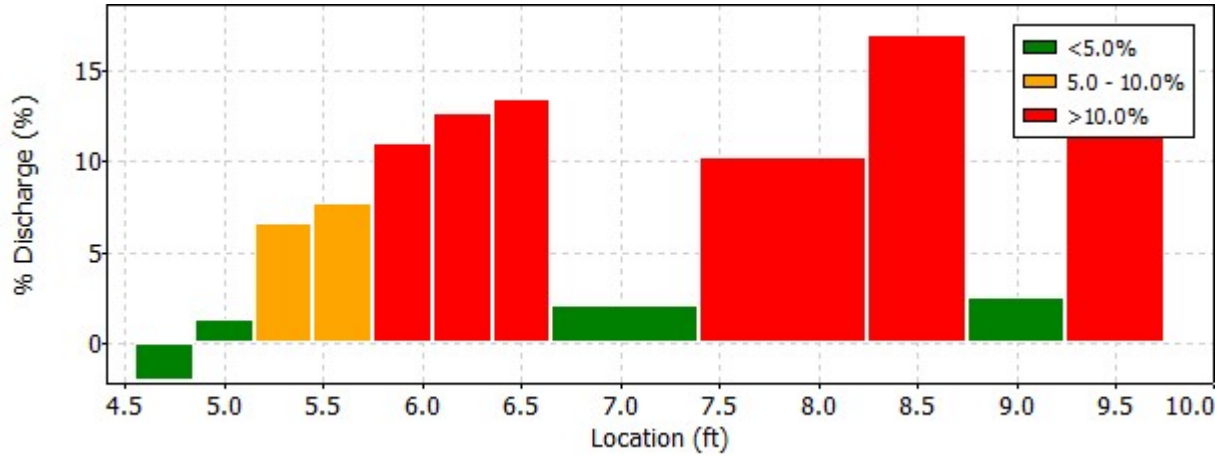
Rows in italics indicate a QC warning. See the Quality Control page of this report for more information.

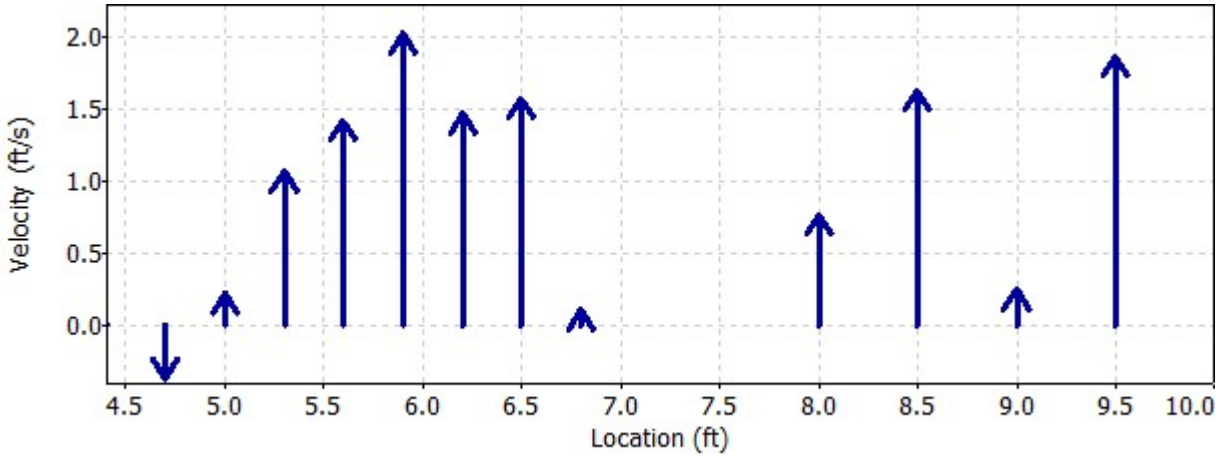
Discharge Measurement Summary

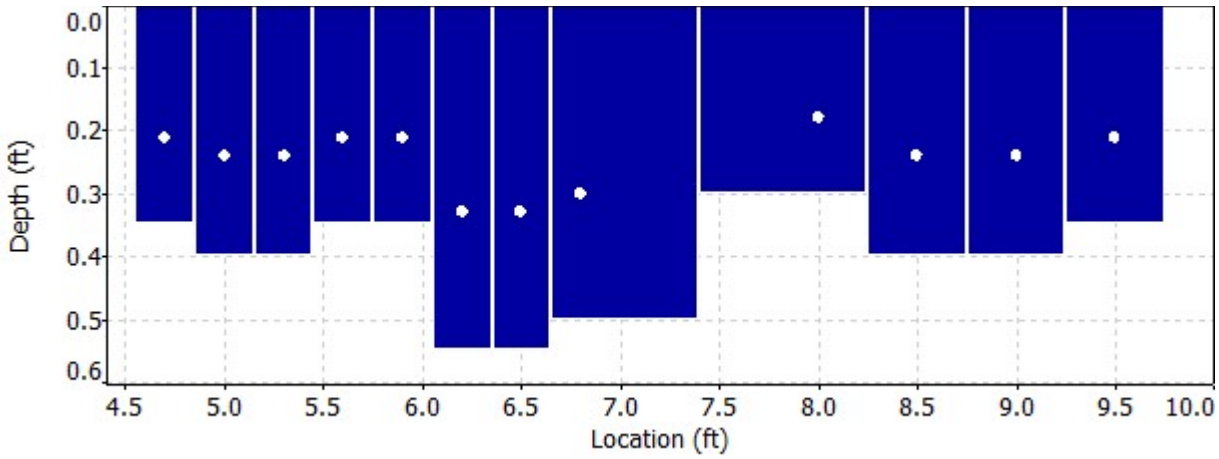
Date Generated: Mon Nov 4 2019

File Information	
File Name	M32C.WAD
Start Date and Time	2019/07/25 09:04:22

Site Details	
Site Name	M32C
Operator(s)	JBW







Discharge Measurement Summary

Date Generated: Mon Nov 4 2019

File Information		Site Details	
File Name	M32C.WAD	Site Name	M32C
Start Date and Time	2019/07/25 09:04:22	Operator(s)	JBW

Quality Control

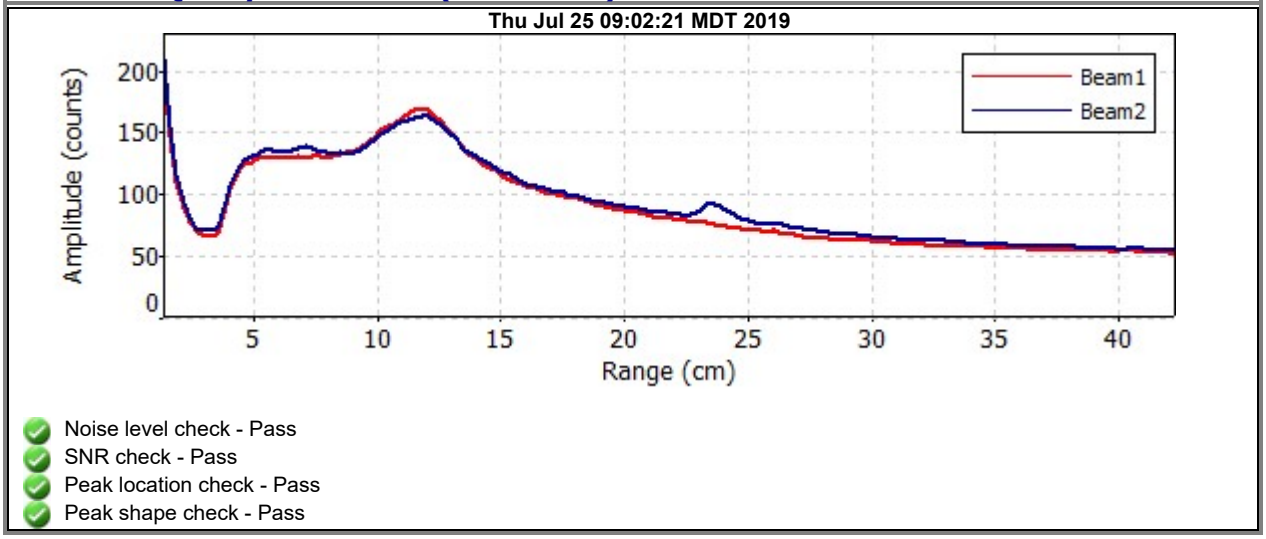
St	Loc	%Dep	Message
1	4.70	0.6	High angle: -144
4	5.60	0.6	Boundary QC is Good; possible boundary interference
6	6.20	0.6	High standard error: 0.388
7	6.50	0.6	High differences in beam SNR: 47.7,31.3
		0.6	High SNR variation during measurement: 1.7,9.5
		0.6	High standard error: 0.584
8	6.80	0.6	High angle: 29
		0.6	High differences in beam SNR: 43.4,14.1
		0.6	SNR (28.8) is different from typical SNR (46.0)
		0.6	High SNR variation during measurement: 3.9,5.6
		0.6	Boundary QC is Fair; possible boundary interference
9	8.00	0.6	High SNR variation during measurement: 3.0,5.2
		0.6	High standard error: 0.549
		0.6	Boundary QC is Good; possible boundary interference
10	8.50	0.6	High SNR variation during measurement: 5.2,6.0
11	9.00	0.6	High angle: 45
		0.6	High standard error: 0.393
		0.6	Boundary QC is Good; possible boundary interference
12	9.50	0.6	Boundary QC is Fair; possible boundary interference

Discharge Measurement Summary

Date Generated: Mon Nov 4 2019

File Information		Site Details	
File Name	M32C.WAD	Site Name	M32C
Start Date and Time	2019/07/25 09:04:22	Operator(s)	JBW

Automatic Quality Control Test (BeamCheck)



- Noise level check - Pass
- SNR check - Pass
- Peak location check - Pass
- Peak shape check - Pass

Discharge Measurement Summary

Date Generated: Mon Nov 4 2019

File Information

File Name	M33.WAD
Start Date and Time	2019/07/24 12:45:28

Site Details

Site Name	M33
Operator(s)	TB

System Information

Sensor Type	FlowTracker
Serial #	P5878
CPU Firmware Version	3.9
Software Ver	2.30
Mounting Correction	0.0%

Units (English Units)

Distance	ft
Velocity	ft/s
Area	ft^2
Discharge	cfs

Discharge Uncertainty

Category	ISO	Stats
Accuracy	1.0%	1.0%
Depth	0.1%	6.1%
Velocity	2.1%	12.0%
Width	0.1%	0.1%
Method	1.9%	-
# Stations	2.0%	-
Overall	**3.6%**	**13.4%**

Summary

Averaging Int.	40	# Stations	25
Start Edge	LEW	Total Width	65.101
Mean SNR	44.4 dB	Total Area	82.313
Mean Temp	49.31 °F	Mean Depth	1.264
Disch. Equation	Mid-Section	Mean Velocity	3.5779
		Total Discharge	**294.5021**

Measurement Results

St	Clock	Loc	Method	Depth	%Dep	MeasD	Vel	CorrFact	MeanV	Area	Flow	%Q
0	12:45	4.00	None	0.000	0.0	0.0	0.0000	1.00	0.0000	0.000	0.0000	0.0
1	*12:45*	*7.10*	*0.6*	*0.700*	*0.6*	*0.280*	*2.4902*	*1.00*	*2.4902*	*2.170*	*5.4048*	*1.8*
2	12:47	10.20	0.6	1.500	0.6	0.600	3.2907	1.00	3.2907	4.650	15.3020	5.2
3	*12:49*	*13.30*	*0.6*	*1.400*	*0.6*	*0.560*	*-2.1601*	*1.00*	*-2.1601*	*4.340*	*-9.3746*	*-3.2*
4	12:51	16.40	0.6	2.200	0.6	0.880	5.8304	1.00	5.8304	4.510	26.2949	8.9
5	13:41	17.40	0.6	2.000	0.6	0.800	4.3192	1.00	4.3192	3.100	13.3899	4.5
6	12:54	19.50	0.6	2.300	0.6	0.920	6.2408	1.00	6.2408	4.600	28.7061	9.7
7	*13:38*	*21.40*	*0.6*	*1.700*	*0.6*	*0.080*	*1.4295*	*1.00*	*1.4295*	*2.635*	*3.7670*	*1.3*
8	12:55	22.60	0.6	2.800	0.6	1.120	5.1066	1.00	5.1066	3.640	18.5877	6.3
9	13:44	24.00	0.6	1.900	0.6	0.760	4.1614	1.00	4.1614	2.945	12.2552	4.2
10	12:57	25.70	0.6	1.600	0.6	0.640	5.9593	1.00	5.9593	3.841	22.8872	7.8
11	12:59	28.80	0.6	1.600	0.6	0.640	5.3327	1.00	5.3327	4.960	26.4517	9.0
12	*13:01*	*31.90*	*0.6*	*1.400*	*0.6*	*0.560*	*3.3652*	*1.00*	*3.3652*	*4.340*	*14.6044*	*5.0*
13	*13:02*	*35.00*	*0.6*	*1.000*	*0.6*	*0.400*	*3.8632*	*1.00*	*3.8632*	*3.100*	*11.9761*	*4.1*
14	13:04	38.10	0.6	1.350	0.6	0.540	3.6122	1.00	3.6122	4.185	15.1181	5.1
15	13:05	41.20	0.6	1.300	0.6	0.520	2.4944	1.00	2.4944	4.030	10.0517	3.4
16	13:06	44.30	0.6	1.600	0.6	0.640	3.9623	1.00	3.9623	4.960	19.6541	6.7
17	13:08	47.40	0.6	1.350	0.6	0.540	2.6759	1.00	2.6759	4.185	11.1992	3.8
18	*13:10*	*50.50*	*0.6*	*0.600*	*0.6*	*0.240*	*4.8173*	*1.00*	*4.8173*	*1.860*	*8.9613*	*3.0*
19	13:11	53.60	0.6	1.400	0.6	0.560	4.5804	1.00	4.5804	4.340	19.8783	6.7
20	13:13	56.70	0.6	1.200	0.6	0.480	1.7828	1.00	1.7828	3.720	6.6329	2.3
21	13:14	59.80	0.6	1.300	0.6	0.520	2.2805	1.00	2.2805	4.030	9.1897	3.1
22	*13:15*	*62.90*	*0.6*	*0.500*	*0.6*	*0.200*	*1.6703*	*1.00*	*1.6703*	*1.550*	*2.5890*	*0.9*
23	13:17	66.00	0.6	0.200	0.6	0.080	1.5719	1.00	1.5719	0.620	0.9752	0.3
24	13:17	69.10	None	0.000	0.0	0.0	0.0000	1.00	0.0000	0.000	0.0000	0.0

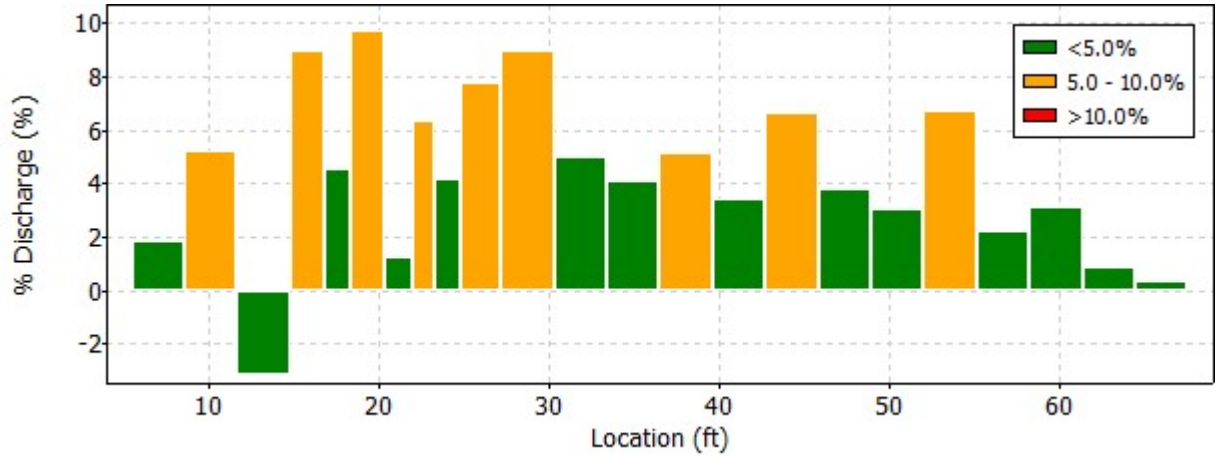
Rows in italics indicate a QC warning. See the Quality Control page of this report for more information.

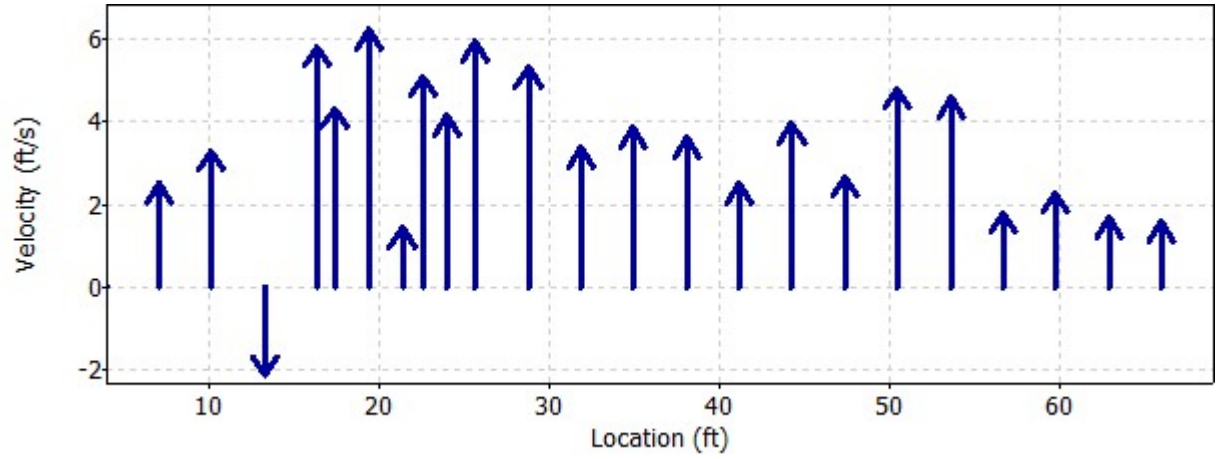
Discharge Measurement Summary

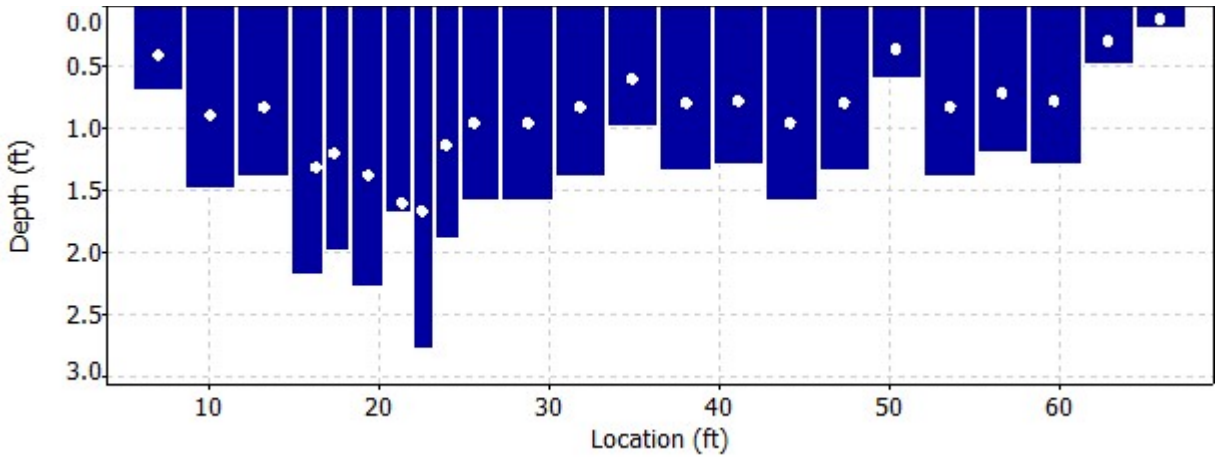
Date Generated: Mon Nov 4 2019

File Information	
File Name	M33.WAD
Start Date and Time	2019/07/24 12:45:28

Site Details	
Site Name	M33
Operator(s)	TB







Discharge Measurement Summary

Date Generated: Mon Nov 4 2019

File Information

File Name	M33.WAD
Start Date and Time	2019/07/24 12:45:28

Site Details

Site Name	M33
Operator(s)	TB

Quality Control

St	Loc	%Dep	Message
1	7.10	0.6	High angle: -34
3	13.30	0.6	High angle: -167
		0.6	High standard error: 1.089
7	21.40	0.6	High angle: -28
		0.6	High standard error: 0.979
12	31.90	0.6	High standard error: 0.384
13	35.00	0.6	High angle: -24
18	50.50	0.6	High standard error: 0.303
22	62.90	0.6	High angle: 23

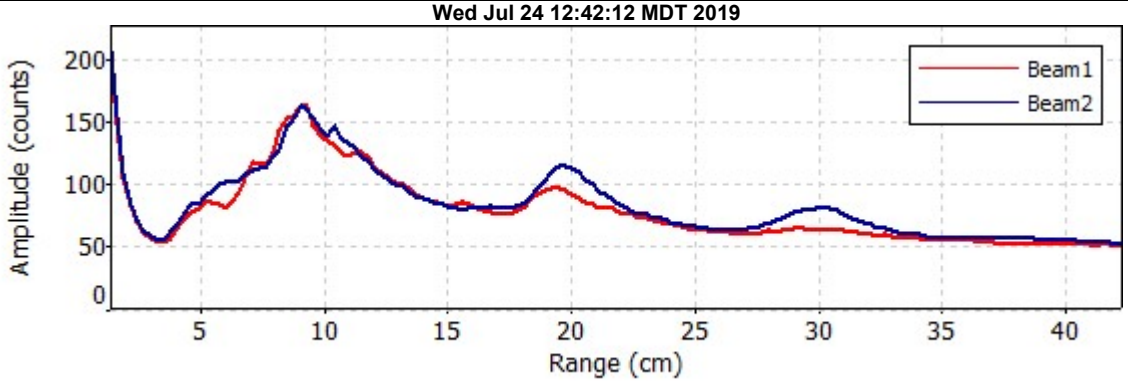
Discharge Measurement Summary

Date Generated: Mon Nov 4 2019

File Information		Site Details	
File Name	M33.WAD	Site Name	M33
Start Date and Time	2019/07/24 12:45:28	Operator(s)	TB

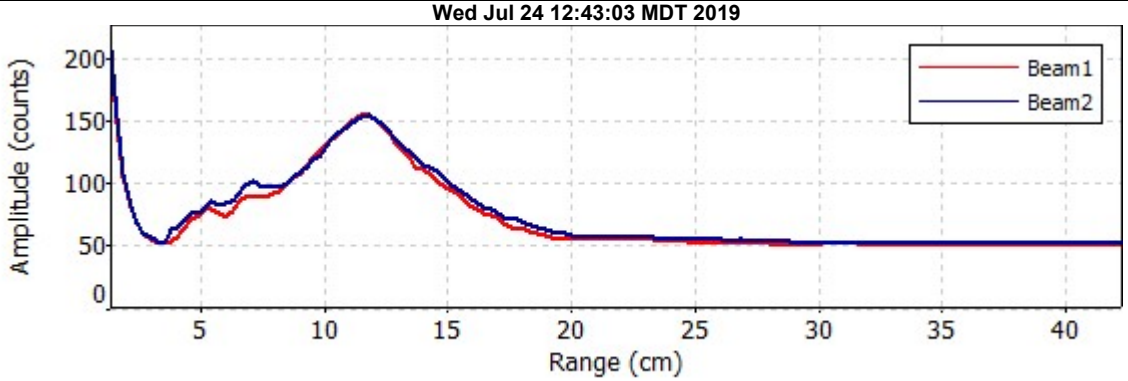
Automatic Quality Control Test (BeamCheck)

Wed Jul 24 12:42:12 MDT 2019



- Noise level check - Pass
- SNR check - Pass
- Peak location check - Fail
- Peak shape check - Pass

Wed Jul 24 12:43:03 MDT 2019



- Noise level check - Pass
- SNR check - Pass
- Peak location check - Pass
- Peak shape check - Pass

Discharge Measurement Summary

Date Generated: Mon Nov 4 2019

File Information

File Name	M35.WAD
Start Date and Time	2019/07/24 11:06:35

Site Details

Site Name	M35
Operator(s)	JBW

System Information

Sensor Type	FlowTracker
Serial #	P5878
CPU Firmware Version	3.9
Software Ver	2.30
Mounting Correction	0.0%

Units (English Units)

Distance	ft
Velocity	ft/s
Area	ft^2
Discharge	cfs

Discharge Uncertainty

Category	ISO	Stats
Accuracy	1.0%	1.0%
Depth	0.1%	1.8%
Velocity	0.8%	3.6%
Width	0.1%	0.1%
Method	1.8%	-
# Stations	2.3%	-
Overall	**3.2%**	**4.1%**

Summary

Averaging Int.	40	# Stations	22
Start Edge	LEW	Total Width	44.000
Mean SNR	42.6 dB	Total Area	73.266
Mean Temp	46.70 °F	Mean Depth	1.665
Disch. Equation	Mid-Section	Mean Velocity	3.9067
		Total Discharge	**286.2304**

Measurement Results

St	Clock	Loc	Method	Depth	%Dep	MeasD	Vel	CorrFact	MeanV	Area	Flow	%Q
0	11:06	2.00	None	0.000	0.0	0.0	0.0000	1.00	0.0000	0.000	0.0000	0.0
1	11:06	4.20	0.6	1.300	0.6	0.520	2.7612	1.00	2.7612	2.860	7.8966	2.8
2	*11:07*	*6.40*	*0.6*	*1.800*	*0.6*	*0.720*	*2.9318*	*1.00*	*2.9318*	*3.960*	*11.6096*	*4.1*
3	*11:09*	*8.60*	*0.6*	*1.600*	*0.6*	*0.640*	*2.6102*	*1.00*	*2.6102*	*3.520*	*9.1890*	*3.2*
4	11:10	10.80	0.6	1.500	0.6	0.600	3.8455	1.00	3.8455	3.300	12.6908	4.4
5	11:11	13.00	0.6	1.800	0.6	0.720	2.7871	1.00	2.7871	3.960	11.0367	3.9
6	11:12	15.20	0.6	1.800	0.6	0.720	2.8422	1.00	2.8422	3.960	11.2549	3.9
7	11:13	17.40	0.6	1.700	0.6	0.680	3.4767	1.00	3.4767	3.741	13.0047	4.5
8	11:14	19.60	0.6	1.700	0.6	0.680	4.0482	1.00	4.0482	3.741	15.1424	5.3
9	11:15	21.80	0.6	1.600	0.6	0.640	4.1988	1.00	4.1988	3.520	14.7813	5.2
10	11:17	24.00	0.6	1.700	0.6	0.680	5.6270	1.00	5.6270	3.741	21.0477	7.4
11	11:18	26.20	0.6	1.700	0.6	0.680	4.2336	1.00	4.2336	3.741	15.8358	5.5
12	11:19	28.40	0.6	2.000	0.6	0.800	5.1877	1.00	5.1877	4.400	22.8271	8.0
13	11:21	30.60	0.6	2.400	0.6	0.960	4.1516	1.00	4.1516	5.280	21.9210	7.7
14	11:22	32.80	0.6	2.100	0.6	0.840	5.3576	1.00	5.3576	4.620	24.7544	8.6
15	11:24	35.00	0.6	1.900	0.6	0.760	4.5289	1.00	4.5289	4.180	18.9312	6.6
16	11:25	37.20	0.6	2.000	0.6	0.800	4.1788	1.00	4.1788	4.400	18.3878	6.4
17	11:26	39.40	0.6	1.600	0.6	0.640	4.3589	1.00	4.3589	3.520	15.3450	5.4
18	11:27	41.60	0.6	1.500	0.6	0.600	3.5430	1.00	3.5430	3.448	12.2174	4.3
19	11:29	44.00	0.6	1.250	0.6	0.500	2.7956	1.00	2.7956	2.124	5.9365	2.1
20	11:31	45.00	0.6	1.250	0.6	0.500	1.9364	1.00	1.9364	1.250	2.4204	0.8
21	11:31	46.00	None	0.000	0.0	0.0	0.0000	1.00	0.0000	0.000	0.0000	0.0

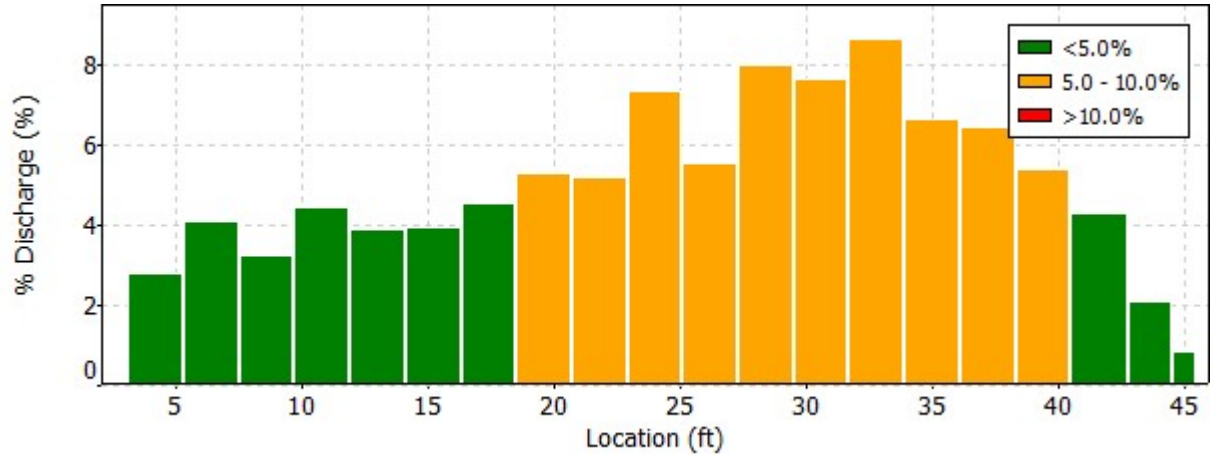
Rows in italics indicate a QC warning. See the Quality Control page of this report for more information.

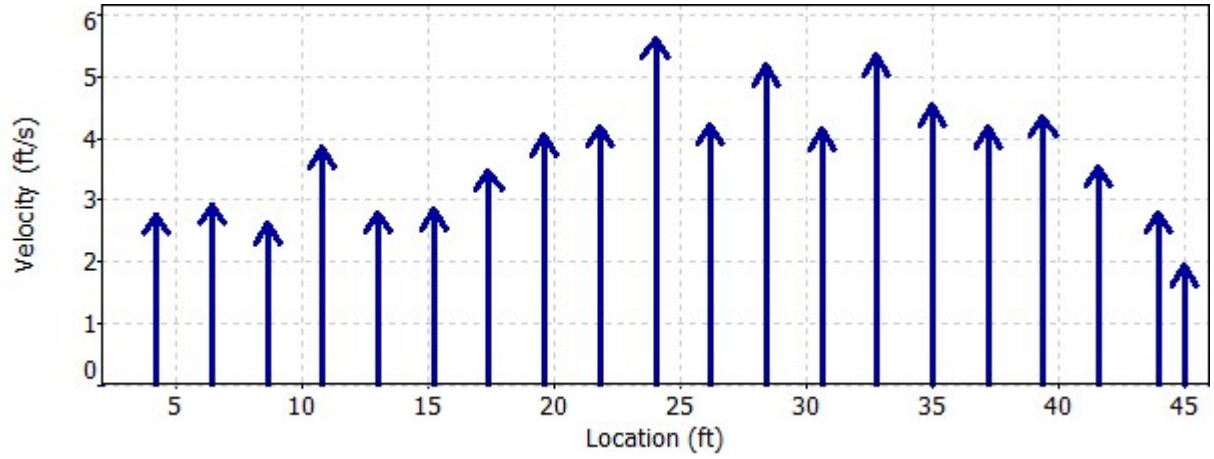
Discharge Measurement Summary

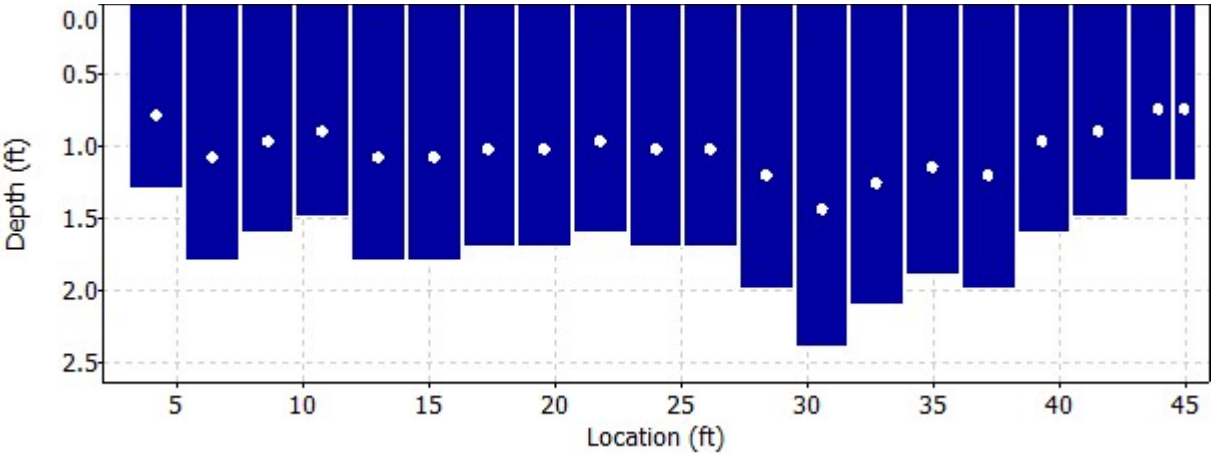
Date Generated: Mon Nov 4 2019

File Information	
File Name	M35.WAD
Start Date and Time	2019/07/24 11:06:35

Site Details	
Site Name	M35
Operator(s)	JBW







Discharge Measurement Summary

Date Generated: Mon Nov 4 2019

File Information

File Name	M35.WAD
Start Date and Time	2019/07/24 11:06:35

Site Details

Site Name	M35
Operator(s)	JBW

Quality Control

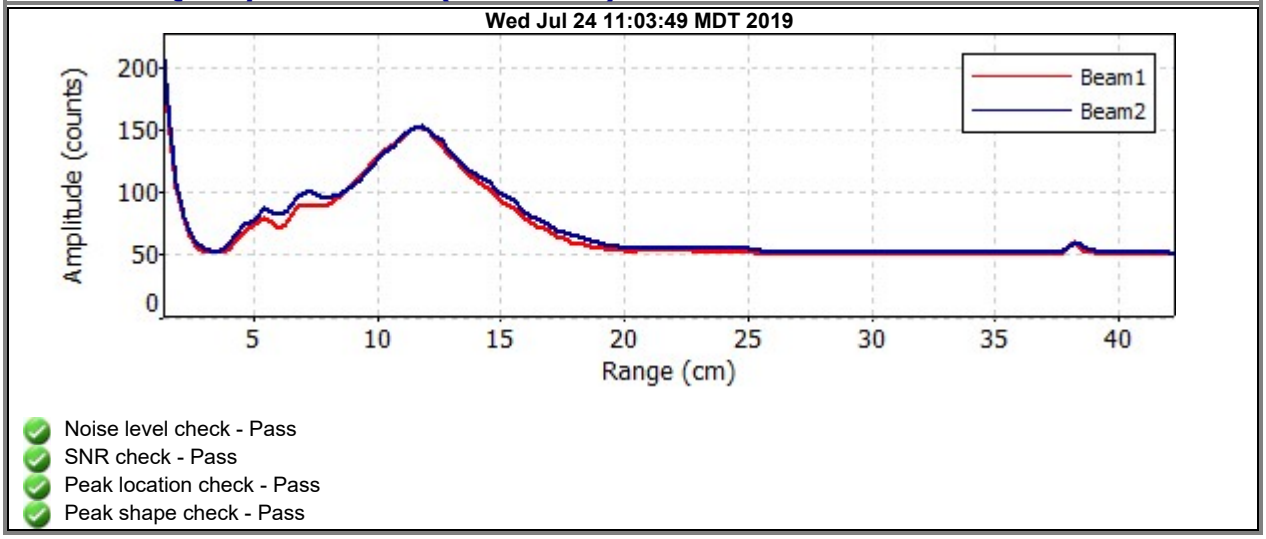
St	Loc	%Dep	Message
2	6.40	0.6	High angle: -20
3	8.60	0.6	High standard error: 0.178

Discharge Measurement Summary

Date Generated: Mon Nov 4 2019

File Information		Site Details	
File Name	M35.WAD	Site Name	M35
Start Date and Time	2019/07/24 11:06:35	Operator(s)	JBW

Automatic Quality Control Test (BeamCheck)



- Noise level check - Pass
- SNR check - Pass
- Peak location check - Pass
- Peak shape check - Pass

Discharge Measurement Summary

Date Generated: Mon Nov 4 2019

File Information

File Name	M38.WAD
Start Date and Time	2019/07/24 10:05:04

Site Details

Site Name	M38
Operator(s)	JBW

System Information

Sensor Type	FlowTracker
Serial #	P5878
CPU Firmware Version	3.9
Software Ver	2.30
Mounting Correction	0.0%

Units (English Units)

Distance	ft
Velocity	ft/s
Area	ft^2
Discharge	cfs

Discharge Uncertainty

Category	ISO	Stats
Accuracy	1.0%	1.0%
Depth	0.1%	3.7%
Velocity	1.0%	3.8%
Width	0.1%	0.1%
Method	2.1%	-
# Stations	2.4%	-
Overall	**3.5%**	**5.4%**

Summary

Averaging Int.	40	# Stations	21
Start Edge	LEW	Total Width	55.500
Mean SNR	39.0 dB	Total Area	91.876
Mean Temp	45.07 °F	Mean Depth	1.655
Disch. Equation	Mid-Section	Mean Velocity	3.3020
		Total Discharge	**303.3747**

Measurement Results

St	Clock	Loc	Method	Depth	%Dep	MeasD	Vel	CorrFact	MeanV	Area	Flow	%Q
0	10:05	11.50	None	0.000	0.0	0.0	0.0000	1.00	0.0000	0.000	0.0000	0.0
1	10:05	13.00	0.6	1.000	0.6	0.400	0.5564	1.00	0.5564	1.500	0.8346	0.3
2	*10:06*	*14.50*	*0.6*	*1.400*	*0.6*	*0.560*	*0.6401*	*1.00*	*0.6401*	*2.100*	*1.3441*	*0.4*
3	10:08	16.00	0.6	1.600	0.6	0.640	1.2927	1.00	1.2927	2.400	3.1025	1.0
4	10:09	17.50	0.6	1.600	0.6	0.640	1.5417	1.00	1.5417	4.000	6.1669	2.0
5	*10:11*	*21.00*	*0.6*	*1.600*	*0.6*	*0.640*	*1.5371*	*1.00*	*1.5371*	*4.800*	*7.3783*	*2.4*
6	10:13	23.50	0.6	1.300	0.6	0.520	1.3031	1.00	1.3031	3.250	4.2348	1.4
7	10:15	26.00	0.6	1.900	0.6	0.760	2.4547	1.00	2.4547	4.750	11.6595	3.8
8	10:17	28.50	0.6	1.000	0.6	0.400	2.6470	1.00	2.6470	2.500	6.6175	2.2
9	10:19	31.00	0.6	1.700	0.6	0.680	3.4367	1.00	3.4367	4.250	14.6070	4.8
10	*10:21*	*33.50*	*0.6*	*2.200*	*0.6*	*0.880*	*2.2205*	*1.00*	*2.2205*	*5.500*	*12.2133*	*4.0*
11	10:22	36.00	0.6	2.000	0.6	0.800	3.0673	1.00	3.0673	5.000	15.3363	5.1
12	10:24	38.50	0.6	2.100	0.6	0.840	4.3533	1.00	4.3533	5.250	22.8558	7.5
13	10:26	41.00	0.6	1.900	0.6	0.760	5.4495	1.00	5.4495	4.750	25.8841	8.5
14	10:28	43.50	0.6	2.000	0.6	0.800	4.9885	1.00	4.9885	5.000	24.9426	8.2
15	10:30	46.00	0.6	2.100	0.6	0.840	5.1063	1.00	5.1063	5.250	26.8089	8.8
16	10:31	48.50	0.6	2.100	0.6	0.840	5.0292	1.00	5.0292	5.250	26.4041	8.7
17	10:32	51.00	0.6	2.100	0.6	0.840	3.8944	1.00	3.8944	6.825	26.5798	8.8
18	10:33	55.00	0.6	2.100	0.6	0.840	4.4478	1.00	4.4478	10.500	46.7037	15.4
19	10:34	61.00	0.6	1.500	0.6	0.600	2.1890	1.00	2.1890	9.000	19.7008	6.5
20	10:34	67.00	None	0.000	0.0	0.0	0.0000	1.00	0.0000	0.000	0.0000	0.0

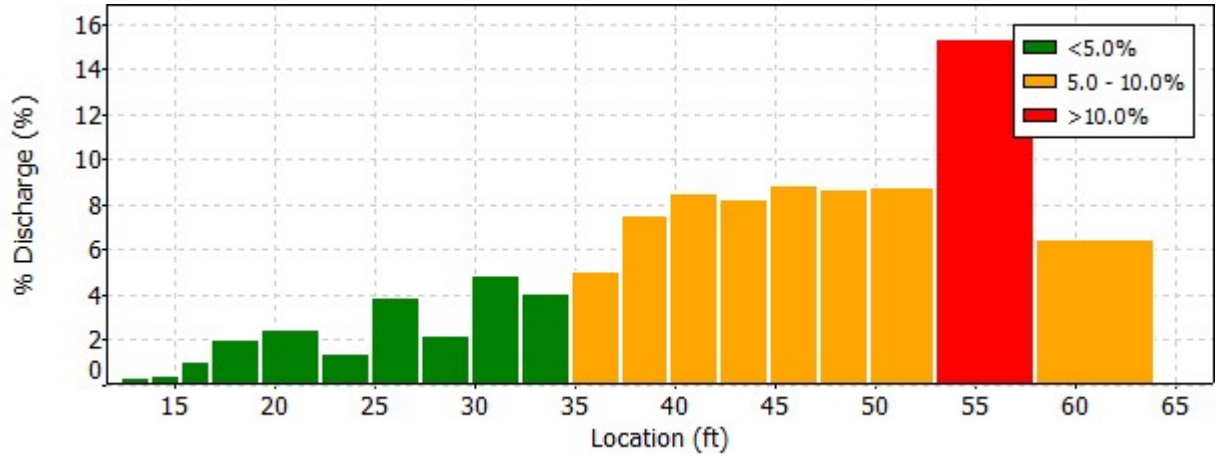
Rows in italics indicate a QC warning. See the Quality Control page of this report for more information.

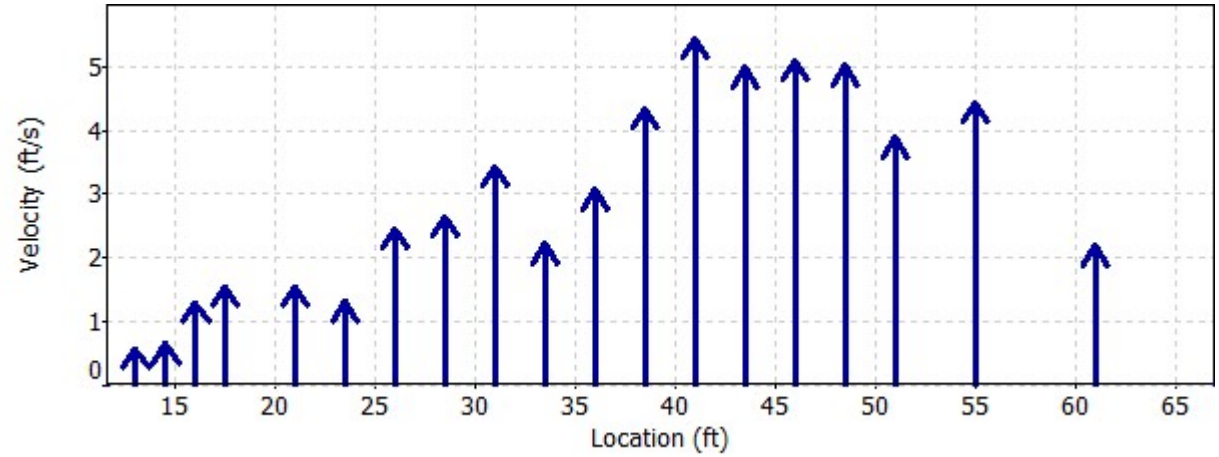
Discharge Measurement Summary

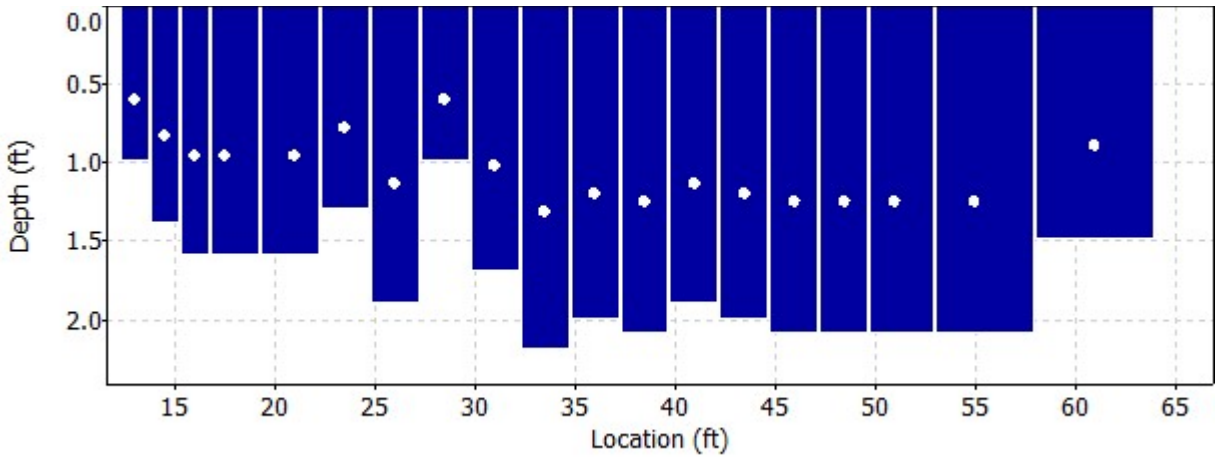
Date Generated: Mon Nov 4 2019

File Information	
File Name	M38.WAD
Start Date and Time	2019/07/24 10:05:04

Site Details	
Site Name	M38
Operator(s)	JBW







Discharge Measurement Summary

Date Generated: Mon Nov 4 2019

File Information

File Name	M38.WAD
Start Date and Time	2019/07/24 10:05:04

Site Details

Site Name	M38
Operator(s)	JBW

Quality Control

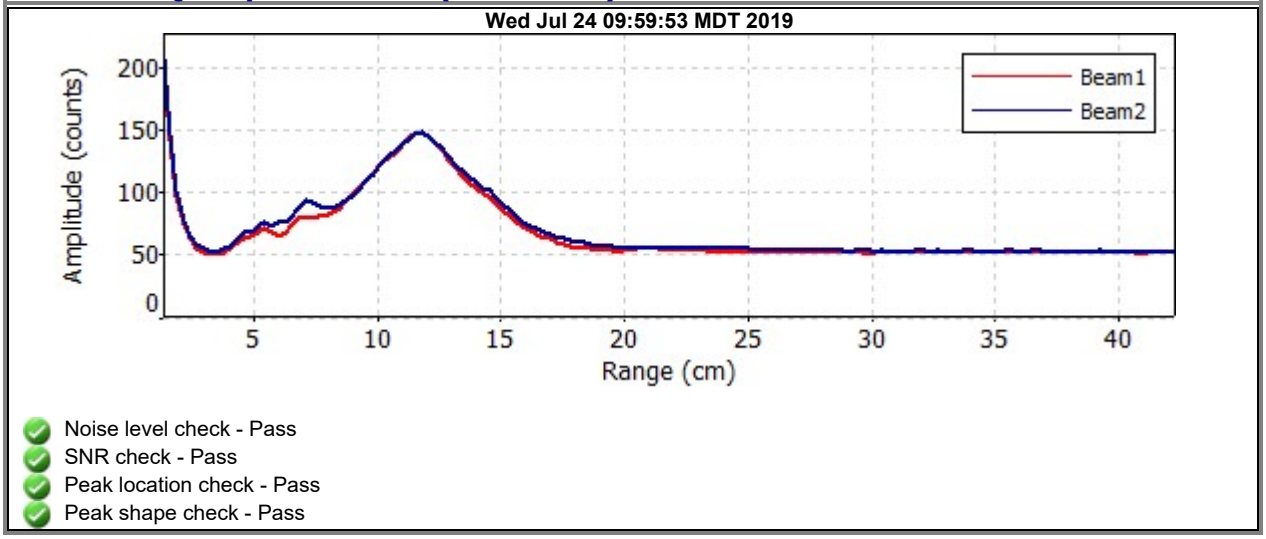
St	Loc	%Dep	Message
2	14.50	0.6	High angle: 20
5	21.00	0.6	High angle: 24
10	33.50	0.6	High standard error: 0.147

Discharge Measurement Summary

Date Generated: Mon Nov 4 2019

File Information		Site Details	
File Name	M38.WAD	Site Name	M38
Start Date and Time	2019/07/24 10:05:04	Operator(s)	JBW

Automatic Quality Control Test (BeamCheck)



- Noise level check - Pass
- SNR check - Pass
- Peak location check - Pass
- Peak shape check - Pass

Discharge Measurement Summary

File Information

File name	M32_20190924-132106.ft
Start date and time	9/24/2019 12:47 PM
Calculations engine	FlowTracker2
Data collection mode	Discharge

Discharge Summary

Start time	9/24/2019 12:48:32 PM	End time	9/24/2019 1:18:36 PM
# Stations	20	Avg interval	40
Mean depth	1.516 ft		
Mean velocity	1.2851 ft/s	Total width	14.250 ft
Mean SNR	32 dB	Total area	21.6000 ft²
Mean temp	48.672 °F	Total discharge	27.7588 ft³/s

System Information

Sensor type	Top Setting
Handheld serial number	FT2H1553025
Probe serial number	FT2P1608015
Probe firmware	1.23
Handheld software	1.4

Site Details

Site name	M32
Site number	M32
Operator(s)	LB
Comment	

Discharge Uncertainty

Category	ISO	IVE
Accuracy	1.0%	
Depth	0.1%	
Velocity	0.7%	
Width	0.1%	
Method	1.9%	
# Stations	2.4%	
Overall	3.3%	

Discharge Settings

Discharge equation	Mean Section
Discharge uncertainty	IVE
Discharge reference	Rated

Station Warning Settings

Station discharge caution	5.00	%
Station discharge warning	10.00	%
Maximum depth change	50.00	%
Maximum spacing change	100.00	%

Summary overview

No changes were made to this file
Quality control warnings

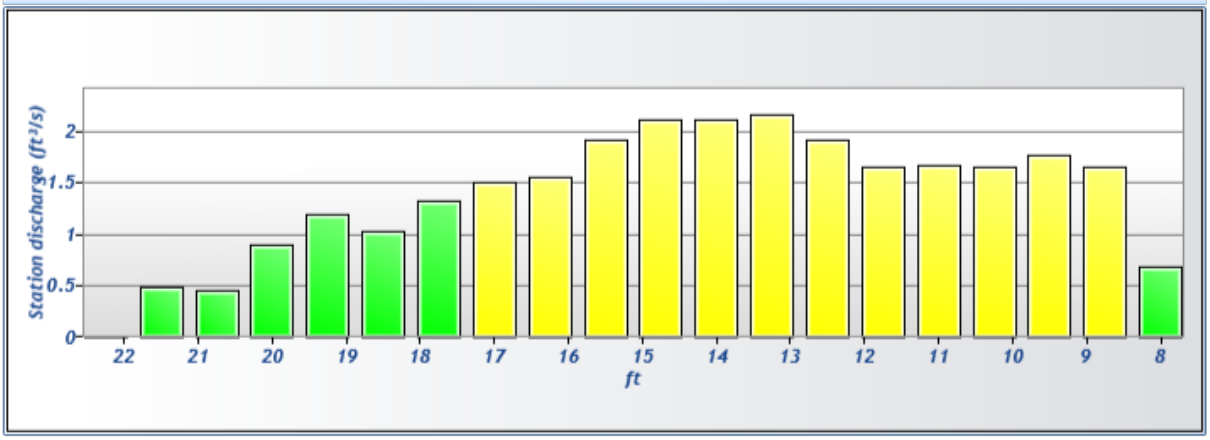
Data Collection Settings

Salinity	0.000	PSS-78
Temperature		°F
Sound speed		ft/s
Mounting correction	0.00	%

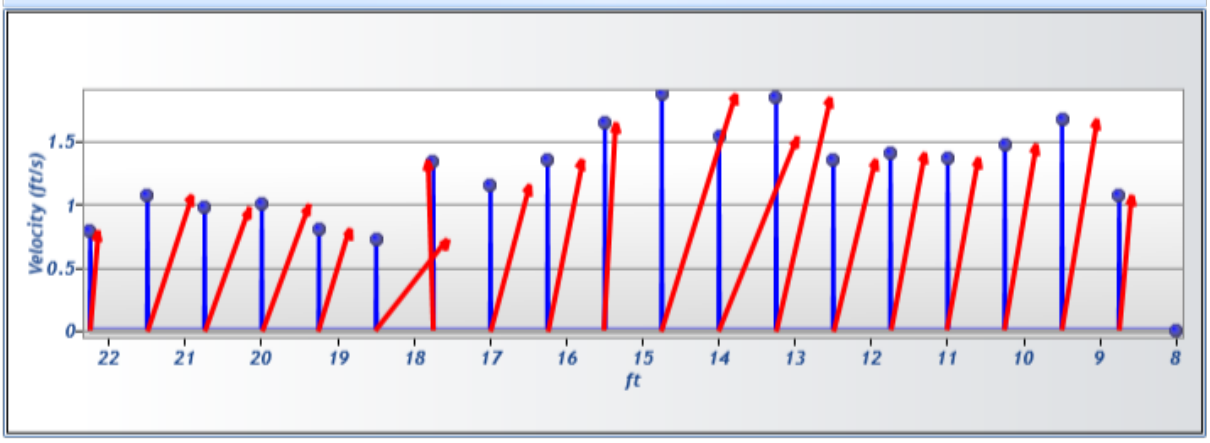
Quality Control Settings

SNR threshold	10	dB
Standard error threshold	0.0328	ft/s
Spike threshold	10.00	%
Maximum velocity angle	20.0	deg
Maximum tilt angle	5.0	deg

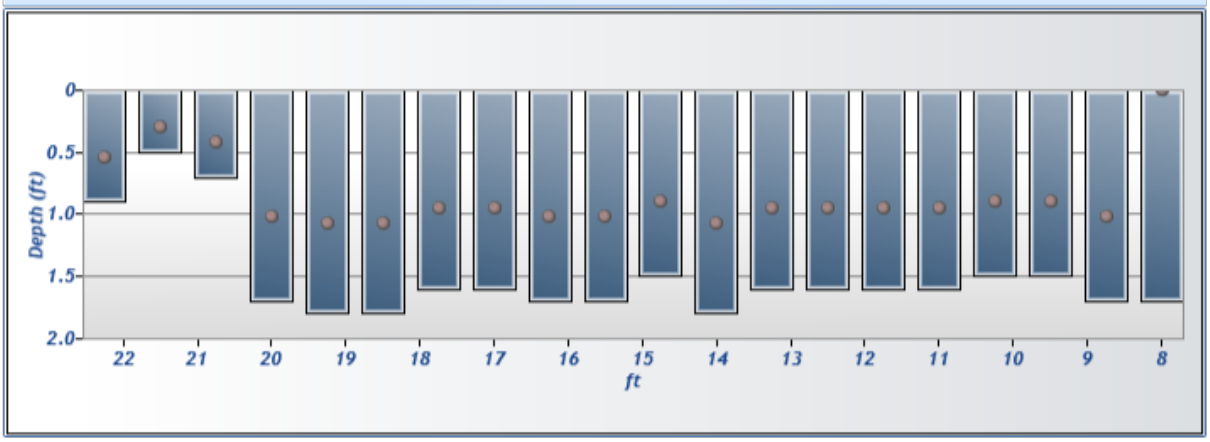
Discharge chart



Velocity chart



Depth chart



Measurement results

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft²)	Flow (ft³/s)	%Q	
0	12:48 PM	8.000	None	1.700	0.0000	0.000	0	0.0000		0.5383	1.2750	0.6863	2.47	✓
1	12:48 PM	8.750	0.6	1.700	0.6000	1.020	76	1.0766	1.0000	1.3728	1.2000	1.6474	5.93	✓
2	12:50 PM	9.500	0.6	1.500	0.6000	0.900	76	1.6691	1.0000	1.5741	1.1250	1.7708	6.38	✓
3	12:51 PM	10.250	0.6	1.500	0.6000	0.900	76	1.4790	1.0000	1.4261	1.1625	1.6578	5.97	✓
4	12:53 PM	11.000	0.6	1.600	0.6000	0.960	76	1.3732	1.0000	1.3898	1.2000	1.6678	6.01	✓
5	12:54 PM	11.750	0.6	1.600	0.6000	0.960	76	1.4065	1.0000	1.3808	1.2000	1.6570	5.97	✓
6	12:56 PM	12.500	0.6	1.600	0.6000	0.960	76	1.3552	1.0000	1.6003	1.2000	1.9203	6.92	✓
7	12:57 PM	13.250	0.6	1.600	0.6000	0.960	76	1.8453	1.0000	1.6921	1.2750	2.1574	7.77	✓
8	12:59 PM	14.000	0.6	1.800	0.6000	1.080	76	1.5389	1.0000	1.7051	1.2375	2.1100	7.60	✓
9	1:01 PM	14.750	0.6	1.500	0.6000	0.900	76	1.8712	1.0000	1.7612	1.2000	2.1135	7.61	✓
10	1:02 PM	15.500	0.6	1.700	0.6000	1.020	76	1.6512	1.0000	1.5038	1.2750	1.9174	6.91	✓
11	1:04 PM	16.250	0.6	1.700	0.6000	1.020	76	1.3564	1.0000	1.2577	1.2375	1.5564	5.61	✓
12	1:06 PM	17.000	0.6	1.600	0.6000	0.960	76	1.1589	1.0000	1.2512	1.2000	1.5014	5.41	✓
13	1:07 PM	17.750	0.6	1.600	0.6000	0.960	76	1.3434	1.0000	1.0352	1.2750	1.3199	4.75	✓
14	1:09 PM	18.500	0.6	1.800	0.6000	1.080	76	0.7270	1.0000	0.7691	1.3500	1.0383	3.74	✓
15	1:11 PM	19.250	0.6	1.800	0.6000	1.080	76	0.8112	1.0000	0.9086	1.3125	1.1926	4.30	✓
16	1:13 PM	20.000	0.6	1.700	0.6000	1.020	76	1.0061	1.0000	0.9948	0.9000	0.8953	3.23	✓
17	1:14 PM	20.750	0.6	0.700	0.6000	0.420	76	0.9836	1.0000	1.0249	0.4500	0.4612	1.66	✓
18	1:16 PM	21.500	0.6	0.500	0.6000	0.300	76	1.0663	1.0000	0.9294	0.5250	0.4879	1.76	✓
19	1:18 PM	22.250	0.6	0.900	0.6000	0.540	76	0.7925	1.0000		0.0000	0.0000	0.00	✓

Quality control warnings

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings	
1	12:48 PM	8.750	0.6	1.700	0.6000	1.020	Standard Error > QC	
3	12:51 PM	10.250	0.6	1.500	0.6000	0.900	Standard Error > QC	
4	12:53 PM	11.000	0.6	1.600	0.6000	0.960	Standard Error > QC	
5	12:54 PM	11.750	0.6	1.600	0.6000	0.960	Standard Error > QC	
6	12:56 PM	12.500	0.6	1.600	0.6000	0.960	Standard Error > QC,Velocity Angle > QC	
7	12:57 PM	13.250	0.6	1.600	0.6000	0.960	Velocity Angle > QC	
8	12:59 PM	14.000	0.6	1.800	0.6000	1.080	Standard Error > QC,Velocity Angle > QC	
9	1:01 PM	14.750	0.6	1.500	0.6000	0.900	Velocity Angle > QC	
10	1:02 PM	15.500	0.6	1.700	0.6000	1.020	Standard Error > QC	
11	1:04 PM	16.250	0.6	1.700	0.6000	1.020	Standard Error > QC	
12	1:06 PM	17.000	0.6	1.600	0.6000	0.960	Standard Error > QC,Velocity Angle > QC	
13	1:07 PM	17.750	0.6	1.600	0.6000	0.960	Standard Error > QC	
14	1:09 PM	18.500	0.6	1.800	0.6000	1.080	Standard Error > QC,Velocity Angle > QC	
15	1:11 PM	19.250	0.6	1.800	0.6000	1.080	Velocity Angle > QC	
16	1:13 PM	20.000	0.6	1.700	0.6000	1.020	Standard Error > QC,Velocity Angle > QC	
17	1:14 PM	20.750	0.6	0.700	0.6000	0.420	Standard Error > QC,Velocity Angle > QC	
18	1:16 PM	21.500	0.6	0.500	0.6000	0.300	Standard Error > QC,Velocity Angle > QC	
19	1:18 PM	22.250	0.6	0.900	0.6000	0.540	Standard Error > QC,Rod Angle > QC	

Discharge Measurement Summary

File Information

File name	M33_20190924-121805.ft
Start date and time	9/24/2019 11:49 AM
Calculations engine	FlowTracker2
Data collection mode	Discharge

Discharge Summary

Start time	9/24/2019 11:49:57 AM	End time	9/24/2019 12:16:21 PM
# Stations	20	Avg interval	40
Mean depth	0.616 ft		
Mean velocity	1.3862 ft/s	Total width	22.230 ft
Mean SNR	30 dB	Total area	13.6890 ft²
Mean temp	46.402 °F	Total discharge	18.9757 ft³/s

System Information

Sensor type	Top Setting
Handheld serial number	FT2H1553025
Probe serial number	FT2P1608015
Probe firmware	1.23
Handheld software	1.4

Site Details

Site name	M33
Site number	M33
Operator(s)	LB
Comment	

Discharge Uncertainty

Category	ISO	IVE
Accuracy	1.0%	
Depth	0.3%	
Velocity	1.2%	
Width	0.2%	
Method	2.4%	
# Stations	2.4%	
Overall	3.7%	

Discharge Settings

Discharge equation	Mean Section
Discharge uncertainty	IVE
Discharge reference	Rated

Station Warning Settings

Station discharge caution	5.00	%
Station discharge warning	10.00	%
Maximum depth change	50.00	%
Maximum spacing change	100.00	%

Summary overview

No changes were made to this file
Quality control warnings

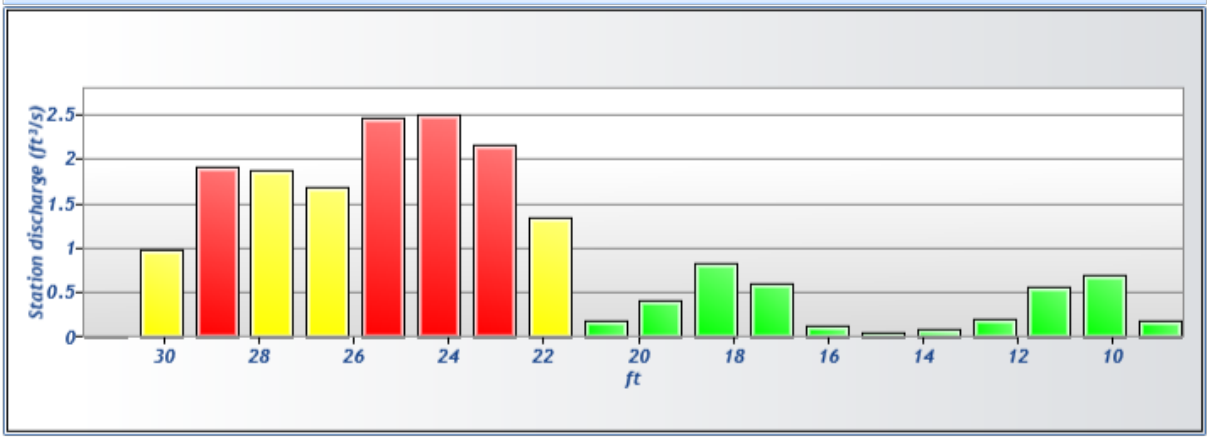
Data Collection Settings

Salinity	0.000	PSS-78
Temperature		°F
Sound speed		ft/s
Mounting correction	0.00	%

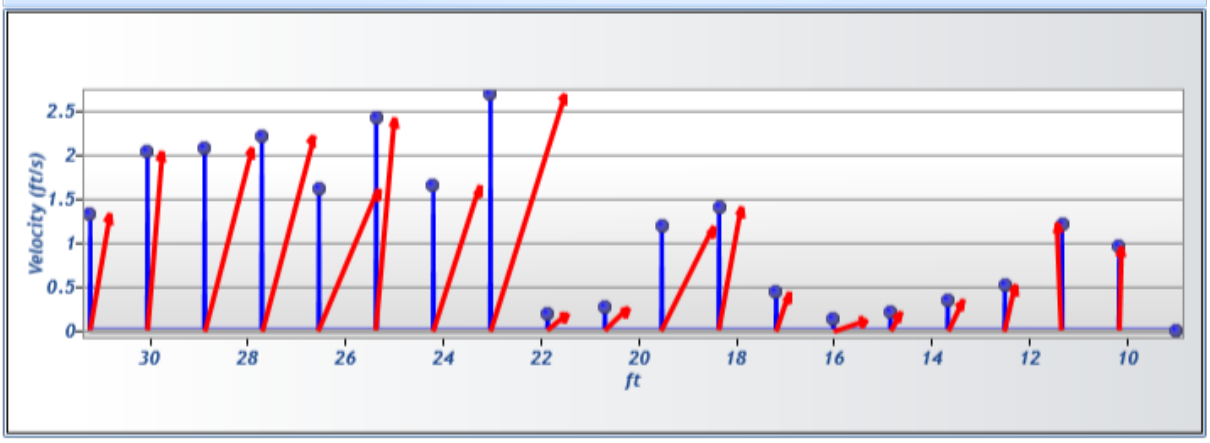
Quality Control Settings

SNR threshold	10	dB
Standard error threshold	0.0328	ft/s
Spike threshold	10.00	%
Maximum velocity angle	20.0	deg
Maximum tilt angle	5.0	deg

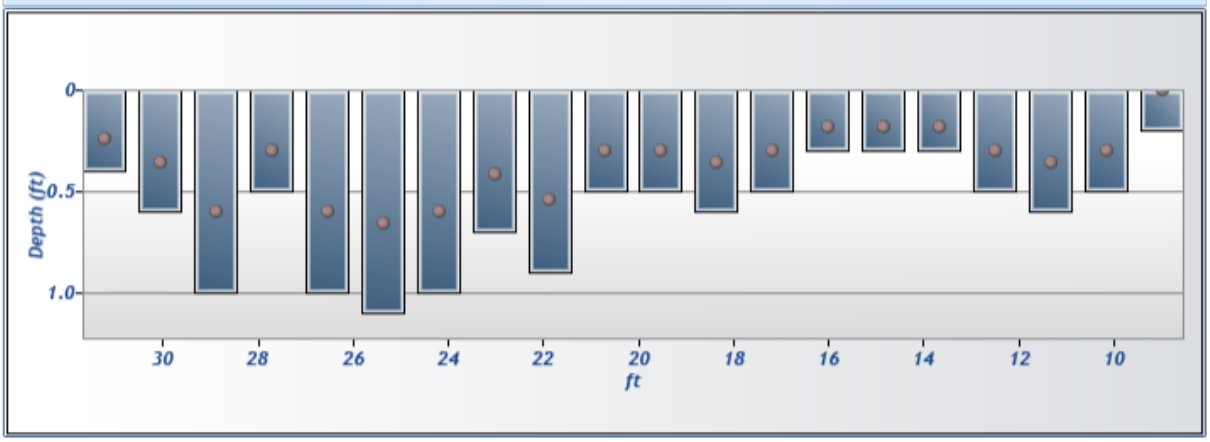
Discharge chart



Velocity chart



Depth chart



Measurement results

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft²)	Flow (ft³/s)	%Q	
0	11:49 AM	9.000	None	0.200	0.0000	0.000	0	0.0000		0.4775	0.4095	0.1955	1.03	✓
1	11:50 AM	10.170	0.6	0.500	0.6000	0.300	75	0.9550	1.0000	1.0887	0.6435	0.7006	3.69	✓
2	11:51 AM	11.340	0.6	0.600	0.6000	0.360	76	1.2225	1.0000	0.8714	0.6435	0.5608	2.96	✓
3	11:52 AM	12.510	0.6	0.500	0.6000	0.300	76	0.5204	1.0000	0.4389	0.4680	0.2054	1.08	✓
4	11:54 AM	13.680	0.6	0.300	0.6000	0.180	76	0.3575	1.0000	0.2864	0.3510	0.1005	0.53	✓
5	11:55 AM	14.850	0.6	0.300	0.6000	0.180	76	0.2153	1.0000	0.1727	0.3510	0.0606	0.32	✓
6	11:56 AM	16.020	0.6	0.300	0.6000	0.180	76	0.1300	1.0000	0.2902	0.4680	0.1358	0.72	✓
7	11:58 AM	17.190	0.6	0.500	0.6000	0.300	76	0.4503	1.0000	0.9299	0.6435	0.5984	3.15	✓
8	12:00 PM	18.360	0.6	0.600	0.6000	0.360	76	1.4096	1.0000	1.3025	0.6435	0.8382	4.42	✓
9	12:01 PM	19.530	0.6	0.500	0.6000	0.300	76	1.1955	1.0000	0.7299	0.5850	0.4270	2.25	✓
10	12:02 PM	20.700	0.6	0.500	0.6000	0.300	76	0.2643	1.0000	0.2280	0.8190	0.1867	0.98	✓
11	12:04 PM	21.870	0.6	0.900	0.6000	0.540	75	0.1916	1.0000	1.4384	0.9360	1.3464	7.10	✓
12	12:06 PM	23.040	0.6	0.700	0.6000	0.420	76	2.6852	1.0000	2.1715	0.9945	2.1595	11.38	✓
13	12:07 PM	24.210	0.6	1.000	0.6000	0.600	76	1.6577	1.0000	2.0375	1.2285	2.5030	13.19	✓
14	12:08 PM	25.380	0.6	1.100	0.6000	0.660	76	2.4172	1.0000	2.0173	1.2285	2.4783	13.06	✓
15	12:10 PM	26.550	0.6	1.000	0.6000	0.600	76	1.6174	1.0000	1.9181	0.8775	1.6831	8.87	✓
16	12:11 PM	27.720	0.6	0.500	0.6000	0.300	76	2.2187	1.0000	2.1468	0.8775	1.8839	9.93	✓
17	12:13 PM	28.890	0.6	1.000	0.6000	0.600	76	2.0749	1.0000	2.0585	0.9360	1.9268	10.15	✓
18	12:14 PM	30.060	0.6	0.600	0.6000	0.360	76	2.0421	1.0000	1.6842	0.5850	0.9853	5.19	✓
19	12:16 PM	31.230	0.6	0.400	0.6000	0.240	76	1.3263	1.0000		0.0000	0.0000	0.00	✓

Quality control warnings

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
1	11:50 AM	10.170	0.6	0.500	0.6000	0.300	Boundary Interference
2	11:51 AM	11.340	0.6	0.600	0.6000	0.360	Standard Error > QC
3	11:52 AM	12.510	0.6	0.500	0.6000	0.300	Velocity Angle > QC
4	11:54 AM	13.680	0.6	0.300	0.6000	0.180	Velocity Angle > QC
5	11:55 AM	14.850	0.6	0.300	0.6000	0.180	Velocity Angle > QC
6	11:56 AM	16.020	0.6	0.300	0.6000	0.180	Velocity Angle > QC
7	11:58 AM	17.190	0.6	0.500	0.6000	0.300	Standard Error > QC,Velocity Angle > QC
8	12:00 PM	18.360	0.6	0.600	0.6000	0.360	Standard Error > QC
9	12:01 PM	19.530	0.6	0.500	0.6000	0.300	Standard Error > QC,Velocity Angle > QC
10	12:02 PM	20.700	0.6	0.500	0.6000	0.300	Velocity Angle > QC
11	12:04 PM	21.870	0.6	0.900	0.6000	0.540	Boundary Interference,Standard Error > QC,Velocity Angle > QC
12	12:06 PM	23.040	0.6	0.700	0.6000	0.420	Standard Error > QC,Velocity Angle > QC,High Stn % Discharge
13	12:07 PM	24.210	0.6	1.000	0.6000	0.600	Standard Error > QC,Velocity Angle > QC,High Stn % Discharge
14	12:08 PM	25.380	0.6	1.100	0.6000	0.660	Standard Error > QC,High Stn % Discharge
15	12:10 PM	26.550	0.6	1.000	0.6000	0.600	Standard Error > QC,Velocity Angle > QC
16	12:11 PM	27.720	0.6	0.500	0.6000	0.300	Standard Error > QC,Velocity Angle > QC
17	12:13 PM	28.890	0.6	1.000	0.6000	0.600	Standard Error > QC,Velocity Angle > QC,High Stn % Discharge
18	12:14 PM	30.060	0.6	0.600	0.6000	0.360	Standard Error > QC
19	12:16 PM	31.230	0.6	0.400	0.6000	0.240	Standard Error > QC

Discharge Measurement Summary

File Information

File name	M34_20190924-111414.ft
Start date and time	9/24/2019 10:38 AM
Calculations engine	FlowTracker2
Data collection mode	Discharge

Discharge Summary

Start time	9/24/2019 10:39:23 AM	End time	9/24/2019 11:11:13 AM
# Stations	20	Avg interval	40
Mean depth	0.853 ft		
Mean velocity	1.7727 ft/s	Total width	21.850 ft
Mean SNR	31 dB	Total area	18.6300 ft²
Mean temp	43.061 °F	Total discharge	33.0261 ft³/s

System Information

Sensor type	Top Setting
Handheld serial number	FT2H1553025
Probe serial number	FT2P1608015
Probe firmware	1.23
Handheld software	1.4

Site Details

Site name	M34
Site number	M34
Operator(s)	LB
Comment	

Discharge Uncertainty

Category	ISO	IVE
Accuracy	1.0%	1.0%
Depth	0.2%	3.9%
Velocity	0.9%	6.0%
Width	0.1%	0.1%
Method	2.2%	
# Stations	2.4%	
Overall	3.5%	7.2%

Discharge Settings

Discharge equation	Mid Section
Discharge uncertainty	IVE
Discharge reference	Rated

Station Warning Settings

Station discharge caution	5.00	%
Station discharge warning	10.00	%
Maximum depth change	50.00	%
Maximum spacing change	100.00	%

Summary overview

No changes were made to this file
Quality control warnings

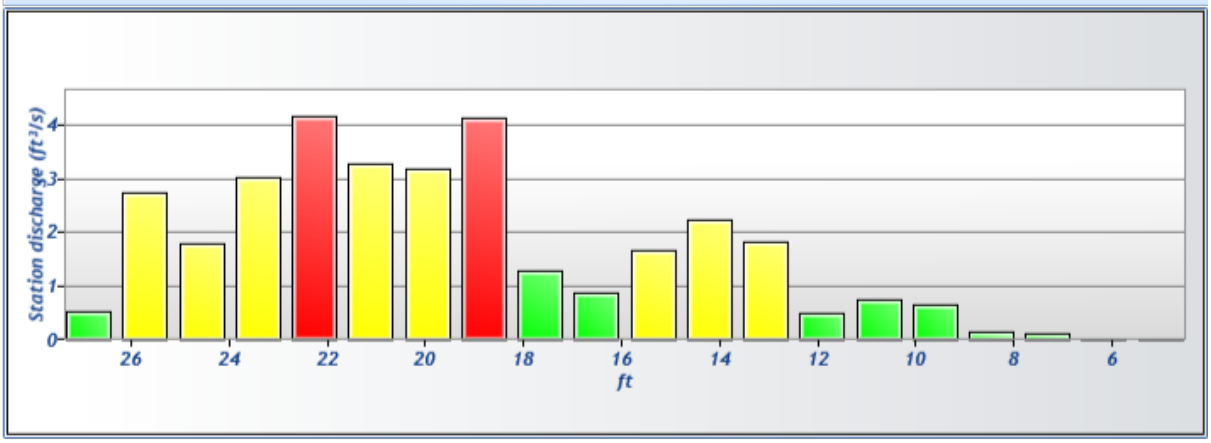
Data Collection Settings

Salinity	0.000	PSS-78
Temperature		°F
Sound speed		ft/s
Mounting correction	0.00	%

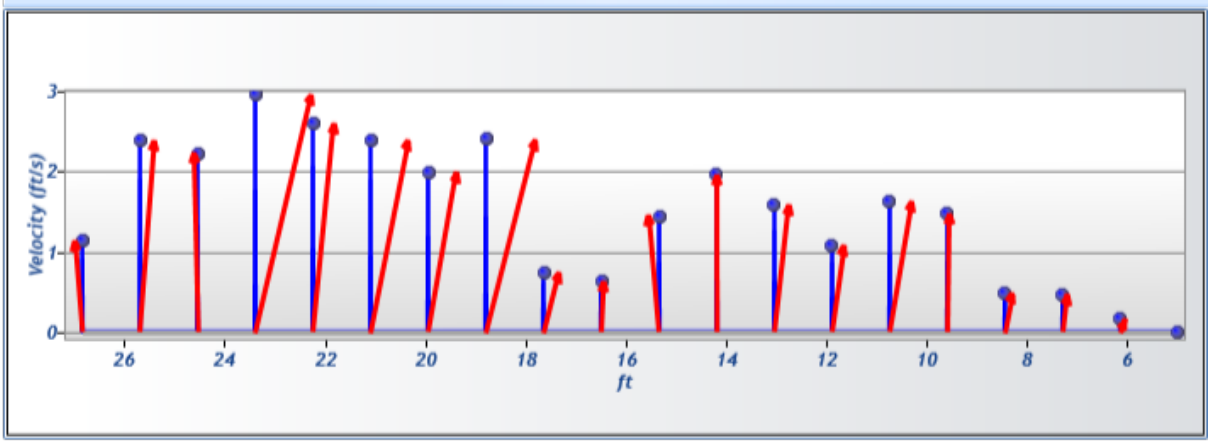
Quality Control Settings

SNR threshold	10	dB
Standard error threshold	0.0328	ft/s
Spike threshold	10.00	%
Maximum velocity angle	20.0	deg
Maximum tilt angle	5.0	deg

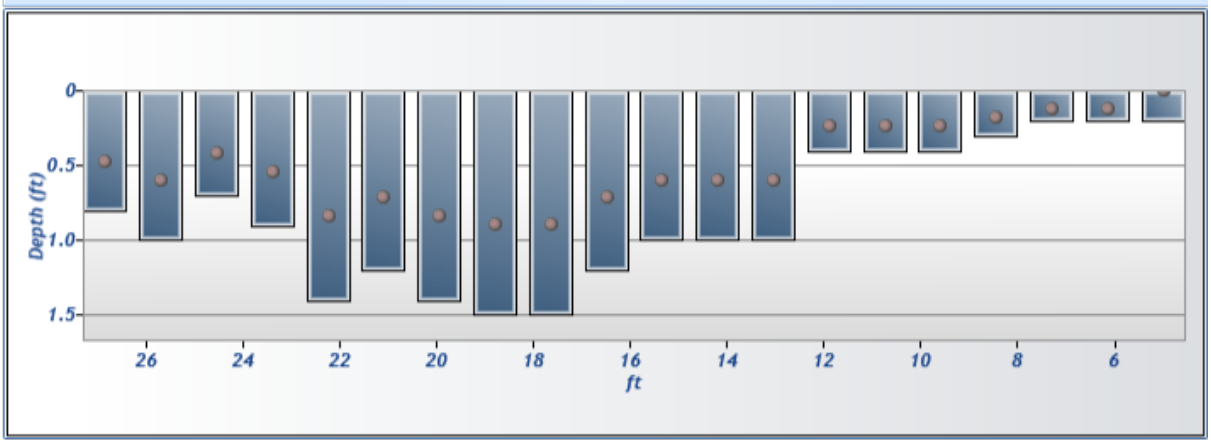
Discharge chart



Velocity chart



Depth chart



Measurement results

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft^2)	Flow (ft^3/s)	%Q	
0	10:39 AM	5.000	None	0.200	0.0000	0.000	0	0.0000	0.0000	0.0000	0.1150	0.0000	0.00	✓
1	10:40 AM	6.150	0.6	0.200	0.6000	0.120	75	0.1825	1.0000	0.1825	0.2300	0.0420	0.13	✓
2	10:42 AM	7.300	0.6	0.200	0.6000	0.120	75	0.4759	1.0000	0.4759	0.2300	0.1095	0.33	✓
3	10:44 AM	8.450	0.6	0.300	0.6000	0.180	76	0.4862	1.0000	0.4862	0.3450	0.1677	0.51	✓
4	10:45 AM	9.600	0.6	0.400	0.6000	0.240	76	1.4689	1.0000	1.4689	0.4600	0.6757	2.05	✓
5	10:49 AM	10.750	0.6	0.400	0.6000	0.240	76	1.6183	1.0000	1.6183	0.4600	0.7444	2.25	✓
6	10:51 AM	11.900	0.6	0.400	0.6000	0.240	76	1.0766	1.0000	1.0766	0.4600	0.4953	1.50	✓
7	10:53 AM	13.050	0.6	1.000	0.6000	0.600	76	1.5859	1.0000	1.5859	1.1500	1.8238	5.52	✓
8	10:54 AM	14.200	0.6	1.000	0.6000	0.600	76	1.9544	1.0000	1.9544	1.1500	2.2475	6.81	✓
9	10:57 AM	15.350	0.6	1.000	0.6000	0.600	76	1.4473	1.0000	1.4473	1.1500	1.6644	5.04	✓
10	10:58 AM	16.500	0.6	1.200	0.6000	0.720	76	0.6362	1.0000	0.6362	1.3800	0.8779	2.66	✓
11	10:59 AM	17.650	0.6	1.500	0.6000	0.900	76	0.7464	1.0000	0.7464	1.7250	1.2875	3.90	✓
12	11:01 AM	18.800	0.6	1.500	0.6000	0.900	76	2.3968	1.0000	2.3968	1.7250	4.1344	12.52	✓
13	11:02 AM	19.950	0.6	1.400	0.6000	0.840	76	1.9926	1.0000	1.9926	1.6100	3.2080	9.71	✓
14	11:04 AM	21.100	0.6	1.200	0.6000	0.720	76	2.3767	1.0000	2.3767	1.3800	3.2799	9.93	✓
15	11:05 AM	22.250	0.6	1.400	0.6000	0.840	76	2.5874	1.0000	2.5874	1.6100	4.1657	12.61	✓
16	11:06 AM	23.400	0.6	0.900	0.6000	0.540	76	2.9480	1.0000	2.9480	1.0350	3.0512	9.24	✓
17	11:08 AM	24.550	0.6	0.700	0.6000	0.420	76	2.2249	1.0000	2.2249	0.8050	1.7911	5.42	✓
18	11:09 AM	25.700	0.6	1.000	0.6000	0.600	76	2.3814	1.0000	2.3814	1.1500	2.7386	8.29	✓
19	11:11 AM	26.850	0.6	0.800	0.6000	0.480	76	1.1335	1.0000	1.1335	0.4600	0.5214	1.58	✓

Quality control warnings

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings	
1	10:40 AM	6.150	0.6	0.200	0.6000	0.120	Boundary Interference,Velocity Angle > QC	
2	10:42 AM	7.300	0.6	0.200	0.6000	0.120	Boundary Interference	
4	10:45 AM	9.600	0.6	0.400	0.6000	0.240	Standard Error > QC	
5	10:49 AM	10.750	0.6	0.400	0.6000	0.240	Standard Error > QC	
6	10:51 AM	11.900	0.6	0.400	0.6000	0.240	Standard Error > QC	
7	10:53 AM	13.050	0.6	1.000	0.6000	0.600	Standard Error > QC	
8	10:54 AM	14.200	0.6	1.000	0.6000	0.600	Standard Error > QC,Rod Angle > QC	
9	10:57 AM	15.350	0.6	1.000	0.6000	0.600	Standard Error > QC	
10	10:58 AM	16.500	0.6	1.200	0.6000	0.720	Standard Error > QC	
11	10:59 AM	17.650	0.6	1.500	0.6000	0.900	Standard Error > QC,Velocity Angle > QC	
12	11:01 AM	18.800	0.6	1.500	0.6000	0.900	Standard Error > QC,Velocity Angle > QC,High Stn % Discharge	
13	11:02 AM	19.950	0.6	1.400	0.6000	0.840	Standard Error > QC	
14	11:04 AM	21.100	0.6	1.200	0.6000	0.720	Standard Error > QC	
15	11:05 AM	22.250	0.6	1.400	0.6000	0.840	Standard Error > QC,High Stn % Discharge	
16	11:06 AM	23.400	0.6	0.900	0.6000	0.540	Standard Error > QC,Velocity Angle > QC	
17	11:08 AM	24.550	0.6	0.700	0.6000	0.420	Standard Error > QC	
18	11:09 AM	25.700	0.6	1.000	0.6000	0.600	Standard Error > QC,Rod Angle > QC	
19	11:11 AM	26.850	0.6	0.800	0.6000	0.480	Standard Error > QC	

Discharge Measurement Summary

File Information

File name	M38_20190924-100032.ft
Start date and time	9/24/2019 8:58 AM
Calculations engine	FlowTracker2
Data collection mode	Discharge

Discharge Summary

Start time	9/24/2019 9:00:30 AM	End time	9/24/2019 9:55:56 AM
# Stations	30	Avg interval	40
Mean depth	0.691 ft		
Mean velocity	1.1439 ft/s	Total width	43.500 ft
Mean SNR	29 dB	Total area	30.0750 ft²
Mean temp	39.140 °F	Total discharge	34.4022 ft³/s

System Information

Sensor type	Top Setting
Handheld serial number	FT2H1553025
Probe serial number	FT2P1608015
Probe firmware	1.23
Handheld software	1.4

Site Details

Site name	M38
Site number	M38
Operator(s)	LB
Comment	

Discharge Uncertainty

Category	ISO	IVE
Accuracy	1.0%	
Depth	0.3%	
Velocity	0.6%	
Width	0.1%	
Method	1.5%	
# Stations	1.7%	
Overall	2.5%	

Discharge Settings

Discharge equation	Mean Section
Discharge uncertainty	IVE
Discharge reference	Rated

Station Warning Settings

Station discharge caution	5.00	%
Station discharge warning	10.00	%
Maximum depth change	50.00	%
Maximum spacing change	100.00	%

Summary overview

No changes were made to this file
Quality control warnings

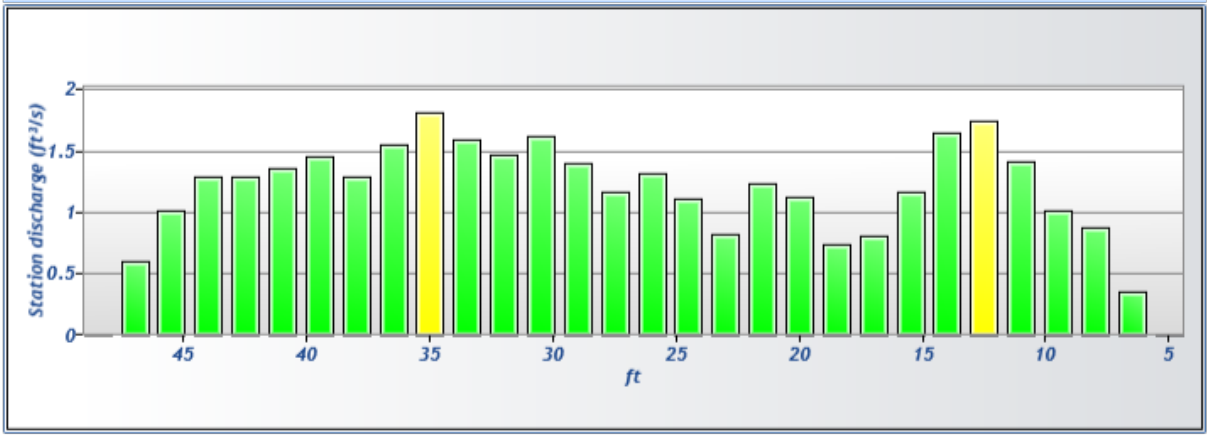
Data Collection Settings

Salinity	0.000	PSS-78
Temperature		°F
Sound speed		ft/s
Mounting correction	0.00	%

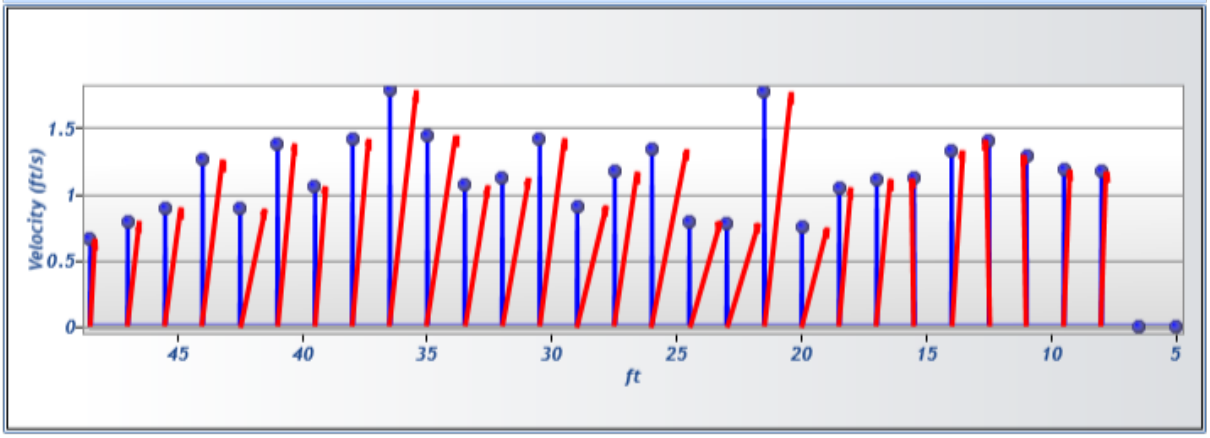
Quality Control Settings

SNR threshold	10	dB
Standard error threshold	0.0328	ft/s
Spike threshold	10.00	%
Maximum velocity angle	20.0	deg
Maximum tilt angle	5.0	deg

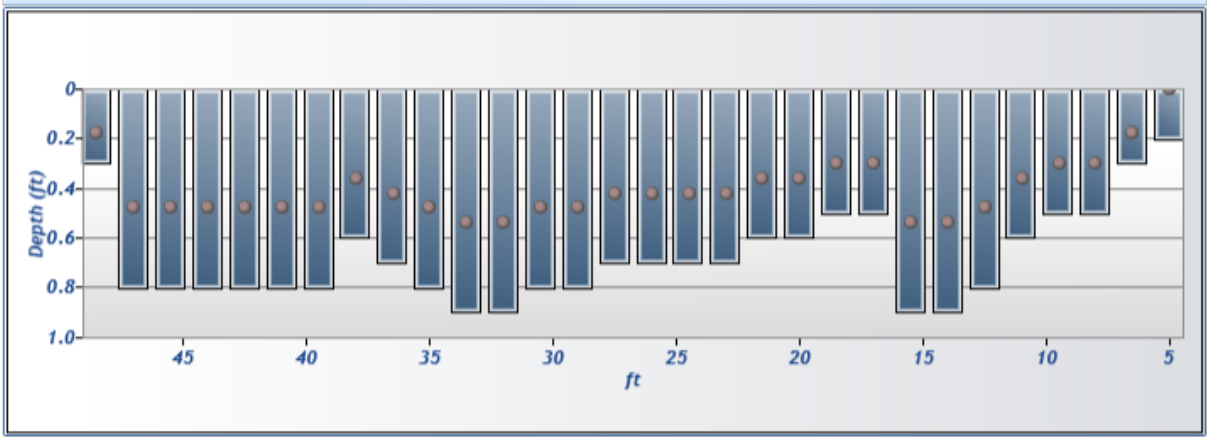
Discharge chart



Velocity chart



Depth chart



Measurement results

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft^2)	Flow (ft^3/s)	%Q		
0	9:00 AM	5.000	None	0.200	0.0000	0.000	0	0.0000		0.0001	0.3750	0.0000	0.00	✓	
1	9:02 AM	6.500	0.6	0.300	0.6000	0.180	76	0.0002	1.0000	0.5846	0.6000	0.3507	1.02	✓	
2	9:08 AM	8.000	0.6	0.500	0.6000	0.300	76	1.1689	1.0000	1.1780	0.7500	0.8835	2.57	✓	
3	9:12 AM	9.500	0.6	0.500	0.6000	0.300	76	1.1871	1.0000	1.2411	0.8250	1.0239	2.98	✓	
4	9:15 AM	11.000	0.6	0.600	0.6000	0.360	76	1.2951	1.0000	1.3507	1.0500	1.4182	4.12	✓	
5	9:17 AM	12.500	0.6	0.800	0.6000	0.480	76	1.4063	1.0000	1.3690	1.2750	1.7455	5.07	✓	
6	9:19 AM	14.000	0.6	0.900	0.6000	0.540	76	1.3317	1.0000	1.2251	1.3500	1.6539	4.81	✓	
7	9:21 AM	15.500	0.6	0.900	0.6000	0.540	76	1.1185	1.0000	1.1174	1.0500	1.1732	3.41	✓	
8	9:22 AM	17.000	0.6	0.500	0.6000	0.300	76	1.1162	1.0000	1.0843	0.7500	0.8133	2.36	✓	
9	9:23 AM	18.500	0.6	0.500	0.6000	0.300	76	1.0525	1.0000	0.9009	0.8250	0.7433	2.16	✓	
10	9:25 AM	20.000	0.6	0.600	0.6000	0.360	75	0.7493	1.0000	1.2588	0.9000	1.1329	3.29	✓	
11	9:28 AM	21.500	0.6	0.600	0.6000	0.360	76	1.7682	1.0000	1.2737	0.9750	1.2419	3.61	✓	
12	9:29 AM	23.000	0.6	0.700	0.6000	0.420	76	0.7792	1.0000	0.7885	1.0500	0.8279	2.41	✓	
13	9:31 AM	24.500	0.6	0.700	0.6000	0.420	76	0.7978	1.0000	1.0668	1.0500	1.1201	3.26	✓	
14	9:33 AM	26.000	0.6	0.700	0.6000	0.420	76	1.3358	1.0000	1.2530	1.0500	1.3157	3.82	✓	
15	9:35 AM	27.500	0.6	0.700	0.6000	0.420	76	1.1703	1.0000	1.0411	1.1250	1.1712	3.40	✓	
16	9:37 AM	29.000	0.6	0.800	0.6000	0.480	76	0.9119	1.0000	1.1669	1.2000	1.4002	4.07	✓	
17	9:39 AM	30.500	0.6	0.800	0.6000	0.480	76	1.4219	1.0000	1.2718	1.2750	1.6216	4.71	✓	
18	9:40 AM	32.000	0.6	0.900	0.6000	0.540	76	1.1218	1.0000	1.0949	1.3500	1.4781	4.30	✓	
19	9:42 AM	33.500	0.6	0.900	0.6000	0.540	76	1.0680	1.0000	1.2544	1.2750	1.5993	4.65	✓	
20	9:44 AM	35.000	0.6	0.800	0.6000	0.480	76	1.4408	1.0000	1.6112	1.1250	1.8126	5.27	✓	
21	9:45 AM	36.500	0.6	0.700	0.6000	0.420	76	1.7816	1.0000	1.5959	0.9750	1.5560	4.52	✓	
22	9:47 AM	38.000	0.6	0.600	0.6000	0.360	76	1.4103	1.0000	1.2325	1.0500	1.2942	3.76	✓	
23	9:48 AM	39.500	0.6	0.800	0.6000	0.480	76	1.0548	1.0000	1.2190	1.2000	1.4628	4.25	✓	
24	9:49 AM	41.000	0.6	0.800	0.6000	0.480	76	1.3832	1.0000	1.1364	1.2000	1.3637	3.96	✓	
25	9:51 AM	42.500	0.6	0.800	0.6000	0.480	76	0.8896	1.0000	1.0756	1.2000	1.2907	3.75	✓	
26	9:52 AM	44.000	0.6	0.800	0.6000	0.480	76	1.2615	1.0000	1.0786	1.2000	1.2943	3.76	✓	
27	9:53 AM	45.500	0.6	0.800	0.6000	0.480	76	0.8957	1.0000	0.8440	1.2000	1.0128	2.94	✓	
28	9:54 AM	47.000	0.6	0.800	0.6000	0.480	76	0.7923	1.0000	0.7279	0.8250	0.6005	1.75	✓	
29	9:55 AM	48.500	0.6	0.300	0.6000	0.180	76	0.6635	1.0000		0.0000	0.0000	0.00	✓	

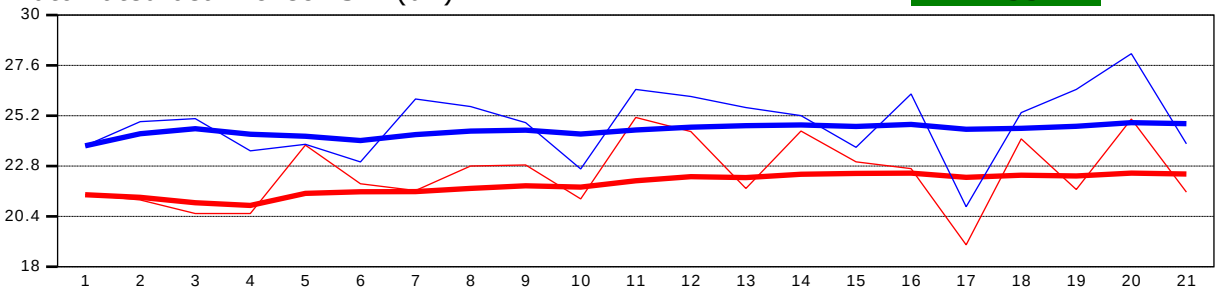
Quality control warnings

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings	
1	9:02 AM	6.500	0.6	0.300	0.6000	0.180	SNR Threshold Variation	
2	9:08 AM	8.000	0.6	0.500	0.6000	0.300	Rod Angle > QC	
4	9:15 AM	11.000	0.6	0.600	0.6000	0.360	Standard Error > QC	
8	9:22 AM	17.000	0.6	0.500	0.6000	0.300	Standard Error > QC,Velocity Angle > QC	
9	9:23 AM	18.500	0.6	0.500	0.6000	0.300	Standard Error > QC,Velocity Angle > QC	
10	9:25 AM	20.000	0.6	0.600	0.6000	0.360	Boundary Interference,Standard Error > QC,Velocity Angle > QC	
11	9:28 AM	21.500	0.6	0.600	0.6000	0.360	Velocity Angle > QC	
12	9:29 AM	23.000	0.6	0.700	0.6000	0.420	Standard Error > QC,Velocity Angle > QC	
13	9:31 AM	24.500	0.6	0.700	0.6000	0.420	Velocity Angle > QC	
14	9:33 AM	26.000	0.6	0.700	0.6000	0.420	Velocity Angle > QC	
15	9:35 AM	27.500	0.6	0.700	0.6000	0.420	Standard Error > QC,Velocity Angle > QC	
16	9:37 AM	29.000	0.6	0.800	0.6000	0.480	Standard Error > QC,Velocity Angle > QC	
17	9:39 AM	30.500	0.6	0.800	0.6000	0.480	Velocity Angle > QC	
18	9:40 AM	32.000	0.6	0.900	0.6000	0.540	Velocity Angle > QC	
19	9:42 AM	33.500	0.6	0.900	0.6000	0.540	Standard Error > QC,Velocity Angle > QC	
20	9:44 AM	35.000	0.6	0.800	0.6000	0.480	Standard Error > QC,Velocity Angle > QC	
21	9:45 AM	36.500	0.6	0.700	0.6000	0.420	Standard Error > QC,Velocity Angle > QC	
22	9:47 AM	38.000	0.6	0.600	0.6000	0.360	Velocity Angle > QC	
23	9:48 AM	39.500	0.6	0.800	0.6000	0.480	Standard Error > QC,Velocity Angle > QC	
24	9:49 AM	41.000	0.6	0.800	0.6000	0.480	Standard Error > QC,Velocity Angle > QC	
25	9:51 AM	42.500	0.6	0.800	0.6000	0.480	Velocity Angle > QC	
26	9:52 AM	44.000	0.6	0.800	0.6000	0.480	Standard Error > QC,Velocity Angle > QC	
27	9:53 AM	45.500	0.6	0.800	0.6000	0.480	Velocity Angle > QC	
28	9:54 AM	47.000	0.6	0.800	0.6000	0.480	Velocity Angle > QC	

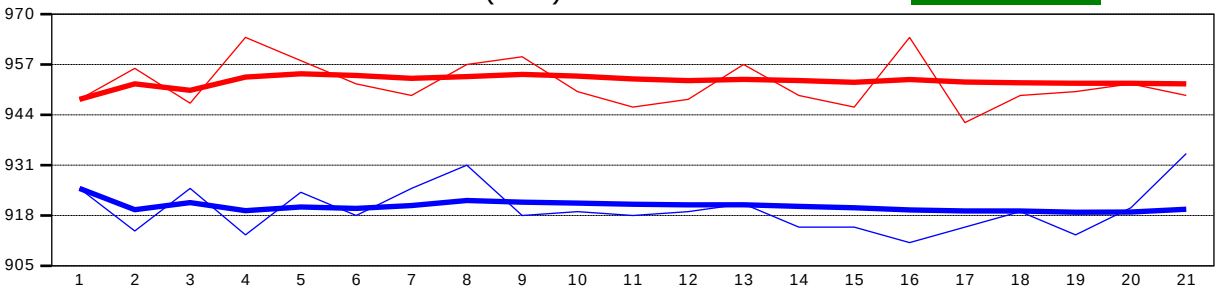
11/4/2019 9:53:24 AM

Automated beam check Start time 9/24/2019 9:00:04 AM

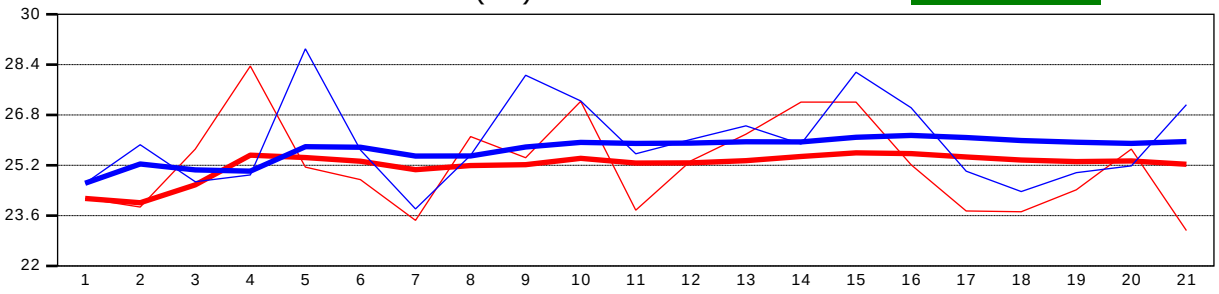
Automated beam check SNR(dB) PASS



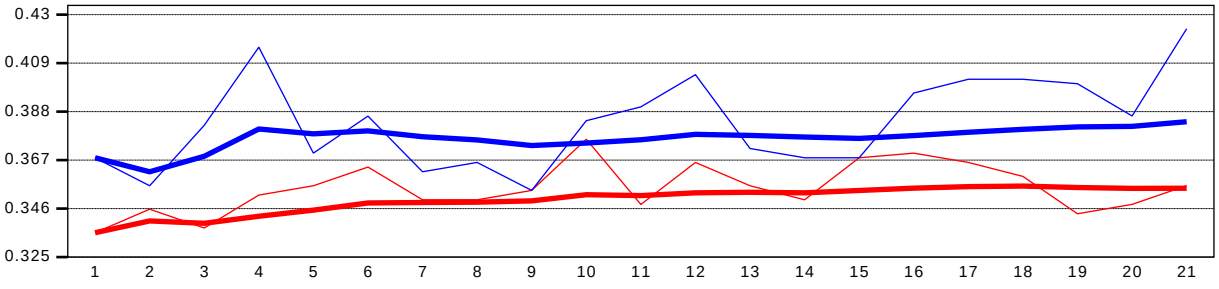
Automated beam check Noise level(cnts) PASS



Automated beam check Peak level(dB) PASS



Automated beam check Peak position(ft) PASS



Automated beam check Quality control warnings

No quality control warnings

Appendix B
Electronic Data Collection Devices Field Notes

Table B.1. Little Dora Mine 2019 Pre-CERCLA Screening High Flow Sampling Field Notes, Weather Conditions, and Personnel.					
Sample/Location ID	**Comments**	**Stream Conditions**	**Weather Conditions**	**Field Scribe**	**Field Sampler**
LD_1_DM	Down 15 ft from adit gate. Single flow path	Clear, Adit; Gravel; Orange Staining	Partly Cloudy; No Precip.; No Wind	Michael Carney	Candace Whitten
LD_2_DM	None	Calm, Cloudy, Pool,Stagnant, Trickle; Marsh; Orange Staining	Partly Cloudy; Rain; No Wind	Ryan Monahan	Ryan Monahan
LD_3_DM	Seeps samples at road where they converge; DO and temp are estimates. Water quality taken from cup. Flow measured by bag method	Cascading, Trickle; Cobble, Gravel, Sandy; Orange Staining	Partly Cloudy; No Precip.; Med. Wind	Landon Bailey	Kyle Sandor
LD_4_unk	Moss, pooling, trickle, seep; Used timed bag method for flow reading	Trickle; Marsh,Algae Present, Cobble; Orange Staining	Partly Sunny; No Precip.; Low Wind	Landon Bailey	Kyle Sandor
LD_5	Flow path down what looks to be an old road.	Clear, Other; Riffle down old road; Algae Present, Cobble, Gravel ,Marsh; No Staining	Sunny; No Wind	Michael Carney	Candace Whitten
LD_6_SS	Seep at toe of aspen and shrubs on right bank of flowpath down old road. Mossy with pockets of open water	Trickle, Clear, Calm; Algae Present, Marsh; White Staining	Sunny; Low Wind	Michael Carney	Candace Whitten
LD_7_L	None	Cascading, Clear; Algae Present, Cobble, Gravel; White Staining	Partly Sunny; Lightning; Low Wind	Landon Bailey	Ryan Monahan
LD_7_R	None	Cascading, Clear; Algae Present, Cobble, Gravel; No Staining	Partly Sunny; No Precip.; Low Wind	Landon Bailey	Kyle Sandor
LD_8A	Supposed to be called LD_8A. Was directed to call it LD_8	Trickle, Clear; Cobble, Gravel, Sandy; No Staining	Partly Sunny; No Precip.; Low Wind	Ryan Monahan	Kyle Sandor
LD_09	Diffuse flow over side road	Trickle, Clear; Gravel; Orange Staining	Sunny; No Wind	Michael Carney	William Schroeder
LD_10	Flow along side of road	Trickle, Clear; Sandy, Gravel; No Staining	Sunny; No Wind	Ryan Monahan	Ryan Monahan
LD_11	Just above pooled area just above culvert.	Trickle, Clear; Algae Present, Gravel, Sandy; Orange Staining	Sunny; No Wind	Michael Carney	Candace Whitten
LD_12	Flow path at side of road	Clear, Trickle; Gravel, Cobble; Orange Staining	Sunny; No Wind	Michael Carney	Kyle Sandor
LDM-SW-DNS-01	Orange water standing above road	Stagnant, Calm, Orange Tinge, Cloudy; Marsh; Orange Staining	Sunny; No Wind	Ryan Monahan	Landon Bailey
A72	None	Calm, Clear; Cobble, Sandy, Gravel; Orange Staining	Partly Sunny; No Precip.; Low Wind	Bailey Lonnberg	Kara Armano
A71B	None	Clear, Turbulent; Cobble, Gravel, Sandy; Orange Staining	Partly Sunny; No Precip.; Low Wind	Bailey Lonnberg	Tanner Banks
M34	Gauge station	Turbulent, Clear; Cobble, Gravel; Orange Staining	Sunny; No Wind	Bailey Lonnberg	Tanner Banks
M35	None	Clear, Turbulent; Boulder, Cobble, Gravel; Orange Staining	Sunny; No Wind	Kara Armano	Kara Armano
M38	Immediately below bridge	Clear, Turbulent; Cobble, Gravel; Orange Staining	Partly Sunny; No Precip.; Low Wind	Bailey Lonnberg	Kara Armano

Table B.2. Little Dora Mine 2019 Pre-CERCLA Screening Low Flow Sampling Field Notes, Weather Conditions, and Personnel.					
Sample/Location ID	**Comments**	**Stream Conditions**	**Weather Conditions**	**Field Scribe**	**Field Sampler**
NS7_1_DM	Adit splits in two; Overflow channel flume	Cascading, Cloudy, Muddy; Cobble, Gravel, Sandy; Orange Staining	Partly Cloudy; No Precip.; Low Wind	Landon Bailey	Kyle Sandor
NS7_2_DM	Samples collected at bottom of pile before spreading out in large marsh/wetland; Extra picture shows flow measurement using timed fill method. Picture shows flow not captured in bucket. Would estimate 50% of flow not captured in bucket. 5 bucket fills were performed	Cascading, Clear; Cobble, Gravel; Orange Staining	Sunny; No Wind	Ryan Monahan	Landon Bailey
NS7_3_ DM	Seep area just at bank on mineral creek. Some small willows present	Clear, Trickle; Marsh; Orange Staining	Partly Sunny; No Precip.; No Wind	Michael Carney	Candace Whitten
NS7_4_ DM	Sample taken in channelized section of flow path just before it becomes diffuse flow path	Cascading, Cloudy; Cobble, Boulder, Gravel; Orange Staining	Partly Sunny; No Precip.; No Wind	Michael Carney	Bill Schroeder
NSM-SW-OPP-01	Used two flumes of the two braided sections of input into mineral creek	Calm, Clear; Sandy, Marsh; Orange Staining	Partly Sunny; No Precip.; No Wind	Bailey Lonnberg	Bailey Lonnberg
M32	None	Clear, Turbulent; Boulder, Cobble, Gravel; Orange Staining	Partly Cloudy; No Precip.; Low Wind	Bailey Lonnberg	Tanner Banks
M33	None	Clear, Turbulent; Boulder, Cobble; Orange Staining	Partly Cloudy; No Precip.; Low Wind	Bailey Lonnberg	Kara Armano
M32B	Stream site is on the north side of the Belcher where main flow exists.	Clear, Cascading; Cobble, Gravel, Boulder; No Staining	Sunny; No Wind	Bailey Lonnberg	Jason Willis
M32C	Flow tracker results had errors. Cascading water and unstable footing led to possibly inaccurate measurements.	Cascading, Clear, Turbulent; Gravel, Cobble, Boulder; Orange Staining	Partly Sunny; No Precip.; No Wind	Tanner Banks	Tanner Banks
M32D	None	Cascading, Clear; Gravel, Marsh, Sandy, Cobble, Boulder; No Staining	Partly Sunny; No Precip.; Low Wind	Bailey Lonnberg	Tanner Banks

Table B.3. North Star Mine 2019 Pre-CERCLA Screening High Flow Sampling Field Notes, Weather Conditions, and Personnel.					
Sample/Location ID	**Comments**	**Stream Conditions**	**Weather Conditions**	**Field Scribe**	**Field Sampler**
LD_1_DM	Adit discharge at the portal before split in flow; Bag flume method from DRMS; Fine aluminum precipitation and sludge like sediment	Adit, Calm; Algae Present; White Staining	Partly Cloudy; No Precip.; No Wind	Robyn Blackburn	Jeff Litteral
LD_2_DM	Bag flume method from DRMS; Sample collected just down from pooled area that's on the road	Cascading, Clear, Muddy; Marsh; Orange Staining	Partly Cloudy; No Precip.; No Wind	Michael Carney	Kristen Brown
LD_3_DM	Bag flume method from DRMS	Not recorded	Partly Cloudy; No Precip.; No Wind	Robyn Blackburn	Jeff Litteral
LD_4_unk	Bag flume method from DRMS	Calm, Pool, Stagnant, Trickle; Algae Present, Sandy; No Staining	Partly Cloudy; No Precip.; low Wind	Robyn Blackburn	Jeff Litteral
LD_5	Flagged sampling location - same one that was sampled during high flow	Clear; Algae Present, Marsh, Gravel, Cobble; No Staining	Partly Cloudy; No Precip.; No Wind	Michael Carney	Kristen Brown
LD_7_L	Flow path on left side of road. Continues down road towards culvert. All flow goes to culvert during low flow at time of sampling	Clear, Cascading; Gravel; White Staining	Partly Cloudy; No Precip.; No Wind	Michael Carney	Kristen Brown
LD_7_R	Some of his flow reports to LD8A; but some flow enters culvert that discharges into Mineral Creek; 5% loss	Clear; Sandy,Algae Present, Cobble; No Staining	Partly Cloudy; No Precip.; No Wind	Robyn Blackburn	Jeff Litteral
LD_8A	2-5 % loss around flume	Clear; Sandy, Gravel, Cobble; Orange Staining	Partly Cloudy; No Precip.; No Wind	Robyn Blackburn	Jeff Litteral
LD_09	Bag flume method from DRMS; Flow path coming down road from LD mine area	Clear; Gravel, Sandy; Orange Staining	Partly Cloudy; No Precip.; No Wind	Michael Carney	Kristen Brown
LD_10	Flow path on side of road before culvert	Clear; Gravel, Sandy, Algae Present; White Staining	Partly Cloudy; No Precip.; No Wind	Michael Carney	Robyn Blackburn
LD_11	Bag flume method from DRMS; Small flow path just above road culvert	Clear; Gravel, Marsh, Algae Present; Orange Staining	Partly Cloudy; No Precip.; No Wind	Michael Carney	Kirsten Brown
LD_13	2% escaping around the flume	Clear; Sandy, Marsh; White Staining	Partly Cloudy; No Precip.; No Wind	Michael Carney	Robyn Blackburn
A72	EDCD died at site	Calm, Cloudy; Cobble, Sandy; Orange Staining	Sunny; No Wind	Miles Batson	Bailey Lonnberg
M34	None	Calm Cascading, Clear, Turbulent	Sunny; Low Wind	Alex Hedgepath	Landon Bailey
M38	None	Calm, Cascading, Clear; Cobble, Gravel, Sandy; Orange Staining	Sunny; Low Wind	Alex Hedgepath	Landon Bailey

Table B.4. North Star Mine 2019 Pre-CERCLA Screening Low Flow Sampling Field Notes, Weather Conditions, and Personnel.					
Sample/Location ID	**Comments**	**Stream Conditions**	**Weather Conditions**	**Field Scribe**	**Field Sampler**
NS7_1_DM	Main adit sample location just outside of tunnel; Existing sample location also collected during high flow event. Adit discharge just outside of portal; Two flume sets added together to get total adit flow path. 2 in flume Ha = 0.56 Hb = 0.16: 1 in flume Ha = 0.28 Hb = 0.04=	Adit, Cloudy, Pool, Turbulent, Tinge; Gravel, Cobble; Orange Staining	Sunny; No Wind	Robyn Blackburn	Tanner Banks
NS7_2_DM	Bag flume method from DRMS; Bottom of cascades	Cascading, Clear, Turbulent; Gravel, Cobble; Orange Staining	Partly Cloudy; No Precip.; No Wind	Michael Carney	Jeff Litteral
NS7_3_ DM	Sampling point just before flow enters Mineral Creek. Flow path above sampling point flows over pile. Stressed and dead vegetation throughout. Flow taken well above sampling point where it is channelized; 5% blow by	Muddy, Cloudy; Marsh; Orange Staining	Sunny; Low Wind	Michael Carney	Robyn Blackburn
NS7_4_ DM	Same location as high flow event. Side channel along waste pile area. Estimated ~30% of total water is overflowing the channel bank into pile area just below sampling location; 10 to 15% blow by	Cascading, Cloudy, Turbulent; Gravel, Cobble; Orange Staining	Sunny; No Wind	Michael Carney	Robyn Blackburn
NSM-SW-OPP-01	Same located in same spot as during high flow. Adit discharge just prior to Mineral Creek; Bag flume method from DRMS	Calm, Clear, Pool; Sandy; Orange Staining	Partly Cloudy; No Precip.; No Wind	Robyn Blackburn	Kirstin Brown
M32	None	Cascading, Turbulent, Cloudy; Cobble, Gravel; Orange Staining	Sunny; Low Wind	Alex hedgepath	Landon bailey
M33	None	Cascading, Turbulent, Clear; Cobble, Gravel; Orange Staining	Sunny; Low Wind	Ale hedgepath	Landon bailey
M32C	Sample location just below waste pile/ore shoot.	Cascading, Clear; Boulder, Cobble, Gravel; Orange Staining	Sunny; No Wind	Michael Carney	Tanner Banks
M32D	Sample location couple hundred feet above last mine waste pile.	Cascading, Clear; Boulder, Gravel, Cobble; No Staining	Sunny; No Wind	Michael Carney	Tanner Banks

Attachment 1
Little Dora and North Star Mines 2019 Pre-CERCLA Screening Mine-Specific Results Packages

Table A.1. Little Dora Mine 2019 Pre-CERCLA Screening High Flow Surface Water Analytical Results.

STATION_ID	ANALYSIS	MATRIX	SAMPLE DATE	SAMPLE TIME	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Uranium	Vanadium	Zinc	Mercury	Hardness[1]
					ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L
LD_1_DM	Total Recoverable Metals	Surface Water	7/24/2019	13:38	1590	2.50 U	5.19 JD	25.0 U	2.29 J	15.9 D	141000	5.00 U	17.4 D	532 D	4510	23.8 D	18800	22700	3.82 JD	275 J	5.00 U	2.50 U	3920	5.00 U	41.9 D	10.0 U	3200	0.100 U	NA
	Dissolved Metals	Surface Water	7/24/2019	13:38	35.5 J	2.50 U	2.50 U	25.0 U	2.00 U	13.7 D	143000	5.00 U	18.0 D	41.8 D	100 U	0.500 U	19000	24100	3.50 JD	252 J	5.00 U	2.50 U	3930	5.00 U	30.2 D	10.0 U	3000	NA	434
LD_2_DM	Total Recoverable Metals	Surface Water	7/24/2019	13:30	2490	2.50 U	7.05 JD	25.0 U	2.78 J	13.5 D	140000	5.00 U	14.6 D	705 D	7650	27.2 D	19100	22200	2.88 JD	306 J	5.00 U	2.50 U	3930	5.00 U	35.1 D	10.0 U	3250	0.100 U	NA
	Dissolved Metals	Surface Water	7/24/2019	13:30	101	2.50 U	2.50 U	25.0 U	2.00 U	12.8 D	139000	5.00 U	15.7 D	34.3 D	100 U	0.500 U	19100	23500	3.71 JD	316 J	5.00 U	2.50 U	4040	5.00 U	20.7 D	10.0 U	2670	NA	427
LD_3_DM	Total Recoverable Metals	Surface Water	7/24/2019	13:15	2170	2.50 U	5.39 JD	46.5 JD	2.64 J	13.8 D	138000	5.00 U	16.8 D	668 D	5010	49.4 D	19600	23800	3.06 JD	352 J	5.00 U	2.50 U	3870	5.00 U	36.8 D	10.0 U	3090	0.100 U	NA
	Dissolved Metals	Surface Water	7/24/2019	13:15	195	2.50 U	2.50 U	25.0 U	2.00 U	11.7 D	145000	5.00 U	18.4 D	54.7 D	100 U	0.500 U	20100	24800	3.19 JD	331 J	5.00 U	2.50 U	4160	5.00 U	25.8 D	10.0 U	2170	NA	445
LD_4_unk	Total Recoverable Metals	Surface Water	7/24/2019	12:16	5290	2.50 U	2.50 U	25.0 U	2.62 J	17.3 D	160000	5.00 U	17.5 D	1330 D	662	27.3 D	23900	20500	8.41 D	543 J	5.00 U	2.50 U	5100	5.00 U	23.3 D	10.0 U	3890	0.100 U	NA
	Dissolved Metals	Surface Water	7/24/2019	12:16	5330	2.50 U	2.50 U	25.0 U	2.50 J	17.5 D	161000	5.00 U	18.9 D	1450 D	615	27.5 D	24000	21500	9.37 D	466 J	5.00 U	2.50 U	5220	5.00 U	23.1 D	10.0 U	4030	NA	501
LD_5	Total Recoverable Metals	Surface Water	7/24/2019	12:22	92.6	2.50 U	2.50 U	25.0 U	2.00 U	0.500 U	51800	5.00 U	0.500 U	17.5 D	100 U	0.500 UJ	5090	147	2.50 U	409 J	5.00 U	2.50 U	2930	5.00 UJ	10.9 D	10.0 U	73.1	0.100 U	NA
	Dissolved Metals	Surface Water	7/24/2019	12:22	45.3 J	0.500 U	0.500 U	7.33 J	2.00 U	0.300	52200	1.00 U	0.100 U	17.6	100 U	0.100 U	5160	151	0.500 U	416 J	2.59 J	0.500 U	2990	1.00 U	11.6	2.00 UJ	73.0	NA	152
LD_6_SS	Total Recoverable Metals	Surface Water	7/24/2019	11:57	4320	2.50 U	2.50 U	25.0 U	2.00 U	8.22 D	55000	5.00 U	0.500 U	1000 D	100 U	0.500 UJ	7510	4220	3.66 JD	952 J	5.00 U	2.50 U	7180	5.00 UJ	3.49 D	10.0 U	1420	0.100 U	NA
	Dissolved Metals	Surface Water	7/24/2019	11:57	4320	0.500 U	0.500 U	18.9	2.00 U	8.15	55300	1.00 U	0.100 U	1160	100 U	0.100 U	7550	4430	5.09	1010	1.58 J	0.500 U	7270	1.00 U	4.01	2.00 U	1500	NA	169
LD_7_L	Total Recoverable Metals	Surface Water	7/24/2019	11:30	182	2.50 U	2.50 U	25.0 U	2.00 U	0.500 U	51600	5.00 U	0.500 U	39.2 D	100 U	0.500 UJ	5140	182	2.50 U	412 J	5.00 U	2.50 U	3070	5.00 UJ	10.5 D	10.0 U	101	0.100 U	NA
	Dissolved Metals	Surface Water	7/24/2019	11:30	142	0.500 U	0.500 U	8.28 J	2.00 U	0.439	52100	1.00 U	0.100 U	40.7	100 U	0.100 U	5210	191	0.500 U	407 J	2.59 J	0.500 U	3150	1.00 U	11.0	2.00 UJ	102	NA	152
LD_7_R	Total Recoverable Metals	Surface Water	7/24/2019	11:20	42.1 J	2.50 U	2.50 U	25.0 U	2.00 U	0.500 U	51100	5.00 U	0.500 U	6.79 D	100 U	0.500 UJ	4980	51.2	2.50 U	376 J	5.00 U	2.50 U	2820	5.00 UJ	10.9 D	10.0 U	46.3	0.100 U	NA
	Dissolved Metals	Surface Water	7/24/2019	11:20	28.0 J	0.500 U	0.641 J	7.10 J	2.00 U	0.185 J	52700	1.00 U	0.100 U	10.1	100 U	0.100 U	5150	54.0	0.500 U	437 J	3.42 J	0.500 U	2950	1.00 U	11.6	2.00 UJ	48.4	NA	153
LD_8A	Total Recoverable Metals	Surface Water	7/24/2019	10:45	132	2.50 U	2.50 U	25.0 U	2.00 U	0.500 U	50200	5.00 U	0.500 U	9.42 D	114 J	0.678 JD	5230	79.6	2.50 U	452 J	5.00 U	2.50 U	3320	5.00 UJ	8.33 D	10.0 U	60.5	0.100 U	NA
	Dissolved Metals	Surface Water	7/24/2019	10:45	58.0	0.500 U	0.500 U	10.3	2.00 U	0.293	50300	1.00 U	0.100 U	10.6	100 U	0.100 U	5240	81.5	0.500 U	460 J	2.40 J	0.500 U	3370	1.00 U	8.14	2.00 UJ	62.3	NA	147
LD_09	Total Recoverable Metals	Surface Water	7/24/2019	10:41	2940	2.78 JD	5.36 JD	126 JD	2.00 U	4.80 D	55100	5.00 U	7.67 D	383 D	7460	52.0 JD	8760	5380	2.50 U	680 J	5.00 U	2.50 U	3540	5.00 UJ	6.11 D	10.0 U	1200	0.100 U	NA
	Dissolved Metals	Surface Water	7/24/2019	10:41	1800	0.510 J	0.500 U	23.2	2.00 U	5.14	55600	1.00 U	7.29	388	259	19.5	8580	5430	1.90	388 J	1.58 J	0.500 U	3560	1.00 U	5.82	2.00 U	1220	NA	174
LD_10	Total Recoverable Metals	Surface Water	7/24/2019	10:10	227	2.50 U	2.50 U	25.0 U	2.00 U	0.655 JD	50600	5.00 U	0.668 JD	38.9 D	162 J	2.53 D	5530	628	2.50 U	408 J	5.00 U	2.50 U	3240	5.00 U	6.22 D	10.0 U	167	0.100 U	NA
	Dissolved Metals	Surface Water	7/24/2019	10:10	158	1.27	0.500 U	15.3	2.00 U	0.679	50900	1.00 U	0.738	36.5	100 U	0.672	5570	619	0.500 U	439 J	2.58 J	0.500 U	3290	1.00 U	6.50	2.00 UJ	163	NA	150
LD_11	Total Recoverable Metals	Surface Water	7/24/2019	10:01	8190	2.50 U	2.50 U	25.0 U	3.15 J	17.9 D	144000	5.00 U	37.9 D	1380 D	966	77.5 D	23300	26100	12.0 D	372 J	5.00 U	2.50 U	5370	5.00 U	28.1 D	10.0 U	4190	0.100 U	NA
	Dissolved Metals	Surface Water	7/24/2019	10:01	8050	2.50 U	2.50 U	25.0 U	3.04 J	17.2 D	145000	5.00 U	41.1 D	1500 D	913	78.7 D	23500	26800	12.7 D	383 J	5.00 U	2.50 U	5340	5.00 U	27.7 D	10.0 U	4220	NA	458
LD_12	Total Recoverable Metals	Surface Water	7/24/2019	9:22	2760	2.50 U	2.50 U	26.4 JD	2.00 U	7.28 D	96600	5.00 U	1.04 D	360 D	100 U	3.62 D	13300	6860	4.24 JD	834 J	5.00 U	2.50 U	4650	5.00 U	1.86 D	10.0 U	1950	0.100 U	NA
	Dissolved Metals	Surface Water	7/24/2019	9:22	2800	0.500 U	0.500 U	28.1	2.00 U	8.20	97300	1.00 U	1.20	424	100 U	4.06	13000	7280	5.08	808 J	1.00 U	0.500 U	4740	1.00 U	2.08	2.00 U	2030	NA	297
LDM-SW-DNS-01	Total Recoverable Metals	Surface Water	7/24/2019	9:25	1090	2.50 U	2.50 U	25.0 UJ	2.00 U	12.7 D	132000	5.00 U	8.61 D	264 D	2020	10.4 JD	20800	17600	5.68 D	337 J	5.00 U	2.50 U	4220	5.00 UJ	5.33 D	10.0 U	3360	0.100 U	NA
	Dissolved Metals	Surface Water	7/24/2019	9:25	1040	2.50 U	2.50 U	25.0 U	2.00 U	12.9 D	133000	5.00 U	9.06 D	265 D	120 J	5.48 D	21000	18400	7.06 D	310 J	5.00 U	2.50 U	4270	5.00 U	4.62 D	10.0 U	3490	NA	418
A72	Total Recoverable Metals	Surface Water	7/24/2019	9:19	419	2.50 U	2.50 U	25.0 U	2.00 U	0.560 JD	26000	5.00 U	1.16 D	2.96 JD	711	2.88 D	2010	357	2.50 U	430 J	5.00 U	2.50 U	1270	5.00 U	0.500 U	10.0 U	210	0.100 U	NA
	Dissolved Metals	Surface Water	7/24/2019	9:19	20.0 U	0.500 U	0.500 U	18.7	2.00 U	0.621	26100	1.00 U	1.26	0.841 J	100 U	0.100 U	2020	366	0.500 U	420 J	1.00 U	0.500 U	1240	1.00 U	0.100 U	2.00 U	199	NA	73
A71B	Total Recoverable Metals	Surface Water	7/24/2019	10:19	457	2.50 U	2.50 U	25.0 U	2.00 U	1.57 D	24900	5.00 U	2.31 D	3.34 JD	703	4.61 D	2030	282	2.50 U	485 J	5.00 U	2.50 U	1320	5.00 U	0.500 U	10.0 U	169	0.100 U	NA
	Dissolved Metals	Surface Water	7/24/2019	10:19	38.4 J	0.500 U	0.500 U	19.2	2.00 U	0.544	24600	1.00 U	1.28	2.04	372	0.118 J	2010	270	0.500 U	403 J	1.00 U	0.500 U	1280	1.00 U	0.100 U	2.00 U	150	NA	70
M34	Total Recoverable Metals	Surface Water	7/24/2019	12:21	511	2.50 U	2.50 U	25.0 UJ	2.00 U	0.500 U	21800	5.00 U	1.20 D	2.50 U	580	1.18 JD	1960	86.2	2.50 U	345 J	5.00 U	2.50 U	1250	5.00 UJ	0.500 U	10.0 U	42.3	0.100 U	NA
	Dissolved Metals	Surface Water	7/24/2019	12:21	50.1	0.500 U	0.500 U	19.5	2.00 U	0.202	21800	1.00 U	1.30	0.948 J	285	0.118 J	1950	88.6	0.500 U	348 J	1.00 U	0.500 U	1230	1.00 U	0.100 U	2.00 U	38.4	NA	62
M35	Total Recoverable Metals	Surface Water	7/24/2019	11:45	501	2.50 U	2.50 U	25.0 UJ	2.00 U	0.500 U	21700	5.00 U	1.28 D	2.50 U	575	1.10 JD	1930	88.1	2.50 U	278 J	5.00 U	2.50 U	1240	5.00 UJ	0.500 U	10.0 U	42.7	0.100 U	NA
	Dissolved Metals	Surface Water	7/24/2019	11:45	48.8 J	0.500 U	0.500 U	19.7	2.00 U	0.189 J	22200	1.00 U	1.30	1.30	296	0.100 U	1980	89.0	0.500 U	406 J	1.00 U	0.500 U	1290	1.00 U	0.100 U	2.00 U	43.0	NA	64
M38	Total Recoverable Metals	Surface Water	7/24/2019	10:33	500	2.50 U	2.50 U	25.0 UJ	2.00 U	0.500 U	21500	5.00 U	1.16 D	2.50 U	579	1.09 JD	1950	91.9	2.50 U	300 J	5.00 U	2.50 U	1240	5.00 UJ	0.500 U	10.0 U	45.3	0.100 U	NA
	Dissolved Metals	Surface Water	7/24/2019	10:33	47.1 J	0.500 U	0.500 U	19.1	2.00 U	0.199 J	22000	1.00 U	1.29	1.09	302	0.100 U	1970	93.8	0.500 U	342 J	1.00 U	0.500 U	1250	1.00 U	0.100 U	2.00 U	43.5	NA	63

[1] Sample-specific hardness calculated using dissolved calcium and magnesium concentrations for use in assessing hardness-based in accordance with Colorado Water Quality Control Commission, Regulation 31 (https://www.colorado.gov/pacific/sites/default/files/31_2018%2801%29.pdf)

NA = Not analyzed

U = Laboratory analysis indicates that the analyte was undetected at the concentration shown

J = Laboratory quality control review indicates that this result is considered estimated

D = Sample diluted prior to analysis; reported result is for undiluted sample

Table A.2. Little Dora Mine 2019 Pre-CERCLA Screening Low Flow Surface Water Analytical Results.

STATION_ID	ANALYSIS	MATRIX	SAMPLE DATE	SAMPLE TIME	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Uranium	Vanadium	Zinc	Mercury	Hardness[1]
					ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L
LD_1_DM	Total Recoverable Metals	Surface Water	9/23/2019	14:55	1210	2.5 U	3.64 JD	25 U	2.05 J	8.99 D	178000	5 U	12.2 D	161 D	1930	21.7 D	16900	16200	5.22 D	2.5 U	250 U	5 U	2.5 U	4670	6.05 JD	34.1 D	10 U	2510	0.1 U	NA
	Dissolved Metals	Surface Water	9/23/2019	14:55	20 U	0.5 U	1.32 J	10.5	2 U	8.52	180000	1.53 J	11.6	17	100 U	0.1 U	17300	15800	5.43	0.5 U	250 U	1 U	0.5 U	4850	1 U	30.9	2 U	2280	NA	521
LD_2_DM	Total Recoverable Metals	Surface Water	9/23/2019	14:01	1180	2.5 U	4.03 JD	25 U	2 U	7.95 D	180000	5 U	11.1 D	151 D	1680	18 D	17200	14900	5 U	2.5 U	262 J	5 U	2.5 U	4680	5 U	32 D	10 U	2150	0.1 U	NA
	Dissolved Metals	Surface Water	9/23/2019	14:01	91.2	0.5 U	0.85 J	10.2	2 U	7.91	177000	1.27 J	10.6	15.9	100 U	0.1 U	17300	14900	5.05	0.5 U	250 U	1 U	0.5 U	4890	1 U	28.3	2 U	1820	NA	513
LD_3_DM	Total Recoverable Metals	Surface Water	9/23/2019	14:19	1110	2.5 U	2.7 JD	25 U	2 U	8.42 D	175000	5 U	13 D	215 D	1660	32.3 D	17000	16500	5 U	2.5 U	348 J	5 U	2.5 U	4630	5 U	33.3 D	10 U	1970	0.1 U	NA
	Dissolved Metals	Surface Water	9/23/2019	14:19	145	0.5 U	0.892 J	10.3	2 U	8.08	178000	1.18 J	12.4	50.4	100 U	1.28	17600	16200	4.82	0.5 U	250 U	1 U	0.5 U	4940	1 U	29	2 U	1750	NA	517
LD_4_unk	Total Recoverable Metals	Surface Water	9/23/2019	13:22	5740	2.5 U	2.5 U	25 U	2.51 J	15 D	159000	5 U	22.2 D	1430 D	1540	37.2 D	23200	19700	5 U	9.19 D	563 J	5 U	2.5 U	5130	5 U	21.6 D	10 U	3100	0.1 U	NA
	Dissolved Metals	Surface Water	9/23/2019	13:22	5380	0.5 U	0.5 U	7.66 J	2.46 J	15.2	160000	1 U	19.8	1250	1500	34	23900	19600	1 U	7.12	400 J	1 U	0.5 U	5380	1 U	20.1	2 U	3250	NA	497
LD_5	Total Recoverable Metals	Surface Water	9/23/2019	13:06	20 U	2.5 U	2.5 U	25 U	2 U	0.5 U	58100	5 U	0.5 U	5.51 D	100 U	0.5 U	5440	24.4	5 U	2.5 U	377 J	5 U	2.5 U	2920	5 U	15.6 D	10 U	32.1	0.1 U	NA
	Dissolved Metals	Surface Water	9/23/2019	13:06	20 U	0.5 U	0.5 U	6.34 J	2 U	0.124 J	58700	1.04 J	0.1 U	4.91	100 U	0.1 U	5600	24.2	3.23	0.5 U	345 J	2.33 J	0.5 U	3110	1 U	14.3	2 U	39.1	NA	170
LD_7_L	Total Recoverable Metals	Surface Water	9/23/2019	12:39	75.1	2.5 U	2.5 U	25 U	2 U	0.5 U	58500	5 U	0.5 U	20.9 D	100 U	0.5 U	5580	50.4	5 U	2.5 U	475 J	5 U	2.5 U	3050	5 U	14.2 D	10 U	53.3	0.1 U	NA
	Dissolved Metals	Surface Water	9/23/2019	12:39	72.2	0.5 U	0.5 U	7.06 J	2 U	0.273	57900	1 U	0.1 U	18.4	100 U	0.1 U	5610	49.3	3.07	0.5 U	440 J	2.05 J	0.5 U	3360	1 U	13.6	2 U	61.8	NA	168
LD_7_R	Total Recoverable Metals	Surface Water	9/23/2019	12:31	39.2 J	2.5 U	2.5 U	25 U	2 U	0.5 U	59800	5 U	0.5 U	4.3 JD	100 U	0.5 U	5600	10.2	5 U	2.5 U	463 J	5 U	2.5 U	2900	5 U	15.3 D	10 U	32.5	0.1 U	NA
	Dissolved Metals	Surface Water	9/23/2019	12:31	20 U	0.5 U	0.5 U	6.4 J	2 U	0.11 J	59300	1 U	0.1 U	3.49	100 U	0.1 U	5640	8.34	3.14	0.5 U	370 J	2.2 J	0.5 U	3230	1 U	14.5	2 U	37.9	NA	171
LD_8A	Total Recoverable Metals	Surface Water	9/23/2019	11:38	31.2 J	2.5 U	2.5 U	25 U	2 U	0.5 U	55400	5 U	0.5 U	5.51 D	100 U	0.5 U	5500	29.3	5 U	2.5 U	522 J	5 U	2.5 U	3090	5.87 JD	11.1 D	10 U	30.5	0.1 U	NA
	Dissolved Metals	Surface Water	9/23/2019	11:38	33.3 J	0.5 U	0.5 U	9.34 J	2 U	0.127 J	57100	1 U	0.1 U	5.44	100 U	0.1 U	5760	23.5	2.3	0.5 U	430 J	1.93 J	0.5 U	3590	1 U	10.3	2 U	31.2	NA	166
LD_09	Total Recoverable Metals	Surface Water	9/23/2019	11:33	2490	2.5 U	2.5 U	25 U	2 U	4.55 D	62800	5 U	9.29 D	390 D	916	26.7 D	9740	5710	5 U	2.5 U	485 J	5 U	2.5 U	4290	5 U	5.02 D	10 U	1070	0.1 U	NA
	Dissolved Metals	Surface Water	9/23/2019	11:33	2260	1.13	0.5 U	16.6	2 U	4.81	63700	1 U	8.51	339	524	22.6	9550	5560	1 U	1.9	427 J	1.59 J	0.5 U	4250	1 U	4.71	2 U	1090	NA	198
LD_10	Total Recoverable Metals	Surface Water	9/23/2019	10:53	260	2.5 U	2.5 U	25 U	2 U	0.544 JD	58100	5 U	0.961 JD	43.3 D	103 J	2.69 D	6140	596	5 U	2.5 U	455 J	5 U	2.5 U	3390	5 U	7.81 D	10 U	130	0.1 U	NA
	Dissolved Metals	Surface Water	9/23/2019	10:53	164	1.45	0.5 U	13.1	2 U	0.655	55900	1 U	0.997	31.5	100 U	1.03	6010	594	1.69	0.5 U	436 J	1.81 J	0.5 U	3410	1 U	7.23	2 U	134	NA	164
LD_11	Total Recoverable Metals	Surface Water	9/23/2019	11:16	7190	2.5 U	2.5 U	25 U	2.73 J	15 D	155000	5 U	33.4 D	1380 D	747	80.1 D	23200	23600	5 U	10.5 D	470 J	5 U	2.5 U	5280	5 U	21.7 D	10 U	3250	0.1 U	NA
	Dissolved Metals	Surface Water	9/23/2019	11:16	6890	0.5 U	0.5 U	11.1	2.7 J	15.3	154000	1 U	29.6	1200	693	58.2	23800	23300	1 U	8.52	421 J	1 U	0.5 U	5580	1 U	20.4	2 U	3310	NA	483
LD_13	Total Recoverable Metals	Surface Water	9/23/2019	10:21	670	2.5 U	2.5 U	25 U	2 U	1.09 D	61800	5 U	2.48 D	109 D	233 J	7.28 D	6820	1640	5 U	2.5 U	524 J	5 U	2.5 U	3390	5 U	8.62 D	10 U	258	0.1 U	NA
	Dissolved Metals	Surface Water	9/23/2019	10:21	100	1.32	0.5 U	12.5	2 U	1.22	59900	1 U	2.34	47.9	100 U	0.861	6950	1590	1.6	0.5 U	392 J	1.87 J	0.5 U	3560	1 U	7.1	2 U	257	NA	178
A72	Total Recoverable Metals	Surface Water	9/23/2019	08:30	1840	2.5 U	2.5 U	25 U	2 U	1.29 D	81100 J	5 U	5.6 D	10.4 D	2540	3.08 D	5280	1180	NA	5.33 D	831 J	5 U	2.5 U	3180	5 U	NA	10 U	473	NA	NA
	Dissolved Metals	Surface Water	9/23/2019	08:30	81.7	0.5 U	0.5 U	24.8	2 U	1.24	77000	1 U	5.41	4.38	1200	0.1 U	5090	1210	NA	0.5 U	854 J	1 U	0.5 UJ	3030	1 U	NA	2 U	481	NA	213
M34	Total Recoverable Metals	Surface Water	9/23/2019	10:30	2760	2.5 U	2.5 U	27.7 JD	2 U	0.742 JD	72000	5 U	7.26 D	7.9 D	3660	2.03 D	5920	406	NA	2.5 U	623 J	5 U	2.5 U	3340	5 U	NA	10 U	163	NA	NA
	Dissolved Metals	Surface Water	9/23/2019	10:30	45.9 J	0.5 U	0.5 U	26.4	2 U	0.629	69400	1 U	6.59	3.3	2290	0.1 U	5780	390	NA	0.5 U	647 J	1 U	0.5 U	3290	1 U	NA	2 U	154	NA	197
M38	Total Recoverable Metals	Surface Water	9/23/2019	08:25	1260	2.5 U	2.5 U	26.4 JD	2 U	0.587 JD	58900	5 U	3.22 D	4.3 JD	1660	1.38 D	5640	228	NA	2.5 U	934 J	5 U	2.5 U	5220	5 U	NA	10 U	229	NA	NA
	Dissolved Metals	Surface Water	9/23/2019	08:25	96.6	0.5 U	0.5 U	25.8	2 U	0.685	59000	1 U	3.68	2.66	1260	0.202	5340	253	NA	0.5 U	775 J	1 U	0.5 U	4540	1 U	NA	2 U	203	NA	169

[1] Sample-specific hardness calculated using dissolved calcium and magnesium concentrations for use in assessing hardness-based in accordance with Colorado Water Quality Control Commission, Regulation 31 (https://www.colorado.gov/pacific/sites/default/files/31_2018%2801%29.pdf)

NA = Not analyzed

U = Laboratory analysis indicates that the analyte was undetected at the concentration shown

J = Laboratory quality control review indicates that this result is considered estimated

D = Sample diluted prior to analysis; reported result is for undiluted sample

Table A.3. Little Dora Mine 2019 Pre-CERCLA Screening High Flow Surface Water Anions and Alkalinity Results.

STATION_ID	ANALYSIS	MATRIX	SAMPLE DATE	SAMPLE TIME	Chloride	Fluoride	Nitrate/Nitrite as N	Sulfate as SO_4	Total Alkalinity	Dissolved Organic Carbon
					mg/L	mg/L	mg/L	mg/L	mg $CaCO_3$/L	mg/L
LD_1_DM	Wet Chemistry	Surface Water	7/24/2019	13:38	5.0 U	4.2 D	2.5 UJ	391 D	85.7	0.9
LD_2_DM	Wet Chemistry	Surface Water	7/24/2019	13:30	2.3 JD	3.8 D	1.0 UJ	404 D	73.2	1.0
LD_3_DM	Wet Chemistry	Surface Water	7/24/2019	13:15	5.0 U	4.3 D	2.5 UJ	401 D	79.3	1.1
LD_4_unk	Wet Chemistry	Surface Water	7/24/2019	12:16	5.0 U	3.1 D	2.5 UJ	576 D	5.00 U	0.9
LD_5	Wet Chemistry	Surface Water	7/24/2019	12:22	1.0 U	1.0	0.5 UJ	80.3	74.6	0.7
LD_6_SS	Wet Chemistry	Surface Water	7/24/2019	11:57	5.7 D	1.9 D	1.0 UJ	199 D	5.00 U	1.1
LD_7_L	Wet Chemistry	Surface Water	7/24/2019	11:30	1.0 J	1.1	0.5 UJ	84.2	71.6	0.7
LD_7_R	Wet Chemistry	Surface Water	7/24/2019	11:20	1.0 U	1.0	0.5 UJ	77.4	76.7	0.7
LD_8A	Wet Chemistry	Surface Water	7/24/2019	10:45	1.5 J	1.1	0.5 UJ	88.5	63.0	0.8
LD_09	Wet Chemistry	Surface Water	7/24/2019	10:41	2.0 U	1.2 D	1.0 UJ	191 D	5.00 U	0.9
LD_10	Wet Chemistry	Surface Water	7/24/2019	10:10	1.2 J	1.1	0.5 UJ	98.5	56.6	0.9
LD_11	Wet Chemistry	Surface Water	7/24/2019	10:08	5.0 U	3.2 D	2.5 UJ	569 D	5.00 U	1.2
LD_12	Wet Chemistry	Surface Water	7/24/2019	09:22	3.7 JD	1.8 D	1.0 UJ	322 D	5.00 U	0.9
LDM-SW-DNS-01	Wet Chemistry	Surface Water	7/24/2019	09:25	5.0 U	2.3 D	2.5 UJ	448 D	5.00 U	0.9
A72	Wet Chemistry	Surface Water	7/24/2019	09:19	1.0 U	0.3	0.5 UJ	59.1	16.8	0.7
A71B	Wet Chemistry	Surface Water	7/24/2019	10:19	1.0 U	0.3	0.5 UJ	56.4	16.1	0.7
M34	Wet Chemistry	Surface Water	7/24/2019	12:21	1.0 U	0.2	0.5 UJ	50.4	14.1	0.7
M35	Wet Chemistry	Surface Water	7/24/2019	11:45	1.0 U	0.1 J	0.5 UJ	49.9	14.1	0.7
M38	Wet Chemistry	Surface Water	7/24/2019	10:33	1.0 U	0.1 J	0.5 UJ	49.9	14.2	0.7

U = Laboratory analysis indicates that the analyte was undetected at the concentration shown

J = Laboratory quality control review indicates that this result is considered estimated

D = Sample diluted prior to analysis; reported result is for undiluted sample

Table A.4. Little Dora Mine 2019 Pre-CERCLA Screening Low Flow Surface Water Anions and Alkalinity Results.

STATION_ID	ANALYSIS	MATRIX	SAMPLE DATE	SAMPLE TIME	Chloride	Fluoride	Nitrate/Nitrite as N	Sulfate as SO_4	Total Alkalinity	Dissolved Organic Carbon
					mg/L	mg/L	mg/L	mg/L	mg $CaCO_3$/L	mg/L
LD_1_DM	Wet Chemistry	Surface Water	9/23/2019	14:55	5 U	3.6 D	2.5 UJ	422 D	95.9	0.9
LD_2_DM	Wet Chemistry	Surface Water	9/23/2019	14:01	5 U	3.6 D	2.5 UJ	428 D	89.6	1
LD_3_DM	Wet Chemistry	Surface Water	9/23/2019	14:19	5 U	3.5 D	2.5 UJ	428 D	80.4	0.9
LD_4_unk	Wet Chemistry	Surface Water	9/23/2019	13:22	5 U	2.5 D	2.5 UJ	559 D	5 U	0.9
LD_5	Wet Chemistry	Surface Water	9/23/2019	13:06	1 U	1	0.5 UJ	86.6	81.6	0.7
LD_7_L	Wet Chemistry	Surface Water	9/23/2019	12:39	1 J	1	0.5 UJ	91.1	74.7	0.7
LD_7_R	Wet Chemistry	Surface Water	9/23/2019	12:31	1 U	1	0.5 UJ	86.9	80.4	0.7
LD_8A	Wet Chemistry	Surface Water	9/23/2019	11:38	1.3 J	1	0.5 UJ	94.5	67.3	0.9
LD_09	Wet Chemistry	Surface Water	9/23/2019	11:33	2 U	1.1 D	1 UJ	214 D	5 U	1
LD_10	Wet Chemistry	Surface Water	9/23/2019	10:53	1.2 J	1	0.5 UJ	106	58.8	1
LD_11	Wet Chemistry	Surface Water	9/23/2019	11:16	5 U	2.6 D	2.5 UJ	552 D	5 U	1
LD_13	Wet Chemistry	Surface Water	9/23/2019	10:21	1.3 J	1.1	0.5 UJ	127	53.3	0.9
A72	Wet Chemistry	Surface Water	9/23/2019	08:30	2 U	0.6 D	1 UJ	209 D	9.59 J	0.6
M34	Wet Chemistry	Surface Water	9/23/2019	10:30	2 U	0.4 D	1 UJ	193 D	5 U	0.6
M38	Wet Chemistry	Surface Water	9/23/2019	08:25	7.4 D	0.3 JD	1 UJ	154 D	5.73 J	0.6

U = Laboratory analysis indicates that the analyte was undetected at the concentration shown

J = Laboratory quality control review indicates that this result is considered estimated

D = Sample diluted prior to analysis; reported result is for undiluted sample

Table A.5. Little Dora Mine 2019 Pre-CERCLA Screening High Flow Field-Measured Water Quality Parameters.

STATION_ID	ANALYSIS	MATRIX	SAMPLE DATE	SAMPLE TIME	pH	Temp.	Dissolved Oxygen	Conductivity	ORP	Flow	Flow Measurement
					Stand. Unit	ºC	mg/L	µS/cm	mV	cfs	Equipment
LD_1_DM	In Situ Measure	Surface Water	7/24/2019	13:38	7.39	7.162	8.43	867	208.8	0.0751	4" Cutthroat Flume
LD_2_DM	In Situ Measure	Surface Water	7/24/2019	13:30	6.43	11.6	9.63	838	129.4	0.0832	4" Cutthroat Flume
LD_3_DM	In Situ Measure	Surface Water	7/24/2019	13:15	7.04	22.3	4.49	952	160.9	0.0030	Flow Tracker
LD_4_unk	In Situ Measure	Surface Water	7/24/2019	12:16	3.36	7.4	11.37	1143	435.6	0.0050	Flow Tracker
LD_5	In Situ Measure	Surface Water	7/24/2019	12:22	7.67	8.73	8.32	314.3	199.2	0.6070	Flow Tracker
LD_6_SS	In Situ Measure	Surface Water	7/24/2019	11:57	4.79	11.794	6.95	421.8	281.2	NC	Too little flow
LD_7_L	In Situ Measure	Surface Water	7/24/2019	11:30	7.12	9.3	11.38	313.9	73.2	0.1872	4" Cutthroat Flume
LD_7_R	In Situ Measure	Surface Water	7/24/2019	11:20	7.11	8	11.91	308.9	55.3	0.3164	4" Cutthroat Flume
LD_8A	In Situ Measure	Surface Water	7/24/2019	10:45	7.06	10.8	10.97	310.5	54.4	0.1872	4" Cutthroat Flume
LD_09	In Situ Measure	Surface Water	7/24/2019	10:41	4.86	13.84	7.53	416.5	324.7	0.0171	1" Cutthroat Flume
LD_10	In Situ Measure	Surface Water	7/24/2019	10:10	6.68	10.7	10.84	318.9	73.2	0.3669	4" Cutthroat Flume
LD_11	In Situ Measure	Surface Water	7/24/2019	10:08	3.39	10.67	6.55	1138	463.5	0.0032	1" Cutthroat Flume
LD_12	In Situ Measure	Surface Water	7/24/2019	09:22	4.78	11.8	8.56	636	158.7	0.0020	Flow Tracker
LDM-SW-DNS-01	In Situ Measure	Surface Water	7/24/2019	09:25	4.96	10.9	4.14	855.00	168.8	NC	Too little flow
A72	In Situ Measure	Surface Water	7/24/2019	09:19	6.88	6.1	9.95	181.5	4.7	589.0000	Flow Tracker
A71B	In Situ Measure	Surface Water	7/24/2019	10:19	7.03	6.9	10.08	157.2	-6.8	NC	Too braided
M34	In Situ Measure	Surface Water	7/24/2019	12:21	7.42	9.1	9.55	149.8	-46.7	364.0000	Flow Tracker
M35	In Situ Measure	Surface Water	7/24/2019	11:45	7.44	8.3	9.4	149.7	-39.3	286.2310	Flow Tracker
M38	In Situ Measure	Surface Water	7/24/2019	10:33	7.27	7.2	9.44	149.2	-22	303.3750	Flow Tracker

NC = Not collected

Table A.6. Little Dora Mine 2019 Pre-CERCLA Screening Low Flow Field-Measured Water Quality Parameters.

STATION_ID	ANALYSIS	MATRIX	SAMPLE DATE	SAMPLE TIME	pH	Temp.	Dissolved Oxygen	Conductivity	ORP	Flow	Flow Measurement
					Stand. Unit	ºC	mg/L	µS/cm	mV	cfs	Equipment
LD_1_DM	In Situ Measure	Surface Water	9/23/2019	14:55	7.54	6.8	8.44	948.0	203	0.0310	Bag fill/flume
LD_2_DM	In Situ Measure	Surface Water	9/23/2019	14:01	7.88	9.4	8.54	928.0	10.9	0.0096	Bag fill/flume
LD_3_DM	In Situ Measure	Surface Water	9/23/2019	14:19	7.60	13.3	5.47	957.0	226.8	0.0054	Bag fill/flume
LD_4_unk	In Situ Measure	Surface Water	9/23/2019	13:22	3.24	6.6	9.74	1109.0	503.7	0.0050	Bag fill/flume
LD_5	In Situ Measure	Surface Water	9/23/2019	13:06	7.31	5.9	8.52	330.4	16.5	0.1872	4" Cutthroat Flume
LD_7_L	In Situ Measure	Surface Water	9/23/2019	12:39	7.43	6.7	9.03	327.1	48.3	0.0468	4" Cutthroat Flume
LD_7_R	In Situ Measure	Surface Water	9/23/2019	12:31	7.74	6.1	9.73	333.3	107.8	0.0685	1" Cutthroat Flume
LD_8A	In Situ Measure	Surface Water	9/23/2019	11:38	7.61	7.2	9.42	329.6	101.5	0.0832	4" Cutthroat Flume
LD_09	In Situ Measure	Surface Water	9/23/2019	11:33	4.15	11.8	6.21	488.3	352.6	0.0145	Bag fill/flume
LD_10	In Situ Measure	Surface Water	9/23/2019	10:53	7.33	7.6	8.90	334.4	60.2	0.1631	4" Cutthroat Flume
LD_11	In Situ Measure	Surface Water	9/23/2019	11:16	3.24	7.4	7.34	1126.0	462.2	0.0067	Bag fill/flume
LD_13	In Situ Measure	Surface Water	9/23/2019	10:21	7.32	8.2	7.97	359.8	67.3	0.1013	4" Cutthroat Flume
A72	In Situ Measure	Surface Water	9/23/2019	08:30	6.17	3.5	11.11	461.6	74.2	91.9000	USGS Gage 09359020
M34	In Situ Measure	Surface Water	9/23/2019	10:30	6.57	5.8	9.01	426.8	99.1	33.0261	Flow Tracker
M38	In Situ Measure	Surface Water	9/23/2019	08:25	6.49	4.1	9.32	425.7	110.6	34.4022	Flow Tracker

NC = Not collected

Table A.7. Little Dora Mine 2019 Pre-CERCLA Screening Low Flow Sediment Sample Analytical Results.

STATION_ID	ANALYSIS	MATRIX	SAMPLE DATE	SAMPLE TIME	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
A72	Total Recoverable Metals	Sediment	9/23/2019	08:30	7710 D	0.759 D	19 D	98.5 D	0.733 JD	2.03 D	1710 D	2.99 D	11.4 D	108 D	36300 D	653 D
M34	Total Recoverable Metals	Sediment	9/23/2019	10:30	8610 D	0.422 JD	20.6 D	105 D	0.669 JD	0.824 D	1990 D	3.07 D	15.4 D	73 D	38200 D	158 D
M38	Total Recoverable Metals	Sediment	9/23/2019	08:25	9460 D	0.562 D	32.9 D	152 D	0.724 JD	1.17 D	2200 D	3.14 D	13.6 D	74.7 D	42400 D	209 D

STATION_ID	ANALYSIS	MATRIX	SAMPLE DATE	SAMPLE TIME	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
A72	Total Recoverable Metals	Sediment	9/23/2019	08:30	4040 D	3280 D	0.02 JD	4.3 D	530 D	0.492 U	1.67 D	123 U	0.492 U	17 D	575 D
M34	Total Recoverable Metals	Sediment	9/23/2019	10:30	3960 D	1050 D	0.03 JD	5 D	649 D	0.621 JD	0.254 JD	195 JD	0.472 U	15.5 D	319 D
M38	Total Recoverable Metals	Sediment	9/23/2019	08:25	4130 D	986 D	0.04 JD	5.11 D	680 D	0.647 JD	0.437 JD	363 JD	0.479 U	17.5 D	472 D

U = Laboratory analysis indicates that the analyte was undetected at the concentration shown
J = Laboratory quality control review indicates that this result is considered estimated
D = Sample diluted prior to analysis; reported result is for undiluted sample

Table A.8. Little Dora Mine 2019 Pre-CERCLA Screening Mine Waste Sample Total Recoverable Metals Results.

STATION_ID	ANALYSIS	MATRIX	SAMPLE DATE	SAMPLE TIME	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
WR-LD-01	Total Recoverable Metals	Soil	07/25/2019	07:55	1530 D	19.7 JD	303 D	193 D	0.498 U	2.14 D	1040 D	1.5 JD	2.97 D	466 D	62900 D	5950 D
WR-LD-02	Total Recoverable Metals	Soil	07/25/2019	08:03	2550 D	23.7 D	45.2 D	185 D	1.54 JD	0.708 JD	603 D	4.95 U	55.5 D	1130 D	279000 D	669 D

STATION_ID	ANALYSIS	MATRIX	SAMPLE DATE	SAMPLE TIME	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
WR-LD-01	Total Recoverable Metals	Soil	07/25/2019	07:55	425 JD	1020 D	0.25 D	1.55 D	2730 D	1.75 JD	39.6 D	160 JD	0.995 U	13.7 D	468 D
WR-LD-02	Total Recoverable Metals	Soil	07/25/2019	08:03	238 D	9540 D	0.66 D	2.48 U	569 D	4.95 U	14.6 D	124 U	4.95 U	9.9 U	772 D

U = Laboratory analysis indicates that the analyte was undetected at the concentration shown
J = Laboratory quality control review indicates that this result is considered estimated
D = Sample diluted prior to analysis; reported result is for undiluted sample

Table A.9. Little Dora Mine 2019 Pre-CERCLA Screening Mine Waste Sample In Vitro Bioaccessibility Assay and Corresponding Soil Sample Total Recoverable Metals Analytical Results.

STATION_ID	ANALYSIS	MATRIX	SAMPLE DATE	SAMPLE TIME	Arsenic	Arsenic	Arsenic	Lead	Lead	Lead
					mg/kg	% IVBA	% RBA	0-*+	% IVBA	% RBA
WR-LD-01	Combined IVBA	Soil	07/25/2019	07:55	3.12 D	1.0	20.0	234 D	3.9	1.0
WR-LD-02	Combined IVBA	Soil	07/25/2019	08:03	2.99 D	0.8	20.0	109 D	4.1	1.0

D = Sample diluted prior to analysis; reported result is for undiluted sample

Table A.10. Little Dora Mine 2019 Pre-CERCLA Screening Mine Waste Sample Soil Synthetic Precipitation Leaching Procedure Soil Leachate Results.

STATION_ID	ANALYSIS	MATRIX	SAMPLE DATE	SAMPLE TIME	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper
					ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
WR-LD-01	SPLP	Soil	07/25/2019	07:55	1060	30 U	0.4 B	66	0.57	2.9	7000	0.5 U	10 U	330
WR-LD-02	SPLP	Soil	07/25/2019	08:03	2420	30 U	0.4 B	33 B	2.85	9.31	22500	0.5 U	60	280

STATION_ID	ANALYSIS	MATRIX	SAMPLE DATE	SAMPLE TIME	Iron	Lead	Magnesium	Manganese	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
					ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
WR-LD-01	SPLP	Soil	07/25/2019	07:55	90	80 B	800 B	3160	8 U	0.2 B	0.1 U	0.1 U	5 U	610
WR-LD-02	SPLP	Soil	07/25/2019	08:03	30 U	30 U	2500	26800	8 U	0.1 B	0.2 B	0.1 B	5 U	1080

B = Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity (same as a CLP laboratory J qualifier).
U = Laboratory analysis indicates that the analyte was undetected at the concentration shown

Table A.11. Little Dora Mine 2019 Pre-CERCLA Screening Mine Waste Sample Acid-base Accounting and Paste pH.

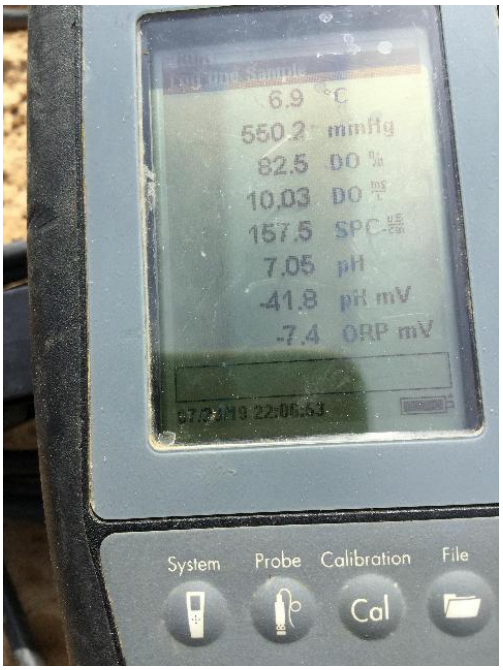
STATION_ID	ANALYSIS	MATRIX	SAMPLE DATE	SAMPLE TIME	Acid Generation Potential (calc on Sulfur total)	Acid Neutralization Potential (calc)	Acid-Base Potential (calc on Sulfur total)	Neutralization Potential as $CaCO_3$	pH, Saturated Paste	Sulfur HCl Residue	Sulfur HNO_3 Residue	Sulfur Organic Residual	Sulfur Pyritic Sulfide	Sulfur Sulfate	Sulfur Total	Total Sulfur minus Sulfate
					t $CaCO_3$/Kt	t $CaCO_3$/Kt	t $CaCO_3$/Kt	%	standard units	%	%	%	%	%	%	%
WR-LD-01	ABA Paste pH	Soil	07/25/2019	07:55	39.4	0	-39.4	0.1 U	4.2	0.64	0.01 U	0.01 U	0.64	0.62	1.26	0.64
WR-LD-02	ABA Paste pH	Soil	07/25/2019	08:03	41.9	0	-41.9	0.1 U	3.9	0.19	0.01 B	0.01 B	0.18	1.15	1.34	0.19

B = Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity (same as a CLP laboratory J qualifier).
U = Laboratory analysis indicates that the analyte was undetected at the concentration shown

Little Dora Mine High Flow Environmental Sampling Photographs (July 2019)

2019 Pre-CERCLA Screening

A71B Downstream



A71B Water Screenshot

A71B Upstream

A72 Downstream

Little Dora Mine High Flow Environmental Sampling Photographs (July 2019)

2019 Pre-CERCLA Screening

A72 Water Screenshot

A72 Upstream

LD_1_DM Downstream

LD_1_DM Flume

Little Dora Mine High Flow Environmental Sampling Photographs (July 2019)

2019 Pre-CERCLA Screening

LD_1_DM Water Screenshot

LD_1_DM Upstream

LD_2_DM Downstream

LD_2_DM Flume

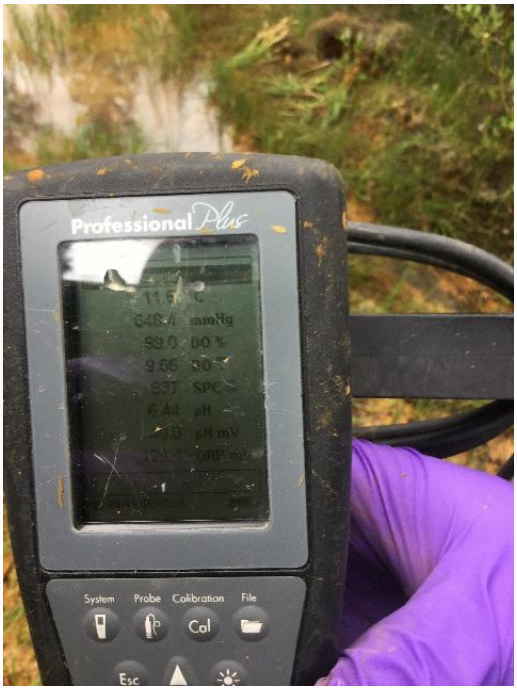
Little Dora Mine High Flow Environmental Sampling Photographs (July 2019)

2019 Pre-CERCLA Screening

LD_2_DM Water Screenshot

LD_2_DM Upstream

LD_3_DM Downstream



LD_3_DM Water Screenshot

Little Dora Mine High Flow Environmental Sampling Photographs (July 2019)

2019 Pre-CERCLA Screening

LD_3_DM Upstream

LD_4_unk Downstream

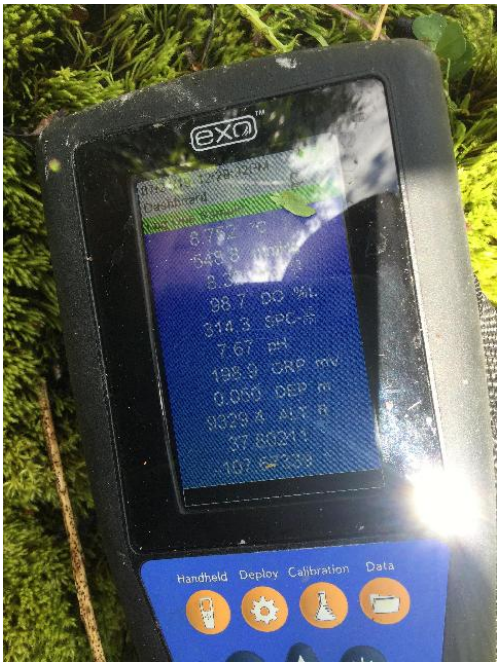
LD_4_unk Water Screenshot

LD_4_unk Upstream

Little Dora Mine High Flow Environmental Sampling Photographs (July 2019)

2019 Pre-CERCLA Screening

LD_5 Downstream



LD_5 Water Screenshot

LD_5 Upstream

LD_6_SS Downstream

Little Dora Mine High Flow Environmental Sampling Photographs (July 2019)

2019 Pre-CERCLA Screening

LD_6_SS Water Screenshot

LD_6_SS Upstream

LD_7_L Downstream

LD_7_L Flume

Little Dora Mine High Flow Environmental Sampling Photographs (July 2019)

2019 Pre-CERCLA Screening

LD_7_L Water Screenshot

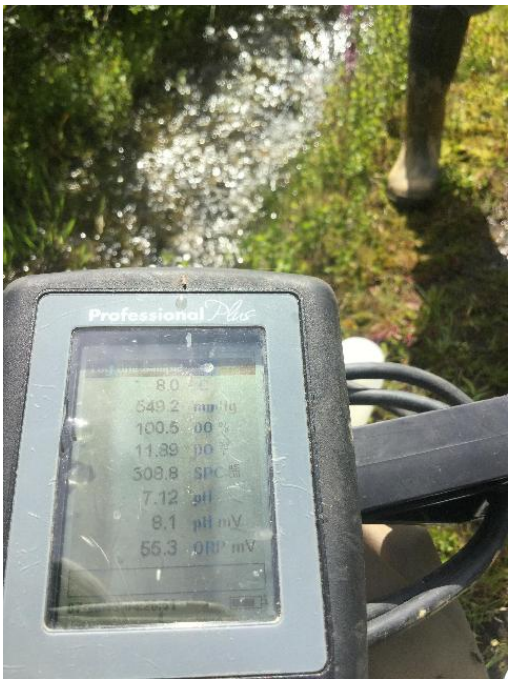
LD_7_L Upstream

LD_7_R Downstream

LD_7_R Flume

Little Dora Mine High Flow Environmental Sampling Photographs (July 2019)

2019 Pre-CERCLA Screening



LD_7_R Water Screenshot

LD_7_R Upstream

LD_8A Downstream

LD_8A Flume

Little Dora Mine High Flow Environmental Sampling Photographs (July 2019)

2019 Pre-CERCLA Screening

LD_8A Water Screenshot

LD_8A Upstream

LD_9 Downstream

LD_9 Flume

Little Dora Mine High Flow Environmental Sampling Photographs (July 2019)

2019 Pre-CERCLA Screening

LD 9 Water Screenshot

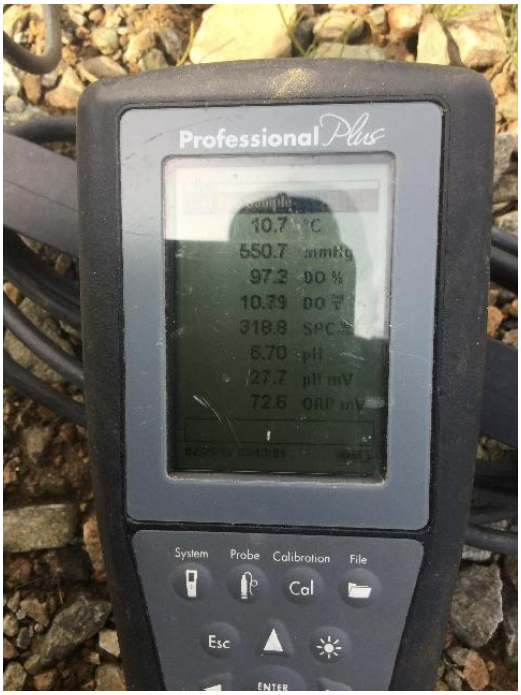
LD 9 Upstream

LD 10 Downstream

LD 10 Flume

Little Dora Mine High Flow Environmental Sampling Photographs (July 2019)

2019 Pre-CERCLA Screening



LD_10 Water Screens

LD_10 Upstream

LD_11 Downstream

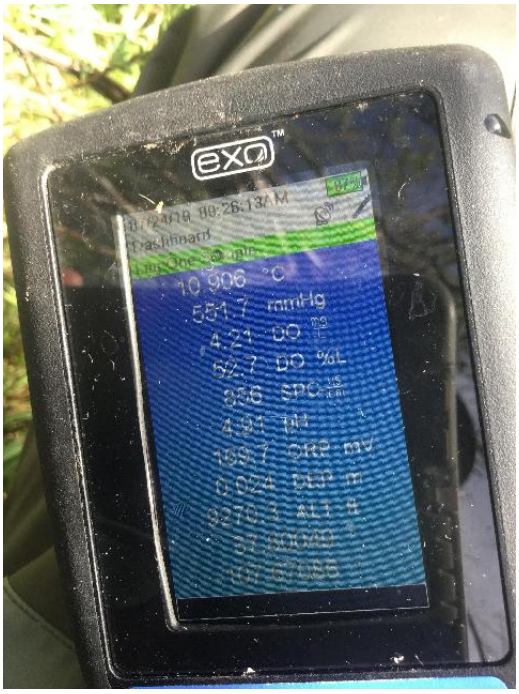
LD_11 Flume

Little Dora Mine High Flow Environmental Sampling Photographs (July 2019)

2019 Pre-CERCLA Screening

LD_12 Upstream

LDM-SW_DNS-01 Downstream



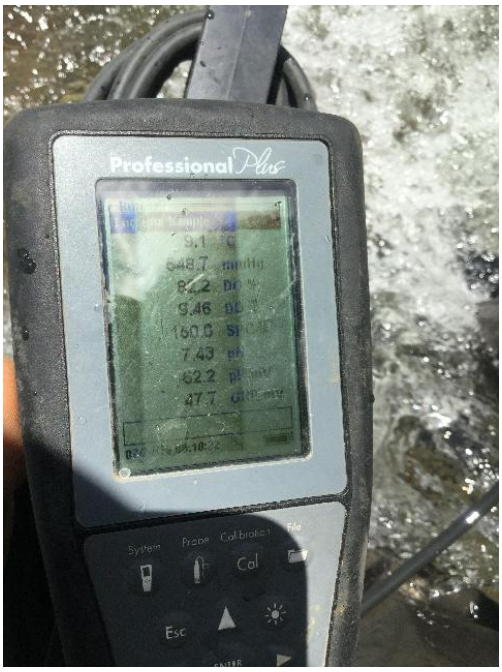
LDM-SW_DNS-01 Water Screenshot

LDM-SW_DNS-01 Upstream

Little Dora Mine High Flow Environmental Sampling Photographs (July 2019)

2019 Pre-CERCLA Screening

M34 Downstream



M34 Water Screenshot

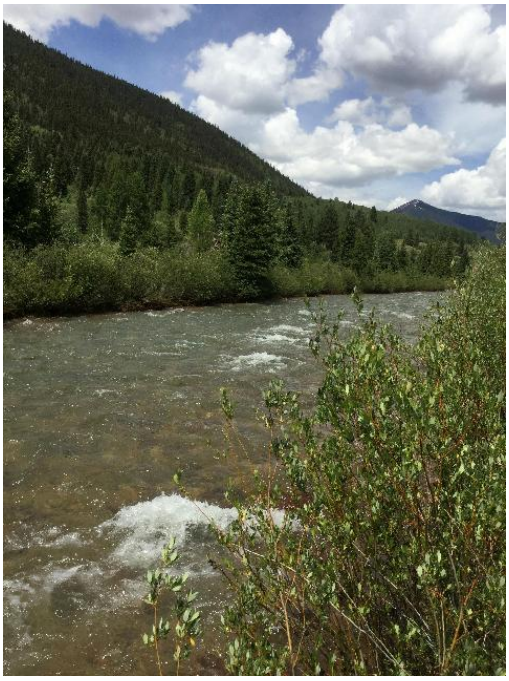
M34 Upstream

M35 Downstream

Little Dora Mine High Flow Environmental Sampling Photographs (July 2019)

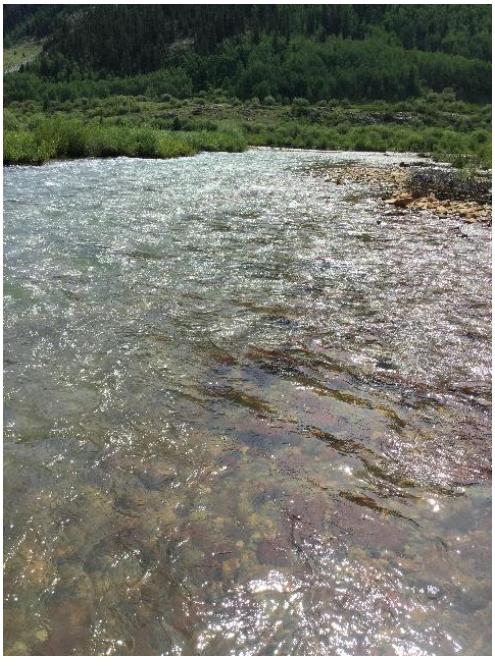
2019 Pre-CERCLA Screening

M35 Water Screenshot



M35 Upstream

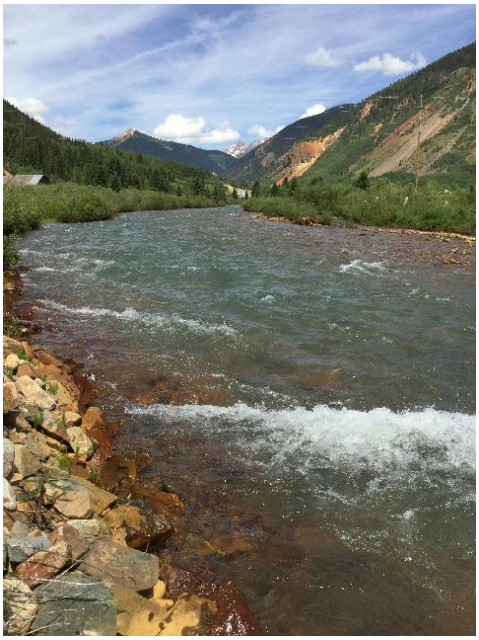
M38 Water Screenshot



M38 Downstream

Little Dora Mine High Flow Environmental Sampling Photographs (July 2019)

2019 Pre-CERCLA Screening



M38 Upstream

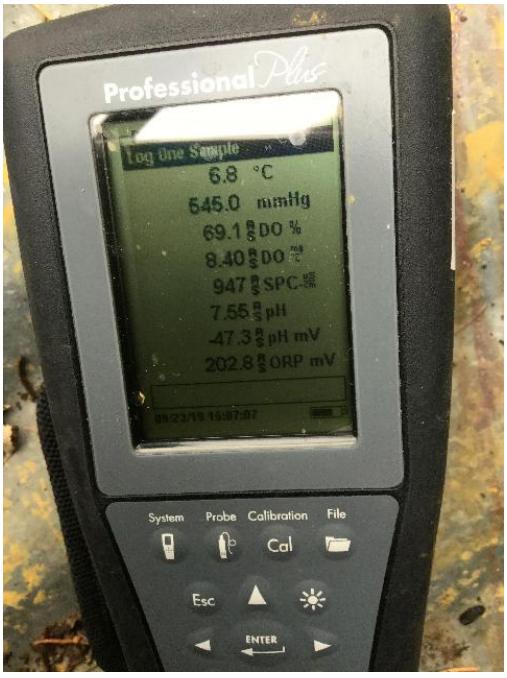
Little Dora Mine Low Flow Environmental Sampling Photographs (September 2019)

2019 Pre-CERCLA Screening

A72 Water Screen Shot

LD_1_DM Downstream

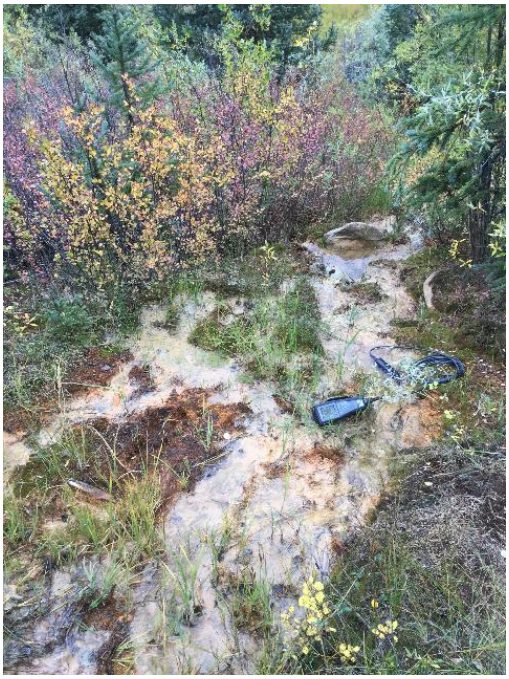
LD_1_DM Upstream



LD_1_DM Water Screen Shot

Little Dora Mine Low Flow Environmental Sampling Photographs (September 2019)

2019 Pre-CERCLA Screening



LD_2_DM Downstream

LD_2_DM Upstream

LD_2_DM Water Screen Shot

LD_3_DM Downstream

Little Dora Mine Low Flow Environmental Sampling Photographs (September 2019)

2019 Pre-CERCLA Screening

LD_3_DM Upstream

LD_3_DM Water Screen Shot

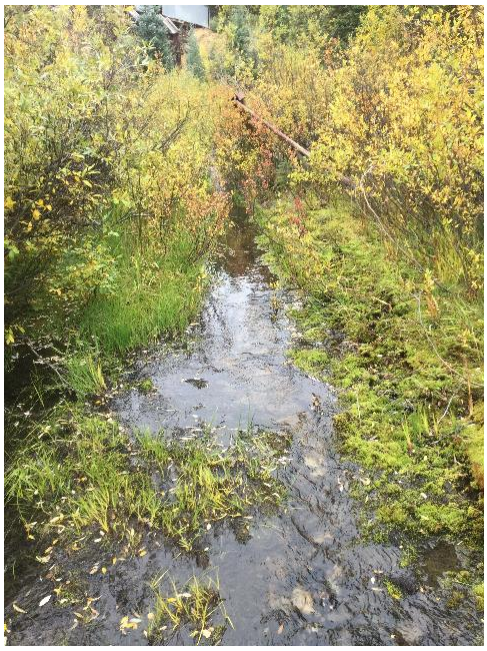
LD_4_unk Downstream

LD_4_unk Upstream

Little Dora Mine Low Flow Environmental Sampling Photographs (September 2019)

2019 Pre-CERCLA Screening

LD_4_unk Water Screen Shot



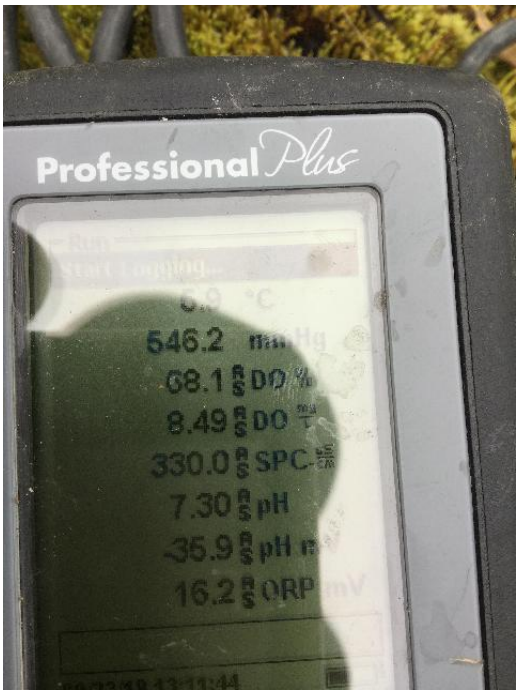
LD_5 Downstream

LD_5 Flow

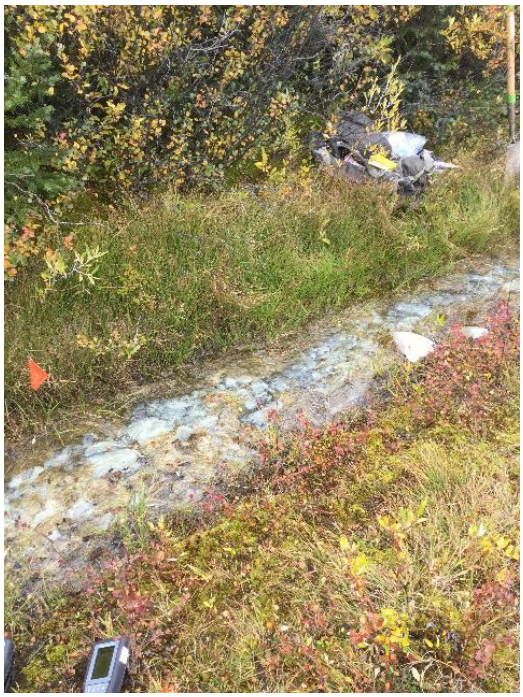
LD_5 Upstream

Little Dora Mine Low Flow Environmental Sampling Photographs (September 2019)

2019 Pre-CERCLA Screening



LD_5 Water Screen Shot



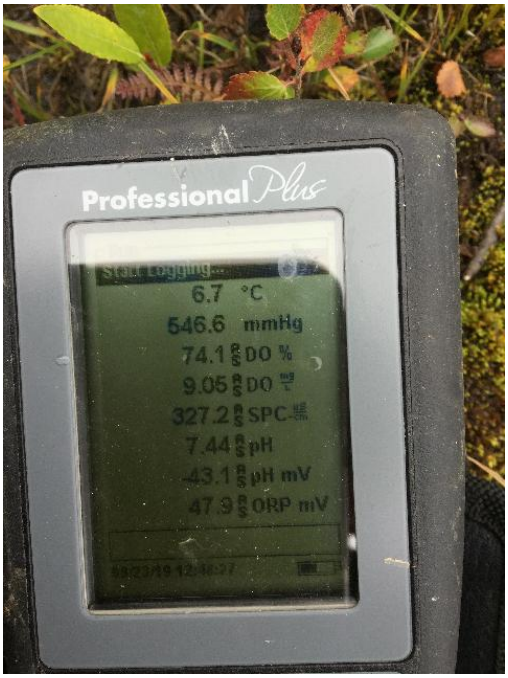
LD_7_L Downstream

LD_7_L Flume

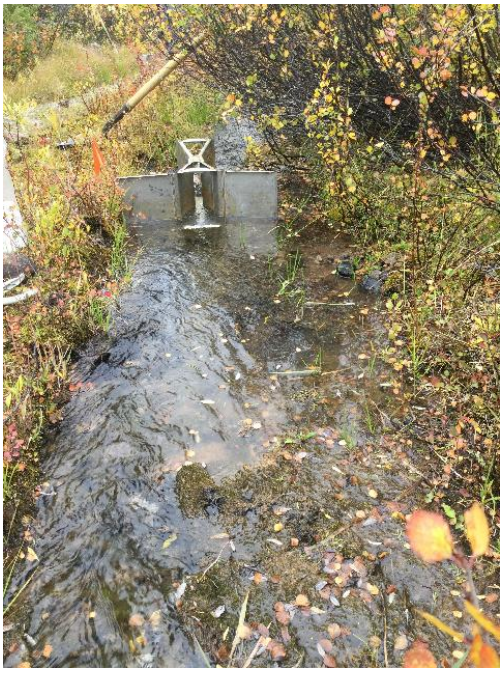
LD_7_L Upstream

Little Dora Mine Low Flow Environmental Sampling Photographs (September 2019)

2019 Pre-CERCLA Screening

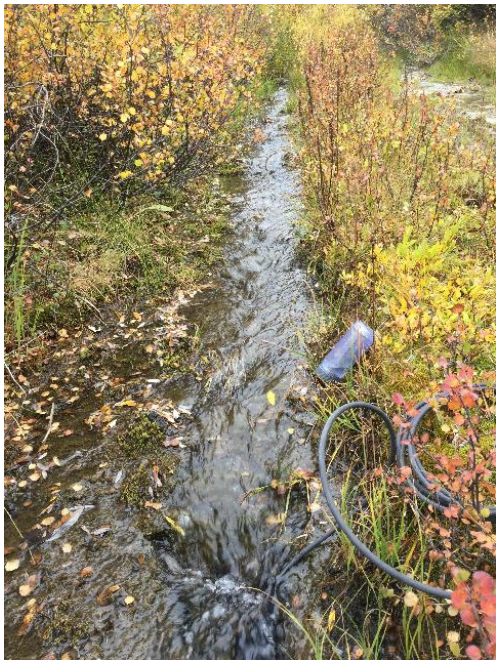


LD_7_L Water Screen Shot



LD_7_R Downstream

LD_7_R Flume

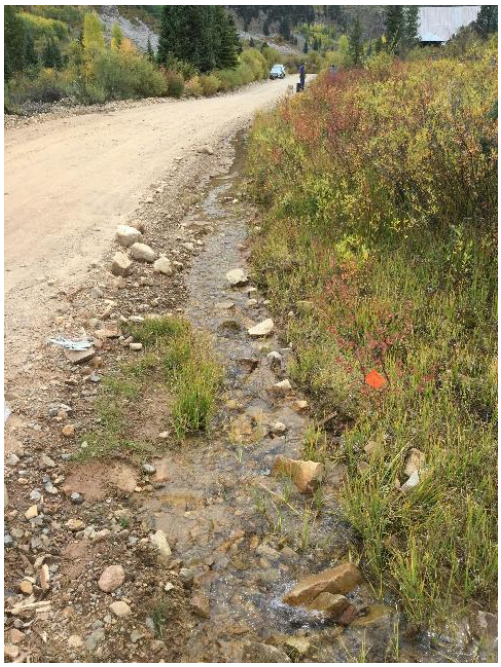


LD_7_R Upstream

Little Dora Mine Low Flow Environmental Sampling Photographs (September 2019)

2019 Pre-CERCLA Screening

LD_7_R Water Screen Shot



LD_8A Downstream

LD_8A Flume

LD_8A Upstream

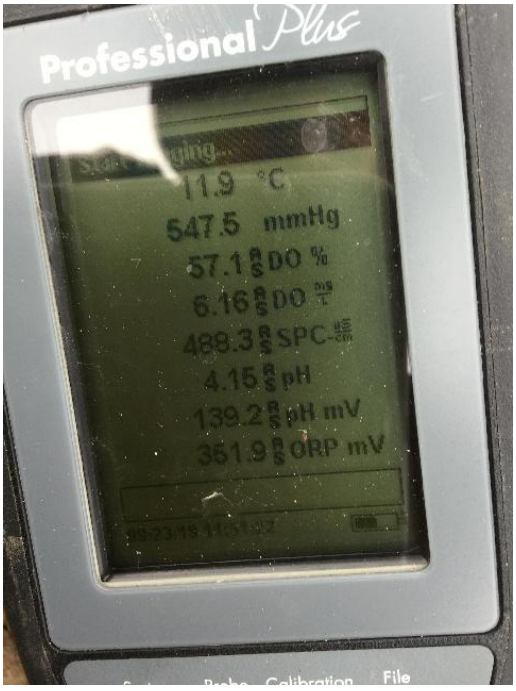
Little Dora Mine Low Flow Environmental Sampling Photographs (September 2019)

2019 Pre-CERCLA Screening

LD_8A Water Screen Shot

LD_9 Downstream

LD_9 Upstream



LD_9 Water Screen Shot

Little Dora Mine Low Flow Environmental Sampling Photographs (September 2019)

2019 Pre-CERCLA Screening

LD_10 Downstream

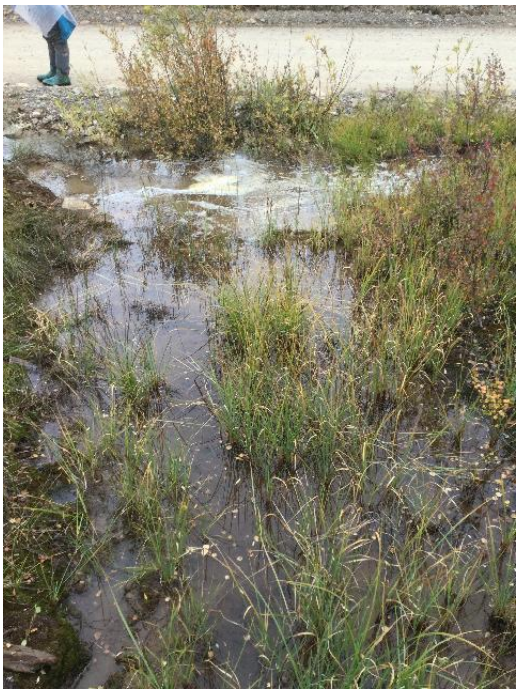
LD_10 Flume

LD_10 Upstream

LD_10 Water Screen Shot

Little Dora Mine Low Flow Environmental Sampling Photographs (September 2019)

2019 Pre-CERCLA Screening



LD_11 Downstream

LD_11 Upstream

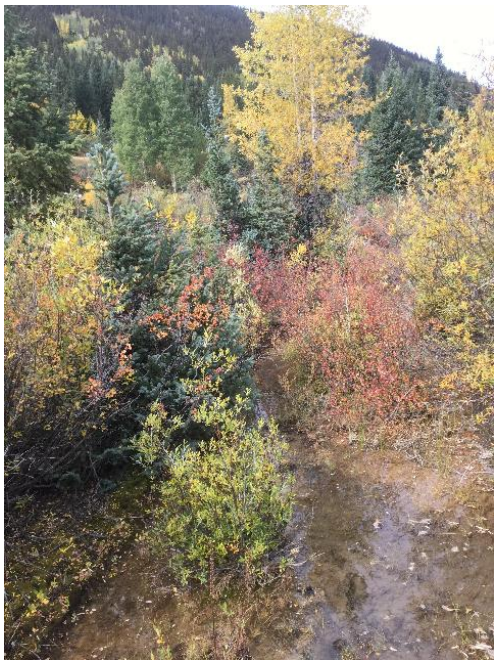
LD_11 Water Screen Shot

LD_13 Downstream

Little Dora Mine Low Flow Environmental Sampling Photographs (September 2019)

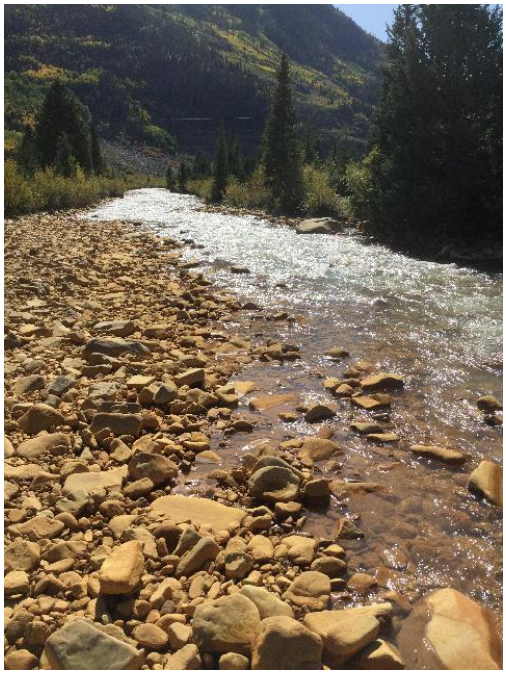
2019 Pre-CERCLA Screening

LD_13 Flume



LD_13 Upstream: looking towards mine

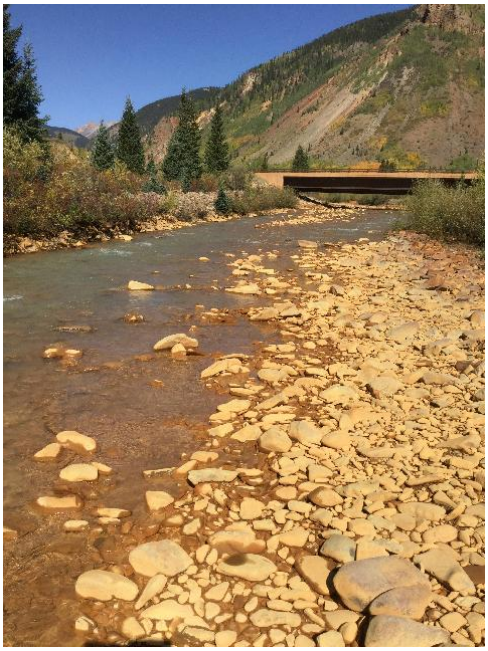
LD_13 Water Screen Shot



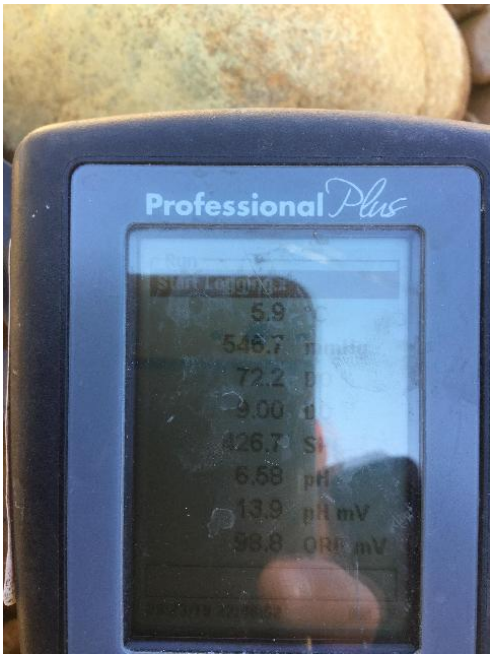
M34 Downstream

Little Dora Mine Low Flow Environmental Sampling Photographs (September 2019)

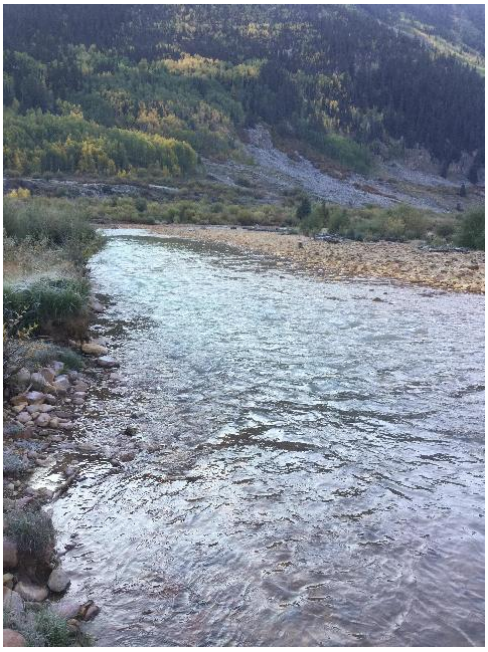
2019 Pre-CERCLA Screening



M34 Upstream



M34 Water Screen Shot

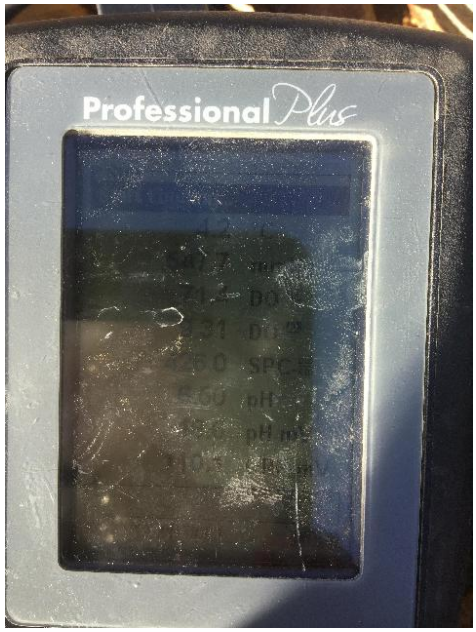


M38 Downstream

M38 Upstream

Little Dora Mine Low Flow Environmental Sampling Photographs (September 2019)

2019 Pre-CERCLA Screening



M38 Water Screen Shot

Figure A.1a

Little Dora Mine, Silverton

Mineral Creek and Animas River

San Juan County, Colorado

2019 Pre-CERCLA Screening
July and September 2019
Surface Water Sample Locations/Key Results*

- Surface Water Sample Locations
  - Dissolved Metals: units = µg/L
  - Total Recoverable Aluminum: units = µg/L
  - Flow: units = cfs
  - pH: units = standard units
  - Hardness: units = mg of $CaCO_3$/L
- Streams

*RED font indicates an exceedance to a hardness-based CO Department of Public Health and Environment (CDPHE) Regulation 31 Chronic Water Quality Standard.

RED BOLD font indicates an exceedance to both an acute and chronic Water Quality Standard (CDPHE Regulation 31).

CDPHE Reg 31: https://www.colorado.gov/pacific/sites/default/files/31_2018%2801%29.pdf

Date: May 11, 2020
Map Projection: UTM Zone 13N, WGS84, Meters
Data Sources:
Streams: *CDOW* (2004);
Sample Locations & Analytical Results: *U.S. EPA* (2019);
Base Map: *Esri World Imagery (Clarity) Web Service* (2020).

0 500 1,000 Feet

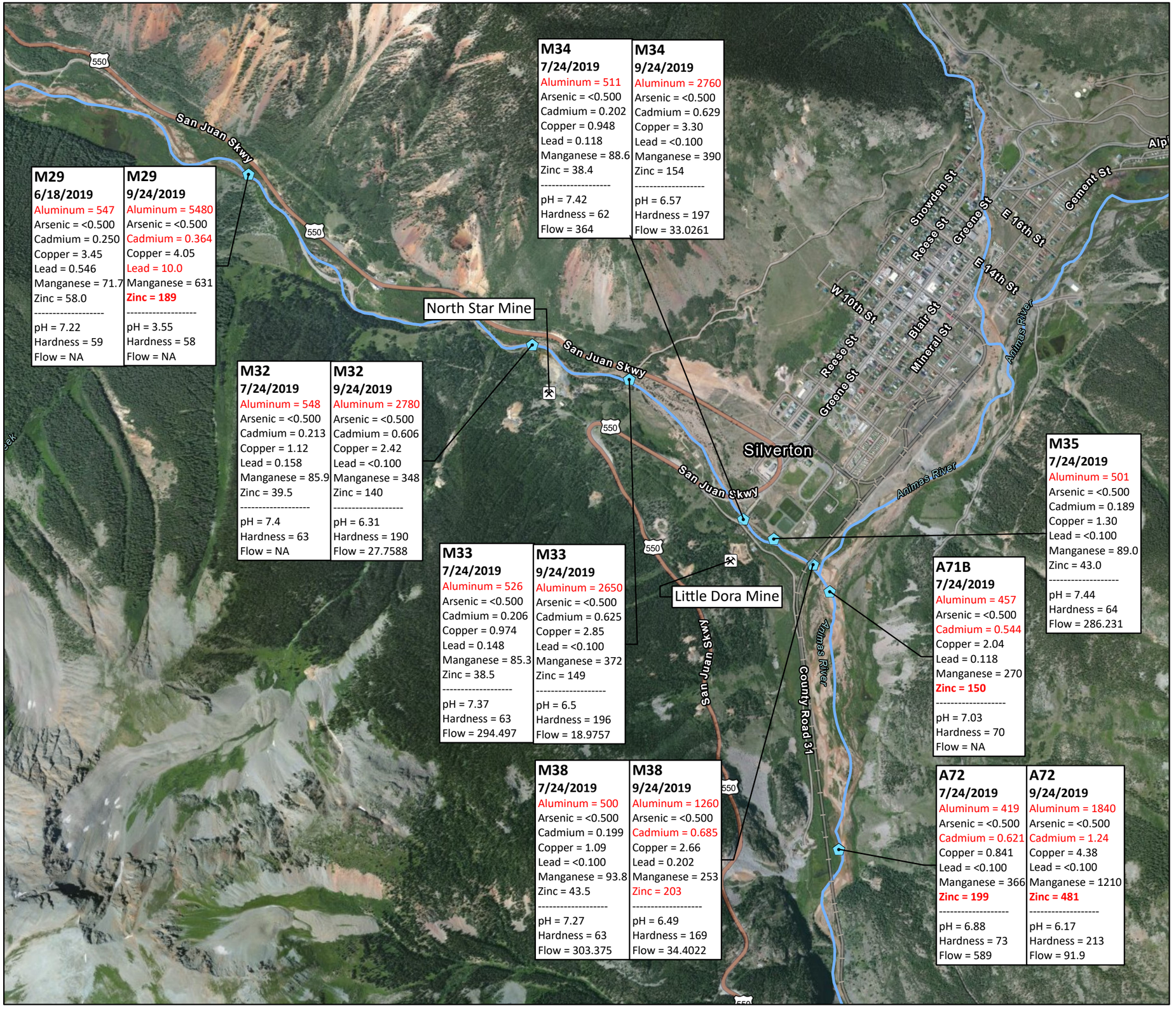


Figure A.1b

Little Dora Mine, Silverton

Mineral Creek and Animas River
San Juan County, Colorado

2019 Pre-CERCLA Screening
July and September 2019
Surface Water Sample Locations/Key Results*

Surface Water Sample Locations
Dissolved Metals: units = µg/L
Total Recoverable Aluminum: units = µg/L
Flow: units = cfs
pH: units = standard units
Hardness: units = mg of $CaCO_3$/L

Streams

*RED font indicates an exceedance to a hardness-based CO Department of Public Health and Environment (CDPHE) Regulation 31 Chronic Water Quality Standard.

RED BOLD font indicates an exceedance to both an acute and chronic Water Quality Standard (CDPHE Regulation 31).

CDPHE Reg 31: https://www.colorado.gov/pacific/sites/default/files/31_2018%2801%29.pdf

Date: May 11, 2020
Map Projection: UTM Zone 13N, WGS84, Meters
Data Sources:
Streams: *CDOW* (2004);
Sample Locations & Analytical Results: *U.S. EPA* (2019);
Base Map: *Esri World Imagery (Clarity) Web Service* (2020).

0 0.25 0.5 Miles

Area Enlarged

Figure A.2

Little Dora Mine, Silverton

Mineral Creek and Animas River
San Juan County, Colorado

2019 Pre-CERCLA Screening
July and September 2019
Soil Sample Locations/Key Results*

- Composite Soil Sample Locations
- Streams

EPA Regional Screening Levels (mg/kg)

	Arsenic	Copper	Lead	Manganese	Zinc
Residential	0.68	3,100	400	1,800	23,000
Industrial	3.0	47,000	800	26,000	350,000

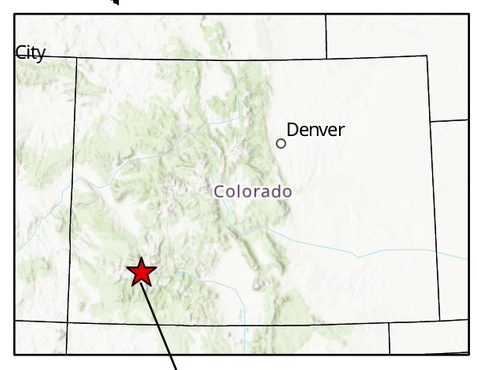
*RED font indicates an exceedance of EPA Regional Soil Screening Levels (RSLs).

https://semspub.epa.gov/work/HQ/199626.pdf

Note: Results only shown for key metals; consult Table A.8 for a listing of all total metals results.

Date: May 11, 2020
Map Projection: UTM Zone 13N, WGS84, Meters
Data Sources:
Streams: *CDOW* (2004);
Sample Locations & Analytical Results: *U.S. EPA* (2019);
Base Map: *Esri World Imagery (Clarity) Web Service* (2020).

0 500 1,000 Feet



Area Enlarged

Table A.12. North Star Mine 2019 Pre-CERCLA Screening High Flow Surface Water Analytical Results.

STATION_ID	ANALYSIS	MATRIX	SAMPLE DATE	SAMPLE TIME	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Uranium	Vanadium	Zinc	Mercury	Hardness[1]
					ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L
NS7_1_DM	Total Recoverable Metals	Surface Water	7/25/2019	10:27	855	2.50 U	14.3 D	25.0 UJ	2.00 U	4.40 D	151000	5.00 U	8.60 D	203 D	9620	11.1 JD	24300	4450	2.50 U	780 J	5.00 U	2.50 U	5170	5.00 UJ	21.6 D	10.0 U	1050	0.100 U	NA
	Dissolved Metals	Surface Water	7/25/2019	10:27	51.2	2.50 U	2.50 U	25.0 U	2.00 U	3.70 D	156000	5.00 U	9.16 D	26.3 D	2400	0.500 U	25100	4700	2.50 U	823 J	5.00 U	2.50 U	5250	5.00 U	13.3 D	10.0 U	1040	NA	494
NS7_2_DM	Total Recoverable Metals	Surface Water	7/25/2019	9:15	967	2.50 U	16.2 D	25.0 UJ	2.00 U	4.34 D	151000	5.00 U	8.69 D	211 D	10000	12.3 JD	24400	4450	2.50 U	794 J	5.00 U	2.50 U	5150	5.00 UJ	21.2 D	10.0 U	1060	0.100 U	NA
	Dissolved Metals	Surface Water	7/25/2019	9:15	20.0 U	2.50 U	2.50 U	25.0 U	2.00 U	3.26 D	153000	5.00 U	8.74 D	5.39 D	575	0.500 U	24700	4650	2.50 U	846 J	5.00 U	2.50 U	5240	5.00 U	13.5 D	10.0 U	878	NA	484
NS7_3_ DM	Total Recoverable Metals	Surface Water	7/25/2019	9:27	167	2.50 U	2.50 U	25.0 UJ	2.00 U	1.12 D	113000	5.00 U	1.92 D	18.8 D	839	0.693 JD	17600	1090	2.50 U	696 J	5.00 U	2.50 U	4140	5.00 UJ	3.95 D	10.0 U	413	0.100 U	NA
	Dissolved Metals	Surface Water	7/25/2019	9:27	83.3	2.50 U	2.50 U	25.0 U	2.00 U	1.14 D	116000	5.00 U	1.79 D	5.88 D	100 U	0.500 U	17900	1140	2.50 U	740 J	5.00 U	2.50 U	4140	5.00 U	3.31 D	10.0 U	421	NA	363
NS7_4_ DM	Total Recoverable Metals	Surface Water	7/25/2019	9:48	597	2.50 U	8.04 JD	25.0 UJ	2.00 U	3.05 D	117000	5.00 U	5.90 D	132 D	6590	7.13 JD	18800	3240	2.50 U	673 J	5.00 U	2.50 U	4220	5.00 UJ	14.2 D	10.0 U	827	0.100 U	NA
	Dissolved Metals	Surface Water	7/25/2019	9:48	20.0 U	2.50 U	2.50 U	25.0 U	2.00 U	2.83 D	119000	5.00 U	6.59 D	6.85 D	1050	0.500 U	19100	3410	2.50 U	755 J	5.00 U	2.50 U	4240	5.00 U	9.72 D	10.0 U	791	NA	375
NSM-SW-OPP-01	Total Recoverable Metals	Surface Water	7/24/2019	14:01	3300	2.50 U	27.9 D	25.0 UJ	2.00 U	4.73 D	139000	5.00 U	6.29 D	375 D	15200	58.1 JD	22300	3340	2.50 U	998 J	5.00 U	2.50 U	5270	5.00 UJ	23.0 D	10.0 U	1270	0.100 U	NA
	Dissolved Metals	Surface Water	7/24/2019	14:01	53.3	0.860 J	0.579 J	12.4	2.00 U	3.79	139000	1.00 U	6.27	16.1	100 U	0.100 U	22300	3390	0.500 U	1060	1.00 U	0.500 U	5230	1.00 U	5.97	2.00 U	977	NA	439
M32	Total Recoverable Metals	Surface Water	7/24/2019	14:48	548	2.50 U	2.50 U	25.0 UJ	2.00 U	0.500 U	21700	5.00 U	1.28 D	2.50 U	644	1.28 JD	1930	86.0	2.50 U	359 J	5.00 U	2.50 U	1260	5.00 UJ	0.500 U	10.0 U	41.5	0.100 U	NA
	Dissolved Metals	Surface Water	7/24/2019	14:48	67.9	0.500 U	0.500 U	20.0	2.00 U	0.213	22100	1.00 U	1.39	1.12	367	0.158 J	1940	85.9	0.500 U	336 J	1.00 U	0.500 U	1280	1.00 U	0.100 U	2.00 U	39.5	NA	63
M33	Total Recoverable Metals	Surface Water	7/24/2019	13:10	526	2.50 U	2.50 U	25.0 UJ	2.00 U	0.500 U	21700	5.00 U	1.21 D	2.50 U	600	1.20 JD	1940	85.6	2.50 U	329 J	5.00 U	2.50 U	1260	5.00 UJ	0.500 U	10.0 U	41.0	0.100 U	NA
	Dissolved Metals	Surface Water	7/24/2019	13:10	56.5	0.500 U	0.500 U	20.0	2.00 U	0.206	22200	1.00 U	1.31	0.974 J	319	0.148 J	1960	85.3	0.500 U	352 J	1.00 U	0.500 U	1270	1.00 U	0.100 U	2.00 U	38.5	NA	63
M32B	Total Recoverable Metals	Surface Water	7/25/2019	9:05	27.5 J	2.50 U	2.50 U	25.0 UJ	2.00 U	0.762 JD	27600	5.00 U	0.500 U	2.50 U	100 U	6.30 JD	4110	20.0	2.50 U	464 J	5.00 U	2.50 U	1550	5.00 UJ	0.549 JD	10.0 U	230	0.100 U	NA
	Dissolved Metals	Surface Water	7/25/2019	9:05	20.0 U	0.500 U	0.500 U	10.4	2.00 U	0.883	27600	1.00 U	0.100 U	1.86	100 U	1.85	4150	14.2	0.500 U	504 J	1.00 U	0.500 U	1550	1.00 U	0.642	2.00 U	236	NA	86
M32C	Total Recoverable Metals	Surface Water	7/25/2019	9:12	20.0 U	2.50 U	2.50 U	25.0 UJ	2.00 U	0.905 JD	27200	5.00 U	0.500 U	2.50 U	100 U	6.67 JD	4120	21.1	2.50 U	463 J	5.00 U	2.50 U	1540	5.00 UJ	0.610 JD	10.0 U	225	0.100 U	NA
	Dissolved Metals	Surface Water	7/25/2019	9:12	20.0 U	0.500 U	0.500 U	10.5	2.00 U	0.885	27700	1.00 U	0.100 U	1.83	100 U	2.42	4150	15.8	0.500 U	490 J	1.00 U	0.500 U	1580	1.00 U	0.655	2.00 U	236	NA	86
M32D	Total Recoverable Metals	Surface Water	7/25/2019	10:37	43.5 J	2.50 U	2.50 U	25.0 UJ	2.00 U	0.817 JD	28100	5.00 U	0.500 U	2.50 U	100 U	1.99 JD	4270	33.1	2.50 U	489 J	5.00 U	2.50 U	1580	5.00 UJ	0.702 JD	10.0 U	250	0.100 U	NA
	Dissolved Metals	Surface Water	7/25/2019	10:37	20.0 U	0.500 U	0.500 U	10.9	2.00 U	0.965	28500	1.00 U	0.100 U	1.33	100 U	0.100 U	4290	23.9	0.500 U	475 J	1.00 U	0.500 U	1580	1.00 U	0.800	2.00 U	254	NA	89
M29	Total Recoverable Metals	Surface Water	6/18/2019	11:58	547	2.5 U	2.5 U	25 U	2 U	0.5 U	21500	5 U	1.36 D	6.64 D	715	3.97 D	1790	94.1	2.5 U	405 J	5 U	2.5 U	1310	5 U	NA	10 U	70.9	NA	NA
	Dissolved Metals	Surface Water	6/18/2019	11:58	86	0.5 U	0.5 U	19.3	2 U	0.25	20700	1 U	1.09	3.45	225 J	0.546	1690	71.7	0.5 U	343 J	1 U	0.5 U	1220	1 U	NA	2 U	58	NA	59

[1] Sample-specific hardness calculated using dissolved calcium and magnesium concentrations for use in assessing hardness-based in accordance with Colorado Water Quality Control Commission, Regulation 31 (https://www.colorado.gov/pacific/sites/default/files/31_2018%2801%29.pdf)

NA = Not analyzed

U = Laboratory analysis indicates that the analyte was undetected at the concentration shown

J = Laboratory quality control review indicates that this result is considered estimated

D = Sample diluted prior to analysis; reported result is for undiluted sample

Table A.13. North Star Mine 2019 Pre-CERCLA Screening Low Flow Surface Water Analytical Results.

STATION_ID	ANALYSIS	MATRIX	SAMPLE DATE	SAMPLE TIME	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Uranium	Vanadium	Zinc	Mercury	Hardness[1]
					ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L
NS7_1_DM	Total Recoverable Metals	Surface Water	9/24/2019	09:49	835	2.5 U	7.32 JD	25 U	2 U	3.51 D	160000	5 U	9.42 D	167 D	9300	10.6 D	23900	3940	5 U	2.5 U	937 J	5 U	2.5 U	5220	5 U	22.6 D	10 U	856	0.1 U	NA
	Dissolved Metals	Surface Water	9/24/2019	09:49	20 U	1.07	1.14 J	8.74 J	2 U	3.09	159000	1 U	8.69	11.4	2400	0.1 U	24300	3920	3.08	0.5 U	784 J	1 U	0.5 U	5910	1 U	16.1	2 U	863	NA	497
NS7_2_DM	Total Recoverable Metals	Surface Water	9/24/2019	16:19	665	2.5 U	6.86 JD	25 U	2 U	3.28 D	158000	5 U	8.93 D	140 D	8240	9.1 D	23700	3870	5 U	2.5 U	884 J	5 U	2.5 U	5160	5 U	21.4 D	10 U	826	0.1 U	NA
	Dissolved Metals	Surface Water	9/24/2019	16:19	20 U	1.05	0.969 J	8.64 J	2 U	2.62	159000	1 U	8.53	4.72	1570	0.1 U	24200	3890	3.14	0.5 U	796 J	1 U	0.5 U	5880	1 U	16.4	2 U	739	NA	496
NS7_3_ DM	Total Recoverable Metals	Surface Water	9/24/2019	09:18	959	2.5 U	9.63 JD	25 U	2 U	3.33 D	158000	5 U	8.88 D	189 D	10200	12.7 D	23600	3760	5 U	2.5 U	941 J	5 U	2.5 U	5140	5 U	22.7 D	10 U	816	0.1 U	NA
	Dissolved Metals	Surface Water	9/24/2019	09:18	20 U	1.07	0.595 J	8.49 J	2 U	2.25	160000	1 U	8.21	2.75	209 J	0.1 U	24600	3820	3.14	0.5 U	805 J	1 U	0.5 U	6010	1 U	16.4	2 U	559	NA	502
NS7_4_ DM	Total Recoverable Metals	Surface Water	9/24/2019	09:03	725	2.5 U	5.24 JD	25 U	2 U	3.06 D	146000	5 U	8 D	143 D	7950	9.16 D	21800	3460	5 U	2.5 U	867 J	5 U	2.5 U	4870	5 U	19.4 D	10 U	773	0.1 U	NA
	Dissolved Metals	Surface Water	9/24/2019	09:03	20 U	1.24	0.801 J	9.3 J	2 U	2.53	147000	1 U	7.56	4.98	1440	0.1 U	22400	3490	2.88	0.5 U	756 J	1 U	0.5 U	5450	1 U	14.6	2 U	726	NA	459
NSM-SW-OPP-01	Total Recoverable Metals	Surface Water	9/24/2019	16:42	447	2.5 U	2.5 U	25 U	2 U	2.58 D	139000	5 U	6.86 D	32.7 D	897	3.64 D	21300	2620	5 U	2.5 U	1070	5 U	2.5 U	5240	5 U	6.81 D	10 U	763	0.1 U	NA
	Dissolved Metals	Surface Water	9/24/2019	16:42	83.7	0.701 J	0.5 U	10.5	2 U	2.54	140000	1 U	6.64	12.2	196 J	0.107 J	21900	2660	1.25	0.5 U	1000	1 U	0.5 U	6110	1 U	5.72	2 U	868	NA	439
M32	Total Recoverable Metals	Surface Water	9/24/2019	12:45	2780	2.5 U	2.5 U	26.6 JD	2 U	0.634 JD	70800	5 U	7.27 D	6.2 D	3720	1.87 D	5480	368	NA	2.5 U	645 J	5 U	2.5 U	3330	5 U	NA	10 U	151	NA	NA
	Dissolved Metals	Surface Water	9/24/2019	12:45	143	0.5 U	0.5 U	27	2 U	0.606	67200	1 U	6.73	2.42	2430	0.1 U	5270	348	NA	0.5 U	690 J	1 U	0.5 U	3230	1 U	NA	2 U	140	NA	190
M33	Total Recoverable Metals	Surface Water	9/24/2019	11:40	2650	2.5 U	2.5 U	28 JD	2 U	0.672 JD	71400	5 U	7.27 D	6.86 D	3570	2.03 D	5770	396	NA	2.5 U	620 J	5 U	2.5 U	3330	5 U	NA	10 U	159	NA	NA
	Dissolved Metals	Surface Water	9/24/2019	11:40	72	0.5 U	0.5 U	26.9	2 U	0.625	69200	1 U	6.51	2.85	2240	0.1 U	5570	372	NA	0.5 U	656 J	1 U	0.5 U	3240	1 U	NA	2 U	149	NA	196
M32C	Total Recoverable Metals	Surface Water	9/24/2019	11:57	20 U	2.62 JD	2.5 U	25 U	2 U	0.686 JD	36100	5 U	0.5 U	2.5 U	100 U	7.46 D	5210	2 U	5 U	2.5 U	528 J	5 U	2.5 U	1940	5 U	0.519 JD	10 U	119	0.1 U	NA
	Dissolved Metals	Surface Water	9/24/2019	11:57	20 U	2.76	0.65 J	10.6	2 U	0.665	36200	1 U	0.1 U	2.15	100 U	6.09	5330	2 U	1.27	0.5 U	458 J	1.08 J	0.5 U	2200	1 U	0.544	2 U	138	NA	112
M32D	Total Recoverable Metals	Surface Water	9/24/2019	12:44	20 U	2.5 U	2.5 U	25 U	2 U	0.5 U	40100	5 U	0.5 U	2.5 U	100 U	0.5 U	5710	2 U	5 U	2.5 U	572 J	5 U	2.5 U	2000	5 U	1.46 D	10 U	120	0.1 U	NA
	Dissolved Metals	Surface Water	9/24/2019	12:44	20 U	0.5 U	0.5 U	11.4	2 U	0.517	39900	1 U	0.1 U	0.792 J	100 U	0.1 U	5800	2 U	1.5	0.5 U	451 J	1.2 J	0.5 U	2280	1 U	1.38	2 U	141	NA	123
M29	Total Recoverable Metals	Surface Water	9/24/2019	14:25	5480	2.5 U	2.5 U	25 U	2 U	0.5 U	22400	5 U	14.1 D	4.2 JD	5930	11.2 D	2960	686	NA	8.31 D	2400	5 U	2.5 U	6340	5 U	NA	10 U	224	NA	NA
	Dissolved Metals	Surface Water	9/24/2019	14:25	4460	0.5 U	0.5 U	25.1	2 U	0.364	19100	1 U	10.5	4.05	3630	10	2570	631	NA	5.2	2150	1 U	0.5 U	6090	1 U	NA	2 U	189	NA	58

[1] Sample-specific hardness calculated using dissolved calcium and magnesium concentrations for use in assessing hardness-based in accordance with Colorado Water Quality Control Commission, Regulation 31 (https://www.colorado.gov/pacific/sites/default/files/31_2018%2801%29.pdf)

NA = Not analyzed

U = Laboratory analysis indicates that the analyte was undetected at the concentration shown

J = Laboratory quality control review indicates that this result is considered estimated

D = Sample diluted prior to analysis; reported result is for undiluted sample

Table A.14. North Star Mine 2019 Pre-CERCLA Screening High Flow Surface Water Anions and Alkalinity Results.

STATION_ID	ANALYSIS	MATRIX	SAMPLE DATE	SAMPLE TIME	Chloride	Fluoride	Nitrate/Nitrite as N	Sulfate as SO_4	Total Alkalinity	Dissolved Organic Carbon
					mg/L	mg/L	mg/L	mg/L	mg $CaCO_3$/L	mg/L
NS7_1_DM	Wet Chemistry	Surface Water	7/25/2019	10:27	5.0 U	1.3 D	2.5 UJ	435 D	57.1	0.5
NS7_2_DM	Wet Chemistry	Surface Water	7/25/2019	09:15	5.0 U	1.4 D	2.5 UJ	431 D	56.2	0.6
NS7_3_ DM	Wet Chemistry	Surface Water	7/25/2019	09:27	2.0 U	1.0 D	1.0 UJ	347 D	23.8	0.6
NS7_4_ DM	Wet Chemistry	Surface Water	7/25/2019	09:48	2.1 JD	1.0 D	1.0 UJ	340 D	45.0	0.5
NSM-SW-OPP-01	Wet Chemistry	Surface Water	7/24/2019	14:01	5.0 U	1.0 D	2.5 UJ	411 D	27.4	1.0
M32	Wet Chemistry	Surface Water	7/24/2019	14:48	1.0 U	0.2	0.5 UJ	50.8	14.0	0.7
M33	Wet Chemistry	Surface Water	7/24/2019	13:10	1.0 U	0.2	0.5 UJ	50.5	14.1	0.8
M32B	Wet Chemistry	Surface Water	7/25/2019	09:05	1.0 U	0.1 J	0.5 UJ	67.6	20.1	0.6
M32C	Wet Chemistry	Surface Water	7/25/2019	09:42	1.0 U	0.1 J	0.5 UJ	68.3	20.3	0.6
M32D	Wet Chemistry	Surface Water	7/25/2019	10:37	1.0 U	0.1 J	0.5 UJ	70.1	21.0	0.5
M29	Wet Chemistry	Surface Water	6/18/2019	11:58	1 U	0.1 J	0.5 UJ	42.6	17.4	1.5

U = Laboratory analysis indicates that the analyte was undetected at the concentration shown

J = Laboratory quality control review indicates that this result is considered estimated

D = Sample diluted prior to analysis; reported result is for undiluted sample

Table A.15. North Star Mine 2019 Pre-CERCLA Screening Low Flow Surface Water Anions and Alkalinity Results.

STATION_ID	ANALYSIS	MATRIX	SAMPLE DATE	SAMPLE TIME	Chloride	Fluoride	Nitrate/Nitrite as N	Sulfate as SO_4	Total Alkalinity	Dissolved Organic Carbon
					mg/L	mg/L	mg/L	mg/L	mg $CaCO_3$/L	mg/L
NS7_1_DM	Wet Chemistry	Surface Water	9/24/2019	09:49	5 U	1.4 D	2.5 UJ	409 D	60.3	0.6
NS7_2_DM	Wet Chemistry	Surface Water	9/24/2019	16:19	5 U	1.5 D	2.5 UJ	407 D	59.6	0.6
NS7_3_ DM	Wet Chemistry	Surface Water	9/24/2019	09:18	5 U	1.5 D	2.5 UJ	407 D	61.1	0.6
NS7_4_ DM	Wet Chemistry	Surface Water	9/24/2019	09:03	5 U	1.3 D	2.5 UJ	380 D	56.5	0.6
NSM-SW-OPP-01	Wet Chemistry	Surface Water	9/24/2019	16:42	5 U	1 D	2.5 UJ	388 D	26.2	0.9
M32	Wet Chemistry	Surface Water	9/24/2019	12:45	2 U	0.3 JD	1 UJ	188 D	5 U	0.6
M33	Wet Chemistry	Surface Water	9/24/2019	11:40	2 U	0.3 JD	1 UJ	192 D	5 U	0.6
M32C	Wet Chemistry	Surface Water	9/24/2019	11:57	1 U	0.2	0.5 UJ	87.8	22.4	0.7
M32D	Wet Chemistry	Surface Water	9/24/2019	12:44	1 U	0.2	0.5 UJ	95.7	26.3	0.6
M29	Wet Chemistry	Surface Water	9/24/2019	14:25	5.5 D	0.4 D	1 UJ	156 D	5 U	1.1

U = Laboratory analysis indicates that the analyte was undetected at the concentration shown

J = Laboratory quality control review indicates that this result is considered estimated

D = Sample diluted prior to analysis; reported result is for undiluted sample

Table A.16. North Star Mine 2019 Pre-CERCLA Screening High Flow Field-Measured Water Quality Parameters.

STATION_ID	ANALYSIS	MATRIX	SAMPLE DATE	SAMPLE TIME	pH	Temp.	Dissolved Oxygen	Conductivity	ORP	Flow	Flow Measurement
					Stand. Unit	ºC	mg/L	µS/cm	mV	cfs	Equipment
NS7_1_DM	In Situ Measure	Surface Water	7/25/2019	10:27	7.10	9.7	7.73	889.0	4.8	0.6094	4" Cutthroat Flume
NS7_2_DM	In Situ Measure	Surface Water	7/25/2019	09:15	7.58	9.5	7.85	882.0	-55.6	0.11852	Bucket fill/flume
NS7_3_ DM	In Situ Measure	Surface Water	7/25/2019	09:27	6.45	11.7	7.02	698.0	181	0.004	Bag fill/flume
NS7_4_ DM	In Situ Measure	Surface Water	7/25/2019	09:48	7.04	7.6	8.56	729.0	34.1	0.4212	4" Cutthroat Flume
NSM-SW-OPP-01	In Situ Measure	Surface Water	7/24/2019	14:01	6.83	15.1	6.82	819.0	73.7	0.1035	4" Cutthroat Flume
M32	In Situ Measure	Surface Water	7/24/2019	14:48	7.40	9.2	9.62	153.6	-18.2	NC	Too deep/unsafe
M33	In Situ Measure	Surface Water	7/24/2019	13:10	7.37	9.7	9.15	149.9	-46.5	294.5	Flow Tracker
M32B	In Situ Measure	Surface Water	7/25/2019	09:05	7.61	4.1	9.22	197.4	108.3	NC	Too braided
M32C	In Situ Measure	Surface Water	7/25/2019	09:42	7.82	4.1	9.35	171.1	107.3	1.924	Flow Tracker
M32D	In Situ Measure	Surface Water	7/25/2019	10:37	7.76	3.4	9.24	202.3	119.7	NC	Too braided
M29	In Situ Measure	Surface Water	6/18/2019	11:58	7.22	5.0	10	137.6	35	NC	Dangerous high flow conditions

NC = Not collected

Table A.17. North Star Mine 2019 Pre-CERCLA Screening Low Flow Field-Measured Water Quality Parameters.

STATION_ID	ANALYSIS	MATRIX	SAMPLE DATE	SAMPLE TIME	pH	Temp.	Dissolved Oxygen	Conductivity	ORP	Flow	Flow Measurement
					Stand. Unit	ºC	mg/L	µS/cm	mV	cfs	Equipment
NS7_1_DM	In Situ Measure	Surface Water	9/24/2019	09:49	6.79	8.0	7.86	881.0	19.5	0.3592	2" Cutthroat Flume
NS7_2_DM	In Situ Measure	Surface Water	9/24/2019	16:19	7.38	8.1	8.78	781.0	-39.1	0.197	Bag fill/flume
NS7_3_ DM	In Situ Measure	Surface Water	9/24/2019	09:18	7.53	8.4	8.44	873.0	-32.8	0.0918	2" Cutthroat Flume
NS7_4_ DM	In Situ Measure	Surface Water	9/24/2019	09:03	7.19	7.4	8.60	821.0	-15.7	0.3921	2" Cutthroat Flume
NSM-SW-OPP-01	In Situ Measure	Surface Water	9/24/2019	16:42	6.97	9.5	7.75	791.0	119.7	0.0145	Bag fill/flume
M32	In Situ Measure	Surface Water	9/24/2019	12:45	6.31	9.2	7.86	415.8	121.4	27.7588	Flow Tracker
M33	In Situ Measure	Surface Water	9/24/2019	11:40	6.50	8.1	8.42	421.6	105.2	18.9757	Flow Tracker
M32C	In Situ Measure	Surface Water	9/24/2019	11:57	7.57	4.1	8.57	251.9	-102.8	0.01	Bag fill/flume
M32D	In Situ Measure	Surface Water	9/24/2019	12:44	7.50	3.3	9.80	265.1	-101.3	0.0871	Bag fill/flume
M29	In Situ Measure	Surface Water	9/24/2019	14:25	3.55	15.8	4.2	437.8	407.8	0.01245	Bag fill/flume

NC = Not collected

Table A.18. North Star Mine 2019 Pre-CERCLA Screening Low Flow Sediment Sample Analytical Results.

STATION_ID	ANALYSIS	MATRIX	SAMPLE DATE	SAMPLE TIME	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
M32	Total Recoverable Metals	Sediment	9/24/2019	12:45	8760 D	0.354 JD	22.5 D	140 D	0.683 JD	0.621 D	2290 D	3.5 D	12.9 D	74.6 D	40000 D	163 D
M33	Total Recoverable Metals	Sediment	9/24/2019	23:40	8170 D	1.02 D	36.4 D	89.1 D	0.626 JD	0.904 D	2370 D	3.4 D	13.6 D	79.3 D	39100 D	801 D

STATION_ID	ANALYSIS	MATRIX	SAMPLE DATE	SAMPLE TIME	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
M32	Total Recoverable Metals	Sediment	9/24/2019	12:45	4060 D	741 D	0.05 D	5.25 D	528 D	0.542 JD	0.479 D	158 JD	0.476 U	16.1 D	299 D
M33	Total Recoverable Metals	Sediment	9/24/2019	23:40	3920 D	1010 D	0.03 JD	5.04 D	655 D	0.52 JD	1.01 D	146 JD	0.488 U	16.6 D	338 D

U = Laboratory analysis indicates that the analyte was undetected at the concentration shown
J = Laboratory quality control review indicates that this result is considered estimated
D = Sample diluted prior to analysis; reported result is for undiluted sample

Table A.19. North Star Mine 2019 Pre-CERCLA Screening Mine Waste Sample Total Recoverable Metals Results.

STATION_ID	ANALYSIS	MATRIX	SAMPLE DATE	SAMPLE TIME	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
WR-NS-01	Total Recoverable Metals	Soil	07/25/2019	10:57	2470 D	473 D	449	220 D	0.498 U	6.15 D	754 D	5.07 D	1.63 D	260 D	25500 D	9920 D
WR-NS-02	Total Recoverable Metals	Soil	07/25/2019	11:21	2310 D	38.3 D	301	201 D	0.496 U	2.56 D	542 D	1.33 JD	1.91 D	214 D	44700 D	4740 D
WR-NS-03	Total Recoverable Metals	Soil	07/25/2019	11:38	3580 D	48.7 D	210	243 D	0.613 JD	2.95 D	1360 D	1.66 JD	8.41 D	284 D	58800 D	3340 D
WR-NS-04	Total Recoverable Metals	Soil	07/25/2019	11:52	2400 D	178 D	480	193 D	0.482 U	10.8 D	446 D	1.12 JD	1.37 D	333 D	34700 D	9600 D
WR-NS-05	Total Recoverable Metals	Soil	07/25/2019	12:18	1110 D	91.2 D	156	184 D	0.477 U	3.31 D	227 D	1.01 JD	1.2 D	112 D	14900 D	3690 D
North Star Level 4	Total Recoverable Metals	Soil	9/24/2019	12:19	1510 D	98.3 D	225	236 D	0.994 U	3.36 D	154 JD	1.21 JD	0.825 D	198 D	27700 D	4430 D

STATION_ID	ANALYSIS	MATRIX	SAMPLE DATE	SAMPLE TIME	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
WR-NS-01	Total Recoverable Metals	Soil	07/25/2019	10:57	1100 D	153 D	1.91 D	1.34 D	1410 D	3.52 JD	82.3 D	137 JD	1.38 JD	11.8 D	1330 D
WR-NS-02	Total Recoverable Metals	Soil	07/25/2019	11:21	1140 D	397 D	0.53 D	1.19 D	2710 D	8.59 JD	24.4 D	207 JD	1.18 JD	45.9 D	696 D
WR-NS-03	Total Recoverable Metals	Soil	07/25/2019	11:38	1570 D	2900 D	0.24 D	2.8 D	4610 D	4.36 JD	37.3 D	366 JD	1.74 JD	17.7 D	605 D
WR-NS-04	Total Recoverable Metals	Soil	07/25/2019	11:52	812 D	207 D	0.36 D	1.13 D	2340 D	5.44 JD	89.1 D	120 U	1.24 JD	9.3 D	2090 D
WR-NS-05	Total Recoverable Metals	Soil	07/25/2019	12:18	379 D	174 D	0.75 D	0.953 JD	983 D	1.96 JD	42.5 D	119 U	0.955 U	4.02 D	660 D
North Star Level 4	Total Recoverable Metals	Soil	9/24/2019	12:19	485 D	107 D	1.27 JD	0.84 JD	1570 D	4.9 D	58.5 D	248 U	1.86 JD	7.03 D	775 D

U = Laboratory analysis indicates that the analyte was undetected at the concentration shown
J = Laboratory quality control review indicates that this result is considered estimated
D = Sample diluted prior to analysis; reported result is for undiluted sample

Table A.20. North Star Mine 2019 Pre-CERCLA Screening Mine Waste Sample In Vitro Bioaccessibility Assay and Corresponding Soil Sample Total Recoverable Metals Analytical Results.

STATION_ID	ANALYSIS	MATRIX	SAMPLE DATE	SAMPLE TIME	Arsenic	Arsenic	Arsenic	Lead	Lead	Lead
					mg/kg	% IVBA	% RBA	mg/kg	% IVBA	% RBA
WR-NS-01	Combined IVBA	Soil	07/25/2019	10:57	12.2	0.5	20	4900	18.2	13
WR-NS-02	Combined IVBA	Soil	07/25/2019	11:21	5.61	2.7	21	392	49.4	41
WR-NS-03	Combined IVBA	Soil	07/25/2019	11:38	11.7	1.9	21	45.9	8.3	4
WR-NS-04	Combined IVBA	Soil	07/25/2019	11:52	9.76	5.6	23	1200	1.4	2.0 U
WR-NS-05	Combined IVBA	Soil	07/25/2019	12:18	7.55	2	21	2850	12.5	8
North Star Level 4	Combined IVBA	Soil	9/24/2019	12:19	1.07	4.8	23	804	77.2	65

U = Laboratory analysis indicates that the analyte was undetected at the concentration shown

Table A.21 North Star Mine 2019 Pre-CERCLA Screening Mine Waste Sample Soil Synthetic Precipitation Leaching Procedure Soil Leachate Results.

STATION_ID	ANALYSIS	MATRIX	SAMPLE DATE	SAMPLE TIME	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper
					ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
WR-NS-01	SPLP	Soil	07/25/2019	10:57	240 B	30 U	2.4	145	0.18 B	11.7	7200	0.5 B	10 U	110
WR-NS-02	SPLP	Soil	07/25/2019	11:21	480	30 U	1.2	84	0.43	5.59	6500	0.5 U	10 U	190
WR-NS-03	SPLP	Soil	07/25/2019	11:38	230 B	30 U	0.3 B	31 B	0.25 B	2.38	5100	0.5 U	10 U	20 B
WR-NS-04	SPLP	Soil	07/25/2019	11:52	180 B	30 U	0.5 B	106	0.15 B	1.06	1700	0.5 U	10 U	40 B
WR-NS-05	SPLP	Soil	07/25/2019	12:18	140 B	30 U	0.8 B	142	0.11 B	2.34	1300	0.5 U	10 U	50
North Star Level 4	SPLP	Soil	9/24/2019	12:19	80 B	30 U	0.5 B	153	0.13 B	1.81	1500	0.5 U	10 U	60

STATION_ID	ANALYSIS	MATRIX	SAMPLE DATE	SAMPLE TIME	Iron	Lead	Magnesium	Manganese	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
					ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
WR-NS-01	SPLP	Soil	07/25/2019	10:57	40 B	8330	1200	380	8 U	0.1 B	1.4	0.2 B	5 U	2030
WR-NS-02	SPLP	Soil	07/25/2019	11:21	200	810	1100	2400	8 U	1	0.1 U	0.1 B	5 U	950
WR-NS-03	SPLP	Soil	07/25/2019	11:38	30 U	30 U	600 B	560	8 U	0.2 B	0.1 U	0.1 U	5 U	1030
WR-NS-04	SPLP	Soil	07/25/2019	11:52	30 U	380	300 B	250	8 U	0.2 B	0.6	0.1 B	5 U	180
WR-NS-05	SPLP	Soil	07/25/2019	12:18	30 U	1860	200 B	190	8 U	0.4	0.1 U	0.1 U	5 U	400
North Star Level 4	SPLP	Soil	9/24/2019	12:19	30 U	5050	200 U	130	8 U	0.5	0.4 B	0.1 U	5 U	340

B = Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity (same as a CLP laboratory J qualifier).
U = Laboratory analysis indicates that the analyte was undetected at the concentration shown

Table A.22. North Star Mine 2019 Pre-CERCLA Screening Mine Waste Sample Acid-base Accounting and Paste pH.

STATION_ID	ANALYSIS	MATRIX	SAMPLE DATE	SAMPLE TIME	Acid Generation Potential (calc on Sulfur total)	Acid Neutralization Potential (calc)	Acid-Base Potential (calc on Sulfur total)	Neutralization Potential as $CaCO_3$	pH, Saturated Paste	Sulfur HCl Residue	Sulfur HNO_3 Residue	Sulfur Organic Residual	Sulfur Pyritic Sulfide	Sulfur Sulfate	Sulfur Total	Total Sulfur minus Sulfate
					t $CaCO_3$/Kt	t $CaCO_3$/Kt	t $CaCO_3$/Kt	%	standard units	%	%	%	%	%	%	%
WR-NS-01	ABA Paste pH	Soil	07/25/2019	10:57	14.7	0	-14.7	0.1 U	4.7	0.2	0.02 B	0.02 B	0.18	0.27	0.47	0.2
WR-NS-02	ABA Paste pH	Soil	07/25/2019	11:21	22.5	0	-22.5	0.1 U	4.2	0.32	0.01 U	0.01 U	0.32	0.4	0.72	0.32
WR-NS-03	ABA Paste pH	Soil	07/25/2019	11:38	24.7	4	-20.7	0.4 B	5.3	0.42	0.01 B	0.01 B	0.41	0.37	0.79	0.42
WR-NS-04	ABA Paste pH	Soil	07/25/2019	11:52	21.6	1	-20.6	0.1 B	4.5	0.32	0.01 U	0.01 U	0.32	0.37	0.69	0.32
WR-NS-05	ABA Paste pH	Soil	07/25/2019	12:18	15.9	0	-15.9	0.1 U	4.7	0.3	0.02 B	0.02 B	0.28	0.21	0.51	0.3
North Star Level 4	ABA Paste pH	Soil	9/24/2019	12:19	14.4	0	-14.4	0.1 U	4.7	0.23	0.03 B	0.03 B	0.2	0.23	0.46	0.23

B = Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity (same as a CLP laboratory J qualifier).
U = Laboratory analysis indicates that the analyte was undetected at the concentration shown

North Star Mine High Flow Environmental Sampling Photographs (July 2019)

2019 Pre-CERCLA Screening

M32 Downstream

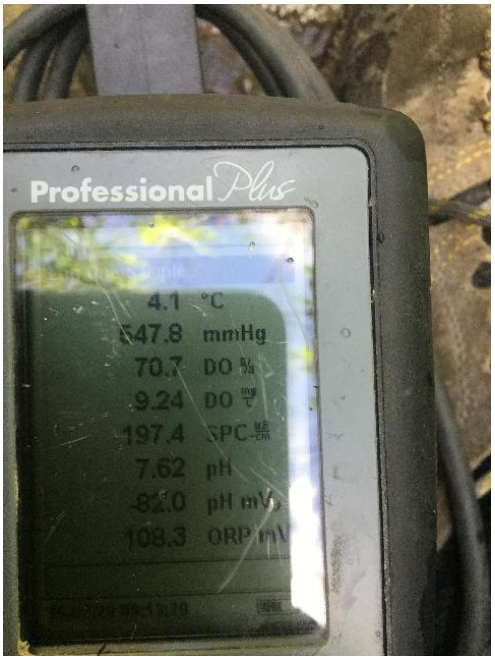
M32 Water Screen

M32 Upstream

M32B Downstream

North Star Mine High Flow Environmental Sampling Photographs (July 2019)

2019 Pre-CERCLA Screening



M32B Water Screenshot

M32B Upstream

M32C Downstream

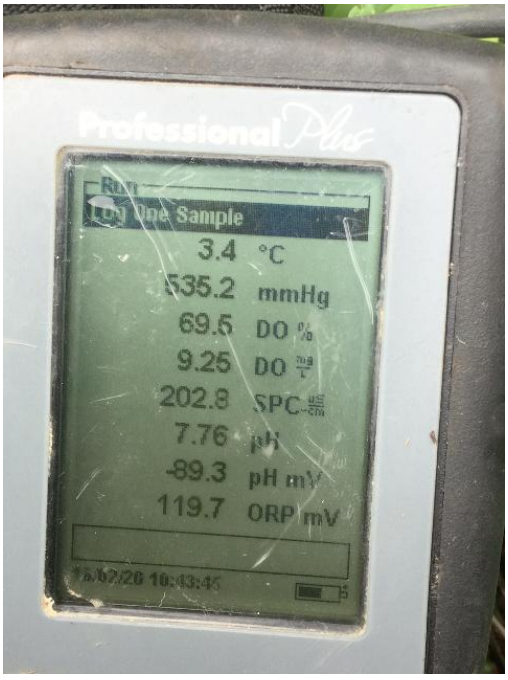
M32C Water Screenshot

North Star Mine High Flow Environmental Sampling Photographs (July 2019)

2019 Pre-CERCLA Screening

M32C Upstream

M32D Downstream



M32D Water Screenshot

M32D Upstream

North Star Mine High Flow Environmental Sampling Photographs (July 2019)

2019 Pre-CERCLA Screening

M33 Downstream

M33 Water Screenshot

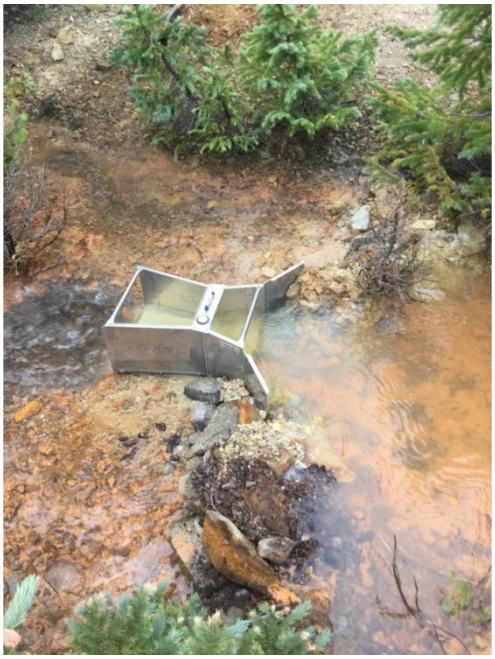
M33 Upstream

North Star Mine High Flow Environmental Sampling Photographs (July 2019)

2019 Pre-CERCLA Screening

NS7_1_DM Downstream

NS7_1_DM Flow Baski



NS7 1 DM Flume

NS7_1_DM Water Screenshot

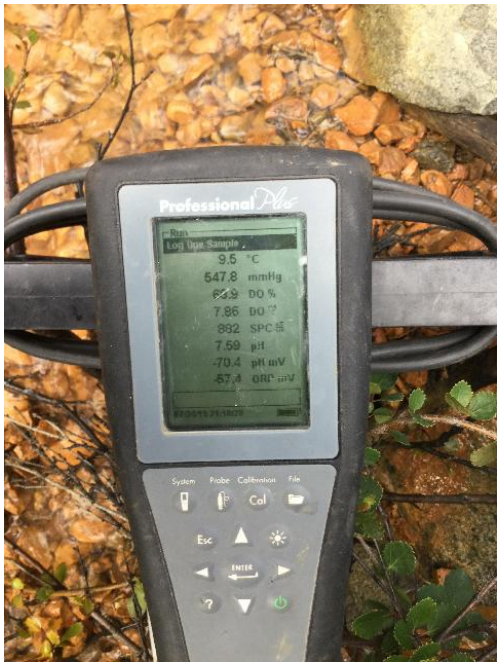
North Star Mine High Flow Environmental Sampling Photographs (July 2019)

2019 Pre-CERCLA Screening

NS7_1_DM Upstream

NS7_2_DM Downstream

NS7_2_DM Bucket



NS7_2_DM Water Screenshot

North Star Mine High Flow Environmental Sampling Photographs (July 2019)

2019 Pre-CERCLA Screening

NS7_2_DM Upstream

NS7_3_ DM Downstream

NS7_3 DM Flume

NS7_3_ DM Water Screenshot

North Star Mine High Flow Environmental Sampling Photographs (July 2019)

2019 Pre-CERCLA Screening

NS7_3_ DM Upstream

NS7_4_ DM Downstream

NS7_4_ DM Flume

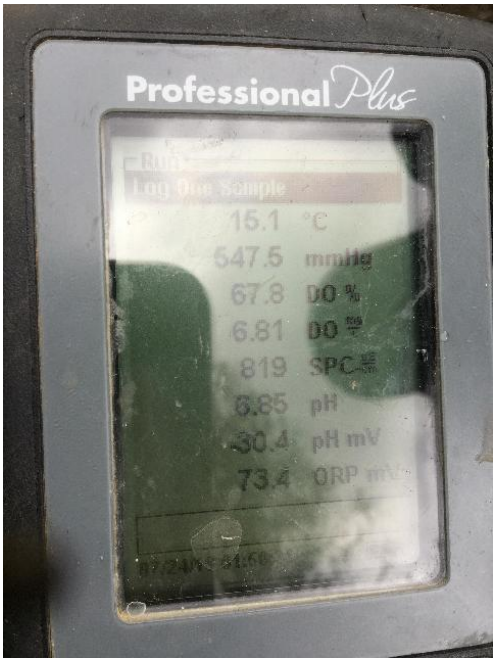
NS7_4_ DM Water Screenshot

North Star Mine High Flow Environmental Sampling Photographs (July 2019)

2019 Pre-CERCLA Screening

NS7_4_ DM Upstream

NSM-SW-OPP-01 Downstream



NSM-SW-OPP-01 Water Screenshot

NSM-SW-OPP-01 Upstream

North Star Mine Low Flow Environmental Sampling Photographs (September 2019)

2019 Pre-CERCLA Screening

M32 Downstream

M32 Red water, slow flow, adjacent, north of river

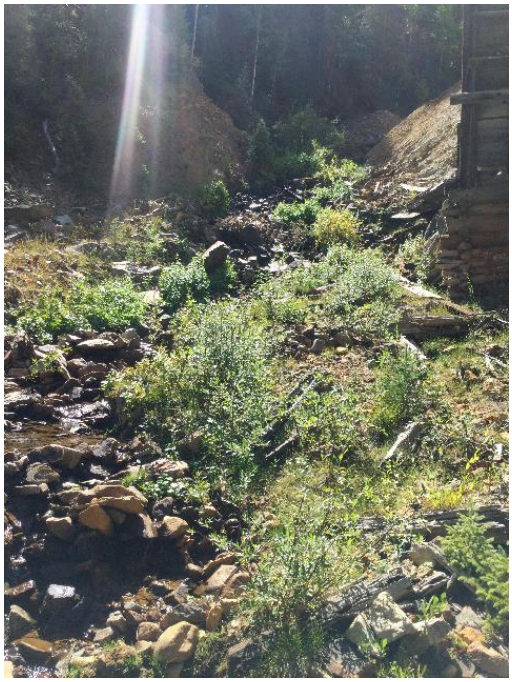
M32 Upstream

M32 Water Screen Shot

North Star Mine Low Flow Environmental Sampling Photographs (September 2019)

2019 Pre-CERCLA Screening

M32C Downstream



M32C Upstream

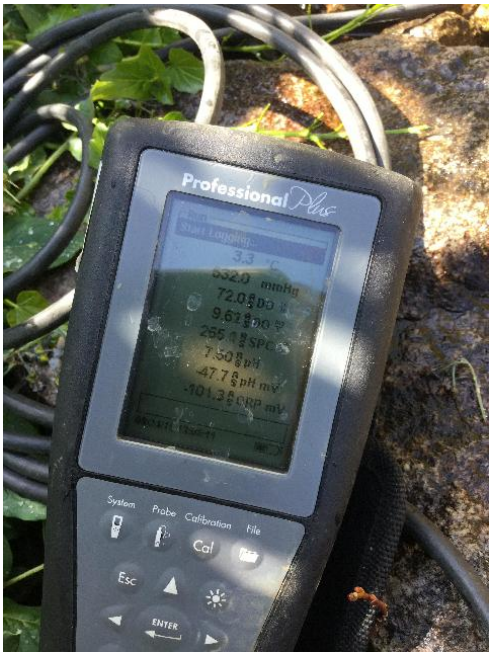
M32C Water Screen Shot

M32D Downstream

North Star Mine Low Flow Environmental Sampling Photographs (September 2019)

2019 Pre-CERCLA Screening

M32D Upstream



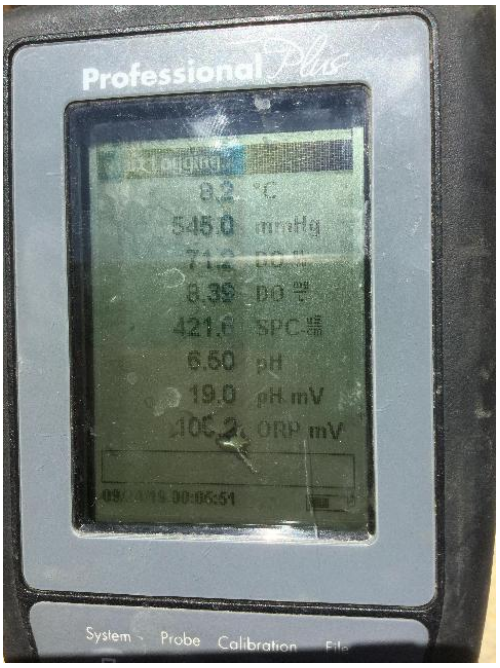
M32D Water Screen Shot

M33 Downstream

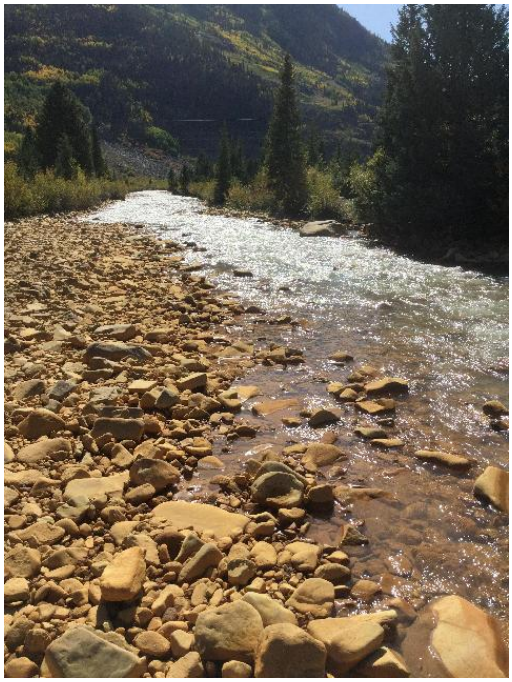
M33 Upstream

North Star Mine Low Flow Environmental Sampling Photographs (September 2019)

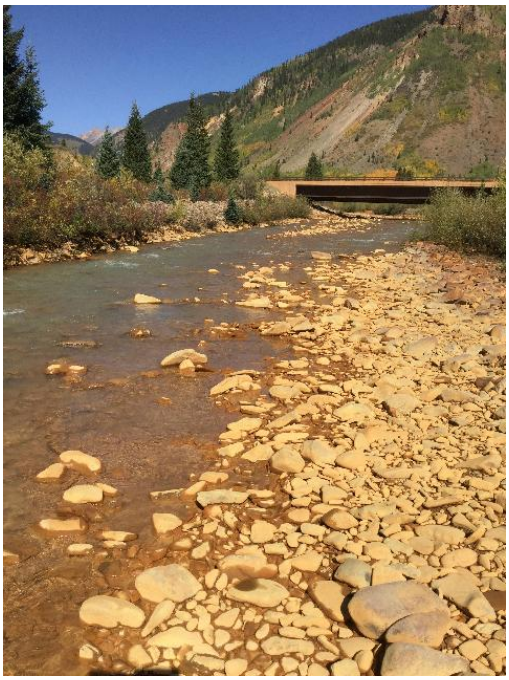
2019 Pre-CERCLA Screening



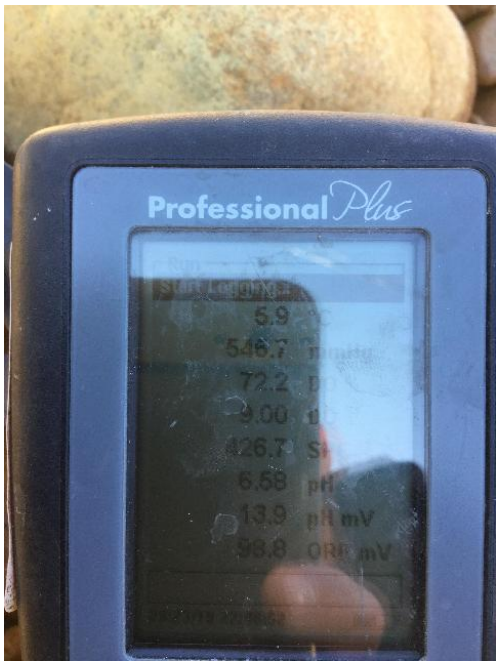
M33 Water Screen Shot



M34 Downstream



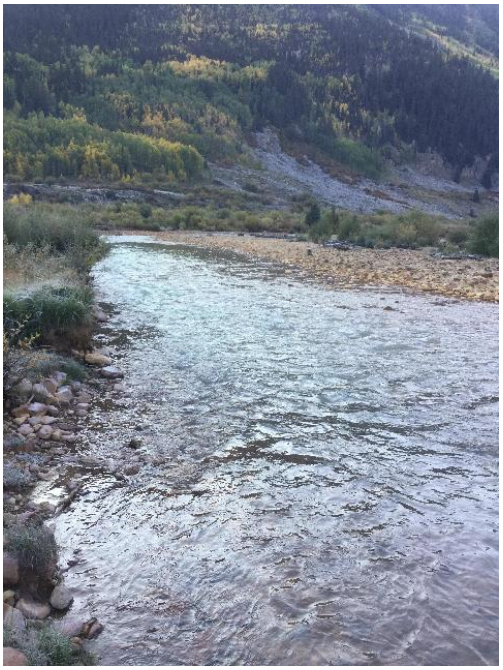
M34 Upstream



M34 Water Screen Shot

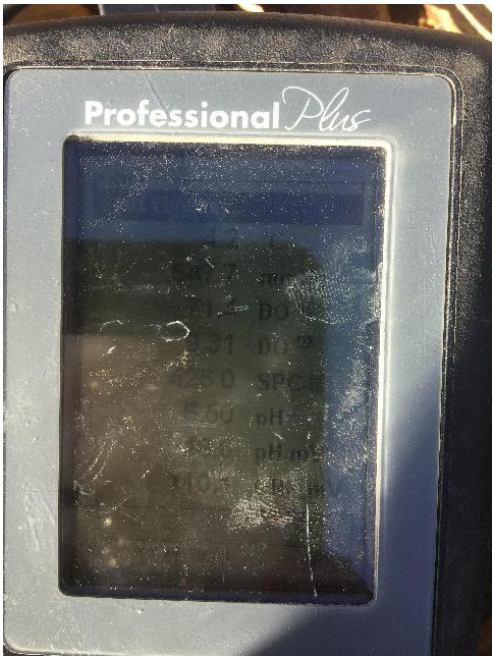
North Star Mine Low Flow Environmental Sampling Photographs (September 2019)

2019 Pre-CERCLA Screening



M38 Downstream

M38 Upstream



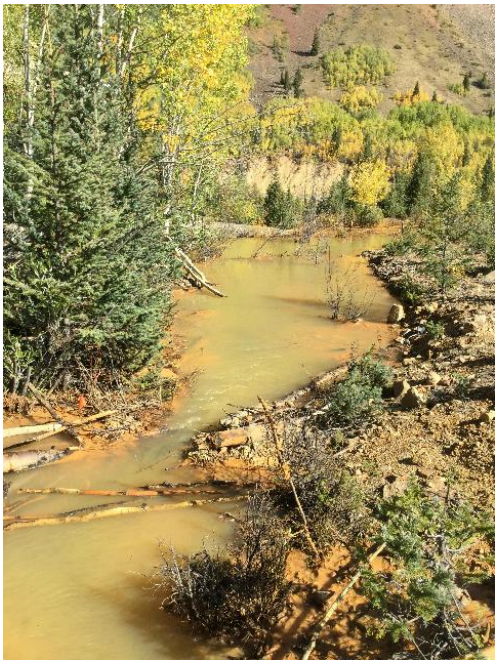
M38 Water Screen Shot

North Star Level 4 Downstream

North Star Mine Low Flow Environmental Sampling Photographs (September 2019)

2019 Pre-CERCLA Screening

North Star Level 4 Upstream



NS7_1_DM Downstream

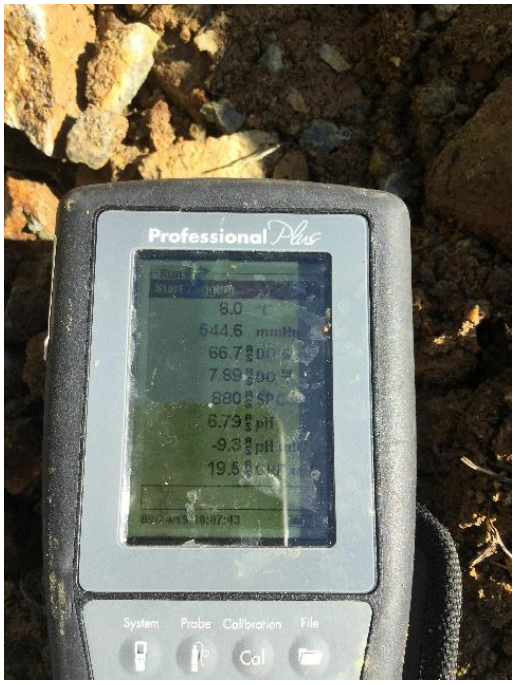
NS7_1 Flume

NS7_1_DM New location, main adit sample location just outside of tunnel

North Star Mine Low Flow Environmental Sampling Photographs (September 2019)

2019 Pre-CERCLA Screening

NS7_1_DM Upstream



NS7_1_DM Water Screen Shot

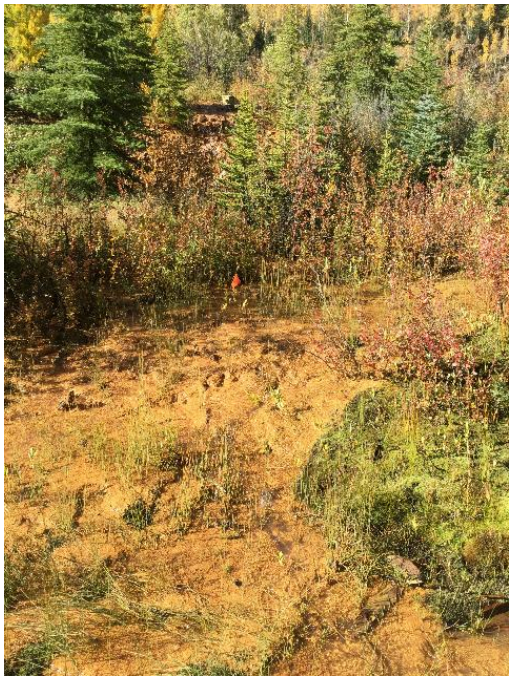
NS7_2_DM Downstream

NS7_2_DM Upstream

North Star Mine Low Flow Environmental Sampling Photographs (September 2019)

2019 Pre-CERCLA Screening

NS7_2_DM Water Screen Shot



NS7_3_ DM Downstream

NS7_3_ DM Flume

NS7_3_DM Upstream

North Star Mine Low Flow Environmental Sampling Photographs (September 2019)

2019 Pre-CERCLA Screening

NS7_3_DM Water Screen Shot

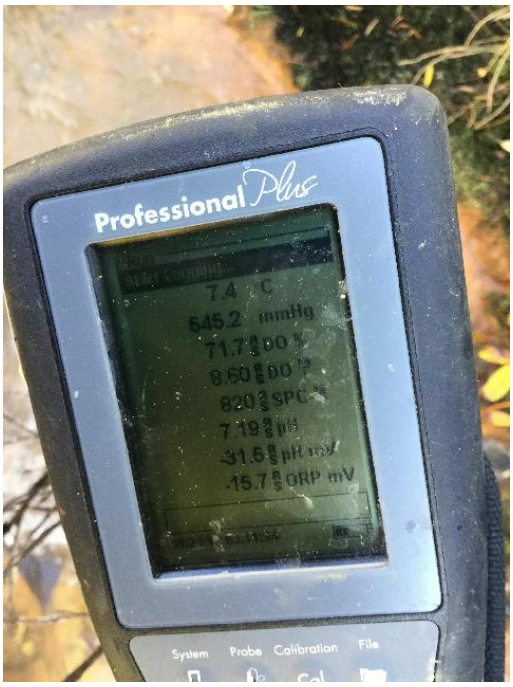
NS7_4_ DM Flume

NS7_4_ DM Overflow area

NS7_4_ DM Upstream

North Star Mine Low Flow Environmental Sampling Photographs (September 2019)

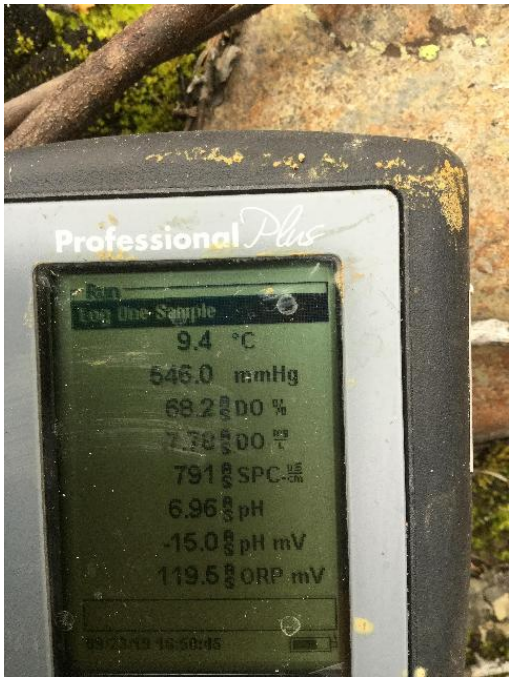
2019 Pre-CERCLA Screening



NS7_4_DM Water Screen Shot

NSM-SW-OPP-01 Downstream

NSM-SW-OPP-01 Upstream



NSM-SW-OPP-01 Water Screen Shot

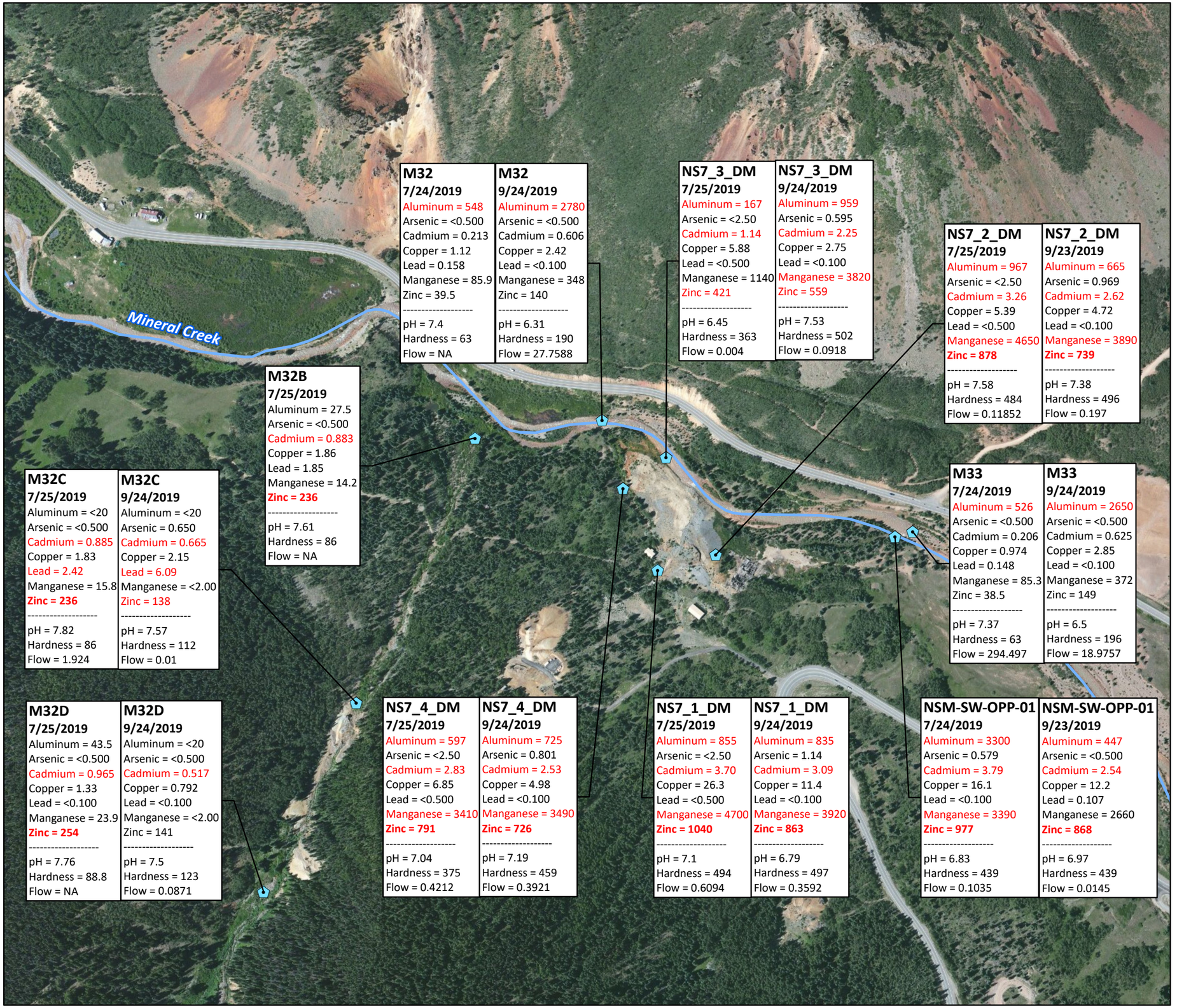


Figure A.3

North Star Mine, Silverton

Mineral Creek and Animas River

San Juan County, Colorado

2019 Pre-CERCLA Screening
July and September 2019
Surface Water Sample Locations/Key Results*

Surface Water Sample Locations
Dissolved Metals: units = µg/L
Total Recoverable Aluminum: units = µg/L
Flow: units = cfs
pH: units = standard units
Hardness: units = mg of $CaCO_3$/L

Streams

*RED font indicates an exceedance to a hardness-based CO Department of Public Health and Environment (CDPHE) Regulation 31 Chronic Water Quality Standard.

RED BOLD font indicates an exceedance to both an acute and chronic Water Quality Standard (CDPHE Regulation 31).

CDPHE Reg 31: https://www.colorado.gov/pacific/sites/default/files/31_2018%2801%29.pdf

Date: May 11, 2020
Map Projection: UTM Zone 13N, WGS84, Meters
Data Sources:
Streams: *CDOW* (2004);
Sample Locations & Analytical Results: *U.S. EPA* (2019);
Base Map: *Esri World Imagery (Clarity) Web Service* (2020).

0 500 1,000 Feet

Area Enlarged

Figure A.4

North Star Mine, Silverton

Mineral Creek and Animas River
San Juan County, Colorado

2019 Pre-CERCLA Screening
July and September 2019
Soil Sample Locations/Key Results*

Composite Soil Sample Locations
Streams

EPA Regional Screening Levels (mg/kg)

	Arsenic	Copper	Lead	Manganese	Zinc
Residential	0.68	3,100	400	1,800	23,000
Industrial	3.0	47,000	800	26,000	350,000

*RED font indicates an exceedance of EPA Regional Soil Screening Levels (RSLs).

https://semspub.epa.gov/work/HQ/199626.pdf

Note: Results only shown for key metals; consult Table A.19 for a listing of all total metals results.

Date: May 11, 2020
Map Projection: UTM Zone 13N, WGS84, Meters
Data Sources:
Streams: *CDOW* (2004);
Sample Locations & Analytical Results: *U.S. EPA* (2019);
Base Map: *Esri World Imagery (Clarity) Web Service* (2020).

0 500 1,000 Feet